AGENDA ITEM or FINAL CONTRACT REVIEW SUBMITTAL FORM

Agenda Item: Discussion; Re: Submission of Comments by the Gunn

Action Requested: Discussion

Parties to the Agreement:

Term Begins: **Term Ends:** **Grant Contract #:**

Summary:

Discussion Re: North Fork Oil & Gas Lease

Fiscal Impact:

Submitted by: Liz Mense **Submitter's Email Address:** EMense@gunnisoncounty.org

Finance Review: ○ Required ◉ Not Required

Comments:

Reviewed by: Discharge Date:

County Attorney Review: ◉ Required ○ Not Required

Comments:

Reveiwed by: GUNCOUNTY1\mhoyt Discharge Date: 8/31/2018 Certificate of Insurance Required Yes ○ No ◉

County Manager Review:

Comments:

Reveiwed by: GUNCOUNTY1\emense Discharge Date: 8/31/2018

○ Consent Agenda ◉ Regular Agenda ○ Worksession Time Allotted: 10

Agenda Date: 9/4/2018

Revised April 2015

Gunnison County
COLORADO

Gunnison County Board of County Commissioners
Phone: (970) 641–0248 • Fax: (970) 641–3061
Email: bocc@gunnisoncounty.org • www.GunnisonCounty.org

Gloria Tibbets
Field Manager
Bureau of Land Management
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

VIA ELECTRONIC SUBMISSION ONLY

July 17, 2018

Dear Ms. Tibbets,

On behalf of the Board of County Commissioners of the County of Gunnison, Colorado ("BOCC"), we submit the following preliminary comments to the Bureau of Land Management's ("Bureau's") proposed December 6, 2018 oil and gas lease sale of eight parcels within the management of the Uncompahgre Field Office ("UFO") in the State of Colorado.[1] Except as otherwise indicated or to the extent the proposed lease sale involves land, water, or other resources within or affecting Gunnison County, the BOCC's comments are limited to the following parcels: 8320, 8351, and 8140.[2] In particular, the BOCC acknowledges its partnership and cooperation with Delta County, Colorado and other members of the North Fork Coal Mine Methane Working Group, respecting that Delta County and other members of the group are important stakeholders in this process who may have additional or different comments regarding the proposed lease sale, particularly with regard to those portions of the proposed lease sale that do not implicate Gunnison County or its citizens. Nothing in the BOCC's comments should be construed as speaking for or against such interests, or as to those matters that exist outside or that do not affect Gunnison County.

At this time, the BOCC provides the following initial comments:

1. The BLM Has Not Identified the Economic Need for a Lease Sale at this Time, Particularly if the Proposed Sale Includes Development of Coalbed Methane as Opposed to Just Coalmine Methane Gas.

The BOCC recognizes that natural gas development is an important part of Colorado's economy and affords economic development opportunities within Gunnison County. Natural gas is a valuable resource that should be extracted in a manner that both permits economic opportunities for the County's citizens and also protects public health, safety, wildlife, tourism and recreation, scenic resources, light and noise pollution, agricultural uses, water quality, and the environment.

[1] The BOCC also submits with this letter maps that help illustrate these comments and provide the BLM information available to Gunnison County regarding the proposed lease sale.
[2] We note that proposed parcel 8135 crosses into Gunnison County. Thus, the comments set forth in this letter would apply to that parcel as well.

200 East Virginia Avenue • Gunnison, CO 81230

At the same time, natural gas prices remain historically low and are predicted to remain so until 2019, thus raising the question of whether it makes sense to develop additional natural gas resources at present. *See* United States Energy Information Administration, "EIA expects 2018 and 2019 natural gas prices to remain relatively flat", *available at* www.eia.gov/todayinenergy/detail.php?id=34672. Moreover, Colorado Oil and Gas Conservation Commission data reveals very few active producing wells within the proposed lease area (at least within Gunnison County), suggesting that there is little need for new wells in this location. *See* www.cogccmpa.state.co.us/cogcc_gis_online. Accordingly, the BLM should explain why the proposed lease sale is economically prudent at this time. This is particularly the case because in February 2013, the BLM elected to defer a similar proposed lease sale covering parcels that are similar to or perhaps part of the present proposed sale in order to address concerns raised by local residents and communities, including Gunnison County. Thus far, Gunnison County has not received any information from the BLM about why the agency believes the 2013 deferred lease sale should be revived at this time, particularly in light of current economic conditions.

The Gunnison BOCC encourages the lease sale to the extent it results in the development of recoverable coalmine methane, or methane recovered from coal mine operations. As the BLM is likely aware, Gunnison County has consistently supported the exploration of methods to safely, economically and effectively recover methane from active and inactive coal mines, particularly in the North Fork Coal Mining Area. In conjunction with Delta County, Gunnison County has convened a North Fork Coal Mine Methane Working Group which is comprised of stakeholders from industry, conservation, land management agencies and local, state and federal government with the mission to support coal mines and the surrounding communities in the North Fork Valley through the development of a comprehensive strategy for education, capture, exploration of mitigation, and economic utilization of coal mine methane. That group has been meeting for almost a year and has developed a robust discussion on various issues, barriers and technologies available for capture, mitigation and utilization of coal mine methane in both active and inactive mines. We ask the BLM to take appropriate steps to ensure that any lease sale encourages the work that this group has conducted in developing a coal mine methane capture and utilization implementation strategy which could include economic utilization and mitigation strategies such as electricity generation, scrubbing and piping and heat generation. In addition, Gunnison County recognizes that, so long as consistent with air and water quality requirements, methane mitigation can occur through methods such as flaring. Thus, Gunnison County would support the development within the proposed lease sale of coal mine methane extraction to the extent it makes economic sense and is consistent with sound management principles and considerations, including the comments that appear in this letter.

With regard to coalbed methane natural gas ("CBM"), however, Gunnison County is not presently aware of the need for exploration and drilling of additional CBM wells in the proposed lease sale area, particularly given the economic conditions described above. Therefore, the BLM should limit the proposed lease sale to economically viable and environmentally responsible coal mine methane extraction and not lease lands for CBM development at this time, unless the BLM can explain and demonstrate to the satisfaction of stakeholders the economic viability of new CBM wells within the proposed leasing area consistent with prudent and responsible operation parameters that take into account at least the issues outlined in this letter.

2. The BLM Should Include Compliance with Gunnison County's Regulations Regarding Oil and Gas Development as a Mandatory Lease Term.

As the BLM is likely aware, Gunnison County has the authority to protect and promote the health, welfare and safety of the people of Gunnison County, and the authority to regulate land use planning and quality and protection of the environment in the County. To this end, Gunnison County has adopted regulations to exercise such authorities including the review, approval or denial of proposed activities and uses of land and natural resources. To the extent the BLM proceeds with the proposed lease sale, it is critical for the BLM to include compliance with all Gunnison County regulations regarding oil and gas exploration, development, operation, and upstream activities as a mandatory lease term in any lease of parcels within the proposed lease area. In addition, the BLM should include a requirement that any lessee comply with any other land use or environmental regulation imposed by Gunnison County that in any way relates to operations on the leasehold, including but not limited to water quality, public roads, emergency response, wildlife concerns, agricultural uses and recreation uses.

3. The BLM Should Ensure that the Proposed Lease Sale Complies with Any Current Resource Management Plan and any Future Plan Adopted During Any Lease Term.

In 2016 the BLM published a proposed Resource Management Plan for the Uncompaghre Field Office that Gunnison County understands includes lands within the proposed lease sale. That RMP recognized, among other things, the critical importance of proper protection and management of "terrestrial and aquatic habitat, water resources, and special management areas, while maintaining biological diversity and native species populations." *See* United States Department of the Interior, Bureau of Land Management, *Uncompaghre Field Office Draft Resource Management Plan and Environmental Impact Statement* (May 2016). Accordingly, the BLM should ensure compliance with the current RMP and also take all necessary steps to ensure that the present proposed RMP, if adopted, be incorporated into the management practices for the natural gas development associated with the proposed lease sale. Further, should BLM adopt any future RMP covering the proposed lease area during the term of any lease that results from the current proposal, that RMP should be applied to such lease(s).

4. The BLM Should Consider Any Potential Impacts to the Paonia Reservoir, Muddy Creek, Deep Creek and Henderson Creek.

Proposed lease areas 8351 and 8320 are close to Muddy Creek and Paonia Reservoir, and part of 8351 bisects Deep Creek that feeds into the Reservoir. The BLM should ensure that any natural gas development in these areas do not negatively impact this important water supply, such as water contamination from drilling operations, fracking, and road and wellpad stormwater runoff.

In addition, proposed lease area 8140 bisects part of Henderson Creek, which is a popular fishing spot. Recreational opportunities such as this one should be protected from excessive visual impacts, noise and air pollution associated with natural gas operations.

With regard to these water and other natural resources within the proposed lease area, the BLM should consider whether to require no surface occupancy ("NSO") stipulations in any lease proximate to such resources in order to afford them at least some protection from development.

This does not mean that in the opinion of the BOCC, NSOs are the only potential issue the BLM should consider with regard to how it protects water and other natural resources. For example, the BLM should carefully consider whether any directional drilling, wastewater disposal or fracking techniques could place these resources at risk through subsidence, seismic disturbance or groundwater pollution.

5. The BLM Should Expressly Identify and Address Potential Wildlife Impacts

It does not appear to Gunnison County that BLM has specifically identified the wildlife species that could be impacted by development on the proposed lease parcels and the scope and extent of that potential impact. The County understands that there may be as many as 40 different wildlife species that could be affected by natural gas exploration, drilling, operations and infrastructure on the proposed lease parcels. They include the Bald Eagle, Peregrine Falcon, Elk, Mountain Goat, Moose, Mule Deer and Wild Turkey. Although these species are not necessarily threatened or endangered, the BLM should take steps to ensure protection of their habitat, range, and food sources from the proposed development, including but not limited to conducting a comprehensive wildlife analysis across the entirety of the potentially effected terrain seasonably in advance of the proposed lease sale.

6. The BLM Should Take Steps to Minimize any Potential Visible Impacts and Noise and Light Pollution.

Parcels 8351 and 8320 are in proximity to Highway 133, which is a designated portion of the West Elk Loop Scenic Byway and as such draw considerable economic income to Gunnison County from tourism. In addition to the visual impacts that natural gas development inevitably creates, exploration, drilling, operation, production and post production of natural gas all negatively affect ambient noise and light levels that are important part of the scenic beauty of this area of the County. The BLM should take appropriate states to prevent or at least minimize the visual and auditory effects that will likely arise from the proposed lease sale.

7. The BLM Should Consider Extending the Comment Period for the Proposed Lease Sale.

The BLM provided only a 15-day initial comment period for the proposed lease sale, and one of the 15 days was a federal holiday and one of the busiest parts of the summer tourist season in the Gunnison Valley. Accordingly, many of Gunnison County's citizens may not have been afforded adequate time to submit comments. For this reason, the BOCC requests the BLM extend the initial comment period for at least an additional 15 days.

Conclusion

In conclusion, the BOCC appreciates the opportunity to provide initial comments to the proposed lease sale, and reiterates its recognition of and commitment to economically viable and

environmentally responsible natural resources development on lands within Gunnison County. Please do not consider the foregoing an exhaustive list of all of the BOCC's comments or concerns regarding the proposed lease sale; the BOCC expressly reserves the right to fully participate in this process, including but not limited to submission of additional comments as the process progresses.

We appreciate your consideration. Thank you.

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF GUNNISON, COLORADO

By:	By:	By:
Phil Chamberland	Jonathan Houck	John Messner
Chairperson	Vice Chairperson	Commissioner

Enclosures

North Fork Valley
December 2018 Oil and Gas Lease Sale
Fact Sheet

On July 2, 2018 the Bureau of Land Management announced an oil and gas lease sale for the State of Colorado and the North Fork Valley.

Background
In 2011 and 2012, the BLM proposed a 30,000-acre and 20,000-acre lease sale in the North Fork Valley. The BLM deferred those lease sales until the revised Resource Management Plan for the Uncompahgre Field is complete, in recognition of the fact that the current RMP is stale and does not provide for adequate protections or considerations. In 2016, the BLM released its draft Resource Management which included no-leasing, no surface-occupancy, controlled surface occupancy and other stipulations. The final Environmental Impact Statement on the RMP is scheduled to come out in Fall 2018, with a Record of Decision in Spring 2019. The BLM's Uncompahgre Field Office had a policy of deferring oil and gas leasing until the revised RMP is completed. Then the Trump Administration pushed new guidance in early 2018, which eliminated routine leasing deferrals and the discretion of state offices by strongly recommending that the State Office consult with the Washington office before deferring any lease parcels. In addition this new guidance made it clear that BLM policy was no longer to wait for completion of a revised RMP.

The Lease Sale in the North Fork Valley

- 8 parcels totaling 7903 acres around Paonia Reservoir, in the Muddy Creek and Hubbard Creek Watersheds, and over Bowie#2 coal mine
    - 1206.89 acres around Paonia Reservoir (15% of the sale acreage)
    - 5072.49 acres over Bowie #2 mine (64% of the sale acreage)
    - 1623.66 acres in the Muddy Creek and Hubbard Creek watersheds (21% of the sale acreage)
- All parcels nominated by Gunnison Energy
- 81% of lease sale acreage in Delta County; 19% in Gunnison County

Issues:

- **Leasing is the most important stage in the oil and gas development process! A federal oil and gas lease conveys an *absolute right to develop*. Once the lands are leased, the developer has a virtually guaranteed right to drill and produce those minerals.**

- **Parcels 8140, 8135, 8138:** Muddy Creek and Hubbard Creek Watersheds, which feed some of the North Fork Valley's most important irrigation and drinking water sources such as the Fire Mountain Canal, are at risk.

- **Parcels 8320, 8351:** These parcels surrounding the Paonia Reservoir are in one of the most geologically unstable regions in the State, which witnessed the largest mudslide in the country, and Hwy 133 has regular problems with rockfalls.

    - There are already injection wells in the area that may be correlated with recent earthquakes near Carbondale (2.8 magnitude on January 19th, 2017 28 km S of Carbondale; 1.6 magnitude on January 19th 26 km S of Carbondale) and Paonia (3.5 magnitude on July 23, 2016 7 km NE of Paonia). The parcels around Paonia Reservoir are dangerously close to the dam. Canadian researchers have found that

fracking results in induced seismicity and recommend a 3-mile buffer around sensitive infrastructure such as dams and reservoirs. These parcels are within that recommended buffer.

- **Parcels 8389, 8390, 8391:** These parcels are over Bowie #2 coal mine. BLM has not analyzed the geological implications, or safety implications of the intersection of coal mines and oil and gas drilling.
- **North Fork Valley farms are the organic breadbasket of Colorado.** North Fork farms stand as a safety net against currently at risk or likely contaminated farms in Colorado. Four of the top agricultural producing counties in the State also four of the top natural gas producing counties in the state. Delta County is the 5th largest agricultural producing county with 1250 farms.
- **Rural gas gathering pipelines are exempt from county, state, and federal oversight,** and the BLM should impose a moratorium on oil and gas leasing and development until the safety of rural gas gathering pipelines can be independently monitored and inspected.
- **The RMP is scheduled to be completed in Spring 2019** and currently has no-leasing, and other important stipulations that conflict with and would otherwise limit or reject these proposed lease parcels.

This proposed lease sale is irresponsible, unnecessary, and dangerous.

This is a complex proposal with significant implications, which merits careful and rigorous review of its cumulative impacts including headwaters, fish and wildlife, recreation, local economy, geological stability, road repair and safety, air quality, seismic activity, and public health.

BLM is seeking scoping comments to inform its Environmental Assessment analyzing the proposal. **The comment deadline is July 17, 2018.**

- Scoping is the first step. The BLM will have a comment period on the preliminary EA from August 27 – September 11th, and then a final protest period from October 22nd – November 1st.

Send comments to the BLM:

- Opposing this lease sale.
- Requesting that BLM withdraw these leases from the December 2017 sale.
- Reminding the BLM that 42,000 no-leasing comments were submitted on the RMP because, a no-leasing alternative is the only way to guarantee that this irreplaceable corner of Colorado is not irreparably harmed.

You can send your comments to:
Acting State Director Greg Shoop: gshoop@blm.gov
Southwest Colorado District Manager Stephanie Connolly: sconnolly@blm.gov
Uncompahgre Field Manager Greg Larson: glarson@blm.gov

Citizens for a Healthy Community

www.chc4you.org

Finding of No Significant Impact (FONSI)

DOI-BLM-CO-N040-2018-0075-EA

Based on review of the Environmental Assessment (EA) and the supporting documents, I have determined that the proposed oil and gas lease sale would not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects from any alternative assessed or evaluated meet the definition of significance in context or intensity, as defined by 43 CFR 1508.27, nor do they exceed those effects as described in the Uncompahgre Basin Resource Area Management Plan and Record of Decision (UBRA RMP/ROD), approved July 26, 1989, or the analysis performed by Uncompahgre Field Office (UFO) resource specialists during preparation of the draft Environmental Impact Statement (EIS) for the new RMP currently in progress. Therefore, an EIS is not required for the December 2018 oil and gas lease sale. This finding is based on the context and intensity of the action as described below, and on the protective lease stipulations listed and described in Attachments C and D of the EA.

Context

The five UFO proposed parcels analyzed in detail in the EA are located in the general area known as the North Fork Valley, which includes the valley of the North Fork Gunnison River in Delta and Gunnison counties, Colorado; the valley of Muddy Creek, which joins Anthracite Creek to form the North Fork Gunnison River below the Paonia Dam and Reservoir; and uplands extending northward and westward from State Highway 133 between Hotchkiss, Colorado, and McClure Pass. The area within which the parcels are located consists of undulating to steeply dissected terrain dominated by foothills shrublands, montane shrublands and woodlands, and areas of subalpine aspen and conifers, with riparian communities along perennial streams.

Oil and gas development has been ongoing at a relatively modest scale in the area for a few decades, but recent advancements in drilling and development technologies, and discovery of large volumes of natural gas in some previously untapped formations, has caused greatly expanded interest in the underlying Federal fluid minerals. The general area surrounding the parcels includes all or part of multiple Federal oil and gas units that have been the target of extensive planning for oil and gas projects, and with some initiation of recently approved projects.

The area is known for its scenic quality, recreational opportunities, wildlife resources, water resources, and agriculture, including organic farming. The area was historically important as a source of high-quality coal shipped from underground coalmines along the North Fork valley floor to utilities and other industries across many states. While greatly reduced from historic levels, underground coalmining continues in the area.

Intensity

The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27 and incorporated into resources and issues considered (includes supplemental authorities Appendix 1 H-1790-1) and supplemental Instruction Memorandum, Acts, regulations and Executive Orders. The following have been considered in evaluating intensity for this proposal:

Impacts that may be beneficial and adverse: There are no direct impacts to resources from the act of leasing. The EA identifies indirect impacts from leasing as a result of potential future impacts from development of those leases at the Application for Permit to Drill (APD) stage. None of the environmental effects associated with offering the proposed lease parcels for sale, as discussed in detail in the EA, were determined to be significant, nor do the effects exceed those described in the 1989 UBRA RMP/ROD or analyzed in the draft EIS recently prepared for the UFO RMP revision currently in progress.

Public health and safety: If the parcels are sold and the leases enter into a development stage, public health and safety would be addressed by following lease stipulations derived from the analysis in the Draft RMP/Draft EIS for the UFO RMP revision, health and safety regulations, and conditions of approval imposed as required following site-specific analysis.

CO-56-Supplementary Air Analysis
UFO-NSO-Occupied Dwellings
UFO-NSO-Public Water Supplies
UFO-CSU-Public Water Supplies
UFO-NSO-Steep Slopes (>40%)
UFO-CSU-Steep Slopes (30-39%)

Unique characteristics of the geographic area: The EA evaluated the area of the preferred alternative's proposed lease sales and determined that no areas with unique geographic characteristics such as Wild and Scenic Rivers, Prime or Unique Farmlands, Areas of Critical Environmental Concern, designated Wilderness areas, or Wilderness Study Areas were present. However, the air quality analysis in the EA addresses Air Quality Related Values (AQRVs), including visibility and deposition of nitrogen and sulfur at the nearby Raggeds, Maroon Bells-Snowmass, and West Elk Wilderness areas.

Degree to which effects are likely to be highly controversial: The majority of the public opinions expressed in the North Fork area have expressed opposition to the proposed new leasing and to existing oil and gas operations in the project vicinity. However, the current RMP designated the area as open to oil and gas leasing and development, and the proposed parcels are within or near multiple Federal oil and gas units for which multiple development projects have been approved through previous NEPA analysis decisions.

Degree to which effects are highly uncertain or involve unique or unknown risks: The lease sale is not unique or unusual. Oil and gas leasing and post-lease development have been ongoing in the United States, including the affected portions of Delta and Gunnison counties, for many years. The BLM has experience implementing similar actions in similar areas. The environmental effects to the human environment are considered in the corresponding UBRA RMP/FEIS and in the Draft RMP/EIS recently prepared by UFO resource specialists. Oil and gas exploration and drilling operations are regulated for health and safety through other agencies of local, State, and Federal governments. There are no predicted effects on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

Consideration of whether the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. This project neither establishes a precedent nor represents a decision in principle about future actions. The leasing of Federal minerals, and more specifically fluid minerals, has been occurring since the creation of the Mineral Leasing Act of 1920. A decision to lease would not limit later resource management decisions for areas open to development proposals.

Consideration of whether the action is related to other actions with cumulatively significant impacts: The EA did not identify any significant cumulative effects beyond those already analyzed in the UBRA RMP/FEIS and the analysis in the Draft EIS recently prepared by the UFO for its RMP revision. The interdisciplinary team evaluated the lease sale in context of past, present, and reasonably foreseeable actions.

Scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places: Because the proposed lease sale does not involve ground disturbance, the proposed undertaking will have no effect on historic properties. Any future development of parcels that are purchased as a result of the lease sale would be subject to additional Section 106 compliance, including identification, effects assessment, and, if necessary, resolution of adverse effects.

This requirement is outlined in lease stipulations CO-39 and UFO-CSU-Cultural Resources, which are attached to each lease parcel.

Threatened and endangered species and their critical habitat: All lease parcels are stipulated to protect resources if they potentially contain habitat for Federally listed, proposed, or candidate threatened or endangered plant or animal species, or other special status plant or animal species (CO-34), alerting operators as to the potential for future restrictions on development if such species and/or habitat is found on the parcel. Any site-specific analysis indicating potential impacts to a Federally listed, proposed, or candidate threatened or endangered species would require consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act. This would include the Green Lineage Colorado River cutthroat trout, to which stipulations UFO-NSO-Native Cutthroat Trout and UFO-CSU-Native Cutthroat Trout would apply. In addition, any future site-specific projects would require conformance to conservation measures for four species of endangered fish species under a 2017 Programmatic Biological Opinion.

Any effects that threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment: The proposed action under the preferred alternative does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment. In addition, the proposed action is consistent with applicable land management plans, policies, and programs.

PREPARER: Allen Crockett

ENVIRONMENTAL COORDINATOR: Gina Phillips

FIELD MANAGER REVIEW: _____
Greg Larson, Field Manager
Uncompahgre Field Office

DATE SIGNED: _____

SIGNATURE OF AUTHORIZED OFFICIAL: _____
Suzanne Mehlhoff, Deputy State Director
Division of Energy, Lands, and Minerals

DATE SIGNED: _____

United States Department of the Interior
Bureau of Land Management

Preliminary Environmental Assessment for the December 2018 Competitive Oil & Gas Lease Sale Uncompahgre Field Office

---

Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

Uncompahgre Field Office
2465 South Townsend Avenue
Montrose, Colorado 81401

DOI-BLM-CO-N040-2018-0075-EA

August 27, 2018

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION 1
1.1 Background 1
1.2 Project Location and Legal Description 2
1.3 Purpose and Need 2
1.4 Decisions to be Made 2
1.5 Public Participation 2
1.5.1 Scoping 2
1.5.2 Public Comment Period 6
CHAPTER 2 - ALTERNATIVES 6
2.1 Introduction 6
2.2 Alternatives Analyzed in Detail 6
2.2.1 No Action Alternative 6
2.2.2 Preferred Alternative 6
2.3 Alternative Considered but Not Analyzed in Detail 7
2.4 Plan Conformance Review 8
CHAPTER 3 – AFFECTED ENVIRONMENT AND EFFECTS 9
3.1 Introduction 9
3.2 Environmental Consequences of the No Action Alternative 9
3.3 Past, Present, and Reasonably Foreseeable Future Actions 10
3.4 Environmental Consequence of Leasing and Potential Development 14
3.4.1 Air Quality and Climate Change 15
3.4.2 Cultural Resources and Native American Religious Concerns 23
3.4.3 Geology 26
3.4.4 Noise 28
3.4.5 Paleontological (Fossil) Resources 30
3.4.6 Ranching and Livestock Management 31
3.4.7 Recreation 32
3.4.8 Socioeconomics 34
3.4.9 Soils 39
3.4.10 Threatened or Endangered Species 40
3.4.11 Transportation 45
3.4.12 Vegetation – Upland, Riparian, Wetland, and Invasive Non-native 47
3.4.13 Visual Resources 49
3.4.14 Wastes – Hazardous or Solid 52
3.4.15 Water Quality – Surface Water and Groundwater 55
3.4.16 Wildlife – Aquatic and Terrestrial 62
CHAPTER 4 – COORDINATION AND CONSULTATION 65
CHAPTER 4 – REFERENCES 66

ATTACHMENTS

Attachment A – All Nominated Parcels/Proposed Action with Stipulations for Lease
Attachment B – Parcels Removed from the Lease Sale
Attachment C – Preferred Alternative Parcels with Stipulations for Lease
Attachment D – Stipulation Exhibits
Attachment E – Maps
Attachment F – Summary of Public and Interagency Scoping Comments

MAPS

Map 1. Five Proposed UFO Parcels in Relation to the Cumulative Effects Analysis Area 3

TABLES

Table 1. Past, Present, and Reasonably Foreseeable Future Actions (RFFAs) in the Cumulative Effects Analysis Area (CEAA) 10
Table 2. CARMMS 2.0 High Scenario New Federal Emissions (TPY) [1] 20
Table 3. CARMMS 2.0 High Scenario Annual Nitrogen Deposition -- UFO 20
Table 4. CARMMS 2.0 High Scenario Visibility Changes – UFO 20
Table 5. COGCC Maximum Permissible Noise Levels 29
Table 6. Listed or Proposed Threatened or Endangered Species Present or Potentially Affected by Potential Future Oil and Gas Development 41
Table 7. Designated Water Uses for Selected Streams in the Area of the UFO Parcels 55
Table 8. Constituents of Typical Hydraulic Fracturing Operations 60

CHAPTER 1 - INTRODUCTION

1.1 BACKGROUND

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 (MLA) and the Federal Land Policy and Management Act of 1976 (FLPMA), to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

The BLM Colorado State Office conducts quarterly competitive sales to lease available oil and gas parcels. A Notice of Competitive lease sale (Sale Notice), which lists lease parcels to be offered at the auction, is published by the Colorado State Office at least 45 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process. Constraints on leasing and any future development of split-estate parcels (private surface overlying Federal minerals) are determined by the BLM in consultation with the surface management agency or private landowner.

In the process of preparing a lease sale, the Colorado State Office sends a draft parcel list to each field office where the parcels are located. Field office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing and that appropriate stipulations have been included; verify whether any new information has become available that might change any analysis conducted during the planning process; confirm that appropriate consultations have been conducted; and identify any special resource conditions of which potential bidders should be made aware. The nominated parcels are posted online for a 15-day public scoping period. The BLM prepares an analysis consistent with the National Environmental Policy Act (NEPA). Scoping comments received from the public are reviewed and incorporated into the NEPA document, as applicable.

After the field office completes the draft parcel review and NEPA analysis, and makes a leasing recommendation to the Colorado State Office, a list of proposed lease parcels and associated stipulations is made available to the public through Sale Notices, which are posted on the Colorado BLM website at:

https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/colorado

On infrequent occasions, BLM may defer or withhold additional parcels prior to the day of the lease sale. In such cases, BLM prepares an addendum to the Sale Notice. Prior to the lease sale, the Deputy State Director signs a decision in which he or she determines which parcels are available and will be offered for lease in the upcoming sale.

Parcels not leased at the December 2018 lease sale will remain available to be leased for up to 2 years to any qualified lessee at the minimum bid cost. Parcels obtained in this way may be re-parceled by combining or deleting other previously offered lands. Mineral estate not leased within 2 year after an initial offering will be unavailable without a new competitive lease sale process prior to being leased.

The act of leasing does not authorize any development or use of the surface of lease lands without further application by the lessee and approval by BLM. In the future, BLM may receive Applications for Permit to Drill (APDs) for those parcels that are leased. If APDs are received, BLM conducts additional site-specific NEPA analysis before deciding whether to approve the APD, and what conditions of approval (COAs) should apply.

Eight parcels within the Uncompahgre Field Office were nominated for the December 2018 Competitive Oil and Gas Lease Sale and initially considered by the BLM. These eight parcels were described to the public during the scoping process of this EA and the lease sale (see **Section 1.5.1**). These parcels were included due to administrative error and have been dropped from the lease sale. Following removal of

these parcels, the area of the UFO parcels currently proposed for lease is 2,830.55 acres, including 818.8 acres of public land and 2,011.75 acres of split-estate (private surface) land. The legal descriptions of the nominated parcels are listed in Attachment A.

This Environmental Assessment (EA) documents the review of the nominated parcels under the administration of the Colorado River Valley Field Office (CRVFO), in collaboration with the Uncompahgre Field Office (UFO). It serves to verify conformance with the approved land use plan and provides the rationale for the recommendation to offer or defer particular parcels for lease sale.

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

The UFO parcels proposed for leasing in December 2018 include portions of the following areas:

Delta County (1,140.16 acres) – Part of Parcel 8135, all of Parcel 8138

Township 12 South, Range 91 West, sections 9-11;

Gunnison County (1,690.39 acres) – Part of Parcel 8135, all of Parcels 8140, 8320, and 8351

Township 11 South, Range 90 West, section 2;
Township 12 South, Range 90 West, sections 28, 33;
Township 12 South, Range 91 West, section 12;
Township 13 South, Range 89 West, sections 3-6.

See **Attachment A** for detailed legal descriptions of the nominated parcels initially considered. Parcel locations are shown on **Map 1**. Attachment E provides detailed maps of three distinct areas of parcels

1.3 PURPOSE AND NEED

The purpose of the Proposed Action is to consider opportunities for private individuals or companies to explore and develop Federal oil and gas resources in specific parcels underlying public or split-estate lands through a competitive leasing process.

The need for the action is to respond to the nomination or expression of interest for leasing, consistent with BLM's responsibility under the MLA, as amended, to promote the responsible development of oil and gas on the public domain to meet national, regional, and local needs. Parcels may be nominated by the public, BLM or other agencies. The MLA establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with FLPMA and other applicable laws, regulations, and policies. This development is required to occur in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with FLPMA, NEPA, and applicable Federal environmental laws, regulations, and policies for the protection of other resources.

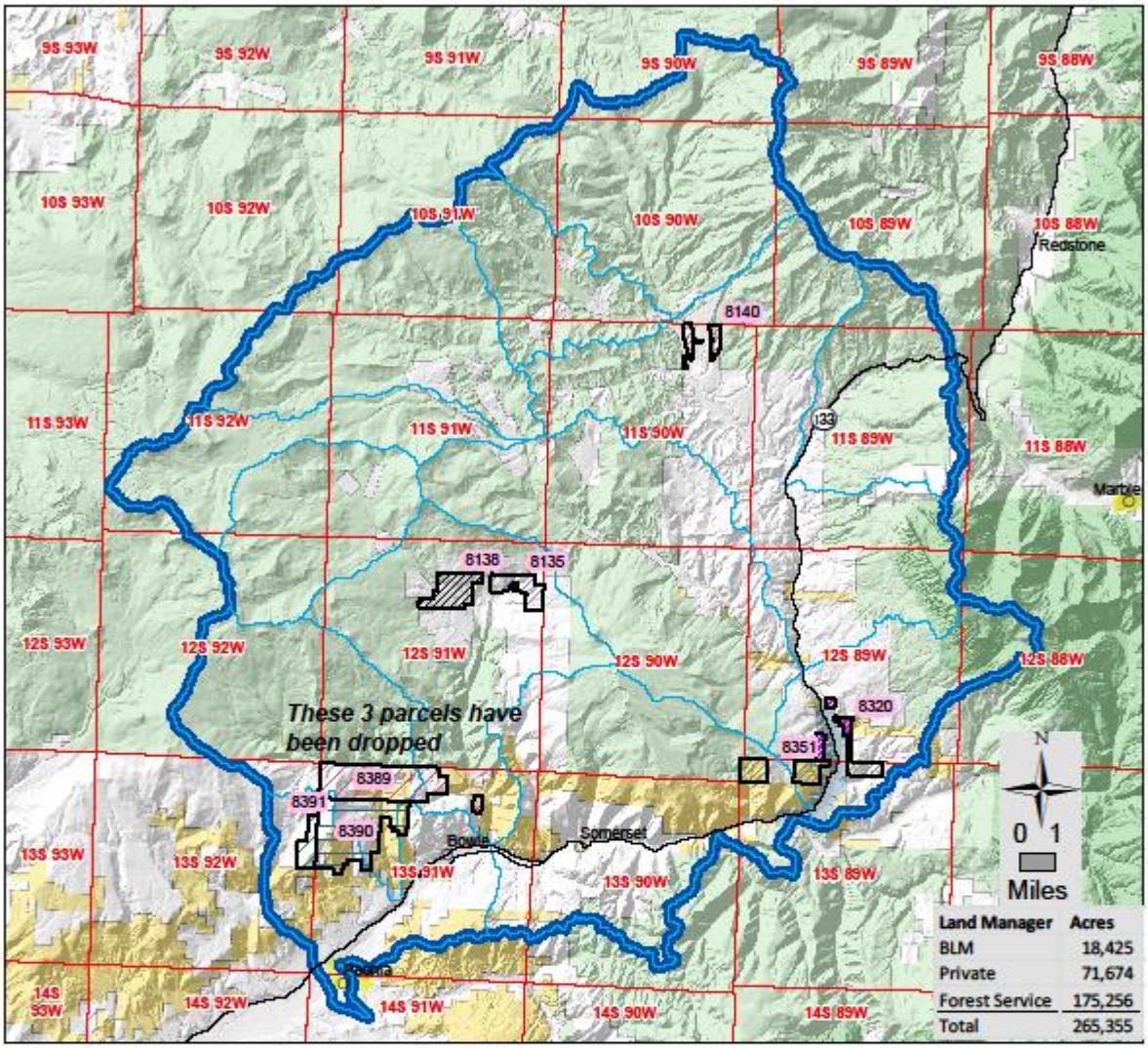
1.4 DECISIONS TO BE MADE

The BLM will decide whether to lease all, some, or none of the currently proposed five parcels at the December 2018 lease sale. The BLM will also decide what stipulations should be attached to the parcels, and whether the stipulations should be applied to all lands in the parcels or to specific aliquots (portions).

1.5 PUBLIC PARTICIPATION

1.5.1 Scoping

The principal goal of scoping is to identify issues, concerns, and potential impacts that require detailed analysis. The BLM uses both internal and external scoping to identify potentially affected resources and associated issues.



Fluid Mineral Estate in CEAA 2018 (265,355 Acres)		
Federal Fluid Mineral Estate	227,877 Acres	
	Acres (Approx)	Pct
USFS Leased	72,937	32%
BLM Leased	6,084	3%
Split-estate Leased	26,709	12%
Unleased USFS	102,063	45%
Unleased BLM	12,342	5%
Split-Estate Unleased	7,752	3%
Private OG Minerals	37,478 Acres	

Cumulative Effects Assessment Area
HUC 6 Boundaries
Forest Service Wilderness
BLM
Bureau of Reclamation
Private
State, County, City Areas
Forest Service
8135
8138
8140
8320
8351
8389
8390
8391

Map produced by Bureau of Land Management, Uncompahgre Field Office, GIS Program. Projection: UTM, Zone 13; Datum: NAD 1983. No warranty is made on the accuracy, reliability or completeness of these data for individual use or aggregate use with other data. Spatial data may not meet National Map Accuracy Standards. This information may be updated without notification.

Map 1. Five Proposed UFO Parcels in Relation to the Cumulative Effects Analysis Area (CEAA) – See Detailed Maps in Attachment E

Internal scoping was conducted through meetings of an interdisciplinary (ID) team of resource specialists and discussion of the nominated parcels. External scoping was conducted by posting the nominated lease parcels, the suite of attached stipulations derived from UFO's Draft Resource Management Plan and Draft EIS (Draft RMP/EIS), and a map of parcel locations for 15 days from July 2, 2018, to July 17, 2018, at the BLM's project website:

https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=86004

This external scoping process gave the public an opportunity to provide comments on the Proposed Action, which BLM has considered and incorporated into the Preliminary EA as appropriate. As part of external scoping, the BLM sent notification letters with parcel listings, parcel maps, and (if requested) GIS shapefiles to representatives of selected Federal, Tribal, State, county, and local governments. Chapter 4 of the EA lists the organizations receiving notification letters. The BLM also sent notification letters to surface owners whose land overlies Federal minerals proposed for leasing.

The BLM received 215 comment submissions during the public scoping period. These submissions included 82 from individuals, 117 from a citizens' group form-letter campaign, 9 from environmental organizations, 3 from local industry representatives, and 4 from governmental entities.

Issues Identified and Analyzed in the EA

The following issues were identified during internal and external scoping and are analyzed in this EA. Issues in *italics* were noted in public scoping comments:

- *Air Quality and Climate Change – Section 3.4.1*
- *Cultural Resources and Native American religious concerns – Section 3.4.2*
- *Geology (including geologic hazards and induced seismicity from hydraulic fracturing) – Section 3.4.3*
- *Human Health and Safety – see Section 3.4.1 (Air Quality), Section 3.4.3 (Geology), Section 3.4.11 (Transportation), Section 3.4.14 (Wastes, Hazardous or Solid), and Section 3.4.15 (Water Quality)*
- *Hydraulic Fracturing – see Section 3.4.3 (Geology) and Section 3.4.15 (Water Quality)*
- Noise – Section 3.4.4
- Paleontological Resources – Section 3.4.5
- Ranching and Livestock Management – Section 3.4.6
- *Recreation – Section 3.4.7*
- *Socioeconomics (quality of life, organic farming, property values, boom-and-bust cycles) – Section 3.4.8*
- Soils – Section 3.4.9
- *Threatened or Endangered Fish and Wildlife Species – Section 3.4.10*
- *Transportation and Access -- Section 3.4.11*
- Vegetation (including invasive non-native species) – Section 3.4.12
- *Visual Resources (including the West Elk Loop Scenic Byway)– Section 3.4.13*
- *Wastes, Hazardous or Solid (including unregulated rural gathering pipelines) – Section 3.4.14*
- *Water Quality, Surface Water and Groundwater -- Section 3.4.15*
- *Wildlife, Aquatic and Terrestrial (including BLM sensitive species) – Section 3.4.16*

Issues Considered but Not Analyzed in the EA

- Fire Management – not affected
- Forestry – not affected
- Prime or Unique Farmlands – none present
- Lands with Wilderness Characteristics – none present
- Special Status Plants – none present
- Wild and Scenic Rivers – none present
- Wilderness Areas and Wilderness Study Areas – none present
- Wild Horses and Burros – none present

Some other items were addressed in public scoping comments but were considered outside the scope of the EA. A brief response to each of these is provided below:

1. *It is inappropriate for the BLM to use oil and gas leases as a process for capturing coalmine methane.*

   The BLM has determined that including the three parcels associated with coalmine methane capture (8389, 8390, and 8391) was an administrative error. These parcels have been dropped from the December 2018 lease sale.

2. *The BLM should defer the UFO parcels from the December 2018 lease sale to allow for completion of UFO's Proposed RMP/Final EIS and Record of Decision (ROD), until the BLM responds to public comments on Alternative B.1 and other alternatives addressed in the Draft RMP.*

   The Proposed Action of offering the proposed UFO parcels at the December 2018 lease sale is supported by the designation of those lands as available for leasing under the 1989 RMP/ROD, which remains the land use plan in effect while a new RMP is being prepared. In addition, as noted above, the UFO used current resource information compiled and analyzed during work on the Draft RMP/EIS as the basis for identifying a suite of appropriate lease stipulations for the five parcels.

   While the BLM has not completed its new RMP, it determined that for the December 2018 lease sale, the stipulations described in this EA are consistent with BLM's Land Use Planning Handbook by applying stipulations that ensure appropriate resource protections, in this case as analyzed for the Draft RMP/EIS, while not being more restrictive than necessary to meet management objectives.

3. *The BLM has not identified the economic need for a lease sale at this time, particularly if the proposed sale includes development of coalbed methane as opposed to just coalmine methane gas.*

   Evaluation of economic needs is not a factor considered by the BLM in offering nominated parcels for sale. However, bids and bonus payments to acquire the leases, and subsequent rentals would be a source of revenue to the Federal government, as would any future royalties on oil and gas production. A portion of the royalties would be returned to the State and in turn shared with the counties.

4. *The BLM should include compliance with Gunnison County's regulations regarding oil and gas development as a mandatory lease term.*

   BLM Colorado is aware of recent and continuing discussion in Colorado regarding the degree to which county and local governments should be able to regulate oil and gas activities. To-date, these have been through agreements with operators rather than by ordinance or regulation, and the courts have ruled that Federal lands and minerals are not subject to local control.

5. *The BLM should incorporate a stipulation that limits the density of surface facilities to no greater than one well pad per square mile (mi^2) (= 640 acres) for parcels that contain the highest priority big game winter habitats and migratory corridors.*

This requested stipulation was not supported by the analysis conducted by the UFO for the Draft RMP/EIS. The BLM believes the density limit would pose substantial problems in managing Federal fluid mineral leases due to variations in geology, parcel sizes and shapes, and other constraints.

6. *The BLM should ensure that the proposed lease sale complies with any current Resource Management Plan (RMP) and any future RMP adopted during any lease term.*

   The proposed sale of the UFO parcels conforms to the current UFO RMP/ROD (BLM 1989) in that it designated the area of the parcels as open to leasing for oil and gas. The lease stipulations to be attached to the parcels were developed by the UFO as part of the Draft RMP/EIS analysis as being needed to ensure adequate protection of resources and resource uses. The BLM is under no obligation to ensure that the lease sale complies with any future RMP.

1.5.2 Public Comment Period

This Preliminary EA and unsigned Finding of No Significant Impact (FONSI) have been made available for a 15-day public review and comment period beginning **August 27, 2018**, and ending **September 11, 2018**. The document is available online at: *https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=109681&dctmId=0b0003e8811450a0*

A hard copy of the Preliminary EA is also available in the public room at the UFO, located at 2465 South Townsend Avenue in Montrose, Colorado. The document may be viewed at the UFO during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays. Comments should be submitted to **the web address above** by close of business on **September 11, 2018**. Comments received from the public will be reviewed and incorporated, as appropriate, into a revised EA, which will include a signed FONSI, if appropriate, and a signed Decision Record (DR).

CHAPTER 2 - ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the alternatives analyzed in detail. An alternative considered but not analyzed in detail is discussed in **Section 2.3**.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 *No Action Alternative*

In an EA, the No Action Alternative typically means that the Proposed Action would not take place. See BLM NEPA Handbook (H-1790-1). Under this alternative, the BLM would defer all five nominated lease parcels in the UFO from the December 2018 lease sale. Surface management of those lands would remain the same, and ongoing or previously approved but not yet implemented oil and gas development on existing Federal leases would continue.

2.2.2 Preferred Alternative

The Preferred Alternative, which drops Parcels 8389, 8390, and 8391 as having been included due to administrative error, would make available for lease sale all parcels that the BLM determines are in conformance with the existing 1989 Resource Management Plan and Record of Decision (RMP/ROD), but with the application of lease stipulations developed based on recent resource information and scoping comments associated with UFO's Draft RMP/EIS (BLM 2016b). In determining that the additional No Surface Occupancy (NSO), Controlled Surface Use (CSU), and Timing Limitation (TL) stipulations were needed to ensure adequate resource protection, the BLM considered the limited number and limited scope of stipulations identified in the 1989 RMP/ROD. See **Section 2.3** for further discussion.

The December 2018 lease sale currently includes two parcels entirely or partially in Delta County, containing 1,140.16 acres. Both of these are located entirely on split-estate (private surface) lands. The sale is also proposed to include three parcels entirely or partially in Gunnison County, containing 1,690.39 acres acres. Two of these include portions on BLM land and portions on private land; the other two parcels are entirely on private land. See **Attachment A** (Nominated Parcels) and **Attachment E** (Parcel Maps). Lands contained within the five UFO parcels have been grouped into lease parcels for competitive sale as oil and gas leases in accordance with regulations at 43 CFR 3100.

The leases would include the standard lease terms and conditions for development of surface lands of oil and gas leases as provided in 43 CFR 3100. These would be supplemented by stipulations related to the protection of other resources and resource uses. As described above and in **Section 2.3**, internal scoping by the BLM indicated that stipulations under the 1989 RMP/ROD would not be adequate to address potential resource impacts from leasing and development of the proposed leases. Although it is not the normal practice to apply stipulations from a not-yet-completed new RMP in an oil and gas lease sale, the BLM concluded that some additional stipulations were needed to ensure appropriate protections based on analysis of recent resource information analyzed during preparation of the Draft RMP/EIS. This is exemplified by realizing that only three UFO-specific stipulations—related to protection of coalmines, big game winter range, and waterfowl habitat—would be applied to some or all of the parcels under the 1989 RMP/ROD. In comparison, the Preferred Alternative would apply 21 stipulations, including five NSOs, ten CSUs, and six TLs, to the UFO parcels.

The 21 stipulations proposed to be applied to the for the December 2018 lease sale, whether applicable to all lands or specific areas, are listed in relation to the individual parcels in **Attachments C** and described in **Attachment D**. These UFO stipulations are in addition to three general stipulations or lease notices applicable to all leases issued by BLM Colorado**: Exhibit CO-34** (Endangered Species Act Section 7 Consultation Stipulation), **Exhibit CO-39** (Cultural Resources Lease Notice), and **Exhibit CO-56** (Air Quality Lease Notice). Also added to all leases would be a UFO lease notice requiring lessees/operators to comply with the Migratory Bird Treaty Act to protect migratory birds and their active nests.

The 21 stipulations and associated exhibits in **Attachment D** form a core of protections for resources and resource uses consistent with currently available resource information, public concerns as evidenced in scoping comments on the Draft RMP/EIS and on recent EIS and EA documents for proposed oil and gas projects in the same general area of the UFO. The BLM believes that the more comprehensive list of stipulations under the Preferred Alternative than are included under UFO's 1989 RMP/ROD (Section 2.2.3, below) reflect responsible resource management as it has evolved over the intervening years.

Under the Preferred Alternative, UFO will defer three parcels from the December 2018 lease sale. Deferral of nominated parcels allows BLM to address situations in which legitimate questions or controversy has arisen over the leasability of a parcel. Deferral does not necessarily preclude potential future leasing, but indicates that further analysis is needed before possible inclusion in a future lease sale.

2.3 ALTERNATIVE CONSIDERED BUT NOT ANALYZED IN DETAIL

In addition to dropping Parcels 8389, 8390, and 8391 from the nominated parcels/proposed initially considered at scoping, the BLM considered but not analyze in detail an alternative that would have offered all parcels administratively available for leasing, but with only standard stipulations and additional stipulations supported by known resource conditions under the 1989 RMP. Internal scoping of the five UFO parcels in relation to the stipulations identified and analyzed in the 1989 RMP/ROD indicated only the following as appropriate for inclusion with the five proposed UFO parcels:

- UB-10 – Lease Notice to help ensure to maximum economic recovery and safety of coalmines.
- UB-04 – Timing Limitation to prohibit development in big game crucial winter range, December 1 to April 30.
- UB-06 – Timing Limitation to prohibit development in waterfowl habitat, March 15 to June 30.

BLM resource specialists concluded during the analysis conducted for the Draft EIS/RMP, incorporated here by reference (BLM 2017), and internal scoping for the December 2018 lease sale that the three measures listed above, even in combination with COAs applied under BLM's regulatory authority at the time of future planning and permitting, would not provide the levels of protection currently considered necessary and appropriate. Therefore, if this alternative were analyzed in detail, all resources and resource uses other than associated with the coal mining LN and the big game and waterfowl TLs listed above would be described in Chapter 3 as having only the protections of standard stipulations, COAs, and mitigation measures. These protections would generally be considerably less than under the same measures in combination with the 20 NSO, CSU, and TL stipulations incorporated into the Preferred Alternative (**Attachments C and D**).

For the reasons described above, the BLM concluded that an alternative of attaching only stipulations available under the 1989 RMP/ROD would be inconsistent with the purpose and need (see **Section 1.4**) of making the mineral resources available for leasing and development, consistent with responsible use of the public lands and protection of other resources.

2.4 PLAN CONFORMANCE REVIEW

The Preferred Alternative was reviewed for conformance (43 CFR 1610.5-3) with the following plan:

Name of Plan: Uncompahgre Basin Resource Area Management Plan and Record of Decision (UBRA RMP/ROD).

Date Approved: July 26, 1989.

Decision Language: The Preferred Alternative and No Action Alternative described above conform to the UBRA RMP (BLM 1989) because they are specifically provided for in the planning decisions. The planning decisions to lease Federal mineral resources are determined within each management unit described in the UBRA RMP.

Management Decisions for Oil Gas, and Geothermal Resources (UBRA RMP pages 9-10): Federal oil, gas, and geothermal estate on both Federal surface and split-estate lands will be open to leasing with standard lease terms. Other conditions for leasing such as no surface occupancy and seasonal stipulations (see Appendix A of the UBRA RMP) are assigned in each management unit prescriptions; special stipulations and conditions also apply to Federal surface and split-estate lands. Any special stipulations (e.g., seasonal closures) will also apply to seismic and drilling activities.

Management decisions by relevant unit (corresponding to proposed UFO lease parcels for the December 2018 lease sale) included the following:

- Management Unit 7, page 21 (includes all or parts of Parcel 8351) – Federal oil and gas estate will be open to leasing with lease terms.
- Management Unit 16, page 28 (includes all or parts of 8135, 8138, 8140, 8320, and 8351) – Federal oil and gas estate will be open to leasing with lease terms.

Discussion: The 1989 RMP/ROD designated the area encompassing the five parcels as open to oil and gas leasing. As noted **in Section 2.2**, the Preferred Alternative would include additional protective stipulations not included in the 1989 RMP/ROD but identified during preparation of the Draft RMP/EIS (BLM 2017) where supported by current GIS mapping or other information regarding resources, resource uses, and environmental conditions in an area.

Adding restrictions to leases issued late in the life of an RMP is supported by other actions that the BLM routinely takes as part of adaptive management in response to changes in the natural and human environment through time, the evolution of public concern, and BLM's responses to public concern regarding both general and specific issues associated with oil and gas development and other land uses. For example:

- Planning documents and COAs for oil and gas or other projects incorporate regular updates to CPW's mapping of special habitats or areas of use, such as big game severe winter range, winter concentration areas, production (fawning/calving) areas, and migration corridors. These typically have represented increases, not decreases, in the extent of these areas and associated COAs.
- Project-specific planning documents also apply the Visual Resource Management (VRM) designations applicable at the time of the project instead of those that existed when the leases were issued. BLM's VRM designations for a particular area often progress from less to more restrictive classes, resulting in additional requirements applied as COAs.
- Restrictions associated with Federally listed, proposed, or candidate threatened or endangered species may also change through the life of an RMP, typically toward more included species, larger areas known to support or be capable of supporting those species, knowledge of additional vulnerabilities and threats, and additional or expanded protective measures for mitigating direct and indirect impacts. Similar increases in protections commonly apply to BLM-designated sensitive species.
- Field Offices continually add COAs or strengthen existing COAs in response to a variety of other new or increasing public and agency concerns related to technologies, resources and resource uses, environmental conditions, human health and safety, and new regulations or policies.

While the BLM lacks the authority to add new stipulations to an existing lease without the consent of the lessee/operator, the points above underscore that the protections applied to projects toward the end of an RMP's life are typically greater than when it was signed, especially for an older RMP that included relatively few stipulations. Based on this consideration, the BLM has determined that leasing the proposed UFO parcels with stipulations developed from the analysis for the Draft RMP/EIS would constitute responsible management.

Although differing substantially in the suite of stipulations compared to those included in the 1989 RMP/ROD, the proposed December 2018 lease sale is consistent with the 1989 RMP/ROD by making the parcels available for oil and gas leasing with lease terms. Therefore, pursuant to 40 CFR §1508.28 and §1502.21, this EA tiers to the Uncompahgre Basin Proposed Resource Management Plan and Record of Decision (BLM 1989), but with stipulations supported by the analysis in the Draft RMP/EIS.

CHAPTER 3 – AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

Council on Environmental Quality (CEQ) Regulations state that NEPA documents "must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an EA. Issues will be analyzed if 1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or 2) if the issue is associated with a significant direct, indirect, or cumulative impact, or if detailed analysis is necessary to determine the significance of the impacts.

3.2 ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE

The No Action Alternative is used as the baseline for comparison of the Preferred Alternative and any other alternatives analyzed in detail. Under the No Action Alternative, the five parcels, totaling 7,903.4 acres, would not be leased. The result would be no subsequent impacts from oil and gas construction, drilling, and production activities. However, the No Action Alternative would not affect the continuation of current land and resource uses in the proposed lease areas.

BLM assumes that the No Action Alternative (no lease option) would result in less oil and gas production than under the Proposed Alternative. This alternative would therefore not provide royalty payments and

would increase the potential for Federal minerals to be drained by wells on adjacent private or State lands. The public's demand for oil and gas is not expected to be affected by whether this alternative or the Preferred Alternative is selected and implemented. Oil and gas consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demographics, geopolitical circumstances, and weather or climate.

3.3 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

NEPA requires Federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the CEQ regulations 40 CFR §1508.7 as "the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency . . . or person undertakes such other actions." In its guidance, the CEQ has stated that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds" using the concept of "project impact zone" (i.e., the area that might be influenced by the Proposed Action).

Offering and issuing leases for the five parcels, in itself, would not result in cumulative impacts to any resource. Nevertheless, future development of the leases could be an indirect effect of leasing. The draft EIS for the new RMP for the UFO provides BLM's analysis of cumulative effects of oil and gas development based on the Reasonable Foreseeable Oil and Gas Development (RFD) scenario. That analysis is hereby incorporated by reference into this EA and available at:

https://eplanning.blm.gov/epl-front-office/projects/lup/62103/152878/187146/Uncompahgre_RFD_2012-0216.pdf.

The cumulative impacts analysis in the draft EIS for UFO's new RMP accounted for the potential impacts of development of lease parcels in the Cumulative Effects Analysis Area (CEAA) shown on **Map 1** The cumulative impacts analysis presented in **Table 1** addresses past, present, and reasonably foreseeable future actions and expands upon the analysis in the draft EIS. Temporal and spatial boundaries used in the analysis were developed based on resources of concern and actions that might contribute to an impact.

Table 1. Past, Present, and Reasonably Foreseeable Future Actions (RFFAs) in the Cumulative Effects Analysis Area (CEAA)

Resource	***Projects***	***Past, Present, or RFFA***
Vegetation Management	Forestry. Past, present, and foreseeable forestry uses in the CEAA include personal and commercial harvest of fuel wood, poles and posts for fence building, wildings (live trees and shrubs), and Christmas trees.	Past, Present, RFFA
	Vegetation treatments. Prescribed fire and mechanical treatments of vegetation (e.g., chaining, roller-chopping, harrowing, drill seeding, hydro-axing, and brush mowing) were common in the past on public and private rangelands in the CEAA. With the exception of chaining, these treatments still occur and are likely to continue.	
	Hazardous fuels reduction. Fuels treatments, including prescribed fires, chemical and mechanical treatment, and seeding, are expected to continue and potentially increase in the future.	
Livestock Grazing	In the CEAA, the BLM manages 12 grazing allotments with 7 grazing permittees. Historically, several areas sustained high levels of both sheep and cattle grazing. Seasonal cattle grazing still occurs, to a lesser degree, from approximately June through September. The Forest Service prepared an EA in 2005 for the Muddy Creek basin (also known as Muddy country). On National Forest System lands surrounding the project area, there are 11 allotments with multiple permittees. This resource is affected primarily by	Past, Present, RFFA

Resource	***Projects***	***Past, Present, or RFFA***
	surface disturbance of forage habitat for livestock. Existing coalmines, increasing oil and gas development, and planting of crops have resulted in loss of grass/forb communities, which is now a limiting factor for grazing.	
Road Construction	Road construction has occurred in association with timber harvesting, historic vegetation treatments, energy development, and mining on BLM-administered lands, private lands, State of Colorado lands, and National Forest System lands. The bulk of new road building is occurring for community expansion and energy development. Road construction is expected to continue at the current rate on BLM and National Forest System lands; the future rate is unknown on private and State of Colorado lands.	Past, Present, RFFA
Realty Authorizations	Colorado Department of Transportation ongoing activities on SH 133 include annual snow maintenance and emergency response actions.	Past, Present, RFFA
	Colorado Department of Transportation is working on highway improvement projects on SH 92 from Hotchkiss to Delta; this project is likely to continue for the next several years.	Present
	Several gravel pits have been approved in the past 5 years, mostly within a few miles of the city of Delta and outside the CEAA.	Past, Present
	Residential developments in the area around the communities of Paonia, Hotchkiss, Crawford, and Delta have been growing in population, with many new houses being built. Most of this development has been downvalley from the coalmines in broader portions of the North Fork Valley. This development has increased traffic and demand for maintenance on SH 133.	Past, Present, RFFA
	Natural gas pipelines in the area include the Bull Mountain Gathering line; Ragged Mountain Gathering; Sheep Gas Gathering System; Henderson Lateral pipeline, Aspen Leaf trunk pipeline, Hotchkiss Ranches Gas Gathering System, Vessels Oxbow facility connection line from Borehole 1, and local utility service pipelines	Past, Present
	Sheep-Bull connector natural gas pipeline. Gunnison Energy (GELLC) would convey produced gas from the Sheep Gas Gathering System to the SG Interests (SGI) Bull Mountain Pipeline. It would connect on private land at the existing Sheep pipeline yard traverse National Forest System lands to the NE cross-country but parallel to NFSR 851 and tie into the Bull Mountain Pipeline on National Forest System lands.	RFFA
Recreation	The primary recreational activities in the UFO are motorized vehicle touring, all-terrain vehicle use, motorcycling, mountain biking, big and small game hunting, fishing, hiking, backpacking, horseback riding, sight-seeing, target shooting, dog-walking, and river boating. Recreation-based visitor use in the UFO has increased in most areas in recent years and is expected to continue to increase on BLM lands and National Forest System lands, State Parks, and private lands.	Present, RFFA
	Unauthorized travel. Travel off designated or existing routes and the creation of social trails has occurred and is likely to continue to occur.	Past, Present, RFFA
	Forest Service Special Areas; Roadless Area Conservation; Applicability to the National Forests in Colorado; Final Rule (77 Federal Register 39576-39612, 3 July 2012). The Colorado Roadless Rule provides management direction for conserving and managing approximately 4.2 million acres of Colorado Roadless Areas on National Forest System lands.	Past, Present

<table>
<tr><th>Resource</th><th>Projects</th><th>Past, Present, or RFFA</th></tr>
<tr><td rowspan="6">Coal</td><td>The following table contains recent production data for the three coalmines in the North Fork Valley, within the CEAA.
<table>
<tr><th colspan="5">Raw Coal Production in the North Fork Valley</th></tr>
<tr><td colspan="5">Year Averages (Tons)</td></tr>
<tr><th>Average Based on</th><th>Bowie No. 2 Mine</th><th>Elk Creek Mine</th><th>West Elk Mine</th><th>Total</th></tr>
<tr><td>5 Years</td><td>2,897,076</td><td>2,555,310</td><td>5,806,743</td><td>11,257,129</td></tr>
<tr><td>1 Year</td><td>Closed</td><td>Closed</td><td>5,551,636</td><td>5,551,636</td></tr>
<tr><td colspan="5">Note: 5-year period ends June 30, 2014; 1-year period is August 1, 2016 through July 31, 2017.</td></tr>
</table></td><td>Past, Present</td></tr>
<tr><td>The Elk Creek Mine was a longwall operation north of Somerset, operated by Oxbow Mining, LLC (Oxbow), with a loadout immediately north of Somerset. A total of 13,430 acres are permitted. The operation is currently closed.</td><td>Past</td></tr>
<tr><td>The West Elk Mine is a longwall operation located south and east of Somerset and is operated by Mountain Coal Company with a loadout about 1 mile east of Somerset. A total of 19,855 acres are permitted.</td><td>Present, RFFA</td></tr>
<tr><td>Bowie No. 2 Mine is a longwall operation located northeast of Paonia, and is operated by Bowie Resources, LLC with a loadout northeast of Paonia. A total of 14,540 acres are permitted in the combined permits of the Bowie No. 1 and No. 2 Mines accessed by the Bowie No. 2 Mine. The mine is currently closed.</td><td>Past, Present</td></tr>
<tr><td>Oxbow has completed exploration drilling to confirm the quality, quantity, and extent of the coal within this area. The Oak Mesa project encompassed about 13,873 acres north of Hotchkiss. The coal exploration license expired under its own terms in September 2014.</td><td>Past</td></tr>
<tr><td>The Forest Service issued a Notice of Intent to prepare a supplemental Environmental Impact Statement to propose reinstatement of the North Fork Coal Mining Area exception of the Colorado Roadless Rule. The North Fork Coal Mining Area exception was reinstated and became effective in April 2017. The exception allows for temporary road construction for coal exploration and/or coal-related surface activities in a 19,100-acre area. Arch Coal plans to expand its underground West Elk Mine.</td><td>RFFA</td></tr>
<tr><td rowspan="2">Oil and Gas</td><td>The BLM routinely offers land parcels for competitive oil and gas leasing to allow exploration and development of oil and gas resources for public sale. Continued leasing is necessary for oil and gas companies to seek new areas for oil and gas production, or to develop previously inaccessible or uneconomical reserves. From 2013 to present, no leases have been issued.</td><td>Past, Present, RFFA</td></tr>
<tr><td>The Cumulative Effects Analysis Area (CEAA, Map 1) includes 265,355 surface acres, of which 227,877 acres (86%) includes Federal fluid mineral estate; the remaining 14% consists of privately owned minerals. See the following table for leased and unleased acres of Federal mineral estate, by surface ownership, in the CEAA.</td><td>Past, Present, RFFA</td></tr>
</table>

<table>
<tr><th>Resource</th><th>Projects</th><th>Past, Present, or RFFA</th></tr>
<tr><td></td><td>The following table summarizes surface ownership and lease status of the 86% of the CEAA that contains Federal fluid minerals.
<table>
<tr><th colspan="3">Federal Fluid Mineral Estate in the CEAA 2018</th></tr>
<tr><th>Category</th><th>Acres (Approx.)</th><th>Percent</th></tr>
<tr><td>Existing Leased</td><td>105,730</td><td>47%</td></tr>
<tr><td>USFS Surface (Leased)</td><td>72,937</td><td>32%</td></tr>
<tr><td>BLM Surface (Leased)</td><td>6,084</td><td>3%</td></tr>
<tr><td>Private Split-Estate (Leased)</td><td>26,709</td><td>12%</td></tr>
<tr><td>Existing Unleased</td><td>122,157</td><td>53%</td></tr>
<tr><td>USFS Surface (Unleased)</td><td>102,063</td><td>45%</td></tr>
<tr><td>BLM Surface (Unleased)</td><td>12,342</td><td>5%</td></tr>
<tr><td>Private Split-Estate (Unleased)</td><td>7,752</td><td>3%</td></tr>
<tr><td>Total Federal Mineral Estate</td><td>227,877</td><td>100%</td></tr>
</table></td><td>Past, Present, RFFA</td></tr>
<tr><td></td><td>BLM Uncompahgre Field Office Reasonable Foreseeable Development Scenario for Oil and Gas (UFO 2012 RFD). This document looks at potential oil and gas resources in the UFO planning area over 20 years.</td><td>RFFA</td></tr>
<tr><td></td><td>In the CEAA, including all operators and both Federal and Fee minerals, 57 wells are currently producing or are capable of producing, 29 wells have been plugged and abandoned, and 15 Federal APDs are approved but not yet drilled. Of the 57 active wells in the CEAA, 32 are Federal fluid minerals, 23 are private fluid minerals, and 2 are water disposal wells. Of these, 35 wells are within the RFD's Conventional Very High category, anticipating more than 12 wells per township; 20 CBM wells include 5 in the CBM Moderate category, anticipating 20-39 wells per township; and 15 are in the CBM High category, anticipating 40 or more wells per township.</td><td>Past, Present</td></tr>
<tr><td></td><td>Vessels Coal Mine Methane Capture Project. Methane Drainage System situated above Oxbow Mining LLC's Elk Creek Mine near Somerset. Capture of low-level coalmine methane emissions produced at the mine as a result of coal extraction, and combusted on site for either electrical generation with excess flared gas rather than venting directly to atmosphere.</td><td>Past, Present</td></tr>
<tr><td></td><td>The GELLC Hotchkiss Federal project in Gunnison County authorized approval of 16 wells on nine pads, of which 10 wells on six pads have been drilled. Three APDs are approved pending drilling.</td><td>Past, Present</td></tr>
<tr><td></td><td>The GELLC/SGI dual operator proposal for 25 natural gas wells on five pads, approximately 5 miles west of the Bull Mountain Unit, approved December 7, 2015. Development to-date includes one well on the existing pad and one new well on a new pad. Up to 17 gas wells may be drilled within the next 5 years. Seven APDs are approved and awaiting development.</td><td>Past, Present, RFFA</td></tr>
<tr><td></td><td>SGI Bull Mountain Master Development Plan: The BMU MDP involves exploration and development of up to 146 wells on 33 pads, and four water disposal wells on Federal mineral leases. Development to-date includes one private surface/private minerals well drilled into an offsite lease, with six additional Federal APDs approved but not drilled. SG also operates and produces 13 private mineral wells in the Unit.</td><td>Present, RFFA</td></tr>
</table>

Resource	*Projects*	*Past, Present, or RFFA*
Oil and Gas	Petrox Resources: APDs for **2 wells** are proposed for development in the Federal Somerset Unit, a 6,400-acre project area that largely overlies the Pilot Knob Roadless Area north of Somerset. An MDP for additional wells has been submitted to the Forest Service but is considered incomplete.	RFFA
	SGI Huntsman Unit Proposal: SGI has proposed drilling in the Huntsman Unit, which includes three SGI leases and has submitted on APD.	RFFA
	SGI Deadman Gulch APD: SGI has proposed **1 well** inside the Deadman Gulch Unit adjacent to the Petrox Somerset Federal Unit. The location is within the Pilot Knob Colorado Roadless Area.	RFFA
	SGI permitted the Bull Mountain compressor station on private land NE of the Bull Mountain Unit. Four gas or diesel motors, three compressors, one separator. Intended to provide compression to assist in moving produced gas from the area through the existing Bull Mountain Gathering line.	RFFA
	North Fork Mancos Master Development Plan (NFMMDP): GELLC proposes to drill, complete, and operate up to **35 horizontal wells from three new and two existing well pads** and to construct associated access roads and gathering pipelines over an estimated 4-to-5-year period. The project area includes the four Federal units (Trail Gulch, Sheep Park II, Iron Point, and Deadman Gulch).	RFFA

3.4 ENVIRONMENTAL CONSEQUENCE OF LEASING AND POTENTIAL DEVELOPMENT

The sale of parcels and issuance of oil and gas leases is an administrative action. Nominated lease parcels are reviewed under the approved RMP, and stipulations are attached to mitigate any known environmental or resource conflicts that may occur on a proposed lease parcel. On-the-ground impacts would not occur until a lessee or their designated operator applies for and receives approval to undertake surface-disturbing lease actions.

The BLM cannot reasonably determine at the leasing stage whether, when, and in what manner and intensity a lease would be explored or developed. The uncertainty that exists at the time the BLM offers a lease for sale includes crucial factors that will affect potential impacts, such as well density, geological conditions, development type (vertical, directional, horizontal), hydrocarbon characteristics; equipment to be used during construction, drilling, production, and abandonment operations, and potential regulatory changes over the life of the 10-year primary lease term.

As an illustration of the uncertainty as to whether a lease parcel, if issued, will be developed, GIS data (as of August 2018) indicate that most (81%) of the Federal oil and gas leases in the CEAA shown on **Map 1** do not have active wells within their boundaries (57 active wells on 18 of 92 existing individual leases in the CEAA), an area comprised of seven full townships and portions of nine others, and totaling nearly 13 townships. Thus, substantial uncertainty exists regarding future development. Therefore, discussions of potential direct, indirect, and cumulative impacts presented in the following 16 resource- or use-specific subsections are necessarily confined to qualitative rather than quantitative characterization.

If lands are offered, leased, and a proposal for site-specific lease operations received by the BLM, additional NEPA documentation and technical analysis would be prepared by the BLM. Aside from the applicable protections provided by the lease stipulations (see **Attachment D**), additional mitigation may be applied as COAs at that time to mitigate identified impacts.

3.4.1 Air Quality and Climate Change

Affected Environment

AIR QUALITY

The portion of the North Fork Valley in which the five UFO parcels are located is within the Central Mountains and Western Slope regions for air quality planning (Colorado Department of Public Health and Environment [CDPHE] 2017a). The Central Mountains Region includes 12 counties in the central area of Colorado, including Gunnison County, and the Continental Divide passes through much of the region. The Western Slope Region includes nine counties, including Delta County, on the far western border of Colorado. Air quality concerns in these regions are primarily from impacts related to particulate pollution from wood burning and road dust and from impacts related to ranching, agriculture, mining, energy development, and tourism.

Air quality impacts from pollutant emissions are limited by regulations, standards, and implementation plans established under the Clean Air Act (CAA), as administered by the CDPHE Air Pollution Control Division (APCD) under authorization of the U.S. Environmental Protection Agency (EPA). The APCD is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made, and those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. Any APCD air quality preconstruction permitting demonstrations required would be based on very site-specific, detailed engineering values, which would be assessed in the permit application review. Any proposed facility that meets the requirements set forth under division permit regulations is subject to the Colorado permitting and compliance processes.

Regulations and standards that limit permissible levels of air emissions and air pollutant concentrations and are relevant to the North Fork area include:

- National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) and Colorado Ambient Air Quality Standards (CAAQS) (5 Code of Colorado Regulations [CCR]-1001-14)
- Hazardous Air Pollutants (HAPs)
- PSD (40 CFR Part 51.166)
- New Source Performance Standards (NSPS) (40 CFR Part 60)
- National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 63)
- Non-Road Engine Tier Standards (40 CFR Part 89)
- Colorado Oil and Gas Permitting Guidance

Air pollutants monitored in the region include the criteria pollutants carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in effective diameter (PM_{10}), particulate matter less than 2.5 microns in effective diameter ($PM_{2.5}$), ozone (O_3), and sulfur dioxide (SO_2), and HAPs benzene and formaldehyde. The most representative monitored regional background concentrations available for criteria pollutants (CDPHE 2016a) indicate that all background concentrations are below the levels of the NAAQS and CAAQS. Federal air quality regulations adopted and enforced by the CDPHE-APCD limit incremental emission increases to specific levels defined by the classification of air quality in an area. The Prevention of Significant Deterioration (PSD) program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. Incremental increases in PSD Class I areas are strictly limited, while limits on increases in sensitive Class II areas are less strict.

Under the PSD program, Class I areas and certain sensitive Class II areas are protected by Federal Land Managers through management of Air Quality Reference Values (AQRVs) such as visibility, aquatic ecosystems, flora, fauna, and others. Although the project area is classified as PSD Class II, it is within 200 kilometers (km) of ten Class I areas (the Eagles Nest, Flat Tops, La Garita, Maroon Bells –

Snowmass, Mount Zirkel, Weminuche, and West Elk wilderness areas, and Arches, Black Canyon of the Gunnison, and Rocky Mountain National Parks) four sensitive Class II areas (the Raggeds and Uncompahgre wilderness areas and Dinosaur and Colorado National Monuments. Dinosaur National Monument is regulated as a Class I area for SO_2 by the CDPHE. Evaluation of potential impacts to AQRVs is performed during the New Source Review permitting process under the direction of the CDPHE-APCD in consultation with Federal Land Managers.

As part of the Interagency Monitoring of Protected Visual Environments (IMPROVE) program, continuous visibility-related optical background data have been collected in the following Class I areas: Flat Tops Wilderness, White River National Forest (Maroon Bells-Snowmass Wilderness), and Weminuche Wilderness. The average standard visual range (SVR) at each of the three sites is historically greater than 150 km. In the most recent reported years, the average SVR has increased to greater than 200 km (IMPROVE 2017a).

Nine lakes in the Flat Tops, Maroon Bells-Snowmass, Raggeds, and West Elk wilderness areas have been identified as sensitive to potential changes in lake acidity from atmospheric acid deposition of nitrogen (N) and sulfur (S) based on the acid neutralizing capacity (ANC) of the lake. Of the nine acid-sensitive lakes in these four wilderness areas, the U.S. Forest Service consider Upper Ned Wilson (Flat Tops Wilderness) and Deep Creek Lake (Raggeds Wilderness) extremely sensitive to atmospheric deposition because the background ANC values are less than 25 microequivalents per liter (μeq/L). At Gothic, east of the proposed parcels, a National Atmospheric Deposition Program (NADP) National Trends Network (NTN) station monitors wet atmospheric deposition of nitrogen (N) and sulfur (S), and a Clean Air Status and Trends Network (CASTNET) station monitors dry atmospheric deposition of N and S.

Consistent with CEQ regulation 40 CFR §1502.21, Incorporation by Reference, and mandates to reduce paperwork, data from the current version of BLM Colorado's Annual Report for Air Resources is incorporated by reference in this analysis to provide supplemental information for the affected environment and cumulative impacts analysis. The current version of the Annual Report is available to the public on BLM Colorado's website at:

https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado

The following lists locations in the online Annual Report where supplemental information can be found:

- "Criteria Air Pollutants" and "Hazardous Air Pollutants" sub-sections of the online Annual Report provide baseline air pollutant monitoring concentration data;
- Additional information regarding PSD analyses and AQRVs can be found in the "Airshed Classes and the Prevention of Significant Deterioration" and "Air Quality Related Values" sub-sections of the online Annual Report.
- Baseline emissions data for counties and areas near the proposed lease parcels can be obtained from the "Emissions Source Classifications and Regulatory Status" section of the current online Annual Report.

CLIMATE CHANGE

Climate change is a statistically significant and long-term change in climate patterns. The terms climate change and "global warming" are often used interchangeably, although they are not the same thing. Climate change is any deviation from the average climate, whether warming or cooling, and can result from both natural and human (anthropogenic) sources. Natural contributors to climate change include fluctuations in solar radiation, volcanic eruptions, and plate tectonics. Global warming refers to the apparent warming of climate observed since the early 20th century and is primarily attributed to human activities, such as fossil fuel combustion, industrial processes, and land use changes.

Current understanding of the climate system comes from the cumulative results of observations, experimental research, theoretical studies, and model simulations. The Intergovernmental Panel on

Climate Change (IPCC) Fifth Assessment Report (AR5) (IPCC 2013) presented findings indicating that warming of the climate system is unequivocal and that many of the observed changes are unprecedented over decades to millennia. An increase in Global Mean Surface Temperature since the late 19th century is described as "certain," while an increase in maximum and minimum temperatures overland since 1950 are described as "virtually certain (99 to 100% probability). The globally averaged combined land and ocean surface-temperature data show a warming of 1.5°F.

Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea-level rise, and in changes in some climate extremes. The AR5 concluded that it is "extremely likely" (95 to 100% probability) that human influence has been the dominant cause of the observed warming since the mid-20th century (IPCC 2013). The U.S. Global Change Research Program released the third U.S. National Climate Assessment (NCA), which summarizes the Assessment summarizes the current State of knowledge on climate change and its impacts throughout the U.S., including the Southwest region in which the proposed UFO parcels are located (NCA 2014).

All climate model projections indicate future warming in Colorado (BLM 2015a). The Statewide average annual temperatures are projected to warm by +2.5 ºF to +5 ºF by 2050 relative to a 1971 to 2000 baseline under Representative Concentration Pathway (RCP) 4.5. Summer temperatures are projected to warm slightly more than winter temperatures, where the maximums would be similar to the hottest summers that have occurred in the past 100 years. Precipitation projections are less clear. Nearly all of the models predict an increase in winter precipitation by 2050, although most projections of snowpack (April 1 snow-water equivalent measurements) show declines by mid-century due to projected warming. Late-summer flows are projected to decrease as the peak shifts earlier in the season, although the changes in the timing of runoff are more certain than changes in the amount of runoff. In general, the majority of published research indicates a tendency toward future decreases in annual streamflow for all of Colorado's river basins. Increased warming, drought, and insect outbreaks, all caused by or linked to climate change, will continue to increase wildfire risks and impacts to people and ecosystems.

Information from the online Annual Report (https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado) is also being incorporated by reference for this section. Baseline GHG and Climate Change information can be found in the "Climate Change Baselines" section of the online Annual Report.

Environmental Consequences of Leasing and Potential Future Development

As noted in **Section 2.2.2** (Preferred Alternative), all lease parcels in Colorado are subject to Exhibit CO-56 (**Attachments C and D**). The purpose of this lease notice is to alert bidders/lessees that operator-provided estimates of air pollutant emissions resulting from future development projects would be a necessary part of the project-specific NEPA planning process and the permitting process of APDs. Sources of emissions include vehicular traffic, well pad and road construction, pipeline construction, and well drilling and completion.

The primary pollutants emitted during development include particulate matter smaller than 10 microns (μ) in effective diameter (PM_{10}), particulate matter smaller than 2.5 μ, nitrogen oxides (NO_X), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOCs), and hazardous air pollutants (HAPs), including benzene, toluene, ethyl benzene, xylenes, n-hexane, and formaldehyde. Major sources include internal combustion engines associated with vehicles, the drilling rig, generators, and hydraulic fracturing, fugitive dust from disturbed surfaces and unpaved roads, chemicals used during drilling and completions, and any uncaptured or uncombusted hydrocarbons. Well development would temporarily elevate pollutant levels, but impacts would be localized and occur only during the development phase.

Emissions during long-term production would occur from vehicular traffic, on-pad equipment such as separators and tank heaters, compressor engines, uncaptured releases from storage tanks, and occasional workovers utilized a small drilling rig. The primary pollutants emitted during long-term production

would be PM_{10}, $PM_{2.5}$, NO_X, CO, SO_2, VOCs, and HAPs. These emissions would affect air quality in the project area over the life of any future development. Production equipment is subject to current and future CDPHE Best Available Control Technology (BACT) and Reasonably Achievable Control Technology (RACT) guidance and applicable portions of 40 CFR Part 63 Subparts OOOO and OOOOa, Standards of Performance for Crude Oil and Natural Gas Production.

The magnitude of potential future oil and gas development of the seven UFO parcels cannot be estimated at this point in the process because of many uncertainties involving the number of oil and gas wells, the size of associated surface disturbance, the exact location of these impact sources, and the timing, intensity, and duration of development and production activities. However, under both FLPMA and the CAA, the BLM cannot conduct or authorize any activity that does not conform to all applicable local, State, Tribal, or Federal air quality laws, statutes, regulations, standards, or implementation plans. Lack of such conformance in connection with future development could include exceedance of applicable NAAQS or CAAAS, or impacts to AQRVs above acceptable levels.

To ensure that future oil and gas projects do not significantly affect air quality, and to assess the contribution of future projects on greenhouse gas (GHG) emissions, all five parcels would have Lease Notice CO-56 attached the leases (see **Attachments C and D**) to alert bidders/lessees of BLM Colorado's air quality process and potential restrictions on their developments to meet National and State standards. Under this process, BLM's Colorado Air Resource Protection Protocol (CARPP), the UFO would perform air quality analyses for future oil and gas developments in order to complete the appropriate level of NEPA analysis and to track emissions statewide. As a component of future site-specific NEPA analysis through a project-level EA, an emissions inventory would be generated for each APD using data provided by the proponent.

The required emissions data comprise more than 250 items per development proposal, including, but not limited to, existing road lengths and types, vehicle speeds, soil characteristics, meteorological parameters, elevation, terrain type, vegetation type, development rates and schedule, estimated oil or natural gas production, area and duration of surface disturbance, dust suppression, heavy equipment operation (by development phase and including quantity of each equipment type, horsepower, load factor, duration of use), drill rig specifications, chemistry of produced gas, well completion details (duration, hydraulic fracturing, closed loop, estimated flowback volume, flowback days, gas control method and efficiency), completion engine specifications, separator and tank specifications, pneumatic device details, components details (quantity of valves, pump seals, connectors, flanges), workover details, and on-road details (by development phase and including vehicle type and quantity, frequency of use, fuel type, round trips, average vehicle weight).

Data included in the inventory are used to determine the level of analysis needed for potential near-field, far-field, and cumulative air quality impacts. Results of the analyses are included in the NEPA records in order to inform the decision-maker of potential impacts to human health and the environment. Data from all emissions inventories throughout BLM Colorado are consolidated to provide an updated cumulative-effects analysis (Colorado Air Resource Management Modeling Study [CARMMS]) and to update field-office-specific NEPA language and annual reports. Estimates of GHG emissions included in the overall emissions inventories for individual projects are also quantitatively assessed and compared to various scales (County, State, and Federal) of such emissions for total oil and gas production. This establishes a frame of reference for the public to analyze potential impacts of each local-scale project at the global-scale of climate change.

Under FLPMA and the CAA, the BLM cannot conduct or authorize any activity that does not conform to all applicable local, State, Tribal, or Federal air quality statutes, regulations, standards, guidelines, or implementation plans. This includes a prohibition against exceedances of National or Colorado ambient air quality standards, and impacts to air quality reference values (e.g., visibility and acid deposition) beyond acceptable levels. Therefore, as a component of BLM Colorado's project-specific emissions

inventory and CARMMS processes, future oil and gas projects involving the seven UFO parcels would be subject to changes in project design as needed to bring the estimated emissions and modeled air quality impacts into conformance with applicable standards. This may include requiring use of equipment with lower emissions rates, adjusting operations to reduce concurrent emissions for major sources (e.g., drilling rig engines and completions engines), and limiting operations to a single drilling rig during seasons when atmospheric conditions are typically less favorable for dispersal (e.g., winter in areas subject to frequent or protracted atmospheric inversions).

Cumulative Impacts of Leasing and Potential Future Development

As described earlier in this subsection, the project-specific NEPA analysis for any future oil and gas developments would include project near-field, far-field, and cumulative impacts in comparison to air quality standards in effect at the time of the future development.

As described in the introduction to Section 3.4, it is impossible to know the timing, scale, locations, or duration of any future oil and gas activities on the currently proposed parcels. Variables affecting future development include market drivers, geological conditions, technological approaches used by various operators for various situations, surface-use restrictions applicable to locations that are preferred for optimizing fluid mineral access, changes in environmental regulations affecting future development, and geopolitical influences.

No standard ratios of wells or well pads per given area exist because of the combination of subsurface geology, surface constraints, and specific technology. However, as shown by data in **Table 1**, the total area of the five proposed UFO parcels represents 2.7% of the currently leased Federal fluid minerals in the CEAA and 1.1% of the total area. Even if these numbers were equivalent to the increase in total number of wells developed in the CEAA, it would not address important factors affecting air quality, including (1) the rate (intensity) at which development occurs, (2) the degree to which development of the five proposed parcels and existing or additional future parcels occurs in proximity to each other; (3) the degree to which development of the five proposed parcels and existing or additional future parcels overlaps in time; (4) continued improvement in emission rates from oil and gas technology and operations; (5) the distribution of development activities in relation to seasonal meteorological conditions; and (6) the ambient air quality at the time of the future development, especially drilling and completions.

To examine potential cumulative air quality impacts from activities that it authorizes, this EA uses Colorado Air Resources Management Modeling Study (CARMMS) second iteration (CARMMS 2.0) modeling results. The study includes assessment of statewide impacts of projected oil and gas development (both Federal and fee, i.e., private) through year 2025 for three development scenarios (low, medium, and high). Projections for development are based on either the most recent Field Office Reasonably Foreseeable Development (RFD) document (high scenario), or by projecting the current 5-year average development pace forward through 2025 (low scenario). The medium scenario includes the same well count projections as the high scenario, but assumes restricted emissions; the high and low scenarios assume current development practices and existing emissions controls and regulations (2015).

Each Field Office was modeled with the source apportionment (SA) option, meaning that incremental impacts to regional ozone and AQRVs from development within each field office are parsed to understand better the significance of development in each area on impacted resources and populations. The CARMMS project leverages the work completed by the Intermountain West Data Warehouse, and the base model platform and model performance metrics are based on those products (2011). The complete report and associated data is available on our website at:

https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado

The BLM continually tracks authorized oil and gas activity to determine which CARMMS scenario would be most appropriate to estimate air resource impacts based on the source apportionment area's cumulative federal development and total production. Although the predicted impacts will be based on

future modeling results (year 2025), the differences in the impacts between the scenarios provide insight into how mass emissions impact the atmosphere on a relative basis, and are thus useful for making qualitative correlations for the tracked emissions levels.

On a cumulative basis, overall Federal oil and gas in Colorado is tracking close to the CARMMS 2.0 low scenario, with higher than CARMMS 2.0 low scenario projected new oil and gas development levels occurring in the DJ Basin of RGFO and within the Colorado River Valley Field Office (two typically high oil and gas development areas of Colorado). The cumulative maximum air quality and AQRV impacts described in this EA use the CARMMS 2.0 high scenario modeling results (**Table 2**) and are greater than those expected to occur in the near future based on observations of actual new oil and gas development trends (because no area in Colorado is outpacing the high development scenario and Colorado on a cumulative basis is tracking below the CARMMS 2.0 high development scenario).

Table 2. CARMMS 2.0 High Scenario New Federal Emissions (TPY) [1]

Source Area	*PM_{10}*	*$PM_{2.5}$*	*VOC*	*NO_X*	*SO_2*
UFO	113	30	358	464	1
Colorado	6,518	1,543	33,514	23,714	1,231

[1] Year 2025 emissions for new Federal oil and gas development years 2016 through 2025

Cumulatively, all new Federal oil and gas developed in Colorado through year 2025 for the CARMMS 2.0 high scenario could contribute a maximum 0.0243 kilograms per hectare per year (kg/ha-yr) of nitrogen deposition annually at the nearby Raggeds Wilderness and approximately 0.0216 kg/ha-yr at the At Maroon Bells – Snowmass Wilderness. For all sources cumulatively, CARMMS 2.0 predicts 0.34 kg/ha-yr of overall improvement from baseline year 2011 through year 2025 for the high scenario for both Maroon Bells – Snowmass and West Elk Wildernesses. **Table 3** shows the contribution from the UFO.

Table 3. CARMMS 2.0 High Scenario Annual Nitrogen Deposition -- UFO

Max Class I (kg/ha-yr)	*Class I Area*	*Max Class II (kg/ha-yr)*	*Class II Area*
0.009	Maroon Bells – Snowmass Wilderness	0.011	Raggeds Wilderness

Cumulatively, all new Federal oil and gas in Colorado for the CARMMS 2.0 high scenario could contribute up to 0.03 dv of visibility change at Maroon Bells – Snowmass Wilderness, as well as at West Elk Wilderness. Overall, the CARMMS 2.0 high scenario cumulative worst 20% visibility days from all sources in future year 2025 predicted 8.24 dv at both Maroon Bells - Snowmass Wilderness and West Elk Wilderness (an improvement from 8.47 dv measured in 2011). **Table 4** shows the contribution for UFO.

Table 4. CARMMS 2.0 High Scenario Visibility Changes – UFO

Max Class I dv	*Class I Area*	*Days > 0.5 dv*	*Days > 1.0 dv*	*Max Class II dv*	*Class II Area*	*Days > 0.5 dv*	*Days > 1.0 dv*
0.13	Maroon Bells – Snowmass Wilderness	0	0	0.14	Raggeds Wilderness	0	0

Project-Level Assessment and Future Monitoring

Over the past few years, BLM Colorado has completed three project-level air quality impacts assessments (Bull Mtn. MDP – 146 wells, Dual Operator Project – 25 wells, and North Fork Mancos MDP – 35 wells) for the area of the proposed lease parcels that included AERMOD / CALPUFF modeling to analyze potential criteria and hazardous air pollutants, and AQRV impacts. Air quality modeling for those analyses accounted for existing and future projected emissions inventories for the Region, and the results for those analyses indicated that each project would not significantly impact air quality and the cumulative concentrations for the area would be below applicable thresholds. As a result for the Bull Mtn. Unit MDP, BLM and project proponent are committed to tracking new oil and gas emissions for the Unit to ensure that new oil and gas emissions levels for the project development stay at or below emissions levels determined to be acceptable in the assessment.

In April 2018, BLM Colorado began operation of an air quality monitor at Paonia High School in the North Fork Valley. Data/information collected at this monitor is being used to support future oil and gas development for the area and ensure that new Federal oil and gas development in the area is not causing significant air quality impacts in the North Fork Valley. Over the past few months (as of late August 2018), BLM has being collaborating with operators in the area obtaining oil and gas development activity information and reviewing this information along with actual monitored concentration data for the North Fork Valley (Paonia).

Any new oil and gas development project that could occur on the proposed lease parcels would also undergo similar analysis where near-field and far-field modeling will be completed, and BLM will continue to monitor air quality for the North Fork Valley as new oil and gas development in the area continues.

GHG and Climate Change

The online Annual Report is also being used to provide information for this section. Information can be found in the "Projected Emissions for Analysis," "Projected Climate Impacts" and "The Carbon Budget" sections of the online Annual Report:

https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado

In addition, information from the Greenhouse Gas and Climate Change Report prepared by Golder Associates (BLM 2017) for the BLM is being incorporated to describe potential GHG emissions for various future years and energy development scenarios. For this report, GHG emissions were calculated for two energy development scenarios ("normal" rate of energy development and consumption, and an above normal energy production and consumption) for projected years 2020 and 2030 for each BLM State including Colorado. GHG emissions estimates for Federal and non-Federal energy related development (i.e., upstream and midstream) consumption (i.e., downstream) were developed for coal, oil, natural gas, and natural gas liquids. This report used coal, oil, and natural gas production and consumption data presented in the Energy Information Administration (EIA) 2016 Annual Energy Outlook (AEO) to determine growth factors to estimate 2020 and 2030 normal / high inventories. The following summarizes the projected future years GHG emissions and trends for Colorado Federal resources:

- Colorado Federal Emissions due to oil production and end-use consumption are projected to remain almost static (not much change) from baseline year (2014) to future years (2020 and 2030) with a slight decrease in GHG emissions for both the normal and high scenarios.
- Colorado Federal Emissions due to natural gas production and downstream consumption are projected to increase into year 2030 for both the normal and high energy projection scenarios from 42.91 MMTCO2e in base year 2014 to 44.55 and 45.03 MMTCO2e in the 2030 normal and high growth scenarios, respectively.

- Colorado Federal Emissions due to natural gas liquids are projected to decrease from baseline year 2014 to projected year 2030 by approximately 25 to 30% for both energy projection scenarios.

As part of the report, Golder examined the contribution of GHG emissions from coal, oil, natural gas, and liquefied natural gas (LNG) for the BLM States in years 2020 and 2030 for both the normal and high production scenarios. Comparing these emissions to the derived BLM emissions profile under the RCP scenarios, the calculated BLM/Federal emissions most closely track with RCP 8.5 in year 2020 and between RCP 2.6 and RCP 4.5 in year 2030 as shown in the following graph. Within the BLM emissions profile, the relative mixture of coal, oil, and natural gas changes from baseline year to 2030. The dependence of coal is reduced, with increased usage of natural gas by year 2030.

In addition, the Golder Report (BLM 2017) provides a supplemental "Understanding Future Climate Impacts" section and summarizes that projected changes in climate are driven by the cumulative emissions, not the emissions profile. When considering the cumulative emissions on a global scale, the sub-national emissions profile (by BLM as a whole, a BLM Field Office, etc.) is one of many emission contributions. Any single contribution on a sub-national scale is dwarfed by the large number of comparable national and sub-national contributors on a global scale. The best surrogate for understanding the potential impact of sub-national (e.g., UFO) emissions on climate is the behavior of the BLM sub-national emissions relative to all the other contributors. If BLM operates under the business-as-usual scenario while all other contributors are reducing their emissions in line with RCP 2.6 (lowest IPCC radiative forcing scenario that will require substantial Global GHG emissions reductions), the relative contribution of BLM increases as the GHG emissions more closely resemble RCP 4.5 (higher radiative forcing/Climate Change impact scenario).

If the BLM operates under the decreased emissions scenario, keeping reductions in line with RCP 2.6 as with all the other contributors, the relative contribution by BLM remains similar to current contributions. If BLM operates under the decreased emissions scenario, while all other contributors are maintaining constant emissions (business-as-usual) or increasing emissions, the relative contribution by BLM greatly decreases (i.e., BLM's GHG emissions footprint is small compared to other contributors). It is very unlikely that the global cumulative emissions will be strongly influenced by a single contributor (e.g., UFO) at a national or sub-national scale. However, the individual behavior of each contributor, through their relative contribution, has the ability to influence which RCP global emissions it most closely resembles, and which projections are most likely to manifest toward at the end of the century.

Potential Future Mitigation

The emissions inventory and modeling described above for Federal oil and gas development projects in Colorado are based on project-specific estimates and modeled near-field and far-field concentrations mitigation required to ensure compliance with air quality standards. Typical examples may include substituting equipment with lower emissions, avoiding concurrent drilling and/or concurrent completions on certain pads based on their proximity to each other and to human or environmental receptors, and limiting operations to a single drilling rig during all or part of the year.

Most projects, and essentially all under current operations, already incorporate certain design features, particularly "green completions" consisting of combusting (in a combustion unit instead of venting or flaring) gas from the borehole during completion operations, and containing flowback fluids (water, hydrocarbons, and a portion of the hydraulic fracturing constituents) in tanks with controls on venting instead of in open pits. Reductions in emissions related to health-based standards and environmentally based air quality values also reduce emissions of GHGs and impacts on climate.

In addition to application of the CARPP to any future oil and gas projects, a COA is applied by the BLM to all oil and gas projects requiring adequate surfacing and dust suppression of new, upgraded, or existing unpaved access roads. This COA is attached to all project-specific NEPA documents for APDs and

ROWs. Dust suppression benefits not only air quality by reducing airborne particulates but also reduces impacts of dust deposition on vegetation and in surface waters, and reduces the impact on quality of life of nearby residents and other users of publicly accessible access roads. In general, dust suppression consists of frequent application of fresh water during construction or periods of increased traffic, such as drilling and completion operations, but is replaced by use of a chemical suppressant (magnesium chloride or other) to provide a structurally more durable surface less prone to generation of fugitive dust during long-term production. Use of chemical suppressants may be restricted in proximity to surface waters or populations of sensitive plants.

Currently, Colorado has some of the strictest emissions regulations in the U.S. for the oil and gas industry not leaving much "available" emissions to reasonably control. The following highlights some of the additional GHG emissions controls that could be implemented for new Federal oil and gas development in the Planning Area and an approximate reduction in future annual UFO GHG emissions that could result in the additional emissions control:

- A large fraction of CO_2 (carbon dioxide) emissions for new oil and gas wells are associated with large O&G development related engines. NONROAD CO_2 emissions factors for large drilling and completion engines are projected to vary little over time even though new equipment technology generally results in cleaner engines, meaning that requiring operators to develop new wells using Tier 4 engines would result in an almost negligible reduction in CO_2 emissions for new oil and gas development.
- A large portion of CH_4 (methane) emissions for new oil and gas wells are associated with pneumatic devices. Implementing no-bleed devices (not feasible for all new oil and gas development) could result in a significant CH_4 emissions reduction. These type design features will be implemented (required by BLM) when feasible on a project-by-project basis.

It is reasonable to assume that BLM Colorado emissions related to oil and gas development will follow the U.S.-wide emissions pathways/GHG emissions trends based on regulation or policy. It also is reasonable to assume that Colorado State Regulations will reduce Colorado-based emissions even more than other States in the U.S. due to increased oil and gas emissions control requirements for Colorado. Additional (beyond State and Federal Regulations) mitigation requirements for oil and gas, and mining projects will be developed at the project-level stage when actual proposed actions are submitted to the BLM.

The BLM will continue to require that activities for projects follow best management practices and continue to encourage operators to control unnecessary GHG emissions using "common sense" and feasible techniques, such as reducing vegetation clearing when not all is needed (offsets CO_2 emissions), reducing truck idling, and double-checking equipment where fugitive emissions could leak (this is also a State and Federal requirement for oil and gas operations).

3.4.2 Cultural Resources and Native American Religious Concerns

Affected Environment

CULTURAL RESOURCES

Cultural resources are defined as fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were important to human history. Cultural resources comprise the physical remains themselves, the areas where significant human events occurred even if evidence of the event no longer remains, and the environment surrounding the actual resource.

Significant cultural resources are defined as those listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Significant cultural resources are generally at least 50 years old and meet one or more of the criteria presented in 36 CFR Part 60. The proposed lease parcels are located within the

North Fork area, which is designated as a "Low Probability" zone for the presence of cultural resources. A Class I report (on file at BLM UFO) indicates a probability of fewer than one NRHP-eligible site per section. Historic properties in the area are mainly of the later Historic Period of Euro-American settlement.

At least eight cultural resource inventories have been conducted in and around the five UFO proposed parcels recommended for inclusion in the December 2018 lease sale. Of the total of 2,830.55 acres in these parcels, less than 1% has been inventoried, resulting in no historic properties identified or recorded.

Environmental Consequences of Leasing and Potential Future Development

The leasing of Federal mineral rights for potential oil and gas exploration and production is an undertaking under Section 106 of the National Historic Preservation Act (NHPA). While the lease sale would not directly affect cultural resources, activities related to lease exploration and development would have the potential to have adverse effects on properties protected under NHPA. Potential impacts would be analyzed under future project-specific NEPA and review of individual APDs, SF-299s (request for right-of-way), Expressions of Interest (EOIs) for geophysical exploration, or Sundry Notices for changes to a well pad after APD approval.

Potential for impacts to cultural resources from oil and gas development is associated primarily with construction of well pads, access roads, and pipelines due to the extent of surface disturbance accompanying those activities. The required project-level cultural surveys are intended to avoid that potential by identifying cultural sites, assessing their eligibility for inclusion on the NRHP, and either avoiding or, alternatively, mitigating (i.e., cataloging, collecting, and curating) the associated resources. Complete Class III cultural resource inventories would be required prior to any development of these lease parcels.

Potential bidders/lessees are alerted by Exhibit CO-39 (see **Attachments C and D**) of the need on all parcels for cultural resource surveys at the time of any future oil and gas projects. In addition to this lease notice, all parcels would have a UFO stipulation specific to the protection of cultural resources:

- Exhibit CO-39 -- This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O.13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.
- UFO-CSU-Cultural Resources – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect eligible or potentially eligible cultural resources.

Despite these protections, indirect impacts from any future oil and gas projects could result from the increase in human presence associated with project workers or from members of the public who may have improved access into the area along project access roads. These impacts could range from accidental damage from cross-country travel to vandalism and illegal collection or excavation of sites.

Cumulative Impacts of Leasing and Potential Future Development

As described above, the project-specific NEPA analysis for any future oil and gas developments would include cultural resource surveys within and adjacent to any areas proposed for surface-disturbing activities. Any NRHP-eligible or potentially eligible sites would be avoided or fully mitigated (cataloged,

collected, and curated). Although it is not possible to predict the location, scale, or intensity of future development, it would be expected that the required surveys and the required protection of significant sites under Federal statutes, BLM policy, and the UFO-CSU-Cultural Resources stipulation would avoid or minimize project-related impacts. Consequently, the contribution of any future project impacts to cumulative impacts would be expected to be minor or negligible.

Potential Future Mitigation

Because some sites may be present but undetectable during pre-project surveys due to soil or vegetation cover, the BLM may apply a COA to any future project requiring that an archaeological monitor is present during surface disturbance in areas with a high potential for additional cultural resources. For all oil and gas projects, a Standard Education/Discovery COA for cultural resources would be attached to the APDs and ROWs. This COA requires that if cultural resources are uncovered during operations, all work in proximity of the resource must cease and the BLM notified immediately. Within 48 hours of the discovery, the State Historic Preservation Officer (SHPO) will be notified of the discovery, and consultation will begin to determine an appropriate mitigation measure. This COA also alerts the project proponent that any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law.

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment

The North Fork area is historically known as part of the Ute Tribe homelands, and such areas may contain Traditional Cultural Properties, culturally sensitive areas and landscapes, and areas of special concern to the modern-day Ute Tribes. Tribal consultation letters for the proposed lease sale were prepared for Field Manager signature and mailed to Tribal representatives of The Ute Indian Tribe of the Uintah & Ouray Reservation, the Southern Ute Indian Tribe, the Ute Mountain Ute Tribe, and the Navajo Tribe. These tribal representatives were asked to provide any information they may have regarding culturally sensitive areas and landscapes within or near the five parcels.

Environmental Consequences of Leasing and Potential Future Development

Impacts to culturally sensitive areas and landscapes have not been identified for the proposed UFO parcels. However, at the time of any future oil and gas development proposed for one or more of the UFO parcels, the BLM would consult again with the Tribes. Although no specific lease stipulation or COA applies to areas of Native American religious concern, the BLM uses its regulatory authority to work with the involved Tribes and the project proponent to provide protections of specific places or qualities through project location and design. This protection process would be applied for Federal well developments on both public and, to the extent possible, split-estate lands. Cumulative Impacts of Leasing and Potential Future Development

Any future development of one or more of the UFO parcels would include re-initiation of Tribal consultation to identify any culturally sensitive areas or landscapes to be affected by the development. Although every effort would be made at the time of project-specific NEPA to avoid diminution of the quality of the places having special significance to the Tribes, any decreased quality would be cumulative to decreases associated with development of other oil and gas leases in the CEAA.

Potential Future Mitigation

At a project-specific level, the BLM works with the Tribes and the proponent to select locations and incorporate design features to avoid or minimize losses or impacts to places of special religious significance. However, this applies only to BLM-administered public lands, because the Tribes do not typically attempt to affect development on private lands.

3.4.3 Geology

Affected Environment

The general area of the UFO parcels lies in the Gunnison Uplift, in Lower Tertiary strata of the Piceance Basin of western Colorado. This basin is defined by the outcropping of the Cretaceous Mesaverde Group, (comprising multiple formations). The Wasatch Formation is the prevalent bedrock geologic unit at the surface, but small areas of Mesaverde outcrop along the southern margin. The Wasatch is a lower Tertiary (Eocene) interbedded and lenticular, tan, yellowish to reddish brown, and reddish-purple clay stone, siltstone, sandstone, and conglomerate. This formation is highly susceptible to landslides, and slide and alluvial deposits represent a variable cover over Wasatch bedrock.

The Wasatch Formation unconformably overlies the Upper Cretaceous Mesaverde Group (i.e., these two formations are separated by erosion that removed intervening strata). The Mesaverde Group is locally about 6,000 feet in maximum thickness, consisting of sandstones and siltstones deposited along or near the shoreline of the retreating Cretaceous inland sea, with fluvial (stream and floodplain) and palustrine (swamp) environments inland of the shoreline. Coals within the Mesaverde Group represent the onshore swamps.

The marine Mancos Shale is the expected target for oil and gas development operations for most of the lease parcels, although coalbed methane associated with the Mesaverde Group may also be a target. The Mancos Shale was deposited on the bed of the shallow Cretaceous sea that covered much of the western interior of the North American continent. The finer (clay) material that dominates the Mancos Shale reflects its location farther from the shoreline where most of the coarser material was deposited.

Quaternary age surficial deposits occurring at the surface throughout the area consist of deeply weathered soils and various colluvial (slope) and alluvial (stream) deposits. Clusters of basalt boulders in some parts of the area may represent erosional remnants of Quaternary age, although the igneous source rocks are older (Tertiary age). Grand Mesa and Battlement Mesa to the northwest have basalt caps, and the nearby Raggeds, Marcelina Mountain, and peaks of the West Elk Range are a series of Tertiary (Oligocene) laccoliths (lens-shaped igneous intrusives) that extend from Mount Sopris to the San Juan Volcanic Area.

GEOLOGIC HAZARDS

Geologic hazards are present in the project area in the form of current and historically unstable slopes, landslides, and debris flows. Areas of instability are typically associated with steep slopes, saturated soil conditions, and bedrock dip slope. The sensitivity of geologic hazards in this region is most often determined by water content of the soil. Water in the pore space of a soil acts as both a lubricating agent and reducer of effective pressure. In general, soil movement is more likely to occur on east- and north-facing slopes due to the regional bedrock dip to the northeast, as well as higher soil moisture.

Localized flooding and debris flows along ephemeral or active stream channels due to the combination of steep gradients through portions of the area, rapid runoff from steep and rocky runoff, and the tendency of the region for brief but intense thunderstorms. Flooding related to these storm events can occur when they occur in late spring or early summer during periods of increased runoff related to snowmelt and protracted rainy periods, when a storm stalls over an area for an extended period instead of moving quickly past, or when a channel has become blocked by debris or structures.

Over the last century, subsidence has been noted at the surface directly above some of the historic coalmines in the area. This coalmining occurred throughout at a small scale but included large underground operations in the areas of Bowie and Somerset, including continuing operations at the West Elk Mine. No damage to overlying resources or structures attributable to subsidence of mined areas has been documented. It is possible that episodes of subsidence aggravated or contributed to some landslide movements, but this has not been established.

The project area has very low seismic activity, where only very low magnitude earthquakes are likely (U.S. Geological Survey [USGS] 2008). No significant active faults occur in the region (Morgan 2008).

INDUCED SEISMICITY FROM HYDRAULIC FRACTURING

Oil and gas companies and independent geophysicists have for many decades monitored microseismic activity—defined as a "faint" or "very slight" tremor—during hydraulic fracturing operations to help them optimize well completions and to gather information about fracture dimensions and propagation (Warpinski 2011). These data give an indication of the magnitude of seismic activity associated with hydraulic fracturing, dimensions of resultant (induced) fractures in geologic formations, and probability for fractures to extend into nearby aquifers, if present. Microseismic activity created by hydraulic fracturing typically occurs at a Richter magnitude of 1.0 or less (Warpinski et al. 2012). In comparison, a magnitude 3 earthquake is the threshold that can be felt at the ground surface. In 2012, the National Academy of Sciences (NAS) reviewed more than 100,000 oil and gas wells and waste water disposal wells around the world and concluded that "incidences of felt induced seismicity appear to be very rare," with only one such documented occurrence, with a magnitude of 3.6 (NAS 2012, Ellsworth 2013).

More recently, earthquakes with magnitudes of 2.1 to 3.0 were recorded in Ohio in 2014. These were subsequently attributed to hydraulic fracturing using large volumes of water in proximity to highly fractured Precambrian basement rocks (Skoumal et al. 2015). No significant damage to buildings or infrastructure is documented to have resulted from the small number of induced earthquakes attributed to hydraulic fracturing (Abdulaziz 2014). In comparison, wastewater disposal wells have a greater potential for felt earthquakes due to the larger volumes and longer durations of fluid injection into bedrock. Recent increases in felt earthquakes in hydrocarbon-producing regions of the central and eastern U.S. have been associated almost exclusively with wastewater disposal wells (e.g., see Ellsworth 2013).

The scale of water disposal associated with future development the UFO parcels and the location of any water disposal wells are currently unknown but would be addressed in detail during associated future project-specific NEPA analysis.

Based on the information above, the BLM does not believe that development of either parcel adjacent to Paonia Reservoir would represent a risk to the dam or the reservoir from induced seismicity.

Environmental Consequences of Leasing and Potential Future Development

Construction related to oil and gas developments has the potential to create or exacerbate situations of slope stability if not properly sited, designed, and implemented. Construction of access roads and well pads can result in changes to the local topography, including creation of steep slopes and compromising the stability of existing slopes. Operation of heavy equipment during construction may also trigger small-scale landslides or rockslides on naturally unstable slopes. The following stipulations, applied to all lands on all parcels, would greatly reduce the potential for slope failure associated with oil and gas activities:

- UFO-NSO-Steep Slopes Greater than 40% – Prohibits surface occupancy or use and surface-disturbing activities on slopes steeper than 40%.
- UFO-CSU-Steep Slopes 30-39% – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters.

Localized flooding could be caused by oil and gas activities that alter channel alignment or geometry, do not adequately control stormwater runoff from the well pad or access roads, or interfere with stormflow conveyance due to undersized or improperly installed culverts. These potential impacts would be addressed during future NEPA planning required for future oil and gas projects through the application of appropriate COAs (see below).

No impacts are anticipated to result from microseismicity induced by hydraulic fracturing. See **Section 3.4.15** (Water Quality) regarding protection surface water and groundwater resources in relation to hydraulic fracturing.

Cumulative Impacts of Leasing and Potential Future Development

Increased slope instability, triggering of historic slumps, landslides, or rockslides by cutting, and localized flooding that may occur despite application of the stipulations for steep slopes and COAs would be cumulative to similar impacts associated with past, present, or reasonably foreseeable oil and gas projects within the CEAA, and to activities associated with coalmining, road construction, and other construction projects. Because 40% of the CEAA is underlain by leased Federal fluid minerals (**Table 1**), future development of the area is likely and would largely be managed by the BLM and/or Forest Service, with protective stipulations and COAs to be applied to minimize potential impacts related to geologic hazards.

Potential Future Mitigation

In addition to the protections of the lease stipulations, BLM's authority under standard lease terms includes potentially relocating project components by up to 200 meters and requiring engineering design for any components that the BLM determine could cause slope instability, localized flooding, or unsafe conditions. This may include an inspection by a geotechnical engineer as part of the design package, and by a civil engineer during design of roads, culverts, and stormwater control. Changes or realignment of channels in relation to oil and gas developments require approval by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, and stormwater management is addressed by the BLM and the State of Colorado (CDPHE). Decisions regarding application of COAs related to geologic hazards, stormwater management, and related issues occurs during NEPA planning for all projects.

3.4.4 Noise

Affected Environment

The area of the UFO parcels is in a rural setting with supporting wildlife use, grazing, farming, and oil and gas development. Existing noise sources include agricultural and oil and gas activities, and both related and unrelated vehicular traffic. Oil and gas pads are currently distributed sparsely throughout the general area. Ambient sound levels in undeveloped rural areas are typically 30 to 40 A-weighted decibels (dBA) (USEPA 1974, Harris 1991). As a basis for comparison, the sound level of a normal conversation between two people standing 5 feet apart is 60 dBA.

Environmental Consequences of Leasing and Potential Future Development

Any future oil and gas activities involving the UFO parcels would increase noise levels near well pads and along access roads. In the short-term, noise levels would increase during construction, well drilling and completions, and major maintenance activities. Drilling, completion, and operation of oil and gas wells and production facilities are required to comply with COGCC's maximum permissible noise levels at a distance of 350 feet from the noise source (**Table 5**).

Short-term increases in noise levels would characterize the gathering pipeline, road, and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991), the typical noise level for construction sites is about 68 dBA (ranging from 63 to 72 dBA) at 350 feet from the source and 59 dBA at 1,000 feet (ranging from 54 to 63 dBA). Future project-related noise levels would be expected to be comparable to these typical values and to active commercial areas as cited by the EPA (1974).

These levels, although higher than the COGCC standard for the Residential/Agricultural/Rural zone, would be limited to areas of active construction, drilling, or completion.

Table 5. COGCC Maximum Permissible Noise Levels

Zone	*Noise Level at 350 feet from the Source (dBA)*	
	Daytime (7:00 A.M. to 7:00 P.M.)	*Nighttime (7:00 P.M. to 7:00 A.M.)*
Residential/Agricultural/Rural	55	50
Light Industrial	70	65
Industrial	80	75
Source: COCGG 2014a.		

Traffic noise would also be elevated during future oil and gas activities. The greatest increase would be along access roads during the drilling and completion phases. Most current operations utilize pipelines instead of haul trucks for moving fresh water, produced water, and liquid condensate, reducing associated noise levels. Based on La Plata County (2002) data, approximately dBA of noise (at a distance of 350 feet) would be occur during the passage of a heavy haul truck. Less noise would be created by smaller trucks and passenger vehicles, such as pickup trucks and sport utility vehicles. Although the duration of project-related traffic increased noise would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase but would remain as background noise near pads and roads. During maintenance and well workover operations, noise levels would temporarily increase above those associated with routine well production. Use of heavy trucks instead of pipelines to move fluids during production, and periodic passage of heavy water trucks used for dust abatement, would tend to keep long-term levels more elevated. These disturbances would be occasional and only during daytime.

Noise impacts would be expected to be less for parcels near State Highway 133 because of currently elevated ambient sound levels.

Cumulative Impacts of Leasing and Future Oil and Gas Development

Cumulative noise impacts occur when multiple noise sources are audible to a listener at a given location, and when multiple noise sources are encountered when moving through an area. Both types of cumulative noise impacts may accompany future development of the five UFO parcels. The first type would consist of future project-related noise in combination with noise already occurring, or occurring in the reasonably foreseeable future, and audible at the same location. An example would be a well pad and adjacent access road in combination with a nearby highway or operation of agricultural equipment. The second type would consist of a well pad and adjacent access road at multiple locations not audible at a given place but encountered repeatedly within a larger area through which a person moves, such as during recreational driving, commuting to/from work, etc.

It is impossible to assess either type of cumulative impact cumulatively because future development locations in relation to other noise sources is unknown. For any particular person, the cumulative impact of multiple noise sources would be based not just on noise levels at the source, distance from the source, and possible attenuation due to intervening topography and vegetation, but also on the scale and pattern of that person's movements in relation to other sources.

Potential Future Mitigation

Measures applied by the BLM to reduce noise impacts associated with oil and gas developments begin with locating well pads and new access roads as far from residences as feasible while accommodating

access to the fluid minerals. Also critical is BLM's requirement for adherence to the noise standard set by COGCC for the residential/agricultural/rural zone, even when no residence is present nearby. Examples of COAs applied by the BLM to abate noise impacts include the following:

- Prohibiting engine braking ("jake brakes") by project-related vehicles
- Requiring that non-emergency major maintenance be conducted during daytime when possible
- Requiring that on-pad gas-lift compressors and water disposal well pumps or generators be enclosed in a sound-abating structure
- In cases where topography tends to focus rather than attenuate noise from a well pad, or when proximity to a house does not allow the noise standard to be met, requiring use of "sound walls" on the well pad

3.4.5 Paleontological (Fossil) Resources

Affected Environment

The BLM classifies geologic formations based on the likelihood of significant fossil occurrence (usually vertebrate fossils of scientific interest) according to the Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands (BLM 2016a). These classifications, Classes 1-5, determine the procedures to be followed prior to granting a paleontological clearance to proceed with a project. The PFYC assignments for the geologic units were previously determined by the BLM.

Predominant sedimentary (potentially fossil-bearing) bedrock types in the general vicinity of the UFO parcels are the Mesaverde Group or the Wasatch Formation. The Mesaverde Group is considered Class 3, while the Wasatch Formation is considered Class 5. Fossils in these formations consist primarily of plants, invertebrates, and remains of vertebrates, such as teeth, scales, and small bones or bone fragments. Class 3 units have moderate potential for scientifically significant fossils, and fossils tend to vary in content and significance. Although scientifically significant fossils may occur, they tend to be widely scattered. Management of these areas may include surveys prior to disturbance, record searches, or monitoring during construction. Class 5 units have very high potential for scientifically significant fossils. Fossils in Class 5 units are highly susceptible to impacts from surface-disturbing activities, and management of these units often requires pedestrian surveys prior to disturbance or onsite monitoring during ground-disturbing activities.

The potentially fossil-bearing bedrock strata are mostly covered by extensive soils and vegetation, as well colluvium (unconsolidated material) on slopes and alluvium (water-deposited material) along streams, valley floors, interior basins, and swales. Soils and other unconsolidated materials are considered Class 1 or Class 2, with low potential of fossil occurrence. Fossils that are present in unconsolidated surficial deposits yield incomplete information on their provenance due to their separation from the bedrock formations. However, alluvium may unfossilized remains of vertebrate animals that occurred in the area during or since the Ice Age.

Environmental Consequences of Leasing and Potential Future Development

Sources of impacts to fossil resources during oil and gas developments include damage or destruction due to construction in unconsolidated surficial materials or contained in shallow or exposed bedrock. Exposures of Wasatch and Mesaverde bedrock are infrequent in the area overall but locally prominent along bluffs, eroded steep slopes, and roadcuts. These exposures are potential sources of fossils that would warrant relocation of proposed activities. The following stipulation on lands for all five parcels is intended to avoid or minimize the risk of loss of scientifically significant paleontological resources:

- UFO-CSU-Paleontological Resources – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect fossils and fossil-bearing bedrock exposures.

Cumulative Impacts of Leasing and Potential Future Development

Any future development of one or more of the UFO parcels would include some loss of surface or near-surface fossils due to being obscured by soil and vegetation cover during surveys. However, the CSU stipulation would minimize this loss. Any fossil losses from oil and gas activities would be cumulative to similar losses associated with past, present, or other future losses on other Federal leases, as well as development of private leases, in the CEAA area. Although 40% of the CEAA currently has Federal fluid mineral leases, BLM or USFS management of these projects is likely to avoid or minimize impacts to fossil resources. In addition, although the location, scale, and intensity of any future oil and gas projects cannot be predicted due to a variety of uncertainties, BLM's experience with oil and gas development in the CEAA indicates that surface-disturbing activities occur across a small percentage of leases, and that construction through bedrock is avoided where possible. Consequently, cumulative impacts on fossil resources are expected to be minor.

Potential Future Mitigation

The CSU developed from the analysis in the Draft RMP/EIS includes the ability to require paleontological surveys where potentially fossil-bearing formations are exposed or occur in the shallow subsurface, and to require relocation of project components during NEPA planning of any future projects. Therefore, these mitigations, typically applied as COAs, would be possible as part of the CSU. An additional measure that is applied as a COA when applicable is to require that any scientifically significant fossils that are discovered during surveys or monitoring of construction, if required, and that would be vulnerable to future damage or loss, are properly salvaged and curated.

3.4.6 Ranching and Livestock Management

Affected Environment

Ranching activities, including hay production and livestock grazing, are widespread in both irrigated and non-irrigated settings through the area encompassing the UFO parcels. While hay production does not occur on BLM-administered public land, it is a common on private land in areas of adequate moisture, the ability to deliver moisture through irrigation if necessary, and the availability of flat terrain and suitable soils. Grazing of livestock on BLM lands is one of the multiple uses available where vegetation and topography are appropriate, access is adequate, and this use is not precluded by conflicts with other resources or uses. Grazing and fluid minerals development are compatible in most situations.

Within the broad area encompassing the UFO parcels (see **Map 1**), the BLM manages 12 grazing allotments with seven grazing permittees. Historically, several areas sustained high levels of both sheep and cattle grazing. Seasonal cattle grazing still occurs, although at a lower level than previously, from approximately June through September. National Forest System lands shown on **Map 1** include 11 grazing allotments with multiple permittees.

Environmental Consequences of Leasing and Potential Future Development

Future oil and gas activities on the proposed parcels, all of which would require subsequent NEPA analysis and documentation, would affect grazing and livestock management on BLM lands from surface-disturbing activities and other forage loss associated with construction of well pads, new or expanded access roads, buried pipelines, and potentially other surface facilities. It is not possible to predict the amount of surface disturbance, because the number of well pads needed to the future lessees drilling plan is unknown, as are pad size and length of access roads and pipelines, and location in relation to different allotments. In general, the amount of vegetation loss represents a small percentage of the total area of a lease. A portion of this loss, mostly limited to the driving surface of roads and working area of pads (reduced at interim reclamation when drilling and completions are finished), extends through the life of a project. The remainder of the vegetation loss is temporary in connection with areas disturbed by road, pad, or pipeline construction and then promptly reclaimed. Some additional short-term decrease in forage

occurs while the temporarily disturbed areas are recovering following revegetation. Up to 5 years may be required before these areas can support the same amount of grazing use as pre-disturbance.

Deposition of fugitive dust on vegetation along unpaved roads can make the vegetation unsuitable for livestock if not adequately controlled. New or increased presence of invasive non-native plants (weeds), particularly along roads, pipelines, and around pads, can also reduce total available forage, since most weeds have low palatability to grazers. For well pads, roads, and pipelines placed on private lands, potential project impacts are somewhat greater, depending on the grazing intensity allowed by the individual landowner. Location of facilities is controlled primarily by the Surface Use Agreement between the operator and the landowner/rancher, and any lost value of hay production or livestock numbers would be offset by the operator, either directly or indirectly.

Other potential impacts include damage to range improvements (cattleguards, stockponds, fences), especially during road and pipeline construction, and temporary or long-term changes in stock movement routes (driveways) due to pads and other facilities. Use by livestock is not affected by activities on well pads, increased traffic, or noise. Injuries or mortalities from vehicles are typically negligible.

Cumulative Impacts of Leasing and Potential Development

Any forage loss from future oil and gas development of the UFO parcels would generally be minor and not affect the number of AUMs (animal units months) of grazing available on a BLM-administered allotment, as these allotments are very large in relation to the amount of direct or indirect forage loss. For allotments that might also include other past, present, or reasonably foreseeable future oil and gas activities, or other activities reducing forage production, the combination of impacts would be greater but again unlikely to affect numbers of AUMs. This is particularly true under current BLM grazing practices, which utilize less intensive and shorter duration of grazing, placing less stress on the vegetation. Because a high percentage of the CEAA consists of lands managed by the BLM or USFS (**Table 1**), cumulative impacts on grazing operations would be expected to be minor.

Potential Future Mitigation

Lost forage cannot be replaced during the project life, except for gradual recovery of temporarily disturbed areas extended across a period of 5 years or more. A standard COA for oil and gas projects requires prompt and effective revegetation of temporarily disturbed areas. This includes an emphasis on palatable native grass species, often with forbs and shrubs to better blend with natural conditions and uses, with the goal of controlling erosion and weeds. Another COA requires monitoring of revegetation success and the effectiveness of weed control is required for every project. At the end of the project, approval by the BLM of a Final Abandonment Notice (FAN) is required as a condition of releasing the operator from further responsibility for the condition of the pad, including an evaluation of whether the pad has been fully revegetated and is acceptably free of weeds.

An additional standard COA requires that the operator promptly repair, replace, or compensate the landowner (private lands) or grazing permittee (BLM lands) for any damage to range improvements, or for any injuries or mortality of livestock (both being infrequent). If the damage consists of loss or decreased capacity of a stock-watering facility, the operator is responsible for replacing the lost capacity.

3.4.7 Recreation

Affected Environment

Access to the proposed UFO parcels is expected to be primarily by State Highway 133 (paved) and then by unpaved County, National Forest, and (with permission) private roads. These roads currently provide access to hiking, mountain biking, dispersed camping, recreational on-road and off-road travel, cross-country skiing, snowshoeing, snowmobiling, and the primary recreational use, hunting. Recreational use is generally lighter in spring, which throughout the region is a transition season in which neither winter

nor summer opportunities exist for most users. Spring weather is often wet and windy and still cold, and the unpaved roads and recreational trails are muddy or partially blocked by lingering snow.

In addition to dispersed recreational pursuits, Paonia State Park, operated by Colorado Parks and Wildlife in combination with the Bureau of Reclamation (BOR), provides a focal point for more intensive recreational use, primarily in summer and early fall. Although camping and picnicking opportunities exist in the park, most activities are water-centered, with Paonia Reservoir providing for waterskiing, jet-skiing, general boating, and fishing.

The general area of the parcels is within CPW Game Management Unit (GMU) 521. Mule deer, elk, pronghorn, moose, black bear, and mountain lion are hunted within GMU 521. Moose also occur but in small numbers. No habitat for pronghorn is present in the area. Hunting for big game typically includes motorized access into and through the general area to a point used to set up camp. Other hunting in the area is for wild turkeys and, at higher elevations, dusky grouse.

National Forest System Trail 802, the Terror Trail, is located off NFSR 704 and provides recreationists with opportunities to explore the Electric Mountain area, including both motorized and non-motorized travel.

Developed recreation facilities such as campgrounds or other developed recreation facilities occur in the area except Paonia State Park and a Forest Service campground adjacent to State Highway 133 near the top of McClure Pass.

Environmental Consequences of Leasing and Potential Future Development

Direct impacts to recreation opportunities, experiences, and setting characteristics from future oil and gas development would result from increased vehicle traffic on area roads, occasional road closures, and increased noise and human presence associated with construction, drilling, and production. These impacts would diminish scenic qualities, decrease naturalness, and limit opportunities for solitude. Dispersed recreation uses such as biking, hunting, camping, and wildlife viewing, where relative quiet and separation from other human activity is sought as essential to the experience, would also be affected.

Displacement of game species due to construction and drilling would alter hunting opportunities, primarily by reducing wildlife use in areas where the activities are occurring. It is likely that as development continues, the areas of reduced use would shift from year to year, requiring advance planning by hunters to identify where to go and not go to seek game. These disruptions, and periodic brief road closures during drilling rig moves, would decline as development of an area moves into production, with much less activity, traffic, and noise. The presence of operational well pads might dissuade some hunters from using the area due to the industrial appearance, while others might be indifferent to this aspect. Use by wildlife of areas near well pads and roads generally rebounds somewhat during production, as the animals habituate to the pads and as human activity becomes less frequent and of lower intensity.

It is not possible to predict what impact oil and gas activities would have on big game populations. The relatively low density of most developments on BLM lands in the area, and the area's undulating or broken terrain, with wooded habitats for screening, generally high quality browse and forage, and ample water sources, may limit population impacts. Existing exposure to human activity from ranching activities, rural residential use, and passive recreation may also reduce impacts compared to the first introduction of oil and gas into an area.

Although hunting is the greatest recreational use, other dispersed recreation also occurs. Associated recreationists would be subject to most of the same types of impacts as hunter, again with most impacts being in areas where development is occurring, or where industrial facilities and associated traffic make the area unsuitable for the specific use or individual user. Impacts to the more developed recreational

uses of Paonia Reservoir would be expected to be low due to the focused human activity and the noise associated with boating create a different local environment, would be expected to be low.

Cumulative Impacts of Leasing and Potential Future Development

Impacts to recreational users of the BLM-administered public lands and split-estate private lands from future oil and gas activities related to the UFO parcels would be cumulative to similar impacts on other landscape and terrains in the CEAA. Aspects of oil and gas developments that result in permanent changes to an area, including more roads, the addition of an industrial component not currently supporting such use, and to a lesser degree the change in vegetation along pipelines would be cumulative to these increasing changes over the long term. This would gradually level out as the oil and gas potential of the area declines. In contrast, cumulative impacts associated with construction and drilling/completions may be lower if development activities shift through the five parcels and the remainder of the CEAA instead of occurring simultaneously in numerous locations. How this proceeds would be based largely on energy demands and commodity prices, and on the number of different lessees/operators.

Potential Future Mitigation

Mitigation of impacts to recreation mostly involves measures to reduce user conflicts. These include requiring that oil and gas lessees/operators inform local communities erect information signage at key access points to provide notice of significant road closures and, when needed, alternative access past the closure. In some cases, traffic control may be required as a way to minimize disruption.

Noise restrictions applied by the BLM (see **Section 3.4.4**) in combination with restrictions on nighttime lighting, and requirements for regular road maintenance, prompt road repair, and ongoing dust abatement would also reduce impacts to recreational users.

3.4.8 Socioeconomics

Affected Environment

The proposed parcels for the December 2018 lease sale are located in rural areas of Delta County (1,690.39 acres) and Gunnison County (1,140.16 acres). Nearby communities would include Bowie in Delta County and Somerset in Gunnison County. Between 2010 and 2016, the population in Delta County decreased by 1% ending with a population of 30,471 residents in 2016 (Colorado Department of Local Affairs – [CDOLA] 2017a). The population in Gunnison County increased by 7% during this same period ending with 16,394 residents in 2016 (CDOLA 2017a). CDOLA forecasts that Delta County will grow to a population of 35,763 residents by 2035 and Gunnison County to a population of 20,277 residents (CDOLA 2017b).

Since 2010, total employment in Delta County increased by 1% with a total of 15,135 jobs in 2016 (Bureau of Economic Analysis (BEA) 2017a) and saw a decrease in the unemployment rate going from 10.7% in 2010 to 4.9% in 2016 (Bureau of Labor Statistics (BLS) 2018). In 2016, the three industries with the greatest number of jobs in Delta County was government (16% of total employment), retail trade (12% of total employment), and health care and social assistance (11% of total employment) (BEA 2017a). Farming employment was 9% of total employment while mining was 2% of total employment in 2016 in Delta County (BEA 2017a). Delta County had a 46% reduction in mining related jobs from 2010 to 2016 (BEA 2017a) driven by coalmine closures. Gunnison County saw a 7% increase in jobs during the period ending with 13,014 jobs in 2016 (BEA 2017a) and a decrease in the unemployment rate going from 6.4% in 2010 to 2.3% in 2016 (BLS 2018). The three industries in 2016 with the greatest number of jobs in Gunnison County were government (17% of total employment), accommodation and food services (13% of total employment), and retail trade (10% of total employment) (BEA 2017a). Farm employment was 2% of total employment in 2016 in Gunnison County and mining related jobs were not disclosed (BEA 2017a).

Tourism and outdoor recreation contribute to the economies of Gunnison and Delta counties. In Gunnison County, skiing, mountain biking, camping, and hiking are popular in Crested Butte and the Gunnison Valley, and hunting is popular in the West Elk Mountains, a small portion of which are located in Delta County. In both counties, the West Elk Loop Scenic and Historic Byway links the historic mining communities of Redstone, Marble, and Crested Butte with orchards and farms near Paonia and Hotchkiss and the Black Canyon of the Gunnison National Park to the south in Montrose County.

In 2016, visitors spent approximately $36 million in Delta County and $196 million in Gunnison County. In 2016, the travel industry, which is represented primarily by businesses in the leisure and hospitality sector, transportation, and retail, supported an estimated 618 jobs in Delta County and 2,334 jobs in Gunnison County (Dean Runyan Associates 2018).

Per capita income increased from 2010 to 2016 in both counties resulting in Delta County having a per capita income of $32,318 in 2016 (up from $27,873 in 2010) and Gunnison County having a per capita income of $43,473 (up from $33,162 in 2010) (BEA 20017b). Income is derived from two major sources: (1) labor earnings or income from the workplace; and (2) non-labor income including dividends, interest, and rent and transfer payments (payments from governments to individuals; age-related, including Medicare, disability insurance payments, and retirements). In 2016, labor income is the main source of income in both counties—labor income was 46% in Delta County and 57% in Gunnison County (BEA 2017b). In Delta County in 2016, 24% of income came from dividends, interest, and rent and 29% from personal transfer payments (BEA 2017b). A considerable portion of income in Gunnison County in 2016 was from dividends, interest, and rent (32%) with personal transfer payments contributing the remaining 12% (BEA 2017b).

Agriculture is a traditional use of lands in the two counties and continues to be important today. There were 1,494 farms totaling 441,004 acres in the two-county region in 2012 (USDA NASS 2014). The North Fork Valley has become known for its rural character and organic farms; approximately 40 farms in Delta County were certified organic or transitioning to organic in 2012; Delta County has the largest concentration of organic farms and orchards of any Colorado County (USDA NASS 2014). The area has become a premier agri-tourism destination in the Rocky Mountains for visitors to organic farms and vineyards; based on the 2012 agricultural census, approximately 21 farms had established agri-tourism opportunities in Delta County, generating $293,000, and 17 farms in Gunnison County generated $243,000 through agri-tourism (USDA NASS 2014). Livestock grazing of cattle and sheep is also a traditional use on public and private lands in the area.

The planning area and surrounding North Fork Valley region consist of a largely rural setting with small towns. Meetings were held with local community leaders in advance of preparing a new RMP, which included collected information about local residents' values and desired conditions for community in the planning area. In meetings held for a Community Assessment in November-December of 2008 and in economic workshops in March of 2010, local residents sited small community feeling, slower pace of life, and outdoor lifestyle as important factors in local communities, particularly in Hotchkiss and Paonia. Local community leaders also stressed the importance of health lands and environment as well as municipal watershed protection as important factors. Some representatives, particularly from Delta County, also recognized the importance of mining jobs for the local economy. All communities desired moderate controlled growth (BLM 2009 and BLM 2010). Both use and non-use non-market values of open space can play a role in attracting new residents who in turn bring new sources of income to the area. Communities adjacent to public lands offer a high level of natural amenities that often attract retirees and others with non-labor sources of income, as well as sole proprietors and telecommuters who bring income from other regions into the local economy (Haefele et al. 2007). Undeveloped open space may also influence property value of local homes (Fausold and Lilieholm 1996, Western Governors' Association 1998, Crompton 2000).

Natural gas production in Gunnison and Delta counties has generally increased over the past several years. Production in the North Fork Valley has centered on natural gas, with relatively little oil. Most production has occurred in Gunnison County, where natural gas production increased from 2,078 MMcf in 2010 to 4,915 million cubic feet (MMcf) in 2016. Oil production in Gunnison County increased from 1,179 barrels in 2010 to 1,608 barrels in 2014 and decreased to 757 barrels in 2016. In Delta County, natural gas production increased from 9 MMcf in 2010 to 1,431 MMcf in 2015 and decreased to 91 MMcf in 2016. Oil production in Delta County increased from 42 barrels in 2010 to 3,044 barrels in 2013 and fell to 5 barrels in 2016 (COGCC 2018).

In the North Fork area, most oil and gas wells on privately owned lands are located on remote ranch parcels. Producing wells on completed well pads typically do not interfere with the productive capability of agricultural land, and have little or no effect on the land's value (Griffith 2017).

Leasing mineral rights for the development of federal minerals generates public revenue through the bonus bids paid at lease auctions and annual rents collected on leased parcels not held by production. Nominated parcels approved for leasing are offered by the BLM at a minimum rate of $2.00 per acre at the lease sale. These sales are competitive and parcels with high potential for oil and gas production often command bonus bids in excess of the minimum bid. In addition to bonus bids, lessees are required to pay rent annually until production begins on the leased parcel, or until the lease expires. These rent payments are equal to $1.50 an acre for the first five years and $2.00 an acre for the second five years of the lease.

The State of Colorado receives 49% of the total revenue associated with federal mineral leases. Federal mineral lease revenue for the State of Colorado is divided as follows: 48.3% of all mineral lease rent and royalty receipts are sent to the State Education Fund (to fund K-12 education); 10% of all mineral lease rent and royalty receipts are sent to the Colorado Water Conservation Board; approximately 2% of all mineral lease rent and royalty receipts are distributed directly to local school districts originating the revenue or providing residence to energy employees and their children; and 40% of all mineral lease rent and royalty receipts are sent to the Colorado Department of Local Affairs, which then distributes half of the total amount received to a grant program, designed to provide assistance with offsetting community impacts due to mining, and the remaining half directly to the counties and municipalities originating the Federal mineral lease revenue or providing residence to energy employees.

Bonus payments are allocated separately from rents and royalties in the following manner: 50% of all mineral lease bonus payments are allocated to two separate higher education trust funds, the "Revenues Fund" and the "Maintenance and Reserve Fund." The Revenues Fund receives the first $50 million of bonus payments to pay debt service on outstanding higher education certificates of participation. The Maintenance and Reserve Fund receives 50% of any bonus payment allocations greater than $50 million. These funds are designated for controlled maintenance on higher education facilities and other purposes. The remaining 50% of mineral lease bonus payments are allocated to the Local Government Permanent Fund, which is designed to accumulate excess funds in trust for distribution in years during which federal mineral lease revenues decline by 10% or more from the preceding year.

During the lease period, annual lease rents continue until one or more wells are drilled that result in production and associated royalties. The federal oil and gas royalties on production from public domain minerals equal 12.5% of the value of production (43 CFR 3103.3.1).

Past research on social impacts associated with energy development shows that social well-being often decreased during a boom, but then tended to increase once the boom is over. A comparative and longitudinal study conducted in Delta, Vernal, and Tremonton, Utah, and Evanston, Wyoming, addressed issues of social well-being in boomtowns (Brown et al. 2005; Brown et al. 1989; Greider et al. 1991; Hunter et al. 2002; Smith et al. 2001). With the exception of Tremonton, each of these communities experienced a boom during the late 1970s and early 1980s. Delta's boom resulted after the construction of a power plant while the booms in Evanston and Vernal were primarily related to oil and gas development. At least four surveys were conducted in these communities from 1975 to 1995. Several

indicators of social well-being were examined, including perceived social integration, relationships with neighbors, trust of community residents and community satisfaction. Delta and Evanston showed similar patterns associated with these indicators. During the peak boom years, residents experienced diminished perceived social integration, relationships with neighbors, trust of residents, and community satisfaction. Interestingly, Brown and others (2005) pointed out that the greatest declines in community satisfaction in Delta occurred just before the largest population increase of the 20-year study period, indicating that changes in population cannot alone account for shifts in community satisfaction and social integration. Nonetheless, by 1995, the levels of these indicators had returned to or exceeded pre-boom levels.

Another 2011 study highlights several of the changes that have been seen across the Bakken oil counties and the impacts to quality of life (Bohnenkamp et al. 2011). For example, the study highlights that the familiarity of residents with other residents and the safety often felt in small rural communities has shifted to in-migration of new people and safety concerns resulting from not knowing these people. The study also highlights concerns over housing prices and values increasing and the 38 changing of the population. While there is an in-migration of people for oil field jobs, there has also been an out-migration of long-time residents due to not being able to afford the rising housing costs (Bohnenkamp et al. 2011).

The proximity of oil and gas wells and related facilities can influence nearby residential property sales, especially those on split estate land. Landowners who do not own mineral rights may be subject to federal mineral development on their land. Usually, these landowners enter into a surface use agreement and receive compensation, i.e., income, for the use of their land. Estimates of how individual properties are affected by nearby oil and gas development vary from case to case depending on specific location and the exact character and features of a property.

Several studies published in the past several years have attempted to estimate how property values are impacted by nearby oil or gas exploration, drilling, and production. See Krupnick and Echarte (2017) for a summary of recent studies. In general, these studies find that, at the time of sale, the presence of oil and gas wells near the property reduces the property value relative to what it would have sold for without a nearby well. Unfortunately, the explicit and implicit assumptions used in these estimates (such as the maximum distance for a "nearby well" vary a great deal from study to study, as does the size of the price impacts, which range from zero to negative 37%.

Who owns the minerals appears to be another factor in property values. Split estates are referenced as a possible source of property value differences is several studies and in one (Boslett et al. 2016) property value estimates tended to be significantly lower in a Colorado region where the minerals were owned by the federal government compared to other areas where a comparable property was located above a non-federal mineral estate.

Additionally, multiple past studies identify concerns about possible environmental impacts associated with oil and gas exploration and development as one reason for property value differences. However, these concerns (and their influence on prices) can be tempered. Roddewig et al. (2014) state that "[past] real estate market studies indicate that investigation and remediation can limit price and value impacts from oil and gas contamination." Note that the BLM actively investigates and seeks remediation for oil and gas contamination resulting from production on federal land or into federal mineral reserves.

Current research also does not provide much guidance on how long these price impacts persist. In a study in Weld County, Colorado, Bennett and Loomis (2015) estimated a 1% decrease in urban house prices for every well being drilled within 0.5 mile "during the time the buyer is deciding upon buying the house (o)nce the well moves out of active drilling and into becoming a producing well, all our models show there is no statistically significant negative effect on house prices."

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, states "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human

health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…." The purpose of EO 12898 is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Indian tribes that may experience common conditions of environmental exposure or effects associated with a plan or project. A review of U.S. Census Bureau 2016 population estimates for race and Hispanic origin (U.S. Census Bureau 2017a), indicates that neither Delta nor Gunnison County meet the criteria of having minority populations that are 5 percentage points greater than the State of Colorado. Based upon U.S. Census Bureau Small Area Income and Poverty 2016 estimates, the percentage of population (all ages) in poverty in Delta County were 5 percentage points higher than for the State of Colorado (U.S. Census Bureau 2017b). This indicates that Delta County has low-income populations that can be considered as environmental justice populations.

Environmental Consequences of Leasing and Potential Future Development

The direct effect of leasing and development would be the payments received from leasing all or a subset of the 7,903.04 acres of federal mineral estate. Indirect effects that might result, should exploration or development of the leases occur, could include increased employment opportunities related to the oil and gas and service support industry in the region as well as the economic contributions to Federal, State, and County governments related to lease payments, royalty payments, severance taxes, and property taxes. Other effects could include the potential for an increase in transportation, roads, and noise disturbance associated with development, and potential for change in property values due to development. These effects would apply to all public land users in the study area, and surface owners above and adjacent to the proposed lease parcels.

Due to energy market volatility and the dynamics of the oil and gas industry, it is not feasible to predict the exact effects of this action, as there are no guarantees that the leases will receive bids, and that any leased parcels will be explored or that exploration will result in discovery of viable fluid mineral production. The types, magnitude, and duration of potential impacts cannot be precisely quantified at this time, and would vary according to many factors. Therefore, any parcel where future drilling activity would take place would first require an Application for Permit to Drill and requisite NEPA analysis, in which site-specific issues would be examined including any identified socioeconomic issues resulting from disturbance and drilling on the leased parcel.

Although oil and gas development already occurs in Delta and Gunnison counties, additional leasing and subsequent development could continue the stress on community services and impact people living near a lease or using a nearby area. Oil and gas exploration, drilling, or production, would potentially inconvenience these people through increased traffic and traffic delays, noise, and visual impacts. These impacts would be particularly noticeable in rural areas in which oil and gas development has not occurred previously. The level of inconvenience would depend on the activity affected, traffic patterns within the area, noise levels, the length of time and season in which these activities occurred, and other factors. Other concerns with additional development and production is the creation of new access roads, potentially allowing increased public access, and exposure of private property to vandalism.

Increased oil and gas development can also increase funding availability for school districts and county infrastructure needs such as road improvements and maintenance and provide job opportunities. Historically, tourism and farm-based agri-tourism have developed concurrently with mineral extraction in the North Fork Valley, and there is no evidence that existing oil and gas development has impacted agriculture or tourism in Delta and Gunnison counties. Based on local experiences, leasing the parcels would not be likely to affect tourism or small-scale farms, including orchards and vineyards, in the North Fork Valley, county government expenditures, or land values.

Executive Order 12898 requires the analysis of disproportionately high and adverse human health effects and environmental effects on environmental justice populations. No surface-disturbing activities are associated with a lease sale and; therefore, impacts from the lease sale would not disproportionately

adversely affect environmental justice populations. As previously noted, any parcel where future drilling activity would take place would first require additional NEPA analysis in which site specific impacts including environmental justice issues will be examined. Please also refer to **Section 3.4.2** (Cultural Resources and Native American Religious Concerns) for the discussion of potential impacts associated with leasing and development. The BLM has considered all input from persons or groups regardless of age, income status, race, or other social or economic characteristics. The outreach and public involvement activities taken by the UFO for this effort are described in **Section 1.5.1** (Public Scoping), and **Section 4** (Consultation and Coordination).

Cumulative Impacts of Leasing and Potential Future Development

Any possible future development of fluid mineral resources resulting from this lease sale would be in addition to the current level of development and would include the same types of socioeconomic impacts. To the extent that future, existing, or other reasonably foreseeable projects would overlap in time, or geographically (e.g., by county), cumulative impacts would be greater than for sequential projects for which short-term impacts have declined before the next project's short-term impacts have begun. Long-term cumulative impacts associated with the production phase of concurrent or sequential projects would be less than overlapping short-term impacts associated with the intensive activities associated with construction, drilling, and complete.

Potential Future Mitigation

The direct, indirect, and cumulative socioeconomic impacts of oil and gas developments are a necessary consequence of the activity and cannot be mitigated. However, impacts to individual resources and resource uses that contribute to aspects of the socioeconomic environment are addressed by lease stipulations and COAs. These are described in other discussions in Section 3.4.

3.4.9 Soils

Affected Environment

Soils in the area encompassing the UFO parcels are mostly derived from sedimentary bedrock parent material, although primarily formed indirectly on unconsolidated materials weathered or eroded from the bedrock. These materials include colluvium on slopes and alluvium deposited by water on valley floors in swales and basins. Where rock outcrops are generally deep, soils are predominantly well-drained loams, clay loams, and stony loams with high to very high runoff potentials. Most of these soils have very limited or poor suitability for native-surface roads because of their low soil strength, excess fines, and high shrink-swell potential. Erosion potential is moderate to high, depending primarily on slope. Hydric soils, with physical characteristics indicating saturation or inundation for substantial portions of the year, such as along slow-flowing drainages, in overbank areas, and at seeps or springs.

Any future site-specific NEPA analysis for oil and gas development would include a compilation of existing soils information available from the Natural Resources Conservation Service (NRCS), with particular attention to any fragile, saline, or highly erosive soils that should be avoided or would require special attention during design, implementation, and reclamation.

Soil erosion occurs in the area encompassing the UFO parcels in association with historically or currently unstable slopes that have led to slumps, landslides, rockslides, and debris flows. These situations are associated with steep slopes accompanying the undulating or deeply dissected terrain and steeply dipping bedrock or fractured bedrock. The triggering condition for slope instability in this region is most often determined by water content of the soil or underlying unconsolidated materials. Water in the pore space of a soil acts as both lubricating agent and reducer of effective pressure. In general, soil movement is more likely to occur on east and north facing slopes due to the regional bedrock dip to the northeast.

Other sources of soil erosion include reduced vegetation cover from surface disturbances, cross-country travel by motorized vehicles ranging from ATVs to 4WD trucks to construction equipment, and

potentially by grazing of livestock if not managed properly. Soil erosion is most problematic on sloping terrain such as found in much of the area. Soil erosion can also occur suddenly through the erosive force of runoff from major rainfall events, both during overland flow and in connection with flashy flows within or outside the banks of drainage channels.

Environmental Consequences of Leasing and Potential Future Development

Potential effects of oil and gas developments on soils include changes to the local topography resulting from surface disturbance, increased slope instability, mass movement in areas of geologic instability, and increased sedimentation due to soil erosion and transport into adjacent drainages. Operation of heavy equipment can also damage soils through compaction, and soils that are stripped and stockpile for later use in site recontouring and reclamation lose their soil structure, often have altered texture, and have lower levels of organic matter, which affects fertility, texture, and moisture holding capacity.

The greatest risk to protecting the soil resource and reducing soil is typically through construction activities or placement of permanent features on steep slopes. Therefore, application of the two following stipulations would greatly reduce the potential for slope failure associated with oil and gas activities:

- UFO-NSO-Steep Slopes Greater than 40% – Prohibits surface occupancy or use and surface-disturbing activities on slopes steeper than 40%.
- UFO-CSU-Steep Slopes 30-39% – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters.

The second stipulation also states that the BLM may require engineering and reclamation plans described how the proponent would mitigate potential effects to slope stability. Other sources of soil erosion or reduced long-term function as a growth medium for desirable plants are addressed through mitigation measures applied as COAs under BLM's regulatory authority (see below).

Cumulative Impacts of Leasing and Potential Future Development

Unavoidable surface disturbance, operation of heavy equipment, changed or increased runoff due to unvegetated surfaces, and the delay before revegetation is fully successful would be expected to lead to soil loss and reduced vegetation cover, which in turn could lead to less stable slopes. It is not possible to predict the scale and intensity of future projects, or their location relative to different soil types, but the stipulations above would keep future project-related surface disturbance off steep terrain.

Impacts of soil loss and reduced productivity would be cumulative to similar impacts associated with other present or reasonably foreseeable oil and gas projects within the CEAA, and with past projects recent enough that disturbed areas are not fully restored. The impacts would also be cumulative to impacts associated with past and present surface components of subsurface coalmining operations, surface sand and gravel operations, road and pipeline construction projects, and grazing operations. The large proportion of the CEAA underlain by Federal fluid minerals (**Table 1**) indicates that the majority of existing or future projects would be managed by the BLM and/or Forest Service, with similar types of stipulations and COAs.

3.4.10 Threatened or Endangered Species

Affected Environment

Species protected under the Endangered Species Act (ESA) as threatened or endangered and potentially present in proximity to the five UFO parcels, or not present nearby but potentially affected by future oil and gas projects authorized under subsequent site-specific NEPA analysis, are listed in **Table 6**. The table reflects a letter from USFWS dated July 6, 2018. As described previously, issuing leases is an administrative action that does not authorize any surface-disturbing activities or other use of the surface or subsurface for development of oil and gas resources within the leasehold. However, because future development of the leases is a likely outcome, this section addresses effects on ESA-listed or proposed

species reasonably anticipated to be associated with any future development, based on known distribution and habitat requirements of the species in relation to the parcels, and on protective lease stipulations to be attached to the parcels as appropriate.

Any future oil and gas development would require project-specific NEPA analysis and, if a listed or proposed threatened or endangered were potentially affected, consultation with the USFWS pursuant to Section 7 of the ESA. The BLM would not approve any future project until the USFWS consultation has been completed, and identified conservation measures have been incorporated into project design.

Table 6. Listed or Proposed Threatened or Endangered Species Present or Potentially Affected by Potential Future Oil and Gas Development

Listed Species	***ESA Status***	***Critical Habitat***	***Effects Determination for Future Development [1]***
Canada lynx, *Lynx canadensis*	Threatened	None in the Project Area	No Effect
North American wolverine, *Gulo gulo luscus*	Proposed Threatened	None Proposed	No Effect
Yellow-billed cuckoo, *Coccyzus americanus,* Western Distinct Population Segment	Threatened with Proposed Critical Habitat	Proposed in North Fork Gunnison near Bowie	No Effect
Colorado pikeminnow, *Ptychocheilus lucius*	Endangered with Critical Habitat	Downstream from Parcel Area	Likely to Adversely Affect [2]
Humpback chub, *Gila cypha*	Endangered with Critical Habitat	Downstream from Parcel Area	Likely to Adversely Affect [2]
Bonytail chub, *Gila elegans*	Endangered with Critical Habitat	Downstream from Parcel Area	Likely to Adversely Affect [2]
Razorback sucker, *Xyrauchen texanus*	Endangered with Critical Habitat	Downstream from Parcel Area	Likely to Adversely Affect [2]
[3] Green Lineage Colorado River cutthroat trout, *Oncorhynchus clarkii* cf. *pleuriticus*	Threatened	None Designated	No Effect

[3] See text following the table for explanation of effects determination.

[2] Tiered to the USFWS (2017) Programmatic Biological Opinion (PBO) for water depletions from the Colorado River Basin of western Colorado in connection with BLM-authorized oil and gas developments.

[3] Green Lineage Colorado River cutthroat trout is indigenous to the Colorado, Gunnison, and Dolores River Basins. It currently is designated as threatened pending further evaluation of ecological and taxonomic status.

Canada Lynx. Canada lynx occupy boreal, sub-boreal, and western montane forests and mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (Ruggiero et al. 2000). In the western United States, they are associated with subalpine fir, Engelmann spruce, and mesic lodgepole pine, and in quaking aspen cover types when mixed with coniferous habitat types. Primary Canada lynx habitat in Colorado is found mostly between 10,000 feet and 12,000 feet elevation, the lower end of which is above the highest elevation in any of the parcels.

The habitats in and near the five UFO parcels consist primarily of oakbrush, mixed mountain shrublands, aspen stands, montane Douglas-fir stands, and mixed riparian woodlands, none of these considered suitable lynx habitat. Because the parcels are not within a mapped Lynx Analysis Unit (LAU) and are within unsuitable habitat, the five location do not locations necessary for the continued persistence of lynx on public lands in Colorado.

North American Wolverine. The North American wolverine the Rocky Mountain region of the lower 48 states was previously proposed for listing as threatened (USFWS 2013), but the proposed listing was withdrawn because the threats cited were not sufficient to support listing (USFWS 2014). In 2016, the U.S. District Court for the District of Montana vacated the 2014 withdrawal of the proposed rule to list the Distinct Population Segment (DPS) of the North American wolverine as threatened, and the wolverine is currently considered a proposed threatened species.

In Colorado, nearly all historical and recent reports of wolverines are from high elevation alpine areas, which is a habitat type not present in or near any of the five parcels. Until recently, the last confirmed wolverine sighting in Colorado was in 1919, but in 2009 a radio-collared male wolverine travelled from Grand Teton National Park, Wyoming, southward into Rocky Mountain National Park, Colorado.

Yellow-billed Cuckoo, Western Distinct Population Segment. The the Western Distinct Population Segment (DPS) of the yellow-billed cuckoo is listed under the ESA as threatened (USFWS 2014). Approximately 550,000 acres of critical habitat have been proposed throughout its range, including along the North Fork Gunnison River upstream to near the town of Bowie. This segment has been proposed as critical habitat for the species. None of the five UFO parcels is located near the proposed critical habitat. The cuckoo could also occur farther upstream along the North Fork Gunnison River to east of the town of Somerset, although the habitat is less dominated by cottonwoods and less continuous. None of the UFO parcels would be expected to receive use by the cuckoo except potentially as transients.

Colorado River Endangered Fishes. The Colorado pikeminnow and razorback sucker occur in the Gunnison River from near the City of Delta to the confluence with the Colorado River and below that point, while the humpback chub and bonytail chub extend a shorter distance into Colorado from Utah. Populations of these fishes have declined throughout their historic range due largely to habitat loss or habitat degradation (mainly through dams and water diversions) and introduction of competitive and predatory non-native fish species. However, a review of the humpback chub has recommended down-listing this species to threatened status because the population recovery criterion included in the 2002 Humpback Chub Recovery Goals (USFWS 2002) was met over the past 5 years (USFWS 2018).

Unlike reaches farther downstream in the Gunnison-Colorado River Basin, the reach of the North Fork Gunnison and floodplain in proximity to some of the parcels is not known to provide spawning, nursery, feeding, and rearing habitats, or access to those habitats. However, impacts to these species from depletions in flows from the Colorado River Basin in connection with BLM-authorized oil and gas projects, and potentially the loss of eggs, larvae, and juveniles during withdrawal of water from the Colorado River Basin for use in oil and gas projects, led to the issuance of by USFWS (2017) of a Programmatic Biological Opinion addressing these issues.

Green Lineage Colorado River Cutthroat Trout. Recent genetic and meristic studies have provided evidence of six historical native lineages of cutthroat trout in Colorado (Metcalf et al. 2012, Bestgen et al. 2013). Two of these lineages are native in the greater Colorado River Basin, of which one, described as the Green Lineage Colorado River cutthroat trout, is native to headwaters and tributaries of the Colorado, Gunnison, and Dolores river basins. Until the taxonomy of indigenous (native) cutthroat trout subspecies in Colorado is resolved, the USFWS is treating the Green Lineage cutthroat as a threatened species, under the listing authority for the greenback cutthroat trout (*Oncorhynchus clarkii* ssp. *stomias*), to which the western populations were previously ascribed. The greenback cutthroat is endemic to the South Platte and North Platte River Basin Colorado's eastern slope, with a disjunct population also present in the Arkansas River Basin. Native cutthroat trout in Colorado are limited to relatively clean, cold headwaters streams and ponds.

Green Lineage cutthroat trout have been documented by CPW in the following streams located in or near the five UFO parcels (**Map 1**). More detailed maps are provided in Attachment E.

- Parcel 8140 – Henderson Creek (eastern portion), Clear Fork Muddy Creek (western portion)

- Parcels 8320 and 8351 – Deep Creek (eastern portion of 8351 only)
- Parcels 8135 and 8138 – Hubbard Creek (8138 only)

The populations of Green Lineage cutthroat in Clear Fork Muddy Creek and Henderson Creek (parcel 8140) are not genetically pure, due to hybridization with stocked rainbow trout or non-native cutthroat trout. Fish in Rock Creek and the South Fork of Twin Creek, tributaries of East Muddy Creek upstream from parcel 8140, are genetically pure and considered core conservation populations.

Environmental Consequences of Leasing and Potential Future Development

Potential impacts of future development would be addressed in a required site-specific NEPA analysis and documentation. For reasons described previously, it is not possible at the leasing stage to know precisely where, when, at what scale and intensity, and for what duration any future oil and gas activities might occur. The following paragraphs address impacts that might reasonably accompany such projects and the bases for the determinations of effects for listed or proposed threatened or endangered species summarized in **Table 6**.

Canada Lynx. While be no long-term or persistent lynx residency is anticipated in the area of the UFO parcels, the potential exists for lynx to pass through the area as they seek out or disperse to suitable habitats. If transient lynx were to utilize the area for dispersal, future development would not be anticipated to create barriers precluding lynx dispersal. For this reason, because any identified potential for impacts to lynx would be addressed at the time through ESA Section 7 consultation, and with the application to all leases of Exhibit **CO-34** for threatened or endangered species, the BLM has concluded that the lease sale and potential future development would have "**No Effect**" on the Canada lynx.

North American Wolverine. Currently, no wolverines are known to occur in Colorado, and it is extremely unlikely that a wolverine would occur in the vicinity of the parcels, even as a transient. For this reason, because all leases would have statewide **Exhibit CO-34** for threatened or endangered species, and because any future projects with the potential to affect the wolverine would be addressed in Section 7 consultation with the USFWS during site-specific NEPA, the BLM has concluded that the lease sale and potential development would have "**No Effect**" on the North American wolverine.

Yellow-billed Cuckoo. As noted above, known cuckoo habitat in proximity to proposed UFO parcels is in riparian habitat along the North Fork Gunnison River. Critical habitat has been proposed as far upstream as Bowie; no parcels are located within the 0.5-mile buffer for this reach of the river. Potentially suitable habitat also occurs farther east to beyond Somerset, and none of portions near Paonia Reservoir lies within 0.5 mile of the North Fork Gunnison riparian corridor. Based on the lack of suitable habitat (except potentially for occasional use by transients), the application of statewide **Exhibit CO-34** to all parcels, and the requirement for site-specific NEPA analysis and, if needed, ESA Section 7 consultation for any future development representing potential impacts, the BLM has concluded that leasing and potential future development of the UFO parcels would have "**No Effect**" on the yellow-billed cuckoo.

Endangered Colorado River Fishes. No oil and gas projects would be authorized under this EA, and any future development would address potential impacts to the Colorado pikeminnow, humpback chub, bonytail chub, and razorback sucker through reference to the analysis in the PBO of withdrawals of water and associated depletions in flows associated with Federal oil and gas development (USFWS 2017). Consequently, the effects determination in the PBO of "**May Affect, Likely to Adversely Affect**" for leasing and potential future development does not require ESA Section 7 consultation. The PBO includes a conservation measure requiring annual reporting of water consumption used for well development, dust abatement, and pipeline testing, and screening of water withdrawal pipes to avoid or minimize direct loss of eggs, larvae, or juveniles during withdrawals from occupied reaches.

Potential magnitude of use of water from the Colorado River Basin and potential withdrawal points due to potential developments are unknown because of uncertainties regarding future location, scale, intensity,

and timing/duration of any such developments. However, compliance with the mandatory conservation measures in the PBO would conform to the effects determination and the associated determination by the USFWS that doing so would avoid jeopardizing the recovery of continued existence of the species.

Green Lineage Colorado River Cutthroat Trout. Potential direct impacts could include inflow of sediments from areas of surface disturbance related to construction activities and long-term road use, and potential inflow of chemical pollutants related to oil and gas activities. Spills or other releases of chemical pollutants as a result of oil and gas activities are infrequent due to the various design requirements for well pads and access roads specified the BLM, Forest Service (no National Forest System Lands are included in the UFO parcels but occur nearby), and State of Colorado. In the event of a spill or accidental release, the operator would implement its mandatory *Spill Prevention, Control, and Countermeasures* (SPCC) Plan.

Statewide **Exhibit CO-34** for threatened or endangered species would apply to all parcels. Additional protections would be provided by the following stipulations where applicable:

- UFO-NSO-Native Cutthroat Trout – Prohibits surface occupancy or use within 325 feet of the edge of occupied habitat for conservation populations (90% pure or greater) of native cutthroat trout. This buffer width is slightly greater than the 300-foot-wide buffer recommended by CPW.
- UFO-NSO-Hydrologic Features – Prohibits surface occupancy or use within 325 from the outer edge of a stream, riparian area, or wetland.
- UFO-CSU-Hydrologic Features – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, within a zone 325 to 500 feet beyond the outer edge of a stream, riparian area, or wetland.
- UFO-TL – Coldwater Sportfish and Native Warmwater Fish – Prohibits work within any stream segment occupied by these species, including the Green Lineage Colorado River cutthroat, during the spawning season of April 1 to July 15.

Based on these protections, the BLM has concluded that leasing and potential future development of the five UFO parcels at the December 2018 lease sale would have "**No Effect**" on the Green Lineage Colorado River cutthroat trout.

Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed parcels in the UFO area would not be offered at the December 2018 Competitive Oil and Gas Lease Sale. Therefore, the potential for direct impacts on listed or proposed threatened or endangered species would not occur in relation to oil and gas activities in these parcels. However, currently permitted activities and other ongoing activities in the area, and associated impacts, would continue. These would include impacts associated with ranching, recreation, and vehicular travel on both Federal and private lands, and potentially with existing or new residential development or other surface-disturbing activities on private lands. Wildland fires, flooding, reduction in vegetation cover due to drought or grazing, and other natural events could also change the condition of the parcels in ways that are detrimental to these fishes.

Cumulative Impacts of Leasing and Potential Future Development

Because of the protections of the ESA, and the lease stipulations described above, potential direct and indirect impacts to listed or proposed threatened endangered species from future development would be expected to be avoided or minimal. This is also true for all other Federal projects to which future development of these parcels would be cumulative, and to some degree is also true of energy, resource, or land development projects and other activities on private lands subject to a Federal nexus and the protections of the ESA. Moreover, the small area of the five UFO parcels currently proposed for leasing in relation to existing Federal oil and gas leases in the CEAA suggests that the cumulative impacts of these parcels would be small.

Potential Future Mitigation

Future oil and gas development of some or all of the UFO parcels would undergo site-specific NEPA analysis and documentation and, if necessary based on biological surveys, other information, and detailed project information, and associated ESA Section 7 consultation. Mitigation measures to be applied to the projects would include conservation measures identified in BLM's Biological Assessment and in the concurrence letter or Biological Opinion prepared by the USFWS. Conservation (mitigation) measures regularly applied by the BLM for oil and gas projects include measures to prevent or minimize the transport of sediments and any chemical pollutants from well pads surfaces and roadways to surface waters by overland flow or along tributary channels.

Spills or accidental releases of chemical pollutants as a result of oil and gas activities associated with Federal leases are infrequent due to design requirements for wells and well pads, associated surface facilities, and access roads specified the BLM, even if on private land, in addition to the requirements by the State of Colorado through the Colorado Oil and Gas Conservation Commission (COGCC) and the Colorado Department of Public Health and Environment (CDPHE) through its delegated authority under the Clean Water Act. Increasing reliance on use of buried pipelines instead of haul trucks to transport liquid condensate (oil) accompany production of natural gas, and of produced water also brought to the surface, has further decreased the risk of spills and accidental releases into the environment. In the event of a spill or accidental release, the operator is required to implement its mandatory *Spill Prevention, Control, and Countermeasures* (SPCC) Plan and other mitigations identified by the BLM.

3.4.11 Transportation

Affected Environment

State Highway 92 (Delta to Hotchkiss) and State Highway 133 (Hotchkiss to Carbondale) would be the primary access roads used to access the UFO parcels from the west and north, respectively. From these paved roads, access to the parcels would be on smaller, unpaved county roads (e.g., the Gunnison County Buzzard Divide Road off State Highway 133 at the north, and potentially the Delta County Stevens Gulch Road and Hubbard Canyon Road off State Highway 133 at the south), and thence on more minor Forest Service or private roads, and potential roads constructed for coalmining. Between Hotchkiss and Carbondale, State Highway 133 is part of the West Elk Loop Scenic and Historic Byway.

Average daily traffic for all types of vehicles on State Highway 133 in 2015 (CDOT 2017) was 5,000 (including 175 trucks) on Bridge Street in Hotchkiss; 2,700 (including 132 trucks) at the intersection with State Highway 187 at Paonia; 2,,100 (including 210 trucks) at the eastern intersection with Bowie Road; 1,900 (including 135 trucks) at Somerset; 1,200 (including 122 trucks) at the intersection County Road 12 (Kebler Pass Road) at Paonia Dam; and 1,500 (66 trucks) north of the intersection with County Road 3 (Marble Road).south of the turnoff.

Environmental Consequences of Leasing and Potential Future Development

Access to the UFO parcels would use existing public or private roads to the extent possible, although some new roads, mostly consisting of short spurs (less than 1 mile) are likely. The location and alignment of new or upgraded roads associated with future oil and gas developments are unknown, as is the potential timing of these activities and the intensity and duration of use. In general, however, future development would cause a substantial increase in truck traffic on existing roads, particularly during construction, drilling, and completion activities and then declining dramatically during long-term production. It also is unknown what portion of increased traffic would occur on State Highways 92 and 133. However, because this route is the primary route for access to the general area and currently receives substantial use, the percentage increase would be less than on the existing county roads, and smaller interior roads, which currently receive low or very low levels of use.

Impacts expected to accompany increased traffic during future oil and gas projects include increased levels of fugitive dust, increases noise levels along currently lightly used roads, and increased risk of collisions or other accidents, including collisions with wildlife. The lack of current knowledge on where, at what level, and during what timeframe development would occur makes it impossible to assess these quantitatively. However, this type of analysis would be a key part of future site-specific NEPA required for planning and, potentially, permitting future projects.

Oil and gas developments can also damage roads or require additional maintenance and repair. These costs are borne by the lessee/operator, either directly of, for county roads, with the respective county transportation department.

A major determiner of traffic levels involving heavy haul trucks would be the extent to which each individual project, and overlapping multiple projects, would be able to meet their requirements for water handling using pipelines. In addition to unknowns regarding the scale and potential for concurrent timing of future projects is the wide range in water needs depending on the type of drilling used, the amount of produced water generated and the lessee/operator's ability to treat and re-use that water or first-use fresh water, and the location of the water source. Although recent trends in oil and gas development include greater use of pipelines instead of haul trucks, this is not always possible, depending on the distance from the source, and the degree to which the scale of initial development in an area justifies the upfront investment in pipeline infrastructure—especially true in unproven "exploratory" areas.

Cumulative Impacts of Potential Future Development

Traffic associated with future oil and gas development of the UFO parcels would be cumulative to both existing and future traffic associated with additional oil and gas projects and to traffic associated with other uses, including general commercial use as well seasonal hauling of agricultural products. Most traffic increases affecting the State Highway 92-133 corridor would occur during construction, drilling, and completion activities. During long-term production, traffic levels would be dramatically reduced and probably not discernible on the primary access roads, but discernible on the internal road network, which would receive light but regular use for monitoring and minor maintenance, short-distance haulage of water and condensate to centralized facilities, and application of water or a chemical suppressant to suppress fugitive dust. The potentially greatest cumulative effect would occur if development activities of the UFO parcels occurs concurrently with each other, and concurrently with some of the reasonably foreseeable future development sharing the State Highway 92-133 corridor.

Potential Future Mitigation Measures

The primary means for reducing truck traffic is the use of pipelines instead of haul trucks to move water needed for drilling and completions activities, and for frequent water to control fugitive dust during construction. During production, use of pipelines to move liquid condensate (oil) and produced water is also beneficial, but these traffic volumes are much lower. In general, the BLM cannot require use of pipelines instead of haul trucks during well development. However, if a substantial increase in traffic accompanies delivery of water from a distant source, the BLM would work with the operator to establish truck-pipeline transfer points at locations that would reduce traffic on small, low-volume roadways.

Impacts from fugitive dust are addressed by a requirement for regular watering during construction, which adds some traffic but at a localized scale. During long-term production and maintenance, dust abatement typically includes use of a chemical suppressant such as magnesium chloride, which provides more durable dust control and helps reduce road damage to unpaved surfaces.

Noise associated with truck traffic is addressed in the Section 3.4.4 (Noise). The risk of increased collisions with other vehicles or wildlife, or of truck accidents generally, is addressed by requiring project-related traffic to adhere to applicable speed limits, and to avoid travel during hazardous driving conditions. The BLM also applies a COA prohibiting the use of engine braking ("jake brakes") on local roads, and where on larger roads where prohibited by county or local road departments.

3.4.12 Vegetation – Upland, Riparian, Wetland, and Invasive Non-native

Affected Environment

The area of the five UFO parcels consists almost entirely of upland vegetation types, with riparian areas primarily along perennial streams, wetlands along drainages and at seeps and springs, and areas with infestations of invasive non-native species.

Upland vegetation across the bulk of the area consists of a mosaic of Gambel's oak (*Quercus gambelii*) shrublands ("oakbrush"), sometimes occurring as taller, single-trunk trees in open woodlands. Both the shrubland and woodland forms The oaks may form rather extensive stands on favorable sites, generally with gentle to moderate slopes in areas of elevated moisture, such as on north-facing slopes and along minor drainageways. More commonly, the oaks occur in a patchwork with meadows of mostly native perennial cool-season grasses and native forbs, or with shrublands of mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Parry's rabbitbrush (*Chrysothamnus parryi*), rubber rabbitbrush (*Chrysothamnus nauseosus*), or roundleaf snowberry (*Symphoricarpos rotundifolius*). Bitterbrush (*Purshia tridentata*) is sometimes present, as is mountain-mahogany (*Cercocarpus montanus*) at the lowest elevations and on warm, dry, mostly rocky sites.

This habitat type grades into two different coniferous types at the upper and lower margins in both elevation and soil moisture. Montane areas include stands or patches of Douglas-fir (*Pseudotsuga menziesii*), while subalpine areas, limited in size and occurrence, are mostly Douglas-fir mixed with some Engelmann spruce (*Picea engelmannii*). Quaking aspen (Populus tremuloides) occurs throughout, while Rocky Mountain juniper (*Juniperus saximontana*) is mostly on sunny, drier sites. At the lower and drier end of the continuum, Rocky Mountain juniper and pinyon pine (*Pinus edulis*) may form woodlands.

Perennial streams often support tall willows (*Salix* spp.), thinleaf alder (*Alnus incana*), western river birch (*Betula occidentalis*), or common chokecherry (*Prunus virginiana* var. *melanocarpa*), and the shorter redtwig dogwood (*Cornus sericea*) and twinberry honeysuckle (*Lonicera involucrata*). These riparian shrubs are mixed with Douglas-fir, blue spruce (*Picea pungens*), Rocky Mountain juniper, and quaking aspen along more major streams; narrowleaf cottonwood (*Populus angustifolia*) may also be present and becomes dominant along reaches of the North Fork Gunnison.

Some frequently saturated or seasonally inundated areas along drainages may support herbaceous wetland vegetation consisting of grasses, sedges, rushes, and forbs classified as obligate or facultative wetland indicator species. A low shrub, shrubby cinquefoil (*Dasiphora fruticosa*) is present along some stream margins at higher elevations. Seeps and springs also commonly support wetland vegetation.

While most meadows or forest and woodland openings support native perennial grasses and native forbs, invasive non-native forbs, mostly annual or biennial species, occur as localized infestations in disturbed or severely degraded areas, and as narrow linear stands along some roadways. Seeds of these species are commonly spread on the feet and legs of livestock, or in mud and dirt attached to the wheels and undercarriages of vehicles. Weed seeds may also be imported in gravel used on roadways, fill dirt used in construction, and seed mixes used for agriculture.

No special status plants—including threatened or endangered species or BLM sensitive species—are known or expected to occur in or near the UFO parcels.

Environmental Consequences of Leasing and Potential Future Development

Potential future oil and gas projects involving the UFO parcels would impact vegetation, primarily upland vegetation, during construction of well pads, roads, and pipelines. It is not possible to predict the amount of direct vegetation loss at this time due to many uncertainties involving numbers and locations of well pads, alignments and lengths of new or widened access roads or pipeline corridors, and potential additional surface facilities. No future oil and gas projects would be authorized by this EA and instead

would require site-specific NEPA analysis when details of the projects and of site conditions in the affected areas have been determined.

Direct impacts to wetlands would generally be avoided, unless disturbance of a jurisdictional wetland is authorized by the U.S. Army Corps of Engineers by a Nationwide or Individual Permit under Section 404 of the Clean Water Act. Riparian areas also would mostly be avoided, except where crossings of the associated drainages are needed for road or pipeline construction. No special (rare or unusual) plant communities are known to occur in or near the parcels, but these would be avoided to the extent possible if identified during future NEPA planning for individual projects.

The following stipulations would be applied to protect plant resources:

- UFO-NSO-Hydrologic Features – Precludes surface occupancy or use within 325 feet of streams, riparian areas, and wetlands.
- UFO-CSU-Hydrologic Features – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, within a zone extending 325 to 500 feet away from streams, riparian areas, and wetlands.
- UFO-CSU-Plant Community – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect significant and/or relict plant communities.

Planning of future oil and gas activities as part of future site-specific NEPA analysis would include working with the lessee/operator to avoid or minimize impacts to higher quality vegetation types, including those of particular importance to wildlife. On private surface, the landowner may assert a preference for developing in native habitats instead of modified habitats such as pastures used for hay production or livestock grazing.

Indirect impacts to vegetation from oil and gas activities are related to reduced soil productivity during stripping and stockpiling from pad sites and road/pipeline alignments for later use in reclamation; compaction and loss of structure and changes in texture from operation of heavy equipment; potential soil loss and erosion; and invasion or expansion of weeds, which compete with native species for space, moisture, and nutrients. Mitigation of vegetation impacts through application of COAs is summarized below.

Cumulative Impacts of Leasing and Potential Future Development

Direct and indirect loss or degradation of vegetation during future oil and gas projects would be cumulative to similar impacts from past, present, and reasonably foreseeable future projects involving replacement of vegetation with surface facilities, temporary disturbance of other areas with permanent changes in soil characteristics, reduced plant vigor that allows invasion by weeds, and direct importation of weed seeds on the wheels or tracks and undercarriages of mobile equipment.

Decreases in vegetation cover and vigor are often more conspicuous at a site-specific level than are widespread decreases associated with grazing, but as a percentage of a given area may be lower. On private lands, agricultural uses and rural residential developments may include extensive vegetation loss or modification, and infestations of weeds. Cumulative impacts may be greater on private surface, and particularly on lands used for development of private minerals, than on Federal lands in relation to area.

Because most of the CEAA includes lands managed by the BLM or USFS (**Table 1**), future development of currently leased and potentially leased lands would be expected to include the types of protective stipulations and/or the types of mitigation measures as associated with future development of the five currently proposed parcels. Within the large area represented by existing, currently proposed, or potential future Federal leases, the amount of direct habitat and the degree of reduced vegetation quality in revegetated areas is expected to be relatively small, as is generally the case for Federal oil and gas projects. Expected cumulative impacts on vegetation associated with oil and gas would be minor overall.

Potential Future Mitigation

During project-specific NEPA planning for future oil and gas developments of the UFO parcels, the BLM would work with the lessee/operator to minimize direct and indirect vegetation impacts. Examples of design features and COAs associated with planning of oil and gas projects include:

- Placement of well pads and alignment of roads and pipelines to avoid or minimize impacts to higher quality plant communities.
- Using the fewest pads possible to accommodate a reasonable level of development, made easier in recent years by advances in directional and horizontal drilling.
- Requiring prompt and effective reclamation designed to preserve viability of salvaged topsoil being stored for later use; properly preparing the soil seedbed, including adding any amendments needed based on soil type and condition; creating an adapted and diverse native seed mix and applying strict restrictions on presence of weed or other undesirable seeds; requiring annual monitoring and treatment of weeds and annual monitoring of reclamation progress; and requiring remedial measures, potentially including repeating the revegetation effort, if deemed necessary for achieving success. On private surface (split-estate) lands, the BLM requires a similar approach to revegetation but the private landowner may specify a seed mix consistent with intended post-project use of the land.

3.4.13 Visual Resources

Affected Environment

The primary sensitive viewing area in the vicinity is along State Highway 133, which is designated by the State of Colorado as part of the West Elk Loop Scenic Byway. The viewshed from McClure Pass to north of Paonia Reservoir captures the rolling foothills and valleys below and to the west of Ragged Mountain and southwest of McClure Pass. Within this setting, human presence may be evident on private in-holdings in a pastoral setting with ranching operations, wood fences ranch homes, cabins, and pastures. Livestock grazing and dispersed recreation are noticeable but do not dominate the landscape.

Along the lower Muddy Creek valley and then turning west below Paonia Dam, views are less expansive initially, being confined by the narrow valley. Although more constrained in distance, the view is visually interesting due to the river corridor, adjacent rocky bluffs, higher slopes, and diverse vegetation associated with these different areas. The presence of coal mining facilities imparts an industrial component in the area of Somerset and Bowie. Closer to Paonia, as the valley widens, views become more distant, and areas on the valley floor include agricultural, residential, and commercial developments.

Within the interior area surround the parcels, rolling hills and low ridges support a mosaic of aspens, oaks, meadows, and agricultural pastures, with tall montane conifers in sheltered or cooler, moister areas. The area is punctuated throughout with ranch buildings, agricultural pastures, rural residences, and existing oil and gas facilities. Along generally east- or south-draining ephemeral, intermittent, and perennial streams, the terrain is often much steeper, rockier, and more sparsely vegetated with shrubs and grasses characteristic of warmer, drier conditions.

Throughout much of the area encompassing the UFO parcels, natural night skies are notably dark due to the absence or widely dispersed development.

The BLM applies Visual Resource Management (VRM) requirements to projects to mitigate impacts to landscape character, consisting of form, color, texture, and line. Visual resource management includes four management classes: Class I, Class II, Class III, or Class IV. BLM lands within and near the five UFO parcels are designated as VRM Class II (Parcels 8320 and 8351 near State Highway 133 and Paonia Reservoir) or VRM Class III (BLM lands near split-estate parcels 8140, 8135, and 8138). These two classes have the following BLM management objectives:

- VRM Class II – Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- VRM Class III – Partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

While VRM objectives do not apply to non-BLM lands, the BLM addresses split-estate lands (e.g., Parcels 8140, 8135, and 8138) during development of underlying or nearby Federal fluid minerals.

The West Elk Loop Scenic Byway corresponding with State Highway 133 through the general area is known for its history, showcasing towns of varied lifestyles and natural beauty. The Delta County Master Plan notes the presence of the Scenic Byway and the protection and interpretation of the cultural heritage and natural resources in the area. The Delta County Master Plan also states the following goal:

> "The preservation of the rural lifestyle and landscape, which includes the natural environment and unique physical characteristics of Delta County. Natural resources associated with the rural landscape include open space and scenic viewsheds, and includes a desired strategy to map the significant physical features and environmental characteristics of the County, such as important scenic viewsheds."

The Town of Paonia has also developed a Highway 133 Corridor Master Plan, which specifically states as a goal that, "*The open scenic character of the West Elk Scenic Byway shall be protected*." It also states that new development should not detract from the rural qualities of the highway corridor and Paonia's small-town character.

Environmental Consequences of Leasing and Potential Future Development

Visual impacts of subsequent development of the UFO parcels could affect landscape character. For example, temporary or permanent facilities that have height, such as produced water, condensate, or oil storage tanks, would provide a strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation. New roads and pipelines would also create contrasts in line, color, and texture. Since potential oil and gas well locations cannot be accurately determined at the leasing stage, it is not possible to predict the visual impacts. The visual impacts of these types of impacts depends on their proximity to roads and areas of regular human use, their visibility from these areas if located farther away, and the overall naturalness of the setting where they are located. The degree to which new oil and gas facilities affect scenic quality is also a function of the extent to which they are novel, or newly introduced into an area.

The possible effects on nighttime lighting of drilling activities would have a temporary affect and would impact those in proximity to the drilling activity. In most instances, the light from the operation would be visible as a point of light in the landscape, similar to headlights of passing vehicles. This impact would be much less, and locally negligible, in proximity to residential, commercial, and light industrial facilities along State Highway 133 near Paonia and Hotchkiss.

Although most measures to reduce visual impacts would associated with planning, design, and implementation of future oil and gas activities (see below), the following lease stipulation would apply to Parcels 8320 and 8351 near Paonia Reservoir:

- UFO-CSU-Scenic Byways – Restricts surface occupancy and use, including requiring special design and implementation and potentially relocation by more than 200 meters, within 0.5 mile (805 meters) of State Highway 133.

In addition, while this stipulation would not apply to the parcels north of Bowie due to being more than 0.5 mile from the highway, any BLM right-of-way grants that may be need outside the parcels would apply this stipulation where applicable within the 0.5-mile buffer.

At the leasing stage, it is not possible to evaluate potential impacts to users of the proposed Carbondale to Crested Butte Trail, which wanders below the western edge of Ragged Mountain east of State Highway 133. Distance alone would substantially minimize impacts of future oil and gas development of the UFO in locations visible from the trail. This would be addressed during future NEPA planning for oil and gas projects and, where appropriate, mitigation measures would be applied (see below).

Cumulative Impacts of Leasing and Future Development

Cumulative impacts of any future development of the UFO parcels would depend on the location, scale, and intensity of the development in relation to naturalness of the setting, the presence of topographic and vegetation screening, and the spatial relationship to roads or other key observation points and to existing or other future development. Except for parts of the parcels along State Highway 133 near Paonia Reservoir, none of the parcels would be visible from the highway. However, upon leaving the highway and driving into the interior areas closer to and within the parcels, visual impacts would occur.

Cumulative impacts from the combination future development of the UFO parcels and existing or unrelated future developments could occur if industrial facilities (e.g., well pads or tank farms) or other stark visual contrasts (e.g., new roads and pipelines) occur at a density that allows multiple sites to be seen from an observation point, the effect could be to change the character of that area from natural, rural residential, or agricultural to industrial. If facilities or other stark contrasts at a low density but through a large area, the effect on visual quality may be less dramatic at a given location but equally or more impactful for people who travel through the larger area.

Because visual impacts of oil and gas facilities can be reduced somewhat through proper planning and placement, they cannot be avoided. Consequently, the level of cumulative impacts is little affected by the proportion of future project or reasonably foreseeable future developments on Federal vs. private lands. The greatest influence would be on the scale (total area) and intensity (density) of future oil and gas developments. While it is not possible to assess these aspects at the leasing stage, the small area of the five UFO parcels (2,830.55 acres), representing 2.7% of the total area of existing Federal oil and gas leases in the CEAA area (105,730 acres) shown on **Map 1**, indicates a relatively small addition to the cumulative visual impact in the CEAA associated with the Federal minerals.

Potential Future Mitigation

As part of reviewing and approving oil and gas development proposals, visual impacts would be analyzed and mitigated by applying COAs. This would apply on Federal surface as well private surface (split-estate) parcels or portions of parcels. This process begins by working with the operator to located well pads and other surface facilities at locations with topographic or vegetation screening to reduce visibility from roads, rural residences, or other key observation points. In uneven terrain, cut-and-fill slopes are minimized to the extent possible. Alignments or roads and pipelines (these being collocated when possible) are also selected to reduce visual contrasts.

COAs applied to specific locations may involve where tall facilities (e.g., storage tanks) are placed on a pad, potentially a requirement for low-profile tanks, choice of a paint color to blend with the surroundings, use of a paint with a non-reflective surface, and requiring that lights are downcast and include as little spread as possible without compromising safety. In most cases, the BLM requires salvaged topsoil to be placed in a low berm around the perimeter of the pad as way to enhance soil viability for future use in revegetation (see **Section 3.12**, Vegetation). This has the additional benefit of helping to obscure the pad's working surface and much of the equipment. In visually sensitive locations, the BLM may also require construction of a higher berm, with an irregular height and footprint width, to hide some of the taller equipment from key viewing points.

3.4.14 Wastes – Hazardous or Solid

Affected Environment

USE, STORAGE, GENERATION, AND DISPOSAL OF HAZARDOUS WASTES

Federal laws and BLM policies regulating hazardous wastes or other hazardous materials include:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) – Prohibits discharge of pollutants into Waters of the U.S., which by definition would include any tributary or dry wash that eventually connects with a perennial stream.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Public Law 96-510 of 1980) – Provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are EPA plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM CRVFO Hazardous Materials Contingency Plan.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) – Regulates the use of hazardous substances and disposal of hazardous wastes. Most of the drilling and production wastes that would be generated by any future development of the UFO parcels would be exempt from the RCRA hazardous waste regulations (e.g., produced water, produced gas). However, the exemption would not relieve the operator from corrective action to address releases of both exempt and non-exempt wastes.

In addition to the requirements of these Federal laws, BLM Instruction Memoranda WO-93-344 and CO-97-023 require that all NEPA documents, including future site-specific NEPA for oil and gas projects, list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed as a result of a project. Practices commonly used in oil and gas developments are dictated by various Federal and State laws and regulations and the BLM standard lease terms and stipulations that would accompany any leases issued pursuant to this EA.

TRANSPORT OF NATURAL GAS AND LIQUID CONDENSATE THROUGH UNREGULATED GATHERING LINES

Although produced gas and liquid condensate are exempt from RCRA hazardous waste regulations, such wastes could present a hazard to human health and the environment. In recent years, public concern has been raised regarding the risk of rural gathering pipelines to public safety. Consequently, the regulatory framework of gathering pipelines has undergone and continues to undergo revisions. While the BLM may evaluate the siting and potential environmental impacts of pipeline activities, as well as perform environmental surface inspections on public lands, the Federal pipeline safety program resides within the U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA has the primary responsibility for the promulgation and enforcement of Federal pipeline safety standards. However, various Federal and State agencies oversee pipeline safety. Determining the specific agencies overseeing pipeline safety in a given scenario is not simple. An overview of hydrocarbon pipeline regulation is provided in "A Regulatory Review of Liquid and Natural Gas Pipelines in Colorado" published by COGCC (2014b).

In general, the PHMSA, Colorado Public Utilities Commission (COPUC), and COGCC oversee the pipeline safety of rural areas in Colorado. The PHMSA Western Region Office of Pipeline Safety inspects interstate natural gas and all hazardous liquids pipeline systems located in Colorado (Colorado Department of Regulatory Agencies 2018). The Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011 was designed to examine and improve the state of pipeline safety regulation. In 2016, the

PHMSA published a notice of proposed rulemaking for gas transmission and gathering pipelines. The notice of proposed rulemaking shall have three separate final rulemakings anticipated in 2019 largely focused on gas transmission, integrity management, and safety of gas gathering lines (USDOT 2018).

The COPUC's Gas Pipeline Safety Section (GPS) enforces the State's gas pipeline safety regulations in order to provide for the public safety of the citizens of Colorado (Colorado Department of Regulatory Agencies 2018). Through its 60105 Agreement with the PHMSA, COPUC's GPS conducts and carries out the inspection and monitoring of intrastate gas pipeline systems. The COPUC works with trade and technical organizations representing the pipeline industry, utility damage prevention, and other State and Federal Agencies. As excavation damage is currently the largest single threat to our state's pipelines, the Utility Notification Center of Colorado (UNCC) is an important resource for understanding the laws, methods, and means of reducing utility damage in Colorado.

To address public safety concern, COGCC began Rulemaking proceedings on flowlines on October 15, 2017 (COGCC 2018a). On February 13, 2018, the COGCC adopted Flowline Rules to address oversight of flowlines and related infrastructure associated with oil and gas development (2018b). COGCC defines a flowline as a segment of pipe transferring oil, gas, or condensate between a wellhead and processing equipment to the load point or point of delivery to a PHMSA- or COPUC-regulated gathering line or a segment of pipe transferring produced water between a wellhead and the point of disposal, discharge, or loading. The Flowline Rules include requirements for registration, installation, and design standards, transfer lines, transfer line valves, enhanced integrity management, abandonment, and financial assurance for produced water transfer systems, among other requirements.

Environmental Consequences

Pollutants potentially spilled or otherwise accidentally released during any future construction could include diesel fuel, hydraulic fluid, and lubricants associated with the operation of heavy equipment. These materials would be used during construction of well pads, access roads, and gathering pipelines and for refueling and maintaining the vehicles and equipment. Potentially harmful substances used during construction and operation would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed in amounts above threshold quantities. Waste generated by construction would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes include those associated with well production and transmission of natural gas through the gathering pipelines and the natural gas itself.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed during construction or operation of the facilities. None of the chemicals typically used in construction meets the criteria for an acutely hazardous material/substance or the quantities criteria per BLM Instruction Memorandum No. 93-344.

Solid waste (human waste, garbage, etc.) would be generated during construction, but primarily during drilling and completion because the workforce would increase during these activities.

Future NEPA analysis for specific oil and gas developments would address potential environmental impacts of gathering pipelines, as well as potential cumulative impacts. The following references a few of the EA sections that address gathering pipelines. Typical mitigation measures are described below.

Cumulative Impacts of Potential Future Development

Cumulative impacts of the use, transport, or storage of hazardous waste, and generation of solid waste—including transport via gathering lines—would would result if multiple incidents of spills or accidental releases resulted in exposures to human and other receptors at levels greater than for individual incidents,

and if the additive exposure levels exceeded a threshold for harm. The risk of multiple spills or accidental increases as the number of activities posing those risks increases. Thus, increasing number of wells, miles or pipelines, and trips by haul trucks moving hazardous substances increases the associated risks proportionately.

For the five UFO parcels, all traffic related to oil and gas activities would access the area via State Highway 133, whether arriving from larger population centers and major highways to the west or north. Similarly, all surface drainages from the five parcels flow toward the North Fork Gunnison. The same is true for existing (past and present) activities as for reasonably foreseeable future activities. As a result, the statistical potential for cumulative impacts is additive among past, present, and reasonably foreseeable future actions.

Potential Future Mitigation Measures

Protective measures related to the hazardous or solid waste fall into two broad categories: engineering controls and administrative controls. Engineering controls are physical design features that address potential hazards and causes of failure. Administrative controls are plans and policies that restrict some activities and require others.

Measures implemented to mitigate potential impacts associated with the use, storage, generation, and transport of hazardous materials and other wastes during any future oil and gas developments would include the following:

- No extremely hazardous substance, as defined in 40 CFR 355, would be produced, used, stored, transported, or disposed during construction or operation above permissible quantities.
- All tanks are required to be placed within an area of secondary containment equal to 110% of the volume of the enclosed tanks.
- Most current operations use a closed-loop drilling, which eliminates the storage of fluids containing hydrocarbons in open pits. Although the BLM cannot require closed-loop drilling, the BLM would require that any fluid-containing pits for any purpose other than storage of fresh water would be lined and equipped with a leak detection system.
- Where topography permits, production equipment would be monitored remotely by radiotelemetry to ensure prompt detection of leaks or other problems.
- Lessees/operators and their contractors would be prohibited from hauling hazardous materials by truck during unsafe conditions such as associated with muddy severe winter conditions.
- Trailers housing workers would be outfitted with self-contained sewage collection system, and regular trash collection would occur throughout drilling and well completion.

Mitigation measures for gathering lines would include use of high-strength steel, use of a corrosion-resistant coating and cathodic protection, wrapping the exterior with a protective material to resist corrosion and physical damage, burying at least 4 feet or deeper to avoid freezing, avoiding installation during frozen conditions, burying at least 4 feet at stream crossings, pressure-testing prior to use, promptly implementing revegetation of the corridor to reduce erosion of the overlying material, and regular monitoring of pressures, and regular monitoring of pipeline integrity.

In the event of any release of a hazardous substance to the environment in reportable quantities, the responsible party would be required to implement its *Spill Prevention, Containment, and Countermeasures* (SPCC) Plan and is liable for cleanup and monetary damages. Depending on the scope of the spill or release, the SPCC Plan or BLM's contingency plan would apply (or other governmental entity's contingency plan, depending on where the incident occurs). These laws, regulations, standard lease stipulations, and contingency plans and emergency response resources are expected to mitigate any potential hazardous or solid waste issues associated with future development.

3.4.15 Water Quality – Surface Water and Groundwater

Affected Environment

SURFACE WATER

In the general area of the UFO parcels, drainages experience high surface flows from both snowmelt and rainfall events. Snowmelt is typically generated from higher elevation headwater areas. Short-duration flooding typically occurs from intense, localized monsoon-driven events in mid to late summer, and has the greatest effect on intermittent and ephemeral channels.

The five proposed parcels are within the North Fork Gunnison Subbasin, which comprises the northern headwaters of the Gunnison Basin and extends from the Continental Divide to the confluence of the North Fork and mainstem of the Gunnison River about 9 miles downstream from Hotchkiss, Colorado. The North Fork Gunnison Subbasin (8-digit USGS hydrologic unit code [HUC] 14020004) drains part of the Grand Mesa and Huntsman Ridge to the west and north, the Elk Mountains to the east, and the West Elk Mountains to the south. The proposed parcels are within two 10-digit USGS HUCs: East Muddy Creek and Hubbard Creek-North Fork Gunnison River.

Subwatersheds (12-digit HUCs) associated with the proposed UFO parcels are as follows:

- Parcel 8140 – Drains to Henderson and East Muddy Creeks and thence to Muddy Creek, as do other, unnamed tributaries, and thence to Paonia Reservoir (created by damming Muddy Creek) and the North Fork Gunnison.
- Parcels 8321 and 8350 – Most aliquots drain to perennial Williams Creek and Deep Creek, previously tributaries of Muddy Creek and now flowing into Paonia Reservoir, as do unnamed intermittent tributaries of Muddy Creek/Paonia Reservoir, and thence to the North Fork Gunnison. The most southwesterly aliquots drain to intermittent Thompson Creek, a tributary of the North Fork Gunnison.
- Parcels 8135 and 8138 – Drains to perennial Alder Creek (including intermittent Big Alder, Morman, and unnamed creeks) and perennial Hubbard Creek (including intermittent Wolf, Branch of Bee, Slide, Willow, Pilot, and unnamed creeks), and thence the North Fork Gunnison.

Within each river basin in Colorado, specific stream segments are defined, and specific use classifications and numeric water quality standards are adopted. The stream segments pertaining to the creeks downstream from the project area to the Town of Paonia are listed in **Table 7**, along with their defined classifications, and any listings of impairment or monitoring and evaluation (CDPHE 2017b, 2018a and 2018b). BLM policy is for activities initiated or authorized by the agency to ensure that water quality continues to support the designated uses.

Table 7. Designated Water Uses for Selected Streams in the Area of the UFO Parcels

Stream Segment	*Designated Uses* [1]	*Current Condition*
Muddy Creek and tributaries	Agriculture Class 1 Coldwater Aquatic Life Recreation Class E Water Supply	Current conditions mostly support those uses. Exceptions are East Muddy Creek for coldwater aquatic life (iron) and water supply (arsenic); and a segment of Muddy Creek for coldwater aquatic life (iron and temperature), water supply (iron and arsenic), and recreation (coliform bacteria).
Paonia Reservoir	Agriculture Class 1 Coldwater Aquatic Life Recreation Class E Water Supply	Paonia Reservoir is on Colorado's Monitoring and Evaluation list for dissolved zinc with regard to aquatic life.

Thompson Creek	Agriculture Class 2 Warmwater Aquatic Life Recreation Class P Water Supply	Current conditions are fully supporting these uses.
Hubbard Creek	Agriculture Class 1 Coldwater Aquatic Life Recreation Class P Water Supply	Current conditions fully support these uses.
Mainstem North Fork Gunnison from its inception to above Paonia	Agriculture Class 1 Coldwater Aquatic Life Recreation Class E Water Supply	Current conditions fully support these uses.
[1] Recreation Class E = Existing primary contact use (swimming, boating, waterskiing), April through September; Recreation Class P = Potential primary contact use, October through March		

Paonia Dam and Paonia Reservoir are located on Muddy Creek, upstream of its confluence with Anthracite Creek, where the North Fork of the Gunnison River commences. Paonia Reservoir manages irrigation water, and has recreation and flood control benefits. The Reservoir bisects portions of parcels 8320 and 8351 and is downgradient from parcel 8140. As noted in **Table 7** and **Section 4.4.7** (Recreation), Paonia Reservoir receives heavy seasonal, including primary human contact with its waters.

In addition to general water quality issues associated with designated uses of area surface waters is the presence of four public water supplies in the general area of some of the propose parcels. Two of these are designated by the State of Colorado as Public Water Systems (PWSs), while the other two locally established Source Water Protection Areas (SWPAs):

- Mountain Coal Company LLC / West Elk Mine PWS – A portion of this PWS extends to the edge of the disjunct western portion of Parcel 8351, and the 0.5-mile external buffer established by COGCC Rule 317B extends into the southeastern corner of this part of the parcel. See the discussion of the requirements of Rule 317B, below. The remainder of Parcel 8351 and all of Parcel 8320 are located more than 5 miles upstream from the intake of this PWS and therefore not subject to Rule 317B. Parcel 8140 lies additional 12 or more miles upstream from this PWS.
- Bowie Mine #2 PWS – Parcels 8135 and 8138 are located in the Hubbard Creek drainage approximately 6 to 7 miles upgradient from the Bowie Mine #2 PWS intake. This water is used by the towns of Somerset and Bowie.
- Pitkin Mesa Pipeline Company SWPA – Source waters are a series of springs approximately 3 miles west of Parcel 8138 but in a different drainage sub-basin and not upgradient.
- Hotchkiss SWPA – This SWPA includes the Town's water intake from Laroux Creek via the Highline Canal, Overland Reservoir, and Overland Ditch. The Overland Ditch crosses a portion of the subwatershed that includes Parcels 8135 and 8138, but this segment of the ditch is more than 15 miles upgradient from the two parcels.

As noted above, the Bowie Mine #2 PWS (Identification No. 215202) and the Mountain Coal Company LLC / West Elk Mine PWS (Identification No. 226838) are afforded certain protections under COGCC Rule 317B, which applies different levels of protection based on distance from a PWS watershed boundary. These are an internal buffer of 0 to 300 feet, an intermediate buffer of 301 to 500 feet, and an external buffer zone of 501 to 2,640 feet (0.5 mile). The southeastern corner of the western portion of Parcel 8351, being located within the external buffer of an arm of this PWS, would include the following State-mandated requirements for any drilling, completion, production, and storage (DCPS) activities:

- Use of pitless (closed-loop) drilling systems (these are always used in modern operations) or containment of flowback and stimulation fluids within tanks placed on a well pad or in an area with downgradient perimeter berming, designed and built to strict specifications.

- Collection of baseline water-quality data for analysis of a suite of organic and inorganic parameters specified by the State.
- Notification to the owner/operator of the PWS within 15 stream-miles downstream prior to commencement of surface-disturbing activities and oil and gas operations.
- Preparation of an emergency spill response program that includes employee training, safety, and maintenance provisions and current contact information for downstream PWS(s) located within 15 stream miles downstream.
- In the event of a spill or release, immediate implementation of the emergency response procedures in the emergency spill response program. If a spill or release impacts or threatens to impact a PWS, the operator shall immediately report the discovery of the release to the COGCC and the Environmental Release/Incident Report Hotline in accordance with COGCC Rule 906.b.(4). An SPCC Plan is also a BLM requirement (see Section 3.4.14).

In addition to the State Rule 317B requirements, UFO's Draft RMP/EIS includes the following stipulations that would be applied to a portion of the western part of Parcel 8351 (see **Attachments C and D**).

- UFO-NSO-Public Water Supplies -- Prohibits surface occupancy or use within 305 meters (1,000 feet) on either side of a classified surface water-supply stream segment (as measured from the average high high-water mark) for a distance of 5 miles upstream of a public water supply intake classified by the State of Colorado, and within 2,640 feet (0.50 mile) of public water supplies that use a groundwater well or groundwater under the direct influence of surface water. No directional drilling is allowed within 457 vertical meters (1,500 vertical feet) below a surface public water supply or 457 vertical meters (1,500 vertical feet) below the depth of a public water supply that uses a groundwater well or groundwater under the direct influence of surface water.
- UFO-CSU-Public Water Supplies – Restricts surface occupancy or use, on lands located greater than 305 meters (1,000 feet) but less than 805 meters (2,640 feet) (0.50 mile) of a classified surface water supply stream segment (as measured from the average high-water mark) for a distance of 8.05 kilometers (5 miles) upstream of a public water supply intake classified by the State as a "water supply," and all public water supplies that use a groundwater well or spring. Special design, construction, and implementation measures, including relocation by more than 200 meters (656 feet), may be required. The operator must comply with all applicable sourcewater protection plans developed by public water providers.

An additional potential impact to surface water could occur from decreases in streamflows if surface waters are used as the source of fresh water for drilling, completions, and dust abatement. Although use of fresh water from surface sources is most likely, it is not possible to know at the leasing stage what sources would be used, how much water would be used (dependent on the length of the wellbore, the completions method used, the target formation, and the use of treated and recycled water), and how that use would be distributed relative to streamflows or water levels in the source waterbody. Any use of a surface water source for oil and gas operations would be under a valid water right.

GROUNDWATER

Groundwater resources in the area include Wasatch and Mesaverde sandstone aquifer systems and Quaternary age alluvial aquifer systems. Within the North Fork Gunnison River Basin, the thickness of the Upper Cretaceous aquifers varies from 250 to 4,500 feet. Alluvial aquifers are thickest in valley bottoms but usually less than 100 feet thick. Groundwater in the bedrock aquifers is stated by Ackerman and Brooks (1986) to flow in the direction of general dip of strata, which is approximately 4 degrees to the northeast; however, there is little potentiometric data on Wasatch or Mesaverde intervals, so this is speculative (Ackerman and Brooks 1986). Groundwater flow in the alluvial aquifer along the North Fork Gunnison is generally in the same direction as surface flows in the river (Kolm and van der Heijde 2013).

Domestic water wells and irrigation wells are distributed throughout the general area. These are mostly completed in alluvial or other shallow aquifers because of generally unsuitable water quality in the bedrock units. A total of approximately 52 domestic wells are currently constructed within 1 mile of the proposed UFO parcels, based on online data available from COGCC.

Environmental Consequences of Leasing and Potential Future Development

Impacts to surface water from oil activities are associated with four potential sources: 1) transport of sediments into surface waters by runoff from areas of surface disturbance; 2) transport of chemical pollutants to surface waters from spills or equipment failures on the well pad or during an accident involving a vehicle or pipeline transporting such chemicals; 3) subsurface movement to surface waters from from pits containing fluids or cuttings stored on the pad and containing hydrocarbons; and 4) movement through the well bore to surface waters subsurface due to improper casing or cementing.

All of these potential sources are the target of restrictions by BLM and COGCC on all phases of the drilling, completion, and long-term production operations. The BLM requires that an additional set of casing, called surface casing, is installed to below the depth of any nearby water wells and, where near a surface water, to below the depth of the surface water. Open pits for flowback fluids containing hydrocarbons are infrequently used under modern operations and, if so, the pits are required to be lined and equipped with a leak detection system. Cuttings trenches are also lined in situations where they could contribute subsurface flow to streams. Remote (radiotelemetric) monitoring of production facilities and containment of all fluid-containing structures within secondary containment capable of containing 110% of the stored capacity—coupled with regular BLM, COGCC, and operator inspections—reduce the potential for releases related to equipment failure and facilitate prompt control All operators and transporters are required to have an established *Spill Prevention, Containment, and Countermeaures* (SPCC) Plan, including an emergency notification procedure. Temporarily disturbed surfaces are promptly revegetated to reduce erosion potential, and the working surface of the pad that remains open during long-term production must have stormwater controls.

Impacts to groundwater can potentially occur from any surface incident involving chemical pollutants in surface with the potential for recharge to groundwater. However, improperly constructed, cased, or cemented boreholes represent the primary risk of contamination by not adequately isolating aquifers.

COGCC Rule 609 requires groundwater sampling in connection with the State-issued APDs. The COGCC-mandated sampling includes baseline samples and subsequent monitoring samples from all available groundwater sources, to a maximum of four within a 0.5-mile radius of a proposed oil and gas well, multi-well pad, or dedicated disposal well. Initial sampling would be conducted within 12 months prior to setting conductor pipe in a well or the first well on a multi-well pad, or commencement of drilling a dedicated disposal well. Repeat sampling would be conducted at the initial locations between 6 months and 12 months following drilling of the well, and again between 5 years and 6 years following drilling.

To meet COGCC requirements, groundwater samples would be analyzed by a qualified laboratory for major ions (including bromide, calcium, chloride, fluoride, iron, magnesium, manganese, potassium, selenium, sodium, sulfate), trace metals (including barium and strontium), dissolved gases (including ethane, methane, and propane), BTEX, TPH (total petroleum hydrocarbons), alkalinity (total bicarbonate and carbonate as $CaCO_3$), nutrients (including nitrite, nitrate, and phosphorus), and total dissolved solids. Field properties to be measured and recorded include pH and specific conductance. Sampling for QA/QC would include one replicate and one blank during each sampling event. The replicate and blank would be analyzed for the same constituents as the environmental samples.

If free gas or a dissolved methane concentration greater than 1.0 milligram per liter (mg/L) is detected in a groundwater sample, gas compositional analysis and stable isotope analysis of the methane would be performed to determine the gas type. The operator would be required to notify the COGCC and the owner of the water well immediately if 1) the test results indicate thermogenic gas (associated with fluid

minerals), biogenic gas (related to bacterial process), or a mixture of the two; 2) the methane concentration increases by more than 5.0 mg/L between sampling periods; or 3) the methane concentration is detected at or above 10 mg/L. GELCC would also notify COGCC immediately if BTEX or TPH is detected.

POTENTIAL SURFACE WATER AND GROUNDWATER IMPACTS FROM HYDRAULIC FRACTURING

The dimensions of induced fractures during hydraulic fracturing during well completions have been measured with field monitoring equipment and in laboratory tests and compared to three-dimensional (3D) models. Researchers have successfully validated these models for fracturing in "tight-gas" reservoirs, including those beginning to be developed in western Colorado. Results of the analyses show that the extent and orientation of fractures resulting from completions of oil and gas wells can be predicted (Zhai and Sharma 2005, Green et al. 2009, Palisch et al. 2012, Ellsworth 2013).

Hydraulically induced fracture orientation in relation to the wellbore depends on the downhole environment (i.e., rock mechanics, minimum and maximum principal stress directions, physical rock properties, etc.) and the wellbore trajectory. In vertical or normal directional wells, fracture growth is primarily lateral or outward from the wellbore, with minimal secondary fractures extending at some angle from the lateral fractures.

In horizontal wells such as those being used to develop deepwater marine shales (e.g., the Mancos Formation), fracture growth from the wellbore is mainly determined by the orientation of the wellbore in relation to the principal stresses of the rock. Fracture growth toward the surface is limited by barriers such as variations in stress and lithology, as is also the case in vertical and normal directional wells. In some horizontal wells, fracture growth is similar to that in vertical or normal directional wells due to wellbore trajectory along the maximum principal stress direction. Analysis of data from thousands of wells indicates fracture extent (length) of less than 350 feet in the large majority of cases, with outliers of 1,000 to 2,000 feet (Maxwell 2011, Davies et al. 2012) in thick deposits of uniform marine shales.

The potential height of hydraulically induced fractures in horizontal drilling is reduced in layered sediments in which a propagating fracture encounters a change in rock type or a bedding plane within a formation or a contact between formations. When these features are encountered, the fracture either terminates or to a lesser extent reorients along the generally horizontal bedding plane or formation contact instead of continuing upward across it. Advances in horizontal drilling technology have allowed enhanced development of deeper marine shales such as the Mancos Formation. These tight-shale deposits are typically a few hundreds or thousands of feet thick in western Colorado, compared to many thousands of feet in some other gas-producing regions. The lesser thickness of hydrocarbon-bearing strata in this area limits the vertical growth of primary and secondary fractures from hydraulic stimulation.

Review of available information on microseismic monitoring and fracture dimensions (Fisher and Warpinski 2012, Stone et al. 2016) indicates that fractures from deep horizontal wells are not a threat to propagate across the long vertical distances (thousands of feet) needed to reach freshwater aquifers much closer to the surface. This conclusion applies to much of western Colorado and is applicable to much shallower potable groundwater sources consisting of unconsolidated alluvium (streambed deposits) associated with the Colorado River and major tributaries. In general, domestic and stock water wells in the project vicinity extend to depths of less than 200 feet, with a few from 200 to 500 feet. Impacts to water quality of shallow fresh-water wells are highly improbable as a result of hydraulic fracturing, which occurs at depths of 5,000 to 10,000 feet below ground surface.

In addition to vertical separation between the upper extent of fractures and fresh-water aquifers are requirements by the BLM and COGCC for proper casing and cementing of wellbores to isolate the aquifers penetrated by the bore. The BLM requires that surface casing be set from 500 to 1,500 feet deep, and potentially deeper, based on a geological review of the formations, aquifers, groundwater, and

proximity to surface waters. Cement is then pumped into the space between the casing and surrounding rock to prevent fluids from moving up the wellbore and casing annulus and coming in contact with shallow rock layers, including fresh-water aquifers. BLM petroleum engineers review well and cement design and final drilling and cementing logs to ensure properly construction. When penetration of groundwater and freshwater aquifers is anticipated, BLM inspectors may witness the cementing of surface casing and pressure testing to ensure that the space between the casing and borehole wall is sealed.

No single list of chemicals currently used in hydraulic fracturing exists for western Colorado, and the exact combinations and ratios used by operators are considered proprietary. However, the general types of compounds and relative amounts are well known and relatively consistent (**Table 8**).

Table 8. Constituents of Typical Hydraulic Fracturing Operations

Additive Type [1]	*Typical Example* [1]	*Percent by Volume* [2]	*Function* [1]	*Common Use of Example Compound*
Acid	Hydrochloric acid	0.123	Dissolves mineral cement in rocks and initiates cracks.	Swimming pool chemical and cleaner
Biocide	Glutaraldehyde	0.001	Eliminates bacteria that produce corrosive/poisonous by-products.	Disinfectant; sterilizer for medical and dental equipment
Breaker	Ammonium persulfate	0.010	Allows delayed breakdown of the gel.	Hair coloring, as a disinfectant, and in manufacture of household plastics
Clay stabilizer	Potassium chloride	0.060	Creates a brine carrier fluid that prohibits fluid interaction with formation clays.	Low-sodium table salt substitutes, medicines, and IV fluids
Corrosion inhibitor	Formic acid	0.002	Prevents corrosion of well casing.	Preservative in livestock feed; lime remover in toilet bowl cleaners
Crosslinker	Borate salts	0.007	Maintains fluid viscosity as temperature increases.	Laundry detergents, hand soaps, and cosmetics
Friction reducer	Polyacrylamide	0.088	"Slicks" the water to minimize friction.	Flocculent in water treatment and manufacture of paper
Gelling agent	Guar gum	0.056	Thickens water to help suspend the sand propping agent.	Thickener, binder, or stabilizer in foods
Iron control	Citric acid	0.004	Prevents precipitation of metal oxides.	Flavoring agent or preservative in foods
Surfactant	Lauryl sulfate	0.085	Increases viscosity of the fluid.	Soaps, shampoos, detergents, and foaming agents
pH adjusting agent	Sodium hydroxide, acetic acid	0.011	Adjusts pH of fluid to maintain effectiveness of other components.	Sodium hydroxide used in soaps, drain cleaners; acetic acid used as chemical reagent, main ingredient of vinegar
Scale inhibitor	Sodium polycarboxylate	0.043	Prevents scale deposits in the pipe.	Dishwashing liquids and other cleaners
Winterizing agent	Ethanol, isopropyl alcohol, methanol	--	Added as necessary as stabilizer, drier, and anti-freezing agent.	Various cosmetic, medicinal, and industrial uses
Total Additives		**0.49**		
Total Water and Sand		**99.51**		

[1] Ground Water Protection Council and the Interstate Oil and Gas Compact Commission 2017.
[2] USDOE 2009.

Although a variety of chemicals are used—the examples in **Table 8** being drawn from a total of 59 listed on the FracFocus website—the bulk of fluid injected into the formation during the process is water mixed with sand, representing 99.51% of the total by volume in the typical mixture shown in the table. The sand listed in the table is used as a proppant to help keep the newly formed fractures from closing.

Following completion of fracturing activities, the pressure differential between the formation – a result of several thousand feet of overlying bedrock – and the borehole that connects with the surface causes most of the injected fluids to flow toward the borehole and then upward to the surface along with the hydrocarbon fluids released from the formation. The composition of this mixture, called flowback water, gradually shifts over a period of several days to a few months as injected fluids that have not yet migrated back to the wellbore or reacted with the native rock are carried out of the formation.

In 2011, the COGCC published an analysis of the use of hydraulic fracturing in Colorado and potential risks to human health and the environment. The introduction to that report includes the following paragraph: "Hydraulic fracturing has occurred in Colorado since 1947. Nearly all active wells in Colorado have been hydraulically fractured. The COGCC serves as first responder to incidents and complaints concerning oil and gas wells, including those related to hydraulic fracturing. To date, the COGCC has not verified any instances of groundwater contaminated by hydraulic fracturing." No cases of groundwater contamination in Colorado as a result of hydraulic fracturing have been documented since the COGCC report.

Various authors (e.g., Shonkoff et al. 2014) have described the potential for contamination of groundwater via induced fractures, but no such contamination has been demonstrated. Based on the information summarized above, the BLM has concluded that use of hydraulic fracturing technology in completions of oil and gas wells to facilitate recovery of Federal fluid minerals does not represent a significant risk of impacts to human health and the environment.

In 2011, the COGCC published an analysis of the use of this technology in Colorado and potential risks to human health and the environment. The introduction to that report includes the following paragraph: "Hydraulic fracturing has occurred in Colorado since 1947. Nearly all active wells in Colorado have been hydraulically fractured. The COGCC serves as first responder to incidents and complaints concerning oil and gas wells, including those related to hydraulic fracturing. To date, the COGCC has not verified any instances of groundwater contaminated by hydraulic fracturing." No incidents of groundwater in contamination in Colorado due to use of this method have been confirmed since the COGCC report.

Cumulative Impacts of Leasing and Potential Future Development

Cumulative impacts of oil and gas operations on surface water and groundwater resources would result from the past, ongoing, and likely continuing development of Federal leases in the CEAA (**Map 1**). Because 86% of the CEAA has Federal fluid minerals, of which more than half is currently leased, the risks of operational, equipment-related, or accidental exposure of surface water would also continually increase. This is also the case for potential impact to shallow aquifers used as water-supply wells for domestic, agricultural, municipal uses. However, risks to groundwater, or to surface water through the groundwater route, have a lower potential due to the very tightly controlled actions related to drilling, completing, and producing a wells, and the constraining subsurface infrastructure and bedrock geology.

For surface waters, cumulative impacts can occur both from multiple episodes of releases of contaminants to a single waterbody close enough in time to be additive in terms of impact, or exposures to multiple waterbodies. It is not possible to quantify the risk because of the many factors affecting the likelihood of an event (e.g., the number of wells with a watershed, the miles of associated roads and pipelines used to transport water or liquid condensate, the proximity of pads and roads to surface water, and difficulty of the terrain crossed by haul roads. Because the portion of the CEAA in which existing oil and gas projects have occurred, or have been authorized but not yet permitted and built, is primarily managed by the BLM

and/or USFS, it is likely that cumulative impacts would be somewhat lower than if oil and gas projects primarily involved private leases.

Cumulative impacts would also be expected from water depletions due to use of surface waters as sources for drilling, completion, and dust abatement. As described in the discussion above on direct and indirect impacts, it is not possible to know the sources, volumes, or seasonal timing of water used for currently authorized or future oil and gas operations. It also is not known how those would coincide in time (concurrent uses of water) or space (use of water from the same watershed).

3.4.16 Wildlife – Aquatic and Terrestrial

Affected Environment

The five proposed UFO parcels contain habitat that supports a variety of terrestrial wildlife, and streams that variously support a variety of aquatic species. Some of these species are designated by the BLM as sensitive species, and some birds (including some sensitive species) are protected by Federal laws, including the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. At the leasing stage, the BLM applies NSO, CSU, or TL stipulations based on current mapping available from CPW, particularly regarding critical big game winter range or seasonally critical habitats and seasonally critical habitat for other game species such as large carnivores (black bears and mountain lions) and upland fowl (e.g., wild turkeys). Other stipulations are applied to all or some portions of the parcels based on information available from online and published sources, BLM's corporate GIS data, and familiarity of BLM resource specialists with the areas based on BLM-conducted management activities or oil and gas activities and other developments on nearby lands.

Categories and species of wildlife of particular interest or concern and known or likely to occur within or near the proposed UFO parcels are described below. Also present are small carnivores, including the coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and bobcat (*Lynx rufus*), small herbivores (hares, cottontail rabbits, and rodents), and a small number of reptiles (snakes and lizards) and amphibians (salamanders, toads, frogs, and allies).

Large Ungulates (Deer, Elk, and Moose). Mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsoni*) occur throughout the project region. Area encompassing the lease parcels include winter range (mostly lower elevations or warmer aspects, generally drier, with less snowcover and with palatable shrubs for browse during winter) and summer range (mostly higher elevations, with more moisture, and often a mosaic of lush meadows and upper montane or subalpine conifers and aspen for hiding and thermal cover). Elk migrate considerable distances both vertically (in elevation) and laterally, while mule deer show smaller movements and often occur in given areas year-round.

Although winter range is widespread through the area of the parcels, areas mapped by CPW as critical winter range (including sensitive winter range and winter concentration areas) for one or both species are less widespread, being limited to parcels 8320 for deer and elk, 8351 and 8390 for elk, and 8140 for moose. Areas intermediate between winter and summer range often support production (elk calving, deer fawning). Elk in particular may concentrate in distinct areas offering ideal conditions for females and the young. No specific calving areas are mapped by CPW in the vicinity of the lease parcels.

The moose (*Alces alces*) is more limited in distribution in Colorado, although locations and numbers have increased markedly in recent years. Within the area of the proposed UFO parcels, CPW noted in its scoping comments that a moose winter concentration area includes parcel 8140.

Upland Gamebirds. Hunting is an important recreational activity in the general area of the proposed UFO parcels. The area is generally too low in elevation for one popular gamebird, the dusky grouse (*Dendragapus obscurus*), but provides high quality habitat for the wild turkey (*Meleagris gallopavo*). This species occurs from foothills through the montane, and sometimes below the foothills zone where habitats are suitable. Turkeys require trees or tall shrubs for cover but often move into nearby meadows

or agricultural fields to feed. Diet is varied but emphasizes seasonally available berries, other plant tissues, and invertebrates in summer and in winter shifts to mast (acorns, grain, and pine seeds) when the summertime foods are less available. For this reason, turkeys share with deer and elk a reliance on suitable winter habitats. Also like the ungulates, turkeys tend to congregate where these conditions exist, commonly including Gambel's oak interspersed with pines and junipers, often near grainfields or other agricultural lands. Parcel 8140 is mapped as including a wild turkey winter concentration area.

Birds of Prey. Several raptor species are known or expected to occur within or near the proposed UFO parcels. These include the cliff-nesting golden eagle (*Aquila chrysaetos*), and the tree-nesting bald eagle (*Haliaeetus leucocephalus*), the latter along or near large streams such as Muddy Creek or the North Fork Gunnison River; two large buteo hawks, a small falcon, and a large owl that nest in trees or on cliffs and bluffs (red-tailed hawk, *Buteo jamaicensis*; Swainson's hawk, B. *swainsoni*; American kestrel, *Falco sparverius*; and great horned owl, *Bubo virginiana*); and two smaller accipiter hawks and a similarly sized owl that nest almost exclusively in trees (Cooper's hawk, *Accipiter cooperi*; sharp-shinned hawk, *A. striatus*; and long-eared owl, *Asio otus*).

Also potentially present but less frequently are the cliff-nesting peregrine falcon (*Falco peregrinus*); tree-nesting northern goshawk (*Accipiter gentilis*) and the diminutive northern saw-whet owl (*Aegolius acadicus*) in higher elevation conifers and aspen; and the diminutive flammulated owl (*Psiloscops flammeolus*) and northern pygmy-owl (*Glaucidium gnoma*) in lower and middle elevation conifers, aspen, and Gambel's oak; and osprey (*Pandion haliaeetus*) along Muddy Creek near Paonia Reservoir or the North Fork Gunnison. The bald eagle and northern goshawk are BLM sensitive species; the bald eagle, golden eagle, peregrine falcon, and flammulated owl listed by the USFWS (2008) as Birds of Conservation Concern (BCC).

Other Native Birds. A variety of other native bird species utilize habitats such as those present in or near the five UFO parcels. Some of these are present year-round as resident species, while others are present only in the summer breeding season from late spring through summer. Of the latter group, of particular concern are species that nest in parts of the North America but nest in the New World tropics, called Neotropical migrants. These include species such as hummingbirds, flycatchers, swallows, vireos, warblers, tanagers, grosbeaks, orioles, finches, and New World sparrows, among others.

A few of the small birds known or expected to nest in the general area of some or all of the UFO parcels and listed as BCC species include the resident or short-distance migrant Lewis's woodpecker (*Melanerpes lewis*) in riparian cottonwoods or mixed pinyon-juniper and foothills conifers; the resident or short-distance migrant pinyon jay (*Gymnorhinus cyanocephalus*) in lower elevation pinyon-juniper habitats; Brewer's sparrow (*Spizella breweri*) during summer in large areas of sagebrush; and Cassin's finch (*Haemorhous cassinii*) during summer in higher elevation conifers and during winter in lower elevation conifers or riparian areas). The Brewer's sparrow is a BLM sensitive species.

The purple martin (*Progne subis*), a large species of swallow, nests in nest cavities near the edges of aspen stands. It is not a BCC species or a BLM sensitive species, but it is Forest Service sensitive species known to nest at middle elevations in the general area, and vulnerable to direct or indirect habitat loss due to specific habitat requirements and, being a colonial nester, subject to impacts to multiple pairs in the same small area.

Non-Native Sportfish Species and Native Warmwater Fishes, and Northern Leopard Frog. The final wildlife group of special concern includes non-native trout such as the widely stocked rainbow trout and non-native subspecies or strains of cutthroat trout; two species of native warmwater suckers (bluehead sucker, *Catostomus discobolus*); flannelmouth sucker, *C. latipinnis*); and the northern leopard frog (*Lithobates pipiens*). The two suckers and the leopard frog are BLM sensitive species. The two suckers are known to occur in Hubbard Creek and West Fork Muddy Creek and probably also occur in the North Fork Gunnison River. The leopard frog occurs in slow-flowing streams, ponds, and surface waters within wetlands or wet meadows potentially throughout the area encompassing the lease parcels.

Environmental Consequences of Leasing and Potential Future Development

Impacts to the species groups of terrestrial wildlife described above as a result of potential future development of some or all of the five UFO parcels include direct habitat loss due to habitat removal or modification, indirect habitat loss due to wildlife avoidance of areas of intensive operations (especially construction, drilling, and completions), habitat fragmentation by breaking larger tracts of habitat into smaller tracts as a result of either habitat loss or avoidance, and interference with seasonal movements. Less frequent as an impact is direct mortality, mostly associated with collisions with project-related vehicular traffic. For aquatic species, potential future impacts include physical loss of habitat such as related to habitat modification along streams, habitat modification or loss in relation to streams and ponds, and changes in water quality due to potential inflow of sediments and chemical pollutants.

Protections for these species provided at the leasing stage include the following stipulations:

- UFO-TL-Big Game Winter Habitat – Prohibits surface occupancy, surface-disturbing activities, and disruptive activities associated with well development in big game severe winter range or winter concentration areas from December 1 through April 15.
- UFO-NSO-Raptor Nest Sites – Prohibits surface occupancy or use within 0.25 mile or 0.5 mile (depending on species) of active raptor nests, or of inactive raptor nests occupied in the previous 5 years and with some or all of the nest remaining.
- UFO-CSU-Raptor Breeding Habitat – Restricts surface occupancy or use, including requiring special design and implementation and potentially relocation by more than 200 meters, to protect nesting habitat during well development activities within 1 mile of nest sites.
- UFO-TL-Raptor Nesting – Prohibits surface occupancy and use associated with well development within 0.25 mile of certain nesting raptors (excluding sensitive species, see below) during species-specific nesting periods.
- UFO-TL-Sensitive Raptor Nesting – Prohibits surface occupancy and use associated with well development within 0.5 mile of active nests of BLM sensitive or other sensitive raptor species during species-specific nesting periods.
- UFO-NSO-Hydrologic Features – Prohibits surface occupancy or use within 325 from the outer edge of a stream, riparian area, or wetland. This NSO and the associated CSU (below) provide protections for moose concentration areas as well as for aquatic and riparian species.
- UFO-CSU-Hydrologic Features – Restricts surface occupancy or use, including requiring special design and implementation and potentially relocation by more than 200 meters, within a zone from 325 to 500 feet beyond the outer edge of a stream, riparian area, or wetland.
- UFO-TL-Coldwater Sportfish and Native Warmwater Fish – Prohibits work within any stream segment occupied by these species during the spawning season of April 1 to July 15.
- UFO-LN-Migratory Birds – Alerts the bidder/lessee that migratory birds nest throughout the UFO area from April 1 to July 15 and that operations must comply with the Migratory Bird Treaty Act.

These stipulations and lease notices, in combination with COAs and other mitigations identified at the time of future site-specific NEPA for future oil and gas projects, would avoid or minimize seasonally important or critical habitats and habitat uses by these species of special interest or concern.

Cumulative Impacts of Leasing and Potential Future Development

Because of the protections of the various lease stipulations described above, potential direct and indirect impacts to terrestrial and aquatic wildlife of special interest or concern would be expected to be minor. This is also true for all other Federal projects to which future development of these parcels would be cumulative, and to some degree also true of energy, resource, or land development projects and other activities on private lands. The small area of the five UFO parcels currently proposed for leasing in

relation to existing Federal oil and gas leases in the CEAA suggests that the cumulative impacts of these parcels would be small. Similarly, the fact that the CEAA is largely underlain by Federal minerals and has a high percentage of Federal surface (**Table 1**) suggests that future oil and gas projects would have similar protections to those above.

Potential Future Mitigation

Future oil and gas development of some or all of the five UFO parcel would undergo site-specific NEPA analysis and documentation and, if necessary based on biological surveys, other information, and detailed project information. Mitigation measures to be applied to the projects to supplement the lease stipulations and lease notice listed above would include a variety of COAs applied by the BLM to:

- Reduce the amount of habitat loss, modification, fragmentation, and interference with migration by careful planning of well pad sizes and locations and through clustering and phasing.
- Minimize transport of sediments or chemical pollutants into surface waters to require rapid containment and mitigation of any spills or accidental releases.
- Emphasize use of pipelines rather than haul trucks to transport liquid condensate, produced water, and fresh water.
- Minimize noise impacts from well pads and other surface facilities during long-term operations.
- Minimize the generation of fugitive dust.
- Require prompt and effective reclamation of temporarily disturbed areas using native grasses, forbs, and shrubs.
- Where appropriate based on site conditions and wildlife use, apply a 60-day TL for the months of January and February on leases not identified by CPW as warranting the longer duration TL stipulation.

CHAPTER 4 – COORDINATION AND CONSULTATION

During public scoping, the following elected officials and governmental agencies were notified of the proposed lease sale of the five UFO parcels (list continued on following page).

U.S. Senate, Hon. Michael Bennet
U.S. Senate, Hon. Cory Gardner
U.S. House of Representatives, Rep. Scott Tipton
State Senate, District 5, Rep. Kerry Donovan
State House of Representatives, District 61, Rep. Millie Hamner
Colorado Dept. of Public Health and Environment
Colorado Dept. of Reclamation, Mining, and Safety
Colorado Div. of Parks and Wildlife
Colorado Oil and Gas Conservation Commission
Delta Co. Board of County Commissioners
Delta County Health Services
GMUG National Forests
Gunnison County
Gunnison County
Montrose County Public Works
Natural Resources Conservation Service
Navajo Nation
Ouray Co. Board of County Commissioners
Southern Ute Indian Tribe
Town of Crawford
Town of Hotchkiss
Town of Paonia
Town of Ridgway
Uintah & Ouray Tribal Business Committed
U.S. Army Corps of Engineers
USDI Bureau of Reclamation
U.S. EPA Region 8
USDA-APHIS Wildlife Services
USDA – National Park Service
USDI Fish and Wildlife Service
Ute Tribe of the Uintah and Ouray Reservation
Ute Indian Tribe
Ute Mountain Ute Tribe
Western Area Power Administration

BLM personnel who participated in the preparation and review of this EA are listed below:

Name	*Title*	*Resource*
Colorado River Valley Field Office		
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concern
Vanessa Caranese	Geologist	Geology, Groundwater, Paleontology
Allen Crockett, Ph.D.	Ecologist/Geologist, Supervisory NRS	Project Lead, Vegetation
Faith Dziedzic	GIS Specialist	GIS
Sylvia Ringer	Wildlife Biologist	Aquatic and Terrestrial Wildlife, Threatened or Endangered Wildlife
Thane Stranathan	Natural Resource Specialist	Project Co-Lead
Carmia Woolley	Physical Scientist	Air and Climate, Soils, Surface Water
Uncompahgre Field Office		
Amy Carmichael	Assistant Field Manager, Lands and Minerals	UFO Management Team
Ken Holsinger	Ecologist	Vegetation, Special Status Plants
Julie Jackson	Recreation and Transportation	Transportation
Greg Larson	Field Manager	UFO Management Team
Neil Perry	Wildlife Biologist	Aquatic and Terrestrial Wildlife, Threatened and Endangered Wildlife
David Sinton	GIS Specialist	GIS
Jedd Sondergard	Hydrologist, Planning and Environmental Coordinator	Soil, Water
BLM District and Regional Staff Resources		
Gina Phillips	Planning and Environmental Coordinator, Southwest District	National Environmental Policy Act Compliance
Jessica Montag	Regional Socioeconomics Specialist	Socioeconomics

CHAPTER 4 – REFERENCES

Abdulaziz, M.A. 2014. Evaluation of Microseismicity Related to Hydraulic Fracking Operations of Petroleum Reservoirs and Its Possible Environmental Repercussions. Open Journal of Earthquake Research. Accessed online: http://file.scirp.org/Html/1-2740050_46457.htm.

Ackerman, D.J., and T. Brooks. 1986. Reconnaissance of Ground-Water Resources in the North Fork of the Gunnison River Basin, Southwestern Colorado. USGS Water Resource Investigation Report 85-4230. Denver, Colorado: USGS.

Bennett, A., and J. Loomis. 2015. Are Housing Prices Pulled Down or Pushed Up by Fracked Oil and Gas Wells? A Hedonic Price Analysis of Housing Values in Weld County, Colorado. Society & Natural Resources 28(11):1168-1186.

Bestgen, K., K. Rogers, and R. Granger. 2013. Phenotype Predicts Genotype for Lineages of Native Cutthroat in the Southern Rocky Mountains. Final Report Submitted to the U.S. Fish and Wildlife Service, Colorado Field Office. Denver, Colorado. Larval Fish Laboratory Contribution 177.

Bohnenkamp, S., A. Finken, E. McCallum, E., A. Putz, G. and Goreham, G., 2011. Concerns of the North Dakota Bakken Oil Counties: Extension Service and Other Organizations' Program Responses

to These Concerns. A report prepared for Center for Community Vitality, NDSU Extension Service, North Dakota State University, Fargo.

Boslett, A., T. Guilfoos, and C. Lang. 2016. Valuation of the External Costs of Unconventional Oil and Gas Development: The Critical Importance of Mineral Rights Ownership. University of Rhode Island.

Brown, R.B., S.F. Dorius, and R.S. Krannich. 2005. The boom-bust recovery cycle—Dynamics of change in community satisfaction and social integration in Delta, Utah: Rural Sociology, 70:1, 28–49.

Brown, R.B., H.R. Geertsen, and R.S. Krannich. 1989. Community satisfaction and social integration in a boomtown—A longitudinal analysis. Rural Sociology, 54:4, 568–586.

Bureau of Economic Analysis (BEA). 2017a. Table CA25N: Total Full-time and Part-time Employment by NAICS Industry. Last Updated November 16, 2017.

--------. 2017b. Table CA5N: Personal Income by Major Component and Earnings by NAICS Industry. Last Updated November 16, 2017.

Bureau of Labor Statistics (BLS). 2018. Local Area Unemployment Statistics 2008 to 2018. Data revised April 20, 2018.

Bureau of Land Management (BLM). 1988. Uncompahgre Basin Proposed Resource Management Plan and Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management. Available at: https://www.blm.gov/style/medialib/blm/co/programs/land_use_planning/rmp/archives/Uncompahgre/final_rmp_eis.Par.41451.File.dat/Ubfrmp.pdf. March 21, 2017.

_____. 1989. Uncompahgre Basin Resource Management Plan and Record of Decision, DOI Bureau of Land Management Montrose District, Colorado Uncompahgre Basin Resource Area.

_____. 2009. Community Assessment of the Uncompahgre Planning Area. BLM, Uncompahgre Field Office, Montrose, CO. 224 pp

_____. 2010. Socioeconomic Baseline report prepared for the Uncompahgre Resource Management Plan. BLM, Uncompahgre Field Office, Montrose, CO. October 2010.

_____. 2012. Reasonable Foreseeable Development Scenario for Oil and Gas for the Uncompahgre Field Office, Colorado. Prepared by BLM Wyoming State Office, Reservoir Management Group for BLM, Uncompahgre Field Office, Montrose, CO. February 2012.

_____. 2015. 2015 Annual Report. BLM Colorado State Office. May. Accessed online: https://www.co.blm.gov/nepa/airreports/AR2015.html. Accessed January 16, 2018.

_____. 2016a. Instruction Memorandum No. 2016-124: Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public land. Washington, D.C. 20240. July 8.

_____. 2016. Uncompahgre Draft Resource Management Plan Revision and Draft Environmental Impact Statement. Uncompahgre Field Office, Montrose, CO. May.

Colorado Department of Public Health and Environment (CDPHE). 2016a. Colorado Air Quality Data Report 2015. Air Pollution Control Division. October 2016.

_____. 2016b. Colorado Department of Public Health and Environment, Air Pollution Control Division, Letter from Nancy Chick to Susan Connell, Carter Lake Consulting, LLC, Summary of background air pollution estimates for the Whitewater Unit, Fram Operating LLC, BLM NEPA Air Analysis. November 23, 2016.

_____. 2017a. 2016 Colorado Air Quality Data Report. CDPHE Air Pollution Control Division, Denver, Colorado. October 2017.

_____. 2017b. Regulation No. 35: Classifications and Numeric Standards for Gunnison and Lower Dolores River Basins. Water Quality Control Commission. APPENDIX 35-1, Stream Classifications and Water Quality Standards Tables. Effective 12/31/2017.

_____. 2018a. Regulation 31. The Basic Standards and Methodologies for Surface Water. Water Quality Control Commission. Amended December 30, 2017. Effective January 31, 2018.

Colorado Department of Local Affairs (DOLA). 2017a. State Demography Office. Current Population Estimates-Counties, 2010 – Current. Vintage 2016, August 2017 version. Accessed online: https://demography.dola.colorado.gov/population/population-totals-counties/#population-totals-for-colorado-counties

_____. 2017b. State Demography Office. Population Forecasts – years (2000 to 2050), 5-year increments, 2000-2050. Produced in October 2017. Accessed online: https://demography.dola.colorado.gov/population/population-totals-counties/#population-totals-for-colorado-counties

Colorado Department of Regulatory Agencies (DORA). 2018. Natural Gas Pipeline Safety. Available online: https://www.colorado.gov/pacific/dora/aboutgaspipelines. Accessed July 12, 2018.

Colorado Department of Transportation (CDOT). 2017. Online Transportation Information System (OTIS). Accessed online: dtdapps.coloradodot.info/otis/TrafficData. February 7, 2017.

Colorado Oil and Gas Conservation Commission (COGCC). 2018. Production by County. Accessed online: http://cogcc.state.co.us/data4.html#/production.

_____. Colorado Oil and Gas Conservation Commission (COGCC). 2014a. Regulation No. 802, Noise Abatement. Accessed online: http://cogcc.state.co.us/documents/reg/Rules/LATEST/800Series.pdf. Accessed March 22, 2017.

_____. Colorado Oil and Gas Conservation Commission (COGCC). 2014b. A Regulatory Review of Liquid and Natural Gas Pipelines in Colorado. Available online: http://cogcc.state.co.us/documents/library/Technical/InterAgency/Final_Pipeline_WhitePaper_w_Appendices_12_12_14.pdf. Accessed July 12, 2018.

_____. Colorado Oil and Gas Conservation Commission (COGCC). 2018a. Statement of Basis, Specific Statutory Authority, and Purpose: New Rules and Amendments to Current Rules of the Colorado Oil and Gas Conservation Commission, 2 CCR 404-1. Flowline Rulemaking. Cause No. 1R. Docket No. 171200767. February 13. Available online: https://cogcc.state.co.us/reg.html#/rules/flowlinerulemaking. Accessed July 12, 2018.

_____. Colorado Oil and Gas Conservation Commission (COGCC). 2018b. Flowline Rulemaking. Final Adopted Rules. Docket No. 171200767. February 13. Available online: https://cogcc.state.co.us/reg.html#/rules/flowlinerulemaking. Accessed July 12, 2018.

Crompton, J.L. 2000. The Impact of Parks and Open Space on Property Values and the Property Tax Base. National Recreation and Park Association, Ashburn, VA.

Davies, R. J., S. Mathias, J. Moss, S. Hustoft, and L Newport. 2012. Hydraulic Fractures: How far can they go? Marine and Petroleum Geology 37(1):1-6. November.

Dean Runyan Associates. 2018. Colorado Travel Impacts: 2000-2017p. Report prepared for the Colorado Tourism Office, Office of Economic Development and International Trade. Released June 2018.

Ellsworth, W.L. 2013. Injection-Induced Earthquakes. Science. Accessed online: http://science.sciencemag.org/content/341/6142/1225942.

Environmental Protection Agency (EPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (550/9-74-004). Office of Noise Abatement and Control. March.

_____. 2017a. Review of the 2016 Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources. 40 CFR Part 60, FRL-9961-09-OAR. Federal Register Vol. 82, No. 63, April 4, 2017. Accessed online: https://www.federalregister.gov/documents/2017/04/04/2017-06658/review-of-the-2016-oil-and-gas-new-source-performance-standards-for-new-reconstructed-and-modified. April 12, 2017.

_____. 2017b. Clean Air Status and Trends Network (CASTNET) Gothic (GTH161). Accessed online: https://www3.epa.gov/castnet/site_pages/GTH161.html. February 2017.

_____. 2017c. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. April. Available online: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2015. Accessed February 6, 2018.

Fausold, C.J., and R.J. Lilieholm. 1996. The economic value of open space. Land Lines 8(5):1–4. September 1996.

Federal Land Managers' Air Quality Related Values Workgroup. 2010. Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised (2010). U.S. Forest Service-Air Quality Program, National Park Service-Air Resources Division, U.S. Fish and Wildlife Service-Air Quality Branch. October 2010.

Fisher, K., and N. Warpinski. 2012. Hydraulic-Fracture-Height Growth: Real Data. SPE Production & Operations Journal 27(1):8-19. SPE-145949-PA. Accessed online: http://dx.doi.org/10.2118/145949-PA.

Green, C.A., R.D. Barree, and J.L. Miskimins. 2009. Hydraulic-Fracture-Model Sensitivity Analysis of a Massively Stacked, Lenticular, Tight Gas Reservoir. SPE Production & Operations Journal 24(1):66-

Greider, T., R.S. Krannich, and E.H. Berry. 1991. Local Identity, Solidarity, and Trust in Changing Rural Communities. Sociological Focus 24(4):263-282.

Griffith, D. 2017 Delta County Assessor. Proceedings of the Board of County Commissioners. Delta County Commissioners Meeting, July 17, 2017.

Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. 2017. What Chemicals Are Used. FracFocus Chemical Disclosure Registry. Accessed online: http://fracfocus.org/chemical-use/what-chemicals-are-used.

Haefele, M., P. Morton, and N. Culver. 2007. Natural Dividends: Wildland Protection and the Changing Economy of the Rocky Mountain West. Washington, D.C. The Wilderness Society.

Harris, C.M. 1991. Handbook of acoustical measurements and noise control, McGraw-Hill, Inc., New York.

Hunter, L.M., Krannich, R.S., and Smith, M.D. 2002. Rural migration, rapid growth, and fear of crime. Rural Sociology, 67:1, 71–89.

Krupnick, A. and Echarte, I. 2017. Housing Market Impacts of Unconventional Oil and Gas Development: The Community Impacts of Shale Gas and Oil Development. Resources for the Future.

Interagency Monitoring of Protected Visual Environments (IMPROVE). 2017. Regional Haze Rule summary data (1988 – 2015), Natural Haze Levels II, Using the Revised (New) IMPROVE Algorithm. Accessed online: http://vista.cira.colostate.edu/Improve/rhr-summary-data/.

Intergovernmental Panel on Climate Change (IPCC). 2013. Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [Stocker, T. F., D. Qin, G. K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P. M. Midgley (eds.)] Cambridge University Press, Cambridge, United Kingdom, and New York, NY, USA. 1,535 pp.

Kolm, K.E., and P.K.M van der Heijde, 2013. Groundwater Systems in Delta County, Colorado: North Fork Valley and Terraces Area, GIS-Based Hydrological and Environmental Systems Analysis and Formulation of Conceptual Site Models. Prepared for Delta County Board of County Commissioners, Colorado. October 2013.

La Plata County, Colorado. 2002. Final La Plata County Impact Report. October.

Maxwell, S.C. 2011. Hydraulic Fracture Height Growth. Canadian Society of Exploration Geophysicists (CSEG) Recorder. November.

Metcalf, J.L., S.L. Stowell, C.M. Kennedy, K.B. Rogers, D. McDonald, J. Epp, K. Keepers, A. Cooper, J.J. Austin, and A.P. Martin. 2012. Historical Stocking Data and 19th Century DNA Reveal Human-induced Changes to Native Diversity and Distribution of Cutthroat Trout. Molecular Ecology. 14 pp.

Morgan, M. L. 2008. Colorado's Earthquake and Fault Map, Showing Locations of Historical Earthquakes and Known or Suspected Geologically Young Faults. Colorado Geological Survey. 1:1,150,000. Accessed online: http://geosurvey.state.co.us/hazards/Earthquakes/Documents/Earthquake_Map_2008.pdf.

National Academy of Sciences (NAS). 2012. Induced Seismicity Potential in Energy Technologies. National Academy Press, Washington, DC.

Palisch, T.T., M.A. Chapman, and J. Godwin. 2012. Hydraulic Fracture Design Optimization in Unconventional Reservoirs: A Case History. Paper SPE 160206 presented at the Annual Technical Conference and Exhibition, San Antonio, TX. October 8-10.

Pipeline and Hazardous Materials Safety Administration (PHMSA). 2016. Pipeline Safety: Safety of Gas Transmission and Gathering Pipelines Notice of Proposed Rulemaking. April 8. Available online: https://www.gpo.gov/fdsys/pkg/FR-2016-04-08/pdf/2016-06382.pdf. Accessed July 12, 2018.

Roddewig, R. and Cole, R. 2014. Real Estate Value Impacts from Fracking: Industry Response and Proper Analytical Techniques. Real Estate Issues 39:3, 6-20.

Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires. (Technical Editors). 2000. Ecology and Conservation of Lynx in the United States. University Press of Colorado. Boulder, Colorado.

Shonkoff, S.B.C., J. Hays, and M.L. Finkel. 2014. Environmental Public Health Dimensions of Shale and Tight Gas Development. Environmental Health Perspectives. Accessed online: http://ehp.niehs.nih.gov/1307866/.

Skoumal, R.J., M.R. Brudzinski, and B.S. Curie. 2015. Earthquakes Induced by Hydraulic Fracturing in Poland Township, Ohio. Bulletin of the Seismological Society of America. Accessed online: http://www.bssaonline.org/content/105/1/189.abstract.

Smith, M.D., R.S. Krannich, and L.M Hunter. 2001. Growth, decline, stability, and disruption—A longitudinal analysis of social well-being in four Western rural communities. Rural Sociology, 66:3, 425–450.

Stone, C.H., W.W. Fleckenstein, and A.W. Eustes. 2016. An Assessment of the Probability of Subsurface Contamination of Aquifers from Oil and Gas Wells in the Wattenberg Field, Modified for

Water Well Location. Society of Petroleum Engineers. Accessed online: https://www.onepetro.org/conference-paper/SPE-181696-MS.

U.S. Census Bureau, 2017a. Table PEPSR6H: Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for the United States, States, and Counties: April 1, 2010 to July 1, 2016. Release date June 2017. U.S. Census Bureau, Population Division.

U.S. Census Bureau, 2017. 2016 Poverty and Median Household Income Estimates - Counties, States, and National. Small Area Income and Poverty Estimates Program. Release date November 2017.

U.S. Department of Agriculture, National Agricultural Statistical Service (USDA NASS). 2014. 2012 Agricultural Census- Colorado State and County Data. Released May 2014.

U.S. Department of Energy (DOE). 2009. Modern Shale Gas Development in the United States: A Primer. National Energy Technology Laboratory, Morgantown, WV, and Office of Fossil Energy, Washington, DC. April.

U.S. Department of Transportation (USDOT). 2018. Report of DOT Significant Rulemakings. June 2018. Available at: https://www.transportation.gov/regulations/significant-rulemaking-report-archive. Accessed July 26, 2018.

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

_____. 2017. Programmatic Biological Opinion for Water Depletions Associated with Bureau of Land Management's Fluid Mineral Program with the Upper Colorado River Basin in Colorado. ES/GJ-6-CO-08-F-0006. U.S. Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado. December 26.

U.S. Geological Survey (USGS). 2008. Seismic Hazard Map of Western U.S., showing Peak Ground Acceleration (PGA) with 2% probability of exceedance in 50 years. Accessed online: http://earthquake.usgs.gov/hazards/products/conterminous/2008/update_201001/maps/2008.WUS.0p

Warpinski, N.R. 2011. Fracture Growth in Layered and Discontinuous Media. Proceedings of the Technical Workshops for the Hydraulic Fracturing Study: Fate and Transport. U.S. Environmental Protection Agency, Washington, DC. May.

Warpinski, N.R., J. Du, and U. Zimmer. 2012. Measurements of Hydraulic-Fracture Induced Seismicity in Gas Shales. Paper SPE 151597 presented at the SPE Hydraulic Fracture Technology Conference, The Woodlands, TX. February 6-8.

Western Governors' Association, 1998. WGA Open Land Initiative. Economic Benefits of Open Space: April 1998. http://www.westgov.org/wga/intiatives/tpl/ecogen.htm

Zhai, Z., and M.M. Sharma. 2005. A New Approach to Modeling Hydraulic Fractures in Unconsolidated Sands. Paper SPE 96246 presented at the SPE Annual Technical Conference and Exhibition, Dallas, TX.

Pipeline and Hazardous Materials Safety Administration (PHMSA). 2016. Pipeline Safety: Safety of Gas Transmission and Gathering Pipelines Notice of Proposed Rulemaking. April 8. Available online: https://www.gpo.gov/fdsys/pkg/FR-2016-04-08/pdf/2016-06382.pdf. Accessed July 12, 2018.

U.S. Department of Transportation (USDOT). 2018. Report of DOT Significant Rulemakings. June 2018. Available at: https://www.transportation.gov/regulations/significant-rulemaking-report-archive. Accessed July 26, 2018.

ATTACHMENTS

Attachment A – All Nominated Parcels with Stipulations for Lease

Attachment B – Parcels Removed from the Lease Sale

Attachment C – Preferred Alternative Parcels with Stipulations for Lease

Attachment D – Stipulation Exhibits

Attachment E – Maps

Left blank for two-sided copying.

ATTACHMENT A

All Nominated Parcels with Stipulations for Lease

Left blank for two-sided copying.

Attachment A

All Nominated Parcels with Stipulations for Lease
December 6, 2018, Oil & Gas Lease Sale

The Bureau of Land Management (BLM) initially scoped 227 parcels containing 236,016.780 acres in the State of Colorado for oil and gas leasing. These parcels included eight locations containing 7,903.040 acres in the Uncompahgre Field Office (UFO). See Attachment C for the Preferred Alternative Parcels with Stipulations for Lease

THE FOLLOWING PUBLIC DOMAIN LANDS ARE SUBJECT TO FILINGS IN THE MANNER SPECIFIED IN THE APPLICABLE PORTIONS OF THE REGULATIONS IN 43 CFR, SUBPART 3120.

PARCEL ID: 8135

T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: N2NE;
Section 12: Lot 1-5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

Gunnison, Delta County
Colorado 560.540 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:

T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: NENE;
Section 12: Lot 1,4,5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

PVT/BLM; COS: UFO

PARCEL ID: 8138

T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,SW,N2SE,SWSE;
Section 11: NWNW;

Delta County
Colorado 763.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0120S., R.0910W., 6TH PM
Section 10: W2NE,NW,NESW,W2SE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,W2NW,SENW,NESW,NESE,W2SE;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,W2NW,SENW,NESW,SWSW,NESE,W2SE;

The following lands are subject to Exhibit Geology Coal Mine CSU CO to accommodate coalmining operations:
T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: S2N2,SW,N2SE,SWSE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,NWNW,E2NW,NESW,SWSW,NESE,W2SE;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%:
T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,NESW,SWSW,N2SE,SWSE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,S2NW,N2SE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8389

T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 3: Lot 4;
Section 3: S2NW,N2SW;
Section 4: Lot 1-4;
Section 4: S2N2,S2;
Section 5: Lot 2-4,9-12;
Section 5: SWNE,S2NW,S2;
Section 6: Lot 1-7;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

Delta County
Colorado 2215.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Coal Mine to accommodate coalmining operations

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 3: Lot 4;
Section 3: S2NW,N2SW;
Section 4: Lot 3,4;
Section 4: S2N2,SW,E2SE;
Section 5: Lot 2-4,9-12;
Section 5: SWNE,S2NW,S2;

Section 6: Lot 1-7;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0130S., R.0910W., 6TH PM
Section 5: Lot 2,4,9-12;
Section 5: SWNE,S2NW,NESW,SE;
Section 6: Lot 1-4;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0910W., 6TH PM
Section 5: Lot 2,4,9-12;
Section 5: SWNE,S2NW,NESW,N2SE;
Section 6: Lot 1-4;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0910W., 6TH PM
Section 5: Lot 2,4,9-12;
Section 5: SWNE,S2NW,NESW,N2SE;
Section 6: Lot 1-4;
Section 6: SENE;

The following lands are subject to Exhibit UFO-CSU-Domestic Water Wells to protect domestic water wells:
T.0130S., R.0910W., 6TH PM
Section 5: Lot 2,9-12;
Section 5: SWNE;
Section 6: Lot 3-5;

The following lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0130S., R.0910W., 6TH PM
Section 5: Lot 11,12;
Section 5: SWNE,S2NW,SE;

The following lands are subject to Exhibit UFO-CSU-Public Water Supplies to protect State- classified "water supply" stream segments upstream of a public water supply intake:
T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 11: NENW;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%:
T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 3: Lot 4;

Section 3: S2NW,N2SW;
Section 4: Lot 1-4;
Section 4: SWNE,S2NW,S2;
Section 5: Lot 2-4,9-12;
Section 5: SWNE,S2NW,S2;
Section 6: Lot 1-7;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0130S., R.0910W., 6TH PM
Section 5: Lot 11;
Section 5: SWNE,S2NW,N2SE,SWSE;
Section 6: Lot 1-3;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8390

T.0130S., R.0910W., 6TH PM
Section 7: Lot 1-4;
Section 7: E2,E2W2;
Section 8: NE,W2,W2SE;
Section 9: NW,N2SW,NESWSW,SESW;
Section 17: W2NE,NW,N2SW,SESW;
Section 18: Lot 1-4;
Section 18: NE,E2W2,N2SE,SWSE;
Section 18: NWSESE;
Section 19: N2NWNE;

Delta County
Colorado 2491.720 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Coal Mine to accommodate coalmining operations

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0130S., R.0910W., 6TH PM
Section 7: Lot 3,4;
Section 7: E2,E2W2;
Section 8: NE,W2,W2SE;
Section 9: NW,N2SW,NESWSW,SESW;
Section 17: W2NE,NW,N2SW,SESW;
Section 18: Lot 1-4;
Section 18: NE,E2W2,N2SE,SWSE;
Section 18: NWSESE;
Section 19: N2NWNE;

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0130S., R.0910W., 6TH PM
Section 8: NE;
Section 18: NE;

The following lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0130S., R.0910W., 6TH PM
Section 8: NE;
Section 18: NE;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%:
T.0130S., R.0910W., 6TH PM
Section 7: Lot 3,4;
Section 7: E2,E2W2;
Section 8: NE,W2,W2SE;
Section 9: NW,N2SW,NESWSW,SESW;
Section 17: W2NE,NW,N2SW,SESW;
Section 18: Lot 1-4;
Section 18: NE,E2W2,N2SE,SWSE;
Section 18: NWSESE;
Section 19: N2NWNE;

The following lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range:
T.0130S., R.0910W., 6TH PM

Section 17: SWNE,E2SW;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0130S., R.0910W., 6TH PM
Section 8: N2NE,SENE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM;BLM; COS: UFO

PARCEL ID: 8391

T.0130S., R.0920W., 6TH PM
Section 12: Lot 9,15;
Section 13: Lot 1,3-6,11,12;

Delta County
Colorado 365.150 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Coal Mine to accommodate coalmining operations

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:

T.0130S., R.0920W., 6TH PM
Section 12: Lot 9,15;
Section 13: Lot 1,4,5,11,12;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8140

T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-5,7,8,11-14;

Gunnison County
Colorado 299.500 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%

All lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range (moose)

Wildlife Big Game Winter habitat All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-4,7,8,11-14;

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,12-14;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,12-14;

The following lands are subject to Exhibit UFO-CSU-Dwellings to protect occupied dwellings:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 11-14;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,11-14;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,13,14;

The following lands are subject to Exhibit UFO-TL-Wild Turkey Winter Use to protect habitat us during the winter season:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 11-13;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8320

T.0120S., R.0890W., 6TH PM
Section 28: SENW,SESE;
Section 28: N2SWSE,SESWSE;
Section 33: NENE,SWNW,W2SW;
Section 33: E2SENE,E2E2SE;

Gunnison County
Colorado 330.000 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossils

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Scenic Byways to protect visual and scenic values along the West Elk Scenic Byway

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0120S., R.0890W., 6TH PM
Section 33: NENE,NESENE;

The following lands are subject to Exhibit UFO-NSO-Major Rivers to protect major rivers:
T.0120S., R.0890W., 6TH PM
Section 28: SENW,NWSWSE,SESWSE;
Section 33: NENE,E2NESE,E2SESE;

The following lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect riparian areas and wetlands:
T.0120S., R.0890W., 6TH PM
Section 28: SENW;
Section 33: NENE,E2SENE;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0120S., R.0890W., 6TH PM
Section 33: NENE,NESENE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8351

T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7-9,15;
Section 5: Lot 3,4,9-12;
Section 6: Lot 6-11,14-16;

Gunnison County
Colorado 876.890 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossils

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Scenic Byways to protect visual and scenic values along the West Elk Scenic Byway

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,11;

The following lands are subject to Exhibit UFO-NSO-Major Rivers to protect major rivers:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 8,9;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,10,11;

The following lands are subject to Exhibit UFO-NSO-Public Water Supplies to protect State-classified "water supply" stream segments upstream of a public water supply intake and public water supplies that use a groundwater well or spring:
T.0130S., R.0890W., 6TH PM
Section 6: Lot 15-;

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7,9,15;
Section 5: Lot 12;
Section 6: Lot 6,8-11,14-16;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-6,10-11;

The following lands are subject to Exhibit UFO-CSU-Public Water Supplies to protect State-classified "water supply" stream segments upstream of a public water supply intake and public water supplies that use a groundwater well or spring:
T.0130S., R.0890W., 6TH PM
Section 6: Lot 9-11,14-16;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 6,7,9,15;

The following lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7,9,15;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,11;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

Left blank for two-sided copying.

Attachment B
Parcels Removed from the Lease Sale

Left blank for two-sided copying.

Attachment B

Parcels Removed from the Lease Sale

The Bureau of Land Management (BLM) has determined that the following three UFL parcels were included in the initial public scoping due to administrative error and has dropped these parcels from the December 2018 Competitive Oil and Gas Lease Sale.

PARCEL ID: 8389 (removed)

T.0130S., R.0910W., 6TH PM
Section 2: SESW;
Section 3: Lot 4;
Section 3: S2NW,N2SW;
Section 4: Lot 1-4;
Section 4: S2N2,S2;
Section 5: Lot 2-4,9-12;
Section 5: SWNE,S2NW,S2;
Section 6: Lot 1-7;
Section 6: S2NE,SENW,E2SW,SE;
Section 11: NENW;

Delta County
Colorado 2215.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8390 (removed)

T.0130S., R.0910W., 6TH PM
Section 7: Lot 1-4;
Section 7: E2,E2W2;
Section 8: NE,W2,W2SE;
Section 9: NW,N2SW,NESWSW,SESW;
Section 17: W2NE,NW,N2SW,SESW;
Section 18: Lot 1-4;
Section 18: NE,E2W2,N2SE,SWSE;
Section 18: NWSESE;
Section 19: N2NWNE;

Delta County
Colorado 2491.720 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM;BLM; COS: UFO

PARCEL ID: 8391 (removed)

T.0130S., R.0920W., 6TH PM
Section 12: Lot 9,15;
Section 13: Lot 1,3-6,11,12;

Delta County
Colorado 365.150 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COS: UFO

Attachment C

Preferred Alternative Parcels with Stipulations for Lease

Left blank for two-sided copying.

Attachment C

Preferred Alternative Parcels with Stipulations for Lease

The Bureau of Land Management (BLM) is analyzing 224 parcels containing 230,944.29 acres in the State of Colorado for oil and gas leasing. The parcels include five locations containing 2,830.55 acres in the Uncompahgre Field Office (UFO).

THE FOLLOWING PUBLIC DOMAIN LANDS ARE SUBJECT TO FILINGS IN THE MANNER SPECIFIED IN THE APPLICABLE PORTIONS OF THE REGULATIONS IN 43 CFR, SUBPART 3120.

PARCEL ID: 8135

T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: N2NE;
Section 12: Lot 1-5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

Gunnison, Delta County
Colorado 560.540 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:

T.0120S., R.0910W., 6TH PM
Section 11: Lot 3,4;
Section 11: NENE;
Section 12: Lot 1,4,5;
Section 12: W2NE,SENE,NENW;
Section 12: E2SE, SWSE;

PVT/BLM; COS: UFO

PARCEL ID: 8138

T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,SW,N2SE,SWSE;
Section 11: NWNW;

Delta County
Colorado 763.620 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0120S., R.0910W., 6TH PM
Section 10: W2NE,NW,NESW,W2SE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,W2NW,SENW,NESW,NESE,W2SE;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,W2NW,SENW,NESW,SWSW,NESE,W2SE;

The following lands are subject to Exhibit Geology Coal Mine CSU CO to accommodate coalmining operations:
T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: S2N2,SW,N2SE,SWSE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,NWNW,E2NW,NESW,SWSW,NESE,W2SE;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%:
T.0120S., R.0910W., 6TH PM
Section 9: Lot 5,6;
Section 9: S2SE;
Section 10: Lot 1;
Section 10: N2,NESW,SWSW,N2SE,SWSE;
Section 11: NWNW;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0120S., R.0910W., 6TH PM
Section 9: SESE;
Section 10: Lot 1;
Section 10: SWNE,S2NW,N2SE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8140

T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-5,7,8,11-14;

Gunnison County
Colorado 299.500 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossil resources

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30-39%

All lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range (moose)

Wildlife Big Game Winter habitat All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1-4,7,8,11-14;

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,12-14;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,12-14;

The following lands are subject to Exhibit UFO-CSU-Dwellings to protect occupied dwellings:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 11-14;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,11-14;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 1,7,8,13,14;

The following lands are subject to Exhibit UFO-TL-Wild Turkey Winter Use to protect habitat us during the winter season:
T.0110S., R.0900W., 6TH PM
Section 2: Lot 11-13;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

PVT/BLM; COS: UFO

PARCEL ID: 8320

T.0120S., R.0890W., 6TH PM
Section 28: SENW,SESE;
Section 28: N2SWSE,SESWSE;
Section 33: NENE,SWNW,W2SW;
Section 33: E2SENE,E2E2SE;

Gunnison County
Colorado 330.000 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossils

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Scenic Byways to protect visual and scenic values along the West Elk Scenic Byway

All lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%

All lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0120S., R.0890W., 6TH PM
Section 33: NENE,NESENE;

The following lands are subject to Exhibit UFO-NSO-Major Rivers to protect major rivers:
T.0120S., R.0890W., 6TH PM
Section 28: SENW,NWSWSE,SESWSE;
Section 33: NENE,E2NESE,E2SESE;

The following lands are subject to Exhibit UFO-CSU-Hydrologic Features to protect riparian areas and wetlands:
T.0120S., R.0890W., 6TH PM
Section 28: SENW;
Section 33: NENE,E2SENE;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0120S., R.0890W., 6TH PM
Section 33: NENE,NESENE;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

PARCEL ID: 8351

T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7-9,15;

Section 5: Lot 3,4,9-12;
Section 6: Lot 6-11,14-16;

Gunnison County
Colorado 876.890 Acres

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal

All lands are subject to Exhibit CO-39 to protect cultural resources

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit UFO-NSO-Raptor Nest Sites

All lands are subject to Exhibit UFO-CSU-Cultural Resources to protect historic/cultural resources

All lands are subject to Exhibit UFO-CSU-Paleontological Resources to protect fossils

All lands are subject to Exhibit UFO-CSU-Plant Community to protect significant or relict plant communities

All lands are subject to Exhibit UFO-CSU-Raptor Breeding Habitat to protect raptor nests and nesting

All lands are subject to Exhibit UFO-CSU-Scenic Byways to protect visual and scenic values along the West Elk Scenic Byway

All lands are subject to Exhibit UFO-TL-Raptor Nests to protect active nests and nesting

All lands are subject to Exhibit UFO-TL-Sensitive Raptor Nests to protect active nests and nesting of sensitive raptors

The following lands are subject to Exhibit UFO-NSO-Hydrologic Features to protect streams, riparian areas, fens or wetlands, and impoundments:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,11;

The following lands are subject to Exhibit UFO-NSO-Major Rivers to protect major rivers:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 8,9;

The following lands are subject to Exhibit UFO-NSO-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,10,11;

The following lands are subject to Exhibit UFO-NSO-Public Water Supplies to protect State-classified "water supply" stream segments upstream of a public water supply intake and public water supplies that use a groundwater well or spring:
T.0130S., R.0890W., 6TH PM
Section 6: Lot 15-;

The following lands are subject to Exhibit UFO-NSO-Steep Slopes to protect slopes of 40% or greater:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7,9,15;
Section 5: Lot 12;
Section 6: Lot 6,8-11,14-16;

The following lands are subject to Exhibit UFO-CSU-Native Cutthroat Trout to protect occupied habitat for conservation populations (90% pure or greater):
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-6,10-11;

The following lands are subject to Exhibit UFO-CSU-Public Water Supplies to protect State-classified "water supply" stream segments upstream of a public water supply intake and public water supplies that use a groundwater well or spring:
T.0130S., R.0890W., 6TH PM
Section 6: Lot 9-11,14-16;

The following lands are subject to Exhibit UFO-CSU-Steep Slopes to protect slopes of 30 to 39%:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 6,7,9,15;

The following lands are subject to Exhibit UFO-TL-Big Game Winter Habitat to protect big game use of crucial winter range:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 5-12;
Section 4: Lot 7,9,15;

The following lands are subject to Exhibit UFO-TL-Coldwater Sportfish and Native Warmwater Fish to protect spawning:
T.0130S., R.0890W., 6TH PM
Section 3: Lot 6,11;

All lands are subject to UFO-LN-Migratory Birds to alert lessee of a requirement to comply with the Migratory Bird Treaty Act

BLM;PVT/BLM; COS: UFO

Attachment D
Stipulation Exhibits

Left blank for two-sided copying.

Lease Number: <LEASE_NUMBER>

Exhibit CO-34

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION STIPULATION

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.

On the lands described below:

<LEGAL_DESCRIPTIONS>

Lease Number: <LEASE_NUMBER>

Exhibit CO-39

CULTURAL RESOURCES

CONTROLLED SURFACE USE

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O.13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

On the lands described below:

Lease Number: <LEASE_NUMBER>

Exhibit CO-56

AIR QUALITY

LEASE NOTICE

Due to potential air quality concerns, supplementary air quality analysis may be required for any proposed development of this lease. This may include preparing a comprehensive emissions inventory, performing air quality modeling, and initiating interagency consultation with affected land managers and air quality regulators to determine potential mitigation options for any predicted significant impacts from the proposed development. Potential mitigation may include limiting the time, place, and pace of any proposed development, as well as providing for the best air quality control technology and/or management practices necessary to achieve area-wide air resource protection objectives. Mitigation measures would be analyzed through the appropriate level of NEPA analysis to determine effectiveness, and will be required or implemented as a permit condition of approval (COA). At a minimum, all projects and permitted uses implemented under this lease will comply with all applicable National Ambient Air Quality Standards and ensure Air Quality Related Values are protected in nearby Class I or Sensitive Class II areas that are afforded additional air quality protection under the Clean Air Act (CAA).

On the lands described below:

<LEGAL_DESCRIPTIONS>

Lease Number: <LEASE_NUMBER>

UFO-NSO-HYDROLOGIC FEATURES

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 100 meters (325 feet) from the mapped extent of perennial, intermittent, and ephemeral streams; riparian areas, fens and/or wetlands; and water impoundments. For streams, the buffer will be measured from ordinary high-water mark (bank-full stage); for wetland features, the buffer will be measured from the edge of the mapped extent.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To maintain the proper functioning condition, including the vegetation, hydrologic, and geomorphic functionality of wetland features; protect water quality, riparian zones, fens, fish habitat, aquatic habitat; and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least a 30-day period.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least a 30-day period.

Lease Number: <LEASE_NUMBER>

UFO-NSO-MAJOR RIVERS

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 400 meters (1,312 feet) of the ordinary high-water mark (bank-full stage) or within 100 meters (328 feet) of the 100-year floodplain (whichever area is greater) on the following major rivers:

- GUNNISON, NORTH FORK GUNNISON, SAN MIGUEL, UNCOMPAHGRE, DOLORES

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect rivers and adjacent aquatic habitat that provide: a) *special status* or *critical* fish and wildlife species habitat: b) important riparian values: c) water quality/filtering values: d) waterfowl and shorebird production values: e) valuable amphibian habitat: f) 100-year floodplain, and g) high scenic and recreation values of major rivers. Minimizing potential deterioration of water quality, high scenic and recreation values, maintain natural hydrologic function and condition of stream channels, banks, floodplains, and riparian communities, and preserve wildlife habitat including designated critical habitat for Federally listed fish species. The buffers are sized to accommodate the rivers' larger floodplains and wider riparian zones.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-NATIVE CUTTHROAT TROUT

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 325 feet of the edge of the ordinary high-water mark (bank-full stage) of occupied habitat for conservation populations (90 percent pure or greater) of native cutthroat trout.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect core populations and maintain habitat integrity for core populations of species, subspecies, or lineages of cutthroat trout native to the mainstem Colorado and Gunnison River basins.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-OCCUPIED DWELLINGS

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within 305 meters (1,000 feet) of occupied dwellings and building units as defined by the State of Colorado.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect residential developments within unincorporated residential communities and isolated dwellings as defined as occupied by the State of Colorado.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-PUBLIC WATER SUPPLIES

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy and use will be allowed within 305 meters (1,000 feet) on either side of a classified surface water-supply stream segment (as measured from the average high high-water mark) for a distance of 5 miles upstream from a public water supply intake classified by the State of Colorado as a "water supply," and within a 2,640 feet (0.5 mile) buffer of all public water supplies that use a groundwater well or spring. In addition, directional drilling will not allowed within 457 vertical meters (1,500 vertical feet) below a surface public water supply or below the depth of a public water supply that use a groundwater well spring.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect public water supplies, water quality, aquatic habitat, and human health.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-RAPTOR NEST SITES

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed within the following areas:

- Bald Eagle and Golden Eagle: Within 0.25 mile of active and inactive nest site or within 100 meters (328 feet) of abandoned nests (i.e., unoccupied for 5 consecutive years) but with all or part of the nest intact
- Northern Goshawk, Ferruginous Hawk, Peregrine Falcon, and Prairie Falcon: within 0.50 mile of active and inactive nest sites
- All Other Raptors (except Mexican spotted owl): Within 0.25 mile of active and inactive nest sites

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect raptor nest sites from placement of long-term or permanent facilities that could prevent future occupation of nests known to have been used, or showing evidence of having been used, within the previous 5 years.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-NSO-STEEP SLOPES (>40%)

NO SURFACE OCCUPANCY

Stipulation: No surface occupancy or use is allowed on lands with steep slopes greater than:

- 40%

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To minimize the risk of mass wasting, sedimentation and reduced reclamation costs, protecting soil productivity, rare or sensitive biota, minimizing risk to water bodies, fisheries and aquatic species habitats and protection of human health and safety (from landslides, mass wasting, etc.).

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-CULTURAL RESOURCES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted due to historic properties and/or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order13007, or other statutes and executive orders. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Office and tribal consultation) under applicable requirements of the National Historic Preservation Act and other authorities.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect historic properties and/or cultural resources protected under other Federal statues and executive orders.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

The Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

The Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Lease Number: <LEASE_NUMBER>

UFO-CSU-DOMESTIC WATER WELLS

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on lands located within 305 meters (1,000 feet) of domestic water wells. Special engineering design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. No directional drilling will be permitted within 457 vertical meters (1,500 vertical feet) below the depth of a domestic water well within a 1,000-foot radius.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect domestic water wells, associated groundwater resources, and human health.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

The Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

The Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may consult with other government agencies and/or the public in order to make this determination.

Lease Number: <LEASE_NUMBER>

UFO-CSU-HYDROLOGIC FEATURES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on lands adjacent to perennial, intermittent, and ephemeral streams; riparian areas, fens, and/or wetlands; and water impoundments. For perennial, intermittent, and ephemeral streams, the extent will be measured from ordinary high-water mark (bank-full stage); for wetland features, the buffer will be measured from the edge of the mapped extent. For unmapped wetlands, the vegetation boundary (from which the buffer originates) will be determined in the field. Surface disturbing activities may require special engineering design, construction, and implementation measures, including re-location of operations beyond 200 meters (656 feet) from the extent of water impoundments, streams, riparian areas, and/or wetlands to protect water resources.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To maintain the proper functioning condition, including the vegetation, hydrologic and geomorphic functionality of wetland features. Protect water quality, riparian zones, fens, fish habitat, aquatic habitat, and provide a clean, reliable source of water for downstream users. Buffers are expected to indirectly benefit migratory birds, wildlife habitat, amphibians, and other species.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-PALEONTOLOGICAL RESOURCES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted to protect paleontological resources. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. An inventory of paleontological resources may be required before construction and drilling may commence. The BLM Authorized Officer may require that a qualified paleontologist be present to monitor operations during surface disturbing activities.

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To conserve significant and/or relict plant communities with

that are not otherwise protected.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

.Lease Number: <LEASE_NUMBER>

UFO-CSU-PLANT COMMUNITY

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted within occupied habitat that meets BLM's criteria, as established in the RMP, for significant and/or relict plant communities (i.e., Exemplary, Ancient, and Rare Vegetation Communities). Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit a plan of development that would demonstrate that habitat would be preserved to maintain the viability of significant or relict plant communities.

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To conserve significant and/or relict plant communities with

that are not otherwise protected.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-PRAIRIE DOG TOWNS

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted within 150 feet of active Gunnison or white-tailed prairie dog towns. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. The operator may be required to submit a plan of development that reduces or eliminates threats to active colonies by siting or prioritizing vegetation clearing, facility construction, and concentrated operational activities (e.g., drilling, completion, and utility installation).

Purpose: To maintain habitat integrity and reduce threats to populations or Gunnison's or white-tailed prairie dogs in active prairie dog towns.

On the following lands:

<LEGAL_DESCRIPTION>

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

In addition, the CSU area may be altered depending on the type of activity and existing disturbance within or adjacent to Gunnison's or white-tailed prairie dog towns.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-PUBLIC WATER SUPPLIES

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on lands located greater than 305 meters (1,000 feet) but less than 805 meters (2,640 feet) (0.50 mile) of a classified surface water supply stream segment (as measured from the average high-water mark) for a distance of 8.05 kilometers (5 miles) upstream of a public water supply intake classified by the State as a "water supply," and all public water supplies that use a groundwater well or spring. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit a coordinated water resources monitoring plan to mitigate potential effects to the source water protection areas of a public water supply. The operator shall comply with all applicable sourcewater protection plans developed by public water providers.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect public water supplies, water quality, aquatic habitat, and human health.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-CSU-RAPTOR BREEDING HABITAT

CONTROLLED SURFACE USE

Stipulation: Special design and implementation measures, including relocation by more than 200 meters (656 feet), are required within 1.0 mile of active nests of raptors (accipiters, buteos, falcons except the American kestrel, and owls except the Mexican spotted owl, a Federally listed species).

<SPECIES><START DATE:END DATE>

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To prevent or minimize disruption of reproductive activity of raptors during the production period.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least a 30-day period.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least a 30-day period.

Lease Number: <LEASE_NUMBER>

UFO-CSU-STEEP SLOPES (30-39%)

CONTROLLED SURFACE USE

Stipulation: Surface occupancy or use may be restricted on steep slopes of 30% to 39%. Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Prior to authorizing activities in this area, the operator may be required to submit an engineering/reclamation plan to mitigate potential effects to slope stability.

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To minimize the risk of mass wasting and sedimentation; reduce reclamation costs; protect soil productivity and rare or sensitive biota; minimize risk to waterbodies, fisheries, and aquatic species habitats; and protect human health and safety (from landslides, mass wasting, etc.).

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-BIG GAME WINTER HABITAT

TIMING LIMITATION

Stipulation: No surface use and surface-disturbing and disruptive activities are allowed during the following time period(s) in big game crucial winter habitat (including severe winter range and/or winter concentration areas) as mapped in the RMP, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies for the following periods:

- Elk, Mule Deer, and Moose: December 1 to April 15
- Pronghorn: January 1 to March 31
- Rocky Mountain and Desert Bighorn Sheep: November 1 to April 15

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To reduce disruption of big game during the winter season in crucial winter habitat.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-COLDWATER SPORTFISH AND NATIVE WARMWATER FISH TIMING LIMITATION

Stipulation: No in-stream channel work is allowed within occupied fisheries, as mapped in the RMP, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies, for coldwater sportfish (cutthroat trout, rainbow trout, brown trout, and brook trout) and native warmwater fish (flannelmouth sucker, bluehead sucker, and roundtail chub), during the following period:

- APRIL 1 TO JULY 15

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To protect redds (egg masses) in the gravel and emerging fry of trout and native nongame fish populations.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites on the lease. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites on the lease to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-RAPTOR NESTING

TIMING LIMITATION

Stipulation: No surface use is allowed within a 0.25-mile (402-meter) radius of active raptor nests, as mapped in the Resource Management Plan, BLM's GIS database or other maps provided by local, state, Federal, or Tribal agencies that are accepted by the BLM during the following time period, or until fledging and dispersal of young:

- Burrowing Owl: March 15 to August 15
- Osprey: April 1 to August 31
- Red-tailed Hawk: February 15 to August 15
- Swainson's Hawk, Cooper's Hawk, Sharp-Shinned Hawk, Northern Harrier: April 1 to August 15
- Great Horned Owl: February 1 to August 15
- Other Owls and Raptors: March 1 to August 15 (does not include American kestrel)

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To prevent disruption of reproductive activity of raptors during the production period.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-SENSITIVE RAPTOR NESTING

TIMING LIMITATION

Stipulation: No surface use is allowed within a 0.5-mile (805-meter) radius of active nests of sensitive raptor nests, as mapped in the Resource Management Plan, BLM's GIS database or other maps provided by local, state, Federal, or Tribal agencies that are accepted by the BLM, during the following time periods, or until fledging and dispersal of young:

- Bald Eagle: November 15 to July 31
- Golden Eagle: December 15 to July 15
- Ferruginous Hawk: February 1 to August 15
- Peregrine and Prairie Falcon: March 15 to July 31
- Northern Goshawk: March 1 to August 31

On the following lands:

<LEGAL DESCRIPTION>

Purpose: To prevent disruption of reproductive activity of raptors during the production period.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold. The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold. In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-TL-WILD TURKEY WINTER HABITAT

TIMING LIMITATION

Stipulations: No surface use is allowed within wild turkey winter habitat, as mapped in the Resource Management Plan, BLM's GIS database, or other maps provided by local, State, Federal, or Tribal agencies that are analyzed and accepted by the BLM, during the following time period:

- DECEMBER 1 TO APRIL 1

On the following lands:

<LEGAL_DESCRIPTION>

Purpose: To prevent disruption of wild turkeys during crucial periods.

This stipulation only applies to construction and drilling, and does not apply to operations and maintenance.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see Bureau of Land Management Manuals 1624 and 3101 or Forest Service Manuals 1950 and 2820.)

Exception: An exception is a one-time exemption for a particular site within the leasehold. Exceptions are determined on a case-by-case basis. The stipulation continues to apply to all other sites within the leasehold.

The Authorized Officer may grant an exception to a stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently such that: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; or 2) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination.

Modification: A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may modify a stipulation or the area subject to the stipulation if it is determined that the factors leading to its inclusion in the lease have changed sufficiently. The Authorized Officer may modify a stipulation as a result of new information if: 1) the protection provided by the stipulation is no longer justified or necessary to meet resource objectives established in the RMP; 2) the protection provided by the stipulation is no longer sufficient to meet resource objectives established in the RMP; or 3) proposed operations would not cause unacceptable impacts. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the modification may be subject to public review for at least 30 days.

Waiver: A waiver is a permanent exemption from a lease stipulation. When a waiver is granted, the stipulation no longer applies anywhere within the leasehold.

In accordance with the provisions of 43 C.F.R. 3101.1-4, the Authorized Officer may waive a stipulation if it is determined that the factors leading to its inclusion in the lease no longer exist. The Authorized Officer may require additional plans of development, surveys, mitigation proposals, or environmental analysis, and may be required to consult with other government agencies and/or the public in order to make this determination, and the waiver may be subject to public review for at least 30 days.

Lease Number: <LEASE_NUMBER>

UFO-LN-MIGRATORY BIRDS

LEASE NOTICE

The lessee is hereby notified that prior to and during all lease operations, including development and utilization of oil and gas resources, the lessee must comply year-round with applicable provisions of the Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703–712, and other state and local statutes, rules, and regulations now in existence or as may be modified in the future, consistent with lease rights. Migratory birds nest throughout the area of the Uncompahgre Field Office, and seasonal timing restrictions for ground disturbing activities may occur within April 1 to July 15 period of which migratory birds may be nesting in the area.

On the following lands:

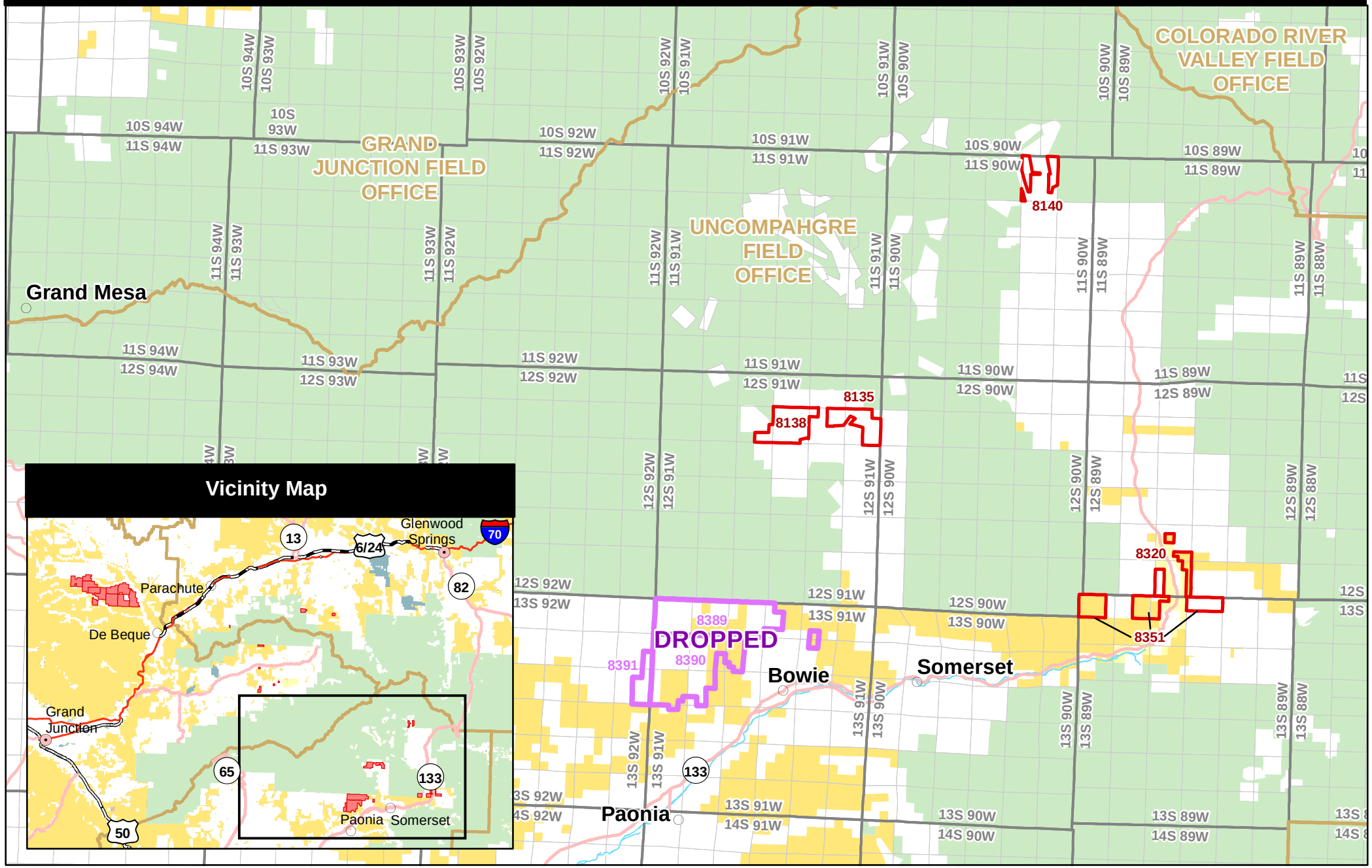
<LEGAL_DESCRIPTION>

ATTACHMENT E

Maps

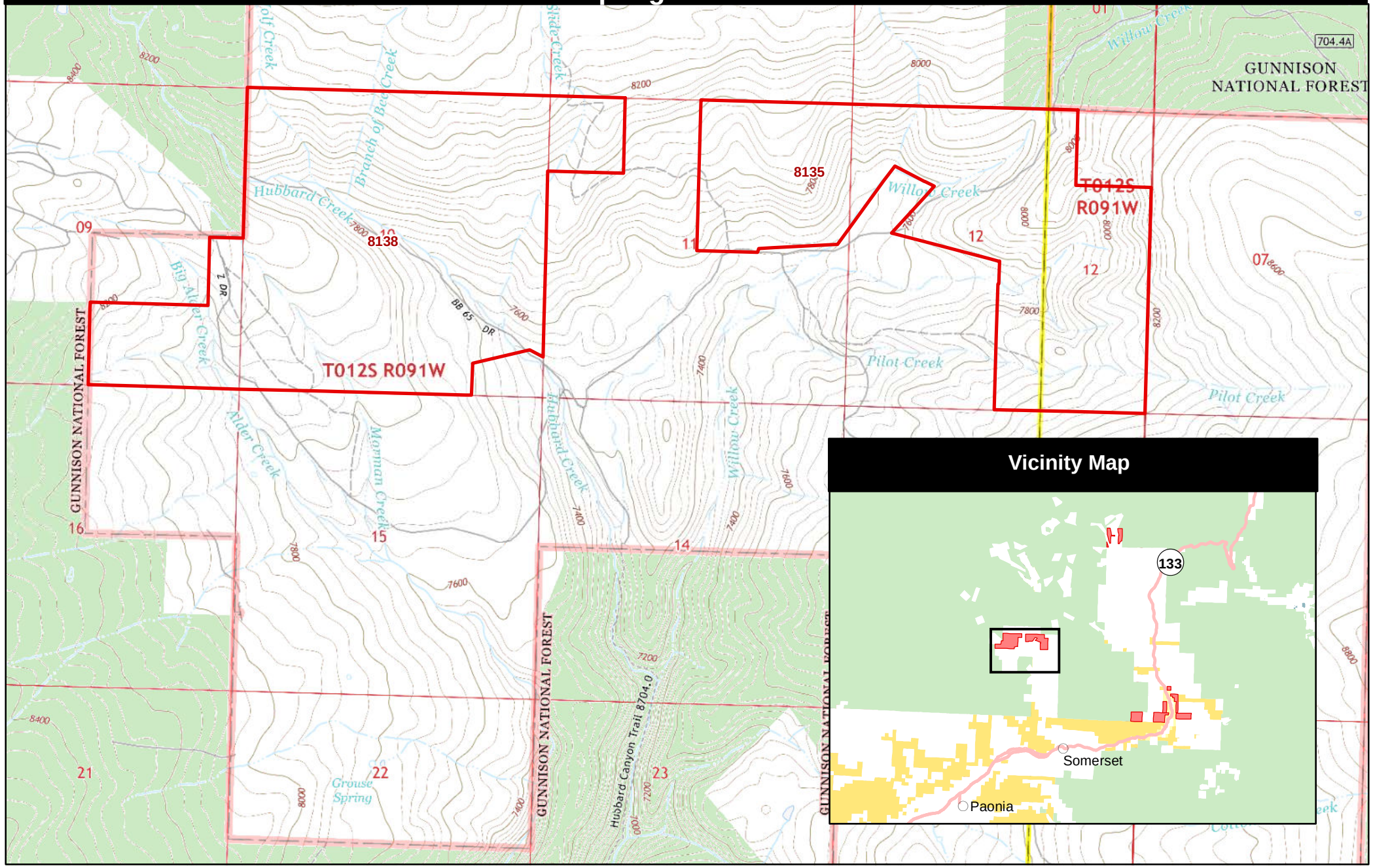
Left blank for two-sided copying.

December 2018 Lease Sale Parcels Uncompahgre Field Office



December 2018 Lease Sale Parcels
Deferred Parcels
BLM Field Office Areas Boundaries
Bureau of Land Management
Bureau of Reclamation
Private
US Forest Service

December 2018 Lease Sale Parcels 8135, 8138
Uncompahgre Field Office



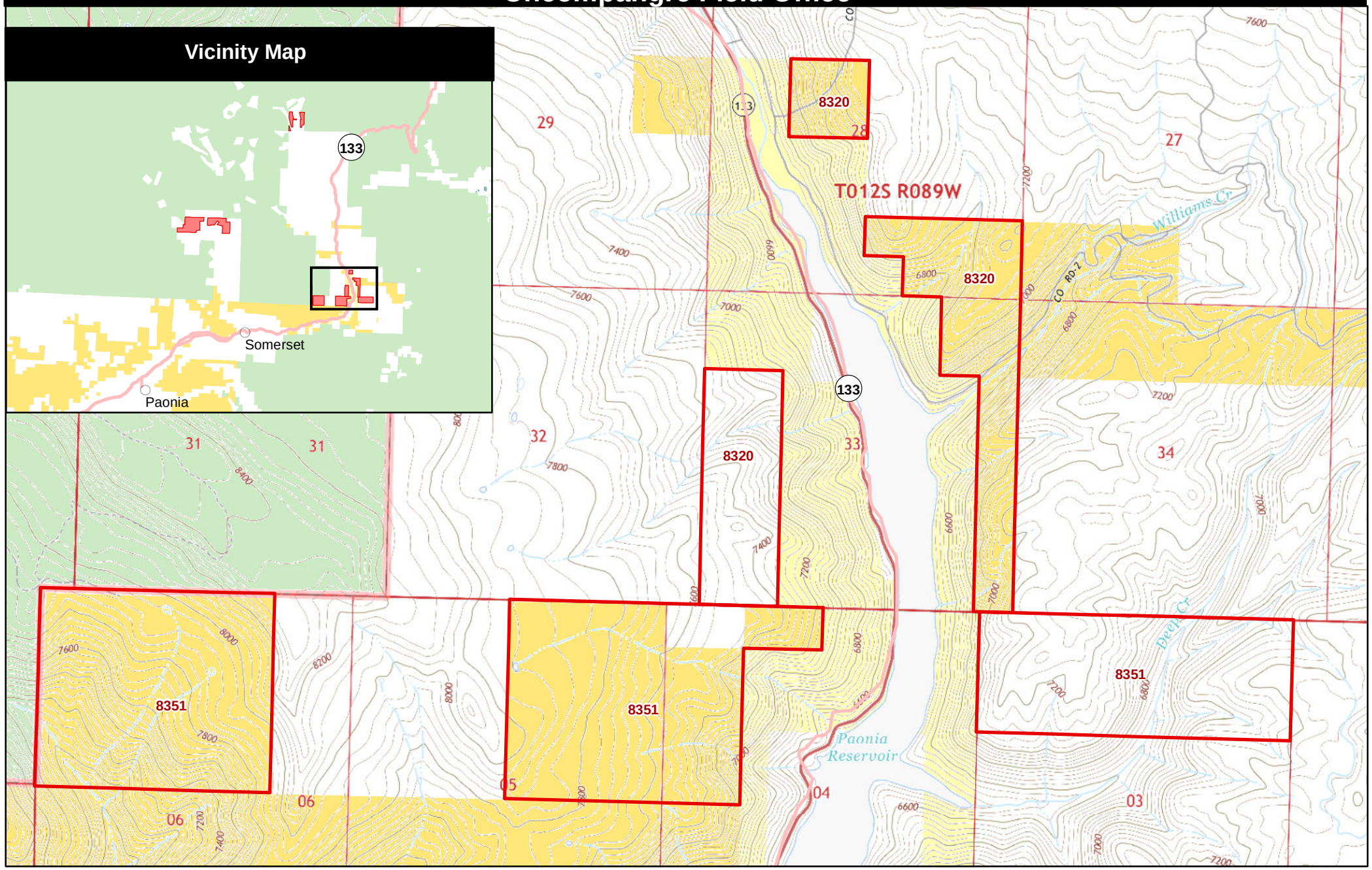
December 2018 Lease Sale Parcels

Private

BLM Field Office Areas Boundaries

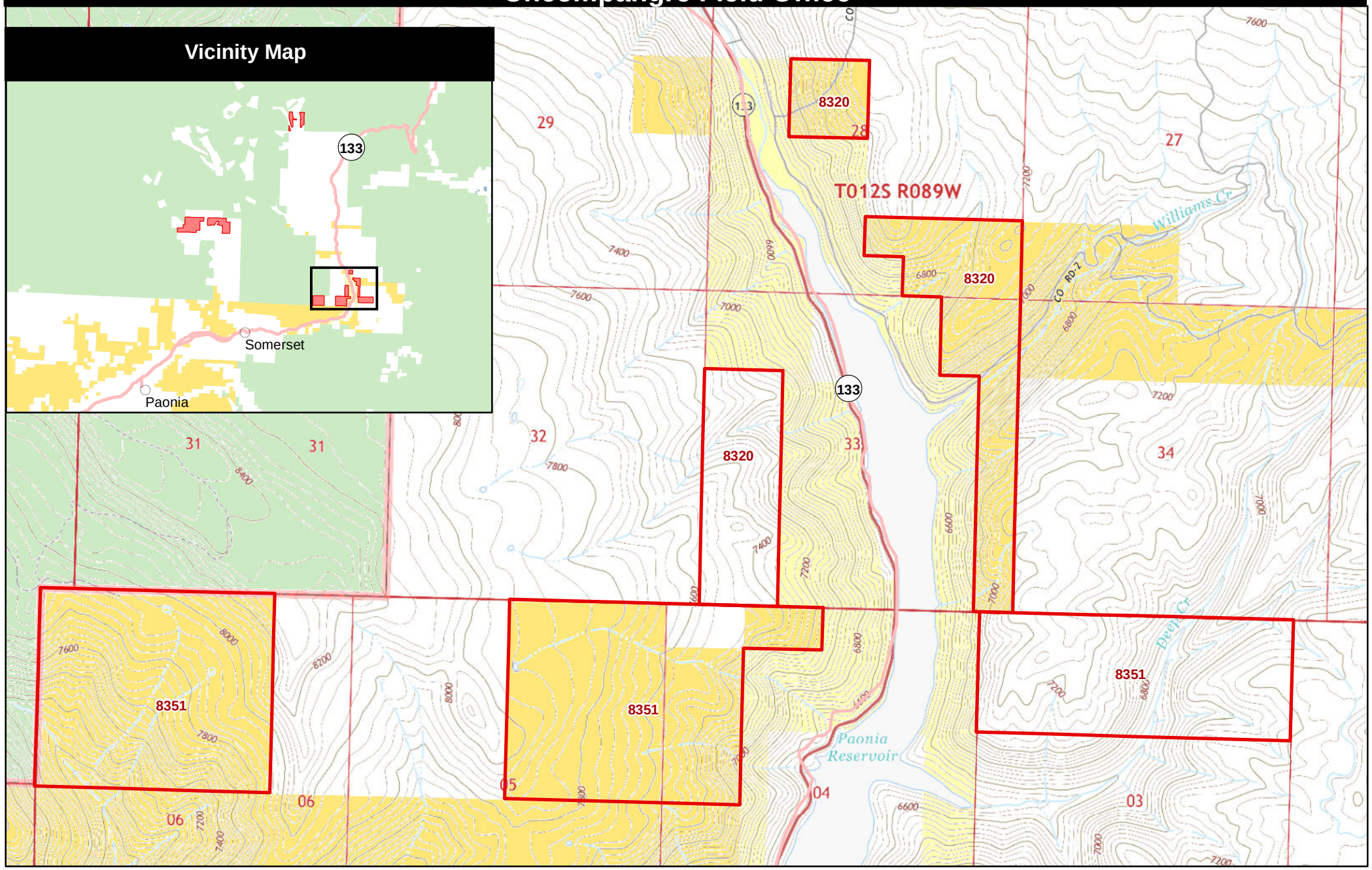
US Forest Service

December 2018 Lease Sale Parcels 8320, 8351
Uncompahgre Field Office



December 2018 Lease Sale Parcels
Bureau of Land Management
Private
BLM Field Office Areas Boundaries
Bureau of Reclamation
US Forest Service

December 2018 Lease Sale Parcels 8320, 8351
Uncompahgre Field Office



December 2018 Lease Sale Parcels
Bureau of Land Management
Private
BLM Field Office Areas Boundaries
Bureau of Reclamation
US Forest Service

ATTACHMENT F

Summary of Public and Interagency Scoping Comments

Left blank for two-sided copying.

Attachment F

Summary of Public and Interagency Scoping Comments, UFO Parcels, December 2018 Lease Sale
(Full Comments Available on Request)

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Classen, Jr.	Clayton	1	Impacts to water, wildlife lands, agriculture, livelihoods of families	No
Follingstad	Gretel	2	These are pristine lands that should be left untouched by oil and gas	No
Halpern	Stuart	3	Proposed lease sale ignores the local community, leaving the future of the North Fork Valley and its waters, wildlife, lands, and agriculture in doubt. Other concerns included Paonia Reservoir and Paonia State Park, surface spill impacting farms and irrigation water, sensitive wildlife, mule deer and elk, local economies and ecologies.	No
Stuart	Belinda	4	Impacts to Paonia Reservoir and Paonia Valley and other sensitive areas.	No
Kreykes	Daniel	5	Impacts to Paonia Reservoir, tourism, farming, natural resources, big game, habitat, economic impacts.	No
Delaney	Adrian	6	Livelihoods of farmers and cattlemen; food sovereignty.	No
Williams	Chelsea	7	Opposed.	No
Mann	Brianne	8	Same issues and concerns as #3.	No
Roush	William	9	Same issues and concerns as #3.	No
Dopchev	Petar	10	Same issues and concerns as #3.	No
Brudzinski	David	11	Impacts to watersheds, farms, ranches, vineyards, wildlife – all depend on water.	No
Smith	Robin	12	Climate change, impacts to local springs, Town of Paonia's water supply, effect of drought on agriculture (Minnesota Ditch). Should emphasize renewable energy.	No
Fixmer	Dylan	13	Paonia Reservoir, contamination of water source for farms.	No
Curtis	Victoria	14	Impacts of hydraulic fracturing on water, air, and general environmental quality. Damage to reputation of Paonia, especially organic produce. Impacts to small communities – crime, boom-town conditions.	No
Reich	Debra	15	Hydraulic fracturing near Paonia reservoir. Results of mining on the backcountry unsightly.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Gebavi	Ingrid	16	Same comment as #3.	No
Inouye	Brian	17	Impacts on water resources, wildlife habitat, irrigation water for agriculture, effects of spills.	No
Stern	Lydia	18	Area should remain roadless and undeveloped. Impacts to sensitive wildlife from spills. Impacts to food production.	No
McIntosh	Tom	19	Impacts to water sources, wildlife, pristine wilderness. Focus on renewable energy, which does not pollute.	No
Morse	Dan	20	Impacts to Paonia Reservoir and Muddy Creek. Impacts of leaks and spills on nearby communities, public health, recreation opportunities, wildlife habitat, and other resources and uses.	No
Goldstone	Beth	21	Impacts to wildlife and farming/vegetable production.	No
Obrien	Colleen	22	Same issues and concerns as #3.	No
Ciaglo	Max	23	Same issues and concerns as #3.	No
Navy	Sue	24	Impacts to economic drivers of organic farms, wineries, hunting and fishing, and other recreation. Impacts to clean water, air quality.	No
Scott	Cody	25	Same comment as #3.	No
Dunkle	Doug	26	Opposed.	No
Mason	John	27, 28	Please keep energy development away from environmentally sensitive areas.	No
Mundt	Alissa	29	Same issues and concerns as #3.	No
Bender	Thomas	30	Please conduct environmental impact studies prior to green lighting thousands of hydraulic fracturing rigs in our idealic [idyllic] valley. Attachment letter expressing concern about hydraulic fracturing due to potential impacts to air and water including wells, organic farming, slope stability, Paonia Dam integrity, fish and wildlife, recreation, local economy, and public health.	Yes
Harte	Mary	31	Same issues and concerns as #3.	No
Ketterhagen	William	32	Same issues and concerns as #3.	No
Wicks	Nancy	33	Direct threat to clean water in the Paonia Reservoir needed for organic agricultural. Please do not let oil and gas be developed in these sensitive areas.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Yale	Laura	34	Not appropriate so close to a town's drinking water supply. It threatens agriculture and farms in Paonia and is a major migration corridor, good for hunting, a major part of the economy.	No
Vogel	Kate	35	Do not allow oil and gas development in the sensitive area of the North Fork valley. Concerns: Impacts to irrigation water, wildlife, agriculture and people.	No
Hosier	Bailey	36	Impacts to elk and other wildlife, food production in Paonia area, need for clean water and maintenance of ecosystems, impacts of hydraulic fracturing on water systems. Should focus instead on clean energy.	No
Mcpherson (Grassroots Coaltion)	Patricia	37	Watershed and scenic wildlife area damaged by contamination and destruction. Other concerns: toxic and carcinogenic substances, impacts on food production, impacts on health from leakage, explosions, fires, and contamination.	No
Johnson	Benjamin	38	Use efforts to convert the U.S. into sustainable fuels. Protect our health through the preservation of our environment.	No
Shelton	Taylor	39	Impacts to bounty and purity of the area, diversity of life, untouched wild areas. Concerns: Impacts to clean water, human health, organic food production.	No
Coleman	Sarah	40	Impacts to outstanding natural beauty, critical wildlife habitat, productive agricultural lands, tourism, recreation, sustainable agriculture, Paonia Reservoir and Paonia State Park. Impacts on other major economic and job-producing industries.	No
Petito	Jackson	41	Threat to pristine outdoor areas and future recreational economic opportunity, in favor of short terms gains for the dying fossil fuel industry, is poor public policy.	No
Maxwell	Brandon	42	Stop further pursuit of burning fossil fuels for energy.	No
Witherell	Deidre	43	Impacts to Paonia Reservoir, towns of Paonia, Hotchkiss and Crawford, organic agriculture (orchards, vineyards, livestock). Impacts of spills on the environment.	No
Nasr	Katja	44	Opposition to hydraulic fracturing – impacts to climate, organic farms, drinking nd irrigation water, ambiance of the valley.	No
Keahon	Christopher	45	Concerned about impacts to deer and elk.	No
Nasr	Sammy	46	Impacts to Paonia Reservoir and nearby springs, irrigation water, domestic water from hydraulic fracturing. Impacts of toxic chemicals on human health and livelihood.	No
Woodside	Bruce	47	Concerned about parcels near Paonia Reservoir, and those [now dropped] near Bowie coal mine, due to proximity valuable watersheds, and ongoing methane release from the Bowie mine. Cites authors and studies opposed to oil and gas development and issues related to	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
			spills, physical damage to the environment, reported lack of proper regulatory oversight and inadequate response to irresponsible oil and gas operations particularly related to hydraulic fracturing.	
Annala	Holly	48	Impacts to Paonia Dam and Reservoir, contamination of waters and downstream users, loss of forests on public lands, impacts on wildlife. Companies should charge more for gas to force reduced use.	No
Hoffman	Andrea	49	Impacts to ranchers, recreation. Loss of access to lands for recreation will hurt local community and economy. Keep a healthy environment and economy.	No
Brett	Elaine	50	Issues include risks of hydraulic fracturing, leasing when the RMP is not yet completed, oil and gas development impacts on public welfare and safety and local economies, inadequacy of mitigation, risks to the lives and livelihoods of residents, cumulative impacts to air, water, wildlife, and public health and safety, the geologic instability around Paonia Reservoir. Proximity to the West Elk Loop Scenic Byway and Raggeds Wilderness, and the Bowie coalmines also mentioned as concerns.	No
Oliver		51	Opposes parcels in North Fork Valley, especially 8320 and 8351 near Paonia Reservoir and 8389, 8390, and 8391 [these have been dropped]. Continued extraction of fossil fuels is wrong due to climate change. Also concerned with impacts Surface spills would irreparably harm the environment. Oil and gas drilling is incompatible with the sustainable, healthy future of the Paonia valley.	
Cain	Mary	52	Concerned about Paonia Reservoir and State Park, impacts of spills on water and agricultural and residential areas, food production, local economy. Physical scars on the land. Need to look forward, not backward.	No
Schmidt	Sarah	53	Agriculture, water quality impacts from chemicals. Paonia State Park, fish and wildlife. Scenic quality and tourism.	No
Burkley	Michael	54	Oil and gas development incompatible with a healthy future for the spectacular North Fork Valley of western Colorado. Scenic beauty, wilderness quality, outdoor recreation, tourism, hunting, organic agriculture – economic drivers of the area. Concerned about geological integrity of the Paonia Reservoir and surrounding slopes, and impacts to water quality, elk and deer from surface and subsurface contamination.	No
Carre	Deborah	55	Impacts to humans, plants, and animals. Organic gardening requires clean water. Safety issues near coal mines [these now dropped] and unstable slopes near Paonia Reservoir. Impacts on municipal water supplies.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Vessels	Thomas	57	Comments related to parcels near coal mine. These parcels have been dropped.	Yes
Stevens	Michael	58	Recreation, pristine environment, sensitive wildlife. Area needs more tourism infrastructure, not more oil and gas extraction	No
Bernholtz	Johnna	59	Water use for hydraulic fracturing, injection of poisonous chemicals, impacts to humans, animals, and food. Impacts of spills on Paonia Reservoir a huge risk for those who depend on clean water.	No
Wegner	Brian	60	Risky to human life and life in general. Paonia Reservoir is geologically unstable. Proximity to Paonia Dam and concern about induced seismicity. Issues related to existing coal mine [these parcels have been dropped]. Impacts on wineries, organic farming, agritourism, hunting, fishing, outdoor recreational activities, local economies. Concerned about rural gas gathering pipelines, climate change, cumulative impacts to airshed and watershed.	No
Hornaday	Heidi	61	Adverse impacts to Paonia Reservoir and downstream users, agriculture, recreation, wildlife, wilderness quality.	No
Miller	Edna	62	Impacts from hydraulic fracturing on human health and the environment, local livelihoods, local economies, air, water quality, soils, tourism, recreation, farming.	No
Wilk	Michelle	63	Farms and farmers' livelihoods, water contamination, sensitive wildlife, boom-and-bust cycles, protection of public lands.	No
Kassoff	Jason	64	Lives on a farm with clean air, water, and soil. The community here is diverse -- filled with artists, coal miners, farmers, engineers, ranchers, entrepreneurs, healers, many of whom would be forced to leave. Concerned about hydraulic fracturing "which will not work here."	No
Darlington	Kate	65	Impacts to open land and farmland, agritourism, outdoor recreation as economic drivers. Farmers depend on clean water, soil, air, and land. Impacts to local water supplies, irrigation water, induced seismicity from hydraulic fracturing, proximity to Paonia Dam. Impacts on livelihoods of farmers and others.	No
Brooks	Melissa	66	Opposed, with mention of boom-and-bust cycles and damage to local communities.	No
Niermann	Lisa	67	Hydraulic fracturing impacts on human health and the environment. Proposed methane capture from a coal mine [these parcels have been dropped]. Would threaten the lives and livelihoods of thousands of North Fork Valley residents dependent on the region's clean air, water, and soils. Instability around Paonia Reservoir. Resents that oil and gas developers are given priority over farmers.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Hellecksondept	Brent	68	Owns a vineyard. Concerns: Impacts to surface, impacts to groundwater, loss of property value and lifestyle, impacts to health, impacts to surface resources (vegetation, soils, snowpack, runoff). How will operators be held responsible for damage? Leasing should await completion of the new RMP.	No
Peterson	Ruth	69	Opposed, mentions degradation of the beauty of the area and undervaluing of the earth and its inhabitants?	No
Thacker	Brad	70	Concerns: Proximity to Paonia Reservoir, contamination of water, impacts organic farming, tourism, and impacts on the North Fork Valley watershed. Influx of new people. Pipeline infrastructure. Human health and safety. Fugitive methane emissions and contribute to climate change	No
Brett	Jim	71	Oil and gas development is incompatible with a healthy future for the spectacular North Fork Valley of western Colorado. Concerns: watersheds, organic farming, wildlands, streams, rivers, hunters, anglers, recreationists, tourists. Instability around Paonia Reservoir. Should await the new RMP. Impacts to public water supplies. Wildlife, including deer, elk, lynx yellow-billed cuckoo, bald eagle, "greenback" cutthroat trout.	No
Helleckson	Brent	72	Same issues and concerns as Comment #68.	No
Hart (Wilderness Workshop)	Peter	73	Letter (4 pages) with the following major points: 1) Recommend that BLM remove these lease parcels from the December 6, 2018 sale; 2) BLM must consider, a) authorizing methane capture activities through existing coal leases, or b) issuing separate leases under the Federal Land Policy and Management Act (FLPMA) section 302 for methane gas capture and sale; 3) BLM should decline to offer a new oil and gas lease for coal mine methane (CMM); 4) BLM should confirm that oil and gas leases are not the appropriate mechanisms for methane capture and sale, instead methane capture should be included in an amendment to existing coal leases; 5) BLM should limit the new leases to CMM capture between specified geologic depths; 6) Parcels 8389, 8390, and 8391 should be included in the December 2018 Lease Sale. Five exhibits were attached.	Yes
Slivka (The Wilderness Society et al.)	Juli	74	Letter (16 pages) with the following major points: 1) BLM must take a "hard look" prior to leasing, such as through an EA or EIS (not a DNA); 2) BLM must consider a range of alternatives such as alternative stipulations and some deferrals; 3) BLM must analyze climate impacts; 4) Prioritizing leasing is inconsistent with FLPMA's multiple-use mandate; 5) Development potential should inform leasing decision; 6) BLM must analyze and mitigate methane waste, including a) BLM has the legal obligation to require waste reduction and a mandate to reduce waste, and b) Colorado state regulations are not sufficient to meet the mandates of FLPMA and the MLA, therefore c) BLM must develop and include	Yes

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
			waste minimization stipulations; ; , nBLM's regulaton e9riodeferring shaould conlblm shge of alternatives, and addressing direct, indirect, and cumulative impacts; 24)nIESI0	
Delta County Board of County Commissioners)		75	Request stipulations for surface water and groundwater for municipal watersheds, public water supplies, and agriculture, protection of waterbodies and structures, wetland and riparian areas, air quality, and standards for public health. Support parcels near coalmines (8389, 8390, 8391) for coalmine methane capture [these have been dropped], parcels near existing leases (8135, 8138, 8140), and advise caution on parcels near Paonia Reservoir (8320, 8351) due to geologic instability, proximity to West Elk Scenic Byway, and watershed areas. Generally supports exploration and development of energy for local and state economies while protecting clean air, clean water, agriculture, tourism, recreation, and a safe and health community for future generations.	Yes
Bradley	Dana	77	Impacts to organic farming, soils very fragile. Calving for elk near Bowie and Somerset. Impacts of roadbuilding on soils, runoff, sediment transport to streams. Impacts to economically important tourism.	Yes
Burkley	Mike	78	Concerned about impacts to wilderness quality solitude, ruggedness, wildlife, and impacts to North Fork headwaters. Also about truck traffic and spills, impacts on water quality, issues of geologic stability, negative instead of positive economic benefits due to damage to organic farming and hunting/fishing. Would feel a sense of loss.	Yes
Johnson	Mick	79	Moved to area for clean air and water. Concerned about hydraulic fracturing. Impacts to wildlife, water, and scenic landscape.	Yes
Heuscher	Enno	80	Concerns; Paonia Reservoir, water quality impacts on organic farming, impacts on visual landscape, purple martins near the reservoir, ,	Yes
Heuscher	Pauline	81	Birdwatching, hiking, camping, photography, being connected to nature. Deer and elk. Opportunities for recreation to support mental and physical health. Concerned about purple martins, bald eagles, lynx, and impact of spills on water quality, organic farming. Impacts on tourism.	Yes
Johnson	Betsy	82	Moved to area for clean air, water, wildlife, now safety is threatened in her "backyard." Concerned about traffic and impacts to livestock herds, also spills, noise, violence. Impacts to eagles, ravens, swallows relying on clean water, and impacts from importation of oilfield workers. A loss for her children and grandchildren.	Yes
Meade	David	83	Uses the area for outdoor recreation. Concerned about impacts to irrigation water, visual ad physical nature of the landscape and public water sysems.	Yes

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Gunnison Co. Board of Co. Commissioners		84, 85 (also #91)	Letter: Specific comment topics: 1) the BLM has not identified the economic need for the lease sale, particularly if it includes coalbed methane as opposed to coalmine methane [the latter parcels have been dropped]; 2) the BLM should include compliance with Gunnison County regulations for oil and gas as mandatory lease terms; 3) the BLM should ensure that the lease sale complies with any future RMP adopted during the lease term; 4) the BLM should consider any potential impact to Paonia Reservoir, Muddy Creek, Deep Creek, and Henderson Creek; 5) the BLM should expressly identify and address potential wildlife impacts; 6) the BLM should take steps to minimize visible impacts and noise and light pollution; 7) the BLM should consider extending the comment period for the proposed sale. Provided separately were six PDF maps showing parcel locations in relation to specific resources of concern to the County. Five additional maps were provided in Comment #91.	Yes
Jursinovic	Mary	86	Impacts to Paonia Reservoir water quality and downstream watersheds, impacts of hydraulic fracturing and seismic activity, increased truck traffic, recreation. BLM should await completion of the new RMP.	Yes
Hart (Wilderness Workshop)	Peter	87	Same as exhibits as were noted for Comment #73.	Yes
Combined Colorado Comments		88	Letter from Gov. Hickenlooper: Concerns include greater sage-grouse, big game winter range and migration corridors (TL restrictions not adequate, recommends limit of one pad per 640 acres, recommends TL from June 1 to November 1 as well as December 1 to April 15), and deferral of parcels until Alternative B.1 is considered in the RMP being prepared. Supports coalmine methane capture [these parcels have been dropped].	Yes
Hart (Wilderness Workshop)	Peter	89	Duplicate of Comment #73.	Yes
Tisdel (Western Energy Law Center)	Kyle	90	Letter is 197 pages long, with 312 attachments. The major topics covered in the letter are: 1. <u>Overall objection to leasing, including</u>: a. RMP revision incomplete. b. NEPA for leasing fails to take a hard look at impacts from development. c. Reinitiate consultation with FWS over the PBO governing Fluid mineral development water depletions, due to change in anticipated water needs for construction, well drilling and completion. d. BLM must analyze and consult over the projects water depletion, pollution and contamination effects on the endangered fish. 2. <u>Believe an EIS is required to address</u>: a. Air Quality, Climate Change, Social Cost of Carbon, Social cost of Methane, Methane Emissions and Waste, and Quantify GHG emissions.	Yes

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
			b. Impacts to wildlife: elk, mule deer, moose, Canada lynx, yellow-billed cuckoo, bald eagle, purple martin, northern goshawk, Gunnison sage-grouse, native cutthroat trout, bluehead suckers. c. Impacts to surface and groundwater resources. Impacts of hydraulic fracturing on farmlands, wastewater disposal, traffic impacts, pipelines, seismic and human health, public water supplies. Require greater disclosure of HF chemicals. d. Analyze using best available information and science to protect federally listed species and their habitats. e. Analyze requiring use of best available methane emission reduction technologies f. Require a programmatic plan for assessing gas gathering pipeline impacts. 3. <u>Analyze all reasonable alternatives:</u> a. Consider leasing with phased development in mind. b. Manage for community and ecosystem resiliency. c. reduce impacts to special places, lands with wilderness character, and important historical resources. d. Lease with all parcels having NSO stipulation. e. Analyze an alternative applying BMPs. f. Analyze a phased development alternative. 4. <u>Choose the No Action alternative</u>.	
Gunnison Co. Board of County Commissioners		91	See Comment 84/85 above. This comment transmitted five additional PDF maps.	Yes
Zoller **(Conserv. Colo. Edu. Fund**	Lilly	92	"Petition" consisting of 3,129 identical one-page letters. Concerns: 1) should not lease until new RMP is done; 2) overlap of parcels with greater sage-grouse habitat [none in UFO parcels area].	Yes
Purves **(Trout Unlimited)**	Cathy	93	Letter (17 pages) with the following points relevant to UFO parcels: 1) Concerned about protection of Colorado River cutthroat trout; 2) Parcels 8320 and 8351 (near Paonia Reservoir) – the reservoir is important as a water supply and for recreation; 3) Parcels 8390 and 8391 [now dropped] – Terror Creek supports a core population of native cutthroat trout and flows to the North Fork Gunnison, potentially transporting sediments and contaminants, and potentially eroding and dewatering the stream. These parcels could also affect the water supplies and recreation along the river.	Yes
Clow	Jody Visconti	94	Water, air, soil, and wildlife. No more oil and gas until it can be done with no contamination.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Burkley	Mike	95	Duplicate of Comment #78.	Yes
Lindsey	Linda	96	Lived on a ranch outside Paonia, raise elk and alpacas. Concerned about hydraulic fracturing and wastewater injection, seismicity, risk to Paonia Dam – failure would cause mayhem. Geologically unstable area. Water impacts to ranches, organic farms, orchards.	No
Ortiz	Karen	97	The BLM should not issue the leases until it has done a thorough analysis as required by FLPMA and NEPA. Specific issues:1) should await completion of the new RMP; 2) public participation inadequate; 3) capture and resale of coalmine methane [these parcels have been dropped]; 4) impacts to other resources and uses including recreation, watershed, wildlife and fish, and scenic values; 5) potential contamination of Paonia Reservoir and irrigation water for economically important agriculture; geologic instability of Muddy Creek area.	Yes
Choszczyk	Ellen	98	Impacts to Paonia Reservoir as a water source for agriculture. Reservoir safety and contamination from hydraulic fracturing. Geologically unstable area. Impacts on traffic and roads. Organic farming, hunting and fishing, tourism. Quality of life in general.	No
Sorensen	Cindie	99	Impacts to agriculture water sources and local water supplies from hydraulic fracturing. Should delay leasing until the new RMP is completed. Conduct Native American Tribal Consultation before leasing. States that Parcel 8140 cannot be developed due to current spacing regulations.	No
Sabine	Naropa	100	Same issues and concerns as Comment #65.	No
Waltermire	Mark	101	Relies on water for irrigation and the Valley's reputation as a source of clean, healthful food grown with clean air, water, and soil. Also concerned about truck traffic, rural gathering lines, impacts to agri-tourism, and believes that the new RMP should be completed before any leasing.	Yes
Schachter	Sumner	102	Agricultural and water resources, tourism, outdoor recreation, and the peace and tranquility of the area.	No
Smith	Paige	103	Believes that the numerous no surface occupancy (NSO) stipulations to be applied to the leases indicates the quality and sensitivity of the area. Concerns include the thriving economy based on agriculture, incompatible with with oil and gas exploration and production, which is the antithesis of multiple use. Concerned that any parcels not leased will become available in two years.	No
McCoy (U.S. Environmental	Melissa	104	Comment focuses on air quality and water resources, with specific recommendations, summarized as follows:	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Protection Agency)			AIR: 1. The cumulative air quality analysis for the EA should include emissions from reasonable scenarios for development on the proposed lease sale parcels as well as from NFMMDP, BMU MDP, and 5 Pad EA (three recent or pending master development plans). 2. The BLM should work with the USFS to determine whether NOx emissions from future development on the proposed lease sale parcels, in addition to emissions from the NFMMDP, BMU and 5 Pad EA, should be kept under the NOx limit deemed appropriate for the BMU. The EPA is available to assist in that effort as needed. WATER RESOURCES: According to the National Hydrography Dataset and National Wetland Inventory data, there are intermittent streams and riverine wetlands on Parcels 8135 and 8391 [the latter has been dropped-; therefore, these lease parcels should be subject to Exhibits UFO-NSO-Hydrologic Features and UFO-CSU-Hydrologic Features.	
Kellogg	Viva	105	Same issues and concerns as Comment #65.	No
Wolcott	Steve	106	Geologic instability of Paonia Reservoir, landslide damage to pipelines and storage tanks, contaminating water. Seismic activity could damage roads and damage Paonia Dam with catastrophic results. Hydraulic fracturing and injection wells could exacerbate these risks, which farmers and other locals would have to bear.	No
Tschinkel	Christopher	107	Same issues and concerns as Comment #99.	No
Hart (Wilderness Workshop)	Peter	108	Consists of 93 individually signed form letters with minor exceptions. Issues and concerns expressed are as follows: 1) impacts on wildlife, rare and endangered plants, historic landmarks, public health, and the inviable climate that we all share; 2) the livelihood of Colorado residents is threatened; 3) the public comment period is too short to allow adequate public participation; 4) would result in emissions that would expedite climate change; 5) the risks of selling these pracels is too high – either cancel them outright or undertake a thorough environmental assessment with additional opportunities for public participation.	Yes
Citizens for a Healthy Community		CHC	Consists of 133 individually signed form letters, some of which include additional notes (presented below as "CHC-"). Issues and concerns in the form letter include the following: 1) the leases are incompatible with the community and economy of the North Fork Valley; 2) special concern about parcels around Paonia Reservoir and located above existing coal mines; 3) risks are too high and unacceptable; 4) BLM should adopt a no-leasing alterntive; 5) concerned about impacts to organic farming; wildlands, streams, rivers that attract hunters, anglers, recreationists; unstable geology; and unregulated gas gathering lines.	Yes
Eichelberger	Maeve	CHC-6	Concerned about impacts to local agriculture, public health, local economy and impact to highway infrastructure and stability.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
LeBounty	Shawn	CHC-9	The decisions that are made here are impactful for all times, beyond the scope of current administrations and perspectives. The health of this valley encompasses the land and the water, but also the reputation, and the draw for people to visit and live here. Please consider all aspects of our valley.	No
Straub	Mike	CHC-11	Consider impacts to water quality if contaminated and quantity necessary to sustain agriculture, air quality, and increased traffic.	No
Jursinovic	Mary	CHC-15	Consider impacts to property values, water quality if contaminated, air quality and defer sale until RMP is complete.	No
Schrieber	Joyce	CHC-16	Hydraulic fracturing. Concerned about using appropriate science to make determinations and the short timeframe by which to submit scoping comments. Concerns include analysis of seismic activity, air and water pollution, potential earthquakes, landslides, methane contamination.	No
Yates	Laura	CHC-17	Concerned about water quality and recreational impacts.	No
Jones	Lisa	CHC-19	Opposed to hydraulic fracturing. Concerned about impact from hydraulic fracturing on local economy and agricultural industry.	No
Wassell	Emily	CHC-24	Concerned about impacts to water, air, health, and local environment from hydraulic fracturing.	No
Lindsey-Wolcott	Ben	CHC-28	Opposed to hydraulic fracturing in the valley. Concerned about impact from hydraulic fracturing on local economy and agricultural industry.	No
Proteau	Zorba	CHC-29	Opposed to lease sale.	No
Goldberg	Dana	CHC-31	Concerned local wilderness and food is not being protected for future generations.	No
Riley	Michelle	CHC-32	Hydraulic fracturing Extractive industry incompatible with local environment and economy.	No
Munoz	Melissa	CHC-34	Opposed to hydraulic fracturing. Consider impacts to water quality if contaminated, air quality and defer sale until RMP is complete. Analyze the parcels in an EIS. Do not lease parcels over Bowie #2 coal mine.	No
Dean	Sue	CHC-36	Concerned about negative impacts of hydraulic fracturing to air quality, water quality, property values, global warming, recreational enjoyment. Safeguards must be employed in recognition of public health, no degradation to water or air quality and watershed.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
MacDonald	Clay	CHC-40	Opposed to hydraulic fracturing. Concerned about air and water pollution, transportation infrastructure degradation, social economics costs and limited financial return to local economy.	No
Doe	Phillip	CHC-45	Concerned about economics of hydraulic fracturing and cleanup costs the public must bare if industry folds.	No
Bishop	Sarah	CHC-46	Opposed to oil and gas extraction activities. Do not lease until 1989 RMP has been updated. Concerned about heavy truck traffic on Hwy 133 and highways integrity.	No
Rochardt	Laurie	CHC-47	Opposed to leasing. Concerned that hydraulic fracturing damages water, wildlife, induces seismicity, and degrade food production.	No
Livingston	David	CHC-53	Concerned that extractive industry is incompatible with local economy and the areas tourism draw.	No
Lewis	Sid	CHC-55	Concerned hydraulic fracturing related spills and accidents are going to happen and degrade the water quality and quality of life.	No
Thacker	Brad	CHC-57	Concerned that the extractive industry is incompatible with the local environment and economy.	No
Carpenter	Nicole	CHC-58	Concerned that water resources are at risk by hydraulic fracturing. Defer parcels.	No
Hunker	Read	CHC-59	Hydraulic fracturing	No
Swackhamer	Phyllis	CHC-60	Hydraulic fracturing Do not consider leasing until RMP Revision is complete.	No
Reily	Katie	CHC-61	Hydraulic fracturing Do not lease parcels using 1989 RMP decisions. Concerns about induced seismicity and leasing over Bowie Mine #2. Concerned about hydraulic fracturing waste management and limiting use of water for extractive purposes.	No
Shishim	Margaret	CHC-63	Hydraulic fracturing Extractive industry incompatible with local environment and economy.	No
Friar	Susan	CHC-68	Concerned about damage from extractive activity to water, soil, animals, and water quantity in the valley is a finite resource already taken up by humans, agriculture and wildlife.	No
Dean	Sue	CHC-69	Concerned about the impacts from hydraulic fracturing, noise, odors, air and water quality degradation, reuse of frac water, global warming contributions, socioeconomics.	No
Stopher	Dana	CHC-71	Opposed to extractive industry. Hydraulic fracturing threatens water quality relied upon in the local agriculture industry.	No
Davis	Philip	CHC-73	Opposed to lease sale.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Phillips	Benita	CHC-74	Concerned hydraulic fracturing water requirements of the industry would impact quantity needed by local agriculture and economy.	No
Dean	Sue	CHC-78	Concerned about protecting watershed and air and water quality.	No
Raleigh	chuck	CHC-80	Opposed to leasing.	No
Roberts	Josh	CHC-81	Concerned that development of leases jeopardizes water resource.	No
Lukesh	Jennifer	CHC-82	Opposed to leasing.	No
Bender	Thomas	CHC-83	Concerned hydraulic fracturing water requirements of the industry would impact quantity needed by local agriculture and economy.	No
Bender	Thomas	CHC-83	Opposed to leasing. Concerned that hydraulic fracturing damages water, dam structure damage, induces seismicity, and degrade food production.	No
Bender	Thomas	CHC-83	Concerned about geological implications and safety of leasing over coal mines for drilling. Implement a moratorium on leasing until safety of rural gas gathering lines are independently monitored and inspected. Analyze impacts to watershed, fish and wildlife, recreation, local economy, air quality, public health and geologic hazards.	No
Thompson	Greg	CHC-87	Hydraulic fracturing Extractive industry incompatible with local environment and economy.	No
York	Sandra	CHC-88	Opposed to hydraulic fracturing.	No
Pretorius	Christel	CHC-89	Hydraulic fracturing Extractive industry incompatible with local environment and economy. Concerned that spills or leaks from hydraulic fracturing will not be dealt with in a speedy and effective manner even if an accident.	No
Haines	Natalie	CHC-99	Concerned about water requirements of hydraulic fracturing – would impact quantity needed by local agriculture and economy.	No
Paigen	Joshua	CHC-100	Opposed to leasing.	No
young	Millicent	CHC-105	Concerned about concentration of activity traffic increasing and great fire risk of the area. Climate change considerations are necessary.	No
Thacker	Brad	CHC-109	Hydraulic fracturing Extractive industry incompatible with local environment and economy. Concerned that spills or leaks from hydraulic fracturing will contaminate Paonia Reservoir.	No
Phillips	Thomas	CHC-111	Opposed to hydraulic fracturing.	No
Brown	Deborah	CHC-113	Hydraulic fracturing Extractive industry incompatible with local environment and economy.	No

Last Name	*First Name*	*Comment*	*Issues and Concerns*	*Attachment?*
Dean	Katherine	CHC-114	Concerned about earthquakes.	No
Ziegler	Cynthia	CHC-115	Concerned about drilling above coalmines and potential negative impact to reservoirs watershed.	No
Goldstein	Elena	CHC-117	Opposed to hydraulic fracturing. Concerned about impacts to local agriculture, public health, local economy and impact to highway infrastructure, stability and induced seismicity.	No
George	Mary	CHC-118	Opposed to hydraulic fracturing.	No
Hottinger	Greg	CHC-119-120	Opposed to leasing.	No
Smith	Mary	CHC-121	Opposed to leasing.	No
Niermann	Erich	CHC-122	Concerned rights to clean water and air are in jeopardy from leasing and water quality at risk.	No
Ferrell	John	CHC-125-127	Extractive industry puts local agricultural industry and food security at risk. Concerned about induced seismicity to surrounding area and Paonia Dam and Reservoir. Concerned that rural gas gathering pipelines are unregulated and the potential for increased geologic hazard occurrences. Consider not leasing the parcels.	No
Coronor	Jim	CHC-126	Same as Comment CHC-126.	No
Whoolilurie	Moriah	CHC-128	Opposed to hydraulic fracturing.	No
Joss	Lisa	CHC-129	Opposed to leasing.	No
Levy	Leslie	CHC-130	Opposed to leasing. Would not want to see the beauty of the area destroyed.	No