

**United States Department of the Interior  
Bureau of Land Management**

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**Environmental Assessment  
for the September 2020 Competitive Oil & Gas Lease Sale**

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White River Field Office  
220 East Market Street  
Meeker, CO 81641

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# CHAPTER 1 - INTRODUCTION

## 1.1 IDENTIFYING INFORMATION

### 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.

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 require additional analysis in addition to what was 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 parcels are posted online for a 15-day public scoping period. BLM prepares an analysis consistent with the National Environmental Policy Act (NEPA), if existing analyses are not sufficient. Scoping comments received from the public are reviewed and incorporated into the NEPA document, as applicable.

After the field offices complete the draft parcel review and NEPA analysis, and make a leasing recommendation to the state office, a list of proposed lease parcels and associated stipulations is made available to the public through a Sale Notice, which is posted on the Colorado BLM website at:

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

Occasionally, 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 offered but not leased at the September 24, 2020 lease sale will remain available to be leased for a period of up to two 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 two years of an initial offering will no longer be available without undergoing a new competitive lease sale process again 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.

The September 2020 lease sale was scoped with two parcels comprising 240.00 acres within the White River Field Office (WRFO 120.00 acres) and Kremmling Field Office (KFO 120.00 acres), for 15 days from March 31 to April 14, 2020.

On October 16, 2019, a U.S. District Court enjoined BLM from implementing the 2019 BLM Greater Sage-grouse Plan Amendments (GRSG RMPA), and requiring BLM instead to implement the 2015 GRSG RMPA, including the 2015 amendments for Northwest Colorado. The proposed action for the September 2020 lease sale would conform with the 2015 GRSG RMPA. Refer to Attachments A and C for a list of parcels and land descriptions considered. Stipulations to protect other surface and subsurface resources would apply, as prescribed by the RMPs. These stipulations are described in Attachment D.

This Environmental Assessment (EA) documents the review of the parcels under the administration of the White River and Kremmling field offices. It serves to verify conformance with the approved land use plan and provides the rationale for the field office's recommendation to offer or to defer particular parcels from a lease sale.

## ***1.2 PROJECT LOCATION AND LEGAL DESCRIPTION***

Please see Attachments A, B, and C and parcel Maps in Attachment E.

## ***1.3 PURPOSE AND NEED***

The purpose of the action is to consider opportunities for private individuals or companies to explore and develop federal oil and gas resources on specific public or split-estate parcels through a competitive leasing process.

The need for the action is to respond to the expression of interest in lands for potential leasing, consistent with BLM's responsibility under the MLA, as amended, to promote the development of oil and gas on the public domain. Parcels may be identified for consideration 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.

### **1.3.1 Decision to be Made**

BLM will decide whether to lease all, some, or none of the parcels at the September 2020 lease sale. The BLM also will 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).

## **1.4 PUBLIC PARTICIPATION**

### **1.4.1 Scoping**

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

Internal scoping was conducted through meetings of an interdisciplinary (ID) team of resource specialists and discussion of the parcels. Internal scoping was initiated on March 9, 2020.

BLM's external scoping process gave the public an opportunity to comment on the initial Proposed Action of two parcels. BLM considered those comments and incorporated them in the EA as appropriate.

The BLM Colorado State office sent scoping letters to the following agencies: Colorado Department of Natural Resources; U.S. Bureau of Reclamation (Albuquerque Area Office, Albuquerque, NM, Upper Colorado Region, Salt Lake City, UT, Eastern Colorado Area Office, Loveland, CO, Great Plains Region, Billings MT, and Western Colorado Area Office, Grand Junction, CO); U.S. Forest Service, Rocky Mountain Region, Golden, CO; U.S. Fish and Wildlife Service, Mountain Prairie Region, Lakewood, CO; National Park Service, Regional Director, Denver, CO; Colorado Parks and Wildlife, Denver, CO; Colorado Department of Transportation, Golden, CO.

BLM also posted maps of the lease parcels and lists of their respective stipulations from the White River and Kremmling Resource Management Plans (RMPs) for a 15-day scoping period from March 31, 2020 to April 14, 2020. Stipulation summaries and GIS shapefiles were posted on the BLM Colorado State Office website:

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

BLM sent letters to surface owners whose land overlies federal minerals proposed for leasing. BLM also sent notification letters with parcel listings, a link to parcel maps, and (if requested) GIS shapefiles to representatives of selected federal, tribal, state, county, and local governments as well as three adjacent surface property owners. Chapter 4 of the EA lists the organizations receiving notification letters.

The WRFO and KFO sent consultation letters by certified mail to the Tribes shown in Table 1.4.1. No initial tribal concerns were identified within any of the proposed parcels. The BLM will reinstitute consultation should any parcel be leased and proposed for development in the future.

**Table 1.4.1 Tribal and SHPO Consultation Dates**

Field Office	Tribes Consulted	Date of Consult Initiation	Response Received	SHPO Consulted
WRFO	Ute Indian Tribe of the Uintah and Ouray Reservation, Southern Ute Indian Tribe, Ute Mountain Ute Tribe, and Eastern Shoshone Tribe	3/25/2020	Requests for Ongoing Consultation	3/19/2020
KFO	Same as above and Northern Arapaho Tribe	5/8/2020	Requests for Ongoing Consultation	5/8/2020

The BLM also sent informational letters to the State Historic Preservation Office (SHPO). The SHPO raised no concerns specific to any lease parcel proposed for sale in the WRFO and KFO. With the use of a lease notice designed to protect cultural resources on all lands associated with the proposed September 2020 lease sale, each field office proposed a finding of *no adverse effect* as defined in 36 CFR 800.5(b).

The BLM received 31,695 comment submissions during the public scoping period. Of these submissions, one was a unique comment from an individual, eight were from agencies, 30,861 comments were submitted by individuals as one kind of identical (form) letter and the other 825 were a different but identical form letter signed by individuals (see Attachment F for a synopsis of the scoping comments).

Issues identified during internal and external scoping that required analysis are listed in Table 1.4.3. Table 1.4.4 includes potential issues that were considered but did not require additional analysis and the rationale behind each determination. Based on a review of available information, the ID team determined that the following resource issues are not present in the project area and do not have the potential to be affected by any of the alternatives; these issues are therefore dismissed from this analysis:

- *Prime and Unique Farmlands (none designated in project area)*
- *Realty Authorizations and Land Tenure changes (none designated or under consideration in project area)*
- *Wild and Scenic Rivers (none designated in project area)*

### 1.4.2 Public Comment

BLM accepted public comment on this EA from May 13, 2020, to June 12, 2020. The BLM received a total of eleven comment submissions; six from organizations (The National Audubon Society (with 18 other organizations), Center for Biological Diversity and Western Watersheds Project, The National Wildlife Federation and Colorado Wildlife Federation, WildEarth Guardians and Center for Biological Diversity, Theodore Roosevelt Conservation Partnership and Grand Valley Audubon), two from Colorado agencies (Colorado Department of Public Health and Environment, Colorado Parks and Wildlife), and three from individuals. Public comments included general opposition to sale of the proposed parcels. Comments opposing the sale consisted of concern about overall impacts to human health and the environment, impacts to quality of life in

the area surrounding the parcels, and impacts to one or more specific parcels and associated or nearby surface landowners, air quality, climate change and GHG's, COVID-19 as it relates to public participation, hydraulic fracturing, NEPA, North Park region, water resources (quality), wildlife (big game migration corridors, general, Greater Sage-grouse), social cost of carbon and socioeconomics. BLM reviewed and responded to the public comments in Attachment F. No additional issues were identified.

### 1.4.3 Issues Identified and Analyzed in the EA:

The following issues are analyzed in this EA:

**Table 1.4.3 Issues Identified and Analyzed in the EA**

Issue	Issue Statement	Impact Indicator
1. Air Quality and GHGs/Climate Change	How would air quality (including air quality related values [AQRVs - visibility, nitrogen deposition, etc.]) and climate (GHG emissions) potentially be affected by leasing of oil and gas resources in the project area?	Contributions from new oil and gas above critical thresholds and cumulative impacts above thresholds / standards.
2. Big Game Migration Corridors and Winter Range	How would oil and gas leasing affect Big Game Migration Corridors and winter range in the proposed project area?	Potential avoidance or reduced use by big game of established migration corridors and winter range; potential population effects due to reduced habitat availability.
3. Social and Economic Conditions	How would oil and gas leasing affect the socioeconomic conditions where the leasing would take place?	Effects to public revenues, agricultural and tourism industries, and property values.
4. Greater Sage-grouse prioritization	How would Greater Sage-grouse be affected by oil and gas leasing?	Potential effects of not prioritizing leasing outside of priority and general Greater Sage-grouse habitat.

### 1.4.4 Potential Issues Considered but not Analyzed in Detail:

The RMP EISs for the RMPs (WRFO ROD/RMPA, 2015; KFO ROD/ARMPA, 2015; GRSG ROD/ARMPA, 2015) contained analyses of the reasonably foreseeable effects of oil and gas leasing and development in the planning areas. Those analyses addressed a number of the issues identified during scoping.

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 APDs for leased parcels. 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.



Based on a review of available information and existing analyses, the interdisciplinary team determined that the issues listed in Table 1.4.4 do not have the potential to be significantly impacted by any of the alternatives in ways not previously considered by BLM, and further analysis is not necessary to make a reasoned choice between alternatives. Therefore, the issues listed in Table 1.4.4 have been considered, but are dismissed from detailed analysis.

**Table 1.4.4 Issues Considered but not Analyzed in Detail**

Issue	Issue Statement	Rationale
Cultural Resources	How would Cultural Resources be affected by Oil & Gas leasing?	<p>The WRFO and KFO have determined that the September 2020 lease sale would have “no adverse effect” to cultural resources as defined in 36 CFR 800.5(b). Within the two parcels, previous overlapping inventories have not identified cultural resources, though a potential for unidentified historic properties within either parcel remains.</p> <p>There would be no new physical or visual impacts to the landscape as leasing itself does not involve ground disturbance. However, future activities related to lease exploration and development could have the potential to adversely affect properties protected under NHPA. In the event that a lease is sold, additional NEPA analysis would be completed prior to the BLM approving any surface-disturbing activity. The BLM would require Class III cultural resource inventories prior to specific development proposals, including the approval of APDs, and all lease parcels would be subject to statewide Exhibit CO-39 to protect cultural resources. The BLM’s standard cultural program procedure is to avoid all sites; operators would work with the BLM to attempt to redesign planned development to avoid any known historic properties by at least 328 feet (100 meters). In addition, the BLM could apply conditions of approval (COAs) to protect cultural resources, which may affect or limit oil and gas development. Through tribal consultation, such measures may include COAs to mitigate visual and audible impacts to sensitive cultural sites.</p> <p>The following stipulations and lease notices have been applied: All lands in both parcels have CO-39 to protect cultural resources. The KFO parcel also has KFO-NSO-16 and KFO-LN-5 to protect cultural resources.</p>
Cultural-Native American Religious Concerns	What effects would Oil & Gas leasing have on Native American Religious Concerns?	<p>Oil and gas operations can have the potential to adversely impact traditional cultural and religious properties located nearby. Any future undertaking with the potential to affect traditional cultural properties is subject to Section 106 of the National Historic Preservation Act. In addition, the BLM could apply conditions of approval (COAs) to protect such properties, which may affect or limit oil and gas</p>

Issue	Issue Statement	Rationale
		development. Through tribal consultation, such measures may include COAs to mitigate visual and audible impacts to sensitive traditional cultural properties.
Paleontological Resources	How would Paleontological Resources be affected by Oil & Gas leasing?	Stipulations or Lease Notices have been applied to each lease parcel to provide the mitigation deemed necessary to avoid or minimize environmental harm to fossil resources relative to each field office. COAs would be added during the APD review if the BLM determines that mitigation is necessary to avoid or minimize impacts to paleontological resources. Appropriate parcels have CO-29 to alert the lessee of a paleontological inventory requirement, WR-LN-12 and KFO-CSU-14 to protect the resource.
COVID-19 Pandemic	How has the pandemic affected the ability of the public to participate in the NEPA process?	<p>The scoping period was the first opportunity for the public to comment on the proposed September 2020 competitive oil and gas lease sale. The public had another opportunity to provide feedback through the 30-day comment period.</p> <p>The BLM evaluates public comment periods and lease sales on a case-by-case basis. BLM completed its public involvement requirement for this oil and gas lease sale through the use of ePlanning publication and electronic submission of comments. These methods comply with stay-at-home orders and allow public participation without having direct contact with others.</p>
Environmental Justice	Would leasing of federal mineral estate disproportionately adversely affect environmental justice populations?	A review of U.S. Census Bureau 2018 population estimates for race and Hispanic origin (U.S. Census Bureau 2019a) indicates that none of the counties with parcels under consideration for leasing meets the criteria of having a minority population that is five percentage points greater than the State of Colorado. Additionally, none of the counties had a percent of population in poverty that was five percentage points higher than for the State of Colorado (U.S. Census Bureau 2019b). The outreach and public involvement activities taken by the BLM for this effort, including the consultation of tribes, are described in section 1.4 Public Participation and Chapter 4 Coordination and Consultation.
Hazardous Materials	How would oil and gas potentially contribute to the release of hazardous materials into the environment? Specifically, introduction of Per – and polyfluoroalkyl (PFAS) and Technologically-enhanced naturally occurring radioactive Materials (TENORM) contaminants	Most of the exploration and production wastes that would be generated by the Proposed Action would be exempt from the Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste regulations (e.g., produced water, produced gas). However, the exemption would not mean that these wastes present no hazard to human health and the environment, nor would the exemption relieve the operator from corrective action to address releases of exempt wastes. Non-exempt wastes such as lubricants, fuels, caustics or acids, and other chemicals would be used during exploration and production activities.

Issue	Issue Statement	Rationale
		<p>Per- and polyfluoroalkyl (PFAS) are a group of man-made chemicals used in numerous industries. In oil and gas exploration and development they are typically found in aqueous film forming foam (AFFF) fire sprays, hydraulic oils used to prevent corrosion, and surfactants (compounds used to lower surface tension between two liquids), and PFAS can be used to increase production in oil reservoirs.</p> <p>Technologically enhanced naturally occurring radioactive material (TENORM) is also found in a number of waste streams (e.g. scap metal, sludge, slags) and include materials such as radon and radium. In oil and gas exploration and development these materials are typically found in specific areas where sludges and solids accumulate, mainly separators and tank bottoms. This equipment is surveyed for the presence of radioactivity and are disposed of in accordance with COGCC regulations at commercial disposal facilities. The other area that may contain elevated levels of TENORM includes produced water, which is usually disposed in accordance with Colorado’s Underground Injection regulations.</p> <p>See Water Quality Rationale below for a description of what the drilling plan would require.</p> <p>Other opportunities for these chemicals to be released into the environment would be during disposal of drill cuttings and other waste streams. This disposal is also part of the overall APD review process and all on-site disposal of drill cuttings must comply with COGCC Rule 9-10. Those materials not meeting the standards of the rule are hauled to appropriate commercial disposal facilities.</p> <p>EPA has delegated to the Colorado Department of Public Health and Environment (CDPHE) the authority to implement CERCLA and RCRA. The BLM would continue to require operators to comply with regulations regarding specific chemical use.</p>
Hydraulic Fracturing	How would oil and gas leasing extraction techniques, such as hydraulic fracturing, affect natural resources	<p>There would be no new physical or visual impacts to the landscape since leasing itself does not involve ground disturbance. However, future activities related to lease exploration, including hydraulic fracturing, and development could have the potential to affect some resources or resource uses.</p> <p>The BLM does not anticipate adverse impacts to surface or subsurface resources as a result of hydraulic fracturing, which has been used in thousands of wells</p>

Issue	Issue Statement	Rationale
		<p>in Colorado across several decades. This conclusion is based on the following:</p> <p>The process of hydraulic fracturing during well completions results in the inducement of microseismicity due to pressures generated that result in fracturing of the surrounding bedrock as a method to enhance recovery of hydrocarbons. However, these microseismic events are normally not detectable at the surface (except by geophysical instruments) or, if felt, are not at a magnitude to cause damage to structures or to trigger slope failure. With very few exceptions, the incidence of felt earthquakes is not related to hydraulic fracturing but to disposal of flowback fluids and produced water in deep disposal wells. Both Federal and private disposal wells in Colorado are regulated by the COGCC, under its delegated authority from the EPA, with regard to location, injection depth, injection pressure, injection rate, and total injected volume. The restrictions are specifically intended to avoid or minimize the risk of felt earthquakes, and of earthquake-related damage.</p> <p>Documented occurrences of contamination of water resources due to use of this technology are also rare, even at a national level. This very low incidence reflects the careful review of drilling and completion plans for proposed wells by both BLM and State petroleum engineers and advances in engineering protections that have accompanied use of this technology. These include isolating the well bore from all but the targeted hydrocarbon-bearing zones with cement and providing further isolation from freshwater or other usable aquifers with the use of additional surface casing around the well bore. Surface casing extends below the depth of any freshwater aquifers that could support a human use or connect to surface waters.</p> <p>Another factor minimizing the risk of impacts on surface waters is that the geologic region in which the parcels are located is characterized by targeted formations being thousands of feet below the ground surface and thousands of feet below the depth of freshwater aquifers and surface waters. In addition, the State requires the collection and analysis of groundwater baseline samples and subsequent multi-year monitoring samples from up to four domestic wells within a 0.5-mile radius of a proposed oil and gas well, multi-well pad, and dedicated disposal well. The State also requires operators to monitor the well's bradenhead pressure during hydraulic fracturing and to report promptly to the COGCC any significant</p>

Issue	Issue Statement	Rationale
		<p>pressure increase. Monitoring these pressures helps to indicate if hydraulic fracturing fluids have escaped the target formation.</p> <p>Regarding chemicals used in hydraulic fracturing, some of these are consumed during the process, and portions that return to the surface in flowback fluids and produced fluids are present at low concentrations. Once at the surface, a variety of operational and technological requirements by BLM and the State are designed to avoid or minimize the risk of exposure of these chemicals to human and environmental receptors while being stored, transported, or disposed.</p>
Market Conditions	Does the lowered market for oil and gas indicate BLM should not proceed with leasing?	Private industry business decisions regarding the acquisition and development of leases may be market-driven, but BLM does not control those decisions. BLM considers parcels for potential leasing in accordance with the MLA, implementing regulations at 43 C.F.R. Part 3100, and agency policy. Receipt of an Expression of Interest indicates some industry interest in oil and gas development of those lands.
Methane Waste (for GHG see Air Quality/climate analysis)	What are BLM's efforts to reduce methane waste for potential new oil and gas development that could occur on the parcels?	If oil and gas operations are proposed for any of the subject lease parcels, the BLM will complete a site-specific NEPA analysis of the proposal(s) utilizing the best available and most current data. That NEPA analysis would consider proposed development activities and project-specific methane waste impacts, as well as waste reduction through the application of general and site-specific conditions of approval. The Onshore Orders require drilling, completion, and production activities to be designed and conducted in a way that considers impacts to resources and resource uses. This site-specific NEPA analysis would guide the BLM's decision whether to approve the proposed oil and gas operations, and if so, under what permit conditions.
North Park Master Leasing Plan (MLP)	Will leasing for the September sale cause BLM to not meet objectives of the North Park MLP?	The Kremmling Field Office Resource Management Plan (2015) adopted the the North Park Master Leasing Plan. This plan closed approximately 14,000 acres of Federal mineral estate from exploration and development of oil and gas. The remaining 376,600 acres of the MLP federal minerals are open to oil and gas leasing and development. When the KFO-RMP was approved in 2015 there were approximately 126,200 acres, roughly 33.5 percent of the MLPs leaseable acres, of authorized Federal oil and gas leases. As of February 2020, 78,160 acres (20.8 percent) acres of federal mineral estate are leased within the North Park MLP. BLM would apply resource-specific leasing stipulations to each future lease within this remaining area. None of the

Issue	Issue Statement	Rationale
		identified lease parcels occur within those areas designated as closed to fluid mineral leasing
Oil and Gas leasing under IM-2018-034	How has the leasing schedule in IM-2018-034 affected BLMs ability to conduct NEPA review?	BLM is completing a thorough review of the proposed lease sale in compliance with NEPA. The NEPA process included a 15-day scoping period and a 30-day public comment period, and BLM will provide a 30-day protest period for the lease sale. The ID team reviews scoping and public comment issues and incorporates them in the EA as needed.
Recreation	How would oil and gas leasing affect recreation?	The alternatives considered in the RMP-EISs, and selected as the approved RMPs, reflect the multiple use policies set forth in FLPMA. BLM has implemented those policies by evaluating the lands proposed for leasing, confirming that they are open for leasing under the RMPs, and applying stipulations consistent with the RMPs to protect known resources. It is unknown when, where, how, or if future surface disturbing activities associated with oil and gas exploration and development such as well sites, roads, facilities, and associated infrastructure would be proposed. It is also not known how many wells, if any, would be drilled and/or completed, the types of technologies and equipment would be used and the types of infrastructure needed for production of oil and gas. At the APD stage, the full range of impacts to recreation can be evaluated and mitigated.
Visual Resources	How would oil and gas leasing affect the visual landscape?	The proposed lease parcels lie in lands managed with VRM Class III, and IV objectives, and private surface, which allow for varying levels of development. Impacts to visual resources associated with development would be analyzed in subsequent NEPA documents with site-specific design features. The following stipulations have been applied to parcels in the sale: KFO-CSU-15 Oil and gas development and operations, and post-operation rehabilitation, KFO-CSU-17, Restrict the siting of oil and gas development and operations from all locations.
Water resources and public drinking water sources	How would the leasing and subsequent future development of oil and natural gas resources affect groundwater and surface water quality, and water consumption?	<p>Impacts to water resources could result from the surface disturbance associated with the construction of roads, pipelines, well pads, and power lines. There is also the potential for chemicals, produced water, oil, or other fluids that could be accidentally spilled or leaked during the development, production, storage, disposal, and transportation.</p> <p>Potential impacts to surface water from sediment transport are typically addressed through the Stormwater Management Plan (SWMP) the operator is required to develop. The SWMP identifies BMPs that would be implemented to control/slow down runoff and capture sediment.</p>

Issue	Issue Statement	Rationale
		<p>Onshore Oil and Gas Order No.1 requires that an APD package include a Surface Use Plan that contains a reclamation plan that addresses both interim and final reclamation. COGCC rule 1002.f. Stormwater management requires oil and gas operators to implement Best Management Practices (BMPs) at all oil and gas locations to control stormwater runoff in a manner that minimizes erosion, transport of sediment offsite, and site degradation. Rule 1002.f also requires a Spill Prevention, Control, and Countermeasure plan that addresses the transport of chemicals and materials, including loading and unloading operations; vehicle/equipment fueling; outdoor storage activities, including those for chemicals and additives; produced water and drilling fluids storage; erosion and vehicle tracking from well pads, road surfaces, and pipelines; waste disposal practices; leaks and spills. COGCC requires spill response procedures for responding to and cleaning up spills along with having the necessary equipment for spill cleanup readily available to personnel.</p> <p>The BLM’s NTL-3A requires the reporting of spills of oil, saltwater, and toxic liquids, or any combination thereof, that result in the discharge of 10 or more barrels of liquid. The COGCC Rule 906 require operators to immediately upon discovery control and contain all spills/releases of exploration and production waste or produced fluids. Any spill greater than one barrel is required to be reported through COGCC’s electronic spill reporting system. Every spill is tracked from the first report of the incident until the final cleanup meets applicable, published standards and has been approved by COGCC. All reports related to the spill are publicly available through the COGCC website and operators are subject to an enforcement action if a spill results from a violation, or a Commission rule, permit, or order, or if they fail to report or remediate a spill. COGCC requires operators to fully investigate and clean up all environmental impacts resulting from a spill, regardless of the size, as soon as practicable.</p> <p>Site specific review would occur during the APD approval process that includes a review of the drilling and surface use plan of operations. The drilling plan would be verified by the BLM petroleum engineer to ensure the well bore design meets the casing and cementing requirements of Onshore Orders No.1 and No.2 for the protection and/or isolation of all usable water zones, lost circulation zones (including faults), abnormally pressured zones. Wells would be cased with multiple layers of steel and cement to isolate</p>

Issue	Issue Statement	Rationale
		<p>freshwater aquifers from the hydrocarbon zone. The steel casing and surrounding layers of cement protect the drinking water aquifers that the wellbore penetrates. Surface casing is required to extend below the base of the deepest freshwater aquifer to seal it off from possible migration of fluids associated with oil and gas development. A production casing is set to provide an added layer of separation between the oil or natural gas stream and freshwater aquifer. BLM technicians are onsite during the setting of surface casing to verify cementing operations on wells in a well field that have potential for loss circulation or in areas of exploratory drilling. A well survey called a cement bond log is performed to ensure the cement is properly sealed around the casing. Prior to hydraulic fracturing, the casing would be pressure tested with fluid to the maximum pressure that would be applied to the casing.</p> <p>The operator must also submit a drilling permit to the COGCC which is reviewed by the professional engineering staff at the. BLM requires operators to comply with the following COGCC Rules that would protect groundwater resources:</p> <ul style="list-style-type: none"> <li>• Rule 317.e “...Ground water bearing zones penetrated during drilling must be protected from the infiltration of hydrocarbons or water from other formations penetrated by the well.”</li> <li>• Rule 317.f requires “sufficient surface casing shall be run to reach a depth below all known or reasonably estimated utilizable domestic freshwater levels.”</li> <li>• Rules 317.g and 317.h set forth specific cementing requirements.</li> <li>• Rule 317.j requires production casing to be “adequately pressure tested for conditions anticipated to be encountered during completion and production operations.”</li> </ul> <p>COGCC Rule 609 requires oil and gas operators to sample water sources within ½ mile of a proposed well within 12 months prior to setting conductor pipe and subsequent samplings between 6 and 12 months and between 60 and 72 months following the completion of the well. The operator is required to immediately notify the COGCC if:</p> <ul style="list-style-type: none"> <li>• The test results indicated thermogenic or a mixture of thermogenic and biogenic gas;</li> <li>• The methane concentration increases by more than 5.0 mg/l between sampling periods; and</li> </ul>



Issue	Issue Statement	Rationale
		<ul style="list-style-type: none"> <li>• The methane concentration is detected at or above 10 mg/l BTEX compounds or TPH are detected.</li> </ul> <p>The following COGCC 1100 series rule flowline regulations would reduce the potential of impacts from oil and gas flow lines to water resources:</p> <ul style="list-style-type: none"> <li>• New crude transfer lines built must be inspected by a third-party inspector before being placed into service.</li> <li>• Operators must maintain flow lines; fix them when leaks are discovered, and all that are not actively in use must have isolation valves locked and tagged out.</li> <li>• All lines must undergo integrity testing before being placed into service; new lines must adhere to steel weld industry standards.</li> <li>• Perform annual maintenance of isolation valves.</li> <li>• Isolation valves must be installed on all new flowlines or crude transfer lines, at each point of transfer along the line: the suction end of a pump station, where they meet a breakout tank; at each point where such a line crosses a public water supply or reservoir storing water for human consumption.</li> <li>• All existing flowlines and crude oil transfer lines must be retrofitted with isolation valves at various locations along the line, identified above</li> <li>• Annual pressure testing of lines, or smart pigging every three years.</li> </ul> <p>In addition, Rule 341 requires operators to monitor the well's bradenhead pressure during hydraulic fracturing and to report promptly to the COGCC any significant pressure increase. Monitoring these pressures helps to indicate if hydraulic fracturing fluids have escaped the target formation. These measures would minimize potential impacts to groundwater resources.</p> <p>COGCC's Rule 317 requires the operator to perform an anti-collision scan of existing offset wells that have the potential of being within close proximity of the proposed wells prior to drilling operations. The well would only be drilled if the anti-collision scan results indicate that there is not a risk for collision, or harm to people or the environment. The Rule also includes a fracture stimulation setback for treated intervals of the wellbore.</p> <p>Water used for oil and gas operations would come from existing water rights or an unappropriated source; water use is administered by the State of Colorado. Water depletions attributable to oil and gas</p>

Issue	Issue Statement	Rationale
		<p>development can contribute cumulatively to the deterioration of critical habitat for the endangered Colorado River fishes and animals, but these effects have been evaluated by FWS and continue to be appropriately mitigated by BLM through programmatic consultation and ongoing oversight with the FWS. At the project level, the BLM analyzes the detailed project and resource information to ensure that appropriate protections are put in place and enforced, including those related to water usage. The APD requires the operator to submit a Surface Use Plan of Operations which includes the source type and estimated volume of water used. Produced water can be recycled and used in well completion operations.</p>
Wildlife- Big Game/CPW Stipulations	Would leasing of federal mineral estate affect high priority big game habitats?	<p>Timing limitations have been applied to parcels within big game winter range and concentration areas, severe winter habitat, and production areas for the protection of big game habitats, as well as CSUs and LNs for high value wildlife habitats and priority sagebrush habitats.</p> <p>The BLM recently developed LN CO-57 to alert potential lessees or their designated operator they will be required to work with the BLM and coordinate with CPW to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor and big game winter range functionality.</p> <p>The BLM coordinates with CPW to create master development plans and wildlife mitigation plans as operators develop oil and gas fields. When APDs are submitted, the BLM will cooperate with CPW to determine the need for additional mitigation, COAs, and design features.</p>
Wildlife-Greater Sage-grouse (GRSG)	How would oil and gas leasing comply with the 2015 GRSG RMPA?	<p>No parcels that would be administratively closed to leasing under the 2015 GRSG ARMPA have been included in the proposed sale. Functional sage-grouse habitat encompassed by the proposed leases would be subject to habitat-specific management direction and stipulations as addressed and authorized through the Northwest Colorado Greater Sage-grouse Approved RMPA (2015). Specific to these proposed leases, applicable stipulations and lease notices would include the following:</p> <ul style="list-style-type: none"> <li>• Exhibit GRSG NSO-46e(1) stipulation to leases in PHMA. No Surface Occupancy in PHMA.</li> </ul>

Issue	Issue Statement	Rationale
		<ul style="list-style-type: none"> <li>• Exhibit GRSG TL-46e within 4 miles of active leks during lekking, nesting, and early brood-rearing (March 1 to July15)</li> <li>• GRSG LN-46e applied to all PHMA</li> <li>• KFO-LN-4 to protect important sage-grouse habitat.</li> </ul> <p>The ARMPA identifies and incorporates appropriate measures to conserve, enhance, and restore GRSG habitat in the context of BLM’s multiple use and sustained yield mission under FLPMA. Consistent with Management Decision MR-1 (page 2-14 of ARMPA) under the proposed alternative, no new leases would be issued for lands within 1 mile of active leks. BLM’s decision to not lease fluid minerals within 1 mile of active leks virtually eliminates the potential for physically altering lek site character or impairing associated loafing habitat and provides a degree of lateral separation between active leks and potential development activity that would substantially moderate stimuli that appear to adversely affect lek attendance and persistence (e.g., noise, human and equipment activity, elevated structures) (see <i>Impacts from Fluid Minerals Management on GRSG</i>, pages 4-89 to 4-97 in ARMPA).</p>
Wildlife-Greater Sage-grouse (GRSG) – CPW requirements	How would the leasing and subsequent future development of oil and gas resources affect GRSG habitat according to CPW guidelines?	<p>CPW has confirmed to BLM in their scoping letter for the September 2020 sale that GRSG stipulations are being correctly applied.</p> <p>Stipulations from the 2015 GRSG ARMPA have been applied (see previous response), and in KFO the following lease notice has been applied:</p> <ul style="list-style-type: none"> <li>• KFO-LN-4 to protect important sage-grouse habitat.</li> </ul> <p>If a lease were granted, the BLM would further evaluate project level proposals (APDs) and include any COAs deemed necessary to meet the goals and objectives of the governing RMPs.</p>
Wildlife-Federally Listed, Proposed, or Candidate Animal Species	How would oil and gas leasing affect Federally Listed, Proposed, or Candidate Animal Species?	<p>BLM consulted with FWS regarding listed species during preparation of the RMPs. The stipulations attached to the proposed leases are consistent with management described in the respective RMPs and amendments. BLM also would apply conservation measures developed through the RMP Section 7 consultation process to any future development of the leases.</p> <p>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. Currently, BLM has no further information about potential effects of future development on listed</p>

Issue	Issue Statement	Rationale
		<p>species. In the future, BLM may receive APDs for leased parcels. BLM would conduct additional site-specific NEPA analysis before deciding whether to approve an APD, and what COAs should apply. At that time, when it has additional information about proposed development, BLM would conduct section 7 consultation, if needed.</p> <p>All Federally Listed, Proposed, or Candidate Animal Species - The following stipulations and lease notices would be applied to areas as needed to protect Threatened and Endangered Terrestrial Wildlife:</p> <ul style="list-style-type: none"> <li>• All federal leases in Colorado: CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.</li> <li>• In WRFO: WR-LN-09 to maintain the occupancy, integrity, and extent of white-tailed prairie dog habitat in support of a reintroduced population of federally endangered black-footed ferret and to minimize the risk of adverse impacts imposed on black-footed ferrets or their habitat.</li> <li>• In KFO: KFO-LN-1 to protect Endangered Species.</li> </ul>

**CHAPTER 2 - ALTERNATIVES**

**2.1 INTRODUCTION**

This chapter describes the alternatives analyzed in detail. Alternatives considered but not analyzed in detail are also discussed.

**2.2 ALTERNATIVES ANALYZED IN DETAIL**

**2.2.1 No Action Alternative**

Under the No Action Alternative, BLM would defer both lease parcels within the WRFO and KFO from the September 2020 lease sale. The deferred parcels could be considered for inclusion in future lease sales. Surface management would remain the same and ongoing oil and gas development would continue on surrounding private, state, and federal leases.

**2.2.2 Proposed Action**

Under this alternative, two parcels totaling 240.00 acres in the WRFO/KFO would be offered in the proposed sale. The leasing of these parcels would conform with the WRFO ROD/RMPA, 2015; KFO ROD/ARMPA, 2015 and GRSG ROD/ARMPA, 2015. The parcels are in Jackson

(120.00 acres) and Rio Blanco County (120.00). The lands are all on private surface (See Attachment C). The lands have been grouped into appropriate parcels for competitive sale as oil and gas leases in accordance with the 43 CFR 3100 regulations. The leases would include the standard lease terms and conditions for development of the surface of oil and gas leases provided in 43 CFR 3100. Stipulations to protect other surface and subsurface resources would apply, as prescribed by the RMPs. These stipulations are described in Attachment D.

### **2.2.3 Preferred Alternative**

Under the preferred alternative, BLM would defer the 120.00 acre parcel in KFO (8560) located in Jackson County. The remaining parcel (8559) is located in the WRFO in Rio Blanco County. Total private surface acres that would be offered would be 120.00 private surface acres. Attachment B lists the parcel that would be deferred from the lease sale under the preferred alternative. Attachment C lists the parcel that would be offered for lease under the preferred alternative with applied stipulations. Attachment D contains descriptions of the applicable stipulations, and Attachment E contains a map of the parcels.

Based on the 2015 GRSG ARMPA, the BLM considered the priority of leasing for both parcels as it relates to GRSG habitat and prior oil and gas leasing and development.

Parcel 8559 does not contain GRSG GHMA or PHMA acres; therefore, this parcel is of high priority to lease as it relates to minimizing impacts to GRSG. The BLM completed a more in-depth review for parcel 8560. This parcel was identified in an expression of interest (EOI) for leasing consideration in December 2019.

From March 2012 until September 2015, BLM Colorado offered 925 parcels, all outside of GRSG habitat, in its lease sales, and issued 763 leases. From the signing of the GRSG ARMPA in 2015 to June 2020, BLM Colorado offered 521 parcels throughout the state and issued 473 leases. In the Northwest District (NWD), BLM offered 224 parcels and issued 210 leases. Of the leases issued in the NWD, 162 are outside of GRSG habitat, 14 contain GHMA and no PHMA, 20 contain PHMA and no GHMA, and 14 have portions of lands in both GHMA and PHMA. Lands containing PHMA and GHMA would be subject to stipulations for protection of GRSG habitat. BLM Colorado continues to prioritize leasing outside of GRSG habitat.

For GRSG considerations, the BLM determined that Parcel 8560 is 100 percent (120 acres) within PHMA and is within one to two miles of a lek and less than one mile to a historic lek. This parcel is within management zone (MZ) 11, and Colorado Parks and Wildlife (CPW) has determined that the population of that zone is decreasing, but not at an alarming rate. The CPW did not identify any concerns with this parcel during the BLM's scoping and comment periods for this sale.

For development considerations, the BLM determined that the parcel is not adjacent to producing leases and the federal minerals adjacent to the parcel are unleased (see Attachment E). The nearest active oil and gas location is approximately 1.2 miles to the East. The parcel is not within a federal oil and gas agreement and the BLM does not have any drainage concerns with the parcel. The parcel is in an area with high oil and gas development potential.

Overall, parcel 8560 has multiple resource considerations that would place this parcel lower on the priority list, and no significant development considerations that would place this parcel higher on the priority for leasing. In addition, BLM has no information indicating that it was identified by an entity developing oil and gas in the surrounding area. Therefore, this parcel is a low priority for leasing in the September 2020 Oil and Gas Lease Sale and would be deferred from the September 2020 lease sale under this alternative.

Please see Issue 4 for discussion of the impacts to Greater sage-grouse habitat under the various alternatives. and refer to maps in Attachment E. Deferral of parcels allows BLM to address situations in which legitimate questions or controversy has arisen over the leasability of a parcel. Deferral does not preclude a parcel from potential future leasing but indicates that further analysis or coordination is needed before possible inclusion in a future lease sale.

### ***2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL***

#### ***Lease all parcels with an NSO stipulation***

An alternative was considered that would offer all the parcels with a no surface occupancy (NSO) stipulation. This alternative was not carried forward for detailed analysis because it is not supported by the current RMPs. It constrains oil and gas occupancy in areas where the RMPs have determined that less restrictive stipulations would adequately mitigate the anticipated impacts to resources.

#### ***Cancel or halt lease sale***

This EA considers a no action alternative, which would have the same impacts as cancelling the lease sale.

#### ***Defer additional parcels recommended by the public or add additional stipulations***

Public scoping comments requested that additional parcels be deferred for leasing due to concerns about air quality and climate, wildlife/big game, Greater sage-grouse, recreational/hunting values, and water quality of surface and ground water as well as public water supplies. Attachment F contains a summary of public comments (and scoping comments) and the BLM's responses to public comments on a preliminary version of this EA. In some cases, the identified resources are not known to be present in those areas (i.e., based upon local knowledge, professional judgment, and/or species maps produced by CPW) or are adequately protected by existing lease stipulations.

Some public comments recommended deferral of entire parcels if a part of the parcel contained any resources of special concern. This alternative was not carried forward into detailed analysis because it is not supported by the RMPs; the RMPs do not direct BLM to defer a portion of a parcel without resource concerns, due to resource concerns present in other portions of the same parcel. Parcels were evaluated on a case-by-case basis and where stipulations could be applied to address resource concerns in conformance with the RMPs, the parcels (or portions of parcels) were considered for leasing with those stipulations.

The no action and proposed and preferred alternatives describe an appropriate range of alternatives for analysis. BLM can choose any combination of those alternatives (including deferral of

additional parcels or portions of parcels) in the final leasing decision. BLM therefore has determined that a separate alternative with additional deferrals is not warranted.

No other alternatives to the proposed action were identified that would meet the purpose and need of the proposed action.

## **2.4 PLAN CONFORMANCE REVIEW**

The proposed action was reviewed for conformance (43 CFR 1610.5-3) with the following plans;

1. Name of Plan: *White River Field Office Record of Decision and Approved Resource Management Plan (RMP) Amendment for Oil and Gas Development (WRFO RMPA)*

Date Approved: August 2015

Decision Language: The 2015 WRFO RMP designated approximately 2.2 million acres of federal mineral estate open for continued oil and gas development and leasing, including the WRFO lands included in the action alternatives. The RMP (with associated amendments) also describes specific stipulations that would be attached to new leases offered in certain areas. Under the proposed action, parcels to be offered would be leased subject to stipulations prescribed by the RMP. Therefore, the proposed action conforms to the fluid mineral leasing decisions in the RMP and amendments and is consistent with the RMP's goals and objectives for natural and cultural resources.

2. Name of Plan: *Kremmling Record of Decision and Approved Resource Management Plan (RMP) (KFO RMP)*

Date Approved: June 2015

Decision Language: The 2015 KFO RMP designated approximately 653,500 acres of federal mineral estate open for continued oil and gas development and leasing, including the KFO lands included in the proposed action. The RMP (with associated amendments) also describes specific stipulations that would be attached to new leases offered in certain areas. Under the proposed action, parcels to be offered would be leased subject to stipulations prescribed by the RMP. Therefore, the proposed action conforms to the fluid mineral leasing decisions in the RMP and subsequent amendments and is consistent with the RMP's goals and objectives for natural and cultural resources.

3. Name of Plan: *Northwest Colorado Greater Sage-Grouse Approved Resource Management Plan Amendment (Approved RMPA); and the Colorado State Office Categorical Exclusion for Greater Sage-grouse Habitat Boundary Adjustments (plan maintenance action, November 2019).*

Date Approved: September 2015

Decision Language: Objective MR-1: Manage fluid minerals to avoid, minimize and compensate for: 1) direct disturbance, displacement or mortality of Greater sage-grouse

(GRSG); 2) direct loss of habitat or loss of effective habitat through fragmentation; and 3) cumulative landscape-level impacts. Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA and GHMA (Priority and General Habitat Management Areas). When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMA and GHMA, and subject to applicable stipulations for the conservation of GRSG, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG. The implementation of these priorities will be subject to valid existing rights and any applicable law or regulation, including, but not limited to, 30 USC 226(p) and 43 CFR, Part 3162.3-I (h).

**MD MR-1:** No new leasing 1 mile from active leks in ADH (All Designated Habitats).

**MD MR-2:** No surface occupancy (NSO) without waiver or modification in PHMA.

**MD MR-3:** In GHMA, any new leases would include TL (Timing Limitations) to protect GRSG and its habitat.

**GRSG TL-46e:** No activity associated with construction, drilling or completions within 4 miles from active leks during lekking, nesting and early brood-rearing (March 1 –July 15). Authorized Officer could grant an exception, modification or waiver in consultation with the State of Colorado.

**MD MR-4:** No surface occupancy (NSO) within 2 miles of active leks in GHMA.

**MD MR-5:** Disturbance on new leases would be limited to 3% in PHMA (biologically significant unit) and would be limited to 1 disturbance per 640 acres calculated by Colorado MZ.

**MD MR-6:** No new leasing in PHMA if disturbance cap exceeds 3 percent calculated by biologically significant unit (Colorado populations) and proposed project analysis area (Colorado MZ) or 1 disturbance per 640 acres density is exceeded.

**GRSG LN-46e:** Any lands leased in PHMA are subject to the restrictions of 1 disturbance per 640 acres calculated by biologically significant units (Colorado populations) and proposed project analysis area (Colorado Management Zone) to allow clustered development.

The RMP EISs contain the BLM's responses to public comments on those documents, and can be accessed at the following Internet addresses:

EIS for the WRFO Oil and Gas ARMPA: [https://eplanning.blm.gov/epl-front-office/projects/lup/65266/79043/91308/2015\\_Oil\\_and\\_Gas\\_Development\\_RMPA\\_ROD.pdf](https://eplanning.blm.gov/epl-front-office/projects/lup/65266/79043/91308/2015_Oil_and_Gas_Development_RMPA_ROD.pdf)



EIS for the KFO RMP: [https://eplanning.blm.gov/epl-front-office/projects/lup/68543/89344/106850/KFO-ARMP-ROD-FINAL\\_Approved-20150618\\_508Compliant.pdf](https://eplanning.blm.gov/epl-front-office/projects/lup/68543/89344/106850/KFO-ARMP-ROD-FINAL_Approved-20150618_508Compliant.pdf)

EIS for the GRSR ARMPA: [https://eplanning.blm.gov/epl-front-office/projects/lup/105596/163463/199455/2015\\_Northwest\\_Colorado\\_GRSR\\_Proposed\\_RMPA-Final\\_EIS\\_508.pdf](https://eplanning.blm.gov/epl-front-office/projects/lup/105596/163463/199455/2015_Northwest_Colorado_GRSR_Proposed_RMPA-Final_EIS_508.pdf)

## **CHAPTER 3 – AFFECTED ENVIRONMENT AND EFFECTS**

### ***3.1 INTRODUCTION***

The 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 where 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 alternatives. Under the No Action Alternative, the two parcels totaling 240.00 acres would not be leased. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. The No Action Alternative would result in the continuation of the current land and resource uses in the proposed lease areas.

BLM assumes that the No Action Alternative (no lease option) may result in less oil and gas production than under the Proposed Alternative. However, oil and gas production and 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. Therefore, it is uncertain if, and to what extent, the No Action Alternative may affect overall domestic oil and gas production. Section 3.4.1 contains additional consideration of impacts associated with the no-action alternative.

### ***3.3 PAST, PRESENT, AND REASONABLY FORESEEABLE 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 subject 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 RMP EISs provide BLM’s analysis of cumulative effects of oil and gas development based on the reasonable, foreseeable oil and gas development (RFD) scenario. This analysis is hereby incorporated by reference and is available at the respective field offices:

*WRFO: Reasonable Foreseeable Development Scenario for Oil and Gas Activities in the BLM White River Field Office: Rio Blanco, Moffat and Garfield Counties, Colorado, September 10, 2007.*

*KFO: Reasonably Foreseeable Development 2008-2027 Oil and Gas Activities in the Kremmling Field Office Jackson, Larimer, Grand and Summit Counties, Colorado, October 2009.*

The cumulative impacts analysis in the EISs accounted for the potential impacts of development of lease parcels in the planning areas as well as past, present and reasonably foreseeable actions known at that time. The analysis in this EA expands upon the EIS analyses by incorporating new information.

The area of influence encompasses lands within the field office resource boundary. The activities listed in table 3.3.1 have been considered in the cumulative impacts analysis of each alternative:

**Table 3.3.1 Cumulative Impacts Analysis Table**

Issue	Geographic/ Temporal Scope	Past Actions	Present Actions	Reasonably Foreseeable Actions
1. Air Quality	Green, White River, Yampa, Middle Colorado, Upper Colorado and North Park Airsheds (CDPHE - APCD defined) that include Regional Class I and Sensitive Class II areas	Past oil and gas development and other emissions sources activities within the airsheds that define CARMMS 2.0 2015 baseline emissions inventory and monitored air quality conditions (including past trends); the 5 years of oil and gas development used to define CARMMS 2.0 “low” oil and gas development scenario.	Current / active emissions sources within the airsheds; new Federal and non-Federal oil and gas projects that began since baseline year 2015, and all other currently operating emissions sources in the Region. Counts for new oil and gas development since baseline year 2015 are provided in Table 3.2 below.	CARMMS 2.0 future oil and gas (and other emissions inventory sectors activities) projections for areas within the airsheds years 2016 through 2025; note that the CARMMS 2.0 analyzes two foreseeable future oil and gas development scenarios including RFD and new oil and gas development continuing at historical rates (uses the 5 years of development data prior to baseline year 2015).

1a. Climate Change	U.S. / World	At the World and U.S. scale, past emissions source activities (including oil and gas) that define Intergovernmental Panel on Climate Change (IPCC) baseline emissions inventories and historical GHG concentrations trends.	Current GHG emissions source developments / activity (World / U.S. scale) that have begun since IPCC Fifth Assessment Study baseline inventory development.	IPCC future projected GHG emissions pathways through year 2100. U.S. Energy Information Administration (EIA) years 2020 and 2030 projections for U.S. and Colorado energy (natural gas, oil, coal, etc.) production and consumption.
2. Big Game Migration Corridors/Winter Range	Jackson and Rio Blanco Counties	Past oil and gas development within the field offices.	Current oil and gas development within the field offices	Future oil and gas development within the field offices
3. Socioeconomic	Jackson and Rio Blanco Counties	Past oil and gas development within the study area.	Current oil and gas development within the study area; development (residential, commercial, agricultural) already occurring in counties.	Future oil and gas development within the study area; planned new/future infrastructure development.
4. Greater Sage-grouse prioritization	Jackson County	Past oil and gas development adjacent to the parcel	Current oil and gas development adjacent to the parcel	Future oil and gas development adjacent to the parcel

***Past Actions***

**White River Field Office:**

In the WRFO, there are three geographically distinct areas; the Mesaverde Play Area (MPA), the Dinosaur Trails Area and the Rangely South Field. The WRFO encompasses a total of 2.67 million acres across portions of three counties (Rio Blanco, Moffat, and Garfield Counties) in northwestern Colorado. The WRFO RMP identifies 1,696,000 acres of the federal mineral estate lands as eligible for oil and gas leasing. The WRFO has a long history of oil and gas drilling and production activity, roughly 6,100 wells having been drilled since the early 1920's as of April 2020. Approximately 3,420 are considered active well 2,680 wells have been plugged/drilled and abandoned. Initial exploration activity began in the late 1800's with the drilling of oil seeps and structural uplifts having obvious surface expression. Most of the wells are located on the western portion of the WRFO in the Rangely oil field, South Rangely, and the Piceance Basin. Development in the South Rangely and the MPA of the Piceance Basin are primarily natural gas resources.

A 2007 RFD scenario projected the maximum levels and types of industry activity, and associated surface disturbance that might occur on all land ownership in the WRFO during the twenty-year period from 2009 through 2028. The MPA is characterized by Upper Cretaceous tight gas sand reservoirs occurring in a concentrated area involving 712,190 acres in the central portion of the field office in the northern Piceance Basin. Approximately 598,700 acres (84 percent) of the MPA are federal oil and gas mineral estate. Federal land activities within the Cumulative Impact Analysis Area (CIAA) include livestock grazing, recreation (hiking, mountain biking, fishing, hunting, picnicking, and camping), agriculture, energy, sodium solution mining, and realty development. The parcel is located entirely within one grazing allotment.

#### Kremmling Field Office:

The KFO encompasses 3.1 million acres of land located in north central Colorado, primarily in Jackson, Grand and Summit Counties, but also includes small portions of Larimer, Routt, and Eagle Counties. The KFO RMP identifies 590,300 acres of the federal mineral estate lands as eligible for oil and gas leasing of which 376,600 acres are within the North Park Master Leasing Plan (MLP) area. As of April 2020, there have been 686 wells drilled since the early 1920s. Approximately 213 wells are considered active wells (e.g. producing, shut-in, temporarily abandoned, injection, and drilling status) the remaining 473 wells have been plugged/drilled and abandoned. Many of these wells are located in the central portion of the KFO in the McCallum and surrounding fields.

Past drilling activity was performed with a one-well-per-pad design until the mid to late 2000s when the development of horizontal drilling techniques provided the ability to drill multiple wells per pad. The most common activities on federal land in the CIAA include livestock grazing, recreational activities, agriculture, and energy and realty development. There are six livestock grazing allotments that overlap portions of the proposed lease parcels. Activities on the private land include grazing, hunting, energy and residential development.

#### ***Present Actions***

##### White River Field Office:

Beginning in 2004, the WRFO has undergone a dramatic increase in drilling activity. Roughly 70 percent of the current operations are centered in the Piceance Creek Drainage Basin (focused on the thick, gas-saturated Mesaverde tight sand play), about 20 percent in the Douglas Creek Arch area (primarily drilling Cretaceous sand, shale, and coalbed gas reservoirs), and the remaining 10 percent in the Rangely Field (targeting the Weber oil sand). The emerging interest in the Mesaverde basin-centered play in the central part of the WRFO is principally related to the development of new completion technology (i.e. modern hydraulic fracturing techniques) coupled with the sustained elevation in gas prices (>\$5.00/thousand cubic feet of gas) over the past few years. Operators have aggressively pursued both exploration and development drilling activities in the Piceance Creek area. Overall authorized federal oil and gas leased acreage within the WRFO has decreased from 1,335,200 acres (~78 percent of lands open under the RMP) in 2007 (BLM 2007c) to 787,250 acres (~46.4 percent) in February 2020.

Federal land activities within the CIAA continue to include livestock grazing, recreation (hiking, mountain biking, fishing, hunting, picnicking, and camping), agriculture, energy, sodium solution mining, and realty development.

Of the approximately 3,420 active wells (e.g. producing, shut-in, temporarily abandoned, injection, and drilling status) within the WRFO, about 1,750 have been spud since January 2000. The majority of the wells are producing from the Mesaverde Group. The COGCC online database indicates there have been 1,152 active wells drilled since the 2007 WRFO RFD.

Kremmling Field Office:

The most common current activities occurring on federal land in the CIAA include livestock grazing, recreational activities, agriculture, energy and realty development. Similar activities occur on private land.

Since the completion of the KFO RMP, 46 wells were drilled within the KFO planning area, mostly as fill in wells in the more northern portion of the basin, in the area south of Walden on private surface. Approximately 376,600 acres (37 percent) of the North Park MLP is open to leasing of the Federal fluid mineral estate. Existing authorized Federal oil and gas leases represent 20.8 percent (78,160 acres) of the federal oil and gas mineral estate open to leasing within the North Park MLP. Overall authorized federal oil and gas leased acreage within the KFO has decreased from 204,000 acres (~54 percent) in 2008 (KFO RFD 2009) to 80,500 acres or 13.6 of the KFO area open for leasing as of February 2020.

Approximately 101 wells of the 213 active wells within the KFO, have been spud since January 2000. The COGCC online database indicates there have been 60 active wells drilled since the 2009 KFO RFD.

Table 3.3.2 summarizes the Colorado State Office’s records of new development and active well numbers for the years 2016, 2017, and 2018. See Section 4.0 of BLM’s Air Resources Annual Report 2.0 for more annual oil and gas statistical data including annual gas and liquid production totals for each BLM Colorado Field Office (link to Annual Report 2.0: <https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>).

**Table 3.3.2 Well Development and Production, 2016-2018**

Development (actual)	WRFO			KFO		
	Total	Federal	Non-Federal	Total	Federal	Non-Federal
2016 New Wells (spuds)	1	0	1	22	0	22
2017 New Wells (spuds)	54	5	49	11	0	11
2018 New Wells (spuds)	52	20	32	13	0	13
2016 Active Wells (producing)	3,104	2,466	638	172	86	86
2017 Active Wells (producing)	3,182	2,471	711	166	86	80

2018 Active Wells (producing)	3,116	2,491	625	176	86	90
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***Reasonably Foreseeable Future Actions***

White River Field Office Development Trend:

COGCC’s online database shows 169 new wells 203 new wells (87 Federal and 116 fee) have been spudded since the signing of the 2015 WRFO RMPA. Recent drilling activity consisted of 55 wells (5 Federal and 50 fee) drilled in 2017; 55 wells (21 Federal and 34 fee) drilled in 2018; 78 wells (50 Federal and 28 fee) drilled in 2019 and 10 wells spudded in the first quarter of 2020. BLM expects the majority of WRFO’s future oil and gas activity to occur in the MPA and to consist of directionally drilled wells with multiple wells per pad at a similar rate as in previous years.

Kremmling Field Office Development Trend:

According to COGCC’s online database, 51 new wells (6 with Federal production and 45 fee) have been spudded since the signing of the 2015 KFO RMP. Drilling activity in recent years consisted of 10 wells (3 with Federal production and 7 fee) drilled in 2017; 13 wells (all fee) drilled in 2018; 6 wells (5 fee and 1 state) drilled in 2019 and no new wells in the first quarter of 2020. BLM expects the majority of KFO’s future oil and gas activity to be horizontally drilled wells with multiple wells per pad, at a similar rate as in previous years.

The RFD scenario in the White River RMPA:

Predicting the quantity of drilling activity that could possibly occur in the next twenty years on federal, state and private lands within WRFO boundaries is somewhat speculative. Actual development activity primarily depends on product pricing and domestic energy needs. It is expected the MPA will remain the primary focus of future industry interest over the predicted RFD twenty year timeframe. Most of the future wells drilled will be development (field extension, infill) wells. Sixty percent of the eligible federal oil and gas mineral estate within MPA is currently leased. Most leasing activity is expected to be associated with reacquiring previously leased lands on which the leases have expired. The WRFO RMPA projected more than 15,000 wells would be drilled over 20 years (2015-2035).

The RFD scenario in the Kremmling RMP:

BLM expects future oil and gas development to remain within Jackson County Colorado in the North Park MLP area and target areas lands in existing leases. The KFO RFD anticipates about 370 additional wells would be drilled from 2008 to 2027; approximately 190 of those would be federal wells, with the remaining wells drilled on private lands.

Tables 3.3.3 and 3.3.4 display the CARMMS 2.0 future new oil and gas development 10-year projections (new development years 2016 - 2025) for the field offices with parcels considered for this lease sale, under the high and low future oil and gas development scenarios. The high scenario is based on the most recent field office RFD projection through 2025 and the low scenario is based

on the 5-year (2010-2014) average development pace, projected forward through 2025. 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, and currently, overall new Federal oil and gas development in Colorado is tracking closer to the CARMMS 2.0 low scenario.

**Table 3.3.3 CARMMS 2.0 High Scenario Projections**

CARMMS RFD Projections	KFO			WRFO		
	Federal	Non Federal	Total	Federal	Non Federal	Total
New Wells / Year (high)	9.6	8.9	18.5	599	82	681
2025 Modeled Counts (high)	96	89	185	5,990	820	6,810

Source: CARMMS 2.0 data.

**Table 3.3.4 CARMMS 2.0 Low Scenario Projections**

CARMMS RFD Projections	KFO			WRFO		
	Federal	Non Federal	Total	Federal	Non Federal	Total
New Wells / Year (low)	1.0	2.4	3.4	75.0	15.2	90.2
2025 Modeled Counts (low)	10	24	34	750	152	902

Source: CARMMS 2.0 data.

### **3.4 ENVIRONMENTAL CONSEQUENCES OF LEASING AND POTENTIAL DEVELOPMENT**

The sale of parcels and issuance of oil and gas leases is an administrative action. Potential 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 its operator applies for and receives approval to undertake surface-disturbing activities on the leased lands. If BLM receives an application for an exploration or development action, it will prepare additional NEPA analysis. At that time, BLM may apply additional impact minimization measures as COAs to moderate identified adverse effects beyond the protections provided by the lease stipulations (see Attachment D).

The BLM cannot meaningfully determine at the leasing stage whether, when, and in what manner and intensity a lease would be explored or developed. The uncertainty at the lease sale stage 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 or beyond. Therefore, many discussions of potential direct, indirect, and cumulative impacts presented in the following resource- or use-specific subsections are necessarily confined to qualitative rather than quantitative characterization.

### **3.4.1 Issue 1: How would air quality (including air quality related values) and climate (GHG emissions) potentially be affected by leasing of oil and gas resources in the project area?**

#### Affected Environment:

Data from the current version of BLM Colorado's Annual Report for Air Resources is incorporated by reference in this analysis to provide information for the affected environment and cumulative impacts analysis. The current version of the Annual Report (Annual Report 2.0) 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 locations in the online Annual Report contain pertinent information about the Affected Environment:

- Regulatory Analysis – This section of the report (Section 2.0 Affected Environment) describes and defines the applicable general and oil and gas specific air quality regulations; provides a basic overview of the science and issues associated with the various types of air pollutants (criteria, hazardous and greenhouse gases) and air quality related values, any applicable metrics for their analysis, and the contexts of such analysis relative to various geographic designations (attainment, non-attainment, Class I airsheds, etc.); and identifies all available criteria pollutant monitoring data and geographic based national emissions inventory data. This section is referenced to set the context for air analysis in terms of current conditions and existing analysis.
- Analysis Methodology Summary – This section of the report (Section 3.0 Analysis Methods and Tools) describes the basic science of air resources analysis; describes the CARPP for analysis guidelines; describes the analysis methods used with the annual report to scale current cumulative development within the context of the applicable CARMMS



scenario; explains the scientific basis for scaling current report year emissions to describe cumulative impacts; and provides plots of the CARMMS high scenario emissions (for various development and pollutant groups) as well as plots of the modelled impacts for each CARMMS scenario. This section is referenced to provide support for the methodology of analysis used in this EA.

- Field Office Data / Analysis – This section of the report (see Section 4.3) provides details about the current and trending pace of oil and gas development within the field office or planning area, and also describes a summary of the available air quality monitoring data for the field office presented in the Regulatory Analysis described above.
- Climate Statistics and Analysis – This section of the report (Section 6.0 Climate Statistics and Analysis) describes Colorado’s climate (as summarized from the Western Regional Climate Center’s website), and the science, metrics and trends accounting for recent and projected climate change (relative to future global emissions scenarios) as summarized from Intergovernmental Panel on Climate Change’s (IPCC) Fifth Assessment Report (2015) and Special Report (SR15). This section also provides context for the estimates of various downstream combustion related emissions from various federal and non-federal contributors relative to total U.S. and global emissions.
  - The “Greenhouse Gases” sub-section provides an overview of GHGs and how they can potentially influence climate change, and contains general climate information.
  - The “Colorado’s Climate” and “Climate Change” sub-sections contain baseline GHG and climate change information, including the following Colorado-specific baseline information:
    - In Colorado, the statewide annual average temperatures have increased by 2.0°F and 2.5°F over the past 30 and 50 years, respectively. Scientists observe warming trends over this period in most parts of the State, and show that daily minimum temperatures have warmed more than daily maximum temperatures. Additionally, temperature increases have occurred in all seasons.
    - No long-term trends in average annual precipitation (30-50 years) have been detected across Colorado, although since 2000 the state has experienced below-average annual precipitation and snow pack. The warming trends have contributed to an earlier shift in snowmelt and peak runoff timing in spring by approximately 1 to 4 weeks.
  - The “The Carbon Budget” sub-section provides baseline year 2018 emissions data for Colorado and the U.S.

BLM Colorado currently participates in operating an air quality monitoring and meteorological station in Rangely, Colorado (this station has been in operation 5+ years) and expects to continue supporting operation of this station. Monitoring data collected at this station is used by the Colorado Department of Health and Environment (CDPHE) for air pollutant attainment analyses and informs the analysis of regional air quality events including winter-time ozone intrusions from northeast Utah. BLM Colorado is installing a new air quality monitoring station that will monitor ozone. Monitoring data collected at this station will inform analysis of the extent of regional ozone plumes, and cumulative air quality conditions for the area.

#### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts

### Alternative A – No Action - Potential Environmental Consequences:

Under the No Action Alternative, the proposed parcels would not be leased. However, the potential air-quality-related impacts from the No Action Alternative would approximate those of the Proposed Action, since the source apportionment modeling for the CARMMS 2.0 high oil and gas development scenario for WRFO/ KFO predicts only minor impacts for new oil and gas development.

Potential greenhouse gas emissions (GHG) and climate change impacts for both alternatives would also be similar, as the future potential GHG emissions difference for new oil and gas production that could occur for the subject lease parcels relative to the No Action Alternative would likely be small when compared to broader scope GHG emissions inventories (U.S., Global). To further understand how BLM Colorado decisions for federal minerals translate into free energy market dynamics and potential climate related impacts, the BLM evaluated federal mineral development in Colorado using the Bureau of Ocean Energy Management’s (BOEM) Market Simulation Model (MarketSim). MarketSim models oil, gas, coal, and electricity markets to produce estimates of the substitute energy source mix from production changes expected under various resource-restricted scenarios. The model provides net substitution assessments for oil and gas imports, onshore oil and gas production, fuel switching (e.g., coal), and reduced energy consumption (demand) for a given period of time. Although BOEM developed MarketSim to produce substitution estimates specifically for the absence of a new Outer Continental Shelf leasing program, the basic model calculations allow for its use in modeling the substitutes for other oil and gas sources, including new onshore production. For additional details on MarketSim, please refer to the full model documentation, entitled “Consumer Surplus and Energy Substitutes for OCS Oil and Gas Production: The 2017 Revised Market Simulation Model (MarketSim),” which is available online at <https://www.boem.gov/ESPIS/5/5612.pdf>.

BLM Colorado used MarketSim to estimate the effects of a statewide federal “No Development” scenario (i.e., no new federal mineral production) at the broader market scales, for the remainder of the CARMMS 2.0 projection period (2019 - 2025), at both the low (current trend) and high (RFD scenario) development rates. The results for the low scenario predict that 71.3% of the eliminated federal mineral production would be offset by additional onshore production, 18.2% by increased foreign imports, 8.3% by decreased demand, and the remainder (2.2%) by increases in coal and other electricity (nuclear, hydro, solar, wind, etc.) markets. The high scenario produced similar results, albeit with a slightly higher shift in demand (decreased consumption) substitution at 8.7%.

BOEM also developed a greenhouse gas lifecycle model (GHG Model) to estimate the GHGs associated with the MarketSim substitution results. The GHG estimates include emissions from oil and gas refining, processing, storage, consumption and substitution. These calculations are not specific to the consumption of OCS production and are thus appropriate to use for calculating the greenhouse gas emissions from the consumption of oil and gas from Colorado federal minerals. The full GHG Model documentation is entitled “OCS Oil and Natural Gas: Potential Lifecycle Greenhouse Gas Emissions and Social Cost of Carbon,” and is available online at <https://www.boem.gov/ocs-oil-and-natural-gas/> (see section 4). The GHG Model does not provide estimates from the upstream (direct) portion of the emissions generating activities, such as exploration and development (i.e. the emissions covered by CARMMS).

In absolute terms, the MarketSim predicts that under the statewide federal “No Development” scenario, emissions from substitute sources would equate to approximately 91% of the Colorado Federal oil and gas GHG emissions (as carbon dioxide-equivalent CO<sub>2</sub>e) associated with both the low and high CARMMS production scenarios. This result can be extrapolated to future GHG emission estimates for smaller areas of Colorado, including groups of lease parcels in a particular field office. Thus, based on the model, BLM would expect that approximately 91% of the future GHG emissions (including those associated with downstream combustion) estimated for potential new oil and gas development on the subject parcels would be generated from substitute sources under the No-Action Alternative. As a result, potential greenhouse gas emissions and climate change impacts for both alternatives are expected to be similar, and the emissions under both alternatives are small in comparison to broader scope GHG emissions inventories (U.S., Global).

#### Alternative A- No action - Potential Cumulative Impacts:

The Potential Environmental Consequences section information for Alternative A above is applicable for describing cumulative GHG emissions and Climate Change impacts. For Alternative A, potential cumulative impacts for other parameters including ozone, and visibility and deposition impacts at nearby sensitive areas would be similar to the potential cumulative impacts described for Alternative B with less overall cumulative impact contributions for new Federal oil and gas sources that could be developed and exist on the subject lease parcels.

#### Alternative B – Proposed Action - Potential Environmental Consequences:

The primary pollutants emitted during potential future development include CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, volatile organic compounds (VOCs), and HAPs, including benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde. Major sources include internal combustion engines associated with vehicles, heavy equipment, 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 localized pollutant levels.

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 utilizing small drilling rigs. The primary pollutants emitted during long-term production would be CO, NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, VOCs, HAPs and GHGs. These emissions could affect air quality in the project area over the life of any future development.

Upstream and midstream 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.

End-use (downstream) combustion of new oil and gas that could be produced on the subject lease parcels would result in GHG emissions. For this assessment, the BLM uses EIA Annual Energy Outlook 30-year projections to estimate potential cumulative downstream GHG emissions (total over 30-year period). The future projected downstream (indirect emissions) estimates are based on EIA assumptions including:

- All future product would be combusted, and none used for other purposes (such as manufacturing), and there would be no losses associated with product transmission and processing;
- All produced oil would go to the transportation sector and gas would be split between residential, commercial and industrial sectors.

Many regulations and incentives affect downstream emission sources (vehicle fuel efficiency requirements, etc.) and the BLM does not have authority over these indirect sources.

The magnitude of potential emissions from future oil and gas development on the proposed lease parcels cannot be estimated with accuracy at this time due to 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, the BLM requires authorized activities to comply with applicable local, State, Tribal, and Federal pollution control laws.

All lease parcels in Colorado are subject to Lease Notice CO-56. The purpose of Lease Notice CO-56 is to alert bidders/lessees of BLM Colorado's air quality review process and potential restrictions that may be applied to protect air resources. The BLM uses this process, Colorado's Comprehensive Air Resource Protection Protocol (CARPP), in its air quality analyses as part of its NEPA review of future oil and gas development proposals. Future site-specific NEPA analysis would include an emissions inventory for each APD and any associated proposed surface-disturbing activity.

The necessary data for a development emissions inventory comprises more than 250 items per development proposal. Data included in the inventory are used to determine the appropriate form of project-specific analysis for potential near-field, far-field, and cumulative air quality impacts. Depending on the size (level of emissions, etc.), future oil and gas projects within one mile of any sensitive receptor (house, school, business, etc.) may undergo a near-field analysis of potential impacts to local air quality. Results of these analyses inform the decision-maker of potential project-specific impacts to human health and the environment at the local and regional scales. Data from all emissions inventories for BLM-approved projects throughout Colorado are consolidated for use in updated cumulative-effects analyses.

Because GHG emissions influence climate change on a global scale, BLM provides 30-year projected GHG emission estimates (including emissions from downstream combustion) for potential new Federal oil and gas development and production on the subject lease parcels. See "Greenhouse Gases - Future Potential Emissions for Lease Sale Parcels" section, below.

#### Alternative B - Proposed Action - Potential Cumulative Impacts:

At this time, BLM does not know the timing, scale, locations, or duration of any future oil and gas activities on the 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. At the time of leasing, the BLM's analysis is limited by unknown information about important factors affecting air quality, including (1) the rate (intensity) at which development occurs, (2) the degree to which development of the proposed parcels occurs in proximity to development on existing or additional future parcels; (3) the degree to which development of the 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.

In light of these uncertainties, BLM's analysis in this EA uses CARMMS 2.0 modeling to examine potential cumulative air quality impacts from activities that it might authorize. The study includes assessment of statewide impacts of projected federal and non-federal oil and gas development through year 2025 for the three development scenarios discussed above: low (5-year [2011-2015] average pace with 2015 regulations), high (RFD pace with 2015 regulations), and medium (RFD pace, with additional restrictions on emissions).

Each field office was modeled with the source apportionment 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. CARMMS 2.0 leverages the work completed by the Intermountain West Data Warehouse, and the base model (2011) platform and model performance metrics are based on those products. The CARMMS 2.0 emissions inventories account for substantial levels of new future oil and gas development and operations for the region and nearby states including Utah, Wyoming and New Mexico. The complete report and associated data are available on our website at: <https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>

Although the CARMMS 2.0 predicted impacts are 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. They also can be qualitatively adjusted based on correlations with the expected emissions associated with actual authorized oil and gas activity, if necessary.

On a cumulative basis, overall new Federal oil and gas development in Colorado is tracking close to the low scenario, with higher levels occurring in the DJ Basin of the Royal Gorge Field Office and parts of the Piceance Basin. The cumulative maximum air quality and AQRV impacts described in this EA use the high scenario modeling results 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 overall, new Federal oil and gas development statewide in Colorado is tracking below the high development scenario, especially for areas with less development). Table 3.4.1 shows new Federal oil and gas emissions modeled for the high scenario.

**Table 3.4.1 CARMMS 2.0 High Scenario New Federal Emissions (TPY) <sup>1</sup>**

<i>Source Area</i>	<i>PM<sub>10</sub></i>	<i>PM<sub>2.5</sub></i>	<i>VOC</i>	<i>NO<sub>x</sub></i>	<i>SO<sub>2</sub></i>
KFO	43	9	90	211	0<1
WRFO	1,199	575	16,109	10,185	1,173
Colorado	6,518	1,543	33,514	23,714	1,231

<sup>1</sup> Year 2025 emissions for new Federal oil and gas development constructed in years 2016 through 2025

Cumulatively, all new Federal oil and gas developed in Colorado through year 2025 for the high scenario could contribute a maximum 0.09 and 0.07 kilograms per hectare per year (kg/ha-yr) of nitrogen deposition annually at the nearby Flat Tops and Rawah Wilderness, respectively. For all sources cumulatively, CARMMS 2.0 predicts 0.25 and 0.51 kg/ha-yr of overall improvements from baseline year 2011 through year 2025 for the high scenario for Flat Tops and Rawah Wilderness, respectively. Table 3.4.2 shows the maximum predicted nitrogen deposition contributions from the relevant northwest Colorado planning areas.

**Table 3.4.2 CARMMS 2.0 High Scenario Annual Nitrogen Deposition\***

<i>Planning Area</i>	<i>Max Class I (kg/ha-yr)</i>	<i>Class I Area</i>	<i>Max Class II (kg/ha-yr)</i>	<i>Class II Area</i>
KFO	0.01	Rawah Wilderness	< 0.01	Mount Evans Wilderness
WRFO	0.14	Dinosaur National Monument (Colorado portion only)	0.35	Dinosaur National Monument

\* as described above, overall new Federal oil and gas development in Colorado is tracking closer to the CARMMS 2.0 low scenario, and the maximum predicted annual nitrogen deposition rates for KFO and LSFO at Class I and Sensitive Class II areas are below the project-level annual nitrogen deposition analysis threshold (DAT) for the low scenario. The annual nitrogen DAT is most appropriate for comparing impacts for proposed projects such as a package of APDs as part of a development plan, rather than field office wide impacts, which would represent multiple “projects”.

Cumulatively, all new Federal oil and gas in Colorado under the high scenario could contribute up to 0.9 dv of visibility change at Arches National Park (< 0.5 at Eagles Nest Wilderness and ~ 0.4 at nearby Rawah Wilderness). Overall, CARMMS 2.0 predicted the cumulative worst 20% visibility days from all sources in future year 2025 under the high scenario to be 10.63 dv at Arches National Park (an improvement from 10.83 dv measured in 2011; CARMMS 2.0 predicted improvements of

similar magnitude at Eagles Nest Wilderness and Rawah Wilderness: ~ 0.23 dv and ~ 0.16 dv, respectively). Table 3.4.3 shows the maximum predicted visibility impact contributions for the relevant northwest Colorado planning areas.

**Table 3.4.3 CARMMS 2.0 High Scenario Visibility Changes\***

<i>Planning Area</i>	<i>Max Class I (dv)</i>	<i>Class I Area</i>	<i>Days &gt; 0.5 dv</i>	<i>Days &gt; 1.0 dv</i>	<i>Max Class II (dv)</i>	<i>Class II Area</i>	<i>Days &gt; 0.5 dv</i>	<i>Days &gt; 1.0 dv</i>
KFO	0.04	Rawah Wilderness	0	0	0.03	Savage Run Wilderness	0	0
WRFO	1.55	Dinosaur National Monument (Colorado portion only)	41	4	2.55	Dinosaur National Monument	83	25

\* As described above, overall new Federal oil and gas development in Colorado is tracking closer to the CARMMS 2.0 low scenario, and there are no (zero) predicted days with changes above 0.5 and 1.0 dv for KFO (one day above 0.5 dv and zero days above 1.0 dv for WRFO) at Class I and Sensitive Class II areas for the CARMMS 2.0 low oil and gas emissions future year 2025 impacts scenario.

For the ozone modeling analysis, CARMMS 2.0 predicted ozone improvement from baseline conditions for areas near the subject lease parcels, taking into consideration new oil and gas development in the region, and the predicted year 2025 cumulative ozone concentrations (design future values) for areas near the lease parcels are predicted to be below the NAAQS for all three modeled future year scenarios. Overall cumulative air quality (and related parameters) conditions are predicted to improve, considering the foreseeable rate of oil and gas development for the region and potential future changes (growth, etc.) in other cumulative emissions inventories.

As described earlier in this section and for Section 3.3 with supporting data shown in Tables 3.3.2, 3.3.3 and 3.3.4, oil and gas development since the CARMMS 2.0 baseline year 2015 is tracking much closer to the “low” levels than the CARMMS 2.0 “high” (RFD) levels. Information shown in the following GHG emissions and Climate Change analysis suggests that ~ 1 new Federal well could be developed in the KFO and WRFO (2 new Federal wells total) on the subject lease parcels. The incremental impacts to Regional ozone formation, visibility degradation and annual nitrogen deposition from 2 new Federal wells would be negligible. The following summarizes CARMMS 2.0 predicted “low” scenario impact contributions for WRFO which would be much higher than impacts for one new Federal well in WRFO; Table 3.3.4 shows 75 new Federal wells per year in WRFO for the CARMMS 2.0 low scenario (750 total new Federal wells for years 2016-2025).

- Max. Class I deciview change ~ 0.25; max. Sensitive Class II deciview change ~ 0.5.
- Max. Class I annual nitrogen deposition ~ 0.01 kg/ha-yr; max. Sensitive Class II annual nitrogen deposition ~ 0.04 kg/ha-yr.

- Maximum contribution to the 4<sup>th</sup> high daily maximum 8-hour average ozone concentration ~ 1.0 ppb.

In summary, the CARMMS 2.0 modeling analysis does not predict any significant impacts to visibility, deposition, or ozone from new Federal oil and gas development that could occur on the subject lease parcels.

The following sections of the online Annual Report 2.0 provide supplemental information for this cumulative impacts discussion:

- Field Office Data / Analysis – This section of the report (see Section 4.3 for KFO; Section 4.8 for WRFO) presents data for cumulative emissions from actual new federal oil and gas development within each field office as compared to the emissions scenarios analyzed by CARMMS, and qualitatively scales the CARMMS projected impacts to the cumulative report year emissions to provide a context for the current (2018, the last full year of data for the annual report) cumulative impacts. As described in the Annual Report, field office-specific contributions to cumulative air quality concentrations and related values (visibility, deposition, etc.) for sensitive areas around the region are predicted to be minimal and insignificant with respect to accepted impact thresholds for new foreseeable Federal oil and gas development post-2015 through year 2025.
- Cumulative Air Resources Assessment (BLM Colorado) – This section of the report (Section 5.0 Cumulative Air Resources Assessment) provides data and analysis similar to those described above, except on a statewide basis (BLM Colorado Cumulative). This section sets the current context for the cumulative impacts at BLM Colorado (i.e. state level) scales. As described in the Annual Report, cumulative air quality concentrations and related value (visibility, deposition) levels for the local area are predicted to improve through year 2025 while considering new oil and gas development within northwest Colorado.

### Greenhouse Gases - Overview

Oil and gas development in Colorado is expected to remain similar to the current track (i.e., close to the CARMMS 2.0 low scenario) for the foreseeable future. Although recent events may lead to shifts in petroleum market dynamics (supply and demand), BLM cannot predict the duration of those changes; nor can BLM foresee changes or advancements in development and recovery technologies, newly discovered resources and plays, or political influences (such as tax or regulatory incentives) that would significantly affect development rates in Colorado. Continued field development, operation of well site equipment, and associated vehicle traffic would result in minor cumulative contributions to atmospheric GHGs. Natural gas and condensate produced from oil and gas development would be refined to produce a wide range of fuel products for consumer or commercial use. The combustion of these fuels would generate GHGs, which may be controlled through GHG control regulations (emissions standards) or air permit requirements.

Other industrial operations in the area would also contribute to GHG emissions through the use of carbon fuels (liquefied petroleum gas, oil, and diesel), and through use of electricity produced using carbon fuels. Other anthropogenic activities, such as residential wood and open burning, as



well as biogenic sources, also contribute GHGs to the atmosphere. These would be intermittent and more dispersed than the emissions from oil and gas development projects.

### Greenhouse Gases - Baseline Global, U.S. and Colorado

Policies regulating specific GHG concentration levels and their potential for significance with respect to regional or global impacts have not been established. According to data extracted from the U.S. Department of the Interior, Office of Natural Resources Revenue (ONRR) in 2017, the country's total Federal (onshore) oil and gas production in 2015 was approximately 191 million barrels (bbl) of oil and 3,482,000 million cubic feet (MMcf) of natural gas, which accounted for 5.6 percent and 10.6 percent of the nation's total production (combined Federal and non-Federal), respectively. Colorado's Federal oil and gas production represented 0.66 percent and 13.7 percent of the nation's Federal oil and gas production, and 0.15 percent and 2.0 percent of the nation's total oil and gas production (Federal and non-Federal, onshore and offshore), respectively. BLM expects that the GHG emissions associated with end uses of oil and gas produced in Colorado would comprise similar percentages of the emissions associated with total U.S. production. For this analysis, the BLM makes the conservative assumption that all of the oil and gas produced in the U.S. is combusted within the larger sectors of the economy (electricity generation, transportation, industry).

The U.S. produced 6,587 MMT of CO<sub>2</sub>e emissions in 2015 according to EPA's 2017 Inventory of U.S. Greenhouse Gas Emissions and Sinks. The calculated downstream 2015 CO<sub>2</sub>e emissions from ONRR's estimates of Federal oil and gas production in Colorado (38.4 MMT) and across the nation (273 MMT onshore and 592 MMT onshore and offshore combined) represent 0.58 percent, 4.1 percent (onshore), and 9.0 percent, respectively, of the nation's total annual GHG emissions.

At a global scale, the U.S. and the world produced 6,344 MMT and 53,530 MMT, respectively, of CO<sub>2</sub>e emissions in 2012, according to the The World Bank Group in 2017. In other words, the U.S. produced 12 percent of the global GHG emissions, and emissions from Federal oil and gas produced in Colorado accounts for less than 1% of the U.S. contribution.

### Greenhouse Gases - Future Potential Emissions for Lease Sale Parcels

Total GHG emissions (tons of CO<sub>2</sub>e) for all stages of oil and gas development, production, transport and consumption were estimated for potential oil and gas development that could occur on the subject lease parcels. Using BLM oil and gas statistics data for Colorado for the last five (2015-2019) years, the lowest oil and gas spacing (i.e. highest well density) value for all federal and nonfederal oil and gas wells for any given year is approximately 210 acres per well. Applying this well spacing density to the total acreage of the subject parcels, BLM calculated an estimate of approximately one new Federal oil and gas well for the lease sale for each WRFO and KFO parcel (2 new Federal wells total). The estimated number of wells was multiplied by northwest Colorado representative per-well emission rates that reflect emissions associated with construction, development, and production activities, as well as end-use combustion emissions based on production volume (with appropriate production decline profiles). This resulted in 30-year projected total potential CO<sub>2</sub>e emissions for new Federal oil and gas development on the subject parcels of approximately 0.1 million tons of CO<sub>2</sub>e for each parcel (0.2 million tons CO<sub>2</sub>e total). Approximately 92% of this total would be associated with "downstream" end-use combustion.

This 30-year projected emissions value assumes well development activities (construction, drilling and completion) and 30 years of midstream operations and downstream combustion emissions for each new well. For comparison to modeled CO<sub>2</sub>e emissions rates for global climate change studies, the 30-year (years 2020-2050) total CO<sub>2</sub>e emissions for the region including the U.S. (R50ECD World Region) under the IPCC concentration pathway for the smallest climate change scenario (RCP 2.6) is approximately 2.7 x 10<sup>11</sup> million tons.

### Greenhouse Gases - Future Potential Cumulative Emissions and Trends

In addition, cumulative GHG and Climate Change information from BLM's Greenhouse Gas and Climate Change Report (2017) is incorporated by reference to describe potential GHG emissions for various future years and energy development scenarios. For that report, GHG emissions were calculated for two energy development scenarios ("normal" and high rates of energy production and consumption) for projected years 2020 and 2030 for each of 12 western states with onshore Federal fossil mineral resources, including Colorado. GHG emissions estimates for Federal and non-Federal energy related production (i.e., upstream and midstream) and consumption (i.e., downstream) were developed for coal, oil, natural gas, and liquefied natural gas (LNG). The report used production and consumption data presented in the Energy Information Administration (EIA) 2016 Annual Energy Outlook to determine growth factors to estimate normal and high inventories. The following summarizes the projected 2020 and 2030 annual GHG emissions and trends for Federal mineral resources in Colorado and nearby States:

- Annual Colorado Federal emissions due to oil production and end-use consumption are projected to remain almost static from baseline year (2014) to future years (2020 and 2030) with a slight decrease in GHG emissions for both the normal and high scenarios from 2.22 million metric tons of CO<sub>2</sub>e in 2014, to 2.02 and 2.15 million tons of CO<sub>2</sub>e in the 2030 normal and high scenarios, respectively.

For twelve western states with onshore Federal oil and gas resources (California, Colorado, Idaho, Kansas, Montana, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah and Wyoming), total annual Federal oil GHG emissions are projected to slightly decrease (- 2MMT CO<sub>2</sub>e) from 2014 to 2030 for the normal scenario and slightly increase (+ 2 MMT CO<sub>2</sub>e) for the high scenario. The year 2014 total annual Federal oil baseline GHG emissions is approximately 68 MMT CO<sub>2</sub>e.

- Annual Colorado Federal emissions due to natural gas production and downstream consumption are projected to increase into year 2030 for both the normal and high scenarios from 42.91 million metric tons of carbon dioxide equivalents (MMT CO<sub>2</sub>e) in base year 2014 to 44.55 and 45.03 MMT CO<sub>2</sub>e in the 2030 normal and high scenarios, respectively.

For BLM oil and gas States, total annual Federal natural gas GHG emissions are projected to increase by almost 25% from 2014 to 2030 for both the normal scenario and high scenarios. The year 2014 total annual Federal natural gas baseline GHG emissions is approximately 210 MMT CO<sub>2</sub>e.

- Annual 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 scenarios from 2.20 million metric tons of CO<sub>2</sub>e in 2014, to 1.60 and 1.70 million tons of CO<sub>2</sub>e in the 2030 normal and high scenarios, respectively.

For BLM oil and gas States, total annual Federal natural gas liquids GHG emissions are also projected to decrease by 25-30% from 2014 to 2030 for both the normal scenario and high scenarios. The year 2014 total annual Federal natural gas liquids baseline GHG emissions is approximately 22 MMT CO<sub>2</sub>e.

- As described above, the 30-year projected total potential CO<sub>2</sub>e emissions for new federal oil and gas development on the two subject parcels is approximately 0.2 million tons CO<sub>2</sub>e; this would equate to an annual average of 0.01 MMT CO<sub>2</sub>e.
  - The CO<sub>2</sub>e emissions for new potential Federal oil and gas development that could occur on the subject lease parcels would constitute approximately 0.014% of the total annual projected year 2030 Colorado Federal emissions due to oil, natural gas, and natural gas liquids production and end-use emissions under the normal scenario.
  - The CO<sub>2</sub>e emissions for new potential Federal oil and gas development that could occur on the subject lease parcels would constitute approximately 0.002% of the total annual projected year 2030 BLM oil and gas states Federal emissions due to oil, natural gas, and natural gas liquids production and end-use emissions under the normal scenario.

Within the BLM emissions profile, the relative mixture of coal, oil, and natural gas is expected to change from baseline year to 2030 (with coal decreasing and natural gas increasing). However, the report notes that projected changes in climate are driven by the cumulative emissions, not the emissions profile.

When considering the cumulative emissions on a global scale, any single contribution on a sub-national scale (such as from BLM as a whole, or a BLM field office) is dwarfed by the large number of comparable national and sub-national contributors on a global scale. The relative contribution of GHG emissions from production and consumption of Federal minerals will vary depending on contemporaneous changes in other sources of GHG emissions. It is very unlikely that the global cumulative emissions will be strongly influenced by a single contributor (e.g., KFO) at a national or sub-national scale. However, each GHG emissions source contributes, on a relative basis, to global emissions and long-term climate impacts.

BLM incorporates here by reference related sections of the most recent Annual Report 2.0 (“Emissions Analysis,” “Projected Climate Change Impacts,” “NEPA Analysis,” and “The Carbon Budget”) for further description of potential cumulative emissions and climate changes. The “Projected Climate Change Impacts” section of the report explains that all climate model projections indicate future warming in Colorado. Statewide average annual temperatures are projected to warm by less than +2.0 °F and increase +2.5°F to +5°F by 2050, relative to a 1971–2000 baseline under the RCP 2.6 and 4.5 scenarios, respectively. Under the IPCC’s high global

GHG emissions scenario (RCP 8.5), the projected warming is +3.5°F to +6.5°F and would occur later in the century, as the RCP scenarios diverge rapidly after mid-century (note that the average temperature for the RCP 2.6 scenario is projected to remain almost static for the second half of the 21st century). Summer temperatures are projected to warm slightly more than winter temperatures, with maximums similar to the hottest summers that have occurred in past 100 years. Precipitation projections for the U.S. are less clear as the climate models consistently project an increase in annual precipitation for the northernmost states of the U.S., and a decrease in precipitation for the far Southwest with individual models showing a range of changes by 2050, such as -2.5% to +2.5% for RCP 2.6, -5% to +6% for RCP 4.5, and -3% to +8% under RCP 8.5. Nearly all of the models predict an increase in winter precipitation by 2050, although most projections of snowpack (snow water equivalent [SWE] as of April 1st) show declines by mid-century due to the 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 towards 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, are expected to continue to increase wildfire risks and impacts to people and ecosystems.

As described in the Annual Report 2.0, consumption of all of the federal energy produced in the U.S. in 2018 (onshore & offshore) would be equivalent to 0.22% of the remaining carbon budget, while the Colorado component of the federal mineral estate is approximately 0.01% of the carbon budget and just 1.02% of total U.S. fossil fuel energy emissions (as CO<sub>2</sub>e) on an annual basis. At the current production rates shown, total federal mineral combustion would exhaust the carbon budget in approximately 461 years, while federal minerals in Colorado would do the same in about 9,943 years.

### Potential Future Mitigation

As noted above, substantial emission-generating activities cannot occur without further BLM analysis and approval of proposals for exploration and development operations. Prior to approving development activities on a leased parcel, the BLM conducts a refined project-level analysis that considers the impacts of the proposal, to the extent reasonably foreseeable. The BLM's analyses typically consider the emissions inventory for the proposal (including GHGs), and estimated emissions from other development on and outside the lease and other nearby emissions sources. Additional analyses (such as air dispersion modeling assessments) may be necessary. All operators must comply with applicable State and Federal pollution control laws. The BLM may impose specific mitigation measures within its authority as conditions of approval (COAs), based on the review of site-specific proposals or new information about the impacts of exploration and development activities in the region.

Based on the project-specific emissions inventory and modeling, future oil and gas projects involving the proposed lease parcels may be subject to changes in project design and schedule as needed to protect air resources and AQRVs. Examples of changes to the project design and schedule include using equipment with lower emissions rates, limiting the well development rate in a general area (number of drilling rigs and/or completion operations at a given time), adjusting the well development schedule to specific seasons, and altering concurrent well development in a general area (e.g., simultaneous well drilling and completion at one location or multiple proximate

locations). In general, project proposals incorporate specific design features to mitigate impacts, such as closed-loop drilling and green completions.

In May 2019, the State of Colorado enacted HB 19-1261, which sets statewide GHG emission reduction goals (year 2025 GHG emissions are to be 26% lower than the year 2005 level, and year 2050 GHG emissions are to be a maximum of 10% of year 2005 level). The statute directs the Colorado Air Quality Control Commission to promulgate regulations to achieve these goals. Such reductions, if achieved, would change the cumulative impacts of emissions resulting from BLM decisions. BLM will continue to evaluate emission trends in its future decision-making. In 2020, CDPHE finalized revisions to its emissions control requirements for the oil and gas industry to include increased gas capturing and leak detection practices that will reduce ozone precursor VOC emissions and methane waste.

The BLM will continue to require that operators follow best management practices and control or offset GHG emissions by using feasible techniques such as minimizing vegetation clearing, maximizing successful interim reclamation, reducing truck idling, and improving equipment to reduce fugitive emissions consistent with state and federal requirements.

### **Consideration of Other Analytical Methods**

BLM has considered whether a “social cost of carbon” (SCC) estimate would contribute to informed decision making regarding the climate consequences of the greenhouse gas emissions considered here. BLM Colorado has chosen not to use the SCC protocol in this analysis for several reasons. The SCC tool was developed for the express purpose of “allow[ing] agencies to incorporate the social benefits of reducing CO<sub>2</sub> emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions” and to assist agencies in complying with Executive Order 12866. Executive Order 12866 required federal agencies to assess the cost and benefits of rulemakings as part of their regulatory impact analyses. The action considered here is not a rulemaking and does not require a regulatory-impact analysis.

The SCC protocol does not add any information about the actual impacts of a project on the biophysical environment or economic conditions in a specific geographic location. The SCC is an estimate of the generalized economic damages associated with an increase in carbon dioxide emissions. NEPA does not require an economic cost-benefit analysis (40 C.F.R. § 1502.23), although NEPA does require consideration of “effects” that include “economic” and “social” effects (40 C.F.R. 1508.8(b)). BLM uses economic impact analyses in lease sale EAs and associated RMP EISs to qualitatively or quantitatively discuss potential revenue and economic activity from future oil and gas development. This potential economic activity, such as royalty revenue, jobs and income should not be mischaracterized as “economic benefits” of the proposed action (Watson et al. 2007).

An economic cost-benefit analysis, on the other hand, is an approach used to determine economic efficiency by focusing on changes in social welfare by comparing whether the monetary benefits gained by people from an action/policy are sufficient in order to compensate those made worse off and still achieve net benefits (Watson et al. 2007, Kotchen 2011). Foundational economic theory dictates that an economic impact does not equate to an economic benefit since economic impact analyses and economic cost-benefit analyses are two very different methods based upon differing

assumptions and terminology, and therefore are not interchangeable. This distinction is important because principles of cost-benefit analysis prohibit mixing economic impacts into a net benefit calculation. Since the full social benefits of oil and gas production and development have not been monetized in this EA and other supporting NEPA documents, quantifying only SCC of emissions but not the benefits would yield information that is both potentially inaccurate and not useful for the decision-maker and the public.

#### Alternative C – Preferred Alternative - Potential Environmental Consequences:

Similar to the Proposed Action Alternative, future site-specific NEPA analysis for new oil and gas that could be developed on the subject lease parcels would include an emissions inventory for each APD and any associated proposed surface-disturbing activity, and the project-level air quality assessment could include screening-level air quality modeling. The assessments of the two action alternatives differ in the GHG emissions estimates that are based on lease parcel acreage. The potential GHG CO<sub>2e</sub> emissions (accounting for upstream activities, and 30 years of midstream operations and downstream combustion) for new oil and gas that could be developed on the subject WRFO lease parcel for the Preferred Alternative would be approximately 0.1 and 0.3 million tons of CO<sub>2e</sub>.

#### Alternative C- Preferred Alternative - Potential Cumulative Impacts:

The cumulative impacts analysis for the Proposed Action Alternative also applies for the Preferred Alternative, as the CARMMS 2.0 emissions inventories and modeling results, and cumulative GHG and Climate Change information are used to assess potential air quality and related impacts for various levels of new Federal oil and gas development that could occur for the northwest Colorado planning areas with subject lease parcels. As described for the Proposed Alternative, overall new Federal oil and gas development in Colorado is tracking close to the CARMMS 2.0 low oil and gas development scenario (see Tables 3.3.2 and 3.3.4 for actual and CARMMS 2.0 low scenario modeled oil and gas development rates, respectively). The CARMMS 2.0 low oil and gas development modeling scenario predicts that new Federal oil and gas emissions sources (developed years 2016-2025) would result in minimal (below Federal Land Manager significant thresholds for most pollutants and AQRVs) contributions to Regional air quality concentrations and related values for each field office.

For the cumulative GHG assessment, the relative percentage of Colorado and BLM States cumulative projected year 2030 GHG emissions for new Federal oil and gas development that could occur on the subject WRFO lease parcel would be approximately half of that estimated for the Proposed Action.

#### Potential Future Mitigation:

Potential future mitigation evaluations and requirements as described for the Proposed Action Alternative also apply for future Preferred Alternative emissions sources.

### **3.4.2 Issue 2: How would oil and gas leasing affect Big Game Migration Corridors where the leasing would take place?**

### Affected Environment:

The leases offered in this sale contain a variety of big game habitats, from summer range and calving (production) areas to winter range and concentration areas to severe winter range and migration corridors used by elk, mule deer, and pronghorn to connect these habitats.

Across northwest Colorado, big game habitat varies widely in character from arid, lower elevation juniper-dominated woodlands and intermixed stands of Wyoming big sagebrush to mountain shrub-dominated sagebrush shrublands at middle elevations to higher elevations that are composed of woodlands that contain larger fractions of pinyon pine to spruce-fir and aspen stands.

Woodlands and adjacent mountain shrub or big sagebrush communities generally possess well developed herbaceous understories. It is likely that the most important role served by sagebrush/saltbush complexes is providing early emerging (e.g., March) herbaceous forage to big game—an important component in regaining an elevated nutritional plane for subsequent birthing and lactation. Important elk seasonal range tends to be distributed in patterns similar to, but not identical with deer. According to CPW's State Action Plan (2018), these deer and elk populations are amongst the most migratory in Colorado, migrating 60 to 70 miles in the spring, moving primarily east-west and up in elevation as vegetation greens up, reversing migration in the fall.

### Environmental Consequences:

#### Alternative A – No Action:

The No Action Alternative would not directly or indirectly affect big game resources. However, big game resources would be affected by the continuation of current land and resource uses on or near the parcels.

#### Alternative A - Potential Cumulative Effects:

The No Action Alternative may reduce or delay cumulative Federal impacts to wildlife migration corridors from potential oil and gas development associated with the lease parcels. However, oil and gas development may occur at a later time or another location, which may affect wildlife migration corridors.

#### Alternative B - Proposed Action:

The act of leasing the parcels for oil and gas development would have no direct impact on wildlife resources; however, impacts at the exploration and development stage could have adverse impacts on wildlife and big game use of migration corridors and priority ranges. The magnitude and location of direct and indirect effects cannot be predicted until the site-specific development stage.

Initial disturbance to wildlife (e.g., construction, drilling, and completion activities) would be relatively localized and temporary. After the initial activities have subsided, human activity and the effects of deer/elk avoidance behavior would continue at reduced levels through the life of well or field.

Impacts can be divided into general categories: 1) direct and indirect loss of habitat; 2) physiological stress; 3) disturbance and displacement; 4) habitat fragmentation and isolation; and 5) other secondary (offsite) effects (Lutz et al., 2011). Potential future development of some or all of the parcels includes 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 daily or seasonal movements, including seasonal migrations. A less frequent impact is direct mortality, mostly associated with collisions with project-related vehicular traffic. The extent of indirect habitat loss varies by the type, duration and timing of the disturbance, and the amount of screening provided by vegetation and topography. The generally lower density of well pads associated with modern types of oil and gas developments in the region, consisting of fewer pads with more wells having longer lateral reaches, would reduce impacts from direct habitat loss or fragmentation and interference with movement patterns of big game ungulates.

Demonstrated widely for big game since the 1970s (Rost and Bailey 1979) and more precisely defined with GPS technology (e.g., Preisler et al. 2006) is the tendency for animals to avoid human disturbance, which is most commonly associated with higher-intensity well and pad development activities and vehicular access. Though some big game populations maybe more resilient to development in some landscapes, impacts and avoidance will occur at some level of development. Mule deer selected sites for sagebrush production, but that use decreased closer to disturbance (Dwinnell et al, 2019) and deer consistently avoided energy infrastructure and used habitats that were up to ~900 m further from well pads as compared to predevelopment patterns of use (Sawyer et al., 2017). Avoidance of human activity, regardless of form, has important ramifications on big game energetics (e.g., avoidance movements, heightened state of alert) (Geist 1978) and nutrition (e.g., reduced time foraging and access to available forage, displacement from preferred foraging sites that, in turn, have consequences on fitness and performance (e.g., survival, reproduction) at the individual and population level. As effective forage availability becomes increasingly constrained by direct removal or avoidance response, and animal use is incrementally relegated to smaller proportions of more optimal seasonal range, it is inevitable that the capacity of the range to support former numbers of animals would deteriorate, and eventually increase the probability of density-dependent adjustments in animal abundance (Bartmann et al. 1992).

Protections in the form of stipulations and lease notices, in combination with COAs and other mitigation measures identified through site-specific NEPA review of future proposed oil and gas projects, would avoid or minimize impacts to seasonally important or critical habitats and other habitat used by big game species.

#### Alternative B – Proposed Action - Potential Cumulative Impacts:

The most important cumulative aspect of lease development is the accumulation of persistent disturbances and the subsequent indirect loss of habitat utility on big game seasonal ranges. Although impossible to predict, development of these leases would contribute incrementally to ongoing and future forms of human activity across the landscape.

Development of one or more of the proposed lease parcels would contribute to impacts to big game species from other ongoing natural gas and mineral development as well as other land uses



such as the development of rights-of-way, recreational uses, and wildfire. Oil and gas development would result in further unavoidable and long-term modifications and reductions in slow-to-develop woodland or shrubland communities as wildlife forage and cover. Roads and working pad surfaces would represent an incremental accumulation of acreage removed from terrestrial wildlife habitat. The established interim and final reclamation procedures adopted by the BLM and COGCC would be expected to provide a foundation for the successional development of native shrubland and woodland communities and over the long-term help re-develop functional wildlife habitat.

#### Potential Future Mitigation for Alternative B:

Future oil and gas development of some or all of the parcels would undergo site-specific NEPA analysis, using detailed project information from the SUPO (Surface Use Plan of Operations), additional information provided by CPW, and biological surveys, as needed. As a means of reducing big game avoidance response, RMP-authorized timing limitation stipulations would be applied to production areas and crucial winter ranges. Oil and gas field development should be designed to conserve sufficient areas of spatially and temporally variable forage resources along migration routes to allow big game to behaviorally compensate for changing climate and resource patterns (Searle et al., 2015).

Consistent with DOI Secretary's Order No. 3362, "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors" (Feb 9, 2018), Lease Notice Exhibit LN-CO-57 was developed in consultation with CPW and applied to applicable leases in order to protect areas identified as wildlife migration corridors and priority winter habitats. In the implementation of the lease notice, the BLM would avoid or minimize the long term loss or adverse modification of effective cover types via vegetation clearing or infrastructure occupation at the potential Federal lease development stage by requiring the lessee or the designated operator "to work with the BLM and coordinate with Colorado Parks and Wildlife to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor and winter range functionality. Big game seasonal migration corridors and winter range are mapped in the RMPs, BLM's GIS database, or other maps provided by local, state, federal or tribal agencies that are analyzed and accepted by the BLM. The BLM would minimize the density and use-frequency of well access roads and limit routine and schedulable activity to timeframes outside sensitive periods for big game. Additionally, BLM would continue to evaluate the sufficiency of leasing stipulations to protect wildlife migration corridors and winter range, in cooperation with CPW. Conserving habitats that provide high quality forage and refuge, while maintaining connectivity along migration routes by concentrating development in areas of lesser value to big game, could be achieved through early planning and coordination that identify areas for both habitat conservation and thoughtful development.

Mitigation measures to be applied to the projects to supplement the lease stipulations and lease notice would include a variety of COAs applied by the BLM to:

- Reduce habitat loss, modification, fragmentation, and interference with migration by careful planning of well pad sizes and locations, such as 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 pipelines instead of trucks to transport water used or produced by the project.
- 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 species. Locating projects along existing access roads and in proximity to existing oil and gas development would reduce the potential for impacts on wildlife, due to clustering the disturbance rather than dispersing it across a landscape.

Alternative C - Preferred Alternative:

The Preferred Alternative, which includes one parcel instead of two, may reduce or delay cumulative Federal impacts to priority big game habitats and migration corridors from potential oil and gas development associated with the development of the lease parcels.

Alternative C- Preferred Alternative - Potential Cumulative Effects

Relative to the proposed alternative, the deferral of a parcel in the preferred alternative would reduce overall potential cumulative impacts to terrestrial wildlife caused by anthropomorphic disturbance resulting in reduction of habitat through vegetation removal and degradation, habitat fragmentation, and avoidance.

However, lease deferral may indirectly cause oil and gas development to occur from alternate locations resulting in less optimal mineral extraction and more surface disturbance, or mineral development on existing leases or private lands, potentially subject to fewer protections for wildlife. These shifts may adversely affect big game populations, habitat, and migration corridors.

Potential Future Mitigation for Alternative C, the Preferred Alternative:

None.

**3.4.3 Issue 3: How would oil and gas leasing affect the socioeconomics where the leasing would take place?**

Affected Environment:

The proposed parcels for the September 2020 lease sale are located in Jackson and Rio Blanco, Counties, Colorado. Accordingly, the socioeconomic study area includes these counties and the State of Colorado as the effects of the economic activity generated by the lease sale may impact the conditions in these areas.

In 2018, Jackson County had 1,399 residents, and Rio Blanco County had 6,336 residents (U.S. Census Bureau 2019a). The average unemployment rate in 2018 for Colorado was 3.3 percent,

while Jackson County was slightly lower at 2.6 percent (Headwaters 2019a). Rio Blanco County was slightly higher at 4.4 percent (Headwaters 2019b).

Agriculture is a traditional use of lands in these counties and continues to be important today. A majority of the farmlands are for raising livestock (USDA NASS 2019). In 2017, Jackson County had a market value of agricultural products sold of approximately \$24.5 million, while Rio Blanco County had almost \$18.8 million.

Jackson County has the highest percentage of travel and tourism related employment with 30 percent of all private employment in this sector, which includes accommodations, retail trade, and food services (Headwaters 2019a). Rio Blanco County employment in tourism is around 15 percent of private employment (Headwaters 2019b). Mining, including oil and gas extraction, represented almost 12 percent of private employment in Jackson County, while in Rio Blanco County it was 37 percent of private employment (Headwaters 2019 and 2019b).

Leasing mineral rights for the development of federal minerals generates public revenue. Potential 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 percent of the total revenue associated with federal mineral leases. This revenue is divided as such: 48.3 percent of all mineral lease rent and royalty receipts are sent to the State Education Fund; 10 percent of revenue is sent to the Colorado Water Conservation Board and approximately two percent is distributed directly to local school districts originating the revenue or providing residence to energy employees and their children. The remaining 40 percent of the mineral lease rent and royalty receipts are sent to the Colorado Department of Local Affairs, which then distributes half 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 payment funds received by the State of Colorado are allocated separately from rents and royalties in the following manner: 50 percent 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 percent 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 percent of state mineral lease bonus payments are allocated to the Local Government Permanent Fund, which accumulates excess funds in trust for distribution in years during which Federal mineral lease revenues decline by ten percent 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 percent 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 (Brown et al. 2005; Brown et al. 1989; Greider et al. 1991; Hunter et al. 2002; Smith et al. 2001). A 2011 study highlighted social changes seen across the Bakken oil counties (Bohnenkamp et. al. 2011). For example, the familiarity of residents with other residents and the safety often felt in small rural communities shifted with the influx of new people. The study also identified concerns over housing price increases. While there was an in-migration of people for oil field jobs, there was an out-migration of long-time residents due to 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 (e.g., distance of 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 percent.

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. But these concerns (and their influence on prices) can be tempered. Roddewig and others (2014) states that “(p)ast 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 of oil and gas contamination resulting from activities on federal land or involving federal minerals.

Current research also does not provide much guidance on how long these price impacts persist. Bennett and Loomis (2015) in a study in Weld County, Colorado, estimate a 1-percent decrease in urban house prices for every well being drilled within one-half mile “during the time the buyer is deciding upon buying the house,” but “(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.”

#### Environmental Consequences:

#### Alternative A – No Action:

Under the No Action Alternative, the two parcels totaling 240.00 acres would not be leased. There would not be any public revenues generated through bonus bids paid at the lease auction nor annual rents collected on leased parcels not held by production. There would be no anticipated impacts from oil and gas development to socioeconomics.

#### Alternative A - Cumulative Effects:

The No Action Alternative would result in the continuation of current land and resource uses, and would not result in any additional impacts to the social and economic conditions found when combined with other past, present, and reasonably foreseeable actions.

#### Alternative B – Proposed Action:

The direct effect of leasing and development would be the payments received from leasing all or a subset of the 240.00 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.

Economic activity associated with tourism and recreation can be an important contribution to local communities and their economies. Potential impacts due to oil and gas development can be concerns for communities that promote recreation and tourism. Oil and gas exploration, drilling, or production, could potentially inconvenience visitors through increased traffic and traffic delays, noise, and visual impacts. 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. Increased truck traffic hauling heavy equipment, fracking fluids, and water as well as increased traffic associated with oil workers and increased populations could cause more traffic congestion, increase commuting times, and affect public safety. Additionally, impacts to visitors could include reduction of current viewsheds, dark night skies, and soundscapes. Some parcels have stipulations that are designed to reduce potential impacts to important recreational species (see Section 3.4.2).

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 leasing 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. BLM does not know when, where, how, or if future surface disturbing activities associated with oil and gas exploration and development such as well sites, roads, facilities, and associated infrastructure would be proposed. Nor does BLM know how many wells, if any, would be drilled and/or completed, the types of technologies and equipment would be used and the types of infrastructure needed for production of oil and gas. The type, magnitude and duration of potential impacts to local social and economic conditions or to home values cannot

be precisely quantified at this time. Any future drilling activity would first require an APD 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.

#### Alternative B - Cumulative Effects:

Any possible future development of fluid mineral resources resulting from this lease sale, together with the current oil and gas development (see Section 3.3) could generate the economic and social impacts described in the proposed action. The magnitude of these types of socioeconomic effects relative to the effects of other past, present, and foreseeable future actions depends on the level and pace of development, which is unknown at this time.

#### Potential Future Mitigation

Mitigation would be determined if leased parcels are proposed for development at the APD stage.

#### Alternative C - Preferred Alternative:

Under the preferred alternative, BLM would offer one parcel for lease and defer one parcel. Given the uncertainty on which areas may be leased and ultimately developed, the direct and indirect impacts will be similar to those discussed under the proposed action, though there is less potential magnitude given the smaller amount of acres offered.

#### Alternative C - Cumulative Effects:

Similar to Alternative B, but with less potential for effects in KFO due to 120.00 acres being deferred in KFO.

#### Potential Future Mitigation

Mitigation would be determined if leased parcels are proposed for development at the APD stage.

### **3.4.4 Issue 4:** How would Greater Sage-grouse be affected by oil and gas leasing?

#### Affected Environment:

The September 2020 sale contains a proposed parcel in KFO (parcel 8560) which covers 120 acres in Priority Habitat Management Area (PHMA) within the North Park GRSG population.

The 2015 GRSG plan states that, “Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside PHMA and GHMA. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMA and GHMA, and subject to applicable stipulations for the conservation of GRSG, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG.” See, e.g., Northwest Colorado Approved Resource Management Plan Amendment, Objective MR-1. BLM also considers analysis completed in previous lease sales and any Expression of Interest submitted by an active lessee in the surrounding area.

In addition to analyzing and offering prioritized parcels, BLM CO complies with Objective MR-1 by applying the seven management decisions and associated stipulations that pertain to unleased fluid minerals in GRSG management areas (MR 1-MR 7; Stipulations GRSG NSO-46e(1), NSO-46e(2), TL 46e, LN-46e).

#### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

##### Alternative A – No Action:

The No Action Alternative would not directly or indirectly affect GRSG habitat. However, GRSG habitat would be affected by the continuation of current land and resource uses on or near the parcels.

##### Alternative A - Potential Cumulative Effects:

The No Action Alternative may reduce or delay cumulative Federal impacts to GRSG populations and habitat from potential oil and gas development associated with the lease parcels. However, not leasing has the potential to indirectly cause oil and gas development to occur from alternate locations resulting in less optimal mineral extraction and more surface disturbance or mineral extraction on existing leases or private lands, potentially subject to fewer protections for wildlife. These shifts may adversely affect GRSG populations and habitat.

##### Alternative B- Proposed Action:

The BLM determined that Parcel 8560 is 100 percent (120 acres) within PHMA and is within one to two miles of a lek and less than one mile to a historic lek. This parcel is within management zone (MZ) 11, and Colorado Parks and Wildlife (CPW) has determined that the population of that zone is decreasing, but not at an alarming rate. The CPW did not identify any concerns with this parcel during the BLM's scoping and comment periods for this sale.

The 2015 GRSG ARMPA contains management decisions addressing fluid mineral leasing within GRSG PHMA, including stipulations for the protection of Greater sage-grouse habitat. Further, parcels would be evaluated by the amount of PHMA, GHMA and percentage of the parcel covered by NSO stipulations. These standards would allow BLM CO to prioritize parcels that are appropriate for the current lease sale versus parcels that might benefit from additional analysis or that would be more appropriate under a future action. Parcel 8560 in KFO is entirely within PHMA (120 acres) and would have GRSG NSO-46e(1) applied to all lands within the parcel which would require horizontal drilling to access the mineral estate. There are no adjacent fluid mineral leases, which would make fluid mineral extraction very difficult under current conditions. Parcel 8559 in WRFO does not overlap GRSG habitat and would not affect GRSG. Parcel 8559 would be a higher priority to lease compared to parcel 8560.

##### Alternative B – Proposed Action - Potential Cumulative Impacts:

The cumulative effects of oil and gas development and its related infrastructure on GRSG have been thoroughly addressed in the EISs for recent land use plan amendments, which are incorporated by reference here. These documents include the EIS for the GRSG ROD/ARMPA,

2015 (Volume 2: Chapter 4, pages 4-77 to 4-82 (Direct and Indirect Impacts on Greater Sage-grouse) and 4-89 to 4-97 (Impacts from Fluid Minerals Management on GRSG); Volume 3: Chapter 5, pages 5-29 to 5-36 (Energy Development and Mining), 5-42 to 5-46 (Infrastructure), and 5-54 to 5-56 (Spread of Weeds), as well as the WRFO and KFO ROD/ARMPA, 2015, (Chapter 3: 3-92 through 3-94).

As analyzed in the 2015 GRSG EIS, the effect of oil and gas development within these sagebrush communities would be contingent on the unpredictable geographic relationship of development to important grouse habitat and use functions. The risk of high levels of adverse behavioral effects would increase as a function of the number of pads or wells developed and would be most pronounced under circumstances where affected habitat supports concentrated winter use or potential nest and brood activities. Influences of oil and gas development on GRSG from an individual and population perspective can include the short term impacts associated with direct habitat loss and behavioral avoidance, and are likely to mirror the implications that have been cited for GRSG. This includes development activity and associated infrastructure which may exert adverse influences on grouse behavior and demographics miles from the source of disturbance prompting declines in lek persistence and male attendance, yearling and adult hen survival, and nest initiation rates as well as elicit strong avoidance response in yearling age classes, nesting/brooding hens, and wintering birds (GRSG 2015 EIS).

#### Potential Future Mitigation:

- Employ habitat reclamation and restoration efforts that are oriented specifically to enhance or expand the availability of suitable GRSG habitat, including monitoring requirements that provide information necessary to determine the success and effectiveness of such efforts in meeting site-specific objectives.
- Reduce exposure of GRSG habitats to development-related noise that exceeds ambient (pre-disturbance) levels.
- Encourage BMPs that reduce the frequency of vehicle support traffic in all sage-grouse habitats, for example, multi-phase gathering to centralized facilities.
- Limit vehicular use of well access routes and associated rights-of-way (if proven necessary) in all GRSG habitats to authorized users and decommission and rehabilitate well access routes after the productive life of the pad.
- Restrict the use of tall facilities, powerlines, and fences in all GRSG habitats. If tall structures cannot be avoided, equip with perch deterrents and fence markers. Depending on topography and lease configuration, the increasing lateral reach of modern drilling techniques often increase flexibility in siting facilities to avoid or minimize the involvement of important surface resources. Traditionally applied timing limitation stipulations would be the primary device used to reduce development-related influences on GRSG on remaining lesser and more peripheral GRSG habitats.

#### Alternative C - Preferred Alternative:

The Preferred Alternative, leasing one parcel and deferring parcel 8560, may reduce or delay impacts to GRSG habitat from potential oil and gas development associated with the development of the lease parcels.



Parcel 8560 is entirely within PHMA. If leased, the entire parcel would have GRSG NSO-46e(1) applied, which would provide ample surface protection for the several active and inactive leks in the area, but would require horizontal drilling to access the mineral estate. There are no adjacent fluid mineral leases, which would make fluid mineral extraction very difficult under current conditions.

#### Alternative C- Potential Preferred Alternative Cumulative Effects

In the preferred alternative, deferral of 120.00 acres within PHMA would reduce the overall potential cumulative impacts to GRSG that would occur under the proposed action. The deferral considered in this alternative would intentionally remove lands within PHMA habitats from leasing consideration.

Deferral of parcel 8560 may indirectly cause oil and gas development to occur from alternate locations resulting in less optimal mineral extraction and more surface disturbance or mineral extraction on existing leases or private lands, potentially subject to fewer protections for wildlife. These shifts may adversely affect GRSG populations and habitat.

#### Potential Future Mitigation:

None needed, because Greater sage-grouse habitat would not be affected under this alternative.

## **CHAPTER 4 – COORDINATION AND CONSULTATION**

### **PERSONS/AGENCIES CONSULTED**

On March 24, 2020, four courtesy letters were mailed to private surface owners of lands associated with the proposed lease parcels. Notification letters were also sent to the following federal, state and local agencies and organizations:

- Arapaho National Wildlife Refuge
- Bureau of Reclamation, Albuquerque, Loveland and Billings, Salt Lake City
- CDOT Regions 3 and 5
- Colorado Department of Agriculture
- Colorado Department of Natural Resources, Denver
- Colorado Oil and Gas Conservation Commission
- Colorado Parks and Wildlife – Grand Junction, Durango, Denver, Colorado Springs
- Colorado State Forest Service
- Colorado State Land Board, NW District
- Colorado State Parks
- Colowyo Mine
- Garfield County Board of Commissioners
- Dinosaur National Monument
- Honorable Cory Gardner, Honorable Michael Bennet
- Jackson County Board of County Commissioners
- Mesa County, Administrators office and Planning Division

- Moffat County Board of County Commissioners
- Natural Resource Specialist, Bureau of Reclamation, Eastern CO Area Office
- Rio Blanco County Board of Commissioners
- Representative Scott Tipton
- Rocky Mountain National Park
- Routt County Commissioners
- Senators Bennett, Gardner, and Tipton
- State Forest State Park
- Town of Collbran
- Town of DeBeque
- Trapper Mining, Inc.
- US Environmental Agency, Denver
- US Forest Service, Arapaho and Roosevelt National Forests
- US Forest Service Medicine Bow-Routt National Forests
- US Forest Service, Lakewood
- US Fish and Wildlife Service, Lakewood
- US National Park Service, Lakewood
- Yampa Valley Land Trust

**Cultural Resources:**

Please see table 1.4.1 in Chapter 1 for a listing of Tribes that were consulted with about the proposed action under scoping, which includes the parcels in the proposed and preferred actions.

Many tribal offices are closed or operating at limited capacity due to the restrictions imposed by the ongoing COVID-19 pandemic. This has caused delays in consultation responses. Consultation is ongoing, and BLM will continue efforts to complete tribal consultation prior to issuing leases.

**LIST OF PREPARERS AND PARTICIPANTS:**

**Table 4.1.1 List of Preparers and Participants**

<i>Name</i>	<i>Title</i>	<i>Area of Participation</i>
<b>White River Field Office</b>		
Paul Daggett	Mining Engineer	Floodplains, Hydrology/Ground and Surface, Minerals/(Fluid and Solid) and Geology, Soils, Groundwater and Surface Quality
Kyle Frary	Fire Management Specialist	Fire Management
Shawn Wiser	Wildlife Biologist	Riparian/Wetland, Aquatic and Terrestrial Wildlife, Special Status Animals, Migratory Birds
James Roberts	Hazardous Materials	Hazardous Materials
Lukas Trout	Archaeologist	Cultural Resources, Paleontological Resources, Native American Religious Concerns

Heather Woodruff	Ecologist	Upland Vegetation, Invasive/ Non-Native Species, Wild Horses, Livestock Operations, Forestry, Areas of Critical Environmental, Special Status Plant Species
Alan Czepinski	Recreation Specialist	Visual Resources, Hazardous or Solid Wastes, Lands with Wilderness Characteristics, Recreation, Access and Transportation, Wilderness, Scenic Byways
<b>Kremmling Field Office</b>		
Paula Belcher	Hydrologist	Air Quality, Floodplains, Hydrology/Ground and Surface, Minerals/(Fluid and Solid) and Geology, Soils, Groundwater and Surface Quality
John Monkouski	Outdoor Recreation Planner	Recreation, Access and Transportation, Scenic Byways, Lands with Wilderness Characteristics
Bill Wyatt	Archaeologist	Cultural Resources, Paleontological Resources, Native American Religious Concerns
Bill Falvey	Wildlife/GIS Specialist	Riparian/Wetland, Aquatic and Terrestrial Wildlife, Special Status Animals, Migratory Birds/GIS
Tiffany Rubalcaba	Wildlife	Special Status Plants
<b>Colorado State Office</b>		
Amy Stillings	Economist	Social and Economic Conditions; Environmental Justice; Social Cost of Carbon
Forrest Cook	Air Resource Specialist	Air Resources
Diane Mastin/Leah Waldner	Natural Resource Specialist	Greater Sage-grouse
<b>Northwest Colorado District Office</b>		
Erin Jones	NEPA Coordinator	Technical Review, NEPA review
Danielle Courtois	Oil and Gas NEPA Coordinator	Writer, Technical Review, NEPA review

**Attachment A**  
**All Parcels/Proposed Action with Stipulations for Lease**

The Bureau of Land Management is analyzing 2 parcels containing 240.00 acres in the State of Colorado for the September 2020 Oil & Gas lease sale.

White River FO- 1 parcel, 120.000 acres

Kremmling FO- 1 parcel, 120.000 acres

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

**PARCEL ID: 8559**

T.0020S., R.1030W., 6TH PM

Section 16: E2NW,SWNW;

Rio Blanco County

Colorado 120.000 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 LN-CO-57 to protect wildlife migration corridors and winter range

All lands are subject to Exhibit WR-TL-14 to reduce the intensity, frequency, and extent of disturbances imposed on big game animals occupying defined winter range and winter concentration area habitats during periods when animals are physiologically or energetically challenged.

All lands are subject to Exhibit WR-TL-15 to prevent disruptions of nesting raptors that are not identified as special status that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

All lands are subject to Exhibit WR-LN-12 to protect paleontological resources.

T.0020S., R.1030W., 6TH PM  
Section 16: E2NW;

PVT/BLM; CON: WRFO

**PARCEL ID: 8560**

T.0100N., R.0790W., 6TH PM  
Section 21: N2NW, SENW;

Jackson County  
Colorado 120.000 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 LN-CO-57 has been added to protect wildlife migration corridors and winter range

All lands are subject to Exhibit GRSG NSO-46e(1) stipulation to leases in PHMA. No Surface Occupancy in PHMA.

All lands are subject to Exhibit GRSG TL-46e within 4 miles of active leks during lekking, nesting, and early brood-rearing (March 1 to July 15). No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood-rearing (March 1 to July 15).

All lands are subject to Exhibit GRSG LN-46e for leases in PHMA: Limit surface disturbance to 3 percent and limit density of infrastructure to 1 per 640 acres in PHMA.

All lands are subject to Exhibit KFO-TL-3 to protect big game crucial winter range.

All lands are subject to Exhibit KFO-LN-2 to protect endangered species

All lands are subject to Exhibit KFO-LN-4 to protect important sage grouse habitat

The following lands are subject to KFO-NSO-11 to protect nesting bald and golden eagles:

T.0100N., R.0790W., 6TH PM  
Section 21: NWNW

PVT/BLM; CON: KFO

**Attachment B**  
**Recommended Parcels for Deferral or Removal**

One parcel has been deferred from the September 2020 lease sale, in the Kremmling Field Office

**PARCEL ID: 8560**

T.0100N., R.0790W., 6TH PM

Section 21: N2NW,SENW;

Jackson County

Colorado      120.000 Acres

**Attachment C**  
**Parcels Available with Stipulations for Lease**

The Bureau of Land Management is analyzing 1 parcel containing 120.00 acres in the State of Colorado for the September 2020 Oil & Gas lease sale.

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

**PARCEL ID: 8559**

T.0020S., R.1030W., 6TH PM

Section 16: E2NW,SWNW;

Rio Blanco County

Colorado      120.000 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 LN-CO-57 has been added to protect wildlife migration corridors and winter range

All lands are subject to Exhibit WR-TL-14 to reduce the intensity, frequency, and extent of disturbances imposed on big game animals occupying defined winter range and winter concentration area habitats during periods when animals are physiologically or energetically challenged.

All lands are subject to Exhibit WR-TL-15 to prevent disruptions of nesting raptors that are not identified as special status that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

All lands are subject to Exhibit WR-LN-12 to protect paleontological resources.

The following lands are subject to Exhibit WR-TL-13 to reduce the intensity, frequency, and extent of disturbances imposed on big game animals occupying defined summer range during periods when animals are physiologically or energetically challenged:

T.0020S., R.1030W., 6TH PM



Section 16: E2NW;

T.0020S., R.1030W., 6TH PM

Section 16: E2NW;

PVT/BLM; CON: WRFO

**Attachment D**  
**Stipulation Exhibits**

**EXHIBIT CO-34**  
**ENDANGERED SPECIES ACT**  
**SECTION 7 CONSULTATION STIPULATION**

Lease Number: <LEASE\_NUMBER>

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>

**EXHIBIT CO-39  
CULTURAL RESOURCES  
CONTROLLED SURFACE USE**

Lease Number: <LEASE\_NUMBER>

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:

<LEGAL\_DESCRIPTIONS>

**EXHIBIT CO-56  
AIR QUALITY  
LEASE NOTICE**

Lease Number: <LEASE\_NUMBER>

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\_DESCRIPTION>

**EXHIBIT CO-57**  
**WILDLIFE-MIGRATION CORRIDOR & WINTER RANGE**  
**LEASE NOTICE**

Lease Number: <LEASE\_NUMBER>

The lease area is located within a big game migration corridor and/or big game winter range identified or currently under review by Colorado Parks and Wildlife. The lessee or their designated operator will be required to work with the BLM and coordinate with Colorado Parks and Wildlife to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor and big game winter range functionality. Big game seasonal migration corridors and big game winter range are 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. The BLM will encourage the use of Master Development Plans for operations proposed on this lease in accordance with Onshore Oil and Gas Order No. 1.

On the lands described below:

<LEGAL\_DESCRIPTION>

## **White River Field Office Exhibits**

**EXHIBIT WR-TL-13  
BIG GAME SUMMER RANGE  
TIMING LIMITATION**

Lease Number: <LEASE\_NUMBER>

**Stipulation:** All defined big game summer range areas within the WRFO (see Map 2-7) will be subject to a timing limitation from May 15 through August 15 which will be applied through lease stipulations or as COAs that could extend up to 90 days.

**On the following lands described below:**

<LEGAL\_DESCRIPTIONS>

**Purpose:** Timing limitations are intended to reduce the intensity, frequency, and extent of disturbances imposed on animals occupying important seasonal habitats during periods when animals are physiologically or energetically challenged. The behavioral response of animals exposed to these disturbances generally elevates energetic demands (e.g., avoidance movements, elevated metabolism) or reduces foraging efficiency (e.g., disuse of available resources, reduced foraging efficiency) which suppresses animal fitness or reproductive performance. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby reduce the extent of seasonal ranges subject to cumulative and chronic adverse behavioral effects (i.e., harassment, avoidance) attributable to oil and gas development.

**Exception:** The Authorized Officer may grant an exception for clustered development remaining within the acute and collective thresholds described below (evaluated by total leaseholdings within a GMU). In short, the threshold allowances are a predetermined percentage of each seasonal range within a leaseholding (i.e., listed below). To qualify for timing limitation exceptions, the extent of fluid mineral development activity, as measured by the area encompassed by 200-meter buffers surrounding development features (i.e., routes, pipelines, pads) within a leaseholding, must not exceed the acreage represented by those threshold allowances. For leaseholders that do not choose to participate in clustered development strategies within threshold allowances, exceptions could be granted if:

- 1) An environmental analysis indicates that the proposed action can be conditioned so as not to interfere cumulatively with habitat function or utility, or compromise animal condition within the project vicinity;
- 2) The proponent, BLM, and CPW negotiate mitigation that would satisfactorily offset anticipated impacts to big game seasonal range function or utility; or
- 3) For actions intended to enhance the long term utility or availability of suitable habitat. This latter set of exceptions is intended to be considered in the context of a project's contribution to cumulative effects through project life and not granted as a means of circumventing



clustered development strategies that are meant to reduce spatial and temporal exposure of big game to behavioral disturbance.

Acute Thresholds: The area of acute effects are defined by the physical footprint of those concentrated, intensive activities associated with, for example, pad and pipeline construction and well drilling and completion operations buffered by 660 feet on all seasonal ranges.

- 20 percent of deer winter range.
- 15 percent of deer severe winter range.
- 15 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 0 percent of defined Restricted Development Areas.

Collective Thresholds: The area of collective effects include the area of acute effects in addition to all residual and incomplete lease development activities buffered as above, including but not limited to: access corridors, multiple well pads awaiting further drilling or not meeting interim reclamation success criteria, linear ROWs that support vehicle traffic after final reclamation, and facilities receiving frequent visitation (i.e., an average greater than seven vehicle trips per pad per week).

- 20 percent of deer winter range.
- 20 percent of deer severe winter range.
- 20 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 5 percent of defined Restricted Development Areas.

The area of acute effects will be exempt from big game seasonal timing limitations as long as lease development activities are managed to not exceed the threshold allowances for collective and acute effects. Minor work involving lower intensity activity (e.g., installation of production facilities, reclamation) within the area of remaining collective effects would, where practicable, be subject to timing limitations. Construction activity that is unrelated to the exercise of lease rights would continue to be subject to timing limitations as established above. Development activities that may affect adjoining leaseholders' acreage may be assessed against the proponent's threshold allowances. Access or other features and facilities used in common may be prorated by operator.

Adverse effects that exceed either the acute or collective threshold will nullify the timing limitation exemptions and subject all leaseholding development to timing limitations as established above.

Because there is no allowance for acute activity (i.e., 0 percent) in Restricted Development Areas, the manner in which these areas would be managed in the context of the threshold strategies differs from its application elsewhere. In these cases, intensive development activities normally assigned to the "acute" effects category would generally be allowed only during those timeframes outside the period of animal occupation (i.e., similar to traditional application of

timing limitations). The accumulation of collective activity would remain subject to a threshold allowance of 5 percent.

**Modification:** The Authorized Officer may modify the size and time frames of this stipulation if:

- 1) CPW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation;
- 2) The proposed action could be conditioned so as not to interfere with habitat function or utility, or compromise animal condition;
- 3) The proponent, BLM, and CPW agree to mitigation that satisfactorily offsets anticipated impacts to big game fitness, productivity, or habitat condition; or
- 4) For actions intended to enhance the long term utility or availability of suitable habitat.

**Waiver:** The Authorized Officer may grant a waiver if CPW determines that the lease area is no longer utilized for, or capable of serving as, seasonal habitat for big game.

**EXHIBIT WR-TL-14**  
**BIG GAME AND WINTER CONCENTRATION AREAS**  
**TIMING LIMITATION**

Lease Number: <LEASE\_NUMBER>

**Stipulation:** All defined big game winter range and winter concentration areas(see Map 2-7) will be subject to deferrals of up to 60 days within the period of December 1 through April 30 in stratified zones of seasonal use (refined set of seasonal use timeframes developed in coordination with CPW). Timing limitations will typically be applied regardless of weather conditions (i.e., address of chronic influences).

**On the following lands described below:**

<LEGAL\_DESCRIPTIONS>

**Purpose:** Timing limitations are intended to reduce the intensity, frequency, and extent of disturbances imposed on animals occupying important seasonal habitats during periods when animals are physiologically or energetically challenged. The behavioral response of animals exposed to these disturbances generally elevates energetic demands (e.g., avoidance movements, elevated metabolism) or reduces foraging efficiency (e.g., disuse of available resources, reduced foraging efficiency) which suppresses animal fitness or reproductive performance. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby reduce the extent of seasonal ranges subject to cumulative and chronic adverse behavioral effects (i.e., harassment, avoidance) attributable to oil and gas development.

**Exception:** The Authorized Officer may grant an exception for clustered development remaining within the acute and collective thresholds described below (evaluated by total leaseholdings within a GMU). In short, the threshold allowances are a predetermined percentage of each seasonal range within a leaseholding (i.e., listed below). To qualify for timing limitation exceptions, the extent of fluid mineral development activity, as measured by the area encompassed by 200-meter buffers surrounding development features (i.e., routes, pipelines, pads) within a leaseholding, must not exceed the acreage represented by those threshold allowances. For leaseholders that do not choose to participate in clustered development strategies within threshold allowances, exceptions could be granted if:

- 1) An environmental analysis indicates that the proposed action can be conditioned so as not to interfere cumulatively with habitat function or utility, or compromise animal condition within the project vicinity;
- 2) The proponent, BLM, and CPW negotiate mitigation that would satisfactorily offset anticipated impacts to big game seasonal range function or utility; or
- 3) For actions intended to enhance the long term utility or availability of suitable habitat. This latter set of exceptions is intended to be considered in the context of a project's contribution

to cumulative effects through project life and not granted as a means of circumventing clustered development strategies that are meant to reduce spatial and temporal exposure of big game to behavioral disturbance.

Acute Thresholds: The area of acute effects are defined by the physical footprint of those concentrated, intensive activities associated with, for example, pad and pipeline construction and well drilling and completion operations buffered by 660 feet on all seasonal ranges.

- 20 percent of deer winter range.
- 15 percent of deer severe winter range.
- 15 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 0 percent of defined Restricted Development Areas.

Collective Thresholds: The area of collective effects include the area of acute effects in addition to all residual and incomplete lease development activities buffered as above, including but not limited to: access corridors, multiple well pads awaiting further drilling or not meeting interim reclamation success criteria, linear ROWs that support vehicle traffic after final reclamation, and facilities receiving frequent visitation (i.e., an average greater than seven vehicle trips per pad per week).

- 20 percent of deer winter range.
- 20 percent of deer severe winter range.
- 20 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 5 percent of defined Restricted Development Areas.

The area of acute effects will be exempt from big game seasonal timing limitations as long as lease development activities are managed to not exceed the threshold allowances for collective and acute effects. Minor work involving lower intensity activity (e.g., installation of production facilities, reclamation) within the area of remaining collective effects would, where practicable, be subject to timing limitations. Construction activity that is unrelated to the exercise of lease rights would continue to be subject to timing limitations as established above. Development activities that may affect adjoining leaseholders' acreage may be assessed against the proponent's threshold allowances. Access or other features and facilities used in common may be prorated by operator.

Adverse effects that exceed either the acute or collective threshold will nullify the timing limitation exemptions and subject all leaseholding development to timing limitations as established above.

**Modification:** The Authorized Officer may modify the size and time frames of this stipulation if:

- 1) CPW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation;
- 2) The proposed action could be conditioned so as not to interfere with habitat function or utility, or compromise animal condition;
- 3) The proponent, BLM, and CPW agree to mitigation that satisfactorily offsets anticipated impacts to big game fitness, productivity, or habitat condition; or
- 4) For actions intended to enhance the long term utility or availability of suitable habitat.

**Waiver:** The Authorized Officer may grant a waiver if CPW determines that the lease area is no longer utilized for, or capable of serving as, seasonal habitat for big game.

**EXHIBIT WR-TL-15  
RAPTOR NESTS  
(NOT CONSIDERED SPECIAL STATUS SPECIES)  
TIMING LIMITATION**

Lease Number: <LEASE\_NUMBER>

**Stipulation:** Surface-disturbing and disruptive activities will not be allowed within 0.25 mile of active nest sites of those raptors that are not considered special-status during the period from nest territory establishment to dispersal of young from nest (within a period from February 1 through August 31).

**On the following lands described below:**

<LEGAL\_DESCRIPTIONS>

**Purpose:** To prevent disruptions of nesting raptors that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

**Exception:** An exception to the TL can be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to interfere with adult attendance and visitation of the nest site, jeopardize survival of the eggs or nestlings, or otherwise impair the utility of nest for current or subsequent nesting activity or occupancy. The Authorized Officer may also grant an exception if the nest is unattended or remains unoccupied by May 15 of the project year. An exception may be granted to these dates by the Authorized Officer, consistent with policies derived from federal administration of the Migratory Bird Treaty Act.

**Modification:** The Authorized Officer may modify the TL dates or buffer distances if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to interfere with adult attendance and visitation of the nest site, jeopardize survival of the eggs or nestlings, or otherwise impair the utility of the nest site for current or subsequent nest activities or occupation. The stipulation may also be modified if the proponent, BLM, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of 5 years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10 year period.

**Waiver:** The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of site occupation within the lease area in the long term.

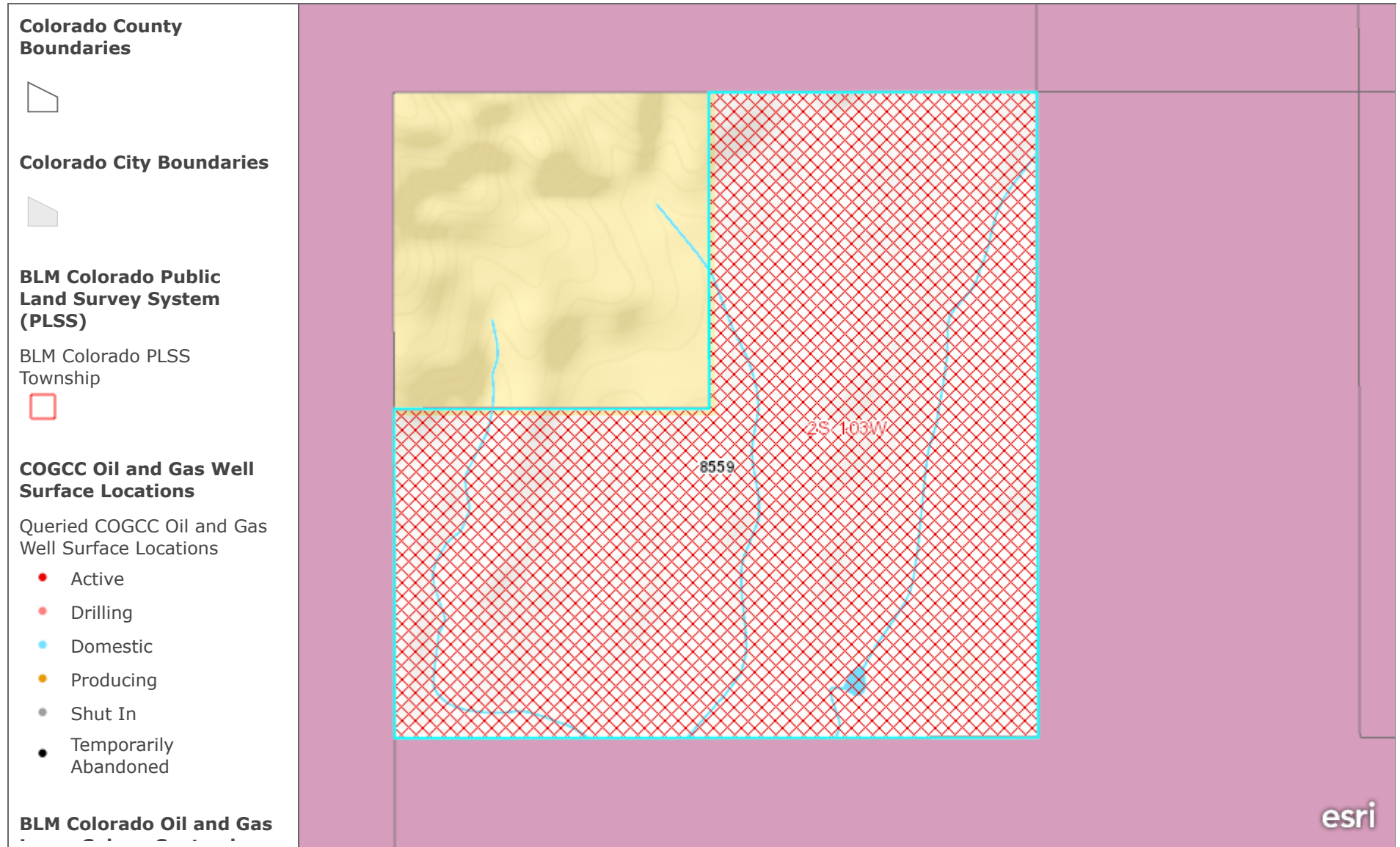
**EXHIBIT WR-LN-12  
PALEONTOLOGICAL VALUES  
LEASE NOTICE**

Lease Number: <LEASE\_NUMBER>

**Lease Notice:** An on-the-ground survey will be required prior to approval of any surface disturbing activities to avoid resource bearing strata for PFYC Class 4 and 5 formations. Mitigation may be required upon the discovery of any vertebrate fossil or other scientifically-important paleontological resource. Mitigation of scientifically important paleontological resources may include avoidance, monitoring, collection, excavation, or sampling. Mitigation of discovered scientifically important paleontological resources might require the relocation of the disturbance over 330 feet. This and any subsequent mitigation work shall be conducted by a BLM-permitted paleontologist. The lessee shall bear all costs for inventory and mitigation (WO IM-2009-011). Exceptions to the survey requirement in these areas could be granted in areas having vertical to near vertical (i.e., unsafe) slopes, areas of soil development, and areas covered with much vegetation, as these areas will be unlikely to produce recoverable fossils. For larger projects, an on-the-ground survey sample may be required of some likely fossiliferous PFYC Class 3 areas.

**On the following lands described below:**  
<LEGAL\_DESCRIPTIONS>

# BLM Colorado Oil and Gas Lease Sale - September 2020

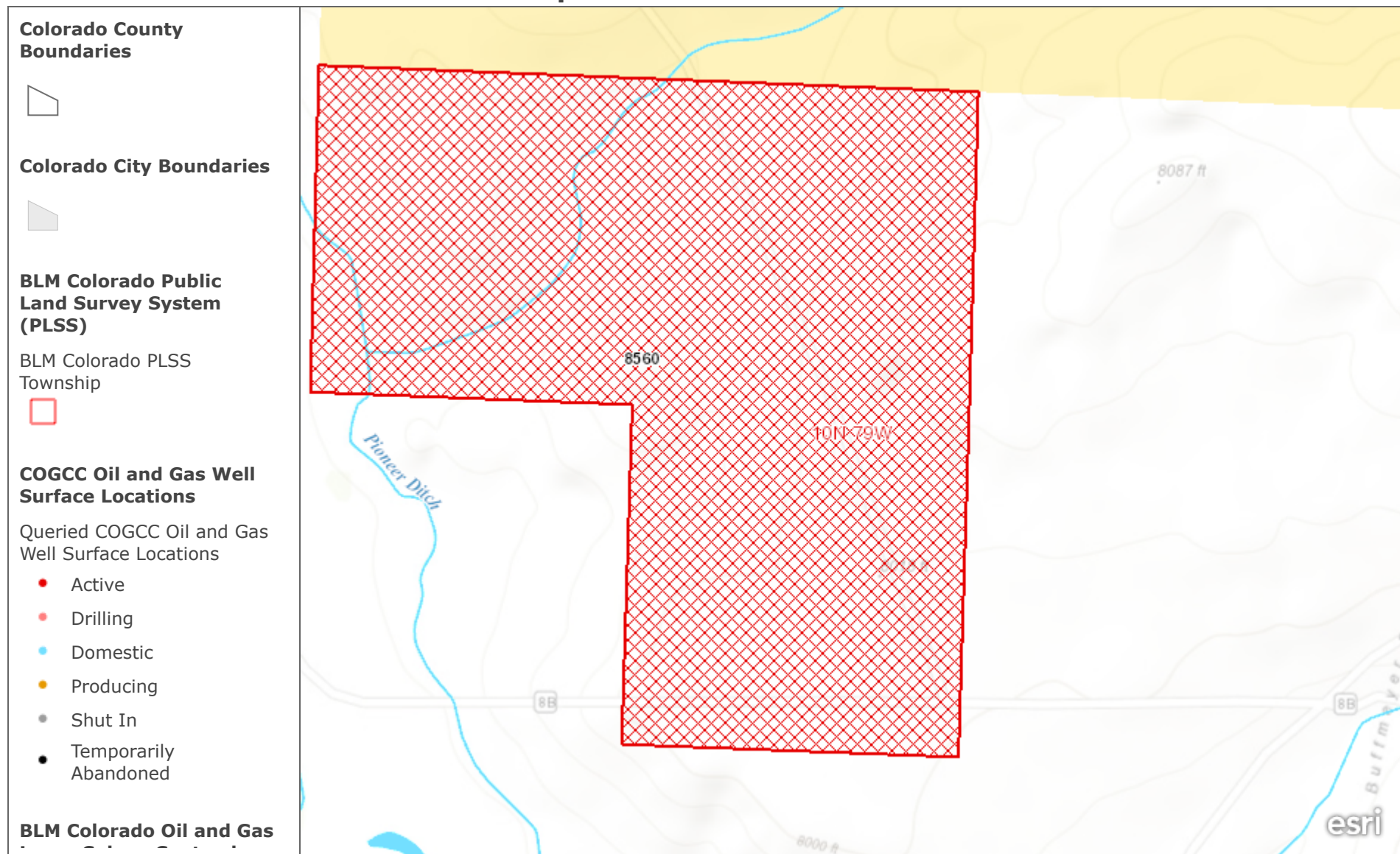


Web map for the BLM Colorado oil and gas lease sales for September 2020 to be used for the web mapping application for the sale.

Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA | BLM Colorado | USGS TNM – National Hydrography Dataset. Data Refreshed April, 2020. | Compiled by Bureau of Land Management Colorado State Office | Colorado Oil and Gas Conservation Commission | US Census



# BLM Colorado Oil and Gas Lease Sale - September 2020



Web map for the BLM Colorado oil and gas lease sales for September 2020 to be used for the web mapping application for the sale.

600ft

**Attachment F**  
**Summaries of Public and State Agency Comments with BLM Responses**  
**WRFO, LSFO, KFO Parcels**  
**September 2020 Lease Sale**  
**(Full Comments Available upon Request)**

**(Summaries of scoping comments begin on page 25.)**

Comment Number	Organization	Commenter	Synopsis of Comment	BLM Response
<b>Air Quality and GHGs and Climate Change</b>				
1	Colorado Department of Public Health and Environment (CDPHE)	Sean Hackett	<p>BLM should prepare an EIS for this proposed lease sale. At a minimum, the EIS should consider the above referenced parcels of concern. The EIS should address cumulative air quality impacts of this proposed lease sale, including climate change impacts. It should include a description of the anticipated environmental impacts of the proposed action in relationship to all other effects from past, present and reasonably foreseeable future federal, non-federal, and private actions within the spatial and temporal bounds of the proposed lease sale. Given the national, cumulative nature of climate change, considering each individual drilling project in a vacuum deprives the BLM and the public of the context necessary to evaluate the totality of air pollutants and green house gases.</p> <p>Additionally, consistent with NEPA’s requirements that an agency consider possible conflicts between the proposed action and the objectives of state plans and policies</p> <p>(40 C.F.R. § 1502.16(c); 1506.2(d)), the EIS should discuss any inconsistencies with Colorado’s efforts to:</p> <ul style="list-style-type: none"> <li>• maintain PM10 federal standards;</li> <li>• achieve visibility goals under the federal Regional Haze Rule;</li> <li>• attain federal ozone standards;</li> </ul>	<p>The September 2020 Lease Sale EA includes a comprehensive analysis for potential air quality pollutant and related values impacts, and GHG emissions and Climate Change. It was determined that no significant impacts or concerns would occur as a result of the Federal actions associated with authorizing the subject leases and subsequent development of potential new Federal oil and gas on the lease parcels, and it was deemed that an EIS was not necessary for the air resource assessment.</p> <p>An EIS is not required because the GHG and climate change assessment completed for this lease sale EA is adequate and comprehensive and addresses all the applicable and relevant climate change questions. The EA includes direct and indirect GHG emissions estimates for new oil and gas development that could occur on the lease parcels, and cumulative GHG and climate change information from BLM’s Greenhouse Gas and Climate Change Report. In addition, the EA included information from a BOEM analysis that was conducted for BLM Colorado using BOEM’s MarketSim model to describe potential differences for the No-Action and Proposed Action Alternatives. The lease sale EA used the CARMMS 2.0 modeling study that assesses cumulative Colorado-wide impacts to air quality pollutants and related values due to projected new Federal and non-Federal oil and gas development through year 2025. As described in the EA, overall cumulative air quality related conditions are</p>

- reduce GHG emissions in accordance with House Bill 1261 (50% reduction by 2030 and 90% reduction by 2050) and;

prioritize public health, safety, welfare, the environment and wildlife resources during oil and gas development as provided for in Senate Bill 19-181.

expected to improve into the future and foreseeable new federal oil and gas development within WRFO and KFO would not cause significant impacts to regional air resources.

BLM and CDPHE currently have an MOU for exchanging data and information to assist CDPHE with developing future federal and non-federal oil and gas emissions inventories for Colorado State Implementation Plan (SIP) demonstrations. BLM Colorado follows protocol for conducting analyses for proposed projects within sensitive air quality areas including the northeast Colorado ozone NAA.

Modeling analyses for the Regional Haze Rule assessments are currently ongoing (2020), and the BLM is working with Stakeholders for source apportioning Federal oil and gas emissions contributions to the cumulative Regional Haze impacts to better understand what sources are driving visibility impacts for the Region.

HB 19-1261 may result in new Colorado Air Quality Control Commission regulations to achieve its GHG emission reduction goals. As noted in the EA, such reductions, if achieved, would change the cumulative impacts of emissions resulting from BLM decisions, and BLM will continue to evaluate emission trends in its future decision-making.

BLM Colorado develops detailed and accurate emissions inventories when proposed projects are submitted to the BLM. BLM Colorado uses regional modeling studies including the CARMMS and near-field analysis tools including AERMOD to account for all potential impacts associated with a project and cumulative emissions sources in order to afford protection to all valuable resources.

New Federal oil and gas development that could occur on the subject lease parcels would not be located within an air

				pollutant non-attainment or maintenance area, and all future Federal oil and gas development (and operations) will be required to follow applicable State and Federal pollution control laws..
2	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffe, Senior Attorney	<p>BLM Fails to Take a Hard Look at the Direct, Indirect, and Cumulative Impacts that Will Result from Greenhouse Gas Emissions from the Proposed Action.</p> <ul style="list-style-type: none"> <li>• BLM’s Comparison of the Impacts Between the No Action Alternative and the Preferred Alternative is Arbitrary.</li> <li>• BLM Fails to Fully Assess the Direct and Indirect Greenhouse Gas Emissions That Will Result from the Lease Sale.</li> </ul> <p>We request that BLM disclose how it reached its direct GHG emissions rate</p> <p>We also suggest that BLM include additional information in its direct and indirect greenhouse gas emissions analysis to disclose whether it considered greenhouse gases beyond CO2.</p> <ul style="list-style-type: none"> <li>• BLM Fails to Analyze Cumulative Greenhouse Gas Emissions That Will Result from the Proposed Action.</li> <li>• BLM Fails to Assess the Proposed Action Within the Context of Recent, Significant Climate Science.</li> <li>• BLM Fails to Assess the Proposed Action Within the Context of Declining Carbon Budgets.</li> </ul>	<ul style="list-style-type: none"> <li>• For the EA No-Action Alternative GHG emissions discussion, the model provides net substitution assessments for oil and gas imports, onshore oil and gas production, fuel switching (e.g., coal), and reduced energy consumption (demand) for a given period of time. For this BOEM analysis, BLM wanted to see how the energy markets and Global GHG emissions profiles would be affected should (hypothetically) the energy market not receive / include ~ 6 years (years 2019 – 2025) of new Colorado Federal oil and gas production. Smaller quantities of new oil and gas production such as the new oil and gas that could be produced from the subject lease parcels could have been evaluated for the BOEM analysis, but BLM wanted to see the energy market and Global GHG emissions impacts for removing a larger quantity of new oil and gas production that reasonably could result in noticeable market / Global shifts. As described in the BOEM report and EA, MarketSim predicts that under the statewide federal “No Development” scenario, emissions from substitute sources would equate to approximately 91 percent of the Colorado federal oil and gas GHG emissions (as CO2e) associated with the 6-year full new oil and gas development scenarios. Using these information, it is reasonable to conclude that removing smaller quantities of new Federal oil and gas production (amounts that could occur for new oil and gas production on the subject lease parcels) would provide similar results or not impact the energy markets as much (i.e more energy would be developed elsewhere to offset). The BOEM analysis conducted for the BLM Colorado is useful for levels of new oil and gas production equivalent to that analyzed (~ 6 years of new Colorado-wide Federal oil and gas production) and smaller quantities of new Federal oil and gas production.</li> </ul>

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|  |  |  |  | <ul style="list-style-type: none"> <li>• The EA provides per-well GHG emissions rates for up-stream (direct), mid-stream (indirect) and down-stream (indirect) activities and processes, and then provides 30-year projected total potential CO<sub>2</sub>e emissions for new federal oil and gas development on the subject parcels using these per-well rates along with reasonably foreseeable new oil and gas development rate based on historical well development density information. The direct GHG emissions were estimated based on northwest Colorado oil and gas emissions rates for active wells in areas near the lease parcels, and account for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions from initial upstream construction and long-term upstream/midstream operational activities. The indirect GHG estimates primarily account for CO<sub>2</sub> emissions associated with downstream combustion of oil and gas that could be produced from the lease parcels. These projected GHG emissions estimates for new Federal oil and gas development are compared to other GHG emissions estimates to provide context for analysis.</li> <li>• In addition to the direct and indirect GHG emissions estimated for new oil and gas development that could occur on the lease parcels, the EA provides cumulative GHG and Climate Change information from BLM’s Greenhouse Gas and Climate Change Report. Other cumulative GHG emissions estimates are provided in the EA including the 30-year (years 2020–2050) CO<sub>2</sub>e emissions total for the region including the U.S. (R50ECD World Region) under the IPCC concentration pathway for smallest climate change scenario (RCP 2.6) to provide for comparing other GHG emissions estimates to the Global modeled scenario with the lowest predicted climate changes.</li> <li>• The lease sale EA references BLM Colorado’s Annual Report 2.0, which incorporates GHG emissions projections and qualitative information about climate change from IPCC’s latest published Synthesis Report (Fifth Assessment [AR5]). The IPCC Synthesis Report describes future Global climate model predicted changes for the Rocky Mountain Region, based on multiple hypothetical</li> </ul> |
|--|--|--|--|--|

				<p>future (through year 2100) emissions scenarios that account for changes in future Global energy profiles (accounting for U.S. federal oil and gas growth and decline for all States). A 30-year (years 2020–2050) GHG emissions sub-set of these projected Global emissions estimates for Region including U.S. (R50ECD World Region) are provided in the EA to provide context for analysis.</p> <ul style="list-style-type: none"> <li>• The Annual Report 2.0 also includes information from IPCC’s latest Special Report (SR15), which includes Carbon Budget revisions to account for problems associated with the Earth System Models used in the AR5 budget estimates. Information regarding the Global Carbon Project is also incorporated for the lease sale EAs.</li> <li>• The lease sale EA discussed and incorporated by reference information from the BLM Colorado online Annual Report 2.0 and BLM’s GHG and Climate Change Report. The Annual Report 2.0 includes information from IPCC’s latest Special Report (SR15) regarding the Global Carbon Project. The EA provides information describing the carbon budget and federal oil and gas GHG emissions contributions to the carbon budget.</li> </ul>
3	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	<ul style="list-style-type: none"> <li>• BLM must analyze climate impacts at the leasing stage. It is well established that federal agencies must analyze climate change when conducting NEPA, including in this lease sale analysis. The NEPA requirement to consider climate change has been repeatedly upheld by the courts. The underlying RMPs are inadequate to support leasing without supplemental NEPA. BLM has never adequately considered the potential climate impacts of issuing the proposed leases. The governing RMPs for the field offices included in this lease sale did not include climate change analysis appropriate to this discrete leasing decision, which requires greenhouse gas quantification and cumulative impact analysis among other elements, but rather discussed climate change at a general level relevant to the high-level NEPA analysis undertaken for field office-wide RMPs. The underlying RMPs also failed to quantify the scale of methane pollution from oil and gas emission sources, and</li> </ul>	<ul style="list-style-type: none"> <li>• BLM has completed a GHG and climate change assessment in this lease sale EA. The EA includes direct (includes methane and associated CO2e based on applicable GWP value) and indirect (downstream combustion) GHG emissions estimates for new oil and gas development that could occur on the lease parcels, and cumulative GHG and climate change information from BLM’s Greenhouse Gas and Climate Change Report. In addition, the EA included information from a BOEM analysis that was conducted for BLM Colorado using BOEM’s MarketSim model to describe potential differences for the No-Action and Proposed Action Alternatives. See also response to Comment #2.</li> <li>• The changes between the November 15, 2016, and the September 28, 2018, Waste Prevention, Production Subject to Royalties, and Resource Conservation rule are described in the Federal Register notice at:</li> </ul>

underestimated by an order of magnitude the global warming potential of such emissions. Because BLM did not adequately analyze climate change impacts from oil and gas leasing in the governing RMPs for these field offices, BLM must conduct that analysis as part of lease sale NEPA prior to offering oil and gas leases for sale. After a court held that the BLM did not sufficiently analyze impacts from the combustion of oil and gas as part of preparing the Colorado River Valley RMP, the agency has now committed to amending the RMP. A recent lawsuit making similar claims with respect to the Grand Junction RMP has led to the deferral of all parcels in the Grand Junction Field Office from the March 2020 lease sale.

- BLM is obligated to regulate waste under the Mineral Leasing Act and to “prevent” waste that could occur as a result of this lease sale. This includes substantive waste prevention requirements and consideration of mitigation measures to reduce waste. This obligation is buttressed by FLPMA’s mandates to prevent unnecessary or undue degradation and to manage for multiple use and sustained yield and in a manner that protects environmental, air, and atmospheric values.

We also recommended that BLM require green completion techniques for every well, require operators to install vapor recovery units at new facilities, implement emission controls for storage vessels and glycol dehydrators that would reduce emissions by 95%, ensure at least 70% of gas compression at compressor stations and well heads would be powered by electricity, and require all pneumatic controllers at gas gathering and boosting stations, well sites, and gas processing plants to meet the EPA new source performance standards (NSPS) requirements.

<https://www.federalregister.gov/documents/2018/09/28/2018-20689/waste-prevention-production-subject-to-royalties-and-resource-conservation-rescission-or-revision-of>.

BLM requires operators to adhere to applicable State and Federal pollution control requirements for new oil and gas development and operations, which include implementing green completions for new development and additional emissions controls for operational equipment and activities including storage tanks, dehy and pneumatics. As described in the EA air resources section, the BLM would continue to require that activities for projects follow best management practices and continue to encourage operators to control GHG emissions using reasonable measures. The BLM has the discretion to modify surface operations to change or add specific mitigation measures when supported by appropriate analysis. See 43 CFR 3101.1. The BLM can require these mitigation measures associated with oil and gas activities as COAs. All mitigation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into COAs in the permit, plan of development, and/or other use authorizations.

**COVID-19**

4	Grand Valley Audubon Society	Nic Korte	<p>We insist that BLM should not be proceeding with lease sales at this time because meaningful public participation in lease sales is not possible.</p> <p>We are in the midst of a national emergency around COVID-19, which is making it too difficult for people to participate</p>	<p>The BLM evaluates all its actions, including public comment periods and lease sales, on a case-by-case basis. BLM regularly posts all information about upcoming lease sales online and completes its public involvement requirements for oil and gas lease sales through the use of ePlanning publication and electronic submission of</p>
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			in comment processes. Moving forward with comment periods and decisions that will grant leases for at least ten years when the public is unable to properly participate violates the requirements of NEPA and FLPMA. BLM’s public rooms are closed (making it difficult to conduct research or deliver lease sale protests), and state and local orders are encouraging people to stay at home and limiting travel.	<p>comments. These methods comply with stay-at-home orders and can be completed without having direct contact with others. In addition, BLM is accepting protests via ePlanning.</p> <p>Health and safety for the public and our employees is taken seriously and is BLM’s highest priority. We continue following guidance from the White House, the CDC as well as state and local authorities as we implement working in a telework environment and ensure proper social distancing.</p> <p>The BLM is finding innovative ways to ensure we are engaging with the public through a suite of virtual meeting tools, and we are making necessary adjustments to allow for appropriate public input while protecting the health and safety of the public and our employees.</p>
5	National Wildlife Federation, Colorado Wildlife Federation	Mary Greene, Suzanne O’Neill	BLM should not conduct lease sales during a national emergency. As we stated in our scoping comments, and will reiterate here, the United States is currently experiencing an unprecedented state of emergency that has upended lives across the country and helped drive the collapse of oil and gas prices. The COVID-19 pandemic will only continue intensify disruptions to daily lives and continue to significantly impact the markets. As a result, we strongly urge BLM to suspend lease sales, and to remain flexible as this scenario continues to play out.	
6	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	<p>We are in the midst of a national emergency around COVID-19, which is making it exceptionally difficult for people to participate in comment processes. Proceeding with lease sales would violate the public participation requirements of the Federal Land Policy and Management Act (FLPMA) and the National Environmental Policy Act (NEPA). As BLM has recently been reminded, “[p]ublic involvement in oil and gas leasing is required under FLPMA and NEPA” and “the public involvement requirements of FLPMA and NEPA cannot be set aside in the name of expediting oil and gas lease sales.”</p> <p>Moving forward with comment periods and decisions that will grant leases for at least ten years when the public is unable to properly participate violates the requirements of NEPA and FLPMA. BLM’s public rooms are closed (making it difficult to conduct research or deliver lease sale protests), and state and local orders are encouraging people to stay at home and limiting travel.</p>	
<b>Hydraulic Fracturing</b>				
7	Wild Earth Guardians and Centers for	Rebecca Fisher, Climate and Energy Program Attorney and Diana	The White River/Kremmling EA fail to include a discussion of the impacts from fracking, including failing to calculate water used for the procedure, air pollution produced, impacts to public health, and impacts to wildlife. Indeed, BLM solely discusses fracking in response to comments and not in the	In the EA, BLM discusses its rationale for concluding that none of the alternatives are expected to result in potentially significant hydraulic fracturing impacts that have not been considered in previous analyses, and further analysis is not



	Biological Diversity	Dascalu-Joffe, Senior Attorney	body of the EAs. To fully assess whether the proposed lease sale poses significant impacts, BLM must analyze, quantify, and disclose the impacts of fracking in an EIS. Unless and until this occurs, both EAs for the September lease sale are deficient and in violation of NEPA. Fracking consistently presents a risk of contamination and oil and gas in Colorado consistently occurs near populated areas, thereby resulting in public outcry and threats to health and safety.	<p>necessary to make a reasoned choice among the alternatives.</p> <p>As explained in the EA, if oil and gas operations are proposed for any of the subject lease parcels, the BLM will complete a site-specific NEPA analysis of the proposal(s) utilizing the best available and most current data. That NEPA analysis would address proposed completion activities (such as hydraulic fracturing) and would address project-specific health and safety impacts through the application of general and site-specific conditions of approval. In addition, BLM’s Onshore Orders require the design and conduct of drilling, completion, and production activities to consider human health and safety. This site-specific NEPA analysis would guide the BLM’s decision whether to approve the proposed oil and gas operations, and if so, under what permit conditions.</p> <p>The BLM has regulations and policies intended to protect public health as well as the environment by avoiding or minimizing public exposures to substances or emissions with the potential to affect human health. Please see Table 1.4.3 of the EA for a list of protections aimed at protecting surface water and groundwater, including waters used for domestic or municipal drinking water</p> <p>The CARMMS 2.0 Study was used for this lease sale EA to assess potential cumulative air quality pollutant and related value impacts for Colorado-wide new oil and gas development including that which could occur on the subject lease parcels. The CARMMS 2.0 emissions inventories and the GHG direct emissions estimates included in the EA account for emissions associated with hydraulic fracturing equipment and processes.</p>
8	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffe, Senior Attorney	The need for BLM to postpone the September 2020 lease sale pending a more complete NEPA analysis is further underscored by the fact that BLM has yet to take a “hard look” at the impacts of fracking.	See response to Comment #7 above.

9	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffee, Senior Attorney	We also request that BLM take its analysis of impacts to water quantity a step further by estimate water usage from the lease sale as required by law.	The estimation of overall water usage associated with the development of oil and gas would be impossible to address during the leasing phase due to differences in completion techniques that are utilized for various types of developments. If oil and gas operations are proposed for any of the subject lease parcels, the BLM will complete a site-specific NEPA analysis of the proposal(s) utilizing the best available and most current data. While the State of Colorado administers the exercise of water rights in the state, BLM's NEPA analysis for proposed completion activities would include overall water usage and would address project-specific health and safety impacts through the application of general and site-specific conditions of approval. In addition, BLM's Onshore Orders require the design and conduct of drilling, completion, and production activities to consider human health and safety. This site-specific NEPA analysis would guide the BLM's decision whether to approve the proposed oil and gas operations, and if so, under what permit conditions.
<b>NEPA</b>				
10	Colorado Dept of Public Health and Environment	Sean Hackett	CDPHE respectfully requests that BLM prepare an environmental impact statement (EIS) for this proposed lease sale in order to avoid or minimize impacts to public health and environment.	The September 2020 Lease Sale EA includes a comprehensive analysis of the action alternatives that identified no potentially significant impacts that have not been previously considered in other NEPA analyses. An EIS is not necessary when an action will not result in new potentially significant impacts.
11	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffee, Senior Attorney	BLM Must Prepare an EIS to Assess Potentially Significant Impacts from All of the Lease Sale Parcels	See response to Comment #10 above.
12	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffee, Senior Attorney	BLM fails to ensure the lease sale complies with NEPA and FLPMA.	See response to Comment #10 above. Conformance with the applicable RMPs is discussed in Section 2.4 of the EA, and the application of stipulations consistent with those planning decisions is discussed in Section Attachment A.
13	Wild Earth Guardians, Audubon, et. al.		Because the September 2020 lease parcels are very near many of the Colorado, Utah, and Wyoming BLM's 2020 parcels, and countless existing oil and gas wells, the fifth intensity factor, cumulative impacts, is also implicated by the lease sale, further underscoring the need for an EIS.	In the EA, BLM has analyzed reasonably foreseeable direct and indirect impacts of leasing the proposed parcels, as well as cumulative impacts. The EA includes a description of the past, present, and reasonably foreseeable future activities that BLM considered in the cumulative impacts

			<p>According to NEPA regulations, “[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.” 40 C.F.R. § 1508.27(b)(7). This latter sentence is particularly important here. The September 2020 lease sale is not occurring in a vacuum. Indeed, both the September 2020 parcels in the White River/Kremmling and Royal Gorge Field Offices are within a few miles of many of the March 2020 parcels in Colorado and the June 2020 parcels in Wyoming. All of these states regulatory hold state lease sale auctions as well.18 BLM must catalogue these sales and study the cumulative impacts of these similar actions occurring within the same area.</p>	<p>analysis. BLM’s air quality and climate analysis discusses the impacts of the actional alternatives relative to regional air quality and GHG emissions.</p>
14	<p>Wild Earth Guardians and Centers for Biological Diversity</p>	<p>Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffe, Senior Attorney</p>	<p>BLM cannot defer site-specific NEPA analysis before proceeding with the proposed lease sale. Yet, in a number of places throughout the EA, BLM defers a full analysis to the APD stage. <i>See, e.g.</i>, RGFO EA at 25 (impacts to wildlife), 28 (impacts to big game), 30 (impacts to migratory birds); White River/Kremmling EA.</p>	<p>Some types of broad impacts of oil and gas development can be reasonably anticipated based on BLM resource specialists’ familiarity with the general area of the lease sale and reviewing of existing GIS or other resource information. These impacts are considered in determining whether offering the parcel for lease is consistent with the RMP, and in assessing whether the impacts have been sufficiently considered in the RMP EISs. Issues that warranted further consideration were analyzed in the EA, to the extent that the impacts of leasing and potential future development are reasonably foreseeable.</p> <p>In the EA, BLM explained that other development-related impacts are not reasonably foreseeable at the lease-sale stage. BLM cannot perform a more detailed analysis of the site-specific impacts of future development without the project-specific information included with an APD.</p> <p>When oil and gas operations on a leased parcel are proposed through an APD, BLM will complete a site-specific NEPA analysis of the proposal(s) utilizing the best available and most current data. The analysis may include an estimate of proposed completion activities (such as hydraulic fracturing) and would address project-specific impacts. This site-specific NEPA analysis would guide the BLM’s decision whether to approve the proposed oil and gas operations, and if so, under what permit conditions. Since the Bureau is not able to speculate on what rates and types of development may be proposed for any future APD(s) for any specific parcel, a fully comprehensive cumulative</p>

				impact analysis of leasing and development approvals that are under consideration would be too speculative to provide useful information to the decision-maker.
15	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffe, Senior Attorney	The impacts of leasing these parcels are reasonably foreseeable. As shown by the map below, there are a significant number of active oil and gas wells near the proposed parcels. Thus, as in <i>Richardson</i> , BLM is required to complete an EIS assessing the reasonably foreseeable effects of oil and gas development at the leasing stage before it irretrievably commits these lands to development.	In the EA, BLM has analyzed reasonably foreseeable direct and indirect impacts of leasing the proposed parcels, as well as cumulative impacts. The EA includes a description of the past, present, and reasonably foreseeable future activities that BLM considered in the cumulative impact analysis.
16	Wild Earth Guardians, Audubon, et. al.	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffe, Senior Attorney; Nada Culver, Vice President, Public Lands, et.al.	Because the BLM essentially analyzes only two alternatives, one no action and two full leasing alternatives, RGFO EA at 15, White River/Kremmling EA at 22, BLM fails to analyze a range of reasonable alternatives.	Leasing decisions by BLM are to lease or not to lease individual parcels. The alternatives often consist of a proposed action that includes all potential lease parcels, and a no action alternative where none of the parcels are offered for lease. In some cases, BLM may identify a preferred alternative that differs from the other two in a way that aids its analysis. The three alternatives considered in the NW June 2020 EA are sufficient for the BLM to consider the potential impacts of leasing, and make an informed decision to offer all, some, or none of the parcels for lease.
17	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	<p>The parties to these comments submitted scoping comments on April 14, 2020 (attached and incorporated by reference), which raised significant concerns regarding proceeding with leasing during the current pandemic and market conditions, compliance with the 2015 Northwest Greater Sage-grouse RMP Amendment, impacts to big game habitat and migration corridors, and climate change implications. The purpose of providing these detailed comments was to alert BLM to important issues and ensure that they were addressed prior to deciding which parcels would move forward for leasing.</p> <p>The Preliminary EAs did not respond to these comments. Attachment F identified the key issues raised in our comments, quoting from requests for analysis, consideration of alternatives and evaluation of preferable alternatives, but did <b>not</b> respond to any comments. The text of the Preliminary EAs also failed to respond to most of the issues we raised.</p>	<p>Comments received during the public scoping period were used to identify potential environmental issues and to define alternatives that meet the purpose and need for the project.</p> <p>Upon completion of scoping all comments received were sorted into themes, reviewed and synthesized to consolidate similar ideas, concepts and feedback. Scoping comments that were outside the scope of this project were set aside for further consideration. Scoping comments that provided no substantive content, such as mere statements of opinion, were not considered any further.</p> <p>All relevant substantive comments were considered as the Proposed Action was developed and analysis of impacts completed.</p> <p>The BLM does not formally respond to scoping comments; however all scoping comments remain part of the Administrative Record for the project.</p>

				Please see Attachment F for a listing of all substantive scoping comments.
18	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	Prioritizing oil and gas leasing is inconsistent with FLPMA’s multiple use mandate. BLM is subject to a multiple-use and sustained yield mandate, which prohibits the Department of the Interior (DOI) from managing public lands primarily for energy development or in a manner that unduly or unnecessarily degrades other uses.	The Federal Land Policy and Management Act of 1976 (FLPMA) requires BLM’s planning process for the management of public lands to accommodate multiple uses while also preserving public lands. Under FLPMA, public lands may be managed for commercial uses, such as livestock grazing, mineral extraction and logging; recreational uses such as fishing, hunting, off-roading; and for conservation of biological, archaeological, historical and cultural resources. BLM prepared EISs for each of the Field Office RMPs and provided periods for public comment and protest in accordance with NEPA and FLPMA. The approval of each of these RMPs serves as the final land use planning decision for the respective resource areas unless the plans are amended or revised. The lands considered in the EA are open to leasing under the current RMPs.
19	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	<p>BLM IM 2018-034 is invalid. BLM is currently implementing its oil and gas leasing program under Instruction Memorandum (IM) 2018-034, which directs BLM to expedite the oil and gas lease sale process and encourages the agency to minimize environmental review and public participation. Such an approach impedes informed decision-making, increases public controversy and prioritizes energy development above other resources and uses in violation of the multiple use mandate established in FLPMA. While the IM had been enjoined under a court ruling, the same court recently permanently vacated portions of IM 2018-034, reiterating: “Public involvement in oil and gas leasing is required under FLPMA and NEPA.” <i>Western Watersheds Project v. Zinke</i>, No. 1:18-cv-00187-REB at 32 (D. Idaho February 27, 2020).</p> <p>Beyond the now-mandated specific public comment periods for lease parcels within the planning area of the greater sage-grouse plans, the court’s ruling is yet another broader indictment of BLM’s attempts to cut the public out of oil and gas leasing decisions affecting our public lands. Noting that BLM’s efforts were explicitly tied to efforts to “streamline” the leasing process by removing the allegedly burdensome requirements for public involvement, the court found that “the public involvement requirements of FLPMA and NEPA cannot be set aside in the name of expediting oil and gas lease sales. It is axiomatic that the benefits of public</p>	BLM has completed thorough NEPA analysis of the impacts of leasing the proposed parcels, with appropriate consideration of public comments..

involvement and the protocol by which public involvement is obtained are not ‘unnecessary impediments and burdens.’”  
*Western Watersheds Project v. Zinke*, No. 1:18-cv-00187-REB at 40.

While BLM has provided a 30-day comment and indicated it will provide a 30-day protest period in connection with this lease sale, other elements of IM 2018-034 which are being applied here are likewise unlawful. For example, IM 2018-034 creates a one-sided burden on requests that BLM defer lease parcels: it requires consultation with BLM’s Washington, DC headquarters to defer parcels, but not to dismiss protests and proceed with a lease sale. IM 2018-034 also requires that BLM complete lease parcel reviews within a 6-month timeline, which severely restricts the agency’s ability to conduct thorough NEPA reviews, and solicit and respond to public input on lease parcels. IM 2018-034 is invalid in the myriad ways it burdens public participation and cannot be relied upon for this lease sale.

**North Park Region**

20

Audubon, et. al.

Nada Culver, Vice President, Public Lands, et.al.

Parcel 8560 is in the North Park area. BLM must analyze the cumulative impacts of oil and gas leasing and development in North Park. There has been extensive leasing activity in the North Park area in recent years, and the impact of parcels leased in September 2019, plus those still available that did not sell in the March 2020 sale, and proposed for the June 2020 and September 2020 lease sales would encumber significant portions of the area, including the North Park Master Leasing Plan (MLP). A map of the area and a discussion of the cumulative impacts on a host of resources are discussed in detail in our scoping comments. Despite these detailed comments and BLM’s acknowledgment that ongoing leasing and development is expected in the area (Northwest District Preliminary EA, pp. 30-31), BLM only analyzed whether the proposed leasing was in a closed portion of the MLP (Northwest District Preliminary EA, p. 15).

BLM prepared EISs for each of the Field Office RMPs and provided periods for public comment and protest in accordance with NEPA and FLPMA. The approval of each of these RMPs serves as the final land use planning decision for the respective resource areas, unless the plans are amended or revised. In the KFO RMP EIS, BLM considered the impacts of all leasing in the planning area, as well as the application of specific NSO, CSU, and TL stipulations. Based on its analysis, BLM established the North Park Master leasing plan as part of the RMP, closing 14,000 acres to leasing in the North Park area. The lands considered in the EA are open to leasing under the current RMP.

Additionally, where appropriate, stipulations related to Visual Resource Management and viewsheds of State, U.S. and Interstate highways, Scenic and Historic Byways, National Trails and National or State Parks are applied at the time of leasing. The BLM retains authority to require mitigation measures based on our site-specific and cumulative impact analysis at the development stage, either as applicant-committed design features, or separate conditions of approval.

The RMP EISs provide BLM’s analysis of cumulative effects of oil and gas development based on the reasonable, foreseeable oil and gas development (RFD) scenario for each planning area. The September 2020 EA included additional analysis of cumulative impacts for appropriate resource issues, and any APD that is submitted will also undergo a cumulative impacts analysis that takes into consideration site-specific information for the proposal.

**Water Resources-Quality**

21

Colorado Dept of Public Health and Environment

Sean Hackett

CDPHE recommends that the EIS process adequately account for source water protection planning areas (aka: drinking water protection areas) and ensure coordination with local public water providers, local government designees, municipalities and counties to evaluate the protection of public drinking water supplies in the proposed lease areas.

WQCD’s Source Water Protection Program may also be used as a resource to provide information regarding locally developed source water protection plans. Moreover, the EIS process should include evaluation of the leased areas in relation to the Colorado Oil and Gas Conservation Commission (COGCC) Rule 317B Public Water System Protection Areas. WQCD’s Source Water Protection Program recently shared Colorado’s 2017 Statewide Source Water Assessment Area dataset with Mr. Edward Rumbold, Aquatic Habitat Management Program Lead. The associated oil and gas leases should be reviewed in relationship to the most current drinking water source dataset.

None of the offered parcels are located within the mapped COGCC Rule 317B Public Water System Protection areas. The EA describes potential impacts to water resources from oil and gas development, and the stipulations that BLM has applied to the proposed parcels to minimize adverse impacts, are described in the EA. Refer to table 1.4.4, water resources.

The EPA has proposed rules intended to lower the amount of perfluoroalkyl and polyfluoroalkyl substances (PFAS) in groundwater. PFAS can be released as a result of oil and gas development. BLM will require that oil and gas operators comply with applicable EPA regulations.

Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) can be encountered during oil and gas drilling processes. BLM would require operators to comply with any applicable state or federal regulation related to TENORM pollution.

22

Colorado Dept of Public Health and Environment

Sean Hackett

When PFAS and TENORM are released into the environment, they can get into water, especially groundwater, and contaminate drinking water supplies. Due to this potential for contamination, CDPHE recommends that the EIS process adequately account for potential impacts associated with PFAS and TENORM.

See response above.

**Wildlife-Big Game and Migration Corridors**

23	Colorado Parks and Wildlife	Taylor Elm	<p>Within CPW’s April 9, 2020 scoping comments, we recommend a temporary deferral of parcel 8559 due to the presence of mule deer severe winter range and winter concentration area habitats.</p> <p>After further analysis, it is evident that much of the landscape surrounding this parcel is in excess of five producing well pads per square mile.</p> <p>At this level of development, much of the habitat value for big game has been lost. Therefore, CPW is amenable to the use of the applied winter range stipulations and lease notification CO-57 to encourage potential operators to work with CPW to avoid, minimize and mitigate further impacts to big game.</p>	<p>The following stipulations have been applied to areas as analyzed in the current RMPs to protect big game: Parcel 8559 has the following stipulation applied:</p> <ul style="list-style-type: none"> <li>All lands are subject to Exhibit WR-TL-14 to reduce the intensity, frequency, and extent of disturbances imposed on big game animals occupying defined winter range and winter concentration area habitats during periods when animals are physiologically or energetically challenged.</li> </ul> <p>Consistent with DOI Secretary’s Order No. 3362, “Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors” (Feb 9, 2018), Lease Notice CO-57 was developed in consultation with CPW and will be applied to appropriate leases in order to protect areas identified as wildlife migration corridors. The BLM will continue to coordinate with CPW to create master development plans and wildlife mitigation plans as operators develop oil and gas fields. When APDs are submitted, the BLM will cooperate with CPW to determine the need for additional mitigation, COAs, and design features.</p>
24	Theodore Roosevelt Conservation Partnership	Nick Payne	<p>In addition, Colorado Parks and Wildlife has requested the deferral of the Northwest District parcels in conflict in this lease sale until a statewide stipulation can be in place. We commend the CO BLM for committing to initiate a targeted plan amendment to address Colorado Executive Order D 2019 011 and Secretarial Order 3362, that will analyze stipulations to conserve these habitats. This planning effort should ultimately resolve the conflict in this lease sale, as well as past sales, between leasing and impacts to big game habitat. But until this planning effort is completed and implemented the BLM cannot lease these parcels and adequately protect big game. <b><i>Therefore, we request that the parcels listed below be deferred until a targeted big game RMPA can be completed, and proper conservation measures put in place for these crucial migratory and winter habitats.</i></b></p>	<p>BLM has described and analyzed the potential effects of possible future oil and gas development on big game migration corridors, to the extent reasonably foreseeable at leasing and based on the analysis within the RMPs. Lease Notice CO-57 has been applied to parcels within big game winter range and concentration areas, severe winter habitat, and production areas for the protection of big game habitats.</p>



Field Office/Parcel ID(s)	Acres	Resource Conflict(s)	Recommendation
White River Field Office/Parcel 8559	120 acres	Mule deer winter concentration area.	Defer parcels in conflict until a targeted big game migration RMPA can be completed, and proper conservation measures put in place for these crucial migratory and winter habitats.
Kremmling Field Office/Parcel 8560	120 acres	Elk severe winter range, pronghorn antelope severe winter range and winter concentration area.	Defer parcels in conflict until a targeted big game migration RMPA can be completed, and proper conservation measures put in place for these crucial migratory and winter habitats.

25	National Wildlife Federation, Colorado Wildlife Federation	Mary Greene, Suzanne O'Neill	<p>We appreciate BLM's recent commitment to undertake a statewide plan amendment to address protection of winter range and migration corridors. Until the amendment is complete, BLM must put stipulations in place that properly protect big-game. These stipulations should be specific to big-game, as sage-grouse stipulations will not sufficiently protect critical habitat or corridors. A number of parcels in the proposed lease sale overlap important big-game habitat and migration corridors:</p> <ul style="list-style-type: none"> <li>- Parcel 8559 in the White River Field Office (WRFO) is entirely within critical mule deer severe winter range</li> <li>- Parcel 8560 in the Kremmling Field Office is completely within elk severe winter range and winter concentration areas as well as a pronghorn migration corridor and severe winter range</li> </ul> <p>We urge the BLM to attached density, timing, and surface use stipulations to these parcels. If the current resource management plan does not allow for sufficiently protective stipulations, the BLM should defer the parcels until the completion of the statewide RMP.</p>
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Parcel 8559 has the following stipulation and lease notice applied:

- All lands are subject to Exhibit WR-TL-14 to reduce the intensity, frequency, and extent of disturbances imposed on big game animals occupying defined winter range and winter concentration area habitats during periods when animals are physiologically or energetically challenged.
- All lands are subject to Exhibit LN-CO-57 to protect wildlife migration corridors and winter range

Parcel 8560 has the following stipulations and lease notices applied:

- All lands are subject to Exhibit LN-CO-57 to protect wildlife migration corridors and winter range
- All lands are subject to Exhibit GRSG NSO-46e(1) stipulation to leases in PHMA. No Surface Occupancy in PHMA.
- All lands are subject to Exhibit GRSG TL-46e within 4 miles of active leks during lekking, nesting, and early brood-rearing (March 1 to July 15). No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood-rearing (March 1 to July 15).
- All lands are subject to Exhibit GRSG LN-46e for leases in PHMA: Limit surface disturbance to 3 percent and limit density of infrastructure to 1 per 640 acres in PHMA.

				<ul style="list-style-type: none"> <li>All lands are subject to Exhibit KFO-TL-3 to protect big game crucial winter range.</li> </ul>																
26		Adena Rice	<p>I request that BLM defer the parcels below from the 09/24/2020 Lease Sale for the reasons outlined in these comments.</p> <table border="1"> <tr> <td>8559</td> <td>Mule Deer</td> </tr> <tr> <td>8560</td> <td>Elk</td> </tr> <tr> <td>8560</td> <td>Pronghorn</td> </tr> <tr> <td>8562</td> <td>Pronghorn</td> </tr> <tr> <td>8563</td> <td>Mule Deer</td> </tr> <tr> <td>8563</td> <td>Pronghorn</td> </tr> <tr> <td>8564</td> <td>Mule Deer</td> </tr> <tr> <td>8564</td> <td>Pronghorn</td> </tr> </table>	8559	Mule Deer	8560	Elk	8560	Pronghorn	8562	Pronghorn	8563	Mule Deer	8563	Pronghorn	8564	Mule Deer	8564	Pronghorn	<p>Parcels 8559 and 8560 are in the WRFO/KFO September 2020 lease sale; parcels 8562, 8563 and 8564 are in the Royal Gorge FO Lease Sale.</p> <p>Refer to previous response to Comment #25 regarding the stipulations and lease notices that were applied to WRFO and KFO parcels.</p>
8559	Mule Deer																			
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27	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	<p>A number of parcels overlap with areas that contain migration corridors or high priority big game winter habitats for the State of Colorado. Parcel 8560 is in a pronghorn migration corridor and overlaps important winter habitat. Parcels 8559, 8562, 8563, 8564, 8581, 8584 and 8599 all overlap with important big game habitat. All but one of these parcels (parcel 8560) would not be covered by additional protections associated with greater sage-grouse habitat. Colorado Parks and Wildlife (CPW) has repeatedly recommended that BLM implement specific stipulations for lease parcels within the State Action Plan priority areas to protect big game habitat and migration corridors, including a stipulation that limits the density of surface facilities to no greater than one well pad per square mile. BLM must either incorporate this recommendation into the parcels offered in the September lease sale or defer the parcels.</p>	<p>Parcels 8562, 8563, 8564, 8581, 8584 and 8599 are in the Royal Gorge Field Office lease sale.</p> <p>Refer to response for comment #25 regarding the stipulations and lease notices that were applied to WRFO and KFO parcels.</p>																

**Wildlife-General**

28		Adena Rice	<p>I request that BLM defer the parcels below from the 09/24/2020 Lease Sale for the reasons outlined in these comments. Parcels 8559, 8560, 8562, 8563, 8564, 8584, and 8591. When I refer to “oil and gas lease parcels” or “lease parcels’ in the comments below, I am referring to these parcels.</p> <p>The proposed leasing may have significant negative impacts on special status species present in or near the lease parcels (Table 1)</p> <table border="1" data-bbox="741 464 1287 1258"> <tr><td>8560</td><td>White-Tailed Prairie-Dog</td></tr> <tr><td>8562</td><td>Preble’s Meadow Jumping Mouse</td></tr> <tr><td>8562</td><td>Black-Tailed Prairie Dog</td></tr> <tr><td>8562</td><td>Swift Fox</td></tr> <tr><td>8562</td><td>Ferruginous Hawk</td></tr> <tr><td>8563</td><td>Black-Tailed Prairie Dog</td></tr> <tr><td>8563</td><td>Preble’s Meadow Jumping Mouse</td></tr> <tr><td>8564</td><td>Black-Tailed Prairie Dog</td></tr> <tr><td>8564</td><td>Preble’s Meadow Jumping Mouse</td></tr> <tr><td>8564</td><td>McCown’s Longspur</td></tr> <tr><td>8564</td><td>Swift Fox</td></tr> <tr><td>8584</td><td>Rocky Mountain Bighorn Sheep</td></tr> <tr><td>8591</td><td>Townsend’s Big-Eared Bat</td></tr> </table>	8560	White-Tailed Prairie-Dog	8562	Preble’s Meadow Jumping Mouse	8562	Black-Tailed Prairie Dog	8562	Swift Fox	8562	Ferruginous Hawk	8563	Black-Tailed Prairie Dog	8563	Preble’s Meadow Jumping Mouse	8564	Black-Tailed Prairie Dog	8564	Preble’s Meadow Jumping Mouse	8564	McCown’s Longspur	8564	Swift Fox	8584	Rocky Mountain Bighorn Sheep	8591	Townsend’s Big-Eared Bat	<p>Parcels 8562, 8563, 8564, 8581, 8584 and 8599 are in the Royal Gorge Field Office lease sale.</p> <p>Parcel 8560 does not have White-tailed prairie-dog habitat.</p>
8560	White-Tailed Prairie-Dog																													
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**Wildlife-Greater Sage-Grouse**

29	Center for Biological Diversity, Western Watersheds Project	Michael Saul, Kelly Fuller	Leasable Fluid Minerals Objective MR-1 of the 2015 currently-operative Northwest Colorado sage-grouse ARMPA explicitly requires that BLM prioritize leasing outside of greater sage-grouse habitat. That has not been	The court’s order in <i>Montana Wildlife Federation v. Bernhardt</i> , No. 4:18-cv-69-BLM, does not preclude BLM from leasing in Greater Sage-Grouse habitat. Consistent with the 2015 Greater Sage-Grouse Approved Resource
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			done here; instead, in the Preliminary EA, BLM relies on Instruction Memorandum 2018-026 to argue that “BLM does not need to lease and develop outside of GRSG habitat management areas before considering any leasing and development within GRSG Habitat.” Preliminary EA at 20 & Response to Scoping Comments at 9-10. Reliance on the BLM’s IM 2018-026 interpretation of the prioritization objective, however, is plainly unlawful. Instruction Memorandum 2018-026, and its use to authorize leasing in designated sage-grouse habitats, has been expressly found to violate the Federal Land Policy and Management Act. <i>See</i> Order on Motions for Summary Judgment in <i>Montana Wildlife Federation v. Bernhardt</i> , No. 4:18-cv-69-BLM, (D. Mont. May 22, 2020).	Management Plan Amendment, the BLM will manage fluid minerals to avoid, minimize, and compensate for: 1) direct disturbance, displacement, or mortality of GRSG; 2) direct loss of habitat or loss of effective habitat through fragmentation; and 3) cumulative landscape-level impacts (Objective MR-1). The methodology for achieving this objective is detailed in the 7 management decisions and associated stipulations that pertain to unleased fluid minerals (MR 1-MR 7; Stipulations GRSG NSO-46e(1), NSO-46e(2), TL 46e, LN-46e).  Under the 2015 GRSG ARMPA, the lands under consideration for leasing are open to leasing, subject to stipulations for the protection of GRSG habitat. BLM has included additional discussion of leasing prioritization in the revised Environmental Assessment for the September 2020 lease sale.
30	Center for Biological Diversity, Western Watersheds Project	Michael Saul, Kelly Fuller	Under the requirements of the approved sage-grouse plan amendments, BLM must prioritize leasing outside of sage-grouse habitats. Given the precarious state of the North Park population and BLM’s pattern of unexamined leasing decisions within its remaining habitat, BLM should comply by withdrawing all parcels containing PHMA and GHMA from the proposed sale. At a minimum, however, BLM must consider, under both NEPA and the 2015 ARMPA the site-specific impacts to the North Park population of greater sage-grouse, including new post-2015 scientific information, prior to offering the parcel 8560 for lease.	See response to Comment #29 above.
31	National Wildlife Federation, Colorado Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O’Neill, Executive Director	BLM must defer all leases in sage-grouse habitat until it can show that it is complying with the 2015 plan’s obligation that leasing outside of habitat is prioritized. Parcel 8560 is within PHMA. BLM must prioritize leasing outside PHMA as required by the Record of Decision (ROD) and Approved Resource Management Plan Amendments for the Rocky Mountain Region and Northwest Colorado Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA).	See response to Comment #29 above.
32	Individual	Adena Rice	I request that BLM defer the parcels below from the 09/24/2020 Lease Sale for the reasons outlined in these comments; parcel 8560, Greater Sage-Grouse	See response to Comment #29 above.

33	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	Parcel 8560 overlaps with Greater Sage-grouse habitat and is in a priority habitat management areas (PHMA). Based on the recent court ruling, BLM must remove this parcel from the lease sale.	See response to Comment #29 above.
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**Social Cost of Carbon**

34	Wild Earth Guardians and Centers for Biological Diversity	Rebecca Fisher, Climate and Energy Program Attorney and Diana Dascalu-Joffee, Senior Attorney	BLM Fails to Analyze the Costs of Reasonably Foreseeable Carbon Emissions Using Well-Accepted, Credible, GAO-Endorsed, Interagency Methods for Assessing Carbon Costs.	<p>BLM has used other approaches to examine climate consequences from greenhouse gas (GHG) emissions associated with the proposed leasing. The EA quantifies estimates of total GHG emissions (tons of CO2e) for all stages of oil and gas development, production, transport and consumption for potential oil and gas development that could occur on the subject lease parcels. In addition, the EA discusses potential climate impacts qualitatively. The BLM took this approach because climate change and potential climate impacts, in and of themselves, are often not well understood by the general public (Etkin and Ho 2007, National Research Council 2009). This is in part due to the challenges associated with communicating about climate change and climate impacts, stemming in part from the fact that most causes are invisible factors and there is a long lag time and geographic scale between causes and effects (National Research Council 2010).</p> <p>The approach taken by the BLM recognizes that there are adverse environmental impacts associated with the development and use of fossil fuels on climate change, provides potential GHG emission estimates, places those estimates in context of emissions at other scales (U.S., Global), and discusses potential climate change impacts qualitatively, thus effectively informing the decision-maker and the public of the potential for GHG emissions and the potential implications of climate change. This approach presents the data and information in a manner that follows many of the guidelines for effective climate change communication developed by the National Academy of Sciences (National Research Council 2010) by making the information more readily understood and relatable to the decision-maker and the general public.</p>
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**Socioeconomics**

35	Grand Valley Audubon Society	Nic Korte	<p>When leasing public lands and minerals, BLM is managing resources for the public and should be ensuring a fair return on these transactions. BLM is not receiving and cannot receive a fair return for leasing at this time. There is every reason to believe that under current economic conditions, fewer parcels will be purchased and those purchased will not garner reasonable prices. This is demonstrated by the fact that BLM is currently granting royalty rate reductions and suspensions.</p>	<p>Lease sales are conducted in accordance with the Federal Onshore Oil and Gas Leasing Act of 1987 (30 U.S. Code §226) which sets the national minimum bid for an acre at \$2 per acre. Markets for all commodities fluctuate over time. The BLM does not attempt to “time” the lease of public lands for minerals development to any particular set of market conditions.</p> <p>Lease parcels often are initially identified through industry expressions of interest in specific lands that the BLM has identified in an RMP as eligible for potential leasing. A successful bidder provides payment for the lease, any bonus bid, and the annual rental for the first lease year. Once a lease has been developed, the wells on that lease pay a royalty rate of not less than 12.5 percent in amount of value of the production removed or sold from the lease. The BLM’s exercise of its authority for royalty rate reductions in accordance with 43 CFR 3103.4-1 relates to existing leases.</p>
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36	National Wildlife Federation, Colorado Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O’Neill, Executive Director	<p>Colorado’s March 2020 lease sale highlights the impact this pandemic has had on the oil and gas market: only 45% of lease sale parcels were purchased. Of the acres that did sell, the majority did not sell for reasonable prices: 33% of acres were purchased at the minimum bid and an additional 43% of acres were purchased below \$10/acre. It is unlikely that oil and gas prices will re-bound by the September sale meaning that BLM can expect a similar, if not worse outcome. Continuing to lease when there is no appetite for such a sale is unfair to the taxpayer, and to the State of Colorado. In the EA BLM seems to suggest that it has no discretion to respond to the current economy in its lease sale notices (this has not stopped BLM from granting royalty relief and lease suspensions).</p> <p>BLM should not lease in low potential lands. As we stated in our scoping comments, BLM should not lease on low potential land. In this lease sale, 40 of the 45 proposed parcels are on low potential lands. This sale continues the disturbing trend of leasing millions of acres on Federal land with very low potential for development. Not surprisingly, lease sales in low potential areas lead to no bids, allowing the BLM to subsequently lease the vast majority of the acreage through a non-competitive process. This outcome is even more likely given the current state of the oil and gas market.</p>	<p>As discussed in the previous comment, Congress enacted a minimum bid of \$2 per acre, and directed that parcels that do not receive bids at auction should remain available for non-competitive sale for two years. See comment above with regards to royalty relief.</p> <p>While BLM’s analyses of resource impacts (such as air quality impacts) may consider available information about the oil and gas potential of particular lands, BLM does not base its leasing decisions on the relative oil and gas potential of particular lands. Oil and gas operators make internal business decisions as to whether to bid on leases in a particular area. Classifications of oil and gas potential may change over time as new technologies develop and new oil and gas discoveries are identified.</p>
37	National Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O’Neill, Executive Director	<p>FLPMA directs BLM to receive “fair market value” for the use of public lands. BLM’s economic valuation handbook defines “fair market value” as “the most probable price . . . for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to fair sale...” H-3070-2—Economic Evaluation of Oil and Gas Properties Handbook at I.B  A necessary part of obtaining fair market value for federal minerals – and responsibly managing those public resources</p>	<p>Markets for all commodities fluctuate over time. Congress sets the minimum bid for oil and gas leases. The BLM does not attempt to “time” the lease of public lands for minerals development to any particular set of market conditions. The BLM holds competitive lease sales (auctions), which contributes to sale prices that accurately reflect fair market value at the time of sale, regardless of market conditions.</p>

			– involves picking the right time to offer them for leasing. The current market clearly prevents BLM from leasing in a “competitive market” under conditions “requisite to fair sale.” In fact, based explicitly on the current economic conditions, BLM is permitting operators to seek royalty relief and lease suspensions	
38	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	Deferring ongoing leasing would also be fiscally responsible because the current market encourages below-market, speculative leasing by industry actors who do not actually intend to develop the public lands they lease. The speculative nature of noncompetitive leasing – and the administrative waste it creates – is evident from a common outcome in noncompetitive leasing: termination for non-payment of rent. A review of noncompetitive leases shows that BLM frequently terminates these leases because the lessee stops paying rent.	Development is still occurring on Federal lands even with the pandemic and the low commodity prices. Many expressions of interest are received anonymously; therefore, the BLM cannot predict which applicant is interested in development versus speculative investment in federal leases.
39	Audubon, et. al.	Nada Culver, Vice President, Public Lands, et.al.	When leasing public lands and minerals, BLM is managing resources for the public and should be ensuring a fair return on these transactions. BLM is not receiving and cannot receive a fair return for leasing at this time. There is every reason to believe that under current economic conditions, fewer parcels will be purchased and those purchased will not garner reasonable prices.  BLM should take into account the “option value” of deferring leasing, which would leave open more opportunities for management that addresses the full range of multiple uses. If BLM moves forward with lease sales, BLM runs the risk of precluding future management decisions for other resources and uses such as bird and other wildlife habitat, wilderness, recreation and renewable energy development.	NEPA mandates the BLM to evaluate the impacts of agency decisions on the natural and human environment. NEPA does not require BLM maximize the net present value that may result from land management decisions. The BLM evaluates the potential social and economic impacts of different alternatives and uses this comparison to inform decisions.  The parcels considered for lease under the Proposed Action of this lease sale EA are designated as open to oil and gas leasing in the approved RMP, based on the analysis in the RMP EIS. In that analysis, BLM considered the relative resource interests in the lands in the planning area. BLM retains discretion to approve the specific location of proposed oil and gas development operations on a given lease and can give further consideration to other resource values at that time.

**Summary of Public and Interagency Scoping Comments  
WRFO, LSFO, KFO Parcels  
September 2020 Lease Sale  
(Full Comments Available upon Request)**



Organization	Name	Synopsis of Comment
<b>Multiple Comments</b>		
Individuals; 825	Source Unknown	<p>Thank you for the opportunity to comment during the Scoping Period for the proposed September 2020 Colorado oil and gas lease sale. Many of the parcels in this sale are concerning for a variety of reasons ranging from overlap with important wildlife habitat to the presence of rare plant species to the abundance of low-potential parcels. Leasing these parcels that conflict with Greater-Sage Grouse and big game habitat, along with areas demonstrating high biodiversity, instead of protecting the habitat and landscapes that make Colorado so special will have an undue burden and impact on the wildlife and wild places that Coloradans rely on. These areas are essential to our way of life and the \$62.5 billion outdoor recreation economy that fuels the state. In addition to these ecosystem concerns, I find it quite concerning that 40 of the 45 parcels, totaling 66,240 acres, are in low-potential lands. Leasing these parcels given record low oil and gas prices not only results in minimal compensation to the American people, it closes the door for future conservation measures on these landscapes with demonstrated characteristics deserving of protection. This speculative leasing is a mismanagement of our public funds, the agency’s resources, and our public lands. At a time when our communities are already struggling to cope with the challenges of COVID-19 I also find it imperative to extend this comment period so that all Coloradans have the opportunity to comment. By extending the comment period during a global pandemic you will be able to see a deeper level of engagement from Coloradans on the management of our public lands. As a Coloradan, I support responsible management of our public lands. Opening precious wildlife habitat, migration corridors, and areas with rich and rare biodiversity to oil and gas drilling and jeopardizing public health does not align with any of these values. That is why I am asking you to defer the parcels that hold any of these conflicts.</p>
Individuals; 30,695	Friends of the Earth	<p>Stop the proposed lease sale in Colorado          “To whom it may concern:          I urge you to stop the proposed leasing of lands that contain Greater sage-grouse and big game habitats, which are slated for June 2020. Protecting these sensitive landscapes from oil and gas activity is essential to protecting Colorado’s environment and wildlife. I ask you to cancel the leasing of the 5,600 acres of parcels within sage grouse and big game habitats. Thank you for considering my opinion,</p>
<b>Comments in Favor of the Sale</b>		
Rio Blanco Board of County Commissioners	Jeff Rector, Chairman; Si Woodruff, Commissioner; Gary Moyer, Commissioner	<p>Rio Blanco County supports the competitive lease sale of 120 acres identified as Parcel 8559, T.0020S., R. 1030W., 6th PM, Section 16: E2NW, SWNW. The sale complies with the provisions of the 2016 Rio Blanco County Land and Natural Resources Plan and Policies (Plan) for public lands in Rio Blanco County. Please see the full section (Section 4.7) on Oil, Gas, Coal and Minerals on pages 34-47. Below are specific statements and policies supporting the use of federal lands for oil and gas development.</p>
White River & Douglas Creek Conservation Districts	Marc Etchart, Vice President; Bill Hume, President	<p>The Districts support the competitive lease sale of 120 acres identified as Parcel 8559, T.0020S., R. 1030W., 6th PM, Section 16: E2NW, SWNW. The sale complies with the provisions of the 2016 Rio Blanco County Land and Natural Resources Plan and Policies (Plan) for public lands in Rio Blanco County. Please see the full section (Section 4.7) on Oil, Gas, Coal and Minerals on pages 34-47. Below are specific statements and policies supporting the use of federal lands for oil and gas development.</p>
<b>Air Quality</b>		

Colorado Dept of Public Health	Sean Hackett, Energy Liaison	Because oil and gas exploration produces ozone precursor emissions, BLM should prepare an EIS for this proposed lease sale, which addresses the contribution of ozone and ozone precursors to the DMNFR Ozone Nonattainment Area (if any). Additionally, parcel 8560 within the Kremmling Field Office is in close proximity to the Rawah Wilderness, which is a Mandatory Class I Federal Area subject to the visibility protection requirements in the Clean Air Act. 42 U.S.C. §7491. Parcel 8560 is also in close proximity to the Arapaho National Wildlife Refuge. Protecting air quality is important not only to human health, but also to natural resources. Natural resources can be harmed by the air pollution emitted by oil and gas activities and increased truck traffic. The EIS should address cumulative air quality impacts of this proposed lease sale, including climate change impacts. It should include a description of the anticipated environmental impacts of the proposed action in relationship to all other effects from past, present and reasonably foreseeable future federal, non-federal, and private actions within the spatial and temporal bounds of the proposed lease sale.
League of Oil and Gas Impacted Coloradans (LOGIC)	Andrew Forkes-Gudmundson, Deputy Director	SB19-181 requires the AQCC update its mandate to prioritize the protection of public health, safety, and the environment, wildlife, and biological resources. <sup>7</sup> HB19-1261 demonstrates our state’s commitment to air quality protections and addressing climate change. The bill aims to reduce 2025 greenhouse gas (GHG) emissions by at least 26%, 2030 greenhouse gas emissions by at least 50%, and 2050 greenhouse gas emissions by at least 90% of the levels of statewide greenhouse gas emissions that existed in 2005. <sup>8</sup> The BLM should consider HB19-1261 a guiding principle as it assesses the potential for greenhouse gas emissions associated with the development of these lease parcels. The BLM must recognize that the only reasonable outcome of this lease sale is the development of the parcels, and assess appropriately.
<b>Air Quality- Waste, Methane</b>		
The National Audubon Society, Conservation Colorado, Rocky Mt. Wild, Audubon Rockies, The Wilderness Society, National Park Conservation Association, Evergreen Audubon, Roaring Fork Audubon, Colorado Chapter of the Sierra Club, Fort Collins Audubon, Denver Audubon, Black Canyon Audubon, Arkansas Valley Audubon, Sierra Club, Aiken Audubon, Great Old Broads for Wilderness.	Nada Culver, Luke Schafer, Tehri Parker, Barbara Vasquez, Daly Edmunds, Jim Ramey, Tracy Coppola, JoAnn Hackos, Mary Harris, Delia G. Malone, John Shenot, Pauline Reetz, Steve Allerton, Dr. Bruce Ackerman, Peg Rooney, Kimberley Pope, Linda Hodges. Shelley Silbert,	The release of natural gas through venting and flaring has both economic and climate-related impacts. The release of methane from oil and gas operations due to its venting, flaring, or leaking—also referred to as waste—is a significant issue relative to climate change because methane is a far more potent GHG than carbon dioxide. Methane is at least 86 times more potent than carbon dioxide. Under the MLA the BLM is obligated to regulate waste. The MLA directs DOI to require “all reasonable precautions to prevent waste of oil or gas developed in the land,” 30 U.S.C. § 225, and mandates that “[e]ach lease shall contain provisions for the prevention of undue waste.” <i>Id.</i> § 187. The MLA also requires BLM to consider not just private oil and gas interests, but also the “interests of the United States” and the “public welfare” when leasing and regulating publicly owned oil and gas resources. <i>Id.</i> § 187.
<b>Air-Climate Change</b>		
The National Audubon Society, et. al.	Nada Culver, et al.	It is well established that federal agencies must analyze climate change when conducting NEPA, including in this lease sale analysis. Courts have repeatedly invalidated oil and gas leasing decisions based on BLM’s failure to adequately analyze potential climate impacts, including downstream impacts associated with leasing decisions.

		<p>Additionally, BLM cannot wave off cumulative impacts of greenhouse gas emissions as insignificant in a global context, as BLM Colorado frequently attempts to do when analyzing oil and gas leasing. BLM has never adequately considered the potential climate impacts of issuing the proposed leases.</p> <p>The governing RMPs for the field offices included in this lease sale did not include climate change analysis appropriate to this discrete leasing decision, which requires greenhouse gas quantification and cumulative impact analysis among other elements, but rather discussed climate change at a general level relevant to the high-level NEPA analysis undertaken for field office-wide RMPs. The underlying RMPs also failed to quantify the scale of methane pollution from oil and gas emission sources, and underestimated by an order of magnitude the global warming potential of such emissions.</p> <p>BLM must evaluate the cumulative impacts of BLM Colorado’s September 2020 oil and gas lease sale in its entirety. BLM Colorado has recently been preparing multiple NEPA documents for each lease sale, none of which analyzes the lease sale as a whole.</p>
<b>COVID-19 Pandemic</b>		
The National Audubon Society, et.al.	Nada Culver, et.al.	<p>We are in the midst of a national emergency around COVID-19, which is making it exceptionally difficult for people to participate in comment processes. Proceeding with lease sales would violate the public participation requirements of the Federal Land Policy and Management Act (FLPMA) and National Environmental Policy Act (NEPA). As BLM has recently been reminded, “[p]ublic involvement in oil and gas leasing is required under FLPMA and NEPA” and “the public involvement requirements of FLPMA and NEPA cannot be set aside in the name of expediting oil and gas lease sales.” <i>Western Watersheds Project v. Zinke</i>, Memorandum Decision and Order, Case 1:18-cv-00187-REB (D. Idaho February 27, 2020), pp. 32, 40. Moving forward with comment periods and decisions that will grant leases for at least ten years when the public is unable to properly participate violates the requirements of NEPA and FLPMA.</p>
League of Oil and Gas Impacted Coloradans (LOGIC)	Andrew Forkes-Gudmundson, Deputy Director	<p>II. BLM has an obligation under NEPA to defer this proposed lease sale in response to the COVID-19 crisis.</p> <p>One basic purpose of NEPA is to assure that the public and policy makers are aware in advance of the potential environmental consequences of proposed actions. 40 C.F.R. § 1500.1(a). The State of Colorado is currently under stay-at-home orders from the Governor in an attempt to limit the spread of COVID-19. The public, our local and state government officials, and state agencies, are all under extreme duress as they attempt to manage this crisis. The scoping phase is where the public identifies potential issues of concern associated with the proposed project. Members of the public are struggling to manage their daily lives, they cannot possibly be expected to assess the potential issues associated with leasing 67,422 acres of federal mineral estate for oil and gas development.</p>
National Wildlife Federation and Colorado Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O’Neill, Executive Director	<p>The United States is currently experiencing an unprecedented state of emergency that has upended lives across the country and helped drive the collapse of oil and gas prices. The COVID-19 pandemic will only continue intensify disruptions to daily lives and continue to significantly impact the markets. As a result, we strongly urge BLM to suspend lease sales, and to remain flexible as this scenario continues to play out. Attempts to move forward with oil and gas lease sales at a time when the country is grappling with COVID-19 disregards the public participation mandate of the Federal Lands Policy Management Act (FLPMA) and the National Environmental Policy Act (NEPA).<sup>1</sup> Given that BLM public rooms are closed, and that Governor Polis has</p>

		issued a Colorado wide stay-at-home order, the public will have to view proposed leases and comment on these proposals on-line. However, many Coloradans do not have access to reliable internet. Colorado ranks 25th for broadband access, <sup>2</sup> with rural areas being most affected by lack of access. Yet it is these rural areas that stand to be most impacted by the proposed lease sales. Moreover, the Mineral Leasing Act (MLA) requires BLM to give notice of proposed leasing and that “[s]uch notice shall be posted in the appropriate local office of the leasing and land management agencies.” <sup>3</sup> Clearly, BLM cannot currently comply with this requirement and will be in violation of the Act if it moves forward with lease sales.
<b>Hazardous Materials</b>		
Colorado Dept of Public Health	Sean Hackett, Energy Liaison	When PFAS and TENORM are released into the environment, they can get into water, especially groundwater, and contaminate drinking water supplies. Due to this potential for contamination, CDPHE recommends that the EIS process adequately account for potential impacts associated with PFAS and TENORM.
<b>Market Conditions</b>		
The National Audubon Society, et. al.	Nada Culver, et. al.	Just 45% of lease sale parcels (translating to 55% of available acreage) were purchased. Of the acreage that did sell, the majority did not sell for reasonable prices: 33% of acres were purchased at the minimum bid and an additional 43% of acres were purchased below \$10/acre. Prices and demand have continued to fall, so there is every reason to believe that even fewer parcels will be purchased and those purchased will not garner reasonable prices. Deferring leasing would also be fiscally responsible because leases in low potential areas generate minimal to no revenue but can carry significant cost in terms of resource use conflicts. In addition to the concerns above, leasing lands with low potential for oil and gas development gives preference to oil and gas development at the expense of other uses while handcuffing BLM’s ability to make other management decisions down the road. This is because the presence of oil and gas leases can limit BLM’s willingness to manage for other resources in the future.
National Wildlife Federation and Colorado Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O’Neill, Executive Director	Colorado’s March 2020 lease sale highlights the impact this pandemic has had on the oil and gas market: only 45% of lease sale parcels (translating to 55% of available acreage) were purchased. Of the acres that did sell, the majority did not sell for reasonable prices: 33% of acres were purchased at the minimum bid and an additional 43% of acres were purchased below \$10/acre. It is unlikely that oil and gas prices will re-bounce by the September sale meaning that BLM can expect a similar, if not worse outcome. Continuing to lease when there is no appetite for such a sale is unfair to the taxpayer, and to the State of Colorado.
<b>NEPA</b>		
The National Audubon Society, et. al.	Nada Culver, et. al.	In order to take the required “hard look” at potential impacts, BLM must prepare an Environmental Assessment (EA) for this lease sale. BLM cannot rely on a Determination of NEPA Adequacy (DNA) for this lease sale. DNAs, unlike Environmental Assessments and Environmental Impact Statements, are not NEPA documents.  BLM must evaluate the cumulative impacts of BLM Colorado’s September 2020 oil and gas lease sale in its entirety. BLM Colorado has recently been preparing multiple NEPA documents for each lease sale, none of which analyzes the lease sale as a whole. Without analyzing the sale as a whole, BLM fails to adequately analyze cumulative impacts of the lease sale.  BLM must evaluate a reasonable range of alternatives in the NEPA document prepared for this lease sale.
Colorado Dept of Public Health	Sean Hackett, Energy Liaison	NEPA requires that federal agencies take a “hard look” at the environmental consequences of proposed actions by ensuring that agencies carefully consider detailed information concerning significant environmental impacts.

		<i>Robertson v. Methow Valley Citizens Council</i> , 490 U.S. 332, 350 (1989). To that end, NEPA requires the preparation of a detailed environmental impact statement (EIS) for any “major federal action significantly affecting the quality of the human environment. In taking a “hard look,” NEPA requires federal agencies to consider the direct, indirect, and cumulative impacts of proposed actions. Under the Administrative Procedure Act, courts will set aside an agency action that is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A).
League of Oil and Gas Impacted Coloradans (LOGIC)	Andrew Forkes-Gudmundson, Deputy Director	The BLM has continuously demonstrated a deeply flawed approach to assessing the cumulative impacts associated with oil and gas development on the federal mineral estate. This is particularly true when it comes to assessments done at the leasing stage. This assessment must be done at the leasing stage, as this is the final moment when the agency irrevocably commits public resources to extraction, because the entire point of NEPA is to study the impact of an action before it is taken. See <i>Conner</i> , 848 F.2d at 1452 (NEPA requires that agencies prepare an EIS before there is “any irreversible and irretrievable commitment of resources”). In order to take the “hard look” required by NEPA, BLM is required to assess impacts and effects that include: “ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.” 40 C.F.R. § 1508.8. (emphasis added).
<b>North Park Region</b>		
The National Audubon Society, et. al.	Nada Culver, et. al.	Parcel 8560 is in the North Park area. BLM must analyze the cumulative impacts of oil and gas leasing and development in North Park. There has been extensive leasing activity in the North Park area in recent years, and the impact of parcels leased in September 2019/2020, plus those still available that did not sell in the March 2020 sale, and proposed for the June 2020 and September 2020 lease sales would encumber significant portions of the area, including the North Park Master Leasing Plan (MLP). Given the high resource values of North Park, the cumulative impacts of leasing and development in the area, and the low likelihood that BLM is able to meet its stated objective for the North Park MLP in the Kremmling RMP given the extensive leasing and development here, BLM should not proceed with further leasing in North Park until the agency has completed further planning to ensure the RMP objectives are being met. BLM could accomplish this through an implementation plan for the North Park MLP. This limitation should include the leases still available from the Sept 2019 and March 2020 sales, as well as the June 2020 and September 2020 sales.
<b>Oil and Gas Leasing - FLPMA</b>		
The National Audubon Society, et.al.	Nada Culver, et.al.	Under FLPMA, BLM is subject to a multiple-use and sustained yield mandate, which prohibits the Department of the Interior (DOI) from managing public lands primarily for energy development or in a manner that unduly or unnecessarily degrades other uses. DOI appears to be pursuing an approach to oil and gas management that prioritizes this use above others in violation of the multiple use mandate established in FLPMA. On our public lands, energy development is an allowable use that must be carefully balanced with other uses. Thus, any action that attempts to enshrine energy development as the dominant use of public lands is invalid on its face and inconsistent with the foundational statutes that govern the management of public lands.
<b>Oil and Gas Leasing – IM-2018-034</b>		
The National Audubon Society, et.al.	Nada Culver, et.al.	BLM is currently implementing its oil and gas leasing program under Instruction Memorandum (IM) 2018-034, which directs BLM to expedite the oil and gas lease sale process and encourages the agency to minimize environmental review and public participation. Such an approach impedes informed decision-making, increases public controversy and prioritizes energy development above other resources and uses in violation of the



		multiple use mandate established in FLPMA. In September 2018, the U.S. District Court for the District of Idaho issued a Memorandum Decision and Preliminary Injunction enjoining and restraining BLM from implementing certain provisions of IM 2018-034, for lease sales within the planning area of the greater sage-grouse conservation plans. The Preliminary Injunction required that BLM offer meaningful opportunities for the public to participate in lease sales affecting sage-grouse habitat, in accordance with the agency’s obligations under NEPA and FLPMA. The express requirements are that BLM must provide for a 30-day public comment period on the Environmental Assessment and/or Determination of NEPA Adequacy for lease sales, as well as provide a 30-day public protest period. While BLM indicates it will be providing 30-day comment and protest periods on the NEPA documents for the September 2020 lease sale in accordance with the court’s ruling, other elements of IM 2018-034 which are being applied here are likewise unlawful. For example, IM 2018-034 creates a one-sided burden on requests that BLM defer lease parcels: it requires consultation with BLM’s Washington, DC headquarters to defer parcels, but not to dismiss protests and proceed with a lease sale. IM 2018-034 also requires that BLM complete lease parcel reviews within a 6-month timeline, which severely restricts the agency’s ability to conduct thorough NEPA reviews, and solicit and respond to public input on lease parcels.
<b>Social Cost of Carbon</b>		
League of Oil and Gas Impacted Coloradans (LOGIC)	Andrew Forkes-Gudmundson, Deputy Director	The social cost of carbon would be a good starting point and would begin incorporating the impacts of climate change associated with the proposed development. On October 6, 2018, the Intergovernmental Panel on Climate Change (IPCC) released a report warning that the environmental impacts of climate change are occurring more quickly than previously forecasted and that these impacts will be more severe at greater degrees of warming. The report took a comprehensive look at differences in environmental impacts between an additional warming of 1.50°C and 2.0°C “based on the assessment of the available scientific, technical and socio-economic literature.” The report reiterated that average global temperatures have already increased by about 1.0°C above pre-industrial levels due to human activities, and found that “[g]lobal warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate” due to a combination of both past and continuing GHG emissions. In addition to increasing the probability of droughts, these temperature increases will also lead to an increase in their intensity or frequency. In ozone-prone areas like the Eastern Colorado planning area, higher temperatures will also increase the risk of heat related morbidity and ozone-related mortality. <sup>11</sup> The BLM must consider whether the future development of these parcels will have an “additive and significant relationship,” <sup>12</sup> to the effects above.
<b>Water Resources</b>		
Colorado Dept of Public Health	Sean Hackett, Energy Liaison	Water quality impacts from pollutant discharges are limited by regulations, standards and classifications established under the federal Clean Water and Safe Drinking Water Acts, as administered by CDPHE’s Water Quality Control Division (WQCD) under authorization of EPA. CDPHE recommends that the EIS process adequately account for source water protection planning areas (aka: drinking water protection areas) and ensure coordination with local public water providers, local government designees, municipalities and counties to evaluate the protection of public drinking water supplies in the proposed lease areas. WQCD’s Source Water Protection Program recently shared Colorado’s 2017 Statewide Source Water Assessment Area dataset with Mr. Edward Rumbold, Aquatic Habitat Management Program Lead. The associated oil and gas leases should be reviewed in relationship to the most current drinking water source dataset.
<b>Water Resources- PFAS and TENORUM</b>		
Colorado Dept of Public Health	Sean Hackett, Energy Liaison	PFAS are a family of human-made substances that do not occur naturally in the environment. They have been used for decades in food packaging, carpets, personal care items, ski waxes, other household items, and firefighting foam due to their ability to resist heat, oil, stains, grease, and water. Human contact with these

chemicals is widespread, and nearly all people have some measurable levels of the chemicals in their blood. Human health toxicity information is only available for about ten of the thousands of these chemicals. The earth's crust is radioactive and has contained naturally occurring radioactive material (NORM) since its formation. NORM includes primordial radionuclides such as uranium and its decay products, thorium and its decay products, and a radioactive isotope of potassium (40K). The geologic formations that contain oil and gas deposits also contain NORM. The Environmental Protection Agency (EPA) defines TENORM as "naturally occurring radioactive materials that have been concentrated or exposed to the accessible environment as a result of human activities such as manufacturing, mineral extraction, or water processing. "When PFAS and TENORM are released into the environment, they can get into water, especially groundwater, and contaminate drinking water supplies. Due to this potential for contamination, CDPHE recommends that the EIS process adequately account for potential impacts associated with PFAS and TENORM.

**Wildlife – Big Game**

National Wildlife Federation and Colorado Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O'Neill, Executive Director	<ul style="list-style-type: none"> <li>Parcel 8559 in the White River Field Office (WRFO) overlaps critical mule deer severe winter range</li> <li>Parcel 8560 in the Kremmling Field Office overlaps elk severe winter range and winter concentration areas as well as a pronghorn migration corridor and severe winter range</li> </ul> <p>We urge the BLM to attached density, timing, and surface use stipulations to these parcels. If the current resource management plan does not allow for sufficiently protective stipulations, the BLM should defer the parcels until such time that it is able to update or supplement its resource management plans (RMP). In general, we believe that BLM needs to develop a state-wide RMP amendment to ensure that migratory corridors are sufficiently protected in Colorado.</p>
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The National Audubon Society, et. al.	Nada Culver, et. al.	A number of parcels overlap with areas that contain high priority big game winter habitats for the State of Colorado. Parcel 8560 is in a pronghorn migration corridor and overlaps important winter habitat. Parcel 8559 overlaps with important big game habitat...these parcels (parcel 8560) would not be covered by additional protections associated with greater sage-grouse habitat.
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Theodore Roosevelt Conservation Partnership	Nick Payne, Representative and Leasing Policy Specialist	<p>For the September 2019 oil and gas lease sale, the BLM justified leasing parcels in big game migration corridors and/or winter range without a big game-specific density stipulation in areas that overlap with similar stipulations for greater sage grouse habitat. The justification seemed to be that stipulations specific to greater sage-grouse would incidentally conserve big game migratory and winter habitats. We find this to be unsatisfactory because the management direction for greater sage grouse is currently under consideration in Federal District Court and thus may change subsequent to the issuance of this lease. A much more satisfactory outcome for big game is to have stipulations applied to the leases at the time of sale that are protective for those species, or to defer the issuance of a lease until those protections can be applied.</p> <p>For these reasons, we request that the BLM either 1) include a density stipulation of one well pad/mile<sup>2</sup> for relevant parcels in the Environmental Assessment to protect the resource and allow for sufficient environmental analysis, or 2) defer the parcels in conflict until a density stipulation of one well pad/mile<sup>2</sup> can be applied.</p>
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Field Office/Parcel ID(s)	Acres	Resource Conflict(s)	Recommendation
White River Field Office/Parcel 8559	120 acres	Mule deer winter concentration area.	Include a density stipulation of one well pad/mile <sup>2</sup> on mule deer, elk, bighorn sheep, pronghorn antelope, mountain goat, and moose winter concentration areas, severe winter ranges, and migratory habitats in the

					Environmental Assessment or defer the parcels in conflict until proper management can be in place and environmental analyses conducted.
		Kremmling Field Office/Parcel 8560	120 acres	Elk Severe winter range, pronghorn antelope severe winter range and winter concentration area  GRSG PHMA	Include a density stipulation of one well pad/mile^2 on mule deer, elk, bighorn sheep, pronghorn antelope, mountain goat, and moose winter concentration areas, severe winter ranges, and migratory habitats in the Environmental Assessment or defer the parcels in conflict until proper management can be in place and environmental analyses conducted.  Comply with the 2015 Northwest Colorado Greater Sage-Grouse Approved RMP Amendment (ARMPA) as ruled in the Idaho district courts.
Colorado Parks and Wildlife	J.T. Romatzke, NW Regional Manager	<p>CPW staff have reviewed the two NW District parcels for the September 2020 fluid mineral lease sale and would like to provide the following scoping comments to help avoid, minimize, and mitigate impacts to wildlife.</p> <ul style="list-style-type: none"> <li>Parcel 8559 is entirely within a mule deer winter concentration area as mapped by CPW.</li> <li>Parcel 8560 is completely within elk winter concentration areas and/or elk severe winter.</li> </ul> <p>BLM has developed a lease notification (CO-57) to inform potential lessees of CPW's management objectives within these habitats. This lease notification should be applied to both parcel 8559 and 8560. Parcel 8560 is entirely within GrSG priority habitat with a no surface occupancy stipulations applied to the entire parcel. Parcel 8559 does not contain any GrSG habitats or other surface restriction stipulations. For this reason, CPW recommends temporary deferral of parcel 8559 until a statewide big game stipulation is developed and available for implementation.</p>			
<b>Wildlife-General</b>					
Individual	Ms. Skye Lewis	<p>The lands proposed in this parcel list, have too many species of threatened or endangered status to justify using the land for oil and gas. The damage from an oil or gas leak would be devastating to this delicate ecosystem. I do not believe the profits justify the means of collection on these lands. I also see no protections for Black-tailed Prairie Dogs. Prairie Dogs are a keystone species and must be recorded in all planning and justification for oil and gas development. Damage to the Prairie Dog populations can disrupt an ecosystem and other protections will not be enough to preserve the system.</p>			
<b>Wildlife- Greater Sage grouse</b>					
National Wildlife Federation and Colorado Wildlife Federation	Mary Greene, Public Lands Attorney; Suzanne O'Neill, Executive Director	<p>BLM should defer all leases in sage-grouse habitat until it can show that it is complying with the 2015 plan's obligation that leasing outside of habitat is prioritized. Parcel 8560 is within PHMA. BLM must prioritize leasing outside PHMA as required by the Record of Decision (ROD) and Approved Resource Management Plan Amendments for the Rocky Mountain Region and Northwest Colorado Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA). The Rocky Mountain ROD specifically states that BLM must "prioritize oil and gas leasing and development outside of PHMAs and GHMAs." See Rocky Mountain</p>			



		<p>ROD at 1-25. Under the ROD, the onus is clearly on the BLM, not the lessees, to prioritize leasing outside of sage-grouse habitat. FLPMA requires that lease sale decisions comply with their governing land use plans. BLM must abide by the ROD and ARMPA. To do so, BLM must apply the prioritization objective to this lease sale when parcels are proposed in or near PHMA and GHMA. BLM must also explain how its leasing decisions comply with the prioritization mandate. Until it is able to show that it is prioritizing leasing outside habitat, BLM should defer all leases PHMA.</p>
The National Audubon Society, et. al.	Nada Culver, et. al.	<p>Parcel 8560 overlaps with Greater Sage-grouse habitat and is in a priority habitat management areas (PHMA). BLM has recognized that it must comply with the 2015 plan amendments, which includes the Colorado Sage-grouse Plan. BLM Colorado has similarly recognized this obligation in previous lease sale analyses for the March 2020 sale. As a result, the EA for this lease sale must fully analyze whether the lease sale complies with the protective requirements of the 2015 plans.</p> <p>BLM Colorado has similarly recognized this obligation in previous lease sale analyses for the March and June 2020 sales and must do so for the September 2020 sale. As a result, the EA for this lease sale must fully analyze whether the lease sale complies with the protective requirements of the 2015 plans.</p> <p>First, we would note that IM 2019-018 relies on a Solicitor Memorandum M-37046, “Withdrawal of M-37039, “The Bureau of Land Management’s Authority to Address Impacts of its Land Use Authorizations Through Mitigation.” (June 30, 2017). Solicitor Memorandum M-37046 withdraws a previous Solicitor Opinion that confirmed BLM’s authority to address land use authorizations through mitigation but did not conclude BLM did not have the subject authority; rather, it “attempted to answer an abstract question.” In actuality, the direction in both IM 2019-018 and the 2019 ROD are arbitrary and capricious, and in violation of law. Consequently, BLM must include requirements for compensatory mitigation in any leases issued in PHMA. Finally, as a distinct authority, BLM also has the obligation to ensure that project-specific authorizations do not result in “undue or unnecessary degradation.”</p> <p>BLM’s conclusions in IM 2019-018, cannot be supported by applicable law, as reviewed in Solicitor’s Opinion M-37039 (Dec. 21, 2016) (attached and incorporated by reference as Exhibit 2). Because lease parcel 8560 in the September 2020 sale covers PHMA, BLM must confirm and address how it will incorporate the net conservation gain/compensatory mitigation requirement in the 2015 Colorado Sage-grouse Plan. BLM must prioritize leasing outside of sage-grouse habitat, as required by both the 2015 Record of Decision (ROD) and Approved Resource Management Plan Amendments for the Rocky Mountain Region and the 2015 Colorado Sage-grouse Plan. In addition, BLM’s current guidance, Instruction Memorandum (IM) 2018-026 (Implementation of Greater Sage-Grouse Resource Management Plan Revisions or Amendments – Oil &amp; Gas Leasing and Development Prioritization Objective), which provides direction on implementing the prioritization requirement is also inconsistent with the direction of the 2015 and 2019 RODs and ARMPAs. For instance, IM 2018-026 states: “BLM does not need to lease and develop outside of [greater sage-grouse] habitat management areas before considering any leasing and development within [greater sage-grouse] habitat.”</p>
Colorado Parks and Wildlife	J.T. Romatzke, NW Regional Manager	<p>CPW has confirmed that all relevant GrSG stipulations from the 2015 GrSG Approved Resource Management Plan Amendment have been correctly applied based on mapped habitats and lek site buffers. Furthermore, there are no additional high priority habitat intersects or CPW property concerns that need to be addressed at this time.</p>
Theodore Roosevelt Conservation Partnership	Nick Payne, Representative and	<p>A recent Idaho court ruling restored the 2015 Northwest Colorado Greater Sage Grouse Approved Resource Management Plan Amendment (GRSG ARMPA) requirements for greater sage grouse management in states including Colorado (W. Watersheds Project v. Schneider, ___ F. Supp. 3d. ___, 2019 WL 5225454 (D. Idaho Oct.</p>

	Leasing Policy Specialist	16, 2019)). Consequently, the BLM is now required to implement this management direction when parcels are put out for sale in sage grouse habitat, as is the case in this lease sale. We thank the BLM for incorporating the management actions as outlined in the 2015 plan in the initial parcel listing and ask that the BLM incorporate all of the management actions as outlined in the 2015 Northwest Colorado Greater Sage Grouse Approved Resource Management Plan Amendment (GRSG ARMPA) in the environmental assessment for this lease sale, and fully implement the management actions throughout the leasing process should the parcels move forward into development.
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## Attachment G - References

- APLIC and U.S. Fish and Wildlife Service (USFWS). 2005. Avian Protection Plan (APP) Guidelines. <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/APP/AVIAN%20PROTECTION%20PLAN%20FINAL%204%2019%2005.pdf>
- Armstrong, Harley J., and David G. Wolny. 1989. Paleontological Resources of Northwest Colorado: A Regional Analysis. Museum of Western Colorado. Grand Junction, Colorado.
- Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.
- Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.
- Bartmann, R.M., G.C. White, and L.H. Carpenter. 1992. Compensatory mortality in a Colorado mule deer population. *Wildlife Monographs* 121: 3-39.
- Bennett, A. and Loomis, J. 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.
- Bureau of Land Management. 1984. Final Resource Management Plan and Record of Decision. U.S. Department of the Interior, Bureau of Land Management. Kremmling Field Office. Kremmling, Colorado. December 1984.
- \_\_\_\_\_. 1997. Standards for Public Land Health and Guidelines for Livestock Grazing Management. U.S. Department of the Interior, Bureau of Land Management. Colorado State Office. Lakewood, Colorado. February 3, 1997.
- \_\_\_\_\_. 1997. Instruction Memorandum No. CO-97-023 Compliance with Washington Office (WO) IM-93-344, Use of the National Environmental Policy Act (NEPA) Process with Hazardous Materials Management
- \_\_\_\_\_. 2007a. Final Analysis of the Management Situation for Glenwood Springs Field Office and Kremmling Field Office. U.S. Department of the Interior. Bureau of Land Management. Glenwood Springs Field Office. Glenwood Springs, Colorado. Kremmling Field Office. Kremmling, Colorado.
- \_\_\_\_\_. 2007b. North-Central Colorado Community Assessment Report for the Bureau of Land Management. U.S. Department of the Interior. Bureau of Land Management.

Glenwood Springs Field Office and Kremmling Field Office. Glenwood Springs and Kremmling, Colorado.

\_\_\_\_\_. 2007c. Reasonable Foreseeable Development Scenario for Oil and Gas Activities in the BLM White River Field Office: Rio Blanco, Moffat and Garfield Counties, Colorado (2007).

\_\_\_\_\_. 2007. Reasonable Foreseeable Development: Oil and GAs in the Little Snake Field Office Administrative Boundary Area (LSFO). Addendum 2007.

\_\_\_\_\_. 2008. Programmatic Biological Assessment for BLM's Fluid Minerals Program in Western Colorado re: Water Depletions and effects on the Four Endangered Big River Fishes: Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail chub (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*), May 2008. 34 pp.

\_\_\_\_\_.2008a. National Environmental Policy Act Handbook. BLM Handbook H-1790-1. January 2008.

\_\_\_\_\_. 2009. Reasonably Foreseeable Development 2008-2027 Oil And Gas Activities in the Kremmling Field Office Jackson, Larimer, Grand, and Summit Counties Colorado (2009).

\_\_\_\_\_. 2010. Proposed Resource Management Plan and Final Environmental Impact Statement for Public Lands Administered by the Bureau of Land Management Little Snake Field Office Craig, Colorado Section 3.2.1.1 Leasable Minerals oil and Gas (2010).

\_\_\_\_\_.2011. Bureau of Land Management, Little Snake Field Office. 2011. Visual Resources Inventory.

\_\_\_\_\_. October 2011, amended September. Little Snake Record of Decision and Resource Management Plan as amended by the Northwest Colorado Greater Sage-Grouse Approved Resource Management Plan Amendment (LSFO RMP/EIS).

\_\_\_\_\_.November 2019. Colorado State Office Categorical Exclusion for Greater Sage-grouse Habitat Boundary Adjustments. DOI-BLM-CO-S000-2020-0003-CX. November 2019.

\_\_\_\_\_. 2015. Bureau of Land Management, Kremmling Record of Decision and Approved Resource Management Plan.

- \_\_\_\_\_. 2015. Bureau of Land Management, Kremmling Record of Decision and Approved Resource Management Plan. Chapter 5, page 5-100 and 5-210, comment letter 0087, Crystal Salas of the National Park Service.  
[http://www.blm.gov/co/st/en/BLM\\_Programs/land\\_use\\_planning/rmp/kfo-gsfo/KFO\\_PRMP\\_FEIS.html](http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/kfo-gsfo/KFO_PRMP_FEIS.html)
- \_\_\_\_\_. 2015. Bureau of Land Management, Little Snake Record of Decision and Approved Resource Management Plan.
- \_\_\_\_\_. 2015. Bureau of Land Management, White River Field Office. 2015. Record of Decision and Approved Resource Management Plan Amendment for Oil and Gas Development.
- \_\_\_\_\_. 2015a. Bureau of Land Management, Washington Office, Oil and Gas statistics.  
[http://www.blm.gov/style/medialib/blm/wo/MINERALS\\_REALTY\\_AND\\_RESOURCE\\_PROTECTION/\\_energy/oil\\_gas\\_statistics/data\\_sets.Par.69959.File.dat/summary.pdf](http://www.blm.gov/style/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/_energy/oil_gas_statistics/data_sets.Par.69959.File.dat/summary.pdf) Accessed December 2015.
- \_\_\_\_\_. 2015b. Bureau of Land Management. NW Colorado Greater Sage-grouse RMP Amendment and EIS. September, 2015.
- \_\_\_\_\_. 2015b. Bureau of Land Management. NW Colorado Greater Sage-grouse RMP Amendment and EIS. September, 2015, Amended March 2019.
- \_\_\_\_\_. 2015c. Colorado Bureau of Land Management Comprehensive Air Resource Protection Protocol (CARPP). Available online at:  
<https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>. Accessed on November 2, 2018.
- \_\_\_\_\_. 2018. Colorado Air Resource Management Modeling Study (CARMMS 2.0): 2025 CAMx Modeling Results for the High, Low and Medium Oil and Gas Development Scenarios, CARMMS 2.0 Draft Report. Bureau of Land Management, Colorado State Office, Lakewood, CO. November. Sent via email from the Colorado State Office on November 2, 2018. Available online at: <https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>
- \_\_\_\_\_. 2019. Colorado Air Resource Annual Report: Annual Report 2.0. Bureau of Land Management, Colorado State Office, Lakewood, CO. Available online at: <https://www.blm.gov/programs/natural-resources/soil-air-water/air/colorado>. Accessed October, 2019.
- Bonnifield, Juanita and Kim Smith. 1996. A Cultural Resource Inventory for the Slater Creek Falls Access Trail and Parking, Routt County, (RE-96-03-832-FS).
- Bohnenkamp, S., Finken, A., McCallum, E., Putz, A., 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.
- Brown, R.B., Dorius, S.F., and Krannich, R.S. 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., Geertsen, H.R., and Krannich, R.S. 1989. Community satisfaction and social integration in a boomtown—A longitudinal analysis. *Rural Sociology*, 54:4, 568–586.
- Christen, Douglas C., and Glenn R. Matlack. 2009. "The Habitat and Conduit Functions of Roads in the Spread of Three Invasive Plant Species." *Biological Invasions* 11.2 (2009): 453-65.
- CDOTa 2016. Colorado Department of Transportation  
<http://dtdapps.coloradodot.info/otis/HighwayData#/ui/2/0/criteria/034A/36/149.633>  
 Accessed 10/03/2016.
- CDOTb 21016. Colorado Department of Transportation  
<http://dtdapps.coloradodot.info/otis/HighwayData#/ui/2/0/criteria/040A/4/5> Accessed  
 10/03/2016.
- CDOW, BLM, USFWS. 2001. A Cooperative Plan for Black-footed Ferret Reintroduction and Management, Wolf Creek and Coyote Basin Management Areas, Moffat and Rio Blanco Counties, Colorado. October 2001.
- CDWR. 2019. Colorado Division of Water Resources  
<https://gis.colorado.gov/dnrviewer/Index.html?viewer=mapviewer> Accessed  
 10/28/2019.
- Colorado Parks and Wildlife. Wildlife Action Plan (2018) link:  
<http://cpw.state.co.us/aboutus/Pages/StateWildlifeActionPlan.aspx>
- COGCC. . Colorado Oil and Gas Conservation Commission web site database  
<http://cogcc.state.co.us/> Accessed 12/20/2019 and 1/21/2020.
- Doi, K. 1990. Geology, and Paleontology of Two Primate Families of the Raven Ridge, Northwestern Colorado and Northeastern Utah. Unpublished Master's Thesis, Department of Geology, University of Colorado. Boulder, Colorado. Manuscript on File in White River Field Office.
- Dwinnell, S. P. H., H. Sawyer, J. E. Randall, J. L. Beck, J. S. Forbey, G. L. Fralick, and K. L. Monteith. 2019. Where to forage when afraid: Does perceived risk impair use of the foodscape? *Ecological Applications* 00(00):e01972. 10.1002/eap.1972.
- EPA 2016. Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States U.S. Environmental

Protection Agency Office of Research and Development, Washington, DC December 2016, EPA-600-R-16-236ES.

- Farmer, A. 1993. The Effects of Dust on Vegetation-a Review. *Environmental Pollution* 79.1 (1993):63-75.
- Federal Water Pollution Control Act (the "Clean Water Act"). 1972, as amended. U.S.C. §§1251-1387.
- Flory, S. Luke, and Keith Clay. 2006. "Invasive Shrub Distribution Varies with Distance to Roads and Stand Age in Eastern Deciduous Forests in Indiana, USA." *Plant Ecology* 184.1 (2006): 131-41.
- Garrott, R.A., G.C. White, R.M. Bartmann, L.H. Carpenter, and A.H. Alldredge. 1987. Movements of female mule deer in northwest Colorado. *Journal of Wildlife Management* 51(3): 634-643.
- Geist, V. 1978. Behavior. Pages 283-296 in J.L. Schmidt and D.L. Gilbert, eds. *Big Game of North America, Ecology and Management*. Wildlife Management Institute. Stackpole Books, Harrisburg, Pennsylvania.
- Gilbert, M.M., and A.D. Chalfoun. 2011. Energy development affects populations of sagebrush songbirds in Wyoming. *Journal of Wildlife Management* 75(4): 816-824.
- Grady, J. 1980. *Environmental Factors in Archaeological Site Locations, Piceance Basin, Colorado*. Bureau of Land Management, Colorado Cultural Resource Series No. 9. Denver, Colorado.
- Greider, T., Krannich, R.S., and Berry, E.H. 1991. Local Identity, Solidarity, and Trust in Changing Rural Communities. *Sociological Focus*, 24:4, 263-282.
- Headwaters Economics. 2019a. A Profile of Socioeconomic Indicator Measures, Profile of Industries that Include Travel and Tourism, and Profile of Mining, Including Oil and Gas: Jackson County, CO. Accessed July 2019.
- \_\_\_\_\_. 2019b. A Profile of Socioeconomic Indicator Measures, Profile of Industries that Include Travel and Tourism, and Profile of Mining, Including Oil and Gas: Rio Blanco County, CO. Accessed July 2019.
- Helldin, J.O., and A. Seiler. 2003. Effects of Roads on the Abundance of Birds in Swedish Forest and Farmland. Habitat Fragmentation due to Transportation Infrastructure. In: IENE Conference 2003 Proceeding. Infra Eco Network Europe, Brussels, Belgium. On file at White River Field Office.

- Hoffman, R.W. 2001. Northwest Colorado Columbian Sharp-tailed Grouse conservation plan. Northwest Colorado Columbian Sharp-tailed Grouse Work Group and Colorado Division of Wildlife, Fort Collins.
- Hoffman, R. W., and A. E. Thomas. 2007. Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*): a technical conservation assessment. Species Conservation Project. U.S. Forest Service, Rocky Mountain Region.
- Hoffman, R. W., K. A. Griffin, J. M. Knetter, M. A. Schroeder, A. D. Apa, J. D. Robinson, S. P. Espinosa, T. J. Christiansen, R. D. Northrup, D. A. Budeau, and M. J. Chutter. 2015. Guidelines for the management of Columbian sharp-tailed grouse populations and their habitats. Sage and Columbian Sharp-tailed Grouse Technical Committee, Western Association of Fish and Wildlife Agencies, Cheyenne, Wyoming, USA.
- Hurlbet, R. E. 1977. Environmental Constraint and Settlement Predictability, Northwestern Colorado. Bureau of Land Management Colorado Cultural Resource Series No 3. Denver, Colorado.
- 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.
- Inglefinger, F., and S. Anderson. 2004. Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. *Western North American Naturalist* 64(3): 385-395.
- Interagency Lynx Biology Team. 2013. Canada lynx conservation assessment and strategy. 3rd edition. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication R1-13-19, Missoula, MT. 128 pp.
- Kotchen, M.J. (2011). Cost-benefit analysis. Chapter in: *Encyclopedia of climate and weather*, Second edition. Schneider, S.H., editor-in-chief. New York, Oxford University Press: pp 312-315.
- 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.
- Lendrum, P. E., C.R. Anderson, R.A. Long, J.G. Kie, and R.T. Bowyer. 2012. Habitat selection by mule deer during migration: effects of landscape structure and natural-gas development. *Ecosphere* 3: art82. <http://dx.doi.org/10.1890/ES12-00165.1>.
- Lutz, D.W., J.R. Heffelfinger, S. A. Tessmann, R.S. Gamo, and S. Siegel. 2011. Energy Development Guidelines for Mule Deer Working Group, Western Association of Fish and Wildlife Agencies, USA.



- Morgan, Paul, and James C. Witcher, 2011. Geothermal resources along the southern Rocky Mountains and the Rio Grande Rift. *The Mountain Geologist*, v. 48, no. 4, p. 81-94. [www.rmag.org](http://www.rmag.org)
- National Research Council. (2009). *Informing decisions in a changing climate*: Washington D.C., The National Academies Press.
- National Research Council. (2010). *Informing an effective response to climate change*: Washington D.C., The National Academies Press.
- NRC 2013. *Induced Seismicity Potential in Energy Technologies* Committee on Induced Seismicity Potential in Energy Technologies, Committee on Earth Resources, 79 Committee on Geological and Geotechnical Engineering, Committee on Seismology and Geodynamics, Board on Earth Sciences and Resources, Division on Earth and Life Studies; Copyright 2013 by the National Academy of Sciences. The National Academies Press Washington, D.C. [www.nap.edu](http://www.nap.edu)
- NRCS United State Department of Agriculture Natural Resource Conservation Service Web Soil Survey database <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>  
Accessed 9/19/2016.
- Padgett, Pamela E., Wendy M. Dobrowolski, Michael J. Arbaugh, and Scott A. Eliason. 2007. "Patterns of Carbonate Dust Deposition: Implications for Four Federally Endangered Plant Species." *Madroño* 54.4 (2007): 275-85.
- Pearl, R.H. 1979. *Colorado's Hydrothermal Resource Base - An Assessment*. Colorado Geological Survey, Department of Natural Resources Denver, Colorado.
- Pearl, R.H., Zacharakis, Ted G.; Ringrose, Charles D. 1982. *Geothermal Resource Assessment of Hot Sulphur Springs, Colorado*. Colorado Geological Survey Dept. of Natural Resources Denver, Colorado.
- Preisler, H.K., A.A. Ager, and M.J. Wisdom. 2006. Statistical Methods for Analyzing Responses of Wildlife to Human Disturbance. *Journal of Applied Ecology* 43: 164-172.
- Reed, Alan D., and Michael D. Metcalf. 1999. *Colorado Prehistory: A Context for the Northern Colorado River Basin*. Colorado Council of Professional Archaeologists. Denver, Colorado.
- Reijnen, R., and R. Foppen. 2006. Chapter 12: Impact of Road Traffic on Breeding Bird Populations *in* J. Davenport and J. L. Davenport, editors, *The Ecology of Transportation Managing Mobility of the Environment*. *Environmental Pollution* 10: 255-274. Springer, The Netherlands. On file at White River Field Office.

- Riffell, S.K., K.J. Gutzwiller, and S.H. Anderson. 1996. Does repeated human intrusion cause cumulative declines in avian richness and abundance? *Ecological Applications* 6(2): 492-505.
- 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.
- Rost, G.R., and J.A. Bailey. 1979. Distribution of mule deer and elk in relation to roads. *Journal of Wildlife Management* 43(3): 634-641.
- Sawyer, H., Korfanta, N.M., Nielson, R.M., Monteith, K.L. and D. Strickland. Mule Deer and energy development- Long-term trends of habituation and abundance. *Glob Charge Biol.* 2017:00:1-9, <https://doi.org/10.1111/gcb.1371>
- Sawyer, H., M.J. Kauffman, and R.M. Nielson. 2009a. Influence of well pad activity on winter habitat selection patterns of mule deer. *Journal of Wildlife Management* 73(7): 1052-1061.
- Sawyer, H., R. Nielson, and D. Strickland. 2009b. Sublette Mule Deer Study (Phase II): Final Report 2007. Western Ecosystems Technology, Inc., Cheyenne, Wyoming.
- Searle, K.R., Rice, M.B., Anderson, C.R., Jr., Bishop, C. and N.T. Hobbs. Asynchronous vegetation phenology enhances winter body condition of a large mobile herbivore. *Oecologia* (2015) 179:377–391.
- Sebol, S., McGee, K., Johnson, E., and Barkmann, P. 2017. Geology and Groundwater Resources of Mesa County, Colorado. Colorado Geological Survey. Colorado School of Mines. Golden, Colorado.
- Sharifi, M. R., A. C. Gibson, and P. W. Rundel. 1997. Surface Dust Impacts on Gas Exchange in Mojave Desert Shrubs. *Journal of Applied Ecology.*, 34 (1997) 837-846.
- 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/>.
- Smith, M.D., Krannich, R.S., and Hunter, L.M. 2001. Growth, decline, stability, and disruption—A longitudinal analysis of social well-being in four Western rural communities. *Rural Sociology*, 66:3, 425–450.
- Tepedino, V. J. 2009. The Pollination Biology of a Piceance Basin Endemic, *Physaria Obcordata* (Cruciferae). Report Prepared for Colorado Natural Areas Program .
- Todd, D.K., and University of California, Berkley. 1980. *Ground Water Hydrology* Second Edition, John Wiley and Sons Inc. (535 pp).

- Topper, R., K. L. Spray, W. H. Bellis, J. L. Hamilton, and P. E. Barkmann. 2003. Ground Water Atlas of Colorado Special Publication 53 Colorado Geologic Survey <http://coloradogeologicalsurvey.org/water/groundwater-atlas/>
- Tweto, O. 1979. Geologic Map of Colorado. United States Geologic Survey, Department of the Interior. Reston, Virginia.
- U.S. Department of Agriculture, National Agricultural Statistical Service (USDA NASS). 2019. 2017 Census of Agriculture: Colorado State and County Data. Volume 1, Geographic Area Series, Part 6. AC-17-A-6. Issued April 2019.
- U. S. Cong. House. 2015. The Energy Policy and Conservation Act (P.L. 94-163, 42 U.S.C. 6201).
- U.S. Census Bureau, 2019a. 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, 2018. Release date June 2019.
- U.S. Census Bureau, 2019b. 2018 Poverty and Median Household Income Estimates - Counties, States, and National. Small Area Income and Poverty Estimates Program. Release date December 2019.
- USDOJ December 11, 2012. Bureau of Land Management. Guidelines for a Quality Built Environment, First Edition.
- USDOJ October 28, 2013. Bureau of Land Management. Instruction Memorandum No. 2014-004. Oil and Gas Leasing and Freedom of Information Act.
- USDOJ December 11, 2012. Bureau of Land Management. Instruction Memorandum No. 2013-026. Confidential Handling of Oil and Gas Informal Expressions of Interest.
- USDOJ, January 31, 2018. Bureau of Land Management. Instruction Memorandum No. 2018-034. Updating Oil and Gas Leasing Reform- Land Use Planning and Lease Parcel Reviews.
- U.S. Fish and Wildlife Service (FWS). 2008. Birds of Conservation Concern. Division of Migratory Bird Management, Arlington, VA. Online version available at <http://www.fws.gov/migratorybirds/>.
- Watson P., Wilson, J, Thilmany, D., and Winter, S. 2007. Determining economic contributions and impacts: What is the difference and why do we care? JRAP 37(2):1-15.
- Webb, S.L., M.R. Dzialak, R.G. Osborn, S.M. Harju, J.J. Wondzell, L.D. Hayden-Wing, and J.B. Winstead. 2011. Using pellet groups to assess response on elk and deer to roads

and energy development. *Wildlife Biology in Practice* 7(1): 32-40. Available online at <http://socpvs.org>

Wikipedia Wikipedia entry on “Field of View” [https://en.wikipedia.org/wiki/Field\\_of\\_view](https://en.wikipedia.org/wiki/Field_of_view)  
Accessed 10/03/2016.