

Environmental Impact Statement for Previously Issued Oil and Gas Leases in the White River National Forest

External Scoping Summary Report

U.S. Department of the Interior
Bureau of Land Management
BLM Colorado River Valley Field Office

February 2015



The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

List of Acronyms

ACEC	Area of Critical Environmental Concern
APD	Application for Permit to Drill
API	American Petroleum Institute
AQRV	air quality related value
AUM	Animal Unit Month
BAT	Best Available Technology
BLM	Bureau of Land Management
BMP	Best Management Practice
BTEX	benzene, ethyl benzene, toluene, xylene
CAA	Clean Air Act
CARMMS	Colorado Air Resources Management Modeling Study
CARPP	Comprehensive Air Resource Protection Protocol
CAMx	Comprehensive Air Quality Model with Extensions (model)
CAS	Chemical Abstracts Service
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO ₂	carbon dioxide
COA	conditions of approval
COGCC	Colorado Oil and Gas Conservation Commission
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
CRCT	Colorado River cutthroat trout
CRVFO	Colorado River Valley Field Office
CSU	controlled surface use
CWA	Clean Water Act
EA	environmental assessment
EIS	Environmental Impact Statement
EMT	Emergency Medical Technician
EO	Executive Order
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act of 1976
FMI	formation micro-imaging
FO	Field Office
FOIA	Freedom of Information Act
GCP	gas capture plan
GEP	good engineering practices
GHG	greenhouse gas
GIS	Geographic Information System

GWP	global warming potential
GWUDI	Groundwater under the Direct Influence [of surface water]
HAP	hazardous air pollutant
HIA	health impact assessment
HUC	Hydrologic Unit Code
IBLA	Interior Board of Land Appeals
IPCC	Intergovernmental Panel on Climate Change
IRA	inventoried roadless area
LRMP	Land and Resources Management Plan
MLA	Mineral Leasing Act
MOU	Memorandum of Understanding
MUSYA	Multiple Use-Sustained Yield Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRDC	National Resources Defense Council
NFMA	National Forest Management Act
NFS	National Forest System
NIH	National Institutes of Health
NMR	Nuclear Magnetic Resonance
NOA	Notice of Availability
NOI	Notice of Intent
NORM	Naturally-Occurring Radioactive Materials
NGO	Non-governmental organization
NRC	National Research Council
NSO	no surface occupancy
PFYC	potential fossil yield classification
PM	particulate matter
PM ₁₀	aerodynamic diameter of 10 microns or less
PM _{2.5}	aerodynamic diameter of 2.5 microns or less
POD	Plan of Development
PSD	Prevention of Significant Deterioration
PSI	pounds per square inch
RFD	reasonably foreseeable development
RFFA	reasonably foreseeable future actions
RMP	Resource Management Plan
RNA	Research Natural Area
ROD	Record of Decision
ROS	Recreational Opportunity Spectrum
ROW	right-of-way
SO	Secretarial Order
SPreAD	System for the Prediction of Acoustic Detectability
SWP	Source Water Protection

SWPP	Source Water Protection Program
TCP	Traditional Cultural Property
TES	Threatened and Endangered Species
TMDL	total maximum daily load
UIC	Underground Injection Control
U.S.	United States
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USDW	Underground Source of Drinking Water
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USPS	U.S. Postal Service
VOC	volatile organic compound
VRM	visual resource management
WEPP	Water Erosion Prediction Project
WRNF	White River National Forest

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1.0 Introduction

The Bureau of Land Management (BLM) is preparing an Environmental Impact Statement (EIS) for Previously Issued Oil and Gas Leases in the White River National Forest (WRNF). The BLM, as represented by the Colorado River Valley Field Office (CRVFO), is the lead agency responsible for the preparation of the EIS. The U.S. Forest Service (USFS) is participating as a key cooperating agency and manages the WRNF, on which the previously issued leases are located.

In 2007, the Interior Board of Land Appeals (IBLA) ruled on a challenge of three leases in Pitkin County that BLM must either do its own environmental analysis or formally adopt the WRNF's 1993 Oil and Gas EIS for Leasing on the White River National Forest (WRNF 1993 EIS) in order to satisfy requirements of the National Environmental Policy Act (NEPA) for the BLM leasing decision.

Through the EIS, the BLM will conduct its own environmental analysis on 65 leases issued since the WRNF 1993 EIS to determine whether the leases should be voided, reaffirmed, modified with additional or different terms, or subject to additional mitigation measures for site-specific development proposals.

Two primary principles of the NEPA are full disclosure of potential environmental effects and open public participation throughout the decision-making process. Through the public involvement process, the public is able to participate in the NEPA process. NEPA requirements for public involvement are set forth in Council on Environmental Quality (CEQ) regulations 40 Code of Federal Regulations (CFR) 1500–1508. Additional BLM guidance and direction for public involvement is provided in the BLM NEPA Handbook (BLM Handbook H-1790-1).

This Scoping Summary Report provides an overview of the public scoping process and a summary of the scoping comments, issues, and concerns identified during public scoping. Although the BLM encourages commenting on the previously issued oil and gas leases in the WRNF throughout the preparation of the EIS, the range of issues summarized in this report is based on the comments received during the public scoping period.

1.1 Purpose and Need of the Proposed Project

As stated in the public scoping materials presented for the EIS for Previously Issued Oil and Gas Leases in the WRNF, the BLM's preliminary purpose for this federal leasing action is to:

- Revisit and/or reaffirm previous BLM decisions to issue 65 leases underlying WRNF lands. These leases were issued from 1995 to 2012 in conformance with the WRNF1993 EIS;
- Assess conformance with the decisions making these lands available for oil and gas leasing in the WRNF 1993 EIS, as reaffirmed in the 2002 White River National Land and Resource Management Plan (LRMP) Revision (WRNF 2002 LRMP Revision);
- Support consistency with the USFS in managing oil and gas resources, as required by law and memorandums of understanding (MOUs) between the agencies; and
- Fulfill the federal government's policy to "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs" (Mining and Minerals Policy Act of 1970) while continuing to sustain the land's productivity for other uses and capability to support biodiversity goals (USFS Minerals Program Policy).

The BLM's preliminary need for this federal leasing action is to:

- Meet domestic energy needs under the requirements of the Mineral Leasing Act of 1920 (MLA), as amended, the Mining and Minerals Policy Act of 1970, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 ("Reform Act"). The BLM's responsibility under the MLA, as amended, is to promote the development of oil and gas on the public domain, and to ensure that deposits of oil and gas owned by the United States shall be subject to disposition through the land use planning process.
- Address the NEPA deficiency identified by the 2007 IBLA ruling by the Board of Commissioners of Pitkin County that BLM must formally adopt NEPA analysis completed by WRNF or conduct a NEPA analysis of its own for issuance of oil and gas leases underlying WRNF lands;
- Support USFS mineral policy that puts responsibility on field units, with the known presence or potential presence of a mineral or energy resource, to foster and encourage the exploration, development, and production of the mineral or energy resource; and
- Meet BLM's collaborative responsibility under the Reform Act to issue and manage oil and gas leases where the USFS has issued a land availability decision.

The EIS for Previously Issued Oil and Gas Leases in the WRNF will analyze 65 existing leases issued since 1993 in the WRNF.

1.2 Purpose of Scoping

The purpose of the public scoping process is to identify issues and planning criteria that should be considered in the EIS and to initiate public participation in the planning process. The BLM follows the public involvement requirements according to the CEQ regulations set forth in 40 CFR 1501.7, which states, "there should be an early and open process for determining the scope of issues to be addressed and for identifying the process for determining the scope of issues to be addressed during the planning process." The scoping process is open to all interested agencies and the public. The intent is to solicit comments and identify the issues that help direct the approach and depth of the environmental studies and analysis needed to prepare the EIS and incorporate the views and concerns of federal, state, and local agencies, as well as the public, regarding the scope of issues to be analyzed in the EIS. Other objectives of scoping include:

- Identifying and inviting agencies with jurisdiction or special expertise relevant to the proposed action and alternatives to participate in the preparation of the EIS as cooperating agencies;
- Identifying other environmental review and consultation requirements;
- Identifying the relevant and substantive issues that need to be addressed during the analyses and in the EIS;
- Determining the range of alternatives to be evaluated; and
- Developing the environmental analysis criteria and systematic planning process and allocating EIS assignments among agencies as appropriate.

1.3 Document Organization

This document contains summary descriptions of the:

- Scoping process, including scoping meetings, advertising leading up to the meetings, and opportunities for public comment during the scoping period (Chapter 2.0).
- Scoping content analysis process, including how individual letters and comments were coded and tabulated (Chapter 3.0).
- Comments organized by resource (Chapter 4.0).
- Issues raised by public comment (Chapter 5.0).
- Next steps in the EIS process (Chapter 6.0).

The report also includes a summary of all unique submittals received during the scoping period (**Appendix E**).

All comments were given equal consideration, regardless of method of transmittal.

2.0 Scoping Process

This chapter provides a description of the scoping process, the means by which the public and agencies were notified and given opportunities to comment on the EIS for Previously Issued Oil and Gas Leases in the WRNF, and a brief summary of the meetings that were held.

2.1 Federal Register Notice of Intent

The scoping comment period began April 2, 2014, with the publication of the Notice of Intent (NOI) to prepare an EIS in the Federal Register (Vol. 79, No. 63, pages 18576 to 18577). The NOI notified the public of the BLM's intent to prepare an EIS for Previously Issued Oil and Gas Leases in the WRNF and the beginning of a 30-day scoping period. The BLM also posted the NOI on the project website (http://www.blm.gov/co/st/en/fo/crvfo/existing_leases_on.html).

The BLM subsequently extended the comment period an additional 14 days. The scoping comment period ended on May 16, 2014.

A copy of the NOI is provided as **Appendix A**.

2.2 Public Notification of Scoping

The BLM issued a news release to local media on April 1, 2014, announcing the beginning of a 30-day scoping period and posted the news release on the project website (http://www.blm.gov/co/st/en/fo/crvfo/existing_leases_on.html). The BLM issued a follow-up email to the same media outlets on April 2, 2014, identifying the dates and venues for three scoping meetings. Meeting dates also were posted on the project website. On April 11, 2014, the BLM issued a second news release, extending the comment period until May 16, and identifying the venue and date for a fourth public scoping meeting (in DeBeque, Colorado).

Additionally, the BLM mailed scoping notification letters to the following 23 stakeholders on or about April 2, 2014:

- Two cities (Glenwood Springs, Carbondale);
- Four counties (Garfield, Mesa, Pitkin, and Rio Blanco);
- Two interested parties (Thompson Divide Coalition, Wilderness Workshop);
- 12 Operators/Leaseholders (Axia Energy, LLC, Black Diamond Minerals, Dejour Energy [USA] Corporation, Encana Oil & Gas [USA] Inc., Knight Technical Services, LLC, Noble Energy, Inc., OXY USA WTP LP, Piceance Energy, LLC, SG Interests I, Ltd., URSA Operating Co., LLC, Willsource Enterprises, LLC, and WPX Energy Rocky Mountain, LLC); and
- Three tribes (Ute Indian Tribe [Uintah and Ouray Reservation], Ute Mountain Ute Tribe, and Southern Ute Indian Tribe).

The letter notified stakeholders of the BLM's intent to prepare an EIS, identified each of the 65 leases by lease number, provided a list of methods for commenting, noted the comment due date, and provided the BLM project website. Tribal scoping letters also extended an offer for government-to-government consultation concerning analysis.

Copies of the news releases and sample city, county, interested party, operator, and tribe notification letters are included in **Appendix B**.

2.3 Scoping Meetings

The BLM hosted four scoping meetings in April and May 2014 with an attendance (signed-in) totaling 772 people (**Table 2-1**). The meetings were an opportunity for the BLM to inform those in attendance about the proposed action and alternatives and the EIS process and to solicit input on the scope of the analysis and potential issues. Each meeting was held from 4:00 PM to 7:00 PM. The three-hour meetings were scheduled as follows:

- 30-minute open house;
- 10-minute presentation;
- 20-minute formal question-and-answer period;
- 45-minute oral comment period;
- 30-minute open house; and
- 45-minute oral comment period

This schedule was modified during the meetings to better accommodate the public's interest in providing oral comment. As modified, the remainder of the meeting following the question-and-answer period comprised an oral comment period that included a short (5- to 10-minute) break.

Table 2-1 Scoping Meeting Summary

Date	Location	Signed-In Attendance
April 15, 2014	Glenwood Springs, CO (Glenwood Springs Community Center)	151
April 16, 2014	Carbondale, CO (Carbondale Town Hall)	286
April 17, 2014	Aspen, CO (Pitkin County Library)	95
May 1, 2014	DeBeque, CO (DeBeque Community Center)	240

Attendees were greeted, asked to sign in, given a project fact sheet and comment form, and informed about the meeting agenda, the general flow of information (display boards) in the room, and ways to submit comments to the BLM, including the opportunity for oral comment. A sign-up sheet was provided for attendees wishing to provide oral comments at the meeting.

Informational display stations positioned around the meeting room explained the scoping process, described the type of comments most useful to the BLM and provided methods and deadlines for comment submittal; outlined the EIS process and timeline; identified the BLM's purpose and need for action and the BLM's decision to be made; and identified three preliminary alternatives and six preliminary resource issues to be addressed in the EIS.

The BLM presented a PowerPoint slideshow providing information regarding the scope of the EIS for Previously Issued Oil and Gas Leases in the WRNF, the NEPA process and need for an EIS, and potential resource issues, as well as answers to Frequently Asked Questions. Attendees also were directed to the BLM project website for copies of the display boards and presentation materials.

Copies of the scoping meeting fact sheet, display boards, presentation, and the comment form are provided in **Appendix C**.

2.4 Opportunities for Public Comment

Members of the public were afforded several methods for providing comments:

- Comments could be recorded on comment cards at the scoping meetings.
- Comments could be given orally at the scoping meeting during the formal oral comment periods.
- E-mails could be sent to a dedicated e-mail address: WRNFleases@blm.gov.
- Letters could be mailed to: EIS for Previously Issued Oil and Gas Leases in the White River National Forest, Bureau of Land Management, Colorado River Valley Field Office, Silt, Colorado 81652.
- Letters could be faxed to 970-876-9090.

3.0 Scoping Content Analysis

Upon receipt, all contact information for all submittals was entered into the comment database and project mailing list (unless there was a specific request for contact information not to be included), along with the submittal method and entity/affiliation of each submittal. Each submittal was labeled with a numeric identifier, and was reviewed to capture both submittal-level and specific comment level information.

3.1 Submittal-level Coding

Each submittal was reviewed as a whole to specifically identify the following:

- Out-of-scope submittals: those submittals that did not pertain to the EIS for Previously Issued Oil and Gas Leases in the WRNF at all (for example, a submittal pertaining to another project or seeking employment);
- Submittals requiring immediate attention, such as submittals containing requests for maps, GIS, or other data; official Freedom of Information Act (FOIA) requests; requests for comment period extension; or other comments that needed to be brought to the attention of the BLM immediately.
- Form letters (standardized and duplicated letters that contain the same text or portions of text and comments) and “form pluses”, which are form letters that have been modified to contain additional unique comments.

Contact information was gathered for out of scope submittals, but the submittals were not processed further (i.e., were not coded to the individual comment level). All other unique submittals were considered to contain substantive comments and were processed further, as discussed in Section 3.2.

Once a form letter was identified, a “master” was prepared for coding. The remaining identical submissions were not processed further (i.e., were not coded to the individual comment level, since the master contained the coded comments) but were linked to the coded form letter master. Contact information was gathered for form letter submittals.

“Form pluses” were electronically filtered to remove all form letter text and then manually reviewed. Unique comments that were not represented by the codes in the master form letter were coded, as discussed in Section 3.2, Comment-level Coding. As shown in **Table 3-1**, The BLM received a total of 32,318 submittals. Most comments were submitted through emails sent to the BLM.

Table 3-1 Submittal Summary by Method

Code	Submittal Method	Number of Submittals
E	Email	31,145
M	Comment submitted at meeting	189
L	U.S. Postal Service (USPS) letter	795
F	Fax	0
O	Other (Testimony/Meeting Commentary QA)	189
TOTAL		32,318

As shown in **Table 3-2**, the majority of comment submissions were form letters or “form pluses”.

Table 3-2 Submittal Summary by Type

Type	Number of Submittals
Unique Submissions	546
Form Letters	31,049
Form “Plus”	723
TOTAL	32,318

Table 3-3 shows the affiliation of each commenter. Individuals provided the largest number of comment documents during the scoping period. No comments were received from Native American tribes. **Appendix D** provides a list of individual commenters and their affiliations.

Table 3-3 Submittal Summary by Affiliation

Code	Type	Number of Submittals
I	Individual	32,239
F	Federal agency	1
S	State agency	1
L	County or local agency	20
O	Non-government organization or special interest group (NGO)	39
B	Business	18
T	Native American Tribe	0
	TOTAL	32,318

Note: Entities may have more than one submittal and some submittals have more than one entity associated with them (multiple signatories).

Of the 32,318 comment documents received by the BLM, 3,275 were from commenters in Colorado, 25,929 were from other states or countries, and 2,643 were from unknown locations (i.e., they did not contain an address) (**Table 3-4**). **Figure 3-1** graphically identifies the frequency of comments within Colorado by zip code. The BLM considers all comments equally, regardless of geographic origin or affiliation.

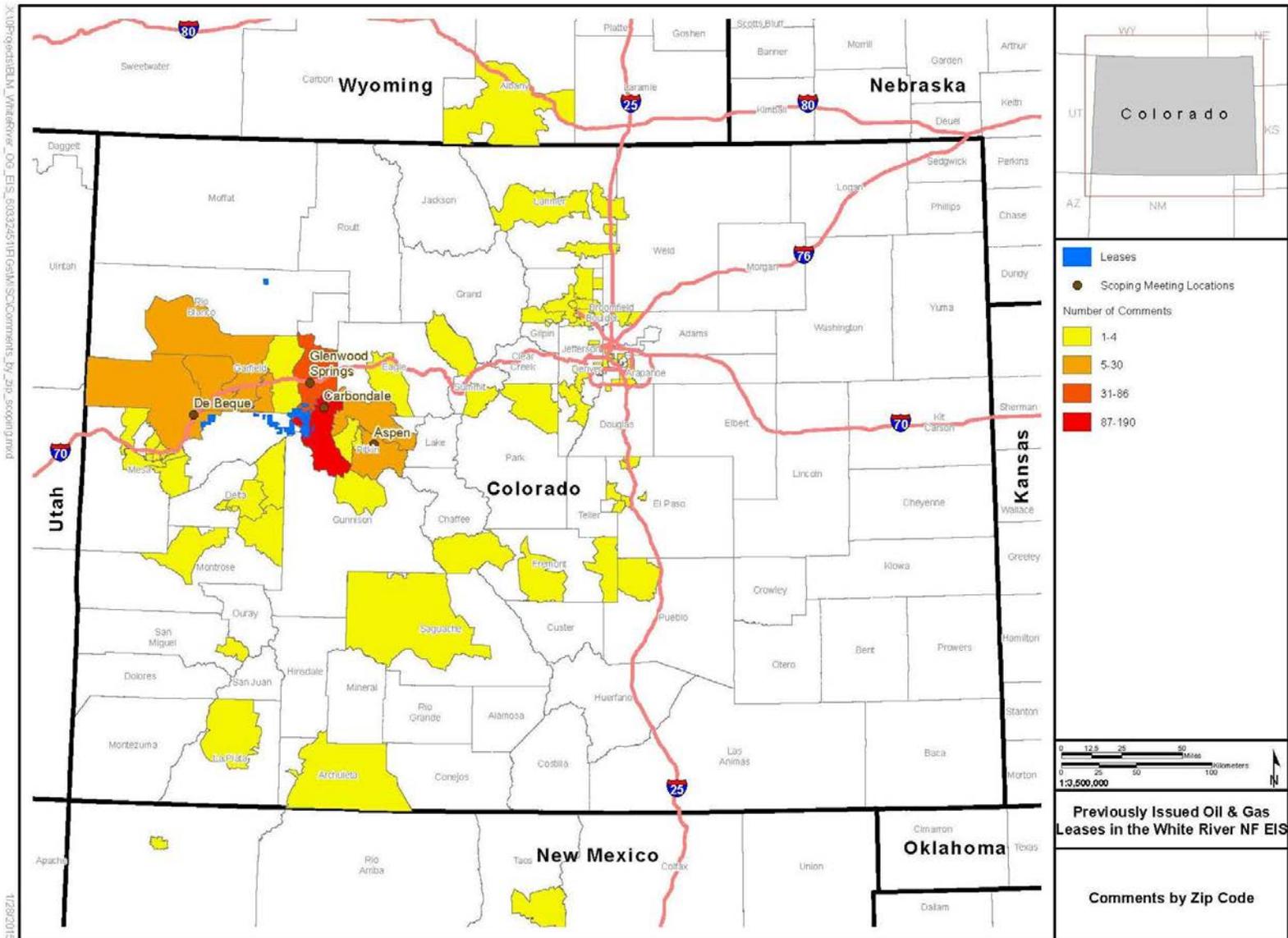


Figure 3-1 Colorado and Adjacent Areas Comment Frequency by Zip Code

Table 3-4 Submittal Summary by Location

Type	Number of Submittals
Colorado	3,275
Other US States	25,929
Canada	471
Unknown	2,643
TOTAL	32,318

3.2 Comment-level Coding

After initial processing, each unique submittal (or form master or “form plus”) was reviewed for the specific comments it contained. Each submittal contained one or more comments, and each comment was categorized and coded by primary resource issue or topic. Comments were assigned a general code corresponding to their respective resource issue or topic (for example, “WL” for wildlife), and a numeric sub-code specific to that resource to further group similar comments (as an example, comments suggesting wildlife existing condition data that should be used in the EIS were coded as “WL-2”). This form of analysis is used to allow resource specialists to view public concerns by general resource issue as well as resource-specific topics. In some cases, comments were given codes for a second primary resource; for example a comment about erosion affecting streams might be given primary resource issue or topic codes (and appropriate sub-codes) for both soils and water resources. Most comments receiving a second primary resource code were those that identified a resource concern but identified that resource issue as rationale for voiding a lease or conducting additional analyses. For example, comments that indicated that the BLM must legally analyze roadless areas were coded to both Special Designations and Process. Similarly, a comment that indicated that the EIS needed to address hydraulic fracturing may have been coded to both Geology and Process.

Many submittals also included attachments. Most attachments were reference citations for BLM review and use in the EIS or other supporting materials. These materials were not coded; however, a complete list of suggested references or supporting materials can be obtained by contacting the CRVFO. There were three attachments that were requested to be incorporated by reference. These were comment letters that were previously submitted to the USFS and BLM for the 2012 WRNF Oil and Gas Leasing Draft EIS (WRNF 2012 Draft EIS) and the CRVFO 2014 Proposed Resource Management Plan (RMP)/Final EIS (CRVFO 2014 RMP/Final EIS), respectively. The attachments were coded and included in the comment totals below.

A total of 3,428 comments were identified and coded. Of this total, 730 comments also were coded to a second primary resource, for a total of 4,158 comments to be considered in the following resource summaries (**Table 3-5**). **Figure 3-2** graphically identifies the percentage of comments by general resource issue or topic.

Table 3-5 Comment Summary by Resource Issue

Resource Issue	Resource
NEPA Process Issues (EIS Chapter 1)	
Purpose and Need	60
Process	592
Project Design (EIS Chapter 2)	
Alternatives	383
Impact Analysis (EIS Chapter 3 and 4)	
Air Quality	250
Cultural Resources	6
Geology/Paleontology	155
Hazardous Materials	54
Human Health and Safety	222
Land Use	73
Livestock Grazing	45
Recreation	207
Socioeconomics	424
Soils	19
Special Designations	112
Transportation	80
Vegetation, including Threatened and Endangered Species (TES)	67
Visual Resources	57
Water Resources	398
Wildlife, including TES	287
Cumulative Impacts	15
Mitigation	13
Other Analysis Issues	57
Opinion Only	584
Total	4,158

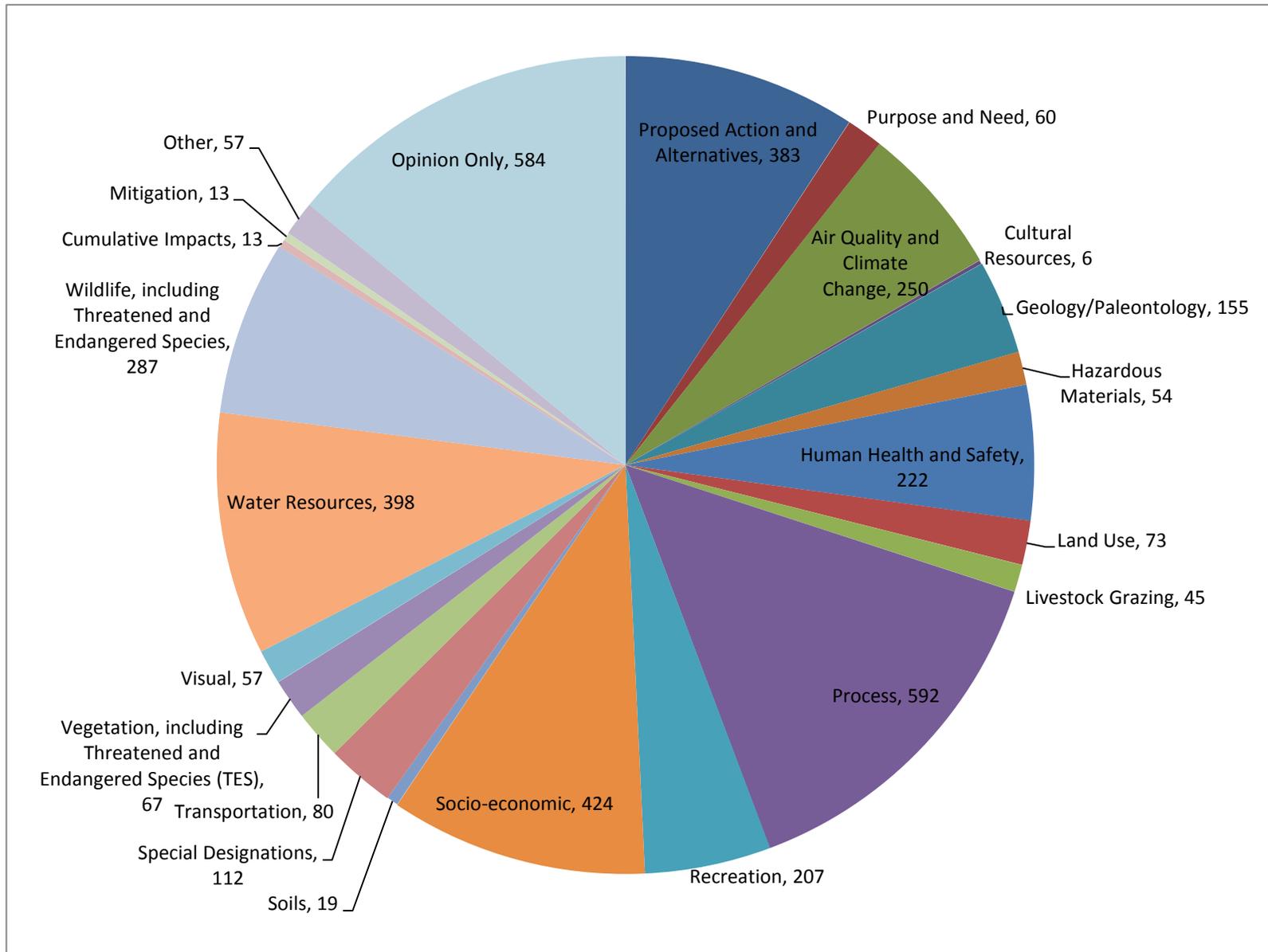


Figure 3-2 Percentage of Comments by General Resource Issue or Topic

4.0 Substantive Public Comment Summary

Substantive scoping comments fell into the following four broad categories: Process, Purpose and Need, Alternatives Development, and Impacts Analysis (including resource-specific concerns and cumulative impacts). Comments are summarized below in narrative form for each resource issue area (e.g., all comments specific to wildlife are included under the Wildlife category; all comments specific to visual resources are in the Visual Resources category, etc.). This section represents a summary of the formal comments received during public and agency scoping. A more detailed record of all unique comments is included as **Appendix E**. A digital list of all respondents and all comments may be accessed via the BLM website.

The narrative summary is organized in the following order, which generally mirrors where the comments would be addressed in the resulting Draft EIS:

- Process (Chapters 1.0 and/or 6.0 of the EIS);
- Purpose and Need (Chapter 1.0 of the EIS);
- Alternatives (Chapter 2.0 of the EIS);
- Impact Analysis (Chapters 3.0 and 4.0 of the EIS), organized by resource type (Physical Resources, Biological Resources, and Human Resources) and followed by general cumulative impacts and mitigation comments and other comments that do not fit other resources categories); and
- Non-substantive Comment Summary, including statements of support for lease reaffirmation and statements of opposition to lease affirmation.

It is important to note that not all of the issues raised by scoping respondents are necessarily within the scope of the EIS for Previously Issued Oil and Gas Leases in the WRNF. For example, many of the comments related to Process (Section 4.1) or Purpose and Need (Section 4.2) are issues that have already been addressed by BLM policy or regulation. However, because they comprised the majority of the public comments, these comments are summarized in the body of the report below.

Issues that are already addressed in BLM policy or by administrative actions will not be carried forward into analysis in the EIS, but rather, will be discussed in Chapter 1 of the EIS as part of the description of the scope of the EIS, Purpose and Need for Action, BLM Decisions to be Made, Regulatory Authority, etc.

4.1 Process

4.1.1 Comments Indicating the BLM has Already Adopted the WRNF 1993 EIS

Respondents included comments questioning the IBLA Decision and the need to adopt the WRNF 1993 EIS. These comments stated that the IBLA's findings failed to acknowledge BLM's acknowledgement of the WRNF 1993 EIS in the BLM 1999 Oil and Gas Leasing EIS, in which the BLM expressly stated that "Management of the surface resources on national forest system lands... is the responsibility of the United States Forest Service... decisions for those lands are not part of this [supplementary EIS]...[t]he WRNF's Oil and Gas Leasing Final EIS (1993) describes the management of oil and gas development on those lands." Respondents indicated that through this express statement, the BLM formally adopted the WRNF 1993 EIS as its own and has already satisfied its obligations under NEPA with respect to the decisions to issue the leases in question and appropriately acknowledged its deference to the USFS's authority over leasing decisions within the WRNF.

4.1.2 Comments in Support of Adopting the WRNF 1993 EIS

Commenters noted that the decision by the IBLA, which was based on a challenge to only three existing leases, included the option to formally adopt the WRNF 1993 EIS for leasing rather than conduct a new EIS. Comments stated that as a cooperating agency with respect to the WRNF 1993 EIS, the BLM accepted the USFS NEPA as sufficient at the time of the lease sales but simply missed the procedural step of formally adopting the analysis. Commenters further indicated that since the original legal error was the lack of adoption of the USFS EIS, the BLM may still simply adopt the existing EIS, which would eliminate the need for a new EIS altogether. Commenters further stated that the original NEPA deficiency does not constitute “improper issuance” of leases, but rather is a minor procedural issue that can be remedied with no legal need to develop an EIS or cancel any leases.

Respondents felt a reconsideration of leasing decisions would serve no useful purpose because the BLM, USFS, and the public considered the environmental impacts associated with the leases prior to leasing (and in some cases, in subsequent site-specific NEPA). While acknowledging that additional analysis of new information or changed circumstances would be required when a major federal action remains to occur, respondents stated no further major federal action remains to occur with respect to the leases in question; therefore, a new NEPA analysis is not required by NEPA, and the BLM may formally document its previous decisions to issue the leases based upon the NEPA analyses existing at the time. Respondents in support of this action indicated that the WRNF 1993 EIS was thorough and well-balanced and suggested that the BLM immediately cease its proposed action under the NOI and issue an amendment to the existing RMP indicating the adoption of the WRNF 1993 EIS was intended and is in effect.

Commenters stated that the WRNF 1993 EIS has guided lease development for the last 20 years and has been affirmed during multiple subsequent NEPA processes. Respondents noted that the 65 leases in question were issued between 1993 and 2012, indicating that after the 2007 IBLA decision; the BLM continued to hold lease sales. Commenters stated these leases were purchased in good faith during multiple publically noticed lease sales, and since their issuance, the USFS has continued to affirm the validity of its Forest Plan and NEPA analysis supporting USFS’ consent to lease, and BLM has recognized the validity of the challenged leases in project-level NEPA. Respondents stated that the attempt by BLM to change its position now is “arbitrary and capricious” and violates fundamental administrative law. Respondents noted that significant financial investment has occurred with these leases; and stated that a retroactive “changing of the rules” would undermine the confidence with which private Operators enter into contracts with the federal government in the future.

Commenters in opposition to this option indicated that there is a “clear need” for an updated analysis of oil and gas leasing on the WRNF, because the existing leases were issued in violation of the Endangered Species Act (ESA); with disregard to the USFS 2001 Roadless Area Conservation Rule and/or the 2012 Colorado Roadless Rule; and because the WRNF 1993 EIS and the WRNF 2002 LRMP Revision are out-of-date in a world of unconventional oil and gas resources. Respondents cited the Government Accountability Office report statistics of more than a five-fold increase in the production of oil and gas from shale and tight sandstone formations from 2007 to 2012 and stated that improvements in drilling technology have led to a level of oil and gas activity on the WRNF that greatly exceeds anything contemplated by prior planning documents. Comments also suggested that new information regarding roadless areas, air quality, and new listed species, other technological advances in drilling, and an increase in public interest have resulted in a landscape so greatly altered since the leases were initially issued that the need to study the economic, health and environmental impacts of resource extraction in the analysis area (and in particular, the Thompson Divide area) is paramount (also see Section 4.1.4, Scope of the EIS).

4.1.3 Comments in Support of Voiding Leases Outright

Some comments indicated that the correct process at this point would be for the BLM to void the leases outright and completely start the leasing process over again, rather than moving forward with an EIS designated to supplement the WRNF 1993 EIS, a process in which lease cancellation is only one alternative. Comments cited the precedent set in 2009 and 2010 in which other leases in the Thompson Divide area had been voided and indicated that the exact same circumstances were in place here. Respondents further stated that NEPA is designed to provide for analysis *before* the irreversible or irretrievable commitment of resources, and now that the BLM has acknowledged that it violated NEPA and issued leases improperly, the proper course would be for BLM to cancel the leases pursuant to 43 CFR §3108.3(d), and perform the requisite NEPA analysis (including ESA compliance) to examine whether or not it should re-lease these lands. Comments also suggested this process would save time and taxpayer monies.

4.1.4 Scope of the EIS

4.1.4.1 Identification of Leases to be Analyzed

Many commenters offered support for BLM's reconsideration of all 65 leases, indicating that a new NEPA process is necessary to address the original NEPA violation, violations of the ESA, and disregard of the Roadless Rule.

Some comments suggested that addressing all 65 leases in a single EIS would be the only appropriate way to avoid piecemeal disputes and inconsistencies in the treatment of individual leases. Other comments stated that the Affected Environment differs widely across the area covered by the leases and that each lease contains different stipulations, making a broad-based NEPA analysis difficult and an inefficient use of invaluable federal resources.

Many respondents noted the IBLA decision did not direct BLM to re-evaluate all other leases that were subject to the same administrative deficiency. Respondents therefore questioned the need for the inclusion of all 65 leases in the EIS, and further noted that no other party had raised this alleged NEPA deficiency with respect to other leases during the appropriate appeal period. Comments suggested that an EIS that exposes the entirety of 65 existing leases to new assessment and reevaluation would be beyond the bounds of the IBLA decision, causing an unnecessary delay in the development of these existing leases resulting in the loss of economic opportunity.

Some respondents suggested that the BLM split the 65 leases currently being debated into two separate areas for consideration: the 25 leases within the Thompson Divide area and the 40 leases outside of the area. This is discussed in more detail in Section 4.3.2.2. Respondents suggested there would be no need to study the potential for significant environmental impacts in a full EIS for the leases within the Thompson Divide area, because cancellation (the preferred alternative) would merely affirm the status quo on the land (which would remain undisturbed) and the BLM could use an environmental assessment (EA) as the decision document. Other comments stated any attempt by the BLM to distinguish between leases in one county versus another would violate long held principles of equal protection.

Comments also expressed concern that because many of these leases are part of larger existing Federal Units, the scope of the EIS could be increased to include those associated units.

Other respondents stated that per the MLA and its implementing regulations, leases that are producing, known to contain valuable oil or gas deposits, or committed to a unitization agreement can only be canceled by judicial proceeding, not through an administrative cancellation such as is being considered by the BLM through this EIS. Respondents therefore recommended those types of leases be removed from the scope of the NEPA analysis (also see comments regarding legality of voiding leases in

Section 4.3.1.2, Lease Cancellation Alternative). Other comments stated that any attempt by the BLM to distinguish between leases because some are producing and some are not would violate principles of equal protection.

Operators who stated that they were *bona fide* purchasers of leases also requested that their leases be removed from the scope of the EIS analysis, stating that the MLA and its implementing regulations prohibit lease cancellation when the lessee is a *bona fide* purchaser of the leases (also see comments regarding legality of voiding leases in Section 4.3.1.3, Lease Cancellation Alternative).

Operators also provided comments that enumerated the stipulations associated with their leases and requested that their leases be removed from the EIS because they have sufficient stipulations to mitigate any environmental effects of development (also see comments in Section 4.3.2.1, Lease Modifications).

4.1.4.2 Incorporation of New Resource Issues

Respondents noted that the NOI indicated that the BLM had identified new information available since the WRNF 1993 EIS and had identified the following preliminary issues: 1) a need to update the reasonably foreseeable development (RFD) scenario; 2) a need to address new exploration and production technologies; and 3) a need to incorporate new information regarding air quality modeling, address lands inventoried as roadless areas, and incorporate changes to BLM sensitive and species listed as threatened or endangered under the ESA.

Comments in support of these actions stated the WRNF 1993 EIS is more than 20 years old and commended the BLM for updating analyses to better reflect current environmental conditions, federal and state regulations, BLM policies and guidance, and advances in natural gas drilling, completion and production technology and operating practices. Many respondents suggested that the BLM rely on the updated analysis developed by the USFS in the WRNF 2012 Draft EIS. Other respondents provided comments indicating concern about the adequacy of the analysis contained in the WRNF 2012 Draft EIS and asked that those concerns be incorporated by reference for consideration as the BLM moves forward with the EIS for Previously Issued Oil and Gas Leases in the WRNF.

Respondents in opposition to the incorporation of new resource issues questioned the BLM's authority to examine new information. Respondents stated that because the BLM's stated Purpose and Need for the EIS is merely "to address the inadequacy identified by the IBLA in the previous decisions to lease", the BLM cannot analyze issues which were not reasonably foreseeable at the time of lease issuance. Respondents cited another retroactive BLM NEPA process, whereby, in correcting its improper reliance on a previous NEPA analysis, the BLM concluded that the appropriate action was to consider only environmental issues foreseeable at the time the leases were offered for sale. Comments identified that the BLM's response in that instance as the appropriate precedent to follow. Commenters also noted that the BLM did receive comments raising similar issues (including air quality, ESA compliance, and RFD limits) during at least one site-specific NEPA process (the West Mamm Master Development Plan was mentioned specifically), but upon review, the BLM decided to authorize that project. As such, commenters stated that BLM's decision to initiate this EIS on this same lease would be inconsistent with its prior determinations and, thus, arbitrary. Other comments indicated that any EIS update must recognize and honor the valid existing lease rights of Operators who legally obtained the leases in 1993.

Comments specific to new resource issues are discussed below, as well in applicable individual resource sections. Comments regarding updated development projections and new technologies are discussed in Section 4.4.1, Development Assumptions.

Incorporating New Air Quality Modeling Information

Commenters in support of reexamining the air quality analysis expressed concern about air quality impacts (particularly ozone) in light of increases in development and also indicated that climate change needs to be addressed in an updated analysis. More information is contained in Section 4.4.2.1, Air Quality.

Commenters in opposition to the inclusion of new information related to air quality stated the BLM must analyze air impacts from the perspective of what was reasonably foreseeable at the time it issued the oil and gas leases and that the USFS did not identify adverse air impacts prior to lease issuance. Respondents noted that the claim has already been made that the BLM and USFS did not adequately analyze air and, in particular, ozone but that the USFS and BLM defended the air analysis and ultimately prevailed in litigation; therefore, the BLM cannot claim that an air analysis it has already successfully defended in court was inadequate.

Respondents also stated that it is unclear how a retroactive analysis of prior lease sales would provide usable information for air quality analysis, noting that until a site-specific Application for Permit to Drill (APD) is submitted, potential impacts to air quality are extremely difficult to assess, and would be speculative in nature. Respondents stated that the question of the utility of lease sale-level analysis for specific environmental impacts has arisen before, and their limits are legally recognized. Respondents also stated that management decisions made under legally effective land use plans cannot be unilaterally revoked by BLM for any reason; therefore, whether BLM now possesses new information on air resources would not be a basis for initiating an EIS on past decisions to issue leases.

Addressing the 2001 Roadless Rule and 2012 Colorado Roadless Rule

Many comments noted that some leases would be in roadless areas and asked how the BLM would achieve compliance with the Roadless Rule. Some respondents asked for clarification if the BLM was planning to address compliance with the 2001 Roadless Rule or the 2012 Colorado Roadless Rule.

Comments in support of addressing the Roadless Rule in the EIS are summarized as follows:

- The 2001 Roadless Rule bars any road construction or reconstruction within inventoried roadless areas (IRAs) on national forest land. Any rights under leases offered after promulgation of the 2001 Roadless Rule are subject to that rule. This is because BLM's standard lease form provides that the lessee's rights are subject, among other requirements, to: (a) "applicable laws," and (b) "regulations . . . hereafter promulgated" when not inconsistent with the lease. In 2012, the Forest Service adopted a state-specific rule for Colorado that requires similar protections. Because the 2012 Colorado rule is "not inconsistent with" leases that are already limited by the 2001 rule, the lessees must comply with the 2012 rule as well.
- Development of leases within the Thompson Divide area would violate the Roadless Rule, as more than 40 of the leases were issued after the Roadless Rule was instated.
- Development of the roads necessary to support lease development would violate the Roadless Rule and the leases would not be able to be developed without roads.
- Existing leases do not adequately protect roadless values.

Comments in opposition to addressing the Roadless Rule are summarized as follows:

- BLM cannot analyze prior leasing decisions pursuant to the 2001 or 2012 Roadless Rules because those Rules were not promulgated until after the leases were issued and were not reasonably foreseeable at the time the leases were issued. Roadless area considerations should, therefore, only be considered for future leasing in the WRNF.

- The BLM cannot unilaterally modify leases to apply additional stipulations (e.g., NSO) that would otherwise prohibit exercise of the basic rights granted by the lease.
- The Colorado Roadless Rule, finalized in July 2012, does not prohibit oil and gas development and specifically exempts leases sold before July 2012. BLM may not modify or cancel leases because of this Rule.
- As an exception to the general prohibition on road construction, the 2012 Roadless Rule allows temporary roads where needed pursuant to the exploration and development of oil and gas leases issued prior to July 2012.
- The Roadless Rule does not fall under the purview of BLM, and the USFS has already recognized the validity of the leases in roadless areas. The BLM IBLA decision confirmed that objections to the conformity of USFS actions with USFS operating procedures or laws solely applicable to the USFS are not properly considered either by the BLM or the IBLA.
- The USFS has already addressed the Roadless Rule through NSO stipulations in roadless areas on some leases.

Addressing New Listed Species

Respondents noted that the BLM's NOI stated that the EIS analysis will address changes since 1993 to species listed as threatened or endangered under the ESA.

Comments in support of addressing changes to listed species in the EIS indicated that some of the leases fall within or in close proximity to areas identified as providing occupied or high potential habitat for the Canada lynx, a species listed in 2000 as threatened under the ESA. Respondents indicated that BLM did not consult with U.S. Fish and Wildlife Service (USFWS) when it issued post-2000 leases nor did they assess lynx presence in the leasing area or evaluate ESA obligations prior to issuing leases. Respondents stated that issuance of an oil and gas lease represents a federal action that may affect listed species or critical habitat, and leasing therefore may not occur without completion of the consultation process. Comments also stated that the U.S. Department of the Interior (USDOI) Office of the Solicitor for the Rocky Mountain Region had concurred on the need for formal consultation with the USFWS prior to issuing an oil and gas lease containing habitat occupied by threatened or endangered species: "...in the absence of an NSO stipulation biological opinions need to be completed at the leasing stage to determine whether the Department must expressly reserve the right to prohibit all surface activity on the lease." Comments requested that the BLM identify which of the leases were issued in violation of the ESA in the EIS. Comments also suggested that those leases must be cancelled.

Comments in opposition to addressing new listed species as part of the EIS are summarized as follows:

- BLM cannot impose new stipulations to existing leases based on post-decision protocols.
- The IBLA made no determination that the CRVFO had violated the ESA for the leases in Pitkin County; thus, the CRVFO may not unilaterally make that determination, 6 years later.
- Changes to BLM sensitive species and TES since 1993 do not warrant a full-blown EIS.
- For some leases, site-specific NEPA analyses have already looked at this issue, and either concluded there would be no impacts or have imposed appropriate conditions of approval (COAs), making this analysis unnecessary. For other leases, impacts to threatened, endangered or sensitive species are better analyzed when permitting applications for individual projects.
- Many existing leases contain NSO or timing stipulations and/or a lease notice for lynx habitat; thus, these issues have already been considered.

4.1.5 Request for Lease Suspension While EIS is Conducted

Operators stated that while they had received notification from the BLM indicating that their leases may be affected by this action, it was unclear whether the BLM would allow operations while NEPA analysis is being performed. Respondents indicated that if continued development were not allowed, they would lose several years of their Congressionally-provided 10-year lease term due to the BLM's decision to move forward with this EIS. Comments noted that the BLM had directly stated, when suspending the SG/URSA leases in 2013, that "no leasehold activities will be authorized until a NEPA analysis addressing the leasing decisions is completed" and requested that the BLM notify the lessees as to the current status of their leases and as to whether operations will be allowed to continue, pending the outcome of any NEPA analysis.

Commenters stated that forcing individual lessees to continue to make annual delay rental payments or minimum royalty payments for leases capable of production in paying quantities would unjustly benefit the BLM to the detriment of the lessees. Some Operators also indicated that because the BLM has stated that it will consider cancelling, voiding or modifying the leases, the proposed EIS has created uncertainty for lease development to the extent that would not make sense to invest in lease development until the NEPA process concluded.

Operators stated that per the MLA, suspensions may be issued "to provide extraordinary relief when lessees are denied beneficial use of their leases" and suggested that suspension of operations and production should be offered immediately for each of the affected leases and should run, at a minimum, until the BLM issues a Record of Decision (ROD) after completion of the EIS. Respondents cited examples in which the BLM had identified two applicable situations for which suspensions would be appropriate: 1) in situations in which the BLM initiates environmental studies that prohibit beneficial use of the lease(s); or 2) situations in which the BLM needs more time to arrive at the decision on the proposal.

As such, Operators requested a suspension of operations and production on leases effective as of May 1, 2014, to remain in effect for 2 years or until the ROD on the EIS for Previously Issued Oil and Gas Leases in the WRNF is issued and Operators are allowed to conduct leasehold activities, whichever is longer. Commenters also stated that the BLM should extend any approved APDs that may expire during the NEPA analysis.

4.1.6 Implication of Decision to Reanalyze the Leases

Several commenters cautioned that if the leases were cancelled, lessees would be entitled to damages, which would consider not only the value of the lease, but also factors such as the cost of compliance with NEPA and permitting (at various stages), rental and royalty payments, expended capital and operational costs, and other investment backed losses.

Comments further noted that if the BLM decision denies or unreasonably delays the lessees' ability to develop their leases, the BLM's actions may constitute a taking in violation of the Fifth Amendment to the U.S. Constitution and lessees would be entitled to damages in the fair market rental value of the leasehold as well as rescission and restitution claims. Respondents indicated that unlike traditional cancellation proceedings, where an interested party timely challenges a lease issuance and the BLM cancels an issued lease and refunds the lessor the bid price of the lease (consistent with the Fifth Amendment), compensation in this case would be equal to the fair market value of the rights taken from lessees, which would include the fair market value of the property at the time of the taking as well as an assessment of the property's capacity to produce future income. As such, fair market value could be in the range of hundreds of millions of dollars.

Comments further noted that because lessees have made investments in leases including some leases that are now producing, counties and local government in the analysis area have realized revenues from these leases. Respondents stated that these entities have subsequently made substantial investments in infrastructure and that returning that revenue may not be possible.

Respondents urged BLM to consider the significant impacts both to Operators and BLM from any such cancellation or modification on its decision to move forward with this analysis.

4.1.7 Public Involvement

Comments regarding public involvement included requests to be placed on the mailing list; comments thanking the BLM for holding public meetings, adding an extra meeting, and for extending the public comment period; and comments regarding the role of public opinions in deciding the fate of the leases.

Comments regarding the role of public opinions fell into three general categories:

- Comments regarding the general role of the public in the NEPA process;
- Comments regarding the role of local sentiment in making decisions about how the leases should be managed.
- Comments identifying the timing of the current public interest as being out of process.

4.1.7.1 Role of the Public in NEPA

Some respondents stated that decisions about oil and gas development should be based on a NEPA process that examines resource issues, not on which alternative receives the most “votes”. As such, the role of the public is to provide specific resource concerns for consideration, not position statements.

Other respondents stressed that NEPA was intended to give the public oversight and the ability to participate in federal decision-making and is the single most significant tool that the public has to participate in how public Federal lands are managed.

Commenters also suggested that NEPA requires only a “reasonably thorough” discussion of the environmental consequences in question, not unanimity of opinion, expert or otherwise. Respondents noted that public opinion varies over time, and while it plays an indispensable role in management decisions, it does not provide a firm foundation on which to provide the long-term certainty required to effectively utilize resources on public lands. Respondents encouraged the BLM to not be swayed by public demand to “do something” about these leases, and simply provide a straightforward accounting of the anticipated impact of oil and gas development. Other comments indicated that while the NOI appeared to imply that public sentiment was not in support of oil and gas leasing industry, the oil and natural gas industry is in fact viewed favorably by a large proportion of the American public.

4.1.7.2 Consideration of Local Sentiment

Respondents stressed the importance of meaningfully engaging the public and local communities with regard to decisions to be made by the BLM. Some comments indicated that the BLM (in part by not scheduling meetings in key areas affected by leasing) did not appear to be willing to let interested parties be a part of the process and had not provided timely notice of project initiation. Other respondents indicated that they felt that the BLM was considering their input and commended the BLM for scheduling additional meetings and allowing for formal public comment.

Comments in support of consideration of local sentiment and preference regarding leasing were received from respondents in favor of lease reaffirmation as well as those in favor of lease cancellation. Comments from both supporters of lease cancellation and lease affirmation indicated that the BLM

should make leasing decisions in collaboration with the local communities. Many comments stated they had no opinion about leasing outside their area of concern.

Respondents in favor of lease cancellation within the Thompson Divide area indicated that both communities and the general public in the Thompson Divide area have voiced strong opposition to oil and gas development in the area and requested that the BLM respect the desires of the people living in proximity to and using the land. Respondents stated that although the BLM failed to meaningfully engage local communities regarding the fate of the Thompson Divide during the original leasing process, the BLM now has the opportunity to do so. Some respondents pointed to the 2009 and 2010 lease cancellations as evidence that the BLM had rightly responded to local concerns. Other respondents expressed concern that the leases would be reaffirmed and developed despite opposition to drilling in the Thompson Divide. Private individuals and local communities indicated that they had voiced opposition to drilling on numerous occasions in the past (e.g., opposition to suspension actions and unitization proposals and support for the Thompson Divide Withdrawal and Protection Act) to little effect. Respondents also indicated that they preferred a different outcome than what happened at the Roan Plateau, where the BLM ended up attaching stipulations to leases instead of making an overall determination that this was not an appropriate area to drill, period.

Comments in support of lease affirmation expressed concern that supporters of Thompson Divide area lease cancellation (whom they perceived as “louder”, wealthier, and therefore able to mount larger public action campaigns) could push through a no-leasing, pro-recreation decision on portions of the analysis area where oil and gas development is supported. Respondents requested that the BLM consider all public opinion equally, and stated that given the BLM multiple-use mandate, no one user group has more rights than another.

4.1.7.3 Current Public Interest Considerations

Respondents stated that consideration of current public interest would be inappropriate not only because the analysis must be based on science—not public opinion—but because the BLM is limited in the EIS to examining issues that were reasonably foreseeable at the time of lease issuance, which means consideration of public interest also would be limited to that which may have existed at the time of lease issuance. Comments stated that this increased level of public interest in oil and gas related activities cited in the BLM's NOI comes well after any member of the public could challenge the lease issuance decision under the 90-day statute of limitations for the MLA.

Respondents indicated that the public was offered ample opportunity, as required by law, to comment on and participate in the processes establishing the USFS plans under which the lease sale took place. Comments stated that the public extensively participated in the WRNF 1993 EIS through two public meetings and a 60-day comment period, and at no point during this NEPA process (nor during the 6-year statute of limitations to file suit in federal judicial court) did the USFS or BLM object to the BLM and USFS's NEPA process on the grounds that such process was deficient, defective, or somehow not in compliance with NEPA on the bases described in the 2007 IBLA decision. Similarly, the public was offered opportunities for public comment during site-specific NEPA processes conducted for some of the leases.

Comments also noted that the BLM received public comments during site-specific NEPA processes raising similar issues as are now being considered under this EIS. During the site-specific NEPA processes, the BLM considered those concerns, and then decided to authorize development projects, therefore making the current decision to reexamine those same issues on the same lease inconsistent and arbitrary.

4.1.8 Cooperating Agencies

Some local governments indicated that the BLM must consider impacts to local communities and collaborate with local and regional government on alternatives development, data collection, and impact analysis. Several entities provided or referenced Master Plans, zoning regulations, permitting requirements, and energy development plans for consideration by the BLM.

Mesa and Pitkin counties requested cooperating agency status for the EIS for Previously Issued Oil and Gas Leases in the WRNF, noting an MOU would be required to formalize this relationship. The Town of Parachute, while not specifically requesting cooperating agency status, requested that the BLM coordinate with the Town and its seven-member Board of Trustees per Section 202 of FLPMA.

Oral comments from State Representative Ray Scott cited an MOU between the BLM and the State of Colorado regarding oil and gas development and indicated that the State of Colorado would be looking at revising the MOU beginning in January to redraft the authority that BLM is given regarding leases versus the State of Colorado.

4.2 Purpose and Need

Comments regarding the Purpose and Need for agency action focused on: 1) how the BLM should balance the goals and the requirements of the MLA and Mining and Minerals Policy Act of 1970 with other agency guidance and multiple use mandates; 2) how the USFS should balance similar goals, requirements and mandates; 3) how the U.S. or world demand for oil and gas should play into the Purpose and Need for agency action; and 4) what part the lessee's Purpose and Need should play in the process.

4.2.1 BLM Purpose and Need for Federal Action

Comments regarding the underlying BLM's Purpose and Need for action focused on whether the stated Purpose and Need for agency action supports reanalysis of the leases; and how the federal action does or does not support BLM's need to comply with the multiple use mandate of FLPMA and the requirements of the MLA and the Mining and Minerals Policy Act of 1970.

Comments in support of lease reaffirmation indicated that the multiple use mandate of FLPMA and the stipulations of the MLA require the BLM to provide for oil and gas development and to continue to issue leases. Respondents indicated that oil and gas development is a crucial part of the BLM's multiple use mandate, that the BLM must ensure that oil and gas development is not unreasonably limited as a result of updating the EIS, and that the BLM cannot impose COAs or other restrictions that in effect prohibit oil and gas development on valid existing leases.

Comments in opposition to lease reaffirmation indicated that the FLPMA multiple use mandate does not mean that all pieces of land need to support all uses, and that the BLM may rightly eliminate leasing from areas which have higher uses. Respondents stated that FLPMA directs the BLM to manage lands in a manner that protects the quality of critical resource values; preserves public lands in their natural condition where appropriate; provides food and habitat for wildlife and domestic animals; and provides human occupancy, use, and recreation. As such, respondents stated that the agency should not elevate the development of oil and gas resources above other critical resource values in the planning area, and where oil and gas development would threaten the quality of critical resources, resource conservation should be the preeminent goal. These respondents pointed to other resource qualities in the analysis area (particularly in the Thompson Divide area) and suggested that the BLM must balance the need to respond to the MLA and FLPMA with consideration of those qualities. Respondents stated that the amount of energy gained from reasonably foreseeable development would not be significant enough to

compensate for the damage to wilderness quality in the Thompson Divide area or the loss of economically more sustainable industries that depend upon wilderness qualities.

Comments stated that actions such as unabated oil and gas development undermine a community's welfare and capacity to provide for itself in the face of recognized changes to climate, fail to realize the agency's multiple use mandate and are incompatible with principals of ecosystem resilience that the BLM has acknowledged as a primary mission, and are indefensible pursuant to the agency's mandate to act as stewards of our public lands. Comments suggested that agency decision-making, both at the planning stage and in future site-specific implementation, must be reflective of the climate challenges we now face and that the BLM must promote ecological resiliency and adaptability by reducing oil and gas development to best position public lands and the communities relying on those public lands to withstand what is acknowledged as ongoing and intensifying climate change degradation.

Some respondents identified the BLM's Purpose and Need from the NOI as: "to address the IBLA's Pitkin County decision requiring BLM to either formally state it was adopting the USFS's analysis or prepare its own analysis". As such, some respondents questioned the need for an EIS to respond to this Purpose and Need, suggesting that the BLM still has the simpler option of adopting the USFS analysis. Additionally, respondents stated that because the BLM's stated Purpose and Need for the EIS is to address this NEPA inadequacy, BLM cannot analyze issues which were not reasonably foreseeable in 2003 and that this Purpose and Need precludes the action alternatives that have been suggested to date (also see Section 4.1, Process and Section 4.3, Alternatives Development for more details on comments regarding analysis of new issues and BLM authority to modify or void leases).

4.2.2 USFS Purpose and Need

Although the BLM is the lead agency for this project, the leases do occur on NFS lands. As a result, some respondents offered their comments in terms of how the USFS should respond to the leases.

Comments in support of the leases indicated that the multiple use mandate of FLPMA and the stipulations of the MLA require the USFS to provide for oil and gas development on National Forest System (NFS) lands.

Comments regarding the USFS's Purpose and Need from those in opposition to the leases stated that the mission of the U.S. Department of Agriculture (USDA) USFS is to "sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations" and that the USFS must balance the need to respond to the MLA, The Mining and Minerals Policy Act of 1970, the Multiple Use-Sustained Yield Act (MUSYA) mandate, and the National Forest Management Act (NFMA), with consideration of the roadless and wilderness qualities of the proposed leasing area. Respondent's indicated that NFS lands should be managed for wilderness preservation, ecological system protection, and biodiversity conservation, not oil and gas development. Other comments indicated that the USFS mandate to sustain multiple uses of renewable resources in perpetuity while maintaining the long-term health and productivity of the land requires science-based planning that promotes the ecological integrity of national forests and which must be ecologically and socioeconomically sustainable. As such, the USFS's obligation to protect natural resources and ecological integrity must drive all land planning.

4.2.3 Lessees Purpose and Need

Comments regarding the lessees Purpose and Need indicated that as existing leases, the lessee must develop and "prove" the leases in order for the leases to not expire.

Respondents in support of lease reaffirmation indicated that the EIS process would interfere with that process and that all leases should therefore be extended for the time period in which it would take to

complete the EIS process. Respondents in opposition to lease reaffirmation indicated that many of the leases have already been extended, and that the lessees have already had ample opportunity to prove their leases, but have not done so. Respondents stated the MLA includes provisions allowing the BLM to cancel/suspend the leases and suggested that the BLM do so.

4.2.4 Other Chapter 1.0 Issues

Several counties submitted comments regarding permits that would need to be obtained including:

- Underground and Utility Permit;
- Conditional Use Permits;
- Stormwater Construction Permits;
- Surface Alteration Permits; and
- Notice of Intent to Permit an Access.

Counties also submitted comments identifying county requirements for plan review, as well as county master plan or zoning prescriptions addressing desirable locations for oil and gas development, acceptable county road use, nighttime light pollution, and wildlife habitat protection. These comments are discussed in greater detail in the Land Use section (Section 4.4.4.4) of this comment summary.

4.3 Alternatives Development

Comments concerning alternatives generally either questioned the alternatives development process, or offered suggestions regarding alternatives to be considered. These comments are discussed in more detail in the following subsections.

4.3.1 Alternatives Process

Comments concerning alternatives development process fell into the following categories: 1) comments about how the No Action Alternative should be defined; 2) comments about the ability of the BLM to develop the alternatives that were defined in the NOI (lease reaffirmation, lease cancellation and lease modification);, and comments suggesting what alternatives should be dismissed from detailed analysis. These comments are discussed in more detail in the following subsections.

4.3.1.1 Defining the No Action Alternative

Submissions in support of the No Action Alternative being defined as lease reaffirmation (as described in the NOI) indicated that this was appropriate because the leases were, in fact, issued from 1995 to 2012 in conformance with the WRNF 1993 EIS. Additionally, respondents noted that some of the leases are producing, and as a result, there is existing surface disturbance. Thus, reaffirmation of the leases represents the status quo.

Submission in opposition to the No Action Alternative as described in scoping presentation materials indicated that the No Action Alternative would be more correctly defined as the non-issuance of leases (i.e., voiding or cancellation), since that was the original No Action Alternative in the WRNF 1993 EIS. Comments stated that because the EIS will reconsider BLM's earlier decision to issue the leases, the No Action Alternative must represent the pre-leasing status quo: an outcome where none of the 65 leases are issued. Respondents further indicated that the point of NEPA is to consider impacts before leasing occurs and suggested that if the status quo of today were used as the No Action Alternative, it would effectively eliminate the purpose of reconsidering BLM's earlier decisions based on additional NEPA analysis.

4.3.1.2 Leases Reaffirmation Alternative

Most comments that emerged from scoping related to lease reaffirmation focused on either the legal basis for an alternative that reaffirmed the leases; or offered requests or rationale for the selection of lease reaffirmation as the agency preferred alternative.

Legal Basis for Lease Reaffirmation

Many comments in support of lease reaffirmation offered general statements regarding the BLM's obligation to honor existing leases. Comments indicated that under basic contract law, the BLM is implicitly bound by the duty of good faith and fair dealing in its performance under contract and cannot violate this duty through action or inaction, whether or not BLM believes its conduct is justified.

Respondents indicated the WRNF 1993 EIS was thorough and well-balanced based on existing information available in 1993 and established clear expectations and obligations that were relied upon for the last 21 years by both the federal government and oil and gas development interests alike. During that time, leases were purchased in good faith during multiple, publically noticed lease sales, and since their issuance, both the USFS and BLM have affirmed the validity of the challenged leases through Project-level NEPA and in the USFS Forest Plan. Noting that the 2007 IBLA decision made no statement as to the validity of the leases themselves or other leases issued pursuant to the WRNF 1993 EIS or the WRNF 2002 LRMP Revision, respondents indicated that a retroactive "changing of the rules" would not only violate valid existing lease rights and undermine the confidence in which private Operators enter into contract with the federal government in the future. Respondents stated it would be inequitable to take actions contrary to the government's prior action, and that "increased public interest" is not sufficient reason to disregard legally binding leases (also see Section 4.1, Process, comments).

Respondents pointed to another retroactive NEPA analysis for oil and gas leasing in which the No Action Alternative was selected (Pennaco Energy EA) and urged the BLM to make a similar decision. Respondents also indicated that important decisions made recently by the Federal Court of Claims cast doubt on the entire line of cases that a lease issued with a flaw at issuance is "void ab initio," (i.e., is invalid from the outset), and thus can be cancelled without regard to contractual rights.

Respondents further stated that because of the good faith reliance on the WRNF 1993 EIS, significant financial investment has occurred associated with these leases by Operators. Operators would be entitled to compensation if leases were cancelled, the value of which would need to consider factors such as repayment of the value of the lease, the cost of compliance with NEPA and permitting, expended capital and operational costs, and other investment backed expectations. Commenters also noted that communities received and spent revenue that resulted from those investments and would experience significant economic hardship if the BLM determined that the leases were not valid and communities needed to repay the royalties received.

Respondent's also questioned the BLM's ability to select any alternative except lease reaffirmation for several reasons:

- While the BLM manages the mineral estate under the WRNF, it is the USFS that manages surface resources and has the authority and responsibility to determine: 1) which NFS lands are available for oil and gas leasing; 2) the lease terms that provide for reasonable protection of surface resources and values within the WRNF. As a result, the BLM's authority with respect to oil and gas leasing on NFS lands is extremely constrained in terms of modifying lease terms or cancelling leases, the two alternatives put forward in this EIS as meeting the BLM Purpose and Need for federal action.
- If the BLM adopted any alternative that denies or unreasonably delays the lessees' ability to develop their leases, the BLM's actions may constitute a taking in violation of the Fifth

Amendment to the U.S. Constitution. Commenters indicated that the Federal Court of Claims has recognized that a temporary taking occurs when the BLM prohibits oil and gas development on a lease for a substantial period of time and lessees are entitled to damages in the fair market rental value of the leasehold, as well as rescission and restitution claims. Therefore, comments continued, the BLM may not analyze or implement any alternative that voids leases, completely denies development, or attempts to unilaterally modify leases, through COAs or otherwise.

- Because the BLM's stated Purpose and Need for the EIS is to address the inadequacy identified by the IBLA in the "previous decisions" to lease, BLM cannot analyze issues which were not reasonably foreseeable in 2003, obviating the need for lease cancellation or modification. As a result, respondents argued, lease affirmation would be the only legal option that would meet Purpose and Need (also see, Process comments for more details on statements regarding analysis of new issues and Action Alternative comments for more details on statements regarding the legality of voiding or modifying leases).
- Once the BLM has issued a federal oil and gas lease without an NSO stipulation, and in the absence of a nondiscretionary statutory prohibition against development, the BLM cannot completely deny development on the leasehold. As such, respondents indicated lease cancellation or lease modification actions alternatives are remote and speculative and must be eliminated from detailed analysis because they do not constitute reasonable alternatives and/or are unlawful. Elimination of those two alternatives therefore would only leave the No Action Alternative (reaffirmation of the leases) and development of mitigation measures for site-specific development proposals. Respondents argued that development of mitigation measures for site-specific development proposals would not meet the Purpose and Need identified by BLM and thus would not constitute a reasonable alternative under NEPA. The comments concluded that the NEPA analysis would serve no purpose because the BLM has not presented reasonable alternatives for BLM to analyze other than the No Action Alternative.

While commenters in support of lease affirmation were not necessarily in favor of the EIS process, they also noted that NEPA is a procedural statute, which does not mandate particular results (for example, there is no burden on industry under an EIS to demonstrate that there will be no impacts), but simply prescribes the necessary process. Thus, the fact that the BLM is required to perform NEPA analysis on these leases does not necessitate a particular finding in favor of the environment or against development. Instead, the BLM only needs to analyze the environmental effects of the leases through NEPA procedures. Therefore, commenters noted, there is no reason why lease reaffirmation cannot be the outcome of the lease process.

Selection of Lease Affirmation (the No Action Alternative) as the Agency Preferred Alternative

Although many respondents in favor of the lease reaffirmation also indicated a new EIS was not needed (see Process comments), they also requested that if the BLM chooses to undertake a EIS, lease reaffirmation (the No Action Alternative) should be selected as the agency preferred alternative. These comments are summarized in Section 4.5.1, Statements of Support for Lease Reaffirmation.

4.3.1.3 Lease Cancellation Alternative

Comments about lease cancellation or voiding fell into three primary categories: 1) comments affirming the BLM's legal authority to void or cancel leases; 2) comments questioning the BLM's authority to cancel leases; and 3) requests to cancel the leases or rationale for selection of the lease cancellation alternative as the agency preferred alternative.

Comments Affirming the BLM's Legal Authority to Void or Cancel Leases

Commenters in support of lease cancellation argued that lease cancellation is far from unprecedented and that the law is clear that no vested rights are created when leases are issued in violation of NEPA. Respondents stated that USDOJ regulations provide that leases shall be subject to cancellation if improperly issued and that IBLA and federal court (including the U.S. Supreme Court) precedent establishes the authority of the Secretary of the Interior to cancel oil and gas leases issued in violation of the law.

Respondents also stated that lease cancellation is the precedent that BLM has already set for leases in the Thompson Divide, indicating that in 2009, the BLM cancelled identically-issued leases in the Thompson Divide, and in 2010 the BLM partially voided four Thompson Divide leases because they were improperly issued on lands occupied by Sunlight Ski Area (the remaining fragments of the four leases are at issue in this analysis). Respondents noted that the oil and gas industry did not contest either cancellation, confirming that industry knows BLM has the right to cancel improper leases. Respondents therefore concluded that no dangerous precedent would be set by cancelling leases. Respondents stated that BLM must follow the 2009 and 2010 precedents, because at least with regard to the undeveloped leases in the Thompson Divide, to do otherwise would frustrate the purposes of NEPA and would amount to an arbitrary action.

Respondents also indicated that the BLM regulation that provides for cancellation of leases issued improperly is a term of the lease written into the contracts at issue. Comments further stated that when the Operators asked BLM for an extension of the lease term, their request was akin to asking for renegotiation of the lease contract. BLM was not obligated to grant the extension, but when it did the agency was entitled to—and did in fact—condition the grant of extra time on reservation of a right to cancel the leases at the conclusion of this NEPA process. Comments stated that this action provides BLM with an entirely independent source of authority to cancel the leases.

Respondents stated there would be nothing inequitable about cancelling undeveloped leases in the Thompson Divide area, as the BLM has made it clear that Operators whose leases are cancelled would receive a full refund of monies paid. Comments also stated that the Thompson Divide Coalition has offered to pay for those leases. Respondents further suggested that such a refund would actually exceed the fair market value of these leases, because the leases cannot be profitably developed in light of current market conditions for natural gas. Respondents indicated that claims by Operators that their leases may be worth more in the future are speculation of a type prohibited by the MLA and Presidential policy. Commenters cited and provided studies concluding that the leases in the Thompson Divide area would not be able to be developed profitably, and requested that those data be considered by the BLM.

Comments Questioning the BLM's Legal Authority to Void or Cancel Leases

Commenters expressed concern regarding the long-term impacts to the management of federal minerals that could result from lease cancellation. Comments stated that the BLM would be setting a precedent that a federal lease has no certainty of tenure or terms and can be cancelled or re-written at any time. Respondents stated that private companies (who expend significant capital to analyze and lease federal resources, complete permitting requirements, and comply with regulations) require some amount of reliability from the BLM to undertake plans to develop federal oil and gas leases. Commenters felt that the proposed precedent-setting action to void leases would discourage future investment in the development of federal minerals. Comments also stated lease cancellation would result in public and political pressure to unduly influence the administrative process and further undermine valid existing rights. Comments stated that such outcomes would run counter to the intent of Congress in enacting the Mining and Mineral Policy Act of 1970, which states, "it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries."

Respondents stated that lease cancellation would not be a valid alternative for analysis under NEPA because the BLM only has limited authority to void leases and the circumstances in which this may occur do not occur in the present situation. Other comments stated that only Congress has the right to completely prohibit development once a lease has been issued.

Commenters requested that the BLM identify what precedents exist for canceling producing leases or leases that are over 10 years old. Comments noted that in other cases where the Court determined that the BLM's NEPA analyses were not sufficient to support leasing, the Court did not void the leases or any of the BLM's subsequent acts implementing the leasing decision. Instead, the Court indicated that doing so might adversely affect property interests obtained by lessees as a result of the lease sale, and prohibited further surface disturbing actions on the leases until the BLM more fully complied with its procedural obligations under NEPA.

Respondents stated that while the BLM manages the mineral estate under the WRNF, it is the USFS that manages the surface resources and has the authority and responsibility to determine which NFS lands are available for leasing and to define the lease terms providing for reasonable protection of surface resources and values within the WRNF. While acknowledging that the BLM has cancelled leases where it did not have the inherent authority to issue the leases (for example, in cases where BLM failed to obtain USFS consent prior to leasing), respondents indicated that those circumstances do not apply to the leases in question because the USFS *did* consent to the leases, and that the leases were, therefore, legitimately issued and are valid.

Respondents stated that the 2007 IBLA decision does not provide a valid basis for lease cancellation as the decision made no statement as to the validity of the leases themselves or other leases issued pursuant to the WRNF 1993 EIS or the WRNF 2002 LRMP Revision. Respondents further stated that in cases of administrative error, the IBLA has held that BLM should not void a lease (even if issued in violation of the MLA itself) in the absence of intervening rights. Comments also stated that when BLM has exercised authority to cancel an oil and gas lease for alleged administrative errors committed prior to lease issuance, the U.S. Supreme Court has upheld such cancellations only where the MLA and its implementing regulations were violated and where there were "proceedings timely instituted by competing applications for the same land." Respondents stated that in this case, no party asserted MLA violations or "intervening rights" challenging lease issuance, and proceedings regarding potential lease cancellations were not timely.

Respondents also stated that the lease cancellation is limited to circumstances in which the lessee does not abide by the terms of the lease, provisions of the MLA, or current regulations promulgated under the MLA. Respondents further indicated that per the MLA and its implementing regulation, leases that are producing, known to contain valuable oil or gas deposits, or committed to a unitization agreement can only be canceled by judicial proceeding, not through an administrative cancellation such as is being considered by the BLM through this EIS. Respondents further stated that this provision applies even in those instances where the lessee itself has failed to comply with the lease or the MLA. Comments noted that many of the proposed leases are producing (particularly in Garfield and Mesa Counties), and that others have been proposed for inclusion in a communization agreement or unit plan or are known to contain valuable mineral deposits (based upon its geographical proximity to producing leases). Respondents stated that the law precludes BLM from administratively canceling any of those leases.

Comments also indicated that the MLA and its implementing regulations prohibit lease cancellation when the lessee is a *bona fide* purchaser of the lease(s) in question, even if the lease is issued in violation of established procedures. Comments indicated that BLM regulation protects leases from any authority BLM may have to cancel leases "to the extent that such action adversely affects the title or interests of a *bona fide* purchaser even though such lease or interest, when held by a predecessor in title, may have been subject to cancellation." Respondents stated that the BLM would need to evaluate whether any

leases are held by *bona fide* purchasers because any finding with regard to a NEPA deficiency would not impact those leases. Some Operators provided lease acquisition history indicating they were *bona fide* purchasers of leases and indicated that at no time prior to or during lease acquisition did BLM notify them that the leases they were seeking to acquire could be subject to cancellation by an administrative decision. These Operators stated it was the responsibility of the BLM to adjudicate lease offers, and as *bona fide* purchasers, they had a right to presume that BLM had properly discharged this duty.

Respondents indicated that the legal doctrines of *equitable estoppel* and *laches* preclude the BLM from modifying or voiding leases. Respondents stated that to successfully claim *equitable estoppel*, a party must show that: 1) the party to be estopped must know the facts; 2) the party to be estopped must intend that his conduct will be acted upon or must so act that the party asserting the estoppel has the right to believe that it was so intended; 3) the party asserting the estoppel must be ignorant of the true facts; and 4) the party asserting the estoppel must rely on the other party's conduct to his injury. Operators stated that while the BLM may assert that the IBLA's 2007 decision effectively notified Operators that the leases they sought to purchase may be subject to cancellation, Operators had no reason to know that the 2007 IBLA decision could impact additional leases since the IBLA affected only three leases, made no broad or sweeping legal conclusions regarding the validity of any other leases, and did not direct the BLM to reevaluate other leases. Additionally, the IBLA issued the 2007 decision in the context of a timely submitted protest and subsequent administrative litigation timely filed pursuant to BLM's appeals process. Respondents stated that no administrative or judicial appeal had been brought forward with respect to the leases within those time periods.

Comments also stated that recent decisions in the Federal Court of Claims cast doubt on the entire line of cases that a lease issued with a flaw at issuance is "void ab initio," never creates a contract, and thus can be cancelled without regard to contractual right.

Respondents also stated that BLM's actions subsequent to the 2007 IBLA decision confirmed the validity of many of the leases. Respondents cited site-specific NEPA analyses approving lease development and which have acknowledged that "denial of an action alternative constituting the Operator's right to explore for oil and/or gas will violate contractual rights granted by the leases." Comments stated that while environmental organizations challenged some of these site-specific approvals, the BLM and the USFS successfully defended these challenges, and there was nothing in the BLM and USFS actions in defending the challenges or the court's opinion indicated that the leases were not valid.

Comments from Operators also noted that the leases in question are subject to environmentally protective stipulations, including NSO stipulations (which prohibit all surface disturbing activities on the leases), partial NSO restrictions with timing limitation stipulations, or controlled surface use stipulations (CSU, which also prohibit surface disturbing activities at different times of the year or during certain times of the day, or restrict surface disturbance in other ways). As such, commenters noted the BLM has no justification for canceling leases on environmental grounds as environmental damage has been minimized or negated by the protective stipulations.

Operators also noted that some leases in question are adjacent to leases on state and private lands that are not a part of this action and from which Operators may still drill and develop producing reservoirs. Thus, cancellation of federal leases would not benefit the environment but would only potentially deprive the BLM and the taxpayers of significant revenue.

Respondents indicated that the IBLA has specifically held that BLM does not have the authority to cancel a lease based upon a NEPA analysis conducted after lease issuance. Respondents noted that while the lease cancellation alternative may have been developed to address issues that were not present at the time of the lease, the BLM's stated Purpose and Need for the EIS is merely to address the inadequacy identified by the IBLA in the "previous decisions" to lease; the BLM cannot analyze issues which were

not reasonably foreseeable in 2003 (also see Process and Alternatives subsections 4.1.4.2 and 4.3.1.3 for more details on comments regarding analysis of new issues and BLM's authority to modify or void leases).

Selection of the Lease Voiding as the Agency Preferred Alternative

Although many respondents in opposition to the leases understood that the scoping process is designed to identify issues for analysis in the EIS rather than make a decision about how the leases should be treated, comments nonetheless contained multiple requests for the BLM to void or cancel the leases or to select this option as the Agency Preferred Alternative. These comments are summarized in Section 4.5.2, Statements of Opposition to Lease Reaffirmation.

4.3.1.4 Lease Modification Alternative

Comments about the potential for the BLM to modify leases with additional or different terms, or subjecting leases to additional mitigation measures for site-specific development proposals fell into four primary categories: 1) comments affirming BLM's legal authority to modify leases; 2) comments denying the BLM's authority to modify leases; 3) comments regarding the need for lease modifications; and 4) suggestions for specific lease modifications.

Comments Affirming BLM's Legal Authority to Modify Leases

Respondents indicated that leases within the Thompson Divide area cannot be developed without roads, the development of which would violate the 2012 Roadless Rule.

Comments on the CRVFO 2014 RMP/Final EIS (which were resubmitted for consideration on this project) indicated that some existing leases pre-date both the current Plan Revision and the 1999 Oil and Gas Amendment. Respondents stated that stipulations attached to these existing leases often fall short of protecting sensitive resources and do not reflect current conditions, changed circumstances, or new science. Comments requested commitments to ensure that the RMP's new stipulations are applied to development proposals that could adversely impact important resources. Respondents noted that the CRVFO 2014 RMP/Final EIS included many statements suggesting that BLM's authority to condition existing leases is limited, but indicated that the BLM does have broad authority to deny proposed actions on existing leases if leaseholders are unwilling to accept stipulations or conditions necessary to protect resources and to bring leases up to standards required in the RMP.

Some comments stated that federal regulations allow the BLM to apply other protection measures in conjunction with planning and implementing oil and gas projects, including applying stipulations consistent with the most recent land use plan as terms and conditions for discretionary approvals (e.g., right-of-way [ROW] actions) and applying COAs to augment protections related to lease activities). Respondents stated that that COAs may include applying a timing limitation of up to 60 days and requiring that a project component be relocated by up to 200 meters (or more than 200 meters for areas with CSU stipulations) to protect a sensitive resource value, as well as requiring adequate reclamation, weed control, erosion control, and dust abatement.

Other commenters indicated BLM's authority is not limited to 60-day timing limitations and 200 meter buffers, but rather, starts with the ability to deny the proposal, period, and extends to as many days, meters, or miles as necessary to protect other resources based on best available information and science.

Comments Questioning BLM's Legal Authority to Modify Leases

As discussed above under lease cancellation, respondents stated that under BLM's principle guiding statute, FLPMA, all BLM actions are subject to valid existing rights and that the BLM cannot limit,

restrain, or unreasonably interfere with existing right by unilaterally modifying the terms of the legal contracts. Respondents indicated that after the BLM accepts the bid and the lessee fully pays for the lease, a contract exists between the lessee and the BLM based solely on those identified terms and conditions and the BLM may not later amend the lease with terms not identified in the sale notice and not part of the contract subject to the bidding process. Respondents indicated that both the USFS and the BLM have recognized publically that the leases in question represent valid existing contract rights.

Respondents stated that federal courts have interpreted the phrase “valid existing rights” to mean that federal agencies cannot impose stipulations or COAs that make development on existing leases either uneconomic or unprofitable. Respondents also indicated that while the BLM manages the mineral estate under the WRNF, it is the USFS that manages the surface resources, and as such, it is the USFS that has the authority and responsibility to determine the lease terms that provide for reasonable protection of surface resources and values within the WRNF. As a result, COAs associated with development of leases within the WRNF are not with the purview of the BLM but are properly governed by the USFS as the surface management agency.

Additionally, respondents noted that BLM and USFS regulations indicate they may only restrict drilling pursuant to: 1) stipulations included in the lease; 2) specific, nondiscretionary statutes; and 3) such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed. Respondents further stated that “reasonable measures” must be consistent with lease rights granted and should not require relocation of proposed operations by more than 200 meters, require that operations be sited off the leasehold, or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year. Respondents also noted that “reasonable measures” cannot include any measures restricting drilling indefinitely or make drilling so economically onerous that the lessee cannot effectively develop the lease.

Respondents also stated that leases cannot be modified to address improvements in drilling technologies; but rather, BLM is limited to considering oil and gas development technology available at the time of lease issuance. Respondents stated that lease modification must therefore be limited to “reasonable measures” consistent with lease rights granted, and the BLM cannot alter lease stipulations based on directional drilling technology, which became widely used and economic after 2003.

Additionally, respondents indicated that although the USFS is near completion of the EIS addressing future leasing in the WRNF, the USFS has acknowledged in the EIS that proposed lease stipulations developed as part of that analysis cannot be applied to producing or existing leases or existing units without voluntary acceptance by the lessee.

Comments Regarding the Need to Modify Leases

Comments in opposition to lease modification argued that modifications were not needed because advances in technology have reduced impacts from drilling far beyond what was envisioned when the leases were issued (see Section 4.4.1, Development Assumptions). Comments further stated that the regulatory environment of 2014 has changed dramatically from that of 1993, and every aspect of oil and gas operations has come under more extensive and stringent regulations from both BLM and the State of Colorado. Respondents suggested that these new regulations essentially provide a layer of additional terms and mitigation measures, and requested that those regulations be included in the EIS analysis.

Respondents in favor of lease modifications cited the following as rationale for reconsideration of lease stipulations:

- Levels of development that are higher than originally anticipated in the WRNF 1993 EIS, requiring additional protections for the environment;

- The use of development techniques such as hydraulic fracturing as a very different type of oil and gas development than was originally envisioned and which may have more significant impacts to water and human health and safety and other resources that need to be mitigated; and
- Changed baseline conditions and regulatory environment, such as the designation of roadless areas, new listed species, and the required protections of those elements.

Comments recommended that the EIS consider and disclose the potential environmental effects of oil and gas development and determine whether there is a need to revise standards and guidelines (including leasing stipulations) to minimize the potential impact of development. Respondents stated that the analysis should not be delayed until site-specific stage, but rather considered now and appropriate land management policies placed through this EIS.

Respondents provided comments submitted as part of the CRVFO 2014 RMP/Final EIS and requested that the BLM examine comments made regarding that analysis for applicability to this project. Specifically, these comments indicated that the BLM must consider the use of BMPs as part of the EIS. Comments noted that the BLM response to these concerns as noted in the CRVFO 2014 RMP/Final EIS response to comments appendix indicated that application of any proposed site-specific requirements would be outside the scope of the RMP planning process. Comments indicated that this statement was not consistent with the contents of other RMPs and the actions of other BLM field offices (for example, the San Juan Public Lands Planning Area/Tres Rios Field Office LRMP/Final EIS, which required the use of BMPs through stipulations, standards, and guidance). Commenters stated that it is not necessary for many BMPs to be site-specific; rather, they can be applied broadly to all oil and gas operations.

4.3.2 Alternative Suggestions

4.3.2.1 Lease Modifications

Respondents requested alternatives that would increase resource protection measures; incorporate limited, phased or paced development options; place strong conservation thresholds for protection of resources; and restrict development in the most sensitive areas. Comments also provided suggested regarding timing stipulations, buffers or other protective measures that could be applied to leases to reduce impacts to specific resources, such as big game or other wildlife species. These measures are discussed within the resources section the measure was suggested to protect. Non-resource-specific suggestions included the following:

- Operators should be required to use existing capped wells as a way to reduce surface disturbance.
- Existing pollution should to be cleaned up before Operators can develop leases.
- Existing sites should be monitored to determine their performance with regard to atmospheric, water and ground contamination -- randomly and without notice.
- The BLM and the USFS should jointly consider and support the application of directional or horizontal drilling of federal leases designated with NSO stipulations from adjacent new or existing locations on federal leases without NSO stipulations or similarly adjacent locations on private leases. Comments stated that this would minimize surface disturbance. Comments also stated that this type of planning would need to address other essential development including the installation of gathering systems within lease road ROWs across lease parcels owned by other Operators, but that pipeline disturbance could be minimized through repeated, episodic construction activities that would allow one pipeline at a time to be installed.

- The BLM should require a compliance bond large enough that it holds the leaseholder accountable for any damages, including health issues, as well as pollution of air or water. Comments stated the bond also must address restoration of the landscape and account for ecosystem damages.

Respondents referenced the stipulations contained in the Tres Rios Field Office LRMP/Final EIS, which requires the use of pitless drilling systems, tanks to store stimulation and flowback fluids, and non-toxic hydraulic fracturing fluids near public water supply intakes.

Other comments suggested that development of COAs as part of the EIS are unnecessary and that COAs are best evaluated and developed at the site-specific project stage. Operators suggested while BMPs and conservation measures that avoid, minimize or mitigate potential environmental impacts related to oil and gas development may be identified in the EIS, the implementation of specific BMPs should not be mandated in the EIS, but rather assessed with consideration of site-specific conditions, EAs, and development plans for proposed projects by Operators. Operators with existing NEPA documents in place noted that site-specific development proposals have already developed appropriate design criteria, conservation practices, and mitigation measures to address site-specific impacts and indicated that subjecting these leases to further NEPA analysis would therefore be unnecessary and a waste of resources, since the NEPA analyses had already concluded that there would be no significant environmental impact in consideration of those elements. Operators further questioned the efficacy of a broad-based NEPA analysis since the affected environment differs widely across the area covered by the leases and that each lease contains different stipulations. Some comments indicated that court decisions have shown that BLM's specific authority to impose post-lease surface use controls is limited to the site-specific development stage.

Commenters acknowledged the protections included in the CRVFO 2014 RMP/Final EIS but stated that additional protections are needed, including but not limited to: improved site characterization to look for pathways by which contaminants may reach groundwater; stronger well design and construction standards; stimulation operation monitoring and reporting requirements; and improved waste water handling planning and practices. Comments also expressed concern about the ability of the BLM to conduct well and/or pipeline inspections or monitor the mitigations that are designed to protect resources. Comments note that the history of remediation of the mining, drilling, and extraction process has been problematic and that companies have not lived up to their promises and/or have gone out of business. Respondents suggested that the BLM must increase the numbers of inspectors and frequency of inspections, particularly in remote, pristine areas. Other comments indicated that companies work very hard to meet government standards and environmental goals.

4.3.2.2 Separating out the Thompson Divide Leases from the Rest of the Leases

Many of the comments requesting the cancellation/voiding or modification of leases were made solely in regard to the 25 leases currently held by SG Interests and URSA Resources within the "Thompson Divide area." Respondents provided a map defining the Thompson Divide area as including the Thompson Creek, Four Mile Creek, Threemile Creek, and Coal Creek watersheds, as well as the headwaters of East Divide Creek and Muddy Basin.

Comments noted that while Senator Michael Bennett has circulated draft legislation that would withdraw the Thompson Divide area from availability for future leasing; it would not protect the area from existing leasing. Respondents requested that the BLM include a distinct alternative within the EIS analysis that recognizes the significant political, legal, cultural, environmental, socioeconomic and community-preference differences between the 25 leases within the Thompson Divide area and the 40 leases located further west and divides the 65 leases currently being debated into two separate areas for consideration. Respondents identified the primary differences between the Thompson Divide area and other area as being:

- The leases within the Thompson Divide area are undeveloped and the surface area remains in the same condition as when the BLM issued the leases in 2003; whereas the leases outside the Thompson Divide area are adjacent to existing natural gas production with existing adequate site access and exploration and production infrastructure.
- The Thompson Divide area has wilderness, wildlife habitat, and recreation/tourism qualities that surpass the potential for profitable oil and gas development, which is categorized as low; whereas the leases outside the Thompson Divide area have ongoing oil and gas development and markedly different economic potential.
- Socioeconomic conditions in the Thompson Divide area are such that oil and gas development would result in significant adverse impacts to multiple non-extractive industries; whereas communities near the leases outside the Thompson Divide area value and need the economic gain related to the oil and gas development.
- County and local government, residents, and recreation users within the Thompson Divide area overwhelmingly do not support lease development; whereas communities near the leases outside the Thompson Divide area support lease development.

Respondents suggested that such a division would be acceptable to both the Roaring Fork Valley inhabitants who value the pristine nature of the Thompson Divide area and those outside the Thompson Divide area who generally are opposed to lease cancellation or modification, or the EIS process in general. Respondents further stated that they had no position regarding the leases outside of the Thompson Divide area, and felt that those decisions should be made in consultation with local communities in the area.

Comments in opposition to separating out the Thompson Divide leases indicated that the BLM should discontinue its use of the term “Thompson Divide area” and should not draw any distinction between leases inside and outside this boundary, as the land inside the “Thompson Divide area” holds no more intrinsic value than lands immediately outside the “Thompson Divide area” These respondents indicated that consideration of an alternative in this NEPA process that distinguishes between the Thompson Divide area leases and other leases for purposes of analysis would inject political bias into the NEPA administrative process. Comments also stated that in this NEPA analysis, the BLM is bound by the land use designations in federal land use plans and not those found in marketing materials or proposed legislation.

4.3.2.3 Restricting Leasing in Portions of the Thompson Divide Area

Some respondents suggested that a management approach that would be consistent with the concept of multiple uses would be to selectively restrict activities such as gas development in only high value areas within the Thompson Divide area, and allow development in areas that are not that exceptional. Comments in favor of this option identified Assignment Ridge and the southern part of the Thompson Divide as areas that are relatively scenic and unspoiled by cattle grazing and other activities, and which are probably too rugged and remote for gas development to be practical.

Comments in opposition suggested that development of any “compromise” alternative allowing a portion of the leases in the Thompsons Divide area to be developed would be an unacceptable solution because the value of the Thompsons Divide area is in its lack of habitat fragmentation.

4.3.2.4 Reducing the Size of the Leases

Comments contained a suggestion to consider reductions in the size of the lease areas or specific leases as a way to address resource impacts.

4.3.2.5 Cancellling Suspensions/Allowing Leases to Expire

Comments suggested that the BLM could best fulfill its mission by allowing the leases to expire and then protecting that area from any further activity from the gas and oil industry. Respondents stated these lessees were awarded with the knowledge that they had to “use them or lose them” within 10 years. Comments stated that leases that sat vacant for more than 10 years should have been allowed to expire. Respondents indicated that: 1) many of the leases show little material progress or demonstration that the leases are viable; and 2) many leases are now nearing expiration (or in some cases, have already expired), so lessees have failed or will shortly fail to meet the terms of the lease within the period of the lease. Commenters stated that the BLM should cancel lease suspensions (thereby recognizing those leases as having expired), and/or allow other leases to expire instead of issuing suspensions. Commenters hypothesized that lease holders in the Thompson Divide area are holding onto leases for speculative purposes or to try to drive up the buyout price they get from the local community.

Other comments suggested that lessees have been moving forward with development plans but haven't yet been able to drill because their development plans weren't approved by the BLM.

4.3.2.6 Restricting Leases in Non-High Potential Lands

Respondents submitted comments made on the CRVFO 2014 RMP/Final EIS and asked that the BLM examine comments made regarding that analysis for applicability to this project. Specifically, these comments indicated that the CRVFO 2014 RMP/Final EIS did not include an alternative closing non-high potential lands to future leasing. While the comments pertains to future leasing, other comments also indicated that lands within the Thompson Divide Area are low potential and indicated that the BLM should consider restricting oil and gas development to only those areas that are high potential.

4.4 Impacts Analysis

Comments noted that the EIS analysis should be based on peer-reviewed science and that the BLM and USFS must identify the science supporting their decisions and planning regarding this project.

Many comments indicated that BLM should adopt an approach to the EIS that minimizes the delay in providing lease holders reasonable access to develop their leases. Respondents indicated that existing analyses should be used to the extent possible and applauded the BLM for its intent to utilize the WRNF 2012 Draft EIS in the EIS to avoid duplicative efforts and enhance the efficiency of the process.

Comments noted that data and research are already available from state and federal agencies, scientists, and non-profit organizations. Many respondents identified reports, newspaper articles, studies, and other information that they suggested should be used for the analysis. A complete list of suggested references can be obtained by contacting the CRVFO.

Noting that some of the leases are currently held by production either from the leases themselves or the units to which they are committed, comments supported the use of site-specific NEPA analysis already prepared by the BLM and the USFS.

Operators requested the following information be included in the EIS: the extent to which each lease (and areas around each lease) has been subject to subsequent NEPA; whether the lease is producing or capable of production; whether the lease has been committed to a unit; the existing stipulations in the lease; the affected environment in the area of the lease; and the level of existing surface disturbance on each of the leases.

4.4.1 Development Assumptions

Respondents offered comments regarding the projected level of development and other assumptions that would be used for analysis. Respondents acknowledged that while the BLM cannot be 100 percent sure about what is going to happen in the future, the BLM must look at past development data to achieve a realistic projection of future development in order to make good decisions. Comments regarding the RFD or analysis assumptions requested consideration of the following:

- Increases in drilling that surpass projected developments levels contained in the RFD;
- Resource requirements of Mancos shale drilling versus other drilling methods, including water and transportation
- Impacts from new drilling techniques such as hydraulic fracturing versus historic drilling methods;
- Impacts from pipelines and roads;
- Incorporating new exploration and production technology into the analysis; and
- Development viability within the analysis area

Consideration of Development that Surpasses the RFD

Respondents indicated that there is far more oil and gas development in the analysis area than was anticipated by the BLM and USFS and that the BLM predicts more than 25,000 new oil and gas wells will be drilled in northwestern Colorado in the next 20 years. Comments noted that one of the major justifications for preparing a new NEPA analysis is the dramatic increase in oil and gas activity in the WRNF since the WRNF 1993 EIS, and the inadequacy of the RFD scenario included in that analysis. Respondents who supported the reexamination of the RFD expressed concern not only about the numbers of wells, but also the types of development that may occur (development of Mancos and Niobrara formations, use of hydraulic fracturing or other technologies that would drastically change the assumptions underlying the RFD; see subsections below). Comments incorporated by reference from the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS expressed concern about the adequacy of the RFD used in the development of the CRVFO 2014 RMP/Final EIS and WRNF 2012 Draft EIS, indicating that the RFD relied on outdated and inadequate information and, thus, did not provide a sufficient basis for the agency's analysis of resource impacts – including impacts to air quality, climate change, water resources, and other values, as well as impacts from hydraulic fracturing. Comments expressing concern with the RFD stated that development of the Mancos and Niobrara formations differ significantly with regard to a wide range of operational and engineering issues that translate into distinct impacts and new management challenges (see subsections below for specific details about Mancos Shale drilling and hydraulic fracturing).

Commenters in opposition to consideration of an updated RFD stated that the BLM cannot look at development activities that were not reasonably foreseeable when the leases were issued. Respondents stated that regardless of whether the BLM thinks that the NEPA analysis and management regime were inadequate, they were legally the guiding documents at the time the leasing decision was made, and must be given deference, and that the BLM cannot seek to apply current conditions and policies to a past decision to lease. Respondents also noted that in 2008, environmental plaintiffs challenged the RFD for the WRNF 1993 EIS as inadequate on the grounds that it did not consider increased drilling activity, but that BLM and USFS rejected that view in 2009, well after the leases had already been issued, and defended the NEPA analysis as adequate. Comments stated that the BLM therefore cannot take a contrary view. Commenters also noted that the CRVFO is in the process of updating its RMP and that the CRVFO 2014 RMP/Final EIS contains ample consideration of oil and gas leasing and development and includes an updated RFD, making the consideration of an expanded RFD as part of this project unnecessarily duplicative. Comments also cited the BLM's own history of allowing drilling in the

Thompson Divide as evidence that drilling has not “dramatically increased” in the “Thompson Divide” leases at this time.

Consideration of Mancos Shale Drilling Techniques

Operators stated that although limited horizontal wells have been drilled and produced to date, they believe that the potential exists for future commercial development of the Mancos/Niobrara shale formations, which may include some of the existing leases. Operators stated that development of the Mancos/Niobrara shale should be less impactful, assuming that these horizontal wells also can be located at existing well pad locations to minimize additional surface disturbance and to utilize existing infrastructure including roads, production equipment, and gathering systems.

Other comments stated that recorded drilling times of 52 to 92 days per well were three to six times as long as those for existing development of the Mesaverde or Williams Fork formations in the CRVFO. Respondents stated that longer drilling times mean longer disturbance periods for wildlife, and greater direct and indirect impacts for a suite of resource values; for example, drilling 12 or more wells from a pad could take from 600 to 1,000 days – or almost 3 years at the higher end of 92 per bore. Respondents stated that data and information regarding these new formations is no longer mostly proprietary within the oil and gas community and that a wealth of new information triggers NEPA’s hard look requirement.

Respondents also stated the EIS must include traffic estimates that reflect potential development and impacts of plays likely to be targeted or the types of technologies that would be used (i.e., deeper drilling, use of hydraulic fracturing, etc.). Comments stated that traffic estimates must include drill rigs, water trucks, trucks with hydraulic fracturing tanks, as well as pilot cars and supply trucks and pickups.

Comments provided on the CRVFO 2014 RMP/Final EIS for incorporation by reference indicated that new information regarding Mancos shale drilling necessitates updates in the RFD; gas, oil and water production history; cost estimates; compressor and pipeline infrastructure; as well as updates to drilling times, length of drilling activities, and the number of fracturing jobs per completion. Respondents indicated that all of these issues have also implications for air quality and other resources. Comments stated that the CRVFO 2014 RMP/Final EIS omitted existing information after 2008 regarding the Mancos and Niobrara formations and stated only that there is a small number of Niobrara wells forecasted. Respondents stated that contrary to that statement, 43 federal wells and federally supervised fee wells have been drilled into the Mancos and Niobrara shales within the CRVFO since 2001 and successful drilling in these formations suggests that development of shale formations may reasonably be expected to dominate drilling activities in the CRVFO in the next two decades. Comments noted that the existing RFD did not consider that Mancos and Niobrara wells are characterized by significantly greater vertical and horizontal distances, significantly longer drilling times; significantly more hydraulic fracturing jobs per completion, greater use of resources including water and chemicals; overwhelmingly greater production, pressure, and associated engineering challenges; and significantly greater truck traffic and infrastructure requirements, with potential impacts to water quality; human health and safety; vegetation and reclamation; wildlife; socioeconomics; and public health issues associated with impacts to water and air as well as from the transportation, storage, and use of fracturing chemicals.

Commenters stated that because of the potential for unique impacts, BLM cannot dispose of this issue by asserting any development of Mancos or Niobrara wells would be applied against the assumed well numbers in the RMP. These respondents indicated that the time to conduct supplemental analysis for these new formations is now, not after allowing a regional science experiment of drilling thousands more wells prior to analyzing development of these shale formations. Respondents noted that the BLM Farmington New Mexico Field Office (FO) has initiated an RMP amendment responding to the emergence of new Mancos Shale formations in the San Juan Basin and suggested that the CRVFO follow suit.

Consideration of Hydraulic Fracturing

Many respondents expressed concern about the potential impacts from hydraulic fracturing on multiple resources. Comments stated that hydraulic fracturing has the potential for adverse impacts that go far beyond what the original lease decisions intended; thus the EIS must analyze those development methods and disclose those impacts. Many comments requested that hydraulic fracturing be prohibited altogether, particularly in the Thomson Divide area.

Respondents stated that while hydraulic fracturing has been around for decades, the magnitude of the modern technique is new. Comments noted that the BLM estimates that roughly 90 percent of new wells on federal lands are hydraulically fractured, and stated that while modern techniques are too recent to know the far ranging impacts of exploding high velocity chemicals and water into rock, wells have been found to leak methane at far greater rates than expected. Respondents also stated that hydraulic fracturing enables the drilling of far more wells than have been planned for in the area and that its use includes thousands of truck trips and 50 to 100 times the water of conventional wells.

Respondents stated that traffic estimates must account for hydraulic fracturing needs and activities such as increased water supply traffic and trucks with hydraulic fracturing tanks. An opposing comment stated that current hydraulic fracturing no longer requires a multitude of water trucks since the water is now delivered by pipeline to and from the wells and that this would vastly reduce the impact of drilling operations and traffic.

Respondents also expressed concern about the content of hydraulic fracturing fluids. Comments stated that about 750 compounds have been listed as additives for hydraulic fracturing in a report to Congress in 2011. Respondents provided multiple pages of text representing a partial list of the chemical constituents in additives used in fracturing operations. Concerns about the impacts of fracturing fluid also are discussed in Section 4.4.2.4, Water Resources, and Section 4.4.4.3, Human Health and Safety, as well as other resources.

Comments submitted on the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS for incorporation by reference indicated that the agencies failed to provide any information or analysis of substance regarding hydraulic fracturing. Comments stated that while the RFD mentions hydraulic fracturing as a technology that is currently used in some areas and may allow for future development of additional plays, the RFD was not updated to address additional water requirements or additional wells that might be drilled and the EISs do not include a discussion of hydraulic fracturing in terms of surface disturbance, water, or air quality impacts, subsidence or seismic impacts. Comments stated the following:

- The CRVFO 2014 RMP/Final EIS based its assumptions and, by extension, its analysis, of oil and gas development on an outdated RFD that was prepared in 2008, just as modern hydraulic fracturing techniques were being developed and tested in the area. The RFD noted that high-energy gas fracturing and new methods of well stimulation are currently being used and may play a part in an increased number of wells being drilled, but did not consider this potential contribution from hydraulic fracturing into its projections of future development. Although the CRVFO 2014 RMP/Final EIS estimated that 4,198 wells would be developed under the Proposed RMP (fewer than the 5,768 wells projected under the RFD), neither of these estimates allowed for the likely scenario that advances in hydraulic fracturing technology would increase the number of drilled wells. Comments stated that the CRVFO 2014 RMP/Final EIS treated development intensity, timing, and location of development of the deep marine shales as too speculative for quantitative impact analysis in part because detailed information regarding development has been considered proprietary by Operators; but indicated sources for obtaining the relevant information are available to the BLM, including, but not limited to, existing data on drilling geologically similar deep tight-gas marine shales, existing data on drilling parts of the Niobrara and Mancos formations not within the CRVFO boundaries, industry experts on

hydraulic fracturing practices, and scientific studies on the development of deep tight-gas marine shales.

- The CRVFO 2014 RMP/Final EIS failed to consider issues of water supply related to hydraulic fracturing. Comments stated that the RFD water usage scenarios used by the BLM were outdated and the biological assessment (BA) was inadequate because it relied on estimates from the RFD. Comments suggested that the BLM utilize projections prepared by other agencies and NGOs that estimate higher water usage rates. Commenters stated that the USEPA estimated that 70-140 billion gallons of water are used annually by wells that conduct hydraulic fracturing in the United States, and that other sources estimate 2 to 8 million gallons being used to fracture a single well.

Comments provided on the CRVFO 2014 RMP/Final EIS also stated that BLM's hydraulic fracturing regulations were last updated in 1988 – which, in the BLM's own words, was, “long before the latest hydraulic fracturing technologies became widely used.” Comments stated that these rules did not foresee the development and prevalent adoption of well stimulation techniques used today, nor did the environmental review of the 1988 rules consider the impact of these practices. As such, the BLM's reliance on these regulations to protect the environment and public health, and their use as a basis for the impact analysis is inadequate. Respondents commented that the CRVFO's failure to account for these changes in the use of hydraulic fracturing failed to satisfy the hard look that NEPA demands, and that the BLM's response to these public comments (which was to cite the management of hydraulic fracturing provided by these regulations), was inconsistent with BLM's own admission in its proposed rulemaking on hydraulic fracturing that the existing BLM regulations do not adequately address the environmental and public health risks from oil and gas production currently occurring on federal lands.

Consideration of Transportation Routes and Pipeline Development

Respondents resubmitted on the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS for incorporation by reference stated that pipelines and transportation were not adequately considered in WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS. Respondents stated that compression and pipeline infrastructure development have significant impacts, and that details associated with such build-out must be analyzed before Mancos/ Niobrara development is allowed to go beyond the exploratory stage.

Comments further stated that necessary road improvements can include: complete redesign, clearing and grubbing, realignment, widening, decreasing road grades, culvert installation, ditch construction, retaining wall construction, and resurfacing, but that not all of these activities are appropriate in all places, and that the USFS neglected to consider as much or to analyze stipulations that would allow the agency to deny use of specific transportation resources in the analysis area. Commenters expressed concern about the impacts of improving and extending roads in the analysis area, including increased erosion, mud and rock slides, decreased grazing and hazards for cattle and wildlife, decreased enjoyment of recreational activities, increased dust and air pollution, and negative impacts to watersheds. Respondents cited and provided a study of the impacts of truck traffic related to hydraulic fracturing which concluded that the hydraulic fracturing process for a single well would require an average of 1,400 one-way truck trips just to haul water to and from the site and that with consideration of full development process (construction, drilling, and completion), an average well utilizing hydraulic fracturing would require 2,206 one-way truck trips, not including production, which could add an additional 730 truck trips per year, depending on various factors, including the success of the well and whether it is re-fracked. Respondents indicated that drilling to different formations also may require workovers on more frequent intervals.

Comments acknowledged that the CRVFO 2014 RMP/Final EIS includes pipelines and roads in its disturbance acreages, but that the CRVFO 2014 RMP/Final EIS failed to quantify any harm, and

minimized the direct, indirect and cumulative impacts of pipeline construction, maintenance and operation.

Comments stated the additional information was lacking:

- The CRVFO 2014 RMP/Final EIS only provided a cursory discussion of how impacts would be changed by reducing truck traffic through the installation of pipelines.
- The CRVFO 2014 RMP/Final EIS was unclear on what pipelines will be required, what pipelines are “feasible,” whether they would be limited in what they transport, how many barrels per day they would transport, and how much truck traffic this would displace (if any, since the pipelines ultimately are transferring product to trucks).
- The CRVFO 2014 RMP/Final EIS provided no specific estimates of how many pipelines will be constructed, how many miles of pipe will be laid, what their diameter would be, how many water-bodies they would cross, or where they will be located. For example, the RMP/Final EIS recognized the potential risk of pipeline ruptures (an average of one rupture annually should be expected for every 5,000 miles of pipeline) but included no projections of how many pipeline miles the CRVFO currently has and how many miles the agency expects will be built in the planning area during the life of the RMP. Further, while the RMP/Final EIS acknowledged the potential for contamination of soils, surface water, and groundwater as a result of spills, there was no discussion of possible spill volumes or consideration of various spill scenarios.

Consideration of New Exploration and Production Technology

Some Operators cited advances that have allowed previously inaccessible hydrocarbon reserves to be developed without increasing into greater environmental impacts, and requested that those improvements be included in the EIS. These included:

- Directional drilling techniques that allow Operators to consolidate wells onto a small number of multi-well pads with greater spacing, and horizontal drilling, which allow access of NNSO leases from adjacent lease areas;
- Multi-stage hydraulic fracturing that allows each individual well-bore to access a greater area of the target formation within the lease;
- Solar-powered telemetry that allow Operators to remotely monitor and control wells and production equipment, resulting in fewer visits and truck trips on lease access roads; and
- Advancements in closed-loop pitless drilling technology, recycling and reuse of produced water for hydraulic fracturing treatment, green completions, the widespread adoption of water-based drilling muds, and the adoption of combustors and auto-igniters that would reduce the impacts of oil and gas development to the surface environment, groundwater resources, and air quality.

While noting that directional drilling is not always an option depending on geology, Operators stated that directional or horizontal drilling could reasonably be projected to form a significant part of the development strategy for the 65 leases under analysis, and as such would represent a drastic reduction in the anticipated surface disturbance per well that should figure prominently in any impact analysis.

Operators also stated that advances such as directional and horizontal drilling also may not be the most environmentally preferable option and recommended that the BLM consult with Operators on current operational practices. Other commenters indicated that some details of development (such as the use of injection wells or flaring) may not be known until the site-specific stage and may not be able to be analyzed as part of this project.

Respondents in opposition to the consideration of new technologies stated that the BLM is limited to considering oil and gas development technology available at the time of lease issuance and cannot, for example, alter lease stipulations based on directional drilling technology which has become widely used and economic only after 2003.

Consideration of the Lack of Development Viability of the Thompson Divide Area

Respondents requested that the BLM disclose the ability of the Thompson Divide area to even be developed. Comments cited studies showing that the areas in question has low potential for development and cannot be developed profitably. Respondents presented independent, peer-reviewed geologic and economic analysis that provided extensive information about the geology of the area and which concluded that only formation which has any chance of producing economic volumes of gas is the Mancos (or Niobrara) formation and that even with consideration of those formations, there would be “little to no economic viability” to drilling of oil and gas leases in the Thompson Divide area. Comments stated that during the 10-year primary term of the Thompson Divide leases, these lands remained undrilled while some 10,000 wells were drilled elsewhere in Garfield County. Comments stated that the capital costs of developing gas in the Thompson Divide are too high for companies to make money drilling there. Respondents indicated that the fact that these lands are not economically prospective should come as no surprise, since most of the leases in the Thompson Divide sold for \$2-8 per acre, whereas federal lands elsewhere in the Piceance Basin typically command thousands of dollars per acre. Comments stated that the actions taken by leaseholders in the Thompson Divide area are entirely consistent with the results of the economic analysis discussed above, in that the lessees did little or nothing for the first 8 years they held the leases and have since filed for suspension of operations and production on their leases. Comments further noted that if gas prices were not high enough for lessees to develop the leases early in the life of the leases they are not high enough now.

4.4.2 Physical Resources

4.4.2.1 Air Quality and Climate Change

Resource Concerns

Respondents expressed concern about air pollution associated both with industrial traffic and oil and gas operations on the WRNF. Respondents indicated that protection of air quality was of prime importance because it has the potential to affect human health and safety, and could affect sensitive wilderness areas with pristine designations, as well as other resources in the area. Commenters stated that these issues also affect resource uses such as recreation, and have serious socioeconomic implications for the area. Comments expressed concern about air emissions from multiple sources, including air emissions from drilling, flaring, hydraulic fracturing, and truck traffic. Respondents generally expressed concern about the following air quality issues:

- Criteria pollutants and their appropriate National Ambient Air Quality Standards (NAQSS [i.e., ozone, particulate matter [PM], dust, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead]). Most comments focused on ozone and or PM/dust.
- Impacts to Class I and sensitive Class II Areas; including air quality related values (air quality related values [AQRVs]; resources sensitive to air quality and including a wide array of vegetation, soils, water, fish and wildlife, and visibility). Most comments focused on visibility and identified locations of concern and expressed concern about secondary impacts to recreation and socioeconomics
- Air emissions from development as they contribute to climate change, including methane. Comments focused on the need to address global warming.
- Air quality effects on human health, particularly from ozone, volatile organic compounds (VOCs), and hydrogen sulfide.

Many of the comments relating to air quality were comments that were submitted as part of the NEPA processes for the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS, and which were resubmitted for incorporation by reference. These comments identified resource issues, expressed concern about the adequacy of the analysis contained in the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS (including existing condition data and modeling) and offered suggestions about mitigations and monitoring.

Comments on the CRVFO 2014 RMP/Final EIS also indicated that the CRVFO 2014 RMP/Final EIS makes clear that oil and gas development on the WRNF and other federal lands will have serious impacts on air quality in our region. Comments on the WRNF 2012 Draft EIS noted that the agency is well beyond levels of development anticipated in the WRNF 1993 EIS and can no longer tier to that plan for approvals and that agencies must undertake thorough analysis of air impacts associated with all proposed oil and gas developments in the planning area until the WRNF 2012 Draft EIS is finalized, and the agency can legally tier to it.

Ozone

Respondents expressed concern about ozone, noting that many recreationalists, including children, could be at risk of adverse health effects as a result of breathing polluted air. Comments included documented incidences of winter-time ozone violations associated with oil and gas activity. Comments stated that oil and gas development in the western U.S. can lead to ozone levels that violate air quality standards. Winter ozone levels in rural areas of Wyoming and Utah have registered at levels comparable to those in the Los Angeles Basin in California. Respondents stated that exposure to ozone is a serious concern as it can cause or exacerbate respiratory health problems, including shortness of breath, asthma, chest pain and coughing, decreased lung function and even long-term lung damage and indicated these effects were especially concerning in light of the fact that winter-time visitors come to the area to enjoy outdoor pursuits that often involve aerobic and anaerobic activities that heighten one's intake of air pollutants. Additional concerns related to ozone also are outlined Section 4.4.4.3, Human Health and Safety.

Particulate Matter and Dust

Respondents expressed concern about particulate matter and dust. Respondents cited multiple reasons for dust increases but expressed concern that dust would increase through increased traffic operations associated with drilling operations. Comments noted that Pitkin County has long faced air quality impacts from PM sources and continues to implement mitigation measures to control PM emissions.

Comments indicated that the CRVFO 2014 RMP/Final EIS continues to predict maximum cumulative 24-hour average and annual average particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}) impacts at Class II receptors above the NAAQS; maximum cumulative 24-hour average particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀) impacts at Class II receptors above the NAAQS; and PM concentrations above the NAAQS predicted outside the CRVFO. Respondents stated that the CRVFO cannot ignore these significant PM impacts.

Respondents stated that any threat to the attainment of the PM NAAQS in the Aspen maintenance area would have direct consequences on the local citizens and governments of Pitkin County. Comments stated that Aspen was designated a "moderate" PM₁₀ nonattainment area in 1990 pursuant to the Clean Air Act (CAA); the U.S. Environmental Protection Agency (USEPA) approved an attainment/maintenance plan for Aspen in 2003 and is in the process of reviewing a revised maintenance plan for the area. Respondents stated that the latest version of the plan includes the following control measures designed to ensure attainment of the NAAQS through 2023: 1) wood burning and restaurant emissions controls; 2) street sanding controls; 3) street sweeping requirements; 4) paid parking requirements to reduce traffic; and 5) transit measures (e.g., expansion of the bus fleet, establishment of additional parking lots

and cross-town shuttle services). Respondents noted that the CAA requires that the maintenance plan contains additional contingency provisions to assure that the state will promptly correct any violation of the PM₁₀ NAAQS that may occur after the redesignation of the area to attainment/maintenance. According to the maintenance plan revision approved by the Air Quality Control Commission, it is likely that no federal or state monies will be available to fund the implementation of the selected contingency measure(s). Most, if not all, of the costs will be borne by local citizens and governments, local businesses, and state government agencies. Respondents stated that all alternatives that would stop short of cancelling the disputed Thompson Divide area leases should fully consider the impact of emissions from that development on maintenance of the PM₁₀ NAAQS in Pitkin County.

Impacts to Class I and Sensitive Class II Area, including Visibility and Air Quality Related Values

Respondents expressed concern that oil and gas leasing and development will have impacts on Class I airsheds and wilderness areas, including air pollution, degradation of high elevation lakes, and reductions in visibility. Comments stated that Section 169A of the CAA of 1970 set forth a national goal to prevent future impairment of visibility and to remedy any existing visibility impairment in Class I areas resulting from manmade air pollution. Comments indicated that Congress adopted the visibility provisions in the CAA to protect visibility in “areas of great scenic importance.”

Commenters stated that anthropogenic sources have already significantly impaired visibility in the Maroon Bells-Snowmass Wilderness which is both adjacent to Pitkin County’s four alpine ski areas, and a substantial attraction to visitors in its own right. Respondents indicated that federal agencies have an affirmative obligation to protect visibility and other air quality related values in this Class I airshed, and that the importance of maintaining good visibility in the region cannot be overstated for both social and economic reasons. Comments indicated that Colorado is known for its tourism values including visual resources and expressed concern that oil and gas development would place these values at risk (also see Section 4.4.4.6, Recreation; Section 4.4.4.7, Socioeconomics; and Section 4.4.4.10, Visual Resources).

Respondents stated there is a need to evaluate how activities that may occur under this EIS could affect air quality and AQRVs and what measures may be needed to manage significant impacts, and indicated that this is particularly important given regional concerns with high ozone levels. Comments stated this is particularly important given regional concerns with high ozone levels, as well as the fact that the planning area includes or is near several CAA Class I Areas (e.g., Maroon Bells-Snowmass Wilderness Area, and Flat Tops Wilderness Area). Comments noted that the CAA provides such areas with special protection for AQRVs, including visibility and indicated that the Draft EIS must adequately analyze and disclose these impacts to areas managed for national designation.

Climate Change and Methane

Respondents expressed concern about the impact of oil and gas development on global warming. Comments stated that the BLM must consider the implications of adding more carbon dioxide (CO₂) emissions to the atmosphere from this extracted carbon based fuel. Respondents stated that the Intergovernmental Panel on Climate Change (IPCC) and others have concluded we need to leave 60 to 80 percent of the known fossil fuels in the ground if we are to avoid the worst effects of a warming earth.

Comments stated that the IPCC report warns that natural gas as a bridge fuel will only be effective if few gases escape into the atmosphere during natural gas production and distribution. Respondents cited studies including that the amount of natural gas that leaks throughout the drilling and completion process, added to the CO₂ emitted from the gas-fired power plant, drives global warming at a rate equal to that of burning coal, because methane is more than 20 times as effective as CO₂ as a greenhouse gas (GHG). Comments also cited recent peer-reviewed science demonstrating that gas-aerosol

interactions amplify methane's impact such that methane is actually 105 times as potent over a 20-year time period.

Comments indicated that the capture of methane is critical due to its global warming potential and stated that the CRVFO has an obligation to ensure compliance with the agency's methane waste obligations through proper analysis and documentation in the NEPA process. Comments also stated that regardless of the variability in methane pollution data and analysis methods, it is clear is that inefficiencies and leakage in oil and gas production results in a huge amount of avoidable waste and emissions and represent a great opportunity for the CRVFO to reduce GHG emissions on public lands.

Comments stated that even setting aside the issue of climate change, every ton of methane emitted to the atmosphere from oil and gas development is a ton of natural gas that cannot be used by consumers or yield royalties otherwise shared between federal, state, and local governments, and reflects serious inefficiencies in how BLM oil and gas leases are developed. Comments noted that a report released by Natural Resources Defense Council (NRDC) identified that "[c]apturing currently wasted methane for sale could reduce pollution, enhance air quality, improve human health, conserve energy resources, and bring in more than \$2 billion of additional revenue each year." Moreover, the report further identified 10 technically proven, commercially available, and profitable methane emission control technologies that together can capture more than 80 percent of the methane currently going to waste. Respondents stated that such technologies also must be considered in BLM's alternatives analysis.

Respondents questioned the BLM during public meetings as to the BLM's and USFS's moral and ethical responsibility to address climate change based on the mission of each agency and how the agencies would respond to the findings of both the IPCC group and U.S. internal climate impact assessment groups. Responses from the BLM indicated that the BLM has a Secretarial Order that mandates consideration of climate change, and that the BLM uses reports directly from the IPCC to help analyze not only impacts to climate change but the impacts climate change is having on the environment and the adaptive nature of the environment. The BLM also indicated it would analyze climate change to the scope and scale appropriate and commensurate with the activity that it is analyzing, the proposed action.

Comments made in regard to the CRVFO 2014 RMP/Final EIS indicated although the CRVFO recognizes the threat of climate change, the agency's decision-making in the RMP/Final EIS is not reflective of this harm and fails to take many necessary and meaningful steps to ameliorate the impacts to communities, landscapes, and species. Comments stated it is incumbent on the CRVFO to not only take steps to stem the pace of climate change through the practical implementation of mitigation technologies but, also, to position communities in a way that allows them to adjust and recover from the climate change impacts that they are already experiencing. Comments stated that in the CRVFO 2014 RMP/Final EIS, the agency stops short of taking all of the meaningful actions available to them to address the cause of anthropogenic climate change (i.e., the GHG emissions that will result from the production and combustion of fossil fuel resources in the planning area). Comments stated that the BLM not only has the authority, but an obligation to address GHG emissions and methane waste and that the CRVFO must consider not only the cumulative impact of the GHG emissions authorized by the RMP, but also those emissions combined with other activities in the area.

Air Quality Impacts on Human Health

Respondents expressed concern with air quality in regards to recreation and human health. Comments stated that air pollution associated both with industrial traffic and oil and gas operations would have the potential to affect local residents, as well as visitors. Comments focused on ground-level ozone in particular, but also expressed concern about other constituents. Comments stated that recent studies in Garfield County confirm that air toxics are generated during every stage of oil and gas development and can have potentially significant health impacts even at concentrations below regulatory thresholds.

Comments cited studies regarding birth defects, and other health issues including cancer, potentially from benzene. This is discussed in greater detail in Section 4.4.4.3, Human Health and Safety.

Existing Condition Characterization

Comments identified all of the following Class I areas within Colorado as relevant for consideration analysis: Mount Zirkel Wilderness, Rocky Mountain National Park, Flat Tops Wilderness, Eagles Nest Wilderness, Maroon Bells Snowmass Wilderness, West Elk Wilderness, Black Canyon of the Gunnison National Park, La Garita Wilderness, Weminuche Wilderness, Great Sand Dunes National Park, and Mesa Verde National Monument.

Respondents indicated that adequate baseline analysis and subsequent air quality analysis need to occur to determine impact and site characterization. Some commenters indicated that the Rifle area had good air quality now and that this needed to be reflected as the baseline condition in the EIS. Other submittals cited studies indicating that air quality is deteriorating. Comments stated that use of air quality studies in oil and gas developments within the region should be included in the EIS and considered to estimate air quality impacts in relation to this development. Commenters suggested studies of significance that should be included or at least considered in the EIS including studies by IPCC Working Group III, Cornell University, and National Research Council (NRC), National Oceanic and Atmospheric Administration, Purdue University, and others. A full list of cited references can be found by contacting the CRVFO.

The BLM indicated in public meetings that data from the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS contains meteorological and air quality data from monitoring stations. Respondents suggested the BLM consider the data offered by the public and/or agencies during public comment periods for the 2012 WRNF Oil and Gas Leasing EIS and the 2014 CRVFO Proposed RMP/Final EIS.

Comments related to climate change requested that the EIS describe any existing regional, tribal or state climate change plans or goals that cover the planning area and include a summary discussion of ongoing and projected regional climate change relevant to the planning area in the Affected Environment section of the EIS, based on U.S. Global Change Research Program assessments. Respondents stated that this would enable the EIS to identify potential impacts that may be exacerbated by climate change (e.g., reclamation could become more difficult with climate change, or the impacts of water consumption could increase) and also would enable the BLM to determine whether it may be appropriate to consider reasonable alternatives to adapt to anticipated climate change.

Suggested Analysis Methodologies or Data

Respondents in opposition to an expanded EIS air quality analysis indicated that the BLM must analyze air impacts from the perspective of what was reasonably foreseeable at the time it issued the oil and gas leases. Comments noted that the USFS did not identify adverse air impacts prior to lease issuance. This issue of the consideration of new information is discussed in more detail in Section 4.1.4.2. Comments also noted that the BLM has analyzed air impacts in several oil and gas development project environmental assessments on leases subject to the White River Lease EIS but has not identified significant air impacts.

The USEPA noted that they, the USDA, and USDOJ entered into an "MOU Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the NEPA Process" on June 11, 2011. The USEPA identified the MOU as a helpful tool to ensure effective and efficient NEPA air quality evaluations. The USEPA commended the BLM Colorado office for the current statewide air quality analysis collaboration underway on the Colorado Air Resources Management Modeling Study (CARMMS). The USEPA identified the MOU's stakeholder process as an appropriate forum to share RFD and emissions inventory information and to determine steps for the air quality analysis, such as

quantitative air quality modeling, and to understand whether other modeling platforms, such as the 3-State Air Quality Study, will be utilized in this effort.

Respondents recommended that the Draft EIS include an evaluation of the direct, indirect, and cumulative impacts from potential activities on the following:

- Each of the criteria pollutants and their appropriate NAAQS (i.e., ozone, PM, carbon monoxide, nitrogen oxides, sulfur dioxide and lead; AQRVs in potentially impacted Class J areas and sensitive Class II areas).
- Prevention of Significant Deterioration (PSD) increment at potentially impacted Class I and sensitive Class II areas.
- Projected ambient concentrations of hazardous air pollutants including: acetaldehyde, benzene, ethyl benzene, ethylene glycol, formaldehyde, methanol, n-Hexane, toluene, xylene (mixture), and any other compounds that the BLM identifies as potential hazardous air pollutants in the planning area.
- An analysis and disclosure of GHG emissions and climate change associated with the RFD for the planning area, potential climate change impacts from the emissions, reasonable alternatives, and/or practicable mitigation to reduce project-related GHG emissions, and a discussion of any appropriate climate change adaptation issues. Comments recommended that GHG emissions be estimated in carbon dioxide equivalent (CO₂e) terms and translated into equivalencies that are more easily understood by the public (e.g., annual GHG emissions for number of motor vehicles, see <https://www.epa.gov/cleanenergy/energy-resources/calculator.html>).

Comments stated that near-field impacts from oil and gas development should be included in any air quality analysis. Respondents indicated it is critical to undertake such an analysis before designating lands as open for leasing because of the substantial likelihood of near-field impacts on human health and properties in which local governments have invested tens of millions of dollars.

Respondents resubmitted comments on the adequacy of the air quality analyses contained in the CRVFO 2014 RMP/Final EIS and the WRNF 2012 Draft EIS for consideration by the BLM as to applicability to the analysis that would be conducted for this project. Comments on the CRVFO 2014 RMP/Final EIS indicated that the BLM removed several of the commitments that were originally in the Draft EIS and noted that these revised requirements do not match what modeled in the Air Resources Technical Support Document. Comments stated that the earlier commitments should be re-included in the Final RMP or the analysis should be revised. Respondents commented extensively on the analyses of ozone, HAPs, visibility, PSD, PM/dust, climate change, as well as cumulative impact modeling. These concerns are summarized below.

Ozone

Comments made on the CRVFO 2014 RMP/Final EIS analysis indicated that in addition to the fact that the model evaluation indicated under-predictions in the analysis, ozone impacts also may be underestimated due to underestimated emissions inputs to the model. Comments cited studies indicating that emission inventories may under-predict fugitive VOC emissions and stated that it is therefore likely that the VOC emissions used in inventories for this analysis may also have underestimated emissions since they were based on similar estimation techniques.

Comments also noted that BLM did not address comments from the State of Colorado recommending that BLM conduct an Unmonitored Area Analysis as a critical part of the ozone analysis because there were so few ozone monitors in the planning area. Similarly, the BLM did not address the State's recommendations to include the Rifle and Palisade monitors in the ozone analysis and a recommended

method for applying 2008-2010 monitoring data from these monitors to develop a baseline design value for use in the 2006 baseline analysis. As a result, the CRVFO 2014 RMP/Final EIS does not consider the most recent monitoring data, which show background concentrations in and near the planning area that continue to be of concern. Comments provided data summarizing recently recorded ozone concentrations in and near the planning area that exceed the level of the NAAQS.

Comments stated that winter-time ozone is an emerging regional concern related to oil and gas development and expressed concern that BLM failed to include an assessment of impacts in winter. Noting that the BLM's response to this concern was that winter ozone formation was not included in the modeling for the air analysis for this RMP because computer model algorithms that simulate winter ozone formation are not currently available, comments stated that the BLM's decision to not include winter ozone modeling is not supported by evidence that the BLM either cannot obtain the needed information without exorbitant cost or cannot present a credible scientific estimation based on methods generally accepted in the scientific community. Comments stated that BLM must offer a better explanation for why the use of the Comprehensive Air Quality Model with Extensions model (CAMx)—while clearly not yet ideal for predicting wintertime ozone concentrations—is not the best available tool based on credible science. Comments noted that the BLM has modeled winter ozone concentrations for other recent NEPA actions. While results generally appear to underestimate winter ozone concentrations, if modeled wintertime ozone concentrations are shown to be a problem, the BLM has an obligation under NEPA to reduce emissions from the proposed development in order to ensure there will be no significant impacts to wintertime ozone levels based on the modeling, as evaluated (with an underestimation bias).

Comments stated that given these limitations in the ozone analysis: 1) the model performance evaluation shows some underestimation bias; 2) the model inventory may significantly underestimate fugitive VOC emissions; 3) there is no analysis of unmonitored areas and monitoring data from more recent and more relevant monitors (e.g., in Rifle and Palisade) are not included in the analysis; and 4) modeling does not account for winter-time ozone formation; it is likely that ozone impacts from the proposed development could be more significant than what is presented in the CRVFO 2014 RMP/Final EIS, and, at the very least, fails to satisfy the CRVFO's obligations under NEPA. Comments stated that the BLM cannot rely on future management actions to address already-known significant impacts and must use its modeling analysis to propose mandatory mitigation measures for the CRVFO 2014 RMP/Final EIS that will ensure modeled concentrations do not result in exceedances of the ozone NAAQS at all modeled receptors (including unmonitored areas) in the impacted region.

Comments on the WRNF 2012 Draft EIS recommended that the Final EIS include the following: 1) a summary of all mitigation assumptions utilized for the CALPUFF and ozone modeling exercises; and 2) a list of mitigation measures that will be required at the development level based on these emissions inventory and modeling assumptions. Comments stated that if the USFS does not intend to require all of the mitigation measures used to develop the ozone modeling emissions inventory, then the Final EIS must disclose: 1) the difference between modeled emission results and projected actual emissions; 2) the rationale for the USFS's selected mitigation measures; and 3) a demonstration that the selected measures will ensure that emissions from future WRNF oil and gas development will not cause adverse impacts to the NAAQS.

HAPs

Comments on the CRVFO 2014 RMP/Final EIS indicated that the BLM did not address requests to look at additional HAPs such as 1,3-butadiene and secondary formaldehyde but that the BLM has completed more comprehensive analyses of HAPs for other recent NEPA actions (and which identified in significant impacts). Comments stated that BLM must include a more comprehensive analysis of HAP impacts addressing the HAPs identified above and in other NEPA analyses, as well as HAP impacts associated with volatile emissions from hydraulic fracturing fluids. Comments stated that it is important to continue to

improve upon the HAP analyses conducted under NEPA in order to ensure there are no significant health impacts from near-field exposure to HAPs from the proposed development in the planning area.

Visibility

Comments regarding the CRVFO 2014 RMP/Final EIS analysis of visibility indicated that the BLM's Draft RMP/EIS far-field direct project and cumulative impact analyses at Class I and sensitive Class II areas showed significant impact, and questioned why the RMP/Final EIS did not include information regarding visibility impacts under some of the alternatives since there were no changes in impact analyses between draft and final documents. Comments stated that the BLM should have fully disclosed the significant direct project impacts on visibility impairment that were disclosed in the draft RMP/Draft EIS and should have included additional mitigation measures in the Proposed RMP/Final EIS to address these significant impacts.

Prevention of Significant Deterioration of Air Quality (PSD)

Comments on the CRVFO 2014 RMP/Final EIS analysis of PSD of Air Quality indicated that the BLM did not properly analyze whether the proposed plan will prevent PSD of air quality, as required by the CAA. Comments stated that while the BLM indicated that the State of Colorado is responsible for conducting a PSD increment consumption analysis, the BLM is required under NEPA to analyze and disclose all significant air quality impacts, regardless of whether another agency might address an adverse environmental impact in the future. Additionally, BLM is required under NEPA to satisfy all CAA requirements, and thus cannot authorize an action unless the agency has ensured that the PSD increments will not be exceeded. Therefore, the BLM must analyze PSD increment consumption, disclose potential impacts, determine the significance of these impacts, and provide for mitigation as necessary to ensure there will be no significant impacts to air quality deterioration from the proposed action.

Particulate Matter and Dust

Comments raised several critical issues with the impact analysis in the CRVFO 2014 RMP/Final EIS with regard to PM modeling. Comments stated that the BLM continues to underestimate PM impacts, because: 1) fugitive dust emissions from vehicle travel on unpaved roads is assumed to occur only from May-October and does not account for the full potential short-term impacts during summer (i.e., 24-hour average PM impacts in summer are based on an annual average emission rate that considers the ratio of months that are frozen/muddy to months that are dry); 2) BLM has not modeled the maximum 24-hour average emission scenario by failing to model construction emissions for all four representative well pads; and 3) BLM is not accounting for PM impacts from the over 1,000 miles of motorized routes designated in the proposed action.

Comments also stated that the failure to include off-highway vehicle traffic in the air quality impact analysis and indicated that the BLM should consider the fugitive dust and tailpipe emissions produced by off-highway vehicles traveling on designated routes under the various alternatives, even if the relative contribution of emissions is less than that from oil and gas development. Comments stated that given the fact that the modeled PM impacts are shown to be high in the western portion of the planning area, emissions from this source, even if small, could contribute to significant impacts in this area when considered cumulatively with all other sources that impact the same area. Comments also stated that the BLM cannot assume background monitored levels of PM₁₀ and PM_{2.5} will account for emissions from off-highway vehicles travel because there are only a few active PM monitors in the planning area.

Comments on the CRVFO 2014 RMP/Final EIS in regards to how PM impacts were presented stated that the BLM should have used the average of the first highest 24-hour average concentration over the five meteorological years modeled combined with the 98th percentile monitored background concentration when comparing PM impacts with the 24-hour average PMs NAAQS.

Comments also suggested that since the AERMOD dispersion model used for the near-field analysis does not have the capability to account for secondary PM_{2.5} formation when predicting PM impacts, use of the 5-year average of the maximum (i.e., highest-first-high) 24-hour modeled concentration compared to the 24-hour PM_{2.5} NAAQS (rather than the 98th percentile value) would be a way to account for potential secondary PM_{2.5} formation.

Climate Change

Comments stated that the CRVFO 2014 RMP/Final EIS references relatively modest figures for GHG emissions from future oil and gas development in the planning area, estimating maximum annual emissions totaling 411,308 metric tons CO₂e. Such emissions, which may be substantially higher, would make a significant contribution to total methane emissions from federal lands, and contribute significantly to total U.S. methane emissions, further threatening the climate. Methane accounts for nearly 9 percent of domestic GHG emissions. Comments noted that not all sources of methane are required to be reported to the USEPA under Subpart W of its Greenhouse Gas Reporting Program and that methane emissions figures from the USEPA therefore excludes the many small sources of emissions from the industry that are under the reporting threshold, and that, with future oil and gas development, would be located in the CRVFO planning area. As a result, the RMP/Final EIS failed to include the full scope of GHG emissions into its analysis, and, thus, failed to provide the hard look detailed analysis of impacts that NEPA demands. Comments stated that even if science cannot isolate each additional oil or gas well's contribution to these overall emissions, this does not obviate BLM's responsibility to consider oil and gas development in the planning area from the cumulative impacts of the oil and gas sector. Respondents stated that agency decision-making – particularly at the RMP stage, where fundamental land use choices are made – must be reflective of this broader reality, and the agency's failure to account for the full lifecycle of oil and gas production represents a fundamental deficiency in the RMP/Final EIS.

Comments stated that oil and natural gas systems are the biggest contributor to methane emissions in the U.S., accounting for more than one quarter of all methane emissions. In light of serious controversy and uncertainties regarding GHG pollution from oil and gas development, the agency's quantitative assessment should account for methane's long-term (100-year) global warming impact and, also, methane's short-term (20-year) warming impact using the latest peer-reviewed science to ensure that potentially significant impacts are not underestimated or ignored.

Comments stated that the 2014/RMP/Final EIS significantly underestimated the impacts of methane emissions because the analysis relied on the USEPA's GHG Inventory, which use a global warming potential (GWP) from the IPCC Second Assessment Report from 1996. However, the IPCC has since updated their recently updated their 100-year GWP for methane, substantially increasing the heat-trapping effect. Additionally, other recent peer-reviewed science demonstrates that gas-aerosol interactions amplify methane's impact such that methane is actually 105 times as potent over a 20-year time period.

Comments further noted that the USEPA has explained that many of uncertainties and underestimates are a result of the fact that emissions factors were developed prior to the boom in unconventional well drilling (1992) in the absence of any field data and does not capture the diversity of well completion and work over operations or the variance in emissions that can be expected from different hydrocarbon reservoirs in the country. As such, the BLM has an opportunity to improve its knowledge base regarding GHG emissions from oil and gas production, providing some measure of clarity to this important issue by taking the requisite "hard look" NEPA analysis as part of its land use decision-making for the RMP and Final EIS.

Comments submitted as part of the WRNF 2012 Draft EIS also indicated that the GHG emissions predictions contained in the Draft EIS are insufficient, outdated, and failed to take the "hard look" that

NEPA requires because it does not quantify emissions using readily available methodologies, omits entire categories of emissions resulting from a potential decision to open up new areas to development, and understates the emissions it does describe. Comments stated that in analyzing the climate change impacts of the proposed action, the Draft EIS merely lists sources of GHG emissions rather than make any effort to accurately quantify these emissions. They stated that the Draft EIS's failure to provide high quality information – that identifies not only specific sources of GHG emissions, but also the magnitude of those emissions – to empower informed decision-making and public participation violates NEPA. Comments stated that the USFS cannot legitimately claim it was unable to quantify reasonably foreseeable GHG pollution resulting from the proposed action, as there are many available methodologies to quantify greenhouse gas emissions from oil and gas production. Comments supplied multiple links and references to GHG reporting tools.

Comments stated that the WRNF 2012 Draft EIS ignored significant emissions sources, such as GHG releases during drilling and completion, as well as fuel combustion and corresponding GHG emissions from pumping water. Comments stated that because NEPA requires consideration of the direct and indirect effects of agency action, a GHG analysis must include a discussion of the emissions resulting from the combustion of resources extracted under various leasing plans. Comments further indicated that the WRNF 2012 Draft EIS made no attempt to quantify the amounts of GHG resultant from the downstream use of the oil and gas that may be recovered from the WRNF, much less translate that into a contribution to climate change. Respondents indicated that the end use of oil and gas falls into the category of indirect effects and also stated that cumulative analyses should address the impact of these GHG emissions on climate change. Comments cited legal precedent for these types of analyses and indicated that a “hard look” at the consequences of oil shale development would have to consider the use of the oil itself in the U.S., including its use in the transportation sector.

Commenters also stated that the WRNF 2012 Draft EIS does not adequately analyze potential impacts of air pollution and climate change on local economies, for example, on tourism and recreation industries.

Cumulative Impact Modeling

Comments on the RFD used for the CRVFO 2014 RMP/Final EIS cumulative impact modeling for air quality stated that the RFD must include the proposed development for the other adjacent planning areas, in addition to the Little Snake, White River and Vernal planning areas. Comments stated that the Kremmling, Uncompahgre, and Grand Junction Field Offices are all working on updates to their RMPs and the maximum development scenarios from these planning areas also must be included in the CRVFO analysis. These neighboring planning areas impact many of the same Class I areas as the CRVFO planning area. Comments also stated that development in the Roan Plateau planning area RMP also must be included in the RFD inventory and analysis. Comments indicated that the current RFD inventory is based on development estimates for the Roan Plateau that suggest that BLM is not considering more recent industry estimates for up to 3,200 wells atop the Roan Plateau.

Comments also stated that the CRVFO 2014 RMP/Final EIS air quality analysis fails to adequately account for the extent of recent development in the field office. In particular, the agency ignored APDs approved between its baseline year of 2006 and the decision adopting the revised RMP. Comments stated that based on information available on the APD page of the CRVFO website, BLM has already approved nearly half or more of the drilling analyzed in the Final EIS for the Proposed RMP – which has not even been adopted yet. As a result, the number of BLM-approved drilling permits is likely to exceed the scope of the Final EIS analysis in just a few years. Moreover, that figure does not include the thousands of additional reasonably foreseeable wells in the Roan Plateau Planning Area that BLM failed to account for in its Final EIS.

Comments stated that these shortcomings are particularly problematic where the agency has acknowledged the significance of the air quality issues in the field office – particularly ozone – yet plans to defer critical aspects of its analysis to implementation-level decisions under the Comprehensive Air Resource Protection Protocol (CARPP).

Comments stated that NEPA requires the agency to conduct that analysis at the RMP stage – before authorizing development, but without a comprehensive air quality analysis at the RMP level that accurately reflects the status quo in the CRVFO, the BLM's conclusion that it is in compliance with the ozone NAAQS and other applicable legal requirements is unsupported, and the agency will be unable to guard against further air quality degradation going forward.

Comments noted that the reasonably foreseeable future actions (RFFA) inventory for the CRVFO 2014 RMP/Final EIS included sources located within the far-field modeling domain that were not reflected in monitored background concentrations and, generally, included sources from Colorado and Utah state inventories that added emissions to the region between 2006 and 2007. For oil and gas sources, emissions from producing wells in Colorado and Utah, where the first production occurred between January 1, 2007 and December 31, 2007, were included in the analysis. Comments stated that BLM should have used the year that corresponds to the highest number of wells impacting the area as the model year for these RFFA oil and gas sources. For example, the number of drilling permits in Colorado peaked – and was significantly higher than all other years – in 2008, with 8,027 permits issued statewide (a 26 percent increase over 2007 permits). In Garfield County, the county reported a similar peak in well starts in 2008 with a 29 percent increase in well starts over 2007. Since modeled emissions are directly proportional to the number of wells assumed in the inventory, BLM should have used the well count for the year (2008) that best represents the maximum development scenario.

Comments also stated that BLM did not address the fact that modeling of sources within the CRVFO assumed certain controls that are not required for non-BLM sources. Comments stated that modeling therefore under-predicted potential impacts from these sources, especially for PM.

Suggested Stipulations, Mitigation, or Conditions of Approval

Comments suggested that any alternatives affirming the leases need to analyze a long-term monitoring and mitigation plan that ensures mechanisms to curtail development as necessary to protect air quality.

Respondents recommended that the BLM identify mitigation measures (including control measures and design features) it would apply at the project level in the event that potential adverse impacts to air quality or AQRVs on affected lands are predicted. These could include emission standards or limitations, (BMPs, dust suppression measures for unpaved roads and construction areas, control technologies, and limitations on the pace of development. Comments also recommended that the BLM identify the regulatory mechanisms it will use to ensure their implementation (including lease stipulations, conditions of approval, and notices to lessees). The USEPA requested the opportunity to work with the USFS prior to release of the Final EIS to develop mitigation measures that may be necessary if the preferred alternative is predicted to have significant air quality impacts, and encouraged the BLM to provide an opportunity for the Colorado Department of Public Health and Environment (CDPHE) to participate in this effort.

Comments on the CRVFO 2014 RMP/Final EIS requested that the BLM reconsider recommendations for mandatory standards and BMPs contained in earlier comments on the Draft EIS. Specifically, these comments recommended making standards mandatory and non-waivable upon issuance of a ROD and requested public input be considered prior to implementing BMPs.

Respondents commented extensively on adaptive managements, monitoring and methane capture. These comments are summarized below.

Adaptive Management Plan (Comprehensive Air Resource Protection Protocol)

Comments on the CRVFO 2014 RMP/EIS raised concern with the adaptive management approach (CARPP) that the BLM has proposed to address air quality impacts. Comments stated that adaptive management is a structured, iterative process for continuously improving implementation practices based on achieving goals and objectives established in the RMP that is not possible without effective monitoring and evaluation because monitoring data show whether progress is being made toward achieving RMP objectives.

Comments indicated that the CARPP does not go far enough in its monitoring, modeling, and mitigation commitments. Comments stated that in general, the CARPP is a reactive management tool, as opposed to a proactive one, and that there is very little required action in the CARPP unless or until an exceedance of a NAAQS is recorded, making it ineffective as a tool to ensure air quality protection.

Respondents stated that the discretionary nature of the CARPP is very concerning since it is relied upon in the RMP/Final EIS as a primary means for protecting air resources and is used by BLM to justify not proposing additional management actions in the RMP/Final EIS to address significant impacts shown in the impact analysis.

Comments stated that the BLM must establish a comprehensive set of mitigation measures for the RMP/EIS that ensures no significant air quality impacts from the proposed development would occur based on the best currently-available analysis tools prior to issuance of a ROD, and should then use the CARPP as a means to improve upon and update those measures, as needed, based on periodic and specific monitoring and modeling commitments that the agency agrees to implement.

Respondents stated that while establishment of a more comprehensive monitoring network will help serve as a backstop to track and ensure air quality protection throughout the planning area and help identify areas of concern with regard to air impacts, the adaptive management process must require frequent and specific actions are taken in order to prevent significant impacts throughout the planning area – as opposed to taking corrective action after a significant impact is identified, as the current management plan proposes. Comments also stated that the CARPP ignores the fact that methane emissions and waste are not monitored in the same manner and to the same degree as criteria and HAPs.

Comments noted that the actions outlined in the CARPP to date are almost entirely made up of discretionary and non-specific actions (e.g., BLM *may* require preconstruction monitoring, *may* require life-of-project monitoring, *may* require project-specific modeling, *may* participate in future regional modeling studies, *may* require mitigation measures and BMPs, etc.). Comments stated that the BLM must establish a specific meaning for what is meant by “a substantial increase in emissions” and must establish specific, numeric criteria for permitting factors, including, for example: what specific magnitude, duration, proximity, conditions, intensity and issues would trigger what, specific, corresponding levels of analysis, monitoring, and reporting. More generally, BLM must establish more definitive requirements for monitoring, modeling, permitting and mitigations; as written, the CARPP only offers analysis and protection of air resources through discretionary means and therefore cannot be relied on to ensure adequate air resource protection. Comments also stated that the BLM should clearly define what it would consider to be “a reasonable correlation” and must specify what would trigger the need for a new modeling analysis.

Comments stated that without specific triggers for further specific action, the CARPP cannot function as an adaptive tool to ensure mitigation measures are appropriate to prevent significant impacts to air quality.

Comments also expressed concern that the CARPP may be modified “without maintaining or amending any specific Field Office RMP” and stated that any modifications to the CARPP should include adequate public participation opportunities. Respondents also noted that the CARPP includes commitments to make available to the public: 1) the CARMMS results and analysis; 2) annual summary reports; and 3) periodic review of the RFD projections to be conducted every 3 to 5 years.

Future Monitoring

Comments on the CRVFO 2014 RMP/Final EIS indicated that the BLM must work with the State of Colorado and USEPA to establish a more comprehensive monitoring network in the planning area and that it is vitally important that the data collected from monitoring efforts throughout the planning area are quality assured and made publicly available through the state and/or USEPA websites. Comments commended BLM for installing air quality monitors at Meeker and Rangely, which have provided valuable new data and improved the understanding of existing air quality levels, and recommended that BLM work with the State to establish an air quality monitoring fund (or another method) to expand the existing air quality monitoring networks to gather meteorological and air quality data at micro, local, and regional scales. Comments stated that funding levels should be sufficient to include AQRV/visibility monitoring at potentially affected mandatory federal Class I areas such as the Flat Tops Wilderness Area. Comments recommended that private sector proponents of oil and gas development fund the regulatory monitoring network enhancements, and recommended that the funding source be flexible enough to allow for future monitoring to include HAPs (such as carbonyl compounds), speciated VOCs (especially BTEX) and GHG (especially methane). Comments stated that monitoring of these types of emissions are notably absent in the oil and gas development area of the CRVFO.

Methane Capture

Comments on the WRNF 2012 Draft EIS stated that the document does not adequately discuss or evaluate feasible measures to mitigate GHG emissions from oil and gas development, such as requiring that the electricity needed is generated from new renewable energy sources; requiring off-site mitigation for the natural gas and/or diesel fuel that will be used; or specifying that no leases will be granted until techniques for sequestering carbon emitted at the facilities are perfected. Respondents indicated that NEPA requires an agency to provide full disclosure of the potential environmental impacts and ways to minimize those impacts. Comments stated that the USFS has discretion to determine how much land to offer for leasing, and what requirements to impose on the leases.

Comments on the CRVFO 2014 RMP/Final EIS cited the MLA's duty to prevent waste, as well as President Obama's Climate Action Plan and Secretarial Order (SO) 3289 and stated that the CRVFO has a substantive duty to consider the enduring legacy of oil and gas development in land management decision-making, which is to be balanced against other critical multiple use resource values. Comments stated that the BLM must strengthen its approach to methane mitigation. While noting the measures that were included in the CRVFO 2014 RMP/Final EIS, comments stated that there are other widely recognized emissions reduction technologies, BMPs, and planning tools for mitigating methane emissions and waste are available to the CRVFO that must be given a hard look in its analysis of the proposed action. Comments referenced measures identified in CARPP which included

- Replacement of wet seals with dry seals in centrifugal compressors;
- Monitoring and replacement of rod packing systems in reciprocating compressors;
- Installation of well deliquification systems such as plunger lifts;
- Use of closed loop process for “blow-down” emissions;

- Replacement of hi-bleed with low- or no-bleed and other low-emission equipment for pneumatic devices; and
- Mandatory leak detection and repair programs.

Comments stated that these measures should be adopted because: 1) they can reduce methane emissions to help protect the climate; 2) they can minimize methane waste; 3) they can have very quick paybacks for industry from the sale of captured methane, even at today's low gas prices; and 4) failure to adopt them as mandatory methane emissions and waste mitigation measures in the RMP/Final EIS may jeopardize the ability of the CRVFO to require them in critical later stages of development, such as lease sales and APDs after lease rights are conveyed.

Comments suggested that the CRVFO consider adopting the mandatory mitigation measures adopted by the BLM Colorado's Tres Rios Field Office and the San Juan National Forest to address methane emissions and waste, which include:

- Centralized liquid gathering systems and liquid transport pipelines;
- Reduced emission completions/recompletions (green completions);
- Low-bleed/no-bleed pneumatic devices on all new wells;
- Dehydrator emissions controls;
- Replace high-bleed pneumatics with low-bleed/no-bleed or air-driven pneumatic devices on all existing wells; and
- Electric compression.

Comments also stated that the CRVFO should require gas capture planning by lessees and planning and timely development of gas gathering, boosting and processing infrastructure to ensure that GHG emissions are reduced, that revenues from gas sales are maximized for the realization of paybacks for Operators, royalty payments for the federal and state governments, and that waste of this important resource is minimized.

Comments noted that the CARPP and Appendix G list several measures that are designed to reduce post-capture methane flaring, emissions, and waste and suggested that the CRVFO look at these alternatives, which include reducing the pace of phasing development to ensure that methane can be used in the field or that gathering, boosting and processing infrastructure is in place to get gas produced to a sales line; requiring natural gas-fired drill rig engines; and requiring centralized or consolidated gas processing facilities.

Comments also noted that the USEPA has identified compression of natural gas for transport; methane re-injection; and electric power generation for on-site use or connection to the grid field use measures that reduce flaring and waste.

Comments also suggested an option promoted by industry to successfully reduce methane venting, flaring, and waste that would require production and midstream companies to conduct front-end planning that includes gas capture plans and midstream planning and tracking.

Comments indicated that the BLM should evaluate emission control technologies, analyzing the benefits of technological implementation versus current agency requirements. Respondents indicated that these benefits, as well as the proven, cost-effective technologies and practices that achieve these benefits, are documented by USEPA's "Natural Gas STAR" program, which encourages oil and natural gas companies to cut methane waste to reduce climate pollution and recover value and consolidate the

lessons learned from industry for the benefit of other companies and entities with oil and gas responsibilities such as BLM. Comments stated that USEPA has identified more than 100 proven technologies and practices to reduce methane waste from wells, tanks, pipelines, valves, pneumatics, and other equipment to make operations more efficient and stated that USEPA's Natural Gas STAR program suggests the opportunity to dramatically reduce GHG pollution from oil and gas development, if its identified technologies and practices were implemented at the proper scale and supported by USEPA's sister agencies, such as BLM. For calendar year 2010, USEPA estimated that this program avoided 38.1 million tons CO₂e, and added revenue of nearly \$376 million in natural gas sales—revenue which translates into additional royalties to federal and state governments for the American public. Although the CRVFO has taken steps in requiring some mitigation measures, additional emission reduction strategies, as detailed herein, can both strengthen the CRVFO's existing requirements, as well as satisfy the requirements of SO 3226, FLPMA, and the MLA.

4.4.2.2 Geology and Minerals, including Paleontology

Resource Concerns

Comments regarding geology, minerals, and paleontology focused on the following concerns.

- Geological and hydrogeological impacts from new drilling techniques such as hydraulic fracturing versus historic drilling methods;
- Impacts to slope stability and erosion potential from construction disturbance through disturbance to fragile sedimentary rocks and erodible shales;
- Impacts to paleontological resources; and
- Conflicts between development of oil and gas and other mineral resources.

Geological and Hydrogeological Impacts from Hydraulic Fracturing

Respondents recommended studying subsidence and earthquake potential as it relates to hydraulic fracturing with specific reference to the geology of the area in question. Comments stated that the analysis area is on a fault. Respondents submitted references and citations summarizing information regarding the correlation between hydraulic fracturing and earthquakes/seismic activity. Comments stated that scientists have understood for decades that oil and gas production activities, including underground injection of fluids and the production of oil and gas, can cause earthquakes and indicated that the threat of seismic activity induced from oil and gas development practices must be sufficiently analyzed by the CRVFO. Comments incorporated by reference from the CRVFO 2014 RMP/Final EIS stated the Final EIS did not address issues of subsidence and the possibility of seismic activity that could result from expanded oil and gas development and wastewater disposal. While acknowledging there could be seismic impacts from development authorized by the CRVFO 2014 RMP/Final EIS, the agency dismissed these concerns without sufficient analysis or study, based on what it alleged would be the small intensity of these potential earthquakes.

Respondents stated that reports from New Mexico have acknowledged a proliferation of “frack hits,” or “downhole communication,” where new horizontal drilling for oil is communicating with both historic and active vertical wells, a significant development that could result in well blowouts, contamination of resources, and disputes over who is responsible for liabilities and costs of such impacts. Comments stated that without implementation of a precautionary approach to these risks, BLM will continue to place community and environmental health at risk. Respondents also requested that the BLM review the history of hydraulic fracturing in other states such as Pennsylvania and Texas to get a sense of what will happen along the Colorado River.

Impacts to Slope Stability and Erosion Potential

Respondents stated that development would exacerbate unstable soil conditions in the Thompson Creek drainage area due to the soft sedimentary rocks and erodible Cretaceous shales. These formations are naturally prone to landslides and other slope instability problems, as evidenced by a large landslide deposit in the North Thompson Creek drainage. Disturbance from road building, erosion, and stream channelization would likely aggravate these geologically fragile conditions which, in turn, could jeopardize this outstanding habitat.

Impacts to Paleontological Resources

Comments submitted as part of the WRNF 2012 Draft EIS (incorporated by reference) stated that the Draft EIS makes it clear that Potential Fossil Yield classification (PFYC) values are high in the area with anticipated use for oil and gas development, and that paleontological resources are nonrenewable and an irreplaceable part of the heritage of the U.S. offering meaningful educational opportunities to all citizens. As such, respondents stated the agency must look thoroughly before authorizing surface disturbing activities in such areas and maintain the flexibility to deny proposed development if potential impacts to paleontological resources cannot be avoided. Respondents noted that the WRNF 2012 Draft EIS indicates that the extent of paleontological resources inventoried and discovered on the WRNF is largely unknown, and suggested that additional information may be needed to evaluate impacts.

Conflicts between Development of Oil and Gas and other Mineral Resources

Comments provided on the WRNF 2012 Draft EIS indicated that the BLM should address potential future conflicts between development of oil and gas and other mineral resources. Respondents stated that in discussing potential direct impacts of leasing on geology and minerals resources, the WRNF 2012 Draft EIS says "If other leasable mineral resources such as coal, geothermal, and oil shale are leased in the future on lands also leased or available for oil and gas leasing, and should development be proposed, the BLM would be responsible for resolving any mineral resource development conflicts." Respondents suggested that agencies take a more proactive role in avoiding potential future conflicts in any final plan.

Existing Condition Characterization Comments supplied as part of the WRNF 2012 Draft EIS for applicability to this project indicated that the EIS lacked meaningful maps and tables depicting existing leases; existing and proposed units; existing wells; and pending APDs.

Respondents asked that the EIS disclose the location of the Lava Boulder Exploratory Well and identified the Reservoir Park dam as having structural issues that could be affected by geological events. Comments also noted that USEPA's DRASTIC model indicates that groundwater in Thompson Creek and other portions of the Piceance Basin sedimentary rock aquifer are the most likely to experience adverse effects.

Suggested Analysis Methodologies or Data

Respondents stated the BLM must consider recent science studying the impacts of modern drilling techniques on geologic resources and other potential impacts.

Comments stated that the CRVFO 2014 RMP/Final EIS (incorporated by reference) did not address issues of subsidence and the possibility of seismic activity that could result from expanded oil and gas development and wastewater disposal, while acknowledging there could be seismic impacts from development authorized by the CRVFO 2014 RMP/Final EIS, the agency dismissed these concerns, without sufficient analysis or study, based on what it alleges will be the small intensity of these potential earthquakes.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents suggested that the BLM not allow drilling in the Thompson Divide because of the more aggressive drilling techniques (fracking, directional drilling) used today versus drilling methods of the past which had less impact. Comments suggested there were many other areas outside of the Thompson Divide that could be viable for exploration.

Respondents suggested the BLM consider the mitigations proposed by the public and/or agencies during public comment periods for the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS. Comments made on these projects supported adding an NSO stipulation to all future leases for protection of paleontological resources to all future leases; waivable only after a study shows that paleontological resources will not be impacted by surface disturbance. Comments also suggested a trained professional undertake a paleontological study prior to ground disturbance in areas with high probable PFYCs.

These comments also noted that Ohio officials placed a five-mile buffer around waste injection wells to address the recognized correlation between oil and gas development practices and the inducement of earthquake. Comments also noted that in 2011, the U.S. Army Corps of Engineers declared a 3,000-foot buffer around dams and water-control structures in some states prohibiting new wells and drilling pads or pipelines, due to questions about whether fracking can cause shifts along natural faults, can cause rock and soil to subside, or whether injecting flowback and produced water underground can trigger earthquakes. Comments suggested that taking such a precautionary approach here through required stipulations that would attach to all oil and gas development in the planning area would be prudent and would help stem potential future impacts.

Comments provided on the CRVFO 2014 RMP/Final EIS also provided extensive design requirements, BMPS and reporting requirements for consideration by the BLM. These requirements are available by reviewing the Response to Comments appendices for each document and include the following

- Site Characterization and Corrective Action Data
- Well Design and Construction Specifications
- Well Logs
- Core and Fluid Sampling
- Testing to Maintain Mechanical Integrity
- Plugging and Abandonment Procedures
- Suggested Reporting Requirements

4.4.2.3 Soil Resources

Resource Concerns

Commenters noted surface disturbance in erodible soils results in increased sedimentation that may degrade water quality. Respondents stated that development would not only threaten special status species and high sensitivity water resources, but also would exacerbate unstable soil conditions in the Thompson Creek drainage area due to the soft sedimentary rocks and erodible Cretaceous shales. Comments stated that current development has already destabilized slopes and altered channels which contribute to excessive sedimentation threatening aquatic species. Comments indicated that, depending on a host of variables including soil characteristics, industrial operations and topography, associated runoff could introduce sediments as well as salts, selenium, heavy metals, nutrients, and other pollutants into surface waters.

Comments noted that dust storms have increased in frequency and strength along the same curve as the growth of the oil and gas industry in Colorado and Utah. Respondents theorized dust increases may correlate to road building and development of mineral interests in Utah and western Colorado and/or off-road vehicle use on BLM land. Comments also expressed concern about climate change and dust deposition on the snow. Respondents also expressed concern about dust mitigation, especially as it relates to fouling of water systems.

Comments also expressed concern about impacts to soil quality from development as related to crop contamination through spills or other methods (also see Section 4.4.4.3, Human Health and Safety).

Existing Condition Characterization

Respondents noted that Four Mile Creek drainage is ranked as having high watershed sensitivity and is projected to be a focal area for proposed surface disturbance.

Comments requested that the EIS include a map and description of topography and soils, specifically steep slopes and fragile or erodible soils, especially near surface waters and intermittent/ephemeral channels

Suggested Analysis Methodologies or Data

Respondents recommended the EIS include a qualitative assessment of potential impacts from erosion on water quality in the planning area. If the qualitative assessment indicates the potential for significant impact, then the EIS should provide a quantitative estimate of erosion rates and sediment loading for each alternative.

Respondents noted that the Wyoming BLM's Bighorn Basin Draft RMP/EIS estimated erosion rates based on projected amount of surface disturbance, types of surface disturbance and general characteristics of the basin (erodible soils, slopes, etc.) and calculated erosion rates using the Water Erosion Prediction Project (WEPP) model, a web-based interface developed by the USDA, Agricultural Research Service. Comments recommended the BLM consider using this model or another appropriate model that would be applicable to this project area.

Respondents expressed concern about the adequacy of the soils analyses contained in the WRNF 2012 Draft EIS and asked that the BLM incorporate by reference earlier comments made regarding that analysis for applicability to this project. Specifically, these comments stated that since the WRNF 2012 Draft EIS does not undertake to analyze site-specific or post-leasing impacts to soil resources, it is unreasonable to conclude that the additive impacts of RFFAs are not anticipated to cause significant soil resource degradation for all alternatives, as the Draft EIS does in the cumulative impacts analysis for soils.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents recommended the following BMPs to minimize erosion and sedimentation:

- Prohibiting roads in riparian areas or areas with erosive soils;
- Minimizing the number of road-stream crossings; and
- Managing road drainage and erosion to avoid routing sediment to streams.

Respondents suggested that existing pollution problems need to be cleaned up before leases are renewed. Comments also suggested that the existing sites of any company considered for a lease extension or renewal should be monitored randomly and without notice to determine their performance with regard to atmospheric, water and ground contamination.

Suggestions made as part of the WRNF 2012 Draft EIS indicated that site-specific, ground-truthed data analysis was not undertaken in the WRNF 2012 Draft EIS and has been explicitly postponed until site-specific development is proposed. Comments noted the agency should preserve the flexibility to protect soil resources with NSO stipulations. Comments further stated that standard lease stipulations, which allow for very little flexibility in moving development sites, would not ensure flexibility necessary to protect soil resources.

4.4.2.4 Water Resources

Resource Concerns

Respondents expressed concern with the interconnectivity of ground and surface water, and cited Colorado water laws that documented that the two systems are connected. Respondents referenced studies that documented groundwater contamination with natural gas and observations of natural gas bubbling to the surface of West Divide Creek. Respondents suggested that the BLM analyze impacts to groundwater could affect surface water and vice versa. Comments generally focused on water quality, water quantity and issues surrounding produced water management.

Water Quality

Respondents stated that water quality deterioration would affect fisheries, recreation and cutthroat trout or livestock grazing (discussed more in Sections 4.4.2.3, 4.4.3.5, and 4.4.3.6 (Wildlife, Livestock Grazing and Wildlife)). Respondents noted that Roaring Fork River Basin is currently a protected water shed, and expressed concern for potential contamination in Thompson Creek, Four Mile Creek, and Crystal River (a currently protected watershed, eligible for Wild and Scenic River designation). Respondents also expressed concern for potential contamination of drinking water. Respondents stated that water quality threats related to oil and gas development include:

- The potential for erosion/sedimentation from the construction of roads and well pads,
- Contamination from wastewater disposal pits, well pad and site runoff, or other waste;
- Potential landslides and additional threats related to floods, wildfire, and other weather events that could affect water resources;
- Potential for pipeline spills, and
- Contamination from hydraulic fracturing.

Respondents expressed significant concern about potential contamination of ground and surface water from contaminants used in hydraulic fracturing operations. Respondents cited studies linking hydraulic fracturing and the contamination of underground sources of drinking water. Respondents noted that additional studies are needed to understand the impacts of hydraulic fracturing on groundwater resources at varying depths, and to identify appropriate mitigation measures. Respondents also stated that hydraulic fracturing is relatively poorly regulated at the federal level, and that much more research is needed to ensure environmental safety. Commenters also expressed concern about hydrochloric acid in fracturing fluids and any potential harmful effects on groundwater.

Respondents suggested that the BLM reference the USEPA's draft report that investigated groundwater contamination from hydraulic fracturing near Pavillion, Wyoming (USEPA 2011). Respondent also noted that the USEPA is just beginning a multi-year study to understand the relationship between hydraulic fracturing and drinking water resources. Respondents encouraged the BLM to use the best and most recent data available when considering the potential effects of hydraulic fracturing. Specifically, respondents asked that the BLM reference the Duke University study on hydraulic fracturing.

Respondents cited an incident where a Garfield County citizen fell ill after drinking water from his well that had been contaminated with benzene, toluene and xylene as a result of improper construction and maintenance of a production pit. Respondents stated that the waste produced by hydraulic fracturing can be toxic, and stated that poor management of this waste has led to contamination of drinking water in various locations. Respondents indicated that the USFS recently proposed to ban horizontal drilling and associated hydraulic fracturing in the George Washington National Forest in Virginia and West Virginia due to the need to protect surface water and groundwater.

Comments stated that Operators have in the past failed to properly characterize subsurface water and have developed site-specific development plans with deficiencies in casing protocol, including impermissibly shallow casing in violation of COGCC standards. Respondents also noted that in 2006, COGCC found that EnCana Oil & Gas (USA) Inc. failed to prevent the intermingling of gas and water strata and to prevent the unauthorized discharge of gas in Garfield County, leading to contamination of drinking water with dissolved methane, ethane, propane, n-butane, iso-butane, n-pentane, iso-pentane, and hexanes. Commenters also cited a 2008 hydrogeological review in Garfield County that found increasing levels of both methane and chloride in groundwater samples that can be correlated to the increased oil and gas development. Comments stated the need for stronger protections and compliance measures.

Some Operators reported that they have had no major incidents.

Comments indicated that the WRNF 2012 Draft EIS highlighted the Thompson Creek as having potentially susceptible groundwater, and that the Thompson and Four Mile Creek have high watershed sensitivity. For this reason, respondents stated that developing these areas is not worth the risk for potential water contamination. Comments also stated that any contamination would have impacts on communities downstream.

Water Quantity

Respondents noted that state records project water shortages of 500,000 acre-feet per year for the next few decades, and asked that the BLM consider water availability in addition to water quality. Respondents noted that Glenwood Springs draws water from water rights along the Roaring Fork River, and that the city of Carbondale draws water from the area under review. Respondents suggested that the BLM include the following in the EIS:

- A range of estimated water demand per well anticipated for well drilling, completion and stimulation in the planning area (based on predicted well depths, formation characteristics, and well designs, as well as hydraulic fracturing operations, if used);
- Possible sources of water needed for oil and gas development; and
- Potential impacts of the water withdrawals (e.g., drawdown of aquifer water levels, reductions in stream flow, impacts on aquatic life, wetlands, and other aquatic resources).

Respondents expressed concern for the amount of water that will be used in hydraulic fracturing/drilling operations, and stated that the user groups such as grazing have already been asked to ration their water use. Respondents stated that portions of Four Mile Creek are already overtaxed from hydropower and irrigation diversions. Respondents also noted that Four Mile well, which supplies water to the Oak Meadows subdivision, is under strict augmentation rules set forth by the county. As such, water drawn must be replaced by augmentation to Four Mile Creek. There's an extensive augmentation system, including ponds, to facilitate this process. Respondents expressed concern for the potential alteration of hydraulic processes as a result of oil and gas development e.g. downstream water rights, allocation, augmentation, sources.

Respondents noted that snowpack is essential for recharging the springs, groundwater, streams, and rivers of the Thompson Divide, and asked that the BLM investigate the potential for development to affect the quantity and quality and water originating from this snowpack.

Comments on the WRNF 2012 Draft EIS (incorporated by reference) indicated that oil and gas development also affects surface waters in light of the large amounts of waters required to stimulate unconventional wells. Commenters stated that although the WRNF 2012 Draft EIS fails to address this issue, BLM needs to analyze it, particularly in light of the pristine quality of surface waters in the Thompson Divide, the lack of water available for appropriation, and the additional impacts on road infrastructure caused by hauling water into the Divide.

Produced Water

Respondents were concerned about the potential for waste from hydraulic fracturing being released directly into watercourses if sites are not properly regulated.

Respondents asked that the BLM discuss how flowback and produced water will be managed, including:

- Estimated volume of produced water per well;
- Options and potential locations for managing the produced water (i.e., underground injection control [UIC] wells, evaporation ponds, and surface discharges); and
- Potential impacts of produced water management.

Some operators reported that they have had no major incidents, and recycled 100 percent of the water produced by hydraulic fracturing.

Existing Condition Characterization

Respondents stated that the White River National Forest is the headwaters to approximately 15 watersheds which ultimately feed the Colorado River.

Comments stated that portions of the WRNF include 22 public water supply source areas.

Respondents recommended that the EIS describe the current water quality conditions for surface water bodies within the planning area, including intermittent, perennial, and ephemeral streams, rivers, lakes, reservoirs, and surface water drinking water sources. Comments recommend the BLM compare existing conditions to existing water quality standards or other reference conditions and presenting associated water quality status and trends. Comments also recommended that the EIS include the following information:

- A map of water bodies within and/or downstream of the planning area that includes perennial, intermittent and ephemeral water bodies; water body segments classified by CDPHE as water quality impaired or threatened under the Clean Water Act (CWA) Section 303(d); water bodies considered not impaired by CDPHE, and water bodies that have not yet been assessed by the CDPHE for impairment status. We also recommend that a table be provided to identify the designated uses of the water bodies and the specific pollutants of concern, where applicable;
- A map of municipal watersheds and designated source water protection zones; and
- A map and description of topography and soils, specifically steep slopes and fragile or erodible soils, especially near surface waters and intermittent/ephemeral channels.

The Thompson Divide Coalition suggested that the BLM consider a report they prepared, The Thompson Divide Baseline Water Quality Report for use in baseline water data characterization.

Respondents expressed concern about impacts to water quality resulting from spills and noted that a COGCC report from June 2013, documented 399 spills in 2012, "including 375 reported by the industry, 17 resulting from commission inspections and six resulting from landowner complaints." Comments stated that 63 of the spills impacted groundwater, and 22 impacted surface water drainages. Commenters noted that data compilations are limited to reported spills, and that 23 were only discovered by inspections or following landowner complaints. Commenters also suggested that the BLM investigate the environmental effects from the March 2013 spill that contaminated Parachute Creek.

Suggested Analysis Methodologies or Data

Respondents asked that the BLM consider field monitoring of surface and groundwater to continuously characterize and evaluate conditions as they are affected by development. Commenters stated that it is important to characterize both the existing and potential groundwater and drinking water resources in the planning area. Comments recommend the EIS include the following information:

- A description of all aquifers in the study area, noting which aquifers are Underground Sources of Drinking Water (USDWs). Federal Safe Drinking Water Act regulations define a USDW as an aquifer or portion thereof: (a)(1) which supplies any public water system; or (2) which contains a sufficient quantity of ground water to supply a public water system; and (i) currently supplies drinking water for human consumption; or (ii) contains fewer than 10,000 mg/l total dissolved solids; and (b) which is not an exempted aquifer (See 40 CFR Section 144.3);
- Available water quality and water yield information for each aquifer;
- Maps depicting the location of sensitive groundwater resources such as municipal watersheds, source water protection zones (available from the CDPHE);
- Descriptions and locations of groundwater use (e.g., public water supply wells, domestic wells, springs, and agricultural and stock wells);
- A map and discussion of proposed wells, existing producing wells, and nonproducing wells in the area including their status (e.g., idle, shut-in, plugged and abandoned), if available. Please refer to the COGCC for location and abandonment information.

Respondents suggested that the BLM consider the river continuum concept when evaluating water systems in the area, noting that it is the scientific framework that evaluates the interconnectedness of river systems.

Respondents asked that the EIS analyze potential impacts to surface waters related to erosion and sedimentation from land disturbance and stream crossings, as well as potential impacts associated with oil and gas well development, including drilling and production and potential spills and leaks from evaporation ponds and pipelines. Respondents suggested that the BLM analyze potential impacts to impaired water bodies within and/or downstream of the planning area, including water bodies listed on the most recent USEPA-approved CWA § 303(d) list. Respondents suggested that the BLM coordinate with CDPHE if there are identified potential impacts to impaired water bodies (in order to avoid causing or contributing to the exceedance of water quality standards). Respondents stated that where a Total Maximum Daily Load (TMDL) exists for impaired waters in the area of potential impacts, pollutant loads should comply with the TMDL allocations for point and nonpoint sources. Respondents recommended that the BLM work with CDPHE to revise TMDL documents and develop new allocation scenarios that ensure attainment of water quality standards.

Respondents expressed concern about the adequacy of the analyses contained in the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS as it relates to water resources, and asked that the BLM incorporate by reference comments made regarding that analysis for applicability to this project.

Comments for the WRNF 2012 Draft EIS expressed the following concerns:

- The WRNF 2012 Draft EIS does not consider how many people are dependent on these watersheds for drinking water, what the potential contaminants may be, the extent of potential contamination, and the potential impacts on human health. Comments pointed that the Draft EIS relies on a model which determined that groundwater in the Battlement Mesa and Thompson Creek areas have favorable ratings for usable groundwater, and that groundwater resources within the Piceance Basin sedimentary rock aquifer portion of the analysis area might be particularly susceptible to adverse effects.
- The WRNF 2012 Draft EIS stated that on-forest uses of groundwater include domestic water supplies for campgrounds, but does not state if or how many local residents rely on groundwater that comes from these sources. Commenters suggested that the USFS analyze how many people rely on these aquifers for groundwater, and how their health might be impacted by groundwater contamination.
- The WRNF 2012 Draft EIS did not consider that existing leases nearby would remain unconstrained by stipulations proposed in the analysis, and suggested that the BLM consider impacts if existing leases are allowed to develop under existing lease terms.
- The WRNF 2012 Draft EIS fails to take into consideration potentially significant short-term impacts, like disturbance associated with pad and pipeline construction. Short-term disturbances may have significant impacts and must be analyzed.
- The WRNF 2012 Draft EIS did not consider all relevant new information on potential threats to groundwater. Comments noted that groundwater from the WRNF is used by special-use permit holders, for domestic water and agriculture, and at USFS campgrounds; groundwater also supports ecological services and helps sustain wildlife populations. Commenters stated that numerous recent studies suggest that groundwater contamination from contemporary drilling practices is a significant threat. Commenters suggested that the USFS investigate the incidents in Garfield County where reports suggested that groundwater contamination resulted from oil and gas development. Comments stated that if groundwater contamination does occur, it may take years to discover, and that remediation is a costly process that takes decades to complete. Commenters stated that any final plan must ensure adequate protection of groundwater resources. Commenters stated that the EIS should consider impacts from new drilling technologies and contemporary wells and potential impacts to water resources.

Issues that were raised during the CRVFO 2014 RMP/Final EIS comment period were asked to be considered in the analysis for this EIS. These included:

- What source waters will be used for well development, and what are the direct, indirect, and cumulative impacts of extracting high volumes of these waters from surface or groundwater sources in this area?
- How would the produced water be disposed of? If produced water is returned to the surface as toxic waste for evaporation, where will such wastewater ponds be located? And, if produced water is re-injected in wastewater wells, where will such wells be located?
- What kind of treatment, if any, will be required of the producer for treating wastewater from hydraulic fracturing?

- What is the potential footprint and location of the necessary treatment facilities and what is the direct, indirect, and cumulative impact of such facilities?
- What mitigation measures and best management practices will BLM require (or at least recommend) to ensure that wastewater does not contaminate surface or groundwater resources, or impact threatened and endangered populations and designated critical habitat in the planning area?

Comments on the CRVFO 2014 RMP/Final EIS stated that the BLM failed to consider issues of water supply related to hydraulic fracturing. Comments stated that the RFD water usage scenarios used by the BLM were outdated and the BA was inadequate because it relied on estimates from the RFD. Comments suggested that the BLM utilize projections prepared by other agencies and NGOs that estimate higher water usage rates. Commenters stated that the USEPA estimated that 70-140 billion gallons of water are used annually to fracture wells in the U. S, and that other sources estimate 2 to 8 million gallons being used to frack a single well. Commenters stated that this massive use of water is of particular concern in states like Colorado where water supplies are already scarce. Commenters stated that removing water for hydraulic fracturing can stress existing water supplies by lowering water tables and dewatering aquifers, decreasing stream flows, and reducing water in surface reservoirs. Comments noted that changes in hydrology can result in changes to water quality, by increasing the concentrations of pollutants in the water.

Comments for the CRVFO 2014 RMP/Final EIS stated that the NEPA analysis must consider the potential sources of water in the CRVFO that would be used for oil and gas development, and the impacts of these water withdrawals on water availability for drinking, agriculture, and wildlife. Comments also stated that the analysis must further address the impacts to water quantity at different annual, seasonal, monthly, and daily time scales because the impacts of such water withdrawals could be more acute during times, months, and seasons of scarcity.

Comments for the CRVFO 2014 RMP/Final EIS stated that the Final EIS does not adequately address or analyze the risks of water quality contamination from surface storage of hydraulic fracturing fluid and other oil and gas wastes, including produced and flowback water from wells. Comments stated that oil and gas development authorized by the 2014 RMP/Final EIS would result in a significant potential to contaminate groundwater resources in the planning area. Commenters stated that contamination could result during:

- The hydraulic fracturing process, due to well malfunctions, migration of fracking fluids or fluids from the fractured formation to aquifers, and mobilization of subsurface materials to aquifers;
- Flowback processes, due to releases, leakage of on-site storage, and spills from pits (caused by improper construction, maintenance, or closure);
- Wastewater disposal, due to discharges of wastewater into groundwater, incomplete treatment, and transportation accidents; and
- Chemical mixing, due to spills, leaks, and transportation accidents.

Commenters for the CRVFO 2014 RMP/Final EIS also suggested that the BLM consider the potential for hydraulic fracturing chemicals and wastewater to contaminate groundwater supplies as a result of illegal dumping. Commenters stated that many of these chemicals that have been disclosed or discovered are toxic, hazardous, or harmful to human health or welfare. Commenters felt that there was a general lack of adequate oversight of hydraulic fracturing operations. Comments cited the BLM as having said that harm to groundwater is not expected from hydraulic fracturing due to the depth of the drilling and groundwater, and that this process occurs at depths below 5,000 feet, while freshwater aquifers are typically less than 2,000 feet deep. Commenters then cited the BLM as having said that the hydraulic

fracturing process may inadvertently invade zones in unintended strata, potentially creating a pathway for migration of hydraulic fracturing fluids and produced fluids into shallower groundwater or surface waters. Commenters stated that the BLM should consider their referenced reports that tied groundwater contamination to hydraulic fracturing.

Respondents for the CRVFO 2014 RMP/Final EIS expressed concern for potential contamination of groundwater with methane, along with other organic and synthetic compounds. Respondents expressed concern for potential contamination like that described in the USEPA Draft Report from Pavillion, Wyoming (USEPA 2011).

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents suggested that the BLM incorporate measures that would retain or improve current water quality. Respondents suggested that the BLM modify the leases to apply measures that protect downstream water uses, including, cancelling, limiting or excluding oil gas development in areas of concern; use of BMPs, setbacks or buffers from sensitive water resources; and monitoring. Each of these is discussed in more detail below.

Respondents suggested all future multiple-well oil and gas projects provide a water resources management plan to address potential water quality impacts due to consumption, storage and disposal of water used in oil and gas production.

Respondents noted that appropriate groundwater protection measures can vary depending on hydrologic conditions and the presence of drinking water resources. Comments suggested that lease stipulations within the Beaver Creek Watershed District need to evaluate consistency with the District and avoid rules that conflict with or are less stringent than those enforced by the City of Rifle.

NSO Stipulations/Setbacks

Comments noted setbacks are effective health and environmental protection tools because they provide an opportunity for released contaminants to attenuate before reaching a key water source and may also afford an opportunity for a release to be remediated before it can impact water resources

Comments noted that contaminants from surface events such as spills, pit and pipeline leaks, and nonpoint source runoff from surface disturbance have the potential to enter and impact surface water resources if these events occur in close proximity to water bodies. If surface activities are set back from the immediate vicinity of surface water, wetlands, and designated source water protection zones, this provides an opportunity for accidental releases to be detected and remediated before impacts reach water resources. If accidental releases are not detected, the setback provides a safety factor and some possibility of natural attenuation occurring. Setbacks also help prevent nonpoint source pollutants such as sediments from impacting surface waters. Comments recommended that the BLM evaluate setback distances identified through leasing stipulations such as NSO for perennial waters including lakes and reservoirs, intermittent and ephemeral streams, steep slopes, and impaired waters within the planning area, and recommended NSO setbacks.

Respondents requested consideration of the following:

- Restrictions (or prohibitions, where possible) on road building on WRNF lands without NSO stipulations.
- Permanent protection from oil and gas development in the Thompson Divide area and associated watersheds and/or limiting development to outside the Roaring Fork watershed.

- Limiting or excluding development in areas of pristine watersheds, including Thompson Creek and/or limiting or excluding development in areas of “high biological stress”, such as Coal Basin, Coal Creek Watershed, and the Crystal River.
- Limiting development to areas outside watersheds that directly affect the water supply to local subdivisions and/or cancelling lease #COC 066688 because it is positioned directly above the Oak Meadows Subdivision and would directly affect its water supply.
- A minimum 500-foot buffer for domestic supply wells and private wells, consistent with proposed protections on federal lands in the CRVFO. Comments noted that a number of states including Colorado and North Dakota have adopted a 500 foot setback from occupied dwellings (and by default, the associated domestic well). Comments also encouraged the BLM to consider source water protection zones delineated by the CDPHE when evaluating the basis and need for setbacks from public water supply wells.
- Municipal Supply Watersheds:
 - Consistent with the CDPHE Source Water Protection Program (SWPP) recommendations, NSO within any of the following areas as deemed appropriate: 1) the entire watershed; 2) Local Source Water Protection Planning Areas where delineated in a SWPP; or 3) drinking water protection areas as defined by Source Water Assessment Areas evaluated by the State.
 - For groundwater and GWUDI sources, if NSO for the Municipal Supply Watersheds is not deemed feasible, a minimum 0.5 mile (2,640 feet) NSO or Controlled Surface Use (CSU) concentric buffer for these sources.
 - For surface water sources, if the Municipal Supply Watersheds NSO is not deemed feasible, then at a minimum, the EIS should cite the COGCC Regulation 317B and incorporate its requirements for protecting surface water drinking water supplies. See <http://cogcc.state.co.us/RR Docs new/rules/300Series.pdf>.
 - A commitment in the Final EIS and Record of Decision to provide notice to lessees regarding these important areas in the planning area. Lease notices for drilling within Source Water Protection (SWP) Zones of public water supplies are now being used for all wells drilled under BLM authority within SWP Zones in Utah.
- Minimum 100-foot NSO setback from slopes greater than 30%;
- Minimum 500-foot NSO setback for flowing waters (rivers and streams) or 100-year floodplain, whichever is greater;
- Minimum 500-foot NSO setback for lakes. Ponds and reservoirs, wetland and riparian areas and springs;
- Minimum 750-foot NSO setback for 303(d) Impaired waters;
- Minimum 1,000-foot NSO setback for special or significant waters; and
- Minimum 100-foot NSO setback for intermittent and ephemeral streams.

Comments submitted on the WRNF 2012 Draft EIS expressed support for NSO and CSU stipulations incorporated into various alternatives to minimize impacts to fens, wetlands, water influence zones (WIZ), public water supply source areas, and groundwater resources, as well as a proposed Public Water Supply Source Area Protection NSO stipulation, a CSU stipulation around public water supply source areas, and a CSU stipulation where potentially susceptible groundwater resources occur. Comments on the WRNF 2012 Draft EIS indicated that Thompson Creek watershed and the Crystal River and its tributaries should be closed to future leasing. The USEPA noted that its DRASTIC model indicates that groundwater in Thompson Creek and other portions of the Piceance Basin sedimentary

rock aquifer are the most likely to experience adverse effects from future oil and gas development, and that the Thompson Creek also has favorable ratings for usable groundwater. Taken together, these facts suggest that the USFS should be taking proactive steps to protect groundwater in Thompson Creek.

Respondents support efforts by the Thompson Divide Coalition to grant permanent protection from oil and gas development in the Thompson Divide and associated watersheds.

BMPs and CSU Stipulations

Comments indicated that BMPs identified as applicable at the leasing stage can be required through a CSU stipulation and identified the following as appropriate BMPs and development technologies:

- Water reuse, closed loop drilling or pitless drilling systems.
- Lining of evaporation ponds; closure and monitoring of reserve pits and evaporation ponds.
- Steel walled containment berms around production equipment, storage of excess chemicals outside the production facility; and leak detection technologies and plans.
- Use of water based drilling muds.
- Sediment control measures.
- A general production well schematic that depicts the following: casing strings; cement outside and between the various casing strings; and the relationship of the well casing cement outside and between the various casing strings; and the relationship of the well casing design to potentially important hydro-geological features such as confining zones and aquifers or aquifer systems that meet the definition of a USDW, and discussion of how the generalized design will achieve effective isolation of USDWs from production activities and prevent migration of fluids of poorer quality into zones with better water quality.
- Abandonment procedures for sealing wells no longer in use in order to reduce to be potential for inactive wells to serve as conduits for fluid movement between production zone(s) and aquifer(s). Comments indicated this is particularly important where existing wells do not have surface casing set into the base of USDWs and lack sufficient production casing cement.
- Monitoring of water quality and water levels (see below).
- A mitigation plan for remediating future unanticipated impacts to drinking water wells, such as requiring the operator to remedy those impacts through treatment, replacement, or other appropriate means.

The following recommendations were contained in the comments on WRNF 2012 Draft EIS:

- Prohibiting roads in riparian areas or areas with erosive soils;
- Minimizing the number of road-stream crossings; and
- Managing road drainage and erosion to avoid routing sediment to streams.

Site Characterization and Corrective Action Data Recommendations

Comments suggested through the CRVFO 2014 RMP/Final EIS provided extensive comments on well and hydraulic fracturing design requirements, BMPs and reporting requirements for consideration by the BLM regarding the requested data and procedures for Site Characterization and Corrective Action Data; Well Design and Construction; Well Logs; Core and Fluid Sampling; Mechanical Integrity; and Plugging and Abandonment (see Section 4.4.2.2). In addition to those requirements, comments stated that within the area of review, operators must identify all wells that penetrate the producing and confining zones and

provide a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the regulator may require. Comments requested that the Operator provide the following information:

- Any sources of water that serve as USDWs in order to characterize baseline water quality; Operators should also consider testing for environmental tracers to determine groundwater age.
- Any hydrocarbons that may be encountered both vertically and aerially throughout the area of review.
- The producing zone(s) and confining zone(s) and any other intervening zones as determined by the regulator.

Comments stated that each hydraulic fracturing treatment must be modeled using a 3-D geologic and reservoir model, as described in the Area of Review requirements, prior to operation to ensure that the treatment will not endanger USDWs. Stimulation operations may not begin until a successful mechanical integrity test is performed and the results are submitted to the regulator. If mechanical integrity cannot be restored, the well must be plugged and abandoned. During the well stimulation operation, the operator must continuously monitor and record the pressures in each well annuli. If during any stimulation operation the annulus pressure 1) increases by more than 500 pounds per square inch as compared to the pressure immediately preceding the stimulation; or 2) exceeds 80 percent of the API rated minimum internal yield on any casing string in communication with the stimulation treatment; the operation must immediately cease, and the operator must take immediate corrective action and orally notify the authorized officer immediately following the incident. If at any point during the hydraulic fracturing operation the monitored parameters indicate a loss of mechanical integrity or if injection pressure exceeds the fracture pressure of the confining zone(s), the operation must immediately cease. If a loss of mechanical integrity is discovered or if the integrity of the confining zone has been compromised, operators must take all necessary steps to evaluate whether injected fluids or formation fluids may have contaminated or have the potential to contaminate any unauthorized zones.

Respondents stated that Operators must submit to the regulator a plan for cumulative water use over the life of the project. The plan should take into account other activities that will draw water from the same sources, such as agricultural or industrial activities; designated best use; seasonal and longer timescale variations in water availability; and historical drought information.

Comments also recommended that Operators submit to the regulator a proposed plan for handling wastewater, such as flowback and produced fluids.

Monitoring Recommendations

Comments stated that the BLM must require baseline and ongoing, long-term water quality monitoring to provide opportunities for early detection of contamination and adaptive management. Comments stated that the BLM must ensure regular inspections of proposed development, despite budget and staffing limitations, especially "high-priority oil and gas wells". Respondents stated that surface water and groundwater resource monitoring will be critical in all areas identified as susceptible to adverse impacts. Commenters noted that Garfield County, the only county in Colorado with a mobile environmental lab, has not had any environmental violations, which they directly attribute that in part to monitoring.

Comments recommended that the EIS address how water quality monitoring in the planning area will occur prior to, during, and after anticipated development to detect impacts to both surface water and groundwater resources, including private well monitoring, and cited the *BLM Gasco EIS Long-Term Plan for Monitoring of Water Resources* as a recent example of a water quality monitoring plan. Respondents also mentioned the *National Ground Water Association's Water Wells in Proximity to Natural Gas or Oil*

Development brief as providing information on the importance of baseline sampling for private wells and types of analysis recommended.

Comments submitted on the WRNF 2012 Draft EIS recommended disclosing future monitoring requirements in the Final EIS in order to provide operators, the public and other stakeholders an opportunity to review and comment. Comments also recommended that the Final EIS address the COGCC requirements for surface water monitoring for surface water drinking water sources by including a reference to the COGCC requirements.

Other Recommendations

Respondents recommended the BLM consider a designation of NSO within Areas of Critical Environmental Concern (ACEC) where important water resources may be impacted.

Comments suggested that existing pollution problems need to be cleaned up before leases are renewed. Comments stated that existing sites of any company considered for a new lease or extension or renewal should be monitored randomly and without notice to determine their performance with regard to atmospheric, water and ground contamination.

Respondents also asked that BLM consider recycling produced water for use in well drilling and stimulation, thereby decreasing the need for water withdrawals and for produced water management/disposal facilities and minimizing the associated impacts.

4.4.3 Biological Resources

4.4.3.1 Vegetation Resources

Resource Concerns

General Vegetation Issues

Respondents were especially concerned with remediation of forested areas. Respondents were concerned about effectiveness of management plans and stipulations in rugged, steep, mountainous and/or forested terrain with long winters. Commenters also indicated that the BLM should consider the potential for toxic chemicals to weaken vegetation, making plants more susceptible to infestation, drought, and/or infection.

Respondents noted the value of plant diversity along wildlife corridors and other key wildlife areas. Commenters also expressed concern for rare plants species such as the stream orchid (*Epipactis gigantean*). Respondents expressed concern about impacts on existing fire-prone conditions. Comments specifically expressed concern about the potential for Gambel oak shrublands to spread fires to neighboring residential and commercial areas under dryer conditions.

Respondents expressed concern for the Jerome Park conservation easements, as well as conservation easements on Cold Mountains Ranch, Crystal Island Ranch, and the Hawkins Island Parcel (also see Section 4.4.4.4, Lands Use). Respondents noted that the Jerome Park Conservation Easement hosts a broad range of plant communities, and 13 species receiving special conservation designation from the Colorado Natural Heritage Program (CNHP) and other agencies. This area is discussed in greater detail in Section 4.4.3.3, Wildlife Resources.

Respondents requested the BLM incorporated by reference comments made during public comment periods for the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS. These comments noted that much of the CRVFO area underlies large forested areas, notably in the WRNF. These comments also referenced studies that looked at land cover change due to shale-gas development. The comments cited studies correlating fire potential and roads, noting that 90 percent of wildland fires are the result of

human activity. Respondents also asked the BLM to consider impacts to alpine ecoregion types. These comments also requested that the BLM identify ecologically intact/undisturbed locations in the study areas, stating that failure to identify these locations puts native plant populations at risk. Comments for the Draft EIS also stated it was necessary to issue no additional leases because alternatives did not meet Threatened, Endangered, and Proposed Species Standard 2, Regional Forester's Sensitive Species Standard 3, and Species of Local Concern Standard 2.

Noxious and Invasive Weeds

Respondents expressed concern about fragmentation and the establishment of noxious weeds, especially in the Thompson Divide area. Respondents requested that the BLM investigate the establishment of invasive weeds as a result of surface disturbance from the construction of roads, pipelines, and pads. Comments further recommended that the BLM look at existing disturbed areas to understand the effectiveness of current weed control practices. Commenters also suggested the BLM consider the impacts invasive vegetation could have on farming and ranching, and available forage for wildlife, noting that the viability of hounds tongue seeds is 40 years. Comments specific to the Thompson Divide area noted that noxious weeds currently impact 71 percent of Four Mile Creek's surveyed riparian and instream habitat, and expressed concern about further disturbance increasing the spread of weeds in the area.

Comments on the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS (incorporated by reference) stated that ground disturbance is the primary conduit for invasive weeds, and that potential impacts were not discussed adequately for the alternative, denoting least future potential disturbance. Comments on the WRNF 2012 Draft EIS requested that the USFS consider the impacts that noxious weeds can have on grazing, TES, fire risk, and socioeconomic conditions.

Wetlands, Riparian Areas and Floodplains

Comments noted that oil and gas development and construction activities have the potential to cause changes in hydrology due to surface disturbance. Respondents suggested the BLM consider indirect impacts to wetlands and riparian areas that could occur from reasonably foreseeable development as a result of stream structure, channel stability, streambed substrate, spawning habitat, stream bank vegetation, riparian habitat, and aquatic biota. Comments on the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS stated that fens are an increasingly rare ecosystem and sensitive to change.

Existing Condition Characterization

Respondents suggested the BLM present inventories and maps of existing wetlands and Waters of the U.S. within the planned leasing areas, as regulated and protected under Executive Order (EO) 11990 and Section 404 of the Clean Water Act (CWA). Commenters suggested the EIS should provide information on acreages, channel lengths, habitat types, values, and functions of these areas.

Comments also noted that the Colorado Natural Heritage Program (CNHP) has identified the Middle Thompson Creek as a Conservation Area of Concern due to the area's exceptional biodiversity and that the CNHP has identified riparian and upland habitat near Sunlight Mountain Resort as a potential conservation area.

Respondents stated that the USFS Watershed Condition Classification ranked the Thompson Creek as "functioning at risk" for reasons including poor road/trail conditions and fair riparian/wetland vegetation.

Suggested Analysis Methodologies or Data

Comments recommended the BLM consider studies documenting acidification of biological environments and the effects on populations.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents suggested development of a fire mitigation plan to address potential fire risks associated with existing roads and the construction of new roads.

Comments suggested that pesticide use next to wildlife corridors should be monitored to prevent destructive impacts to pollinators and corresponding impacts to vegetation.

Comments regarding mitigation for noxious and invasive weeds strongly recommended that the BLM include effective and detailed mitigation measures and remediation strategies for preventing the spread of noxious weeds. Respondents suggested the BLM consider the lack of effectiveness of the stipulations in place for Source Gas and Kinder Morgan, stating that these stipulations have been ineffective in preventing the spread of noxious weeds caused by machinery in the construction of the pipeline. Respondents recommended an invasive weed control plan that would require leaseholders to be responsible for weed control for the longevity of invasive plant seeds (up to 40 years). Respondents also asked that the BLM consider more stringent consequences for those noncompliant companies.

Respondents recommended the following measures to protect wetlands, riparian areas, and floodplains:

- The application of minimum setback requirements, such as NSO for wetlands and riparian areas;
- Leasing stipulations to protect floodplains, such as NSO within the 100-year floodplain;
- Delineation and marking of perennial seeps, springs and wetlands on maps and on the ground prior to project development to ensure identification and facilitate protection of these resources; and
- NSO stipulations for fens.

4.4.3.2 Vegetation Resources-Special Status Species

General Concerns

Respondents expressed concern about the impacts to special status plant species, particularly in the Thompson Divide area. Comments suggested the BLM consult with the USFWS, Colorado Parks and Wildlife (CPW), and CNHP to ensure that sensitive plant species are adequately protected.

Comments submitted on the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS (incorporated by reference) stated that natural gas development is probably the largest threat to DeBeque phacelia (threatened). Comments for the WRNF 2012 Draft EIS also stated that alternatives inadequately protected rare plant species and that this was grounds for cancelling leases. Comments on the Draft EIS also suggested that the USFS should explicitly describe assumptions regarding proposed development on existing leases pursuant to existing stipulations, as this may affect cumulative impacts to rare plant species.

Existing Condition Characterization

Respondents provided for the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS suggested that field surveys, instead of GIS modelling, be undertaken to identify special status plants prior to leasing.

Suggested Analysis Methodologies or Data

No specific methodologies or study areas for analysis were suggested.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents suggested the BLM consider the mitigations proposed by the public and/or agencies during public comment periods for the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS. Suggestions included:

- NSO stipulations for known and potential habitat for Colorado hookless cactus.
- NSO stipulations for known and potential habitat for Ute ladies tresses orchid.
- NSO stipulations for known and potential habitat for DeBeque phacelia.
- NSO stipulations for sensitive plant species such as Piceance bladderpod, sun-loving meadowrue, Rocky Mountain thistle, Wetherill's milkvetch¹, Harrington beardtongue², lesser panicked sedge, American yellow lady's-slipper, and giant helleborine.
- Explicit commitments to let existing leases expire.

4.4.3.3 Wildlife

General Concerns

Respondents expressed concern for the degradation of habitat and subsequent effects on wildlife, and requested that the BLM analyze the impacts of habitat fragmentation on wildlife. Commenters suggested the BLM analyze the indirect impacts to wildlife from noise, water pollution, air pollution, and road construction. Commenters also requested that the BLM investigate the potential effects of toxic chemicals frequently used in oil and gas development, citing studies addressing the impacts of toluene on sensitive species.

Respondents were concerned with the effects of energy development, especially hydraulic fracturing, on wildlife. Commenters asked that the BLM investigate the effects of current development in Rifle, Colorado, noting that a large percentage of the wildlife there has fled and that hunting has diminished greatly in that area (discussed in Section 4.4.4.6, Recreation).

Respondents noted that the Thompson Divide does not have year-round roads, thus limiting disturbance to wildlife. Respondents also pointed out that Pitkin County, along with other agencies, have invested many financial resources into preserving private lands in the Crystal Valley and Thompson Divide areas to promote the health of wildlife populations in the region.

Respondents were deeply concerned with water-related impacts to wildlife (e.g., pollution, depletion). Respondents referenced biomonitoring studies that suggested the presence of organic pollution in the Four Mile Creek and associated minor stress to aquatic life along a portion of the creek and noted that many species rely on this habitat. Respondents also noted that snowpack is essential to recharging the springs and streams that wildlife rely on, and suggest that the BLM investigate the potential effects of dust control chemicals and other drilling chemicals on this specific water supply.

Respondents noted that the Thompson Divide area is a wildlife refuge and incubator area that is stressed by existing development in surrounding areas, citing an updated CPW analysis from 2013.

¹ The assumption was made that the respondent was referring to Wetherill's milkvetch (*Astragalus wetherillii*) when saying "Astragalus wetherill".

² The assumption was made that the respondent was referring to Harrington beardtongue (*Penstemon harringtonii*) when saying "Harrington penstemon".

Respondents referred to the Thompson Divide area as one of the few unfragmented areas of mid-altitude mountain wildlife habitat that is critical to the preservation of wildlife. Respondents also noted that the lower elevations provide ample forest and meadow vegetation for a full spectrum of healthy wildlife. Respondents cited an analysis from CPW that described the Thompson Divide as containing great fisheries habitat. Respondents expressed concern for the Jerome Park Conservation Easement, noting that the area protects thousands of acres of wildlife habitat, and receives special conservation designation from CNHP and other state and federal agencies. Comments stated that Jerome Park also provides a land bridge between USFS and BLM lands.

Respondents requested the BLM incorporate by reference comments made for the WRNF 2012 Draft EIS for applicability to this project. These comments indicated that the analysis area has some of the richest wildlife resources on the WRNF; provides habitat for TES such as lynx and fish species (including genetically pure populations of cutthroat trout); and provides habitat for the nation's largest elk herds, moose and black bears. Comments made on the WRNF 2012 Draft EIS also encouraged the USFS to utilize the latest research on habitat fragmentation.

Respondents expressed concern about the following species: deer, elk, moose, bear, wolverine, mountain lion, bobcat, lynx, fox, coyote, hawks, eagles, bats and cutthroat trout. Respondents also noted that approximately 18 bat species could potentially inhabit the Thompson Divide area and cited studies showing bats radio-tracked to the Thompson Divide area from eastern Colorado, and associating bat mortalities with energy development.

Comments regarding big game and avian and aquatic species are summarized in subsections below. Comments regarding lynx and other federally listed species are addressed in Section 4.4.3.4, Wildlife - Special Status Species.

Big Game

Respondents expressed concern for big game species including deer, elk, bear, and moose. Respondents noted that mule deer and elk will avoid areas impacted by oil and gas development, forcing the species into less viable habitat or decline with development densities as low as one well pad per section. Respondents noted that considerable development has occurred in lower elevations of Garfield, Mesa, Delta, and Gunnison counties, removing suitable displacement habitat and increasing the importance of keeping existing backcountry areas intact. Respondents expressed specific concern about impacts to big game with increased traffic, noise pollution, and air pollution. Furthermore, commenters stated that with energy development and fragmentation of habitat, populations of elk and bighorn sheep have declined. Respondents noted that while elk may be able to avoid immediate impacts by avoiding disturbed areas, development could have cascading effects on mule deer. Additionally, development could force elk into not-impacted areas that could be associated with agriculture.

Commenters stated that the Thompson Divide area has been recognized by the CPW as high value habitat for big game species; supports some of the state's largest big game herds; provides crucial elk winter and summer habitat, migration routes, and calving range; contains critical habitat for mule deer and elk in the region; and provides keystone habitat, acting as a lynchpin between high elevation wilderness areas and lower elevation wintering range on the Grand and Battlement mesas. Commenters stated that ranches in the area, as well as existing leases, provide winter range, severe winter range, winter concentration areas, and production areas for both elk and deer. Comments also noted that the area overlaps Game Management Units 42, 43, and 521 which generated more than 20,000 hunting licenses each year (discussed in Section 4.4.4.6, Recreation).

Elk: Respondents noted that the Thompson Divide contains 56,263 acres of mapped elk calving areas and approximately 30,200 acres of winter conservations areas (respectively 23 percent and 14 percent of the Thompson Divide area). Respondents cited studies documenting decreased reproduction and

survival rates for elk related to development. Respondents cited studies that looked at elk avoidance of roadways and suggested that the BLM consider these spatial models to manage elk summer and calving ranges. Respondents also cited studies of elk response to energy extraction activities (Hayden-Wing Associates 1990; Johnson and Lockman 1981; Powell 2003) and roadways (Phillips and Alldredge 2000; Preisler et al. 2006; Rowland et al. 2000; Shively et al. 2005; Vieira 2000), and expressed concern about elk avoiding wintering range and calving areas due to active development in those areas. Respondents for the WRNF 2012 Draft EIS indicated that the Draft EIS failed to adequately protect elk production areas and cited studies that indicated roads are the most significant modifier of elk habitat, and that road densities less than 1 mile per square mile may eliminate effective habitat for elk.

Mule Deer: Respondents indicated that deer populations in Colorado are limited by habitat and expressed concern about potential negative impacts to deer winter range and availability of quality forage areas. Respondents cited studies that showed displacement of mule deer populations and declines of population counts in response to energy development. Commenters also noted that the Thompson Divide contains 13,042 acres of severe winter range for mule deer and that this small amount makes these areas more valuable. Respondents noted that CPW is currently conducting meetings and studies throughout western Colorado to address the decline in mule deer populations.

Comments on the 2012 WRNF Oil and Gas Leasing EIS and the 2014 CRVFO Proposed RMP and Final EISs (incorporated by reference) stated that mule deer show stress response to human activity at a distance of 0.29 mile and are less likely to use the habitat for normal life functions. Respondents also cited a study from the Wyoming Game and Fish Department (WGFD) concluding that a density of one well per square mile causes moderate impacts to mule deer winter range; a density of two to four well pads per square mile causes high impact; and densities over four wells per square mile would have extreme impacts (WGFD 2010). Respondents also cited a 2009 CPW Thompson Divide Wildlife Summary (prepared for the Thompson Divide Coalition) that concluded gas development in the area is likely to have detrimental effects in mule deer, including habitat fragmentation, habitat loss, increased vehicle traffic, noise pollution, and light pollution that would lead to displacement of deer from traditional fawning grounds and summering areas, and direct mortalities due to mortality strikes.

Moose: Respondents noted that CPW and USFS have invested substantial resources to reintroduce and expand moose populations in Colorado, calling the moose the second most watchable wildlife species and a coveted big game species. Comments noted that moose were introduced within the Grand Mesa National Forest in 2005, again in 2006 and 2007, and has since expanded its range. Comments noted that moose have been living near Oak Meadows for several years and are thought to have migrated through the Thompson Divide from the Grand Mesa. Respondents also noted that the Thompson Divide provides an important movement corridor between existing moose concentration areas in the Hightower area and Crystal River Valley. Commenters noted that moose are already occupying this area, as it provides numerous riparian systems and preferred foraging areas. Respondents indicated that the Thompson Divide area contains approximately 50,000 acres of mapped winter concentration areas for moose (23 percent of the Thompson Divide), and that production areas are in the process of being identified and mapped.

Black Bear: Respondents stated that oil and gas development is expanding rapidly into black bear habitats and that complaints about bears at oil and gas locations have increased. Commenters also were concerned that energy development could push bears out of their habitats and into more densely populated urban areas, thus increasing the potential for negative human-bear encounters.

Bighorn Sheep: Comments from the WRNF 2012 Draft EIS noted that herds occur on Battlement Mesa, south of Carbondale, on the Flattops and near Elk Creek drainages, among other places. These respondents stated that the Clinetop herd, located north of New Castle, has dwindled to only a few animals and would likely be detrimentally impacted by oil and gas leasing allowing surface development.

Avian Species

Respondents noted that there are numerous raptor nest sites and foraging areas within the Thompson Divide area, and expressed concern about the potential for nest site abandonment due to direct and indirect disturbance, and habitat alteration. Comments stated that golden eagle, peregrine falcon, and northern goshawk exist within the area.

Respondents expressed concern for songbirds being adversely affected by increased roads and potential displacement by cowbird and starlings. Commenters noted that native birds are declining at alarming rates and encouraged the BLM to conserve existing habitat for avian species.

Respondents suggested the BLM consider the data offered by the public and/or agencies during public comment periods for the 2012 WRNF Oil and Gas Leasing EIS, which stated that the density of sagebrush obligate species drops by 50 percent on lands within 100 meters of a road or well pad.

Aquatic Species

Respondents noted that the river drainages in the area provide diverse aquatic habitat, with headwaters being home to cold water aquatic species (e.g., brook, cutthroat trout, and boreal toads) and the aquatic assemblages shifting as water temperatures rise in a downstream direction. Respondents asked that the BLM recognize the potential for both acute and chronic impacts. Comments identified acute impacts as those that could occur quickly and compromise the aquatic habitat, such as potential chemical or hazardous material spills, and chronic impacts as including increased turbidity from sediment deposition in waterways and/or the accidental release of nuisance species through water transport activities.

Comments submitted as part of the WRNF 2012 Draft EIS and resubmitted for consideration applicable to this EIS noted that the analysis area includes strongholds for native species, and identified Milk Creek and Divide Creek as the two stream systems on the WRNF with the richest native species assemblages. Comments identified the following locations of concern:

- Four Mile Creek: comments identified this creek as an important tributary for brown trout spawning. Respondents were significantly concerned with potential impacts to Colorado River cutthroat trout (CRCT) (USFS Sensitive, CPW Species of Special Concern) and Greenback Cutthroat trout (Threatened) (discussed in Wildlife - Special Status Species).
- Crystal River Hatchery unit south of Carbondale: Respondents expressed concern for potential changes in water quality that this hatchery unit, and noted it contains the largest salmonid brood unit in the CPW hatchery system, and operates primarily on spring water diverted from the Crystal River and Thompson Creek.
- Outlet Roaring Fork River (including Thompson Creek drainage): Comments noted this river has a High Watershed Sensitivity, and that this area, along with portions of North and South Thompson Creeks would experience some of the greatest surface disturbances from development.

One respondent suggested that the BLM pay close attention to trout populations near the gas pumping station along Four Mile Road, stating that he/she has been unable to catch fish in Park Creek since the gas well was installed.

Respondents also noted that the Thompson Divide area includes approximately 38 miles of aquatic conservation waters for native non-salmonid fish species (i.e., flannelmouth sucker, bluehead sucker, and roundtail chub). Commenters asked that the BLM reference the Rangewide Conservation Agreement and Strategy currently in place for these three species, and described specific occurrences of these species throughout the Thompson Divide area.

Respondents expressed concern that vegetation disturbance, increased erosion, poor sediment transport, habitat alterations, and flow modifications could potentially disadvantage native species in favor of invasive species, such as rusty crayfish and zebra mussels.

Existing Condition Characterization

Most information characterizing existing condition was anecdotal descriptions of the value of the Thompson Divide area, as is described in the comments above. Respondents suggested the following specific data be used for developing existing condition statements:

- A 2013 CPW study providing information and analysis of big game in the Thompson Divide area;
- The WRNF 2012 Draft EIS, which rates the Outlet Roaring Fork River (including Thompson Creek drainage) as having high watershed sensitivity;
- USFS's Watershed Condition Classification, which ranks the Thompson Creek Watershed as "Functioning at Risk" with poor road and trail conditions; and fair aquatic biota, riparian/wetland vegetation, water quantity, and aquatic habitat conditions;
- CPW species activity maps maintained by CPW, which identify species-specific seasonal habitats; and
- Data offered by the public and/or agencies during public comment periods for the WRNF 2012 Draft EIS.

Respondents also suggested that the BLM conduct new baseline studies on current conditions, including studies for aquatic species in the creeks within the Thompson Divide area, as they suspect previous studies will be insufficient for this EIS.

Suggested Analysis Methodologies or Data

Respondents requested that the BLM perform an in depth analysis of indirect impacts from support facilities, and referenced indirect impacts of natural gas development on terrestrial wildlife as described by the WGFD. Direct and indirect impacts described in this document included:

- Direct loss of habitat;
- Physiological stress to wildlife;
- Disturbance and displacement of wildlife;
- Habitat fragmentation and isolation;
- Alteration of environmental functions and processes (e.g., stream hydrology, water quantity/quality);
- Introduction of competitive and predatory organisms; and
- Secondary effects created by work force assimilation and growth of service.

Comments specific to mule deer and elk suggested the BLM must inform and update the analysis with the most recent studies of impacts of oil and gas development on big game, including the recommendations from CPW. Respondents specifically requested that the BLM analyze the following:

- Impacts of exploration, construction, production, and reclamation activities on mule deer and elk herds in the region;
- Impacts to mule deer and elk migration corridors that may lead to habitat fragmentation;

- Impacts to mule deer winter range and severe winter range that may lead to habitat loss, herd decline, and displacement;
- Impacts to elk winter concentration areas and production areas that may lead to habitat loss, herd decline, and displacement; and
- Impacts to big game hunting.

Some respondents suggested that the BLM reference the WRNF 2012 Draft EIS for descriptions of impacts as a result of road development. Other respondents expressed concern about the adequacy of the analyses contained in the WRNF 2012 Draft EIS and encouraged the USFS to utilize the latest research on habitat fragmentation and cited examples of direct and indirect impacts roads can have on wildlife. These included:

- Loss of core habitat areas and habitat connectivity for wildlife movement and dispersal.
- Adverse genetic effects such as reducing genetic diversity by isolating populations.
- Increased potential for extirpation of localized populations or extinction of narrowly distributed species from catastrophic events.
- Modifications in animal behavior through reductions in habitat use due to human activity and interference with wildlife functions such as courtship, nesting, and migration.
- Disruption of the physical environment in many ways including direct removal of habitat due to route construction, reduction of cover, and habitat security, increasing dust and erosion.
- Alteration of the chemical environment through vehicle emissions and herbicides.
- Changes in habitat composition by direct loss of vegetation from road construction and changes in microclimates in road-edge habitats potentially resulting in alterations in type and quality of foodbase and reduction in habitat cover as well as reduction in the total amount of interior habitat that interior obligate species may exclusively require.
- Spread of exotic species that may lead to competition with preferred forage species.
- Degradation of aquatic habitats through alteration of stream banks and increased sediment and chemical loads.
- Changes to flows of energy and nutrients such as changes in temperature in microclimates created at road edges.
- Increased alteration and use of habitats by humans through activities that include increased unethical hunting practices and increased dispersion of recreation impacts, particularly by off-road vehicles due to a proliferation of roads.
- Mortality from construction of roads.
- Mortality from collisions with vehicles.

Additional comments regarding the WRNF 2012 Draft EIS indicated that the analysis failed to adequately analyze impacts of oil and gas development on wintering wildlife. Respondents stated that the Draft EIS failed to acknowledge that much of the analysis area is only accessible by snowmobile, skis, or snowshoes in winter months, and that future development will likely open up vast tracts of backcountry to year-round travel, thus amplifying wintertime disturbance.

Comments also suggested the BLM employ the GIS model based on the System for the Prediction of Acoustic Detectability (SPreAD) to determine potential sound impacts in areas managed for wildlife, and what steps must be taken to mitigate such impacts.

Comments on avian species suggested that the BLM investigate the potential for nest site abandonment due to direct and indirect disturbance and habitat alteration.

Respondents also requested that the BLM perform an in-depth analysis of cumulative impacts from oil and gas development. Respondents expressed concern about the adequacy of the analyses contained in the WRNF 2012 Draft EIS that stated the WRNF 2012 Draft EIS failed to adequately analyze cumulative impacts. Respondents cited studies that projected the populations of surrounding counties to more than double by 2035 and stated the USFS failed to consider impacts from residential oil and gas development as residential areas expand and occupy lower elevation habitat.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Commenters recommended that the BLM consider the WGFD's 2010 Recommendations for Development of Oil and Gas Resources Within Important Wildlife Habitats, which contains comprehensive guidelines for wildlife protection in areas of energy development. Respondents also suggested that the BLM consider guidelines that BLM Utah has used for raptor protection, such as spatial and temporal buffers and citing multiple studies recommending disturbance-free buffers for nest sites.

Commenters requested that the BLM consider implementing protective measures that preserve populations of mule deer and elk herds in the area. Respondents offered the following mitigations or design features to minimize impacts to big game:

- NSO stipulations to preclude surface disturbance activities in all IRAs to protect and keep the highest value deer and elk habitat in the region intact.
- Apply stipulations and/or conditions of approval that require avoidance of deer and elk migration corridors.
- Apply recommendations from CPW to reduce impacts to big game herds and other wildlife.
- Limit development density to levels at or below those recommended by CPW.
- Broaden NSOs to include production areas for bighorn sheep.
- Consider the use of bear proof trash containers and regulations that reduce the availability of human food sources at sites.

Respondents requested the BLM consider the following proposals submitted during public comment periods for the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS for applicability to this project:

- Wildlife corridors should be several miles wide to allow for movement of even the largest mammals.
- Seasonal habitats should be linked by wildlife corridors whenever possible to ensure functional year-round habitat.
- Leases could be issued with NSO stipulations to effectively ensure that road densities do not increase beyond requirements of the WRNF 2002 LRMP Revision and to protect against further degradation of wildlife habitat.

Comments stated that the WRNF 2012 Draft EIS proposed stipulations did not explicitly protect moose, and requested protections for moose and moose habitat based on best available research.

Respondents also suggested that pesticide use in wildlife corridors should be monitored to prevent destructive impacts to pollinators that could affect plant diversity (also see Section 4.4.3.1, Vegetation).

4.4.3.4 Wildlife - Special Status Species

Resource Concerns

Respondents indicated that the analysis area has some of the richest wildlife resources on the WRNF, stating that the area provides habitat for TES, including lynx and numerous fish types.

Respondents stated that the EIS must address any previous deficiencies associated with the ESA and requested that the BLM consult with the USFWS, CPW, and the CNHP to ensure that sensitive wildlife are adequately protected.

Respondents noted that the CPW has compiled a summary of wildlife species in the Thompson Divide area and stated that these undeveloped public lands provide high quality habitat for many wildlife species, including CRCT and special status raptor species.

Respondents noted that the USFS is currently considering a plan to reintroduce the North American wolverine into Colorado and suggested that the BLM consider potential impacts to this species if the Thompson Divide area was chosen as a site for reintroduction.

Respondents noted that the Townsend's big-eared bat (USFS Sensitive, CPW Species of Special Concern) could potentially inhabit the Thompson Divide area, and cited studies showing bats radio-tracked to the Thompson Divide area from eastern Colorado, and associating bat mortalities with energy development.

Canada Lynx (Threatened)

Respondents stated that all of Thompson Divide is listed as potential habitat for Canada lynx. Commenters noted that since its reintroduction in 1999, populations have increased, thus increasing potential occurrence within the Thompson Divide area. Respondents suggested that the BLM consider the habitat protection measures for lynx as outlined in the Southern Rockies Lynx Management Direction ROD and RMP for the WRNF.

Aquatic Species and Amphibians

Comments indicated that genetically pure populations of cutthroat trout are present in the analysis area and expressed concern about the impacts energy development could have on CRCT (USFS Sensitive, CPW Species of Special Concern) and Greenback cutthroat trout (Threatened). Specifically, respondents expressed concern about sediment runoff from road and site construction, and subsequent impacts to trout and the invertebrates they feed on as well as the potential contamination of habitat with the accidental release of drilling chemicals.

Respondents indicated that the largest concentrations of cutthroat trout habitat in the areas being evaluated are contained within the IRAs and the Thompson Divide area. Respondents also stated that the maintenance of water quality in the Crystal River and its tributaries is essential to the health of cutthroat trout. Respondents noted that the Thompson Divide area contains approximately 90 miles of cutthroat trout habitat over numerous streams and creeks. Respondents pointed out that the BLM and USFS are signatory to the 2005 Tri-State CRCT Conservation Plan and Strategy, and asked that the BLM reference the updated conservation plan.

Respondents identified the greenback cutthroat trout and CRCT as occurring in two forks of Thompson Creek. Commenters stated that Barbers Creek and Thompson Creek contain important conservation

populations defined as having high genetic integrity. Comments submitted as part of the WRNF 2012 Draft EIS (and resubmitted as part of this project) identified Milk Creek and Divide Creek as the two stream systems on the WRNF with the richest native species assemblages.

Comments submitted as part of the WRNF 2012 Draft EIS expressed concern about potential impacts to boreal toads (USFS Sensitive Species) and the Northern leopard frog (USFS Sensitive, CPW Species of Special Concern). Commenters stated that the only two active Northern leopard frog breeding sites on the WRNF occur in the WRNF 2012 Draft EIS analysis area. Respondents also asked that the BLM consider how projects will comply with the recovery goals of the Upper Colorado River Endangered Fish Recovery Program.

Avian Species, including Raptors and Migratory Birds

Comments on the WRNF 2012 Draft EIS and the CRVFO 2014 RMP/Final EIS (incorporated by reference) noted that the Columbian sharp-tailed grouse (a BLM Sensitive Species) are now relegated to 10 percent of their historic range, and that known and potential habitat for Columbian sharp-tailed grouse should not be available for lease. Comments on the WRNF 2012 Draft EIS also expressed concern for Greater sage-grouse (Proposed Threatened and Candidate). Specifically, respondents cited studies correlating high well densities with decreased survival rates and nest initiation rates.

Existing Condition Characterization

Respondents referenced biomonitoring studies that suggested the presence of organic pollution in the Four Mile Creek and associated minor stress to aquatic life along a portion of the creek. Respondents also noted that many species rely on this habitat, including the Northern Leopard Frog (USFS sensitive, CPW Species of Special Concern) and the Canada Lynx (Threatened).

Respondents suggested that the USFS conduct surveys for suitable boreal toad habitat in the analysis area.

Respondents asked that the BLM reference the updated Tri-State Colorado River Cutthroat Trout Conservation Plan and Strategy (December 2012).

Suggested Analysis Methodologies or Data

None.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents suggested that the BLM consider the habitat protection measures for lynx as outlined in the Southern Rockies Lynx Management Direction ROD and RMP for the WRNF.

Commenters suggested applying NSO stipulations and restriction activities to portions of leases within the IRAs or other areas to protect cutthroat trout habitat.

The following mitigations or design features were suggested to minimize impacts to aquatic species:

- 100-meter buffers for sensitive native species (e.g., mountain sucker, bluehead sucker, flannelmouth sucker, and roundtail chub).
- Apply a 0.25-mile NSO buffer along streams occupied by CRCT.
- Apply a 350-foot buffer along streams designated as cutthroat trout recovery habitat.
- Apply Forest Plan Colorado River Cutthroat Trout Standard 2 in the WRNF 2012 Draft EIS, Appendix B, Page B-4, to leases within the Hydrologic Unit Code (HUC)-6 watersheds

containing conservation population of cutthroat trout to limit road density associated with oil and gas development [Standard 2 from the 2012 WRNF Oil and Gas Leasing Draft EIS reads as follows: "When implementing management activities in the 6th field HUC (sub-watershed) containing cutthroat trout identified as recovery populations in the CRCT Recovery Plan, maintain or reduce existing net density of roads (open or closed) to restore or prevent alteration of the hydrologic function of the sub-watershed. Temporary roads must be decommissioned upon project completion."]

Additionally, respondents for the WRNF 2012 Draft EIS suggested prohibiting in-channel work during fish spawning, egg incubation, and fry emerging seasons.

Respondents for the WRNF 2012 Draft EIS suggested the recommended for protection of aquatic species:

- Consider all management solutions described in the Rocky Mountain Region's Technical Conservation Assessment for Leopard Frog (2007) including a 200 meter buffer around known suitable ponds; and protection of breeding ponds with NSO stipulations
- Maintain adequate vegetation cover around occupied boreal toad habitat when implementing management activities to minimize avian predation on newly metamorphosed toads;
- Use only chemical herbicides shown to have no effect on boreal toads or use other vegetation management techniques, within 300 feet of occupied or known historic boreal toad sites;
- Do not use fish toxins with the potential to harm boreal toads in occupied habitats; and
- Ensure that anyone working in boreal toad habitat will disinfect waders, nets, and other items that come into contact with water, with a 10 percent bleach solution before moving between ponds or drainages to reduce the likelihood of chytrid fungus and other disease transmission.

Respondents to the WRNF 2012 Draft EIS also suggested that the USFS make the Thompson Creek watershed unavailable for future leasing to ensure the protection of sensitive species, including the lineage Greenback cutthroat referred to in the Draft EIS.

4.4.4 Human Resources

4.4.4.1 Cultural Resources

Resource Concerns

Comments identified the Thompson Divide area as a sacred Traditional Cultural Property (TCP) and expressed concerns over the cultural and health violations that will occur if the suspended oil and gas leases are not voided. Commenters reminded the BLM that EO 13007 charges management of federal lands to accommodate access to, and ceremonial use of, sacred sites and to avoid adversely affecting the physical integrity of such sacred sites.

Comments expressed concern for heritage tourism, particularly in regards to the Redstone, the Coke Ovens, Elk Park, and the Thompson House in Carbondale. Respondents stated that cultural resource sites are non-renewable resources, and they would lose integrity, heritage value, and potentially important information if they are developed.

Existing Condition Characterization

None.

Suggested Analysis Methodologies or Data

None.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents indicated the preferred management for eligible sites would be avoidance to protect against direct, indirect, and cumulative impacts, and suggested that the BLM impose NSO stipulations if eligible cultural sites are located on leases.

4.4.4.2 Hazardous Materials

Resource Concerns

Comments expressed concern over accidental spills and well failure resulting in contamination of surface and groundwater and eventual contamination of wells that provide water for the Oak Meadows Subdivision and residents along Four Mile Road. Comments further noted concerns for contamination of air and soil. Respondents indicated that contamination also could impact crops, livestock, wildlife, and vegetation and continue down the watershed.

Respondents stated that there were many pathways for chemicals used in natural gas operations to contaminate surface and ground waters including spills during transport, before and after extraction, the drilling and fracturing processes, disposals of waste water, failure of well casings, and structural issues surrounding abandoned wells. Comments requested the BLM to analyze impacts of oil and gas development in the exploration, construction, production, and reclamation phases to downstream water uses, particularly in regards to accidental spills and releases.

Wellpad and Pipeline Spills

Commenters expressed concern about spills. Respondents stated that the BLM must fully address the risk of potentially catastrophic spills and blowouts at well sites, noting that major spills are not uncommon in natural gas drilling. Commenters also indicated that after wells are completed, condensate tanks at well heads vent volatile organic compounds (VOCs), and the tanker trucks that empty those tanks inevitably tip over from time to time, leaving behind a toxic mess. Commenters mentioned a recent spill in Rulison, Colorado, and expressed concern with the low number of inspectors, potential unreported spills, and the industries spotty record of taking necessary safeguards.

Other respondents expressed concern about spills from pipelines, and noted that the Thompson Divide is a remote area where spills could remain undetected, especially in winter. Respondents noted that, in 1991, Source Gas moved their compressor station from the Wolf Creek Storage Field to a site 3 miles west of Carbondale on Thompson Creek Road because the winters made it too tough to get in to check on their compressor station, and suggested that facilities requiring inspections should not be located in that area.

Respondents suggested that BLM BMPs are often not implemented and difficult to enforce with so few inspectors and insufficient bond requirements. Comments further stated that BLM, Colorado Oil and Gas Conservation Commission (COGCC) or local governments are not able to provide regular monitoring and enforcement in this area, and stated that this concern carries special significance in remote areas where landowners and ordinary citizens are less likely to detect mishaps in a timely fashion, and where the existing natural resource values are high.

Hydraulic Fracturing

Comments regarding hydraulic fracturing included the lack of disclosure regarding chemicals used in the hydraulic fracturing fluids, transportation, and disposal of both fluids and produced water, and the

presence of carcinogenic ingredients. Respondents indicated that studies have concluded that hydraulic fracturing fluids and hydrocarbons themselves may, following Operator exploration and stimulation activities, migrate into subsurface drinking water sources both through natural faults and through pre-existing historical wells. Respondents noted that hydraulic fracturing is a relatively recent technological development with no long-term history of effects, and stated that the EIS should take into account possible long-term degradation of the environment and human health through the introduction of unknown chemicals into the environment. Other comments noted that the COGCC requires that Operators publically disclose the ingredients and concentrations of fracturing chemicals for each well and that the information is required to be posted on www.frackfocus.org, and that many of the chemicals currently used on well sites in in Garfield County are identified as endocrine disruptors.

Naturally Occurring Radioactive Materials (NORM)

Comments indicated that processes used to produce oil and gas often generate radioactive waste containing concentrations of NORM. Respondents indicated that radioactive wastes from oil and gas drilling may include produced water, drilling mud, sludge, and evaporation pits and may concentrate in pipes, storage tanks and facilities, and other extraction equipment, and may be left on-site or be emitted into the environment.

Wastewater Disposal Methods

Respondents stated that the BLM must fully analyze the wastewater disposal methods, without assuming that treatment can and will be adequate. Comments stated that storage ponds were a concern due to storm events and potential mud slides.

Bonding and Compliance

Comments stated that the bond amounts required by federal law—which allows an Operator to post a single \$150,000 bond to cover all of its operations nationwide—are inadequate to protect the public from the risks of unexpected contamination.

The remote nature of the Thompson Divide means that emergency response services to address accidents may be unable to arrive in time to prevent mishaps from seriously contaminating vulnerable surface waters. All of this emphasizes the need to close the Thompson Divide to oil and gas development, not pretend that it can be done safely through the use of stipulations or mitigation that cannot be meaningfully enforced in such a remote and rugged location.

Comments in support of oil and gas development indicated that companies spend a great deal of time and detail in maintaining operations compliance.

Comments also expressed concern about the potential for Operators to pull out without adequate reclamation when a market “bust” occurs.

Existing Condition Characterization

Respondents noted that there were 495 reported oil and natural gas spills in Colorado just in 2013, with 71 spills impacting groundwater and 41 impacting surface water. Respondents further noted that companies only have to report spills to the public if the spill is more than 209 gallons.

Respondents provided information regarding a major spill occurring in Windsor, Colorado, in February of 2013, where at least 84,000 gallons of water contaminated with oil and chemicals used in hydraulic fracturing spilled from a broken wellhead and into a field.

Respondents cited and/or provided data which they stated confirmed the risk to surface waters from hydraulic fracturing and hydraulic fracturing-related activities.

Comments made on the CRVFO 2014 RMP/Final EIS (incorporated by reference) included concerns regarding the importance of using recycled water and decreasing the use of evaporation ponds, as well as questions about the safety of injection wells. Submitted comments noted that the BLM response to these concerns in the CRVFO 2014 RMP/Final EIS Response to Comments appendix was that underground injection of the hydraulic fracturing wastewater is preferable to evaporation ponds and is safe because it is isolated from non-target strata and is treated. Comments stated that this response failed to satisfy the BLM's obligation to take a hard look at wastewater disposal, and in no way provide a comparative analysis of the different alternatives for disposal.

Suggested Analysis Methodologies or Data

None.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Comments recommended that the Operators develop, submit, and implement an emergency response and remedial action plan. Comments stated that the plan must describe:

- The actions the Operator will take in response to any emergency that may endanger human life or the environment (including [USDW]), such as blowouts, fires, explosions, or leaks and spills of toxic or hazardous chemicals.
- The ability of local resources to respond to such emergencies and, if found insufficient, how emergency response personnel and equipment will be supplemented.
- The actions the Operator will take to respond to cases of suspected or known water contamination, including notification of users of the water source.
- The actions the Operator will take to replace the water supplies of affected individuals in the case of the contamination of a USDW.

4.4.4.3 Human Health and Safety, Including Noise

Resource Concerns

Exposure to Chemicals and Toxic Substances

Commenters submitted concerns regarding exposure to chemicals and toxic substances through contaminated air, food from local farms and ranches, wildlife consumed through fishing and sustainable hunting, and surface and groundwater. Respondents requested that the EIS analyze of health effects by those living near oil and gas drilling.

Respondents expressed concern about public drinking water supply sources (e.g., surface water sources, including groundwater under the direct influence of surface water [or GWUDI] sources, and groundwater sources). Respondents living in the Oak Creek Subdivision noted the proximity of gas leases and expressed concern that drilling or hydraulic fracturing could cause leakage of toxic chemicals into the water system that could result in health issues.

Commenters stated that for the past several years, human illness, and birth defects in the analysis area have increased as the gas industry has grown in Garfield County. Respondents stated that the EIS needs to analyze the correlation between Rifle residence hospital visits and birth defects since 2000 and the health of Battlement and Grand Mesa residences and pets, as well as the quality of their tap water. Comments cited a case where thermogenic methane was detected in two domestic water wells, noting

the case is currently under investigation to determine the likelihood that a nearby oil and gas well was the source of this gas.

Comments from local health professionals indicated they have experienced the effects of drilling on patients/population, and are concerned about the impact Thompson Divide gas development will have on the communities of Glenwood Springs and Carbondale. Comments indicated that a branch of the National Institutes of Health (NIH) is investigating birth defects of locals believed to be associated with contaminated water from hydraulic fracturing. Comments stated it made no sense to risk health issues and the potential loss of money from the Roaring Fork Valley's environment-based economy for the benefit of oil and gas companies, and although proof of toxicity may take decades to prove, risking health is not a prudent decision, given the BLM's mandate of sustainability.

Respondents stated that despite the energy industry's explanation that a thick layer of bedrock safely separates the gas-containing rock layer being fractured from ground-water used for drinking and surface water sources, evidence is emerging which warns that contaminants from gas wells are making their way into groundwater. Respondents provided multiple examples of recent instances that suggest contaminants from drilling and fracking operations have contaminated drinking water.

Respondents provided multiple health studies and reference citations for BLM review and use in the EIS (including Adgate 2014; Bamberger and Oswald 2012; Colborn et al. 2012; Esswein et al. 2013; Fontenot et al. 2013; Gilman 2013; Gross 2013; Lyman and Shorthill 2012; Litovitz 2013; Moore 2014; McKenzie et al. 2012; Perry 2013; Tager et al. 2005; Shonkoff 2014; Steinzor et al. 2013; U.S. Department of Health and Human Services 2008; Vengosh et al. 2014; Wayne and Klimasinska 2012; a complete list of studies, articles, and reports that were cited or supplied by commenters may be obtained by contacting the CRVFO). These included studies analyzing health effects by those living near oil and gas drilling; reports regarding impacts to endocrinology from hydraulic fracturing chemicals and surface and ground water; chemicals in air samples; VOCs from oil and natural gas operations; potential public health hazards, exposures and health effects from unconventional natural gas development, including shale gas exploration and hydraulic fracturing; evaluations of water quality in private drinking water wells near natural gas extraction sites; analysis of benzene, ethyl benzene, toluene, xylene (BTEX) groundwater concentrations from surface spills associated with hydraulic fracturing operations; occupational exposures to respirable crystalline silica during hydraulic fracturing, and other relevant topics.

Comments identified toluene as a volatile organic compound (VOC) used in the fracturing fluids as a solvent that has the ability to be emitted as pollution through water, soil, and air. Respondents stated that the concentration of toluene is much higher at natural gas sites and that occupational exposure occurs primarily by respiratory uptake and skin contact. Comments stated that toluene can affect the central nervous system, eyes, skin, respiratory system, liver, kidneys, and that breathing high levels of toluene during pregnancy has been shown to result in children with birth defects and to retard mental abilities and growth.

Comments in opposition to these concerns stated that there is no indication that water in areas where hydraulic fracturing is used has ever harmed anyone's domestic water and cases where gas has appeared in water have been shown to have had trace amounts of gas prior to drilling. Respondents stated that government agencies are in unison that hydraulic fracturing is a viable, safe method that should be encouraged. Respondents stated that the oil and gas industry is one of the most heavily regulated industries in the country and with consideration of regulations, BMPs, and voluntary compliance measures, purported environmental and human health risks are not backed up by science.

Comments also indicated that the number one factor for health is not quality of medicine, environmental protection, or education, but is the economy, and stated that if the local economy declines as a result of lease cancellations, local health will really suffer.

Exposure to NORM

Respondents also stated that BLM must analyze potential health impacts associated with NORM that may be released into the environment due to oil and gas extraction activities, indicating that NORM may concentrate in pipes, storage tanks and facilities, and on other extraction equipment, and that some of these materials can penetrate the skin and raise the risk of cancer.

Ozone Impacts

Respondents stated that oil and gas development in the western U.S. can lead to ozone levels that violate air quality standards, noting that winter ozone levels in rural areas of Wyoming and Utah have registered at levels comparable to those in the Los Angeles Basin in California. Respondents stated that exposure to ozone can cause or exacerbate respiratory health problems, including shortness of breath, asthma, chest pain and coughing, decreased lung function, and even long-term lung damage. Comments stated that in a letter to former USEPA Administrator Lisa Jackson, a group of five national medical and public health groups wrote that the most vulnerable individuals, including children, teens, senior citizens, people who exercise or work outdoors. Comments continued that children are particularly vulnerable because their lungs are still developing until about age 18, and as their lungs grow in the presence of ozone, their alveoli production is reduced, and they can end up with smaller, more brittle lungs. Comments also indicated that women exposed during pregnancy deliver preterm, low birth weight babies with a high probability of developing asthma. Respondents cited USEPA and NRC references stating that short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths.

Commenters stated that these risks are especially problematic given that winter-time visitors come to the area to enjoy outdoor pursuits that often involve aerobic and anaerobic activities that heighten one's intake of air pollutants, as do the outdoor recreational pursuits for residents of Pitkin County, such as cross country skiing at Spring Gulch and hiking or running along the Marion Gulch access. Respondents stated that the air pollution associated both with industrial traffic and oil and gas operations on the adjoining WRNF could put residents and recreationists—including schoolchildren who train and race at Spring Gulch—at risk of adverse health effects as a result of breathing polluted air.

Comments submitted on the CRVFO 2014 RMP/Final EIS and resubmitted for consideration on this project indicated that the 2014 Final EIS does not take into account the people that live near these sites, and does not say if the hydrogen sulfide risk will be completely eliminated or will still present a threat to local residents. Comments further noted that samples taken near the or within the analysis area contained levels of hydrogen sulfide more than 185 times higher than the long-term level set by the USEPA, and that hydrogen sulfide gas has been found to be at near-fatal levels south of Parachute.

Emergency Response

Comments stated that the effectiveness of emergency response services is a concern. Increasing industrial development and traffic would likely increase the demand on law enforcement, emergency medical technicians (EMTs), and firefighters. Industrial traffic and activities would introduce significant public safety hazards. Emergency response services to address accidents may be unable to arrive in time to save lives or prevent mishaps from seriously contaminating vulnerable surface waters. The Thompson Divide area is rugged, remote, and buried in snow for the majority of the year. Additionally, the narrow mountain roads' limited access within the Thompson Divide area would make it difficult for residents there to escape from a fire or toxic spill.

Human-Wildlife Conflicts

Commenters were concerned with the connection between rural development activities and conflicts with bears, stating that oil and gas development in Thompson Divide will be another factor to push bears out

of natural habitats, where human encounters are infrequent, into habitats closer to more densely populated urban areas of the Roaring Fork Valley, thus increasing the potential for negative human-bear encounters.

Noise

Commenters expressed concern with noise impacts from industrial equipment and traffic. Respondents currently living near wells indicated the noise pollution continues day and night and is especially loud because many residents do not have air conditioning and therefore windows are open most seasons. Respondents also expressed concern about the sound's negative effect on populations living near transportation routes, and indicated that the roads in the area are not meant for the type of traffic drilling requires.

Transportation Safety

Respondents expressed concern about the effect that increased traffic volumes would have on the safety of local residents. Respondents noted that many of the proposed routes are narrow mountain roads that have dangerous road conditions in winter. Commenters also noted that several proposed routes are used regularly by bicyclists and equestrians. Respondents noted that Midland Avenue (the route to access oil and gas leases in the Thompson Divide) passes just to the west of many residential neighborhoods and an elementary school which serves over 700 children.

Occupational Safety

Comments expressed concern about exposure to toxic chemicals as described above, and also stated that some areas, like Coal Basin, are too difficult and dangerous to use for extraction purposes.

Fires

Respondents stated that combining industrial activities, petroleum products, and forests in remote areas such as the Thompson Divide, presents combustion risks and that fire, in turn, presents risks of contamination and habitat destruction to this largely roadless habitat and water sources. Respondents indicated that a recent review of fire history in Alberta from 1996 to 2005 revealed there were 987 overall industry-caused fires. Comments noted that local communities are often the first and primary responders placed in harm's way when things go wrong and that firefighting in the Thompson Divide area is often provided by volunteers. Respondents stated it was unnecessary and inappropriate to impose such risks on local communities.

Cumulative and Combined Impacts on Health

Respondents noted that the assessment of cumulative impacts in NEPA documents is required by CEQ regulations. Comments stated that because the BLM will be leasing minerals located directly beneath and adjacent to private property, and because thousands of people live in close proximity to the industrial activity that will be permitted by the agency, BLM has the responsibility to consider potential impacts on human health from all development, and look at them cumulatively; for example, an individual exposed to both air and water pollution will have different health impacts than an individual exposed only to air pollution.

Respondents also noted that oil and gas development includes hundreds of potential pollutants, both man-made and naturally occurring, and that when considered together, pollutants emitted with common timing and/or common geography may create additional health impacts that should be assessed. Comments also noted that oil and gas development may create health impacts from air pollution, water contamination, soil contamination, or a combination of all three. Due to the multiple variables and factors involved in oil and gas development, respondents stated that the BLM should ensure a health impact

assessment that fully considers all cumulative impacts to comply with federal regulations and to appropriately assess health impacts and inform the public.

Existing Condition Characterization

Respondents recommended that the EIS include a map delineating source water protection areas for public water supply wells and identifying reservoirs that are drinking water sources.

Respondents suggested that the EIS describe how many people live within a certain distance of proposed oil and gas facilities, as well as any sensitive populations (such as children or the elderly) who have specific vulnerabilities to environmental health risks that are in the immediate vicinity of the lands to be leased.

Suggested Analysis Methodologies or Data

Comments stated that the BLM must conduct a comprehensive health impact assessment (HIA) or equivalent analysis to satisfy NEPA and its implementing regulations. Respondents stated that the benefits of an HIA include, among other things: clarifying the potential elements of policy trade-offs; describing the potential interactions and relationships among the different environmental health areas and sectors; allowing a clearer analysis of potential mitigation strategies for negative effects or enhancement of positive benefits; and making the overall project approval process more transparent and providing a structured environment for stakeholder input. Respondents stated that such an analysis is required under NEPA to fully assess the potential impacts to human health from actions authorized by the decision to make available and apply lease stipulations to NFS lands within the WRNF, to develop plans to prevent and mitigate them, and to consider the costs and benefits of different alternatives considered in the EIS.

Respondents noted that EO 12898, issued in 1994, requires that federal agencies “identify and address the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

Other requests included an analysis of:

- Impacts to source water protection areas for public water supply wells and identifying reservoirs that are drinking water sources.
- The exposure risk associated with types, amount, and distance of the chemicals.
- Potential for illness caused by the stress and mental anguish associated with living near intensive oil and gas development.
- Impacts from vehicle accidents or other safety issues.
- The increase in healthcare coverage premiums, and decrease in overall health of communities that are adjacent to current oil and gas development.
- Risk of exposure to NORM.
- Near-field air quality impacts from oil and gas development on human health and properties in in which counties and local governments have invested tens of millions of dollars (also see Section 4.4.2.1, Air Quality).
- Impacts to noise levels. Comments suggested the BLM employ the SPreAD-GIS model to determine potential sound impacts in areas managed for quiet recreation and wildlife, and what steps must be taken to mitigate such impacts.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents recommended the following NSO language, consistent with the CDPHE Source Water Protection Program (SWPP) recommendations in order to ensure public drinking water supply sources (e.g., surface water sources, GWUDI, and groundwater sources) are fully protected from potential impacts associated with oil and gas leasing:

- Municipal Supply Watersheds: NSO within any of the following areas as deemed appropriate by the USFS:
 - The entire watershed;
 - Local Source Water Protection Planning Areas where delineated in a SWPP; or
 - Drinking water protection areas as defined by Source Water Assessment Areas evaluated by the State.
- For surface water sources, if the Municipal Supply Watersheds NSO is not deemed feasible by the USFS, then at a minimum, the EIS should cite the COGCC Regulation 317B and incorporate its requirements for protecting surface water drinking water supplies.
- For groundwater and GWUDI sources, if the Municipal Supply Watersheds NSO is not deemed feasible by the USFS, a minimum 0.5 mile (2,640 feet) NSO or CSU concentric buffer for these sources.
- A commitment in the Final EIS and ROD to provide notice to lessees regarding these important areas in the planning area. Lease notices for drilling within Source Water Protection (SWP) zones of public water supplies are now being used for all wells drilled under BLM authority within SWP zones in Utah.

Comments submitted as part of the WRNF 2012 Draft EIS and resubmitted for consideration under this project suggested that the USFS, BLM, and existing leaseholders should work together to reduce or eliminate the need for new road construction associated with development of existing leases to ensure that oil and gas leasing and development on the WRNF does not dramatically increase fire danger. Respondents also suggested the incorporation of BMPs to reduce the threat of industry-caused fire.

Comments addressing wildlife-human conflicts suggested the use of bear proof trash containers and regulations that reduce the availability of human food sources at sites.

4.4.4.4 Land Use

Resource Concerns

Comments expressed concern that oil and gas activities could limit or otherwise affect existing or proposed land uses. Uses of concern included private or residential property (see Section 4.4.4.7, Socioeconomic Resources), livestock grazing allotments (see Section 4.4.4.5, Livestock Grazing), other zoned county uses, and multiple conservation easements acquired to advance the outstanding scenic, historic and agricultural values of the area and generate revenue by offering quality recreational opportunities.

Commenters emphasized the need to protect sensitive habitat. Respondents stated that the BLM must consider that specific areas in the analysis area may be inappropriate for surface use and that some environmental values or uses may require additional protections.

Respondents indicated that Garfield County includes a multitude of sensitive ecosystems, including riparian and wetlands resources, wildlife habitat, and important visual corridors and that development

must balance the need for economic development with policies to ensure minimum impact on these sensitive environments.

Respondents noted that Pitkin County has invested tens of millions of dollars in property acquisitions and restoration activities to protect that valley from inconsistent development and degradation. Comments stated that the Crystal River Valley Master Plan discourages oil and gas development in the Crystal River area. Likewise, Pitkin County's land use code places limits on oil and gas development in the Thompson Divide area, and the zoning—were it not preempted—excludes oil and gas development from this area.

Comments expressed concern that oil and gas activities would affect private property values and/or the desirability of properties that are for sale in the area due to increased traffic, noise, and the industrial presence. Respondents stated that these activities damage property values by contaminating the air, contaminating the water under the property, by busying roads with trucks, by diminishing tourism, and by negatively affecting local economies (also see Section 4.4.4.7, Socioeconomics).

Respondents expressed concern about the potential for groundwater impacts that may affect private wells (also see Section 4.4.2.4, Water Resources). Comments noted that the mountainous terrain results in numerous breaks in geological layers which may result in leaks that can affect groundwater and/or private wells. Comments stated that just the potential for such an event devalues their land and homes and noted that the CEO of Exxon recently sued to keep hydraulic fracturing away from his land because it "will damage property values." Comments expressed specific concerns about contamination of surface and groundwater and eventual contamination of wells that provide water for the Oak Meadows Subdivision and residents along Four Mile Road.

Also see Section 4.4.4.3, Human Health and Safety, for comments for comments regarding human health and safety and the need for a comprehensive health risk assessment to ensure that impacts to residential areas and drinking water would be analyzed and those resources protected.

Existing Condition Characterization

Respondents stated that the EIS analysis must consider the Comprehensive Plans for each county, which are state mandated guides for future development.

Mesa County also requested that the EIS consider the Mesa County Mineral and Energy Resources Plan.

Respondents identified several conservation easements and other uses that may be inconsistent with oil and gas development within Pitkin County, and provided information about the investments that have been made to date:

- Pitkin County and Great Outdoors Colorado jointly acquired a \$7.5 million conservation easement on the Cold Mountain Ranch, which straddles Highway 133 south of Carbondale.
- Pitkin County invested \$5 million to conserve the former Mautz Ranch, which now includes sustainable settings and incorporates property on both sides of Highway 133.
- Pitkin County owns interests in Elk Park and the historic Redstone Coke Ovens, which sit astride Highway 133 at its intersection with the County's Coal Creek Road.
- Pitkin County's Open Space and Trails Department invested \$9,952,365 to purchase the Jerome Park conservation easement on 4,773 acres of private land immediately adjacent to the WRNF and BLM lands comprising the eastern portion of the Thompson Divide. The Jerome Park acquisition matched Pitkin County resources with funds from the State of Colorado's Great

Outdoors Colorado Trust Fund, as well as numerous nonprofits and individual donors. To facilitate the transaction, the county also authorized through its zoning powers the creation of 13 transferable development rights, which have the effect of transferring development impacts from one area of the county to another. The total value of the conservation easement—including the nearly \$ 10 million cash investment, the transfer of development rights, and donation values—exceeded \$19 million.

- Pitkin County and its partners have protected more than 7,747 acres in the Crystal River Drainage. To conserve these lands, Pitkin County invested over \$27 million, with the County's partners contributing over \$5 million more, for a total investment of \$32,334,664. These property interests protect superlative scenery along the Highway 133 Scenic Byway and in the Thompson Divide; connect and expand a vast landscape of wildlife habitat serving species from moose to fireflies; provide habitat for several rare plants and plant communities; conserve a total of approximately 7.8 miles of river corridor; promote the continuing viability of ranchlands critical to continuing agriculture in the Crystal Valley; and provide an array of public recreational access points to public lands on the WRNF.

Suggested Analysis Methodologies or Data

Comments suggested the need for a comprehensive health risk assessment as part of the EIS to evaluate impacts to residential areas (see Section 4.4.4.3, Human Health and Safety).

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents stated that the EIS must include stipulations to protect the environment from future pipeline construction and maintenance, and indicated that the MLA gives agencies authority to impose stipulations on pipelines. Comments suggested that pipeline authorizations should be subject to the same stipulations as leases (e.g., areas that are NSO for leasing also should be unavailable for pipeline construction).

4.4.4.5 Livestock Grazing/Agriculture

Resource Concerns

Respondents stated that the Thompson Divide area has been ranched for more than a century, and it remains one of the strongest enclaves of traditional ranching culture on Colorado's Western Slope. Comments indicated there are dozens of working ranches in the Crystal, Roaring Fork, and Colorado River Valleys that rely on USFS grazing allotments within this area for operational viability. Commenters expressed concerns regarding the health of livestock due to threats such as:

- Loss of forage due to an increase in roads, pipelines, wells, and well pads;
- Exposure to hydraulic fracturing fluids via contaminated water;
- Increased calf-mother separation, and/or stress to calves from noise and traffic resulting in lower weight gains and corresponding loss of income;
- Increased difficulty in managing cattle from roads, open gates, and cuts in forests;
- Exposure to fugitive dust;
- Increased spread of noxious weeds; and
- Increased potential for poaching.

Commenters also expressed concern about the quality of forage vegetation that would remain available to livestock. Respondents requested the BLM analyze the potential for drilling and fracking to effect surface and groundwater quality used for livestock grazing.

Respondents stated that successful grazing and agricultural operations in the Thompson Divide area rely on livestock and organic crops being free from exposure to chemicals. Commenters stated there is a successful grass-finished beef market. Respondents noted that buyers expect beef to be free of chemicals and that even the perception of toxicity associated with oil and gas development could negatively impact this niche market.

Commenters expressed a concern regarding loss of public land that can no longer support the same level of livestock grazing, compromising the viability of ranching operations. Respondents stated that the Thompson Divide is home to 53 different agriculture and ranching operations. Comments indicated that highways and truck traffic would cut across these areas, making it nearly impossible to ranch. Comments indicated that federal grazing permittees are increasingly marginalized as oil and gas proliferates on public lands, resulting in historical grazing operations becoming less economic and ranchers selling out. Respondents stated that this trend results not only in a conversion of rural agricultural land to sprawling residential development and a resulting increase in the need for energy, it also changes the fabric of local communities. Respondents stated that the local economy would decline if ranching operations are compromised and several conservation easements may be at risk and noted that ranching, in combination with other existing uses, support nearly 300 jobs and \$30 million in annual economic impacts for the rural communities that surround this area. Commenters expressed concern about jeopardizing these industries in favor of oil and gas operations.

Comments from an active ranching operation stated that they have allowed oil and gas production and hydraulic fracturing on their land and have had no negative impacts. Other respondents indicated that the natural quality of much of the land in the Thompson Divide area has been degraded by cattle grazing, which has severely damaged much of the understory and riparian vegetation. Comments further noted that the cattle are not the least bit disturbed by scattered gas or oil wells and there is no need to offer any additional protections to preserve this area for livestock grazing.

Existing Condition Characterization

Respondents indicated that the Cornell Veterinary School has documented a case where 17 cattle died within one hour from exposure to hydraulic fracturing fluid.

Comments also cited two cases involving beef cattle farms that inadvertently provided control and experimental groups approaching the design of a controlled experiment, and strongly implicate wastewater exposure in the death, failure to breed, and reduced growth rate of cattle. In the first case, a creek into which wastewater was allegedly dumped was the source of water for 60 head, with the remaining 36 head in the herd kept in other pastures without access to the creek. Of the 60 head that were exposed to the creek water, 21 died and 16 failed to produce calves the following spring. Of the 36 that were not exposed, no health problems were observed, and only one cow failed to breed. In the second case, 140 head were exposed when the liner of a wastewater impoundment was allegedly slit, as reported by the farmer, and the fluid drained into the pasture and the pond used as a source of water for the cows. Of those 140 head exposed to the wastewater, approximately 70 died and there was a high incidence of stillborn and stunted calves. The remainder of the herd (60 head) was held in another pasture and did not have access to the wastewater; they showed no health or growth problems.

Suggested Analysis Methodologies or Data

None.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

None.

4.4.4.6 Recreation

Resource Concerns

Commenters submitted concerns about impacts to the local tourism and recreational-based economy, as well as recreational resources, opportunities, and quality, including angling, road and mountain biking, camping, canoeing/rafting, four-wheeling, hiking, horseback riding, hunting, photography, rock climbing, downhill and cross-country skiing, snowmobiling, snowshoeing, and wildlife viewing. Respondents provided comments about their personal recreation experiences in the WRNF and indicated that they valued the unspoiled wilderness and tranquility of the area.

Respondents stated that wilderness experiences are the essential Colorado value, and that the value of the Thompson Divide lies in its five watersheds and (relatively) clean air; in the variety of wildlife; in the pristine nature of the streams and landscape; all of which provide recreation, jobs, and sustenance for the local population.

Comments expressed concern that visual and other air quality impacts, including winter ozone levels, as well as traffic impacts on the Highway 82 access from Interstate-70 to the resort areas of Aspen and Snowmass Village, may compromise the overall experience that makes the area one of the most sought-after recreation destinations in the world. Comments stated that if visitors begin to go elsewhere due to oil and gas development, the impact on Pitkin County's finances would be direct and serious (also see Section 4.4.4.7, Socioeconomics and Section 4.4.4.10, Visual Resources).

Comments regarding the Jerome Park area and Sunlight Mountain Resort stated that oil and gas impacts to Sunlight Ski Area Resort, including impacts from traffic and air pollution, would negatively impact Pitkin County's investment in Jerome Park. Respondents stated that the Jerome Park Conservation Easement assures continuation of a lease of 240 acres to Sunlight Ski Area (which receives over 100,000 skier visits a year) as well as public access along Marion Gulch to adjoining WRNF lands on the western boundary of the ranch. Respondents cited studies conducted by Colorado College and the Environment Colorado Research and Policy Center regarding the demand for conservation easements and the need to preserve agricultural lands and open space, indicating that when ranching disappears, visitor numbers in rural agricultural communities may decrease by 50 percent. Respondents stated that in 2014, Sunlight Ski area experienced 6,000 more visits than the previous year and expressed concern that Glenwood Springs' existing and growing tourist economy will be seriously affected by the increase in truck traffic for oil development in an area that is not likely to be economically viable for Operators.

Respondents provided comments on the WRNF 2012 Draft EIS for consideration by the BLM which indicated that a final plan authorizing no additional leasing and making explicit commitments to reduce potential impacts of development on existing leases is necessary to protect recreational resources and experiences on the WRNF.

Comments suggested that keeping surface disturbing activities outside of areas that retain semi-primitive and non-motorized recreation Recreational Opportunity Spectrum (ROS) class areas on the WRNF would be the only way to ensure protection of unique values retained in such areas. Respondents also noted that while NSOs provide some significant measure of protection for recreation resources, it is not true that NSOs alone provide adequate protection of recreation resources. Comments noted that many forest users seek quiet and while NSOs will certainly help reduce noise associated with future oil and gas development, they will not necessarily protect the resource.

Commenters noted that many of the leases being analyzed are located in the headwaters of tributaries to the Crystal River, Frying Pan River, Roaring Fork River, and the Colorado River. Respondents indicated that the Crystal River is known for its high quality angling and pristine water, the Colorado River

is a high quality brown trout fishery through reaches below Rifle, and the Roaring Fork River contains a Gold Medal fishery. Comments expressed concern that decreases in the quality of trout habitat in these streams due to sedimentation or pollution could cause declines in the fisheries, potentially causing the Roaring Fork to lose its Gold Medal status and causing economic harm to local guide shops and recreation businesses.

Commenters noted concerns regarding impacts to Game Management Units #42, #43, and #521 which generate more than 20,000 big game hunting licenses every year and makes the area invaluable to hunters and anglers throughout the nation (also see Section 4.4.3.3, Wildlife Resources). Respondents indicated that the hunting areas within the Thompson Divide are some of the most hunted units in Colorado, with more than 5,000 deer and elk tags available by draw in the three main Game Management Units well as over-the-counter hunting opportunities in 2011. Comments indicated that these habitats must be safeguarded to ensure such opportunities are available for future generations.

Respondents submitted comments questioning why oil and gas development would hurt the recreational resources, opportunities, and economy when the area has supported drilling and logging for several years. Comments stated that several industries, including, but not limited to, coal, pipelines, gas storage and oil and gas have had operations within the Thompson Divide area, resulting in no negative environmental concerns, minimal actual impacts and no reduction of use by those who use the area for recreational enjoyment or a multitude of other uses. Respondents requested that the BLM acknowledge these other activities and not make a false or unsupported assumption that these lands are too pristine or too wild for the oil and gas industry. Respondents indicated that the EIS should clearly recognize the ability for recreational, agricultural, and energy industries to co-exist.

Additionally, it was noted that improvement of county roads has the potential to increase the public's enjoyment of the Thompson Divide for recreation or other multi-use purposes.

Existing Condition Characterization

Respondents submitted an economic study (BBC Economic Study March 2013) of the Thompson Divide area indicating that the Thompson Divide area generates some 300 jobs and \$30 million in economic activity on a sustainable annual basis. Commenters submitted additional information based on the BBC's economic impact model stating that hunting on the Thompson Divide generates approximately \$6.8 million in annual economic outputs and supports 72 total jobs in local communities.

Commenters also submitted a CPW report issued in April of 2009 regarding the Thompson Divide area indicating that the cold water streams of the Thompson Divide provide great fisheries habitat and recreation opportunities. It also cited the headwaters of North and Middle Thompson Creeks as containing viable populations of Colorado River native cutthroat trout and the Middle Thompson Creek as containing a large, isolated population identified as a genetically pure strain of Colorado River Native Cutthroat Trout.

Comments requested information about the numbers of issued hunting permits in the Thompson Divide area (perhaps using Rifle as an example).

Suggested Analysis Methodologies or Data

Respondents indicated that the EIS must examine the following:

- Impacts of oil and gas development to hunting, angling, and other recreational uses in the areas being analyzed, and consider applying protection measures that preserve the sustainability of hunting and fishing opportunities and the associated local economy.

- Impacts to the local community from loss of habitat, declines in game and fish populations, and/or decreases in the quality of the hunting, fishing and recreational experience.
- Income generated from all recreational activities that are popular within the Thompson Divide area, including hotel/lodges, restaurants, guide services, and stores.
- Impacts to downstream water uses, including the fishery on the Crystal River and the Gold Medal fishery on the Roaring Fork River.
- The historic numbers of individuals using these areas for all other allowed or permitted uses, and project actual impact to those numbers with development of these leases for oil and gas.
- The multiple restrictions in the existing, valid oil and gas leases.
- Sound impacts associated with potential oil and gas. Comments suggested the BLM employ the SPreAD-GIS model to determine potential sound impacts in areas managed for quiet recreation and wildlife, and what steps must be taken to mitigate such impacts.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Comments suggested that the BLM should apply mitigation measures that protect the sustainability of the existing uses. Respondents indicated that the BLM should apply NSO stipulations on IRAs to preserve backcountry areas for hunters, anglers, and recreational users. Respondents also suggested NSO stipulations on all Semi-Primitive Non-motorized, Semi-Primitive Roded, and Roded Natural ROS class areas.

4.4.4.7 Socioeconomic Resources

Resource Concerns

Respondents stated that NEPA requires that impacts from an agency action to the “human environment” be considered, and indicated that NEPA regulations direct that the “human environment” shall be interpreted comprehensively and includes the consideration of economic and social effects when they are interrelated with effects to the natural or physical environment.

Concerns about Socioeconomic Impacts of Lease Cancellation

Commenters expressed concerns related to impacts to the local economy through loss of jobs, revenue, affordable health care and emergency facilities, and grant funding generated by oil and gas companies if the leases were to be voided.

Respondents stated that the oil and gas development provides the communities with well-paying jobs that afford employees a good quality of life that cannot be found in other industries in the area. Comments received from members of the public that are employed by the oil and gas industry indicated that lease cancellation would result in severe economic hardship to their families and other members of the public who rely on employment within extractive industries. Respondents further noted that the economic risk of lease cancellation would affect not only oil and gas development but also related businesses that service oil and gas fields.

Respondents indicated that many of the employees that work in the industry are locals, and as such, are hunters, fishermen, hikers, farmers, and ranchers that are concerned with the well-being of their environment. Comments also stated that the oil and gas industry is a good neighbor that contributes to the economic well-being of local communities not only through oil and gas revenues but also through fundraisers, scholarships, and other charitable ventures.

Comments suggested that leasing is not incompatible with other industries and that the analysis must not consider the socioeconomic benefits of oil and gas development exclusive of other land uses,

including grazing, silviculture, and recreation, when these multiple uses can be managed in concert with oil and gas development.

Comments noted that the US has received millions in royalty payments to date. Respondents stated that the BLM must recognize the actual socioeconomic benefits that have already been experienced as a result of development and production of some of the leases to date, and identify the socioeconomic benefits associated with future development.

Respondents also stated that Operators have invested a substantial amount of money in exploration, development, production costs as well as for the cost of NEPA compliance, permitting, and litigation. Respondents stated that damage payment calculations included in the socioeconomic impacts analysis for alternatives that void, cancel, or otherwise significantly modify or restrict leases must consider not only the value of the lease, but also factors such as the cost of compliance with NEPA and permitting (at various stages), rental and royalty payments, expended capital and operational costs, and other investment backed losses incurred by Operators. Comments further noted that in light of BLM's current resource constraints, BLM would undoubtedly be forced to seek repayment of funds from the State of Colorado, which receives fifty (50) percent of all money BLM receives from sales; bonuses; royalties, including the value of the lease; interest charges collected; and continuing lease payments.

The Town of Parachute indicated that oil and gas industries provide a considerable amount of tax revenue from oil and gas development and that the town would not be able to continue to function without these tax revenues.

The Grand River Hospital District also indicated that the majority of the funds by which they operate are directly attributable to oil and gas development and stated that curtailing oil and gas production in Garfield County would have devastating effects to the District and their ability to provide affordable health care. The District indicated that oil and gas revenues allowed them to build the Rifle campus/hospital (2003); the Medical Office building and conference center (2009); the \$16 million Battlement Mesa Clinic West Facility and Occupational Health and Safety Center (2014), as well as a new Medical Office Building currently being constructed in Battlement Mesa. The District hopes to pass a bond to build an obstetrics unit, an intensive care unit, and a new care center, but that the bond will only provide enough revenue for these projects if there is continued oil and gas production activity in the region.

Garfield County also indicated that the majority of the funds by which they operate are directly attributable to oil and gas development and through their grant program. The Parachute/Battlement Mesa Parks and Recreation District and other Special Districts located within the county have received grant funding for needed improvements and/or construction. The Town of Silt Board of Trustees confirmed that grants from Garfield County allowed them to complete projects such as water/wastewater improvements, water tank expansion, downtown infrastructure improvements and roundabout development and asserted that the Town would have been unable to have balanced budgets without oil and gas revenues.

The Grand Valley Fire Protection District stated that 93 percent of the district's budget is comprised of property taxes derived from oil and gas activities and that increases in drilling activities have allowed them to move to a combination of paid and volunteer staff; provide 24/7 shift coverage of the district; build a fire station in Battlement Mesa, and remodel a fire station in Parachute; replace aging equipment; create a capital projects fund and a replacement plan to continue to replace the District's equipment into the future; create a future operational fund in order to save for future down turns in the economy, and staff a seasonal wildlife firefighting Type VI engine this summer.

Operators stated that the BLM also must consider the socioeconomic impacts to its lessees and other mineral owners. Operators noted that some wells have been developed by placing well pads on private

lands and stated that the BLM needs to consider the social and economic impacts on both the Operator and the private land owner if the BLM were to cancel or add new stipulations to leases. Comments indicated that the analysis should also consider the impact to private mineral owners adjacent to these federal oil and gas leases, indicating that the value of these private minerals is greatly diminished, or completely taken, by invalidating the surrounding federal leases because no oil and gas exploration company will develop small private mineral holdings independently of inclusion in a large field project.

Concerns about Socioeconomic Impacts of Lease Reaffirmation

Other commenters expressed concerns related to impacts to jobs and revenue generated by tourism, recreational activities, ranching, and agriculture.

Specific recreation activities included angling, biking, camping, climbing, hunting, horseback riding, rafting, skiing, and other winter activities. Concerns were specific to degradation of natural resources (air quality, wildlife habitat and water quality), and aesthetic qualities (sense of wilderness, visual, etc.). Comments received from individuals working in the recreation industry and businesses that provide goods or services for recreationists indicated that their job or business depends on the unaltered natural resources in the area and that these qualities would be jeopardized by oil and gas development.

Respondents stated that much of the Colorado economy, which depends on tourism, depends on preserving the state's natural areas. Respondents expressed concern that impacts from development, including winter ozone levels and traffic impacts near popular resorts will compromise the overall experience, and stated that in a competitive international market, Colorado cannot be too careful about protecting the natural assets that attract our guests.

Commenters noted that residents of many local communities choose to live where they do because of outdoor opportunities afforded by the WRNF, which receives over 9.7 million visits annually—making it the most visited National Forest in the Nation. Respondents characterized the WRNF as the economic engine for resort towns like Aspen, Vail, and Glenwood Springs, which are dependent on the tourism- and recreation-related activities on the WRNF. Comments noted communities such as Carbondale, Rifle, Silt, and New Castle have long marketed the abundance of outdoor recreation opportunities on the WRNF to lure visitors and new residents and that the area also includes two Scenic Byways. Impacts of concern included increased traffic volumes that could deter visitors from coming to the area; traffic noise and pollution which would change the character of tourism destinations or accommodations, decreased property values and declines in the real estate market, and loss of the rural character of the area.

Comments specific to the Thompson Divide area expressed concern that local jobs and a vibrant regional economy based on non-extractive industries would be jeopardized by an oil and gas play that independent mineral analysis found would “likely fail.” Respondents cited information in the WRNF 2012 Draft EIS indicates that the long-term return from production of 84 existing wells on other areas of the Forest is two jobs and \$164,000 in annual economic activity. Respondents stated that given the lands in the WRNF at issue in this analysis have very little potential for oil and gas development, it is time to consider the values the land holds, such as water resources, vegetation that will support carbon sequestration, agriculture production, tourism, and other sustainable economies.

Comments referenced presentations stating that drilling for natural gas is getting more and more expensive as the focus turns from conventional resources to nonconventional resources and is diminishing in drilling productivity and that this, in concert with the increasing harm to the environment and climate change impacts will result in significant impacts to other valuable forest resources and the local economies that rely upon those other forest resources. Respondents also pointed to reports showing that wildlands that are left undeveloped have a higher economic value than those that are exploited for commodities and that in areas with only small cities and towns, the more of the land base that was protected as wilderness, parks, and wildlands, the higher were the measures of local economic vitality.

Comments stated that the EIS needs to recognize the fact that many residents of the analysis area reside there exclusively or primarily because of the recreational opportunities provided by nearby national forest lands. Without those opportunities, many locals would leave and others who would have been attracted to move to the area due to the recreational opportunities afforded by the WRNF would not relocate to the area.

Commenters expressed their opinion that oil and gas is not a sustainable industry and were concerned with the downside of the boom and bust cycle of oil and gas development. Further, comments stated that jobs created by oil and gas development would not replace those lost in the agricultural, ranching, recreation, and tourism industries and that agriculture, recreation, and tourism are sustainable and have built the local economy.

Respondents also stated that the influx of a transient work force would add more burdens on local police, fire, and medical staff than what is gained by their contribution to local communities. Respondents indicated that a transient work force also makes prices go up for hiring employees, finding decent housing for employees, and lowers the caliber of employees needed to sustain viable resort/tourist economy. Respondents commented on the change to the social fabric resulting from oil and gas development stating that impacts to personal lives would include experiencing increased traffic, industrialization, air pollution, water pollution, locked gates, and reduced opportunities for quiet recreation and remote backcountry experiences.

Comments submitted as part of the WRNF 2012 Draft EIS (and resubmitted for consideration by the BLM for applicability to this EIS) indicated that the WRNF 2012 Draft EIS did not discuss the social upheaval caused by the cyclical boom and bust of oil and gas development, including increases in crime, drug abuse, and domestic abuse; increased demand on social services; and the financial burdens on local governments associated with providing basic services for increasing populations. Comments concluded that conclusions in the WRNF 2012 Draft EIS that “costs to local governments would remain unchanged” or “demand for services and infrastructure would not change” are not supported and appear to be arbitrary.

Respondents commenting on the estimates of oil and gas reported in the WRNF 2012 Draft EIS stated that the impact of closing the area to future leasing would be small. They noted that canceling leases in the Thompson Divide will not cost drilling jobs because the area remains undeveloped—and probing expert reports indicate that it cannot be profitably developed in light of the enormous infrastructure costs involved combined with the low expectations of finding economically recoverable reserves. Respondents indicated that further evidence of the lack economic viability of the Thompson “Divide leases can be seen by examining gas prices in the area during the primary term of the leases: If gas prices were not high enough for Operators to develop the leases early in the life of the leases they are not high enough now.

Comments expressed concern about the impacts of hydraulic fracturing on socioeconomic resources, indicating that such practices would damage local resources, tourism, and local economies. Respondents also expressed concern about community health impacts from drilling, spills or fires. Respondents noted these spills or water contamination also would affect local agricultural and ranching industries and fire would likely put members of the volunteer fire department at risk.

Commenters noted that the WRNF 2012 Draft EIS indicated that oil and gas development on the WRNF would constitute a small proportion of the local oil and gas industry, at less than 1 percent of oil and gas activity in Garfield, Mesa and Rio Blanco Counties and indicated that independent feasibility studies have indicated that it is highly likely that any attempts to develop the leases would lead to a substantial loss of money for the Operator.

Existing Condition Characterization

Royalties from leasing were reported to be distributed as follows:

- Under the MLA, approximately 49 percent of those rentals and royalties from mineral production on federal lands are returned back to the state of origin for planning, construction, and maintenance of public facilities in areas socially and economically impacted by the mineral leasing development that occurs on federal lands.
- Fifty percent of the State's receipts from the severance tax on minerals and mineral fuels are credited to the Local Government Severance Tax Fund. The state allocates 70 percent of these funds to local governments through discretionary grants and loans. The remaining 30 percent is placed in a county pool and distributed directly to municipalities and counties economically and socially impacted by mineral production based on similar factors under the FLPMA.

Respondents provided comments disclosing the following information about the revenues or funding received from oil and gas development:

- **Town of Parachute:** Oil and gas money in the Town of Parachute area provides 93 percent of the budget for the fire house they have. In 2012, the Town received \$350,000 from the Mineral Lease Funds. In 2012, the Town of Parachute received \$111,829 in tax revenues directly attributable to oil and gas production in Garfield County. Land in the Town of Parachute had a total assessed value of \$29,567,220, of which \$8,231,070 was directly attributable to oil and gas, resulting in 27.84 percent of total Town revenue. The Town of Parachute would not be able to continue to function without these tax revenues. In 2013, the Town of Parachute received \$177,600 from Federal Mineral Lease and \$144,696 in Severance Tax Direct Distribution, for a total of \$322,296.
- **Garfield County:** The top ten tax payers in Garfield County are from oil and gas and 70 percent of the Garfield County tax base is from oil and gas and related industries.
- **Grand River Hospital District:** In 2013, the Grand River Hospital District received \$17,934,514 in tax revenues attributable to oil and gas production in Garfield County. Land within the jurisdiction of the District had a total assessed value of \$3,211,857,600, of which \$2,839,552,470 was directly attributable to oil and gas, resulting in 88.41 percent, or \$17,934,514, of the total District property tax revenues.

Respondents also provided copies of economic studies or other data supporting the economic contribution of non-oil and gas industries:

- **Glenwood Springs:** Tourism is the number one economic industry in and around Glenwood Springs, generating some \$243.5 million in annual economic activity. Rand McNally map makers listed Glenwood Springs as the Number One Fun City in the U.S. in 2013. Sports Illustrated listed Glenwood Springs as the Number One Fishing Destination in 2002 or 2003. The Thompson Divide area is a core ingredient in this industry.
- **Thompson Divide area:**
 - Activities centered on the Thompson Divide area generate some \$30 million in economic activity annually, and support nearly 300 jobs statewide.
 - The Thompson Divide area includes portions of four big Game Management Units. Based on the information developed by way of BBC's 2008 Colorado Divisions of Wildlife economic impact model, hunting on the Thompson Divide generates approximately \$6.8 million in annual economic outputs and supports 72 total jobs in the communities.

- The immediate economic value of grazing in the Thompson Divide area is at about \$1.9 million per year. The full economic value, however, of the cattle supported by ranches with grazing on the Divide is about \$11.2 million per year.
- Pitkin County: Over 46 percent of the County's approximately 16,000 people are employed in the tourism business. Approximately 50 percent of Pitkin County's land ownership is in the hands of part-time residents attracted to the activities and lifestyle of a rural mountain area.
- \$127,000 in labor income is generated in the analysis area for every 1,000 non-local hunting visits. Another \$73,000 in labor income is generated for every 1,000 local hunter visits.

Suggested Analysis Methodologies or Data

Commenters suggested that the EIS must include a detailed economic analysis impact study specific to each of the proposed alternatives that either considers reaffirming, modifying, or voiding the 65 existing leases that considers:

- Beneficial impacts of oil and gas development including
 - Socioeconomic benefits of oil and gas development *in conjunction with* the continuation of other land uses, including grazing, silviculture, and recreation, when these multiple uses can be managed in concert with oil and gas development;
 - Socioeconomic benefits that have already been experienced as a result of development and production of some of the 65 leases to date; and
 - Socioeconomic impacts that may be realized from potential future development of the Mancos/Niobrara shale for the existing 65 leases.
- Adverse impacts of Impacts associated with suspending approved leases indefinitely, including:
 - Refunding lease payments;
 - Lost revenues to all levels of government and taxing districts including ad valorem tax, severance tax, Federal Mineral Lease royalties, energy impact dollars, business personal property tax, and sales taxes;
 - The potential for reducing their ability to provide services (fire protection, education, medical, etc.) to all associated counties and local communities; and
 - Reduction of employment and increase in unemployment rate.
- Adverse impacts of oil and gas development, including:
 - Costs that communities will absorb improving and maintaining transportation corridors to support increased development;
 - Impacts to private mineral owners adjacent to these federal oil and gas leases;
 - Impacts to the local businesses that are supported by recreation and tourism in all associated counties;
 - Increase in health care coverage premiums, and decrease in overall health of communities that are adjacent to current oil and gas development;
 - Potential socioeconomic effects in counties and communities without any existing drilling (significant impacts are more likely to occur and to be significant in areas that do not already have oil and gas development, where the oil and gas industry has no contemporary presence, and where the infrastructure to undertake contemporary drilling does not exist);

- Socioeconomic cumulative effects in the context of projected development on nearby public lands. BLM's Colorado River Valley and White River Field Offices are almost entirely open for leasing and projected to see approximately 25,000 new wells in coming years; and
- Costs to local governments and communities associated with the boom and bust nature of oil and gas development. Short-term booms result in population growth and new jobs primarily consisting of a transient workforce, a demand for affordable housing, potential increase in crime, and greater demands on emergency services and local infrastructure. The downward bust side of the cycle leaves deflated and depressed communities and destabilized social structures.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Comments stated that the EIS must protect hunting opportunities and other economic activities dependent on undeveloped landscapes. No specific measures were offered beyond NSO stipulations.

One respondent suggested that if any leases are cancelled in Mesa County, there should be an impact fee on every cubic feet of natural gas moving out of Mesa County to mitigate for the economic repercussions of lease cancellation.

4.4.4.8 Special Designations

Resource Concerns

IRAs

Commenters identified the Thompson Divide as containing one of the densest concentrations of IRAs in the West. Respondents identified the following IRAs as being invaluable to hunters and anglers and having potential for impacts:

- Baldy Mountain IRA;
- Clear Fork IRA;
- East Divide/Four Mile Park IRA;
- East Willow IRA;
- Housetop Mountain IRA;
- Huntsman Ridge IRA;
- Mamm Peak IRA; and
- Thompson Creek IRA.

Respondents indicated these IRAs provide protection to significant headwaters and some of the most important and diverse habitat available on the WRNF. Comments indicated IRAs provide habitat for rare and genetically pure CRCT, as well as clean drinking water for the Colorado River Valley.

Respondents stated that at least 42 of the leases under consideration, and a majority of the total leased acreage in the 65 leases, lie within these IRAs and expressed concern about lease development within IRAs and would be inconsistent with the value of the designated area and diminish the qualities for which the IRAs were designated. Commenters requested that the EIS analyze and disclose the impacts to wilderness qualities and undisturbed/unfragmented habitat for wildlife, and indicated that impacts to IRAs must be analyzed, in spite of the fact that they did not exist when the original EIS was released. Comments stated that the BLM must consider the impacts that oil and gas development and hydraulic

fracturing would have on the full spectrum of roadless values, including local economic contributions and unspoiled forest habitat, and to the landscape across the WRNF.

Comments stated that most or all of the leases covering those roadless lands appear to lack stipulations or notices expressly requiring compliance with the USFS roadless rules, an omission that violated USFS regulations. Although noting that oil and gas development is not precluded within IRAs, many respondents indicated that the leases would not be able to be developed without a network of supply roads, which would violate the Roadless Rule. Respondents stated that the BLM must recognize that existing leases in IRAs do not convey any right to build roads and that road building and timber cutting are not allowed on roadless leases issued within roadless areas after implementation of the 2001 Roadless Rule (also see Section 4.1, Process comments).

Other comments stated that the Colorado Roadless Rule, finalized in July 2012, does not prohibit oil and gas development and does not apply to leases sold before July 2012, and allows for the construction of temporary roads for leases sold prior to the 2012 decision and that the BLM may therefore not modify or cancel leases because of this Rule. Other comments added that the Forest Service Roadless Rule does not fall under the purview of BLM (also see Section 4.1, Process comments).

Designated Scenic Byways

Comments noted that the Highway 133/West Elk Loop is a Designated Scenic and Historic Byway and expressed concern that traffic, construction, and the industrial aspect of drilling would negate all area efforts to provide a quality tourist experience and could impact the “scenic” designation of this byway.

Research Natural Areas

Comments also expressed concern about impacts to Research Natural Areas (RNAs) or potential RNAs. Comments indicated that the same edge effects likely to occur in roadless areas have the potential to occur in RNAs and could cause the RNA to no longer be eligible for designation.

Wild and Scenic Rivers

Comments identified the Thompson Creek as being eligible for federal Wild and Scenic River designation and noted that it provides habitat for CRCT, lynx, and elk, flows through a BLM-designated ACEC, boasts striking sandstone fins and stunning views, and includes a CNHP-identified Potential Conservation Area because of its exceptional biodiversity.

Respondents also indicated that the USFS has found the Crystal River eligible for federal Wild and Scenic River designation.

Other Special Designations

Commenters stated that many areas in the Thompson Creek/Thompson Divide area have such qualities as to be considered Wilderness Study Areas, and identified the Thompson Creek ACEC and several conservation easements as areas that may be impacted by oil and gas development.

Existing Condition Characterization

None.

Suggested Analysis Methodologies or Data

None.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Respondents suggested excluding Thompson Divide area from drilling through voiding or cancelling leases. Other suggestions for minimizing impacts included the following:

- NSO protections for roadless areas;
- NSO buffers around streams containing CRCT; and
- Lease notices or stipulations requiring compliance with both the USFS' 2001 Roadless Area Conservation Rule and the 2012 Colorado Roadless Rule. While these rules (and other applicable laws) are incorporated into standard federal lease terms, stipulations or conditions expressly referencing the roadless rule are necessary to ensure that the rule is implemented.

4.4.4.9 Transportation

Resource Concerns

Respondents expressed general concern about the impacts of transportation route development and traffic within the analysis area.

Transportation Route Development

Respondents noted that proposed areas for drilling in the Thompson Divide area have to be reached by roads that do not accommodate semi-trailer traffic and are often subject to mud and rock slides that preclude any and all traffic. Commenters expressed concern about the impacts of improving and extending these roads, including increased erosion, mud and rock slides, decreased grazing and hazards for cattle and wildlife, decreased enjoyment of recreational activities, increased dust and air pollution, negative impacts to the watersheds, negative impacts to vegetation and further fragmentation to wildlife habitat. Respondents noted roads would extend into designated roadless areas and indicated that heavy truck traffic would degrade the conservation values in these areas. Comments also stated that road construction would underpin the many millions of dollars invested in the acquisition of conservation easements, and diminish the value of the County's investments. Some comments suggested that oil and gas development should occur in areas of Western Colorado that are closer to existing road networks.

Other respondents commented that increased points of access into the WRNF would increase the public's enjoyment of the Thompson Divide for recreation or other multi-use purposes (also see Section 4.4.4.6, Recreation, and Section 4.4.4.8, Special Designation comments).

Comments indicated that the existing proposal from Operators to develop the Thompson Divide area via an access route that travels through the heart of the Glenwood Springs tourist district and along Four Mile Road has drawn universal condemnation from local citizens and elected officials.

Respondents stated that road use must comply with county policies and that counties may require road use or access permits (which may have timing limitations), road maintenance agreements, and bonding (which comments noted tended to be inadequate). Comments also cited Colorado Department of Transportation regulations and recommended coordination with county road departments regarding applicable requirements.

Comments identified an ongoing conflict between Garfield County and current lessees over whether use of Four Mile Road is guaranteed to the lessee. Comments indicated that these same access conflicts also will arise if leases are developed near Carbondale.

The public scoping meeting Question and Answer session included a question as to whether the EIS would include mileages and locations of new roads. Responses from the BLM clarified that site-specific

NEPA analysis would contain that information and that the public should review current and future site-specific NEPA analysis to find out the specific details of an Operator's proposed Plan of Development (POD).

Respondents providing comments on the WRNF 2012 Draft EIS and CRVFO 2014 RMP/Final EIS for consideration for this project stated that transportation impacts were not adequately considered in these previous analyses. Comments further stated that necessary road improvements can include complete redesign, clearing and grubbing, realignment, widening, decreasing road grades, culvert installation, ditch construction, retaining wall construction, and resurfacing, but that not all of these activities are appropriate in all places, and that the USFS neglected to consider as much or to analyze stipulations that would allow the agency to deny use of specific transportation resources in the analysis area.

Respondents suggested that specific roads like the 108 road southwest of Carbondale, and the Four Mile Road, should be protected from transportation related impacts from future oil and gas leasing and development with specific protective stipulations.

Impacts to Existing Roadway Infrastructure

Commenters expressed concern about impacts to existing roadway infrastructure, stating that trucks, haul rigs, and other construction equipment are often over-weight, over-width, and over-length. Comments stated that many existing roads and bridges in the analysis area were not built to withstand the increased volume of traffic and heavy truck traffic. Respondent provided a report from a civil engineering firm documenting impacts that oil and gas development traffic has on road infrastructure. Comments identified the following specific routes of concern: Midland Avenue (which includes a roundabout and areas that are old and already in need of repair); Four Mile Road (County Road 117); Coal Creek Road; Thompson Creek Road; Dry Park Road; Highway 133; 27th Street; and Grand Avenue (in Glenwood Springs). Comments stated that the 27th Street Bridge has been identified by the State of Colorado as being functionally obsolete and structurally deficient. Comments expressed similar concerns about the Grand Avenue/CO 82 bridge.

Garfield County stated that, as expressed in their comments on the WRNF 2012 Draft EIS, that County Road 117 (Four Mile Road) may not be utilized as a haul route for new energy exploration because it is not constructed with the physical capacity to accommodate the significant volume and weights of vehicles commonly associated with oil and gas development.

Increases in Traffic Volume

Respondents stated that contemporary drilling techniques and formations likely to be targeted in future leasing and development could involve substantially more traffic than historic drilling. Respondents noted that contemporary well development involves thousands of truck trips, including more than 100 truck trips per day during drilling.

Respondents stated that hydraulic fracturing requires huge amounts of water, and consequently a great number of tanker truck trips, to transport water and chemicals to the site and to transport waste from the site. Respondents cited and provided a study (Boulder County 2013) of the impacts of truck traffic related to hydraulic fracturing which concluded that the hydraulic fracturing process for a single well would require an average of 1,400 one-way truck trips just to haul water to and from the site and that with consideration of full development process (construction, drilling, and completion), an average well utilizing hydraulic fracturing would require 2,206 one-way truck trips, not including production, which could add an additional 730 truck trips per year, depending on various factors, including the success of the well and whether it is re-fracked. Respondents indicated that drilling to different formations also may require workovers on more frequent intervals.

While noting that current practices include consolidating wells and reducing pad numbers, respondents stated that traffic generation is primarily linked to well numbers, not pad numbers; thus, impacts to traffic may not be mitigated by clustering development on a small number of pads and imposing stipulations.

An opposing comment stated that current hydraulic fracturing no longer requires a multitude of water trucks since the water is now delivered by pipeline to and from the wells and that this would vastly reduce the impact of drilling operations and traffic.

Impacts from Traffic

Respondents expressed concern about the effect that increased traffic volumes, especially on narrow mountain roads, would have on the safety and enjoyment of local residents as well as on property values. Respondents noted that many of these routes have dangerous road conditions in winter. Commenters included references related to impacts from traffic safety as a result of oil and gas development and noted that several proposed routes are used regularly by bicyclists and equestrians.

Respondents specifically noted traffic concerns about the following roads: Midland Avenue, East Divide Road, Four Mile Road (County Road 117), Thompson Creek Road (County Road 108), Highway 133, and Grand Avenue (in Glenwood Springs). Comments also noted that a proposed haul road is routed right by a designated safe school route.

Respondents expressed concern about the roads within the Thompson Divide area and noted these roads already have considerable traffic through their use for ranching, recreation, skiing and logging, and stated that increased traffic would interfere with current uses of this area. Respondents indicated that heavy truck traffic would degrade the conservation values in roadless areas and diminish the conservation easements and other county investments. Commenters also noted that there are limited routes in and out of the Thompson Divide area and suggested that increased traffic on those routes would impede the ability to escape in the case of a fire, a toxic spill, or other development issues.

Respondents indicated the use of Highway 133 as an industrial corridor would diminish the value of the Crystal Trail, 5.2-mile pedestrian and bicycle amenity within the ROW for Highway 133 and could eliminate its use in winter.

Respondents expressed concern that increased heavy truck traffic in the City of Glenwood Springs would result in a reduction to tourism and impact associated businesses (also see Section 4.4.4.7, Socioeconomics) due to road congestion, air pollution, dust, and noise. Comments also expressed concern about the potential for increased road repairs and temporary road closures as a result of increased traffic, as well as the lack of any secondary access out of South Glenwood Springs.

Operator comments also noted that leases not included as part of this action also will require use of portions of Four Mile Road and that lease cancellation will not avoid use of Four Mile Road and a transportation route.

Respondents also expressed concern about increases in vehicle repair due to the pot holes in streets and rocks thrown up from trucks.

Existing Condition Characterization

Respondent cited a new traffic analysis (SGM 2012) which includes a discussion of congestion and access problems and requested that this information be incorporated in the EIS.

Suggested Analysis Methodologies or Data

Commenters stated that the transportation impact analysis must include increased maintenance demands, consider safety costs for increased roadway use, increased traffic accidents and associated medical impacts and burdens on local hospitals, burdens on first responders and the criminal justice system, and project where or how many miles of access roads will be constructed. Commenters specifically requested that the EIS disclose the estimated road traffic increase on Highway 82 and Four Mile Road.

Respondents stated the EIS must include traffic estimates that reflect potential development and impacts of plays likely to be targeted or the types of technologies that would be used (i.e., deeper drilling, use of hydraulic fracturing, etc.). Comments stated that traffic estimates must include drill rigs, water trucks, trucks with hydraulic fracturing tanks, as well as pilot cars and supply trucks and pickups.

Commenters also requested that the transportation analysis analyze and disclose potential impacts to creeks in the area from road construction or transportation spills.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Some comments suggested that the potential for impacts from transportation necessitated cancelling leases, and that oil and gas development should occur in areas of Western Colorado that are closer to existing road networks. No specific mitigation measures were suggested.

4.4.4.10 Visual Resources

Resource Concerns

Comments concerning impacts to visual resources generally expressed concern about impacts to the general landscape and rural character of the area and indicated that oil and gas development is already contributing to visibility impairment of some of the most remarkable scenery in the WRNF. Respondents identified the Thompson Divide area, Crystal River Valley, the Elk Mountains, Roaring Fork Valley, and IRAs as areas of particular concern that should not be eligible for development.

Commenters expressed concern about impacts to the viewshed of the Jerome Park Conservation Easement, which currently provides and protects views of Mount Sopris and other peaks in the Elk Mountains; the sandstone fins, and other features of the Thompson Creek Drainage; and the Crystal River Valley from Thompson Creek Road. Respondents identified these views as some of the more dramatic in Colorado. Williams Peak also was mentioned as an area of concern.

Commenters expressed a concern for air quality and visibility (haze), fearing that emissions resulting from construction and operation activities would compromise the overall quality of the viewshed. Comments submitted on the 2012 Draft EIS (incorporated by reference for consideration by the BLM as to applicability to this project) indicated that any development within the WRNF would significantly impair visibility in the Maroon Bells/Snowmass Wilderness and compromise the viewshed from all four ski areas. Respondents indicated that the WRNF 2012 Draft EIS failed to analyze potential impacts to scenery outside the analysis area likely to be impacted by leasing and development as a result of visibility impairment.

Comments indicated that some leases are located adjacent to ski areas and other outdoor recreation areas and their presence would hurt the recreational economy (also see Sections 4.4.4.6 and 4.4.4.7, Recreation and Socioeconomics comments). Several comments noted the presence of Scenic Byways in the analysis area.

Other comments indicated that they did not feel visual impacts were an issue; that existing wells were not visually obtrusive on the landscape and that horizontal well technology has reduced the number of wells visible in an area. Some commenters felt that visual intrusion was an acceptable sacrifice, stating “endangering the beauty of our country should be considered a possibility”.

Existing Condition Characterization

Respondents noted that the Crystal Valley contains the West Elk Loop National Scenic and Historic Byway (Highway 133).

Suggested Analysis Methodologies or Data

None.

Suggested Leasing Stipulations, Mitigation, or Conditions of Approval

Comments recommended applying visual BMPs to protect recreation uses in the area, including hunting, fishing, and recreational opportunities. Examples include locating disturbance and equipment to minimize visual detection from adjacent areas, and painting equipment in neutral tones that match surrounding landscape.

4.4.5 General Cumulative Effects Comments

In addition to resource-specific comments regarding cumulative impacts (which are discussed within individual resource summaries), respondents offered several comments regarding cumulative impacts on a more general level.

Respondents stated that impacts from lease development, which would affect multiple resources (for example, air, water, landscape, ecological systems, etc.), necessarily go beyond individual lease areas. Respondents living in the area commented extensively on the cumulative nature of the impacts on oil and gas development on air quality, water quality, human health and safety, as well as opportunities for recreation, visual resources, etc. Commenters also pointed to past mining processes that still have not been reclaimed, as well as past drilling where drill pads were abandoned, and roads and pits have been left to sink or erode with results that are visible. Additionally, some commenters indicated that the issue of cumulative impacts goes beyond the local or regional level and should be addressed at the national (or global) level.

Comments pertaining specifically to the Thompson Divide area noted that ski area development, coal mining, and public grazing also are actions that need to be considered in the cumulative impacts analysis.

Conversely, some commenters pointed to the presence of past and present oil and gas development actions as rationale for reaffirming the lease. These comments indicated that there is no need for voiding leases because there have not been significant environmental impacts associated with those actions.

In response to BLM comments about not speculating about the future, respondents expressed concern about how RFFAs would be addressed in the analysis, indicating that while the BLM cannot be 100 percent sure about what is going to happen, they must look at past development data to achieve a realistic projection of future development in order to make good decisions about the future.

Respondents noted that BLM's analysis of the 65 leases takes place against the backdrop of two new planning decisions by BLM and the USFS Service: the proposed RMP for BLM's CRVFO RMP, and the USFS' Service's Oil and Gas Leasing EIS for the WRNF (the Oil and Gas Leasing EIS) and that the BLM

must identify and disclose all connected actions and cumulative impacts resulting from other activities occurring under these plans.

4.4.6 General Mitigation Comments

In addition to resource-specific comments regarding mitigation (which are discussed within individual resource summaries), respondents offered several comments regarding mitigation on a general level.

Some respondents suggested that the leases should incorporate measures that require restoration of the land to existing or better condition than before development. Respondents also suggested a mitigation measure requiring immediate restoration or cleanup of any environmental impact, and which would halt new oil and gas development until the environmental degradation is removed.

Respondents speaking in regard to the Thompson Divide area indicated that the BLM must prevent damages such as those seen in western Garfield County from occurring in this area and stated that leases should not be allowed if there is any negative impact that cannot be mitigated. Comments provided examples of other areas where damage from oil and gas development could not be mitigated and where road restoration has not occurred 30 years after development. Comments stated that no mitigation measures exist that would restore air and water quality after it is polluted. Some respondents stated that there are no mitigation efforts that could make impacts from oil and gas development in the Thompson Divide area acceptable.

Respondents supporting lease reaffirmation indicated that although the BLM may impose mitigation measures on operations, the BLM cannot impose conditions of approval that are inconsistent with existing, contractual lease rights or which restrict operations to the point that economic development on a lease is precluded. Commenters also stated that the foreseeable impacts of oil and gas exploration and production are limited and mitigated by expanded federal, state, and local regulations put in place since the WRNF1993 EIS. These respondents cited COGCC state regulations of 2009, 2011, 2012, and 2013 as examples of relevant oil and gas operation regulations that essentially provide a layer of additional mitigation. Commenters urged the BLM to consider development of any additional mitigation in light of these newer regulations already in place and avoid unnecessary redundancy and duplication.

4.5 Non-substantive Comment Summary

The content of many of the scoping submittals did not contain specific statements about what resource issues, alternatives, or mitigation should be analyzed in the EIS, but rather, offered statements of general support or opposition to the leases or simply requested that the BLM either void or reaffirm the leases. A summary of these statements (and supporting rationale) are included below. A full list of general statements of support or opposition by submission can be obtained by contacting the CRVFO.

4.5.1 Statements of Support for Lease Reaffirmation

Respondents in support of the leases stated that natural gas is critical for heating buildings and is a less environmentally risky substitute for coal and oil in generating electricity and powering transportation and suggested that federal agencies must continue to support oil and gas energy development as an alternative to imports in order to keep energy available and costs down. The BLM received many submittals that offered general statements of support for the reaffirmation of the leases or continuation of leasing or opposition to voiding of leases. Comments offered several types of rationale for these requests, summarized as follows:

- The leases are legally binding agreements entered into years ago, in good faith, by the leaseholders and, in some cases, are already in production. If leases were voided, companies will choose not to ever do business in Colorado, which is a dangerous precedent, and probably illegal.
- The alleged NEPA deficiency the EIS process seeks to remedy does not constitute grounds for “improper issuance”, thus there is no reason to cancel or modify leases.
- Lease reaffirmation is the only legal alternative put forward by the BLM that meets BLM Purpose and Need.
- Legal action will inevitably follow if any of the leases are canceled or modified in this process.
- The companies are already subject to multiple regulations to the environment: air, water, habitat, and human health and safety, and there have been no concerns regarding significant environmental impacts on the existing leases-- thus, no reason to modify or cancel leases.
- The leases would lead to increased economic benefits to the local communities (direct employment and secondary employment, increased tax revenue, infrastructure improvements resulting from increased tax base, etc.).
- There have been significant economic investments made by the various oil and gas companies that relied upon these leases. If the leases were cancelled then the State of Colorado and/or the taxpayers would be responsible for repaying lessees for these leases. Additionally, lessees would be entitled to damages, which would consider not only the value of the lease, but also factors such as the cost of compliance with NEPA and permitting (at various stages), rental and royalty payments, expended capital and operational costs, and other investment backed losses.
- Any retraction of leases may result in the need to repay revenues that county or local governments have received from the industry, which would be difficult, if not impossible, and which would affect the governments’ ability to provide infrastructure and vital community services.
- Voiding or restricting leases in the Thompson Divide area will not necessarily prevent future oil and gas development in that area because there are other leases in the area.
- The federal government should not be involved in private land ownership.
- Roads from lease development would be able to be used by the community.

4.5.2 Statements of Opposition to Lease Reaffirmation

Statements of Opposition to Lease Reaffirmation focused on reasons why the respondents are not in support of lease reaffirmation, why the EIS must contain a lease cancellation alternative, why the BLM should void or cancel the leases, or why the BLM must select this action as the Agency Preferred Alternative.

It should be noted, however, that many requests for lease cancellation were not necessarily expressed as global requests applicable to all leases, but rather, were directed at the leases in the Thompson Divide area, and the leases with potential to affect the water supply of the Oak Meadows Subdivision. Additionally many of the submittals focused on the need to eliminate hydraulic fracturing specifically rather than the need to eliminate leases generally.

Rationale for these statements included the following:

- Leases were issued illegally; cancellation is the only best decision to remedy the situation.
- The leases were issued in violation of environmental laws; as such they must be cancelled so that they can be reassessed with the full scope of a careful study for their merit under those laws.
- Cancellation supports the NEPA process which is supposed to take place at a pre-commitment stage of the process, before any irreversible or irretrievable commitments of resources.
- The Thompson Divide area leases, which were purchased inexpensively, were not acted upon in a timely fashion and should have expired in a timely fashion. Additionally, the leases are not economically viable. Since the lessees have failed to meet the terms of the lease within the period of the lease, the lease should not be extended and should be retired.
- Colorado is already doing more than its share to provide gas for the U.S.; the amount of oil and gas that would be developed under the leases in question would contribute only a small amount overall (particularly in the Thompson Divide); and that the U.S. is in fact producing more oil that is needed anyway (and therefore sending oil and gas overseas).
- Oil and gas resources are wasted through flaring.
- It is time for the agencies who are charged with protection of those lands to review these changes in the area, acknowledge the need to identify the special places and special needs, and reflect, in one of the available alternatives, that only a choice of withdrawal of the current leases with a requirement for no future leasing in the area is acceptable.
- Many of the leases were without compliance with the ESA.
- Impacts to air and watershed quality and human health and safety are too great (generally from oil and gas development but more specifically from hydraulic fracturing).
- Lease cancellation in the Thompson Divide area is supported by county and local governments and the local community at large, as well as by both state senators, who are sponsoring the Thompson Divide Withdrawal and Protection Act.
- Many of the leases are in roadless areas and were issued in conflict with the USFS' Roadless Rule (also see Section 4.4.4.8, Special Designations). Development would significantly impact these designated roadless or wilderness qualities.
- There are some places so unique and special, so pristine in nature, that they should be set aside from oil and gas exploration. The Thompson Divide area as an undeveloped and unique national forest has a much higher value as wildlife habitat, wilderness, etc. than it does for leasing. The BLM's multiple use mandate does not require leasing on all areas.
- The Thompson Divide area supports extensive recreation, tourism, and real estate industries that contribute more to the local economy (300 jobs and \$30 million in annual economic impacts) than oil and gas leasing and which rely on the undeveloped nature of the area. These industries cannot effectively coexist with oil and gas.
- Development in the Thompson Divide area would be in conflict with local municipalities' clean energy goals.
- Development in the Thomson Divide would irrevocably damage the "quality of life" of residents who live in the area because of its pristine and undeveloped nature.
- Some lease areas have conditions that would make them too dangerous for development.

- Development in the Thompson Divide represents an environmental hazard due to its remoteness and terrain.
- Development would have significant impacts to transportation and transportation systems.
- Leases near the Oak Meadows Subdivision present an extreme hazard to the water supply for the subdivision both in terms of water quality and quantity (also see, Section 4.4.2.4, Water Resources).
- The Thompson Divide Coalition will pay the leases, so there would be no economic loss.
- The proposed Thompson Divide Withdrawal and Protection Act would end drilling in the Thompson Divide in areas that have not been leased, does not apply to existing leases unless they expire; therefore additional protections are needed.
- The BLM is unable to adequately inspect wells and enforce lease stipulations.

The majority of these letters stated that the Thompson Divide area was “not the right place” for oil and gas development and contained some combination of the above statements. Although respondents supplying these comments indicated they understood the scoping process is designed to identify specific issues for analysis in the EIS rather than make a decision about how the leases should be treated, many indicated that the overall combination of the above so overwhelmingly supported lease cancellation that any specific suggestion related to analysis was made moot.

Some submittals also opposed lease reaffirmation because it would continue reliance on fossil fuels, and urged the BLM to focus their attention on renewable energy instead or wait for 5-10 years before considering development, when there would likely be better development and possibly new energy alternatives.

4.5.3 Out of Scope Comments

Out of scope comments included submittals that related to other projects, were spam, or which contained recommendations that were outside of the decision space for this EIS (i.e., were about revising the leasing system, the MLA or other BLM regulations). Out of scope submittals included the following:

- Request to add the commenter to the mailing list of other oil and gas projects in the CRVFO
- Comments indicating that the MLA needed to be revised to address a changing world where pollution, climate change, and the advance of renewable energy make oil and gas development less desirable or necessary.
- Comments urging the BLM to focus on renewable energy.
- Comments calling for a transfer of federal lands to the State vis-a-vis the Enabling Act.
- Comments suggesting that the U.S. explore offshore drilling.
- Comments supporting the general need for continued oil and gas development
- Comment suggested a moratorium on drilling until the full cumulative effects of the current level of industrial activity is known.
- Comment suggesting that cumulative impacts analysis should be conducted at a national or global level rather than on a project-specific level.
- Comment suggesting that the BLM consider creating a point system when issuing oil and gas leases, based on environmental factors: existing infrastructure, pristineness of area, water availability, amount of traffic generated, risk to water both close to the drill site and to

downstream users, closeness to towns, ability to limit methane leaks, etc. Leases would go to the companies causing the least impact on the environment and society.

- Comments on the CRVFO 2014 RMP/Final EIS and the WRNF 2012 Draft EIS that were submitted for incorporation by reference but were not applicable to this project. These included requests for the inclusion of commitments eliminated from the CRVFO 2014 RMP/Final EIS in the Approved RMP; comments on the CRVFO 2014 RMP/Final EIS and the WRNF 2012 analysis assumptions regarding how existing leases would be addressed upon expiration; or comments identifying other errors or omissions in the CRVFO 2014 RMP/Final EIS and the WRNF 2012 Draft EIS that were not pertinent to the analysis that will be developed for the EIS for Previously Issued Oil and Gas Leases in the WRNF.

5.0 Issue Summary

Based on the comments submitted during external scoping and summarized above, the BLM developed 94 preliminary issue statements, in the form of questions, which describe the general issues and concerns identified during external scoping (**Table 5-1**). For each resource issue statement, **Table 5-1** also identifies the sections of the scoping report from which each issue statement was developed, a preliminary disposition, and brief preliminary notes about how the issue may be handled in the EIS (e.g., through continued public outreach, development of the purpose and need statement, though impact analysis, etc.). Preliminary comment disposition codes are as follows:

- **Already Addressed:** Already addressed, such as by BLM policy, regulations, etc.
- **Process:** Addressed through the NEPA Process.
- **Purpose and Need:** Addressed through development of the BLM Propose and Need
- **Alternatives:** Addressed through alternatives development.
- **Impacts Analysis:** Addressed though impacts analysis.
- **Out of Scope:** Cannot be addressed, beyond the scope of the project.

In general, notes are not provided for issues that will be addressed through alternatives development and impacts analysis. Revisions to the resource issues will be made as needed during the NEPA process as the BLM completes internal scoping, reviews data and documentation, initiates analysis, and receives additional input from the public, cooperating agencies, Tribes, and other affected parties.

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
Process		
What NEPA deficiencies exist and by what process should the BLM address them?	4.1.1, 4.1.2, 4.1.3	AA, PN
Does lease development status or location affect which leases should be addressed within the EIS?	4.1.4.1	AA, PN
By what authority may the BLM cancel or modify leases?	4.3.1.3, 4.3.1.4	AA, PN
How would the EIS process affect Operators' ability to develop or retain their leases?	4.1.5, 4.1.6, 4.2.3	AA
How can cooperators, agencies with regulatory authority, affected stakeholders, and other interested parties participate during the NEPA process?	4.1.7	PRO
Purpose and Need		
Should the Purpose and Need for agency action extend beyond addressing a NEPA deficiency?	4.2.1	PN
How should the BLM balance the requirements of its multiple use mandate under FLPMA and the need to maintain resource values with the need to respond to the requirements of the MLA?	4.2.1	PN, ALT
What are BLM's and USFS's respective roles and decisions to be made?	4.2.1, 4.2.2	PRO, PN
How should the BLM consider the changing need for energy resources?	4.2.1, 4.2.2	PN, OOS
Alternatives Development		
How should the BLM interpret the No Action Alternative?	4.3.1.1	ALT
What is a reasonable range of alternatives that meet Purpose and Need?	4.3.1, 4.3.2	ALT
Does lease status or location affect the range of alternatives that should be examined in the EIS?	4.3.2	ALT
What COAs, BMPs, or other lease stipulations are appropriate to apply to existing leases with valid existing rights? At what level of development are protective measures more appropriately applied to the leases?	4.3.2, see also individual resource sections	AA, ALT, IA, PRO

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
Impacts Analysis		
Analysis Approach (General)		
How will the differences in individual lease stipulations be addressed in the EIS?	4.1.4, 4.3.2	IA
What RFD scenario and other development assumptions should be used for EIS analysis?	4.4.1	PRO, IA
What level of analysis is appropriate for a lease sale EIS?	Multiple resource sections	AA, IA
How should unknown or inadequate information be addressed?	Multiple resource sections	PRO,IA
How should the BLM address changed circumstances and new information in a remedial NEPA process?	4.1.4.2, 4.4.1, multiple resource sections	ALTS, IA
Air Quality and Climate Change		
How would reasonably foreseeable development activities such as drilling, production, vehicle use, and other sources at the leasing level affect air quality? What methodologies and baseline data should be used for a robust and quantitative modeling of these potential air pollutants?	4.4.1, 4.4.2.1	IA
How will the proposed action and alternatives address conformance with the NAAQS and PSD standards?	4.4.2.1	IA
How will the proposed action and alternatives address emissions of GHGs and potential contributions to climate change?	4.4.2.1	IA
How will the proposed action and alternatives address emissions of GHGs and potential contributions to climate change?	4.4.2.1	IA
How will the proposed action and alternatives address the potential impacts from methane emissions?	4.4.2.1	IA
How will the proposed action and alternatives address the potential impacts from ozone precursors?	4.4.2.1	IA
What methods or actions can minimize or mitigate air quality impacts and potential effects on human health and other resources from the proposed action and alternatives?	4.4.2.1	ALT, IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
Geology and Paleontology		
What is the potential for seismic activity or other geological instability as a result of reasonably foreseeable development?	4.4.2.2	IA
How does area geology affect the potential for gas and liquid to migrate from one formation or zone to another during reasonably foreseeable development??	4.4.2.2	IA
How does the development potential of the analysis area from a geological perspective impact the lease area's resource uses?	4.4.1, 4.4.2.2	IA
How would the potential for gas and liquid migration or seismic activity be affected by Mancos shale drilling, hydraulic fracturing, injection of produced water, or other reasonably foreseeable activities? How can those risks be minimized?	4.4.2.2	IA
What is the potential for impacts to important paleontological resources from reasonably foreseeable development and how can this be minimized?	4.4.2.2	IA
Soils		
How does area soil type affect the potential for erosion, runoff, and subsequent sediment loading? What is the appropriate level of analysis for a leasing EIS?	4.4.2.3	IA
How will impacts from reasonably foreseeable development to erodible soils, saline soils, or other sensitive soil types be minimized or mitigated?	4.4.2.3	IA
Water Resources		
What water sources would be used for drilling, hydraulic fracturing, and oil production activities? How would the projected water use affect long-term availability of these sources for use due to depletion caused by oil activities in conjunction with use by other entities?	4.4.1, 4.4.2.4	IA
How would the characteristics of the oil/gas formations, aquifer formations, and their interconnectedness affect water quality during activities such as drilling, hydraulic fracturing, or other reasonably foreseeable activities?	4.4.2.4	IA
What design features, BMPs, mitigation measures, and conditions of approval can be incorporated into the proposed action and alternatives to reduce risk to water resources?	4.4.2.4	ALT, IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
What are appropriate setbacks for protection of public and private wells, lakes and streams, impaired waters, floodplains, or other water resources?	4.4.2.4	ALT, IA
How can the impacts from spills to water quality and other resources be minimized?	4.4.2.3, 4.4.2.4, 4.4.4.2	ALT, IA
How can impacts to waters with special designations such as Gold Medal fisheries, Wild and Scenic Rivers or 303(d) listed waters be minimized?	4.4.2.4, 4.4.4.6, 4.4.4.8	ALT, IA
How should water quantity and quality be monitored?	4.4.2.4	IA, PRO
Vegetation		
How will vegetation resources, plant diversity, and ecologically intact/undisturbed locations be protected from the impacts of reasonably foreseeable development and maintained?	4.4.3.1	ALTS, IA
How would special status plant species be protected from the impacts of reasonably foreseeable development?	4.4.3.2	ALTS, IA
How would surface disturbance or changes in hydrology affect wetlands, riparian areas, and floodplains and how will these areas be protected?	4.4.3.1, 4.4.2.4	IA
How would the potential spread of noxious weeds be mitigated?	4.4.3.1	IA
How can the risk of wildland fire from human activity be reduced?	4.4.3.1, 4.4.4.3	IA
Wildlife and Special Status Species		
How would reasonably foreseeable habitat disturbance, vehicle use, and other elements of oil and gas development such as noise affect wildlife, special status species, and their habitat?	4.4.3.3, 4.4.3.4	IA
How will the proposed action and alternatives affect big game, including effects on habitat fragmentation and connectivity and the potential for additional human disturbance or poaching from roads? How would these impacts affect big game hunting?	4.4.3.3	IA
What acute or chronic impacts could result from reasonably foreseeable development that would affect aquatic species, including special status native and/or game species? How would these impacts affect hatchery operations fishing activities?	4.4.3.3, 4.4.3.4	IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
What is the potential for the proposed action and alternatives to affect the Colorado River System fish through consumptive use or impacts to water quality?	4.4.3.4	IA
What stipulations or BMPs, mitigation measures, or conditions of approval can be incorporated into the proposed action and alternatives to reduce risk to wildlife and special status species?	4.4.3.3, 4.4.3.4	ALT, IA
Cultural Resources		
How can the BLM protect and conserve cultural resources, including TCPs from reasonably foreseeable development?	4.4.4.1	ALT, IA
What cultural importance do local Tribes place on the analysis area, and how might important areas be affected?	4.4.4.1	IA
How can the setting of historic tourism be maintained in consideration of reasonably foreseeable development?	4.4.4.1	IA
Hazardous Materials		
What are the types and amounts of hazardous materials that will be used for drilling, hydraulic fracturing, and other aspects of oil and gas development? What methods will be used for hazardous materials transport, storage, and operations (including drilling and fracturing processes) to reduce risk of adverse impact to physical, biological, and other resources?	4.4.1, 4.4.4.2	IA
How will contaminants, including produced water be disposed of?	4.4.4.2, 4.4.2.4	IA
What contingencies exist to handle unexpected contaminations such as NORMs or accidental spills and releases?	4.4.4.2, 4.4.2.4	AA, IA
How will the BLM enforce compliance with safety requirements?	4.4.4.2	AA, PRO
Human Health and Safety		
How will the BLM protect public health and safety in and around the analysis area?	4.4.4.3	AA, IA
What are the cumulative and combined impacts of multiple exposures to chemicals and toxic substances such as hydraulic fracturing flues, ozone, and VOCs on humans? How will exposure to these chemicals and substances be minimized for workers, area residents, and visitors?	4.4.1, 4.4.2.1, 4.4.2.4, 4.4.4.2, 4.4.4.3	IA
How will the BLM minimize the impacts to the safety of workers, area residents, and visitors that may result from increased traffic and/or the use of certain routes for transportation?	4.4.4.3	ALT, IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
How will reasonably foreseeable development impact emergency and health care services?	4.4.4.3	IA
How can the BLM minimize human-wildlife conflicts resulting from oil and gas development activities?	4.4.4.3	ALT, IA
How can noise from oil and gas development activities and transportation be mitigated?	4.4.4.3	IA
Land Use		
How would the proposed action and alternatives comply with federal, county and local policies concerning development?	4.4.4.4, 4.4.4.9	PN, IA
How will the values of conservation easements and county land acquisitions identified for protection in the Master Plans be protected from reasonably foreseeable development?	4.4.4.4, 4.4.4.7	ALT, IA
Livestock Grazing		
How will reasonably foreseeable development impact livestock grazing, including loss of forage due to development; damage to range improvements; increased spread of noxious weeds and other factors that may result in would result in an increased difficulty in managing cattle and potential loss of animal unit months, reductions in allotments, and declines in economic returns?	4.4.4.5	IA
How will the BLM minimize potential health impacts to livestock in and around the analysis area from exposure to hydraulic fracturing fluids, fugitive dust, and stress from noise or traffic?	4.4.2.1, 4.4.2.4, 4.4.4.5	IA
What mitigation measures should be used to reduce the impacts to livestock grazing?	4.4.4.5	IA
What opportunities exist for the BLM, Operators, and permittees or ranchers to work collaboratively to minimize conflicts due to operations or transportation?	4.4.4.5	IA
Recreation		
How would reasonably foreseeable activities affect access to recreation and the quality of the recreational experience? How would this affect the recreation industry?	4.4.4.6, 4.4.4.7	IA
What are the hunting and fishing values of lands and waters in the analysis area? How would those activities be affected by potential development?	4.4.3.3, 4.4.3.4, 4.4.4.6, 4.4.4.7	IA
How will the effects of the extraction industry on recreational resources and opportunities (as well as the recreation industry) be mitigated?	4.4.4.6, 4.4.4.7	ALT, IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
Socioeconomics		
Would reasonably foreseeable development be compatible with the varying social and economic conditions across the analysis area, including employment patterns, and preferences for oil and gas development versus other industries?	4.4.4.7	IA
How would lease cancellation affect local and regional social and economic conditions? How would lease cancellation payments be made? How would lease cancellation affect Operators or recipients of past royalties?	4.4.4.7, 4.1.6, 4.3.1.3	IA
How would lease reaffirmation affect social and economic conditions on local and regional levels?	4.4.4.7, 4.3.1.2	IA
How would resource conservation measures and other actions that would restrict or limit oil and gas development (such as modifying leases) affect social and economic conditions?	4.4.4.7	IA
How would reasonably foreseeable development impact the less tangible social issues such as quality of life?	4.4.4.7	IA
What mitigation strategies can be used to minimize adverse social or economic impacts?	4.4.4.7	ALT, IA
How would reasonably foreseeable development affect private property values?	4.4.4.4	IA
Would impacts to private property occur, such as the contamination of lands or well water, and if so how would they be mitigated?	4.4.4.4, 4.4.4.7	IA
Special Designations		
How would the proposed action and alternatives comply with the 2001 and 2012 Roadless Rules? How would the alternatives affect the wilderness qualities of IRAs and RNAs? What measures may be implemented to reduce those impacts?	4.1.4.2, 4.4.4.8	ALT, IA
How would the relevant and important values of ACECs be protected?	4.4.4.8	IA
How would reasonably foreseeable development affect designated Scenic Byways?	4.4.4.8	ALT, IA
How would rivers found eligible for Wild and Scenic River designation be protected?	4.4.4.8	ALT, IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
Transportation		
How will development in the analysis area affect access to federal, state, and private lands?	4.4.4.4, 4.4.4.6, 4.4.4.9	IA
How will reasonably foreseeable development affect traffic on local and regional levels on a daily and annual basis?	4.4.1, 4.4.4.9	IA
How will reasonably foreseeable development affect the local road system in terms of existing road standards, usage, condition, dust abatement, maintenance, noise, and traffic safety?	4.4.4.9	IA
How will proposed action and alternatives minimize adverse impacts to traffic and the local transportation network?	4.4.4.9	ALT, IA
How will the BLM coordinate with counties on road development?	4.4.4.4, 4.4.4.7, 4.4.4.9	ALT, PRO
Visual Resources		
How would the reasonably foreseeable development affect the general landscape and rural character of the area under each of the alternatives?	4.4.4.10, 4.4.4.6, 4.4.4.7	IA
How will the construction and operation activities affect visibility (haze) from Class I and sensitive Class II areas and important recreational facilities?	4.4.2.1, 4.4.4.10	IA
How will the proposed action and alternatives minimize adverse impacts to areas with high quality visual resources?	4.4.4.10, 4.4.4.6, 4.4.4.7	ALT, IA
Cumulative Impacts (General)		
How will the cumulative impacts from oil and gas and other regional development affect air quality, visibility, water resources, greater sage-grouse, and other wildlife?	4.4.5	IA
What RFFAs are appropriate for inclusion in the cumulative impact analyses? How will the analysis incorporate the connected actions and cumulative impacts resulting from the 2014 RMP/Final EIS and the 2012 Draft EIS?	4.4.5	IA

Table 5-1 Preliminary Resource Issue Statements

Public Scoping Issue	Applicable Scoping Report Section(s)	Preliminary Disposition*
Mitigation (General)		
What mitigations are appropriate to impose at the leasing level and in light of existing, contractual lease rights?	4.4.6	AA, IA, PRO
How should the BLM evaluate proposed mitigations against federal, state, and local regulations to avoid unnecessary redundancy and duplication?	4.2.4	IA, PRO
<p>*Preliminary Disposition:</p> <ul style="list-style-type: none"> AA Already addressed by BLM policy and regulations. PRO Addressed through the NEPA Process. PN Addressed through development of the BLM Propose and Need. ALT Addressed through alternatives development. IA Addressed though impacts analysis. OOS Cannot be addressed, beyond the scope of the EIS. 		

6.0 Next Steps

The BLM will consider the comments submitted during scoping and the issues identified in this Scoping Report when developing alternatives to the Proposed Action. The BLM will continue to consider issues identified during scoping, along with other issues and potential impacts, during preparation of the EIS. The BLM will analyze and document potential impacts that could result from implementing the Proposed Action and the alternatives in a Draft EIS.

The Draft EIS is currently scheduled for publication in Winter of 2015. A Notice of Availability (NOA) for the Draft EIS will be published in the *Federal Register* announcing availability of the Draft EIS for review and comment. Publication of the NOA for the Draft EIS will initiate a 45-day public comment period during which the BLM will invite the public and other interested parties to provide comments on the Draft EIS. The BLM will hold public meetings during the public comment period and will advertise meetings through electronic mailings to contacts on the mailing list and through other notification methods.

The BLM will review and consider all comments received on the Draft EIS and will revise the Draft EIS as appropriate. All substantive comments and responses will be incorporated into the Final EIS. A NOA for the Final EIS will be published in the *Federal Register* announcing the availability of the Final EIS. The Final EIS is scheduled to be released in summer of 2016. The BLM will prepare a ROD to document their selected alternative and identify any accompanying mitigation measures and will issue the ROD no sooner than 30 days after the NOA for the Final EIS is published in the *Federal Register*.

Figure 6-1 shows the steps of the NEPA process.

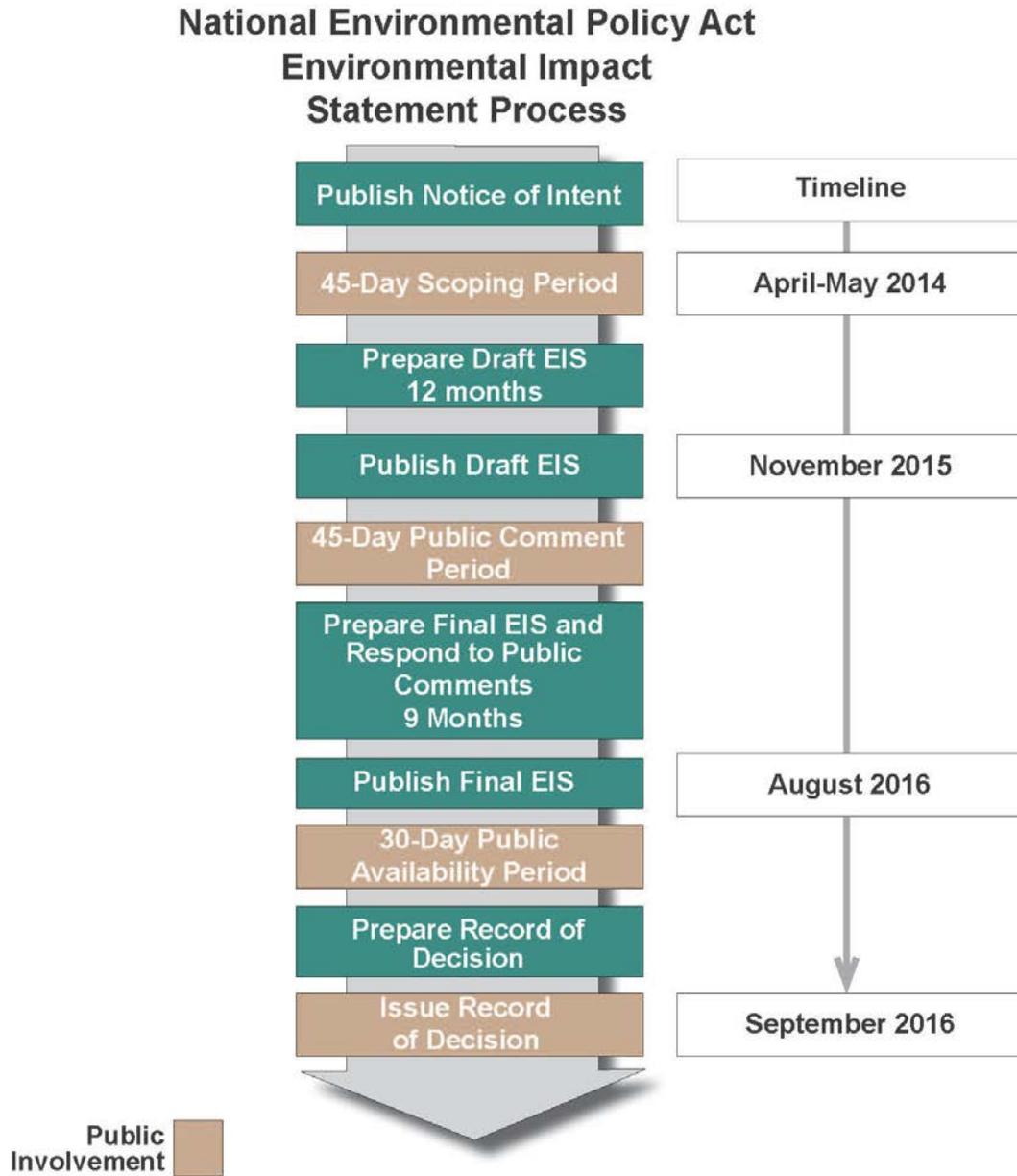


Figure 6-1 Preliminary Timeline