BLM

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment

Tigertail Federal 2–3 APD

May, 2015

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Environmental Assessment
Tigertail Federal 2–3 APD

DOI-BLM-CO-F020-2015-0004 EA

Prepared by
U.S. Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
Canon City, CO

May, 2015

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Chapter 1 Introduction

1.1. Identifying Information:

1.1.1. Title, EA number, and type of project:

Tigertail Federal 2–3 APD

DOI-BLM-CO-F02-2015-0004 EA

1.1.2. Location of Proposed Action:

7N, 64W, S2

1.1.3. Name and Location of Preparing Office:

Royal Gorge Field Office

1.1.4. Identify the Subject Function Code, Lease, Serial, or Case File Number:

COC 67169

1.1.5. Applicant Name:

Grynberg Petroleum

1.2. Introduction and Background

BACKGROUND:This EA has been prepared by the BLM to analyze environmental impacts of the construction of one well pad and access road, and the drilling of one oil well on private surface estate/over private mineral estate (split estate). The project is located on rangeland in Northwest Weld County approximately twelve miles east of the town of Ault, Colorado. The federal mineral estate that will be accessed by the wells is leased and subject to oil and gas development. All surface activities related to these actions will take place on privately owned surface, there is no public land or public access in the project area.

1.3. Purpose and Need

The purpose of the action is to provide the applicant the opportunity to develop their lease for the production of oil and gas. The need for the action is to develop oil and gas resources on Federal Lease COC67169 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended.

1.4. Decision to be Made

The BLM will decide whether to approve the Tigertail Federal 2–3 Application for Permit to Drill (APD) project based on the analysis contained in this Environmental Assessment (EA). This EA will analyze the proposed action; to construct one well pads and access road, install production facilities, and drill a well in order to develop federal minerals from a private surface (split estate). Access to the proposed project would be on existing highway, county and oil field roads. The finding associated with this EA may not constitute the final approval for the proposed action.

1.5. Plan Conformance Review

PLAN CONFORMANCE REVIEW: The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

> Name of Plan: Northeast Resource Area Plan and Record of Decision as amended by the Colorado Oil and Gas Final EIS and Record of Decision (RD)
>
> Date Approved: 09/16/86 amended 12/06/91
>
> Decision Number/Page: O&G Resources, Issue 21
>
> Decision Language: "These 210,410 acres of surface and subsurface may be leased and developed for oil and gas with the standard stipulations included in the leases and standard site-specific stipulations included in any use authorization."

1.6. Scoping, Public Involvement and Issues

NEPA regulations (40 CFR §1500-1508) require that the BLM use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation to identify issues, concerns, and potential impacts that require detailed analysis.

Persons/Public/Agencies Consulted: Scoping, by posting this project on the Royal Gorge Field Office NEPA website, was the primary mechanism used by the BLM to initially identify issues.

Issues Identified: No issues were identified during public scoping.

Chapter 2 Proposed Action and Alternatives

2.1. Description of the Proposed Action

The BLM RGFO has received an Application for Permit to Drill (APD), proposing the construction of a well pad and access road, and the drilling of one vertical oil well on private surface over federal minerals (split estate).

The project is located on rangeland in Northwest Weld County approximately twelve miles east of the town of Ault, Colorado. The general area description would be defined as rural rangeland located on the northeastern plains of Colorado, used primarily for livestock production and oil and gas development. There are a few county roads in the project area. Access is limited to private or petroleum field roads, over private surface. There is no public land in the project area. Extensive oil and gas development has occurred in the area, mostly on private (fee) surface and private (fee) mineral estate.

During the pre-project onsite visit attended by BLM, the operator, permit agent, surveyor and surface owner, the proposed pad was relocated to avoid prairie dog burrows, to avoid impacts to prarie dogs that may potentially be in the project area. No animals were present, the activity of the colony is unknown.

2.2. Alternatives Analyzed in Detail

Proposed Action

The proposed pad would result in approximately 1.3 acres of surface disturbance that would be reduced to approximately .75 acres after interim reclamation. Pad construction will result in a maximum cut of approximately 2.5 feet, and a maximum fill of approximately 3.2 feet, resulting in approximately 10 cubic yards of excess subsoil, not including the top 6 inches of soil that will be segregated and used as topsoil during interim reclamation.

The well will be completed as a traditional vertical bore with no fracking. Construction and reclamation of pad and road will be done in accordance with BLM's Gold Book standards, and employ applicable oilfield BMPs. Stormwater/erosion control measures will be taken to stabilize the site. The proposed drilling and completion of all wells will utilize closed loop systems. All liquids will be stored in tanks on the pad. No pits will be utilized. All waste materials produced during drilling, completion and operation of the well (drill cuttings, completion fluids, produced water, sewage and garbage) will be hauled off site and recycled or disposed of at applicable state permitted commercial treatment/disposal facilities. The duration of drilling is estimated to be 20 days.

The proposed access road would be approximately 1,126 feet in length, and have a maximum disturbance width of 30 feet, with a permanent running width of twenty feet. This would result in approximately .75 acres of initial disturbance witch would be reduced to approximately .5 acres after interim reclamation. There is no significant cut/fill associated with the proposed road, which will cross essentially flat ground. Road will be constructed with clay base surfaced with gravel.

Interim reclamation of pad will begin within 6 months (weather permitting) of completion of the well. Interim reclamation will consist of redistribution of excess soil, re-contouring the areas of the pad not needed for production as close to original as possible. All areas not needed for

transportation of produced liquids and routine maintenance will be re-vegetated in accordance with the reclamation section of the multi-point surface operations plan.

Final reclamation of each project will begin within 6 months (weather permitting) of well plugging, or in the event of a dry hole. Final reclamation will be completed in accordance with the reclamation section of the multi-point surface operations plan, which consists of proper plugging of wells, removal of all facilities and related equipment from the surface of the site (if left in place, abandoned pipelines will be flushed, cut below ground level, and capped), and removal of any surfacing materials on road or pad. Top soil will be stripped and segregated so it can be spread evenly over the entire area. Pad and road areas will be ripped, re-contoured to their original form and top soil will be evenly spread over the surface. The area will be drill or broadcast seeded, and if necessary covered with weed free mulch. Area will be monitored for presence of weeds, which will be controlled if present. If initial seeding is not successful, the operator must re-seed the area until desirable vegetation is established. The bond will not be released until BLM has determined that successful reclamation has been achieved.

The Application for Permit to Drill (APD) includes a detailed and specific drilling program and multi-point surface operations plan (including detailed construction and reclamation plans.) The proposed action would be implemented consistent with the operations plans provided with approved permit, with Conditions Of Approval (COAs), terms of lease # COC67169, Onshore Oil and Gas Orders, 43 CFR §3100 and all applicable state and local laws.

Figure 2.1.

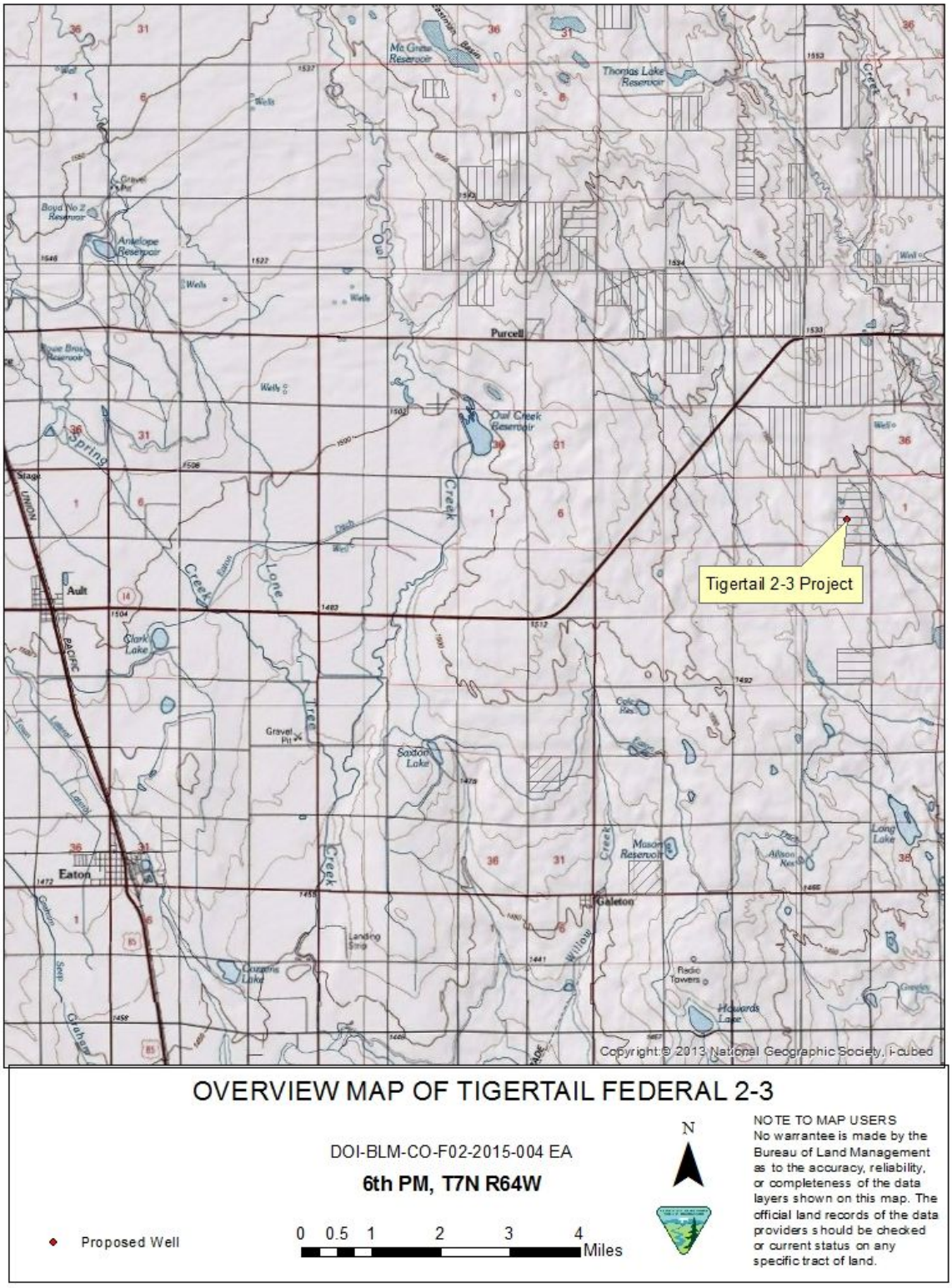

Tigertail 2-3 Project
Purcell
Ault
Eaton
Galeton
Mc Gree Reservoir
Thomas Lake Reservoir
Antelope Reservoir
Owl Creek Reservoir
Clark Lake
Saxton Lake
Mason Reservoir
Long Lake
Howards Lake
Copyright:© 2013 National Geographic Society, i-cubed
OVERVIEW MAP OF TIGERTAIL FEDERAL 2-3
DOI-BLM-CO-F02-2015-004 EA
6th PM, T7N R64W
Proposed Well
0 0.5 1 2 3 4 Miles
N
NOTE TO MAP USERS
No warrantee is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked or current status on any specific tract of land.

Figure 2.2.

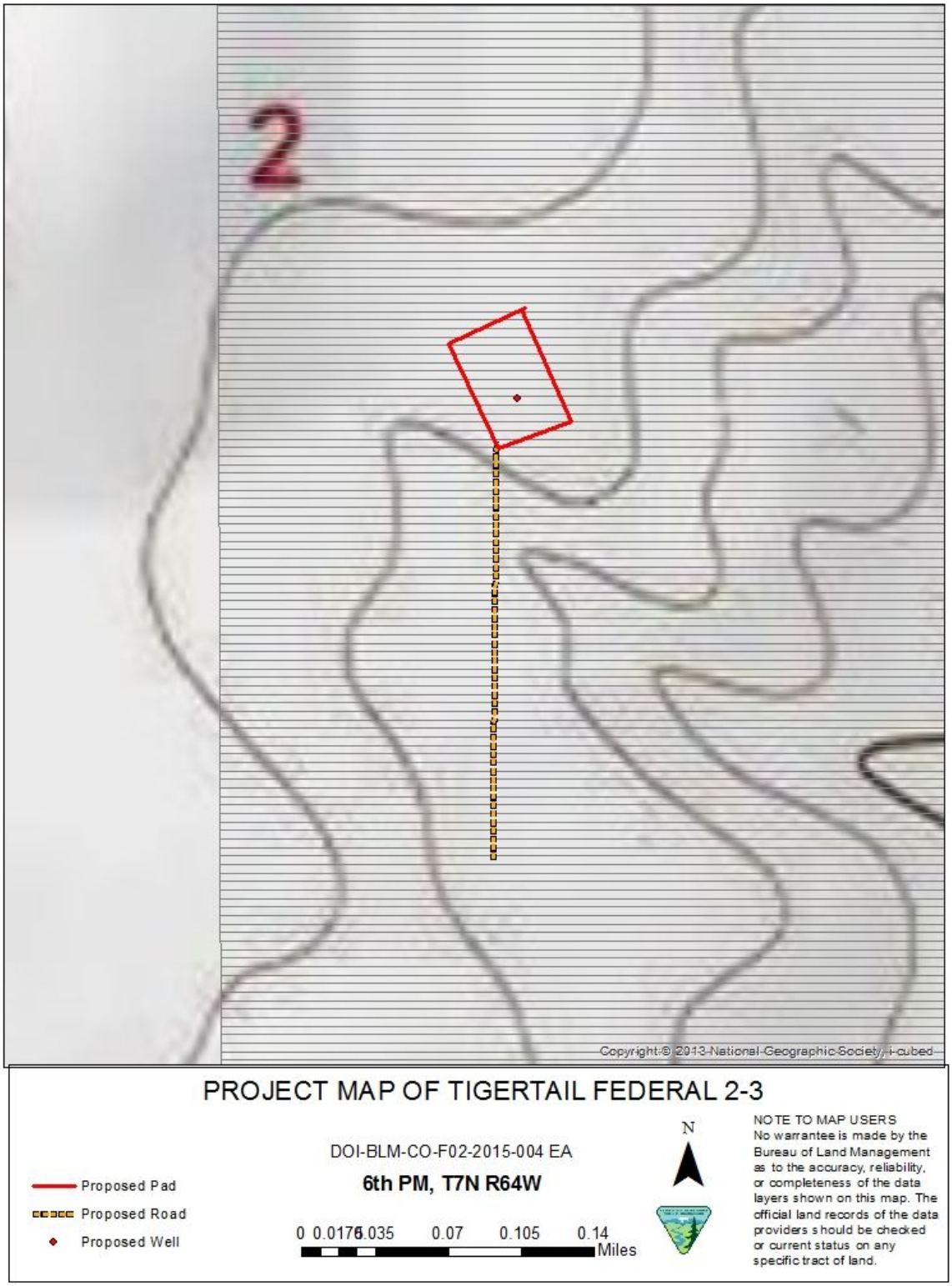

2
Copyright:© 2013 National Geographic Society, i-cubed
PROJECT MAP OF TIGERTAIL FEDERAL 2-3
DOI-BLM-CO-F02-2015-004 EA
6th PM, T7N R64W
Proposed Pad
Proposed Road
Proposed Well
0 0.0175 0.035 0.07 0.105 0.14
Miles
N
NOTE TO MAP USERS
No warrantee is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked or current status on any specific tract of land.

Figure 2.3.

PROJECT MAP OF TIGERTAIL FEDERAL 2-3
DOI-BLM-CO-F02-2015-004 EA
6th PM, T7N R64W
Proposed Pad
Proposed Road
Proposed Well
0 0.0175 0.035 0.07 0.105 0.14
Miles
N
NOTE TO MAP USERS
No warrantee is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked or current status on any specific tract of land.

2.2.1. No Action Alternative

The proposed action involves federal subsurface minerals that are encumbered with federal oil and gas leases, which grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied. The no action alternative constitutes denial of the APD associated with the proposed action.

2.3. Alternatives Considered

2.3.1. Alternatives Considered, but not Analyzed in Detail

Other alternatives were not considered due to the proposed project being a non-discretionary action being proposed on private surface estate.

Chapter 3 Affected Environment and Effects

3.1. Introduction

3.1.1. Interdisciplinary Team Review

The following table is provided as a mechanism for resource staff review, to identify those resource values with issues or potential impacts from the proposed action and/or alternatives. Those resources identified in the table as impacted or potentially impacted will be brought forward for analysis.

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
Air Quality Ty Webb, Chad Meister, Forrest Cook	AR for CM 4/16/2015	See Affected Environment
Geology/Minerals Stephanie Carter, Melissa Smeins	MJS, 11/4/2014	See Geology/Minerals Section 3.2.2
Soils John Smeins	JS, 11/4/14	See Soils section, 3.2.3
Water Quality Surface and Ground John Smeins	JS, 11/4/14	see Water Quality section, 3.2.4
Invasive Plants John Lamman	JL, 11/10/2014	See affected environment.
T&E and Sensitive Species Matt Rustand	MR, 12/2/2014	See affected environment.
Vegetation Jeff Williams, Chris Cloninger, John Lamman	JL, 11/10/2014	See affected environment.
Wetlands and Riparian Dave Gilbert	DG 11/17/2014	The Proposed Action is within an upland setting.
Wildlife Aquatic Dave Gilbert	DG 11/17/2014	The Proposed Action is within an upland setting and away from aquatic habitat.
Wildlife Terrestrial Matt Rustand	MR, 12/2/2014	See affected environment.
Migratory Birds Matt Rustand	MR, 12/2/2014	See affected environment.
Cultural Resources Monica Weimer	MMW, 10/28/14	The proposed undertaking will have no effect on any historic properties (those eligible for the NRHP) [see report CR-RG-11–111 (P)].
Native American Religious Concerns Monica Weimer	MMW, 10/28/14	The BLM conducted a consultation with 17 tribes (CR-RG-14-34 NA), and none identified properties of traditional religious or cultural significance in the APE.

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
Economics	AR 4/16/15	Economic impacts would be limited to a slight temporary increase in demand for local services during drilling/construction, and slight increase in royalties to the federal government and severance taxes to state and local governments.
Paleontology Melissa Smeins, Stephanie Carter	MJS, 11/4/ 2014	See Paleontological Resources Section 3.4.3
Visual Resources Linda Skinner	LS, 10/28/ 2014	No public surface area to affect visual resources.
Environmental Justice Martin Weimer	mw, 10/28/14	The proposed action affects areas that are rural in nature. The land adjacent to these parcels is mixed short grass prairie and farmland, as a result, there are no minority or low-income populations in or near the project area. As such, the proposal will not have a disproportionately high or adverse environmental effect on minority or low-income populations.
Wastes Hazardous or Solid Stephanie Carter	MJS, 11/4/ 2014	See Wastes Section 3.4.7
Recreation Linda Skinner	LS, 10/28/ 2014	No public surface area or access for recreation.
Farmlands Prime and Unique Jeff Williams, Chris Cloninger, John Lamman	JL, 11/10/2014	No Prime or Unique Farmlands
Lands and Realty	AR, 4/16/2015	N/A Private Surface
Wilderness, WSAs, ACECs, Wild & Scenic Rivers Linda Skinner	LS 10/28/2014	No Wilderness, WSAs, ACECs, Wild &Scenic Rivers in the area.
Wilderness Characteristics Linda Skinner	LS, 10/28/ 2014	No areas with wilderness characteristics in the project area.
Range Management Jeff Williams, Chris Cloninger, John Lamman	JL, 11/10/2014	Surface estate is private.
Forest Management Ken Reed	AR, 4/16/2015	N/A Private Surface
Cadastral Survey	AR 4/16/2015	Chain of Surveys Completed
Noise Martin Weimer	mw, 10/28/14	The project area is located in farm and grasslands. Certain levels of noise are associated with drilling operations, these include drill rig operation, compressors/generators and general machine and vehicle operation. Such noises could have the effect of driving away wildlife. These impacts are temporary and terminate when drilling operations are complete.

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
Fire Ty Webb	AR, 4/16/2015	N/A Private Surface
Law Enforcement Steve Cunningham	mw for SC,10/28/14	There are no law enforcement issues associated with this action.

The affected resources brought forward for analysis include:

- Air Quality and Climate
- Geologic and Mineral Resources
- Soils
- Hydrology/Water Quality
- Invasive Plants
- Threatened, Endangered and Sensitive Species
- Vegetation
- Wildlife Terrestrial
- Migratory Birds
- Paleontological Resources
- Wastes, Hazardous and Solid

3.2. Physical Resources

3.2.1. Air Quality and Climate

Affected Environment:

The Clean Air Act (CAA), which was last amended in 1990, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS), codified at 40 Code of Federal Regulations (CFR) part 50, for criteria pollutants. Criteria pollutants are air contaminants that are commonly emitted from the majority of emissions sources and include carbon monoxide (CO), lead (Pb), sulfur dioxide (SO2), particulate matter smaller than 10 and 2.5 microns (PM10 and PM2.5, respectively), ozone (O3), and nitrogen dioxide (NO2). Ambient air quality standards must not be exceeded in areas where the general public has access.

The CAA established two types of NAAQS:

Primary standards: – Primary standards set limits to protect public health, including the health of "sensitive" populations (such as asthmatics, children, and the elderly).

Secondary standards: – Secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

The EPA regularly reviews the NAAQS (every five years) to ensure that the latest science on health effects, risk assessment, and observable data such as hospital admissions are evaluated, and can revise any NAAQS if the data supports a revision. The Colorado Air Pollution Control Commission can establish state ambient air quality standards for any criteria pollutant. Any state standard must be at least as stringent as the federal standards. Table 3-1 lists the federal and Colorado ambient air quality standards.

Pollutant **[final rule citation]**		**Standard** **Type**	**Averaging Period**	**Level a**	**Form**
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		Primary	8-hour	9 ppm	Not to be exceeded more than once per year c
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		Primary and secondary	Rolling 3-month average	0.15 µg/m3	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		Primary and secondary	Annual	53 ppb	Annual mean
Ozone [73 FR 16436, Mar 27, 2008]		Primary and secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter [73 FR 3086, Jan 15, 2013]	PM2.5	Primary	Annual	12 µg/m3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m3	Annual mean, averaged over 3 years
		Primary and secondary	24-hour	35 µg/m3	98th percentile, averaged over 3 years
	PM10	Primary and secondary	24-hour	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010]		Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
[38 FR 25678, Sept 14, 1973]		Secondary	3-hour	0.5 ppm b	Not to be exceeded more than once per year

a mg/m3 = milligrams per cubic meter, µg/m3 = micrograms per cubic meter, ppb = parts per billion, ppm = parts per million.

b Colorado Ambient Air Quality Standard for 3-hour SO2 is 0.267 ppm.

Source: National – 40 CFR 50, Colorado – 5 CCR 1001-14

c 8-hr CO standard is based on the second high

For areas that do not meet the NAAQS (these are designated by EPA as nonattainment areas), the CAA establishes timetables for each region to achieve attainment of the NAAQS. The State (Colorado Department of Public Health and Environment [CDPHE]) must prepare a State Implementation Plan (SIP), which documents how the region will reach attainment by the required date. A SIP includes inventories of emissions within the area and establishes emission budgets (targets) and emission control programs that are designed to bring the area into compliance with the NAAQS. In maintenance areas (nonattainment areas that have achieved attainment), SIPs document how the State intends to maintain compliance with NAAQS.

In addition to the criteria pollutants, regulations also exist to control the release of hazardous air pollutants (HAPs). HAPs are chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. EPA currently lists 188 identified compounds as hazardous air pollutants, some of which can be emitted from oil and gas development operations, such as benzene, toluene, and formaldehyde. Ambient air quality standards for HAPs do not exist; rather these emissions are regulated by the source type, or specific industrial sector responsible for the emissions.

The CAA and the Federal Land Policy and Management Act of 1976 (FLPMA) require BLM and other federal agencies to ensure actions taken by the agency comply with federal, state, tribal, and local air quality standards and regulations. FLPMA further directs the Secretary of the Interior to take any action necessary to prevent unnecessary or undue degradation of the lands [Section 302 (b)], and to manage the public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" [Section 102 (a)(8)].

Section 176(c) of the CAA prohibits Federal entities from taking actions in non-attainment or maintenance areas that do not "conform" to the SIP. The purpose of this conformity requirement is to ensure that Federal activities: (1) do not interfere with the budgets in the SIPs; (2) do not cause or contribute to new violations of the NAAQS; and (3) do not impede the ability to attain or maintain the NAAQS. To implement CAA Section 176(c), EPA issued the General Conformity Rule (40 CFR Part 93, Subpart B), which applies to all Federal actions not funded under U.S.C. Title 23 or the Federal Transit Act (BLM actions are not funded by U.S.C. Title 23 or the Federal Transit Act). The General Conformity Rule established emissions thresholds (40 CFR 93.153), known as *de minimis* levels, for use in evaluating the conformity of a federal action. If the net emissions increases due to the action are less than these thresholds, the project is presumed to conform and no further conformity evaluation is required. If the emissions increases exceed any of these thresholds, a conformity determination is required. The conformity determination can entail air quality modeling studies, consultation with EPA and state air quality agencies, and commitments to revise the SIP or to implement measures to mitigate air quality impacts. The BLM, as the federal entity with jurisdiction for the proposed action (i.e. the approval of a single application for permit to drill (APD), must demonstrate that the proposed action(s) meet(s) the requirements of the General Conformity rule.

The proposed Tiger Tail well is located within the EPA-designated Denver-Boulder-Greeley-Fort Collins ozone nonattainment area. Because the General Conformity rule applies to actions in nonattainment or maintenance areas, these well is subject to the general conformity requirements. Figure 3-1 depicts the general location with respect to the nonattainment area boundaries and also provides context for the current and historical oil and gas development within the area, with the red dots indicating existing well locations.

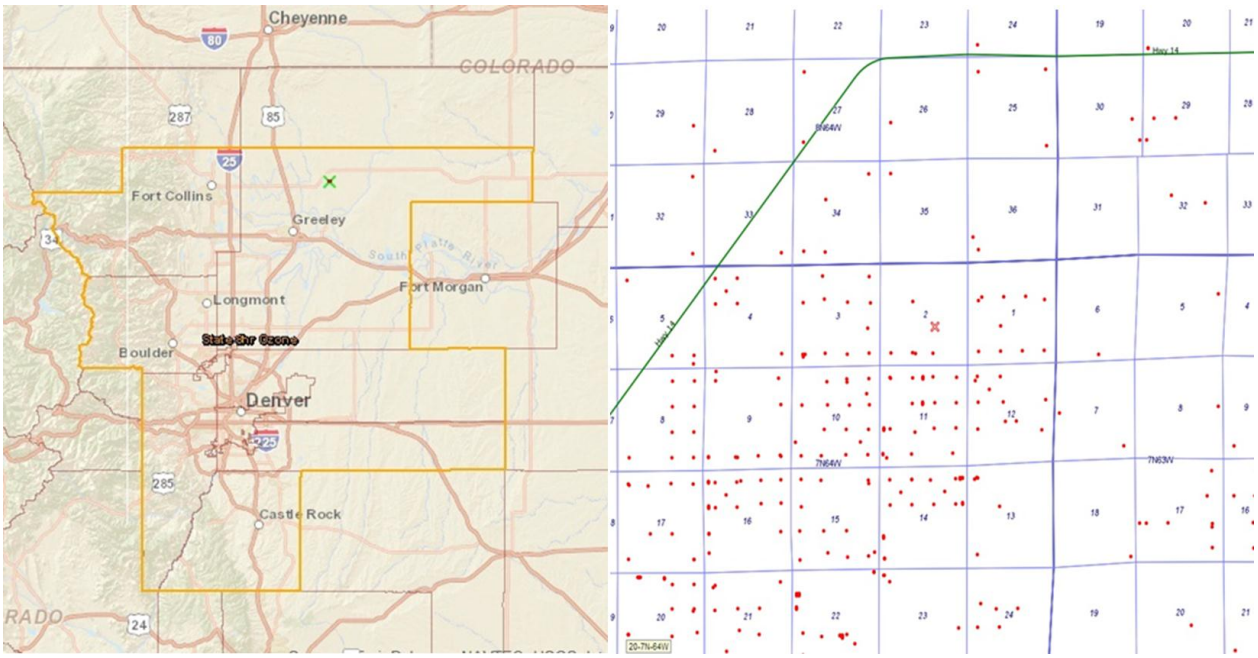


Figure 3.1. Well location and Ozone Nonattainment Area & Area O&G Development

The Prevention of Significant Deterioration (PSD) provision of the CAA established Class I areas in which very little degradation of air quality is allowed (e.g., national parks and large wilderness areas) and Class II areas (all non-Class I areas). The PSD Class II designation allows for moderate degradation of air quality within certain limits above baseline air quality. In addition to the criteria PSD pollutants, Class I & II areas may also be analyzed for Air Quality Related Values (AQRVs). AQRVs are metrics for atmospheric phenomenon like visibility and deposition impacts that may adversely affect specific scenic, cultural, biological, physical, ecological, or recreational resources. Visibility changes can occur when excessive air contaminates (mostly fine particles) scatter light such that the background scenery becomes hazy. Deposition (via wet and dry mechanical processes) can cause excess nutrient loading in native soils and acidification of the landscape, which can lead to declining buffering capacity changes in sensitive stream and lake water chemistries (commonly referred to as acid neutralization change (ANC)). The tiger Tail pad is within an area designated as Class II. The closest Class I area to the proposed well site locations is Rocky Mountain National Park, which lies approximately 86 km to the west.

Land Use in the Project Region: The vicinity of the Project Area (northern Weld County) is predominantly used for agriculture. Approximately 75% of the available land area of Weld County is linked to the agricultural sector of the economy in one form or another. Oil and gas development is another major economic driver for the area, and Weld County has more than 25,000 active wells within its boundaries. The population density of Weld County within the vicinity of the Project Area is generally dispersed, with less than 25 people per square mile. Activities occurring within the area that affect air quality include exhaust emission from cars, drilling rigs, agricultural equipment, and other vehicles, and oil and gas development activities, as well as fugitive dust from roads, agriculture, and energy development.

Meteorology in the Project Region: Mean temperatures in the area range from 15.6 degrees Fahrenheit (°F) in January to 88.7° F in July. The area receives average annual precipitation of approximately 14.22 inches. Frequent winds in the area and a lack of complex topographical

features provide for excellent dispersion characteristics for anthropogenic emissions within the region.

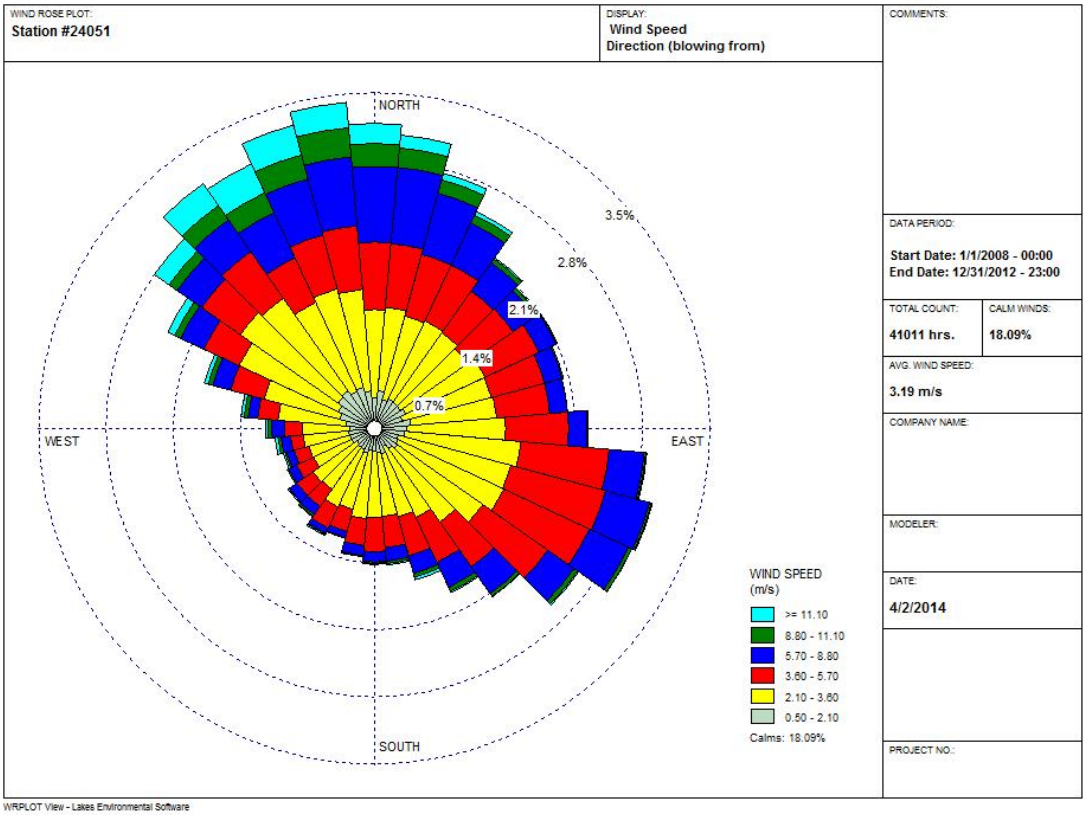


Figure 3.2.

Existing Air Quality Measured in the Region and County Emissions: The Air Pollution Control Division (APCD) of the Colorado Department of Public Health and Environment measures ambient air quality at a number of locations throughout the state. The nearest APCD air monitors to the project are the Weld County West Annex (CO), County Tower (O3), and Hospital (PM10 and PM2.5) sites located in Greeley, and one site in Briggsdale (O3). Table 3-2 provides the measured concentrations of criteria pollutants at these monitors for the most recent three years. There are no lead, NO2, or SO2 monitors near the project area. Table 3-2 indicates that no violations of the NAAQS have occurred in the project region in the last three years, (O3 3 yr. ave. = 74.6 ppb). Table 3-3 provides a look at the corresponding emissions levels within Weld County that may contribute to the monitored air quality data. The EPA compiles the National Emissions Inventory (NEI) as a triennial report, with the last available compilation year being 2011.

Table 3-2: Measured Ambient Concentrations in the Region

Monitor Location	**Pollutant (Averaging Period – Unit, Form)**	**Measured Concentration**		
		2011	**2012**	**2013**
Weld County West Annex, Greeley	CO (1 Hour – ppm, maximum)	2.7	3.2	2.6
	CO (8 Hour – ppm, maximum)	1.5	1.6	1.4

Monitor Location	Pollutant (Averaging Period – Unit, Form)	Measured Concentration		
		2011	2012	2013
Weld County Tower, Greeley	O3 (8 Hour – ppm, 4th maximum)	0.077	0.074	0.073
Briggsdale	O3 (8 Hour – ppm, 4th maximum)	0.066	–	–
Weld County Health Dept. (Hospital), Greeley	PM10 (24 Hour - µg/m3, maximum)	46	91	47
	PM2.5 (24 Hour - µg/m3, 98th percentile)	23	32	18
	PM2.5 (Annual - µg/m3, annual mean)	6.7	7.9	7

Table 3–3: Weld County NEI Data

Weld	PM10	PM2.5	VOC	CO	NOX	SO2	CO2	CH4	N2O	NH3	HAPs
Agriculture	9,082.1	1,865.76	.	.	.	.	.	.	.	15,762.85	.
Biogenics	.	.	21,009.7	4,785.29	1,977.03	.	.	.	.	.	4,285.85
Bulk Gasoline Terminals	.	.	201.55	3.72	2.22	.	.	.	.	.	3.01
Commercial Cooking	57.41	53.25	7.72	22.07	.	.	.	.	.	.	2.96
Dust	14,441.01	1,746.99	.	.	.	.	.	.	.	.	.
Fires	1,143.49	662.71	912.93	7,256.49	236.89	113.98	31,689.18	125.99	.	42.12	333.41
Fuel Comb	755.03	751.5	2,716.57	10,024.4	7,566.29	118.99	.	.	.	172.3	485.6
Gas Stations	.	.	688.37	.	.	.	.	.	.	.	12.14
Industrial Processes	1,890.59	646.6	105,039.54	4,616.66	7,534.01	295.91	.	.	.	.	535.53
Miscellaneous	.	.	158.17	.	.	.	.	.	.	.	11.66
Mobile	457.31	383.81	3,743.02	41,484.96	8,320.49	43.51	1,750,627.	140.48	59.45	103.	940.11
Solvent	22.41	18.7	3,069.71	7.47	18.58	.	.	.	.	.	1,258.83
Waste Disposal	110.34	64.94	170.21	21.16	7.51	2.13	.	.	.	.	16.77
Sum Totals:	**27,959.7**	**6,194.28**	**137,717.5**	**68,222.23**	**25,663.02**	**574.52**	**1,782,316.18**	**266.48**	**59.45**	**16,080.26**	**7,885.87**

Source: EPA NEI 2011

There is broad scientific consensus that humans are changing the chemical composition of Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accumulation of trace greenhouse gases (GHGs) such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and several industrial gases in the Earth's atmosphere. An increase in GHG emissions is said to result in an increase in the earth's average surface temperature, primarily by trapping and thus decreasing the amount of heat energy radiated by the Earth back into space. The phenomenon is commonly referred to as global warming. Global warming is expected in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, which is collectively referred to as climate change. The Intergovernmental Panel on Climate Change (IPCC) has predicted that the average global temperature rise between 1990 and 2100 could be as great as 5.8°C (10.4°F), which could have massive deleterious impacts on the natural and human environments. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and the burning of fossil carbon fuel sources have caused GHG concentrations to increase measurably, from approximately 280 ppm in 1750 to 400 ppm in 2014 (as of April). The rate of change has also been increasing as more industrialization and population growth is occurring around the globe. This fact is demonstrated by data from the Mauna Loa CO2 monitor in Hawaii that documents atmospheric concentrations of CO2 going back to 1960, at which point the average annual CO2 concentration was recorded at approximately 317 ppm. The record shows that approximately 70% of the increases in atmospheric CO2 concentration since pre-industrial times occurred within the last 54 years.

Environmental Effects:

Proposed Action (Direct and Indirect Impacts): The proposed action will have a temporary negative impact to air quality which will mostly occur during the construction phase. Utilization of the access road, surface disturbance, and construction activities such as drilling, well

completion, and equipment installation will all impact air quality through the generation of dust related to travel, transport, and general construction. This phase will produce short term emissions of criteria, hazardous, and greenhouse gas pollutants from vehicle and construction equipment exhausts. Once construction is complete the daily activities at the site will be reduced to operational and maintenance checks which may be as frequent as daily visits. Emissions will result from vehicle exhausts from the maintenance and process technician visits, as well as oil and produced water collection or load out trips. The pad can be expected to produce fugitive emissions of liquid flashing gases, which can contains a mixture of methane, volatile organic compounds, and inert or non-regulated gases. Fugitive emissions may result from pressure relief valves and working and breathing losses from any tanks located at the site, as well as any flanges, seals, valves, or other infrastructure connections used at the site.

An emissions inventory (see table 3-4 below) has been compiled for the well pad based on the levels of activities required to implement the proposed action. The emissions inventory (EI) considered reasonably foreseeable oil and gas development activities for the proposed well, and includes emissions from both construction and production operations. The following pollutants were inventoried where an appropriate basis, methodology, and sufficient data exists: CO, NOX (includes NO2), PM2.5, PM10, SO2, VOCs, HAPs, CO2, CH4, and N2O. The EI was developed using reasonable but conservative scenarios for each activity. Production emissions were calculated based on full production activity for an entire year. Potential emissions were calculated for the well assuming the minimum/basic legally required control measures, site specific voluntary operator controls, operational parameters, and equipment configurations data that was provided by the applicant.

Table 3-4: Tiger Tail 2-3 Emissions Inventory

Emissions Summary (tons) Total Wells to be Developed = 1 Total Well-Pads to be Developed = 1 Federal Factor ("1" = 100%) = 1.00

Activity	Criteria Pollutants						GHGs				HAPs
Construction	PM10	PM2.5	VOC	NOx	CO	SO2	CO2	CH4	N2O	CO2eq	All
Construction Activities	0.18	0.03	0.01	0.07	0.07	0.00	13.21	0.00	0.00	13.32	0.00
Rig & Drilling Ops	0.57	0.16	0.19	3.46	2.14	0.12	420.45	53.69	10.74	4,876.61	0.00
Completion	0.25	0.05	0.23	0.72	0.49	0.02	91.77	2.10	0.08	161.69	0.02
Initial Reclaimation	0.09	0.02	0.00	0.03	0.03	0.00	5.97	0.00	0.00	6.02	0.00
Sub-total: Construction	**1.08**	**0.26**	**0.44**	**4.28**	**2.74**	**0.15**	**531.39**	**55.79**	**10.82**	**5,057.64**	**0.02**
Operations											
Fugitive Dust	1.16	0.14	NA	NA	NA	NA	NA	NA	NA	NA	NA
On-Road Mobile	0.01	0.01	0.02	0.19	0.24	0.00	55.55	0.00	0.00	55.75	0.00
Off-Road Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.19	0.00
Non-Road Portable	0.00	0.00	0.00	0.06	0.05	0.00	7.07	0.02	0.00	8.55	0.00
Tanks	NA	NA	2.23	NA	NA	NA	NA	0.00	NA	0.00	0.37
Tank (liquids) Loadouts	NA	NA	0.15	NA	NA	NA	NA	0.00	NA	0.00	0.00
Components	NA	NA	0.55	NA	NA	NA	0.91	4.97	NA	105.36	0.07
Pneumatic Devices	NA	NA	0.29	NA	NA	NA	0.48	2.66	NA	56.35	0.03
Heaters	0.00	0.00	0.00	0.04	0.04	0.00	51.47	0.00	0.00	51.78	0.00
Stationary Engines / Pumps	0.00	0.00	0.18	0.26	0.52	0.00	118.24	1.34	0.00	146.47	0.00
Compression Start-up & Shutdown	NA	NA	0.00	NA	NA	NA	NA	0.00	NA	0.00	0.00
Dehydration Units	NA	NA	0.00	NA	NA	NA	NA	0.00	NA	0.00	0.00
Flares / Control Equipment	0.00	0.00	0.00	0.01	0.03	0.00	8.58	0.00	0.00	8.61	0.00
Blowdown Venting	NA	NA	0.05	NA	NA	NA	0.09	0.51	NA	10.72	0.01
Flares / Blowdowns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Workovers - Re-completions	0.13	0.03	0.12	0.36	0.25	0.01	45.88	1.05	0.04	80.84	0.00
Flares / Workovers - Re-completions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Operations	**1.30**	**0.18**	**3.59**	**0.92**	**1.13**	**0.02**	**288.46**	**10.56**	**0.05**	**524.63**	**0.47**
Sub-total: General Conformity	NA	NA	**2.93**	**4.94**	NA	NA	NA	NA	NA	NA	NA
Total Emissions	**2.39**	**0.45**	**4.03**	**5.20**	**3.86**	**0.16**	**819.85**	**66.35**	**10.87**	**5,582.27**	**0.50**

Notes:

Recompletion and workover activities are unlikely to occure in the first few years of production when other production based emissions (flashing, dehy, loadouts, etc...) are at their highest, thus they are not included in the totals, but are presented for informational purposes only.

Conformity subtotals calculated for the Denver - Northern Front Range 8 hr Ozone Nonattainment area only. Future updates may include calcs for other state Maintenance areas as needed.

Ozone is noticeably absent from the EI due to the fact that it is not directly emitted like other criteria pollutants. Ozone is chemically formed in the atmosphere via interactions of oxides of nitrogen (NOX) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NOX and VOCs are ozone precursors). Ozone formation and prediction is complex, non-linear, generally results from a combination of significant quantities of VOCs and NOX emissions from various sources within a region, and has the potential to be transported across long ranges. Therefore, it is typically not appropriate to assess (i.e. model) potential ozone impacts of a single project on potential regional ozone formation and transport. However, to obtain region wide ozone assessment data the BLM has initiated the Colorado Air Resources Management Modeling Study (CARMMS). The study utilized the Comprehensive Air-quality Model with extensions (CAMx) to predict statewide impacts to air quality and air quality related values from projected oil and gas development out to year 2021 for three development scenarios (low, medium, and high). Each BLM field office was modeled with the source apportionment option, meaning that incremental impacts to regional ozone and AQRVs from development in these areas are essentially tracked to better understand the significance of such development on impacted resources and populations. At this time, only the CARMMS high / RFD modeling scenario is complete, and thus only those results will be used to describe potential air quality impacts of future federal oil and gas development within the RGFO Planning Area. See the results / more information within the cumulative impacts section below.

The General Conformity Rule at 40 CFR 93.153 defines the *de minimis* thresholds for NOX and VOC in a marginal or moderate ozone nonattainment areas, and outside of any designated transport region, as 100 tons per year (tpy). The federal action triggering the general conformity rule applicability analysis is the approval of the well APD.

The proposed action(s) is scheduled to commence in the spring of 2015, with the construction phase lasting approximately 2 months. The life of the wells, if economically viable, would be expected to sustain operations for approximately 20 – 30 years once production begins. Maximum foreseeable direct and indirect emissions would occur at the beginning of the project (2015).

The Tiger Tail 2-3 APD well project, as designed and submitted, have been evaluated in accordance with the requirements of 40 CFR 93.153 subpart B and have been found to conform for the following reason(s):

[X] Potential maximum total Direct and Indirect emissions that are not subject to exemptions under the rule are below *de minimis* threshold levels:

Ozone (NOX): 5.20 tpy in 2015 (maximum year, combined construction and production)

Ozone (VOC): 4.03 tpy in 2015 (maximum year, combined construction and production)

A screening-level near-field ambient air quality impact assessment was performed to quantify and evaluate maximum pollutant impacts at sensitive ambient receptors in the immediate area of the proposed North Platte facilities. The BLM Colorado near-field modeling tool uses the EPA AERMOD modeling system for estimating ambient air concentrations for access road (or corridor) construction / travel emissions and emissions associated with one or two centralized O&G well-pads / facilities. Five years (2008-2012) of Colorado-based surface and upper-air meteorology is used to predict possible air quality impacts for both screening tools modules (roadway and centralized facilities). The screening model predicts the maximum concentration of a pollutant for a given receptor distance for typical O&G volume and point source release parameters (fugitive (non-combustion) and combustion related emissions sources, respectively).

Using aerial images and GIS, the nearest ambient receptor (location of residence, business, school, hospital) was determined to be approximately 1,860 meters from the proposed site. The screening tool was run for the maximum emissions rate as determined from the emissions inventory for all of the estimated processes / activities. Table 3-5 presents the results of the screening analysis.

Table 3-5 Screening Model Results

Pollutant	Ave. Period	Modeled Parameter(s)	Concentration (ug/m3)		Standard (ug/m3)	Percent of NAAQS
			Modeled	Background		
CO	1 hour	construction, point source (drilling)	35.02	5.0	40,000	1%
NO2	1 hour	construction, point source (drilling)	43.58	112.8	189	83%
NO2	Annual	construction, point source (drilling)	1.09	20.7	100	22%
PM10	24 hour	production, volume (fugitive dust)	32.19	41	150	49%
PM2.5	24 hour	production, volume (fugitive dust)	2.62	22	35	70%
PM2.5	Annual	production, volume (fugitive dust)	0.27	7	12	61%

* Percent of NAAQS is the modeled concentration plus the background divided by the standard. All backgrounds provided by CDPHE with the exception of CO, which was estimated from the 1st maximum monitored value within the area. The analysis is a snapshot, and does not consider multi-year values where such standards exist.

As shown in the Table above, the maximum modeled impacts at the ambient receptors distance from proposed project well-pad emissions are below the applicable NAAQS. In order to achieve compliance with the PM NAAQS for the well-pad facility modeling, the construction activity dust emissions were controlled to levels attained by continuous watering. A 50% control assumption is a standard practice where daily watering of the disturbed surfaces is employed to control dust emissions. This control value is reflected in the emissions inventory.

The BLM also performed a screening analysis for two Hazardous Air Pollutants (HAPs); formaldehyde (point – engines), and benzene (volume – fugitives). Background pollutant concentration data collected at a regional monitoring site that is located in a high-density area of oil and gas were obtained from EPA Air Quality System (AQS) database and are included for total modeled concentrations. The background concentrations represent all non-project near-field emissions sources and are added to the near-field modeled concentrations to produce cumulative predicted near-field concentrations for comparison to applicable impact thresholds.

Short-term (1-hour) HAP concentrations are compared to acute Reference Exposure Levels (RELs). RELs are defined as concentrations at or below which no adverse health effects are expected. These values approximate pollutant concentrations likely to produce mild effects during 1-hour exposures. The 1 hr. maximums results for both pollutants were less than 10% of the applicable RELs.

Long-term maximum potential exposures to HAPs are compared to Reference Concentrations for Chronic Inhalation (RfCs). An RfC is defined by USEPA as the daily inhalation concentration at which no long-term adverse health effects are expected. RfCs exist for both non-carcinogenic and carcinogenic effects on human health. Annual modeled HAP concentrations are compared

directly to the non-carcinogenic RfCs, and modeled benzene and formaldehyde annual average concentrations for all receptors are no more than 50% of their respective RfCs.

As for air quality related values (AQRVs) such as deposition and visibility impacts, the BLM used the Flag 2010 screening guidance for projects that are at distances greater than 50km from any Class I or sensitive Class II area to determine if a more refined analysis should be considered. Although the screening method is not explicitly applicable to non-PDS sources (i.e. minor sources), it still provides useful data for determining if additional analysis should be considered. The results (0.09 <= 10) of the Q/d analysis (NOX + PM10 + SO2 / distance (km)) suggest the project will have negligible impacts to Rocky Mountain National Park, the closest Class I area. Thus, no further discussion of project level AQRVs is warranted.

The implementation of the Proposed Action is estimated to contribute 5,490 tons of carbon dioxide equivalent (CO2e) in the maximum year (2015). Annual operating GHG emissions will be approximately 9% of the total emissions shown for the maximum year within the first year of full production. Over the average 25 year project timeframe the total GHG emissions can be conservatively estimated to be approximately 16,852 tons of CO2e. The estimate is a linear interpolation and does not account for production declines nor additional lift or compression that may be required as the well ages. The total provided also does not account for the ultimate use or consumption of any produced minerals at this time due to the fact that the ultimate form of use and any additional processing required to render the product to sufficient quality (which would cause changes to the quantity of product) cannot be predicted with any reasonable certainty. Additionally, it should be noted that production values are all estimates at this time and will vary significantly over the life of the project making any prediction of the quantities of GHG emitted very speculative.

In 2010, the state of Colorado's GHG emissions was 130,000,000 metric tons[1]The proposed action's GHG emissions represent about 0.0013% of the state of Colorado's GHG emissions on an annual basis. The relative magnitude of greenhouse gas emissions associated with the development of the well as compared to the state's GHG emission levels is extremely small. To provide additional context for the level of project emissions and potential impacts, the EPA has recently modeled global climate change impacts from a model source emitting 20% more GHGs than a 1500MW coal-fired steam electric generating plant (approx. 14,132,586 metric tons per year of CO2, 273.6 metric tons per year of nitrous oxide, and 136.8 metric tons per year of methane). It estimated a hypothetical maximum mean global temperature value increase resulting from such a project. The results ranged from 0.00022 and 0.00035 degrees Celsius occurring approximately 50 years after the facility begins operation. The modeled changes are extremely small, and any downsizing of these results from the global scale would produce greater uncertainly in the predictions. The EPA concluded that even assuming such an increase in temperature could be downscaled to a particular location, it "would be too small to physically measure or detect", see Letter from Robert J. Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation re: "Endangered Species Act and GHG Emitting Activities (Oct. 3, 2008). The project emissions are a fraction of the EPAs modeled source and are shorter in duration, and therefore it is reasonable to conclude that the project would have no measurable impact on the climate.

Cumulative Impacts:

[1]Colorado Greenhouse Gas Inventory—2014 Update Including Projections to 2020 & 2030, https://www.colorado.gov/pacific/sites/default/files/AP-COGHGInventory2014Update.pdf

The area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. The addition of the infrastructure needed to construct and drill the additional pad and well would have a cumulative impact to the area's air quality; however, given the existing level of development in the area, the proposed action's impacts would be very minor. In the long term, if economical quantities of oil and gas are found and /or produced, additional wells can be expected to be drilled on Federal, State, and private lands. This could result in additional impact to air quality in the future.

As discussed above, the BLM in an effort to analyze cumulative impacts to air quality (including ozone and AQRVs), has initialized the Colorado Air Resources Management Modeling Study (CARMMS). The results shown below are for the high RFD scenario. The data is presented for four quasi cumulative source groups that range from the RGFO source apportionment (SA) area #1, i.e. where the tiger Tail project will occur (Note: the RGFO was broken up into 4 distinct geographical regions due to its size and varying levels and types of oil and gas development), to the full one atmosphere model domain that CAMx has the capability to simulate. The CARMMS report is not yet final, and is far too complex to provide an adequate summary of the study methodologies within this document. However, when the study concludes (projected to be the end of 2014), all of the CARMMS information will be available to the public via the BLM Colorado website.

Table 3-6 CARMMS High Emissions (2021 - tons)

SA Area (Group)	CARMMS High Scenario SA Area Name	PM10	PM2.5	NOX	VOC
I + J	RGFO O&G Federal	910	119	1,233	3,557
R	All BLM CO Federal O&G	7,856	1,430	29,245	67,929
S	All Colorado O&G (federal and non-federal)	37,842	6,888	131,649	313,464
W	CAMx Cumulative (4km)	*	339,768	814,425	2,140,889

*Data missing from draft CARMMS report

PSD Increment Impacts: EPA has defined PSD Concentrations Increments for Class I and II areas for 8 different pollutant concentration/averaging time combinations. In this section we present the "Average" PSD concentration impacts at applicable Class I and sensitive Class II areas. Of the 8 defined PSD increments, only the 24 hour PM10 and PM2.5 yielded significant data for RGFO Area 1. The increments for SO2 (all averaging times), annual PM10, annual PM2.5, and annual NO2 are of little consequence as RGFO SA Area 1 contributes 0% towards these area's metrics. The modeled impacts are based on the CAMx PSAT source apportionment contributions. For short-term averaging times (i.e., not annual), the highest second high concentration at each Class I/II area is selected for comparison with the PSD increment. Rows for source groups that had no predicted impacts (i.e., 0.000 ug/m3) were removed from table 3-7 to reduce its size. The PSD data below does not constitute an official PSD increment analysis, which is the sole function and responsibility of CDPHE. Further, the cumulative source groups do not represent PSD permit applications where such an analysis would be conducted. The data is presented for informational purposes only. Please note that it is expected that the larger cumulative source groups would always exceed the increments which are used to gauge significance of individual sources or projects requiring such an analysis.

Table 3-7 CARMMS High Scenario – Average PSD Concentrations

Group	PSD Class I Increment	Max @ any Class I area	Percent of PSD Class I Increment	Class I Area where Max occurred	PSD Class II Increment	Max @ any Class II area	Percent of PSD Class II Increment	Class II Area where Max occurred
NO**2** Annual								
R	2.5	0.350	14.0%	Mesa_Verde	25	0.436	1.7%	Hovenweep
S	2.5	0.787	31.5%	Mesa_Verde	25	1.242	5.0%	Hovenweep
W	2.5	2.371	94.8%	Petrified_Forest	25	25.466	101.9%	Aztec_Ruins
PM**10** 24-hour								
I	8	0.003	0.0%	Rocky_Moun-tain	30	0.002	0.0%	Mount_Evans
J	8	0.011	0.1%	Rocky_Moun-tain	30	0.008	0.0%	Mount_Evans
R	8	0.478	6.0%	Mount_Zirkel	30	0.483	1.6%	Raggeds
S	8	0.636	7.9%	Mesa_Verde	30	1.153	3.8%	Aztec_Ruins
W	8	217.661	2720.8%	Bandelier	30	191.183	637.3%	Dome
PM**10** Annual								
R	4	0.108	2.7%	Mesa_Verde	17	0.126	0.7%	Raggeds
S	4	0.221	5.5%	Mesa_Verde	17	0.378	2.2%	Aztec_Ruins
W	4	15.409	385.2%	Salt_Creek	17	65.226	383.7%	Valle_De_Oro_ NWR
PM**2.5** 24-hour								
I	2	0.001	0.1%	Rocky_Moun-tain	9	0.001	0.0%	Mount_Evans
J	2	0.006	0.3%	Rocky_Moun-tain	9	0.004	0.0%	Mount_Evans
R	2	0.455	22.7%	Mount_Zirkel	9	0.428	4.8%	Raggeds
S	2	0.480	24.0%	Mount_Zirkel	9	0.525	5.8%	Colorado
W	2	193.166	9658.3%	Bandelier	9	171.269	1903.0%	Dome
PM**2.5** Annual								
R	1	0.101	10.1%	Mount_Zirkel	4	0.104	2.6%	Raggeds
S	1	0.111	11.1%	Mount_Zirkel	4	0.124	3.1%	Raggeds
W	1	7.359	735.9%	Bandelier	4	14.039	351.0%	Valle_De_Oro_ NWR
SO**2** 3-hour								
R	25	0.531	2.1%	Dinosaur_CO	512	0.427	0.1%	Dinosaur_all
S	25	0.604	2.4%	Dinosaur_CO	512	0.486	0.1%	Dinosaur_all
W	25	27.514	110.1%	Bandelier	512	29.993	5.9%	Dome
SO**2** 24-hour								
R	5	0.135	2.7%	Dinosaur_CO	91	0.108	0.1%	Dinosaur_all
S	5	0.154	3.1%	Dinosaur_CO	91	0.123	0.1%	Dinosaur_all
W	5	8.620	172.4%	Bandelier	91	7.531	8.3%	Dome
SO**2** Annual								
R	2	0.014	0.7%	Dinosaur_CO	20	0.011	0.1%	Dinosaur_all
S	2	0.016	0.8%	Dinosaur_CO	20	0.013	0.1%	Dinosaur_all
W	2	1.805	90.3%	Galiuro	20	0.863	4.3%	Bitter_Lake_NWR

Visibility Impacts: Table 3-8 displays the Class I and II areas where the maximum number of days Δdv (dv = deciview, w/ 1 dv being equivalent to a "just perceptible" change in visibility clarity) exceeds the 0.5 and 1.0 thresholds and the maximum Δdv due to the source groups. The RGFO SA Area 1 did not have any days where the modeled deciview change was greater than 0.5, and thus according to the FLAG 2010 guidance, the projected development in this area does not contribute to visibility changes in any Class I or Class II area. All cumulative visibility impacts in the future improve for the 20% worst days. Approximately half of the 20% best visibility days

at monitored Class I areas improve, while the other half degrade slightly (indicated by negative values) in the future. The results shown for the cumulative areas (Table 3-9) were selected based on the individual source group impact areas within Table 3-8.

Table 3-8 CARMMS High Scenario – Max dv Days and Calculated dv

Source Group	Max # Days > 0.5 dv @ Any Class Area	Where > 0.5 dv Count Occurs	Max # Days > 1.0 dv @ Any Class Area	Where > 1.0 dv Count Occurs	Max dv@ Any Class I	Where Max Occurs
Class I Area Impacts						
I	0	NA	0	NA	0.02253	CI_Rocky_Mountain
J	0	NA	0	NA	0.12545	CI_Rocky_Mountain
R	72	CI_Mount_Zirkel	12	CI_Mount_Zirkel	1.63971	CI_Flat_Tops
S	281	CI_Mesa_Verde	55	CI_Mesa_Verde	4.19030	CI_Rocky_Mountain
W	365	Multiple Areas	365	Multiple Areas	81.23828	CI_Pecos
Class II Area Impacts						
I	0	NA	0	NA	0.01337	CII_Mount_Evans
J	0	NA	0	NA	0.05321	CII_Mount_Evans
R	110	CII_Dinosaur_all	27	CII_Dinosaur_all	2.63206	CII_Colorado
S	288	CII_South_San_Juan	55	CII_Colorado	4.59771	CII_Colorado
W	365	Multiple Areas	365	Multiple Areas	57.91427	CII_Dome

Table 3-9 CARMMS High Scenario – Cumulative Worst & Best Days at Class I & II Areas

Class I Name	Class Type	State	2008 Base	2021 High	High w/o R	High w/o S	2021 High Improvement from 2008	dv from R	dv from S
Worst 20% Visibility (dv)									
Flat Tops Wilderness	I	CO	8.68	8.07	8.06	7.89	0.61	0.01	0.18
Mesa Verde NP	I	CO	11.20	10.82	10.79	10.77	0.38	0.03	0.05
Mount Zirkel Wilderness	I	CO	9.36	8.54	8.53	8.45	0.82	0.01	0.09
Pecos Wilderness	I	NM	11.33	10.86	10.80	10.76	0.47	0.06	0.10
Rocky Mountain NP	I	CO	12.04	11.15	11.14	11.09	0.89	0.01	0.06
Colorado NM	II	CO	8.68	8.00	7.98	7.78	0.68	0.02	0.22
Dinosaur NM	II	CO	8.68	8.06	8.05	8.02	0.62	0.01	0.04
Dome Wilderness	II	NM	11.33	11.17	10.95	10.75	0.16	0.22	0.42
Mount Evans Wilderness	II	CO	8.68	8.02	8.01	7.95	0.66	0.01	0.07
South San Juan Wilderness	II	CO	9.95	9.28	9.24	9.23	0.67	0.04	0.05
Best 20% Visibility (dv)									
Flat Tops Wilderness	I	CO	0.69	0.55	0.53	0.41	0.14	0.02	0.14
Mesa Verde NP	I	CO	3.12	3.28	3.24	3.21	-0.16	0.04	0.07
Mount Zirkel Wilderness	I	CO	0.95	0.84	0.83	0.72	0.11	0.01	0.12
Pecos Wilderness	I	NM	4.54	4.65	4.60	4.57	-0.11	0.05	0.08
Rocky Mountain NP	I	CO	1.91	1.87	1.86	1.82	0.04	0.01	0.05
Colorado NM	II	CO	0.69	0.60	0.58	0.45	0.09	0.02	0.15
Dinosaur NM	II	CO	0.69	0.57	0.56	0.53	0.12	0.01	0.04
Dome Wilderness	II	NM	4.01	4.64	4.41	4.19	-0.63	0.23	0.45
Mount Evans Wilderness	II	CO	0.69	0.57	0.56	0.52	0.12	0.01	0.05
South San Juan Wilderness	II	CO	2.25	2.28	2.23	2.21	-0.03	0.05	0.07

Deposition Impacts: Table 3-10 shows the cumulative model results for nitrogen deposition averaged across the entire class I or II area. Although sulfur deposition was also modeled, the

BLM authorized emissions are insignificant such that disclosure would be meaningless. For the areas affected in Table 3-10 the future cumulative deposition values (source group W) are all above the critical load value of 2.3 kg/ha-yr (as identified by the National Park Service for sensitive high alpine ecosystems). Compared to the cumulative base year deposition model results, it's clearly evident that predicted deposition rates will be in decline in the future (Table 3-11). The result is consistent with the overall cumulative emissions inventory declines. Cumulative emissions from the RGFO SA Area 1 (I + J) are not significant.

Table 3-10 CARMMS High Scenario – Cumulative Nitrogen Deposition (Average)

Group	2021 Max @ any Class I area (kg/ha-yr)	Class I Area where Max occurred	2021 Max @ any Class II area (kg/ha-yr)	Class II Area where Max occurred
I	0.0001	Rocky_Mountain	0.0002	Lost_Creek
J	0.0006	Rocky_Mountain	0.0007	Lost_Creek
R	0.1454	Flat_Tops	0.1160	Colorado
S	0.2550	Flat_Tops	0.2191	Colorado
W	3.1160	Mount_Zirkel	8.8528	Valle_De_Oro_NWR

Table 3-11 CARMMS High Scenario – Class I Cumulative Nitrogen Deposition Change (Average)

Area	Class Type	2008 (kg/ha-yr)	2021 (kg/ha-yr)	2021 – 2008	% 2021 Reduction
Rocky_Mountain	I	3.50	2.58	-0.92	26.3
Flat_Tops	I	3.09	2.39	-0.70	22.6
Mount_Zirkel	I	3.95	3.12	-0.84	21.0

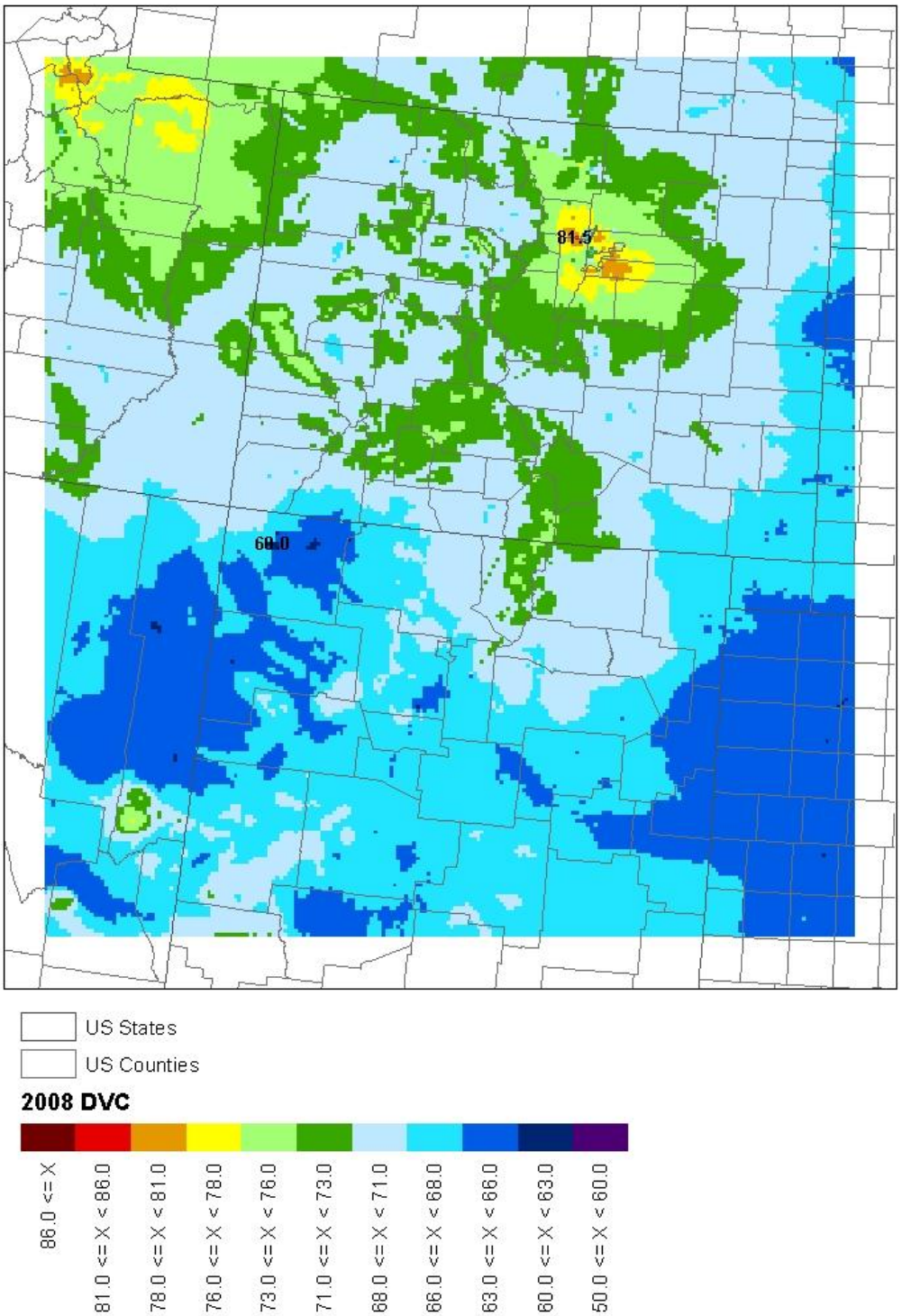
Ozone Impacts: EPA's Model Attainment Test Software (MATS) was used to make future year ozone Design Value (DV) projections using the CAMx 2008 Base Case and 2021 High Development Scenario modeling results. MATS was also used to make future year 2021 ozone DV (DVF) projections for the 2021 High Development Scenario removing the contributions of two of the combined Source Groups R and. MATS was used to make 2021 ozone DVF projections at the monitoring sites as well as throughout the CARMMS modeling domain using the MATS Unmonitored Area Analysis (UAA) procedures. Table 3-11 provides the change in predicted ozone values at monitored location throughout Colorado (as existed in 2008). All of the future monitor values go down in the future with the exception of the 0011 monitor in Larimer County. Further the total number of exceedances/violations drops from five monitors to two in the future. Federal oil and gas contributions (source group R) do not exceed 1 ppb in the DVF results. Figures 3-4 and 3-5 provide a graphical representation of how ozone concentrations are expected to change in the future, and in general the changes show decreasing values.

Table 3-11 CARMMS High Scenario –Cumulative Ozone Impacts

Name	**2008 Base DVC**	**DVF**			**Contributions**	
		2021 Hi	**2021 Hi w/o R**	**2021 Hi w/o S**	**Group R**	**Group S**
CO_Adams_3001	71.5	70.5	69.7	67.2	0.8	3.3
CO_Boulder_0011	77.3	74.4	73.5	69.0	0.9	5.4
CO_Denver_0014	70.3	69.0	68.3	66.2	0.7	2.8
CO_Douglas_0004	78.3	75.7	74.9	72.3	0.8	3.4
CO_El Paso_0013	68.0	66.0	65.4	64.5	0.6	1.5
CO_El Paso_0016	70.3	68.8	68.4	67.7	0.4	1.1
CO_Jefferson_0002	75.0	73.5	72.6	70.0	0.9	3.5
CO_Jefferson_0005	74.3	72.4	71.8	70.0	0.6	2.4
CO_Jefferson_0006	82.0	79.5	78.6	74.5	0.9	5.0

Name	2008 Base DVC	DVF			Contributions	
		2021 Hi	2021 Hi w/o R	2021 Hi w/o S	Group R	Group S
CO_Jefferson_0011	76.3	74.0	73.3	71.0	0.7	3.0
CO_La Plata_1004	70.0	69.8	69.5	69.3	0.3	0.5
CO_La Plata_7001	66.0	65.9	65.5	65.1	0.4	0.8
CO_La Plata_7003	67.0	66.8	66.4	66.0	0.4	0.8
CO_Larimer_0007	74.3	72.7	72.4	70.1	0.3	2.6
CO_Larimer_0011	78.0	78.9	78.6	73.5	0.3	5.4
CO_Larimer_1004	67.3	67.4	67.2	62.9	0.2	4.5
CO_Montezuma_0101	69.3	68.9	68.6	68.3	0.3	0.6
CO_Weld_0009	72.7	72.1	71.5	64.9	0.6	7.2

Figure 3-3 CARMMS High Scenario –Cumulative Ozone Impacts (DVC & DVF)


81.5
68.0
US States
US Counties
2008 DVC
86.0 <= X
81.0 <= X < 86.0
78.0 <= X < 81.0
76.0 <= X < 78.0
73.0 <= X < 76.0
71.0 <= X < 73.0
68.0 <= X < 71.0
66.0 <= X < 68.0
63.0 <= X < 66.0
60.0 <= X < 63.0
50.0 <= X < 60.0

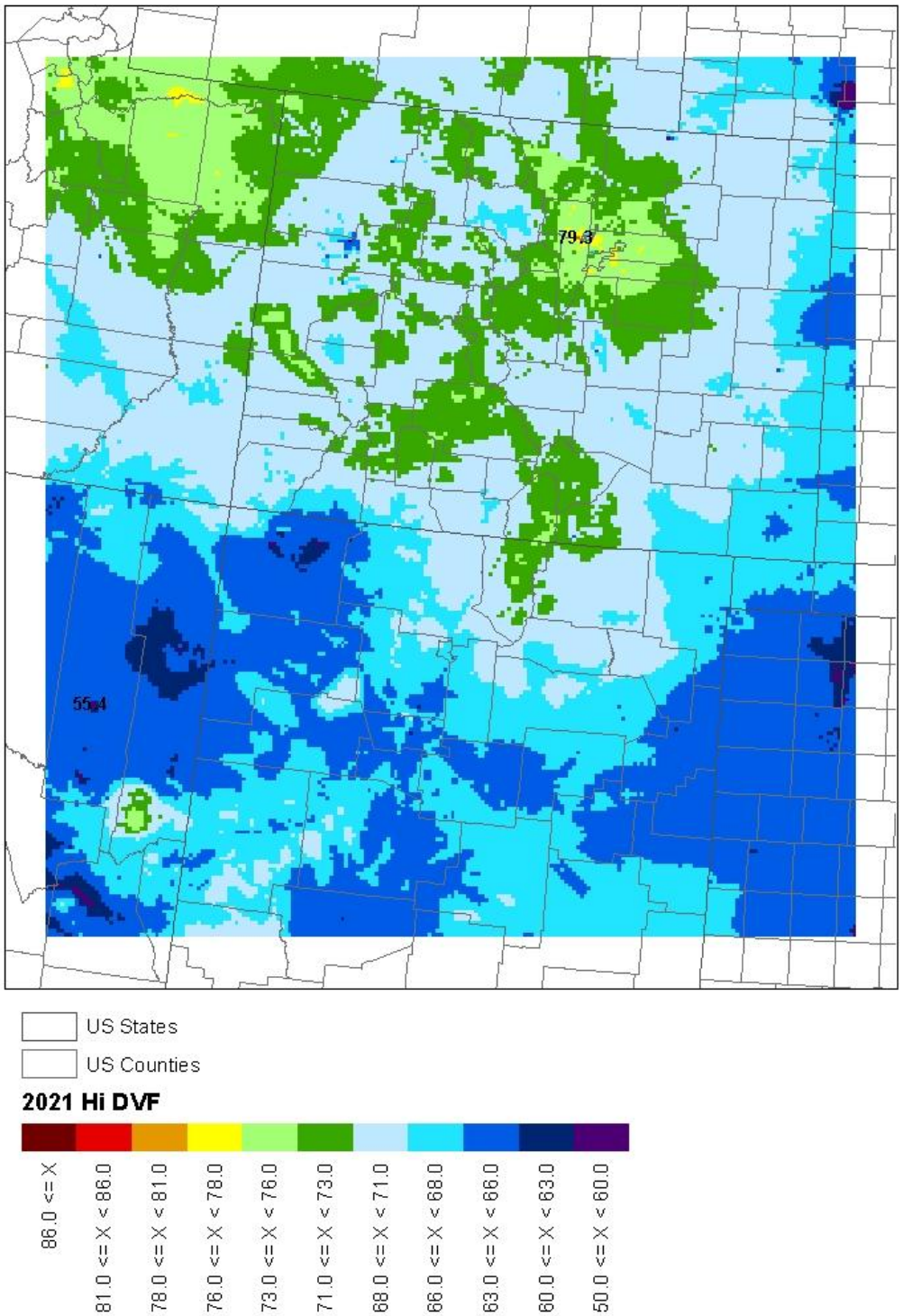
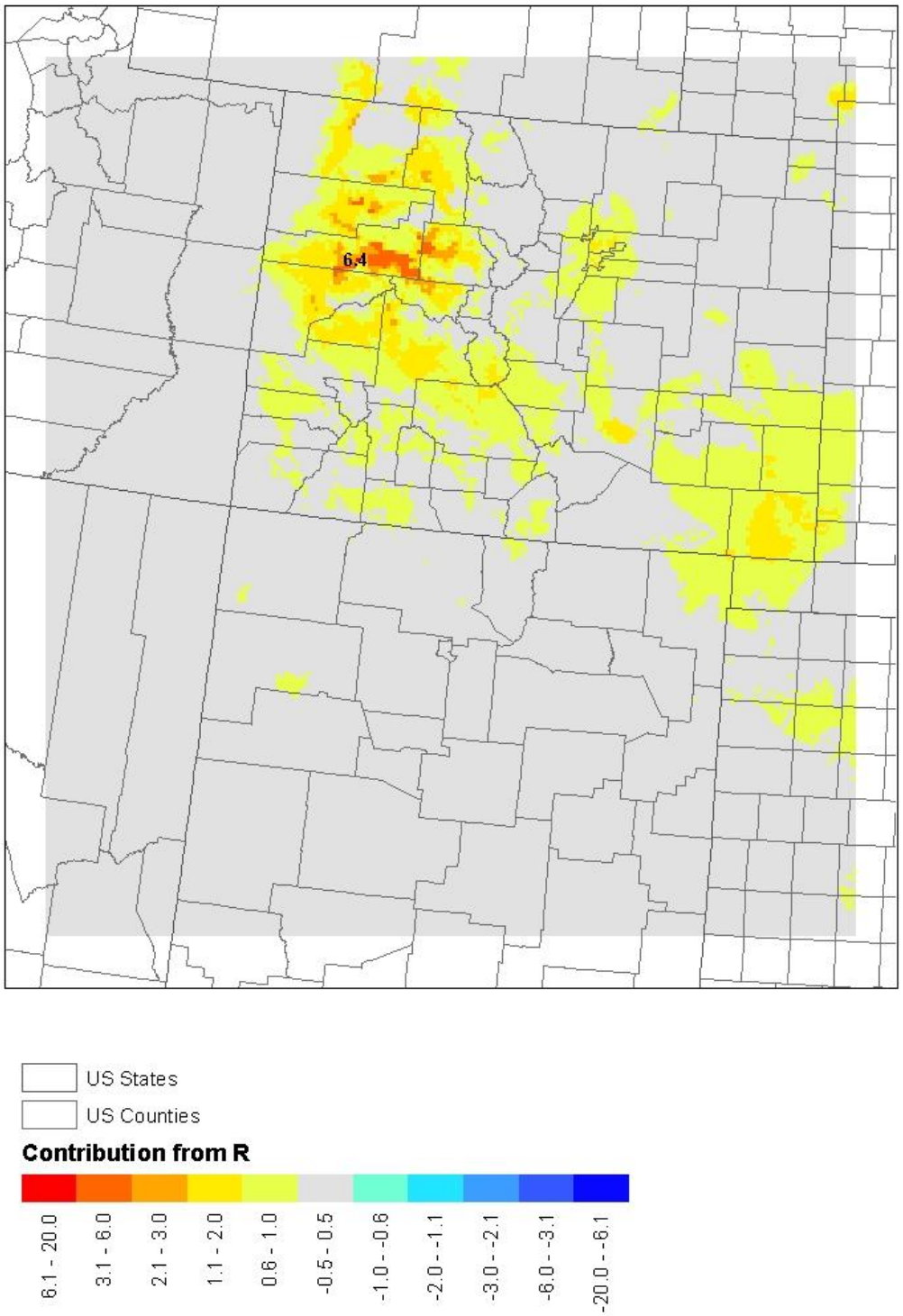


Figure 3-4 CARMMS High Scenario –Cumulative Ozone Impacts (Group R & S Contributions)


6.4
US States
US Counties
Contribution from R
6.1 - 20.0
3.1 - 6.0
2.1 - 3.0
1.1 - 2.0
0.6 - 1.0
-0.5 - 0.5
-1.0 - -0.6
-2.0 - -1.1
-3.0 - -2.1
-6.0 - -3.1
-20.0 - -6.1

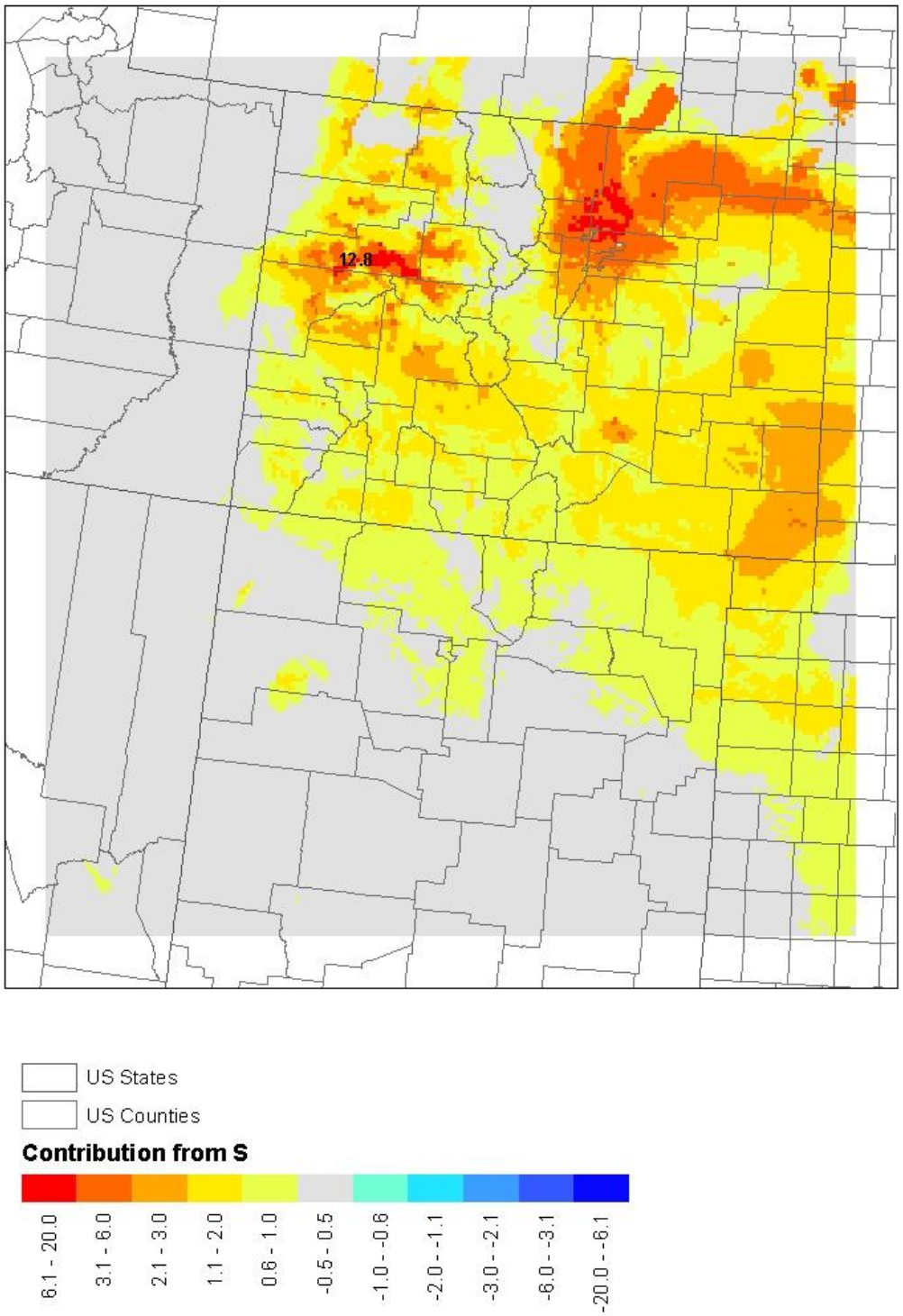
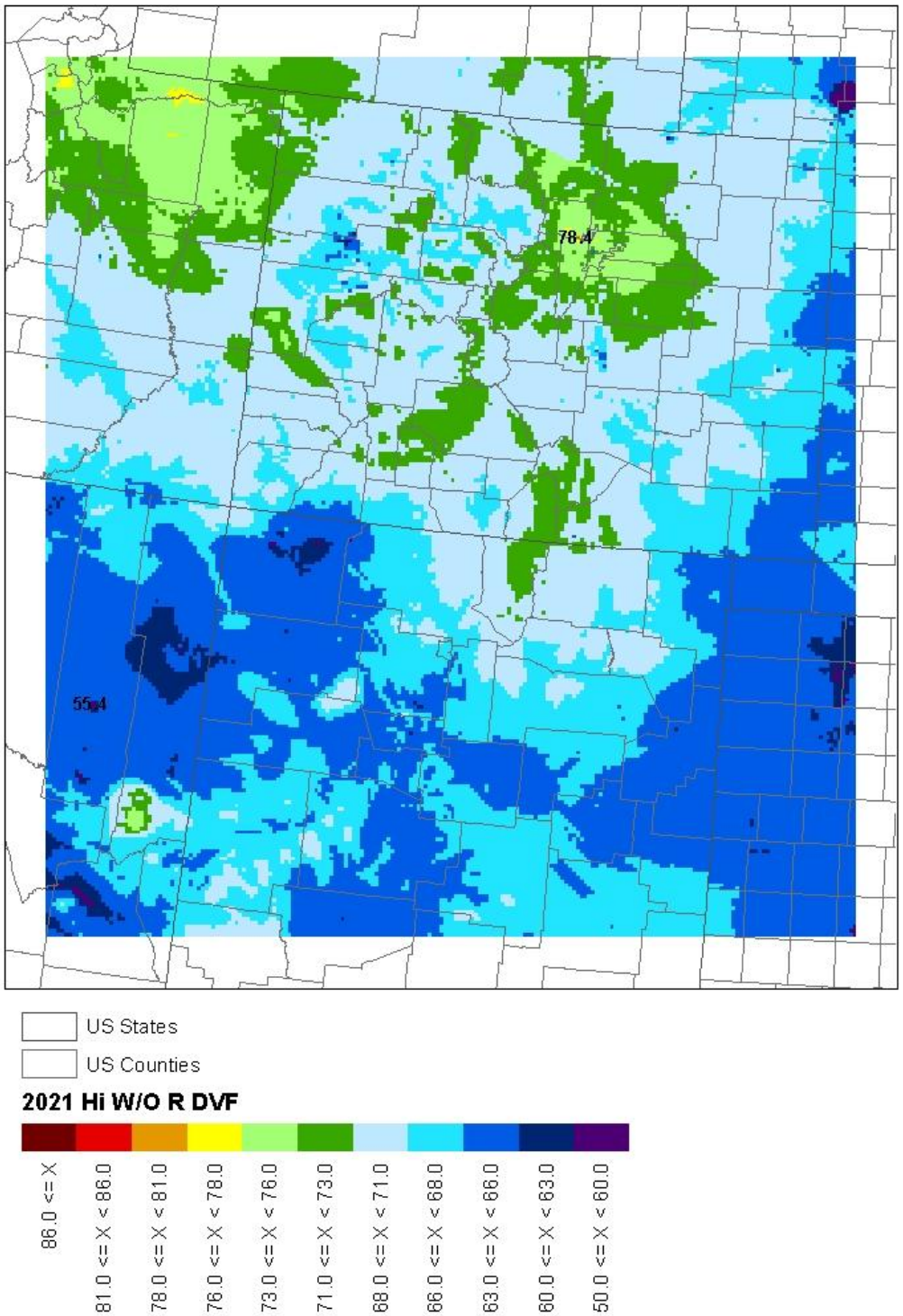
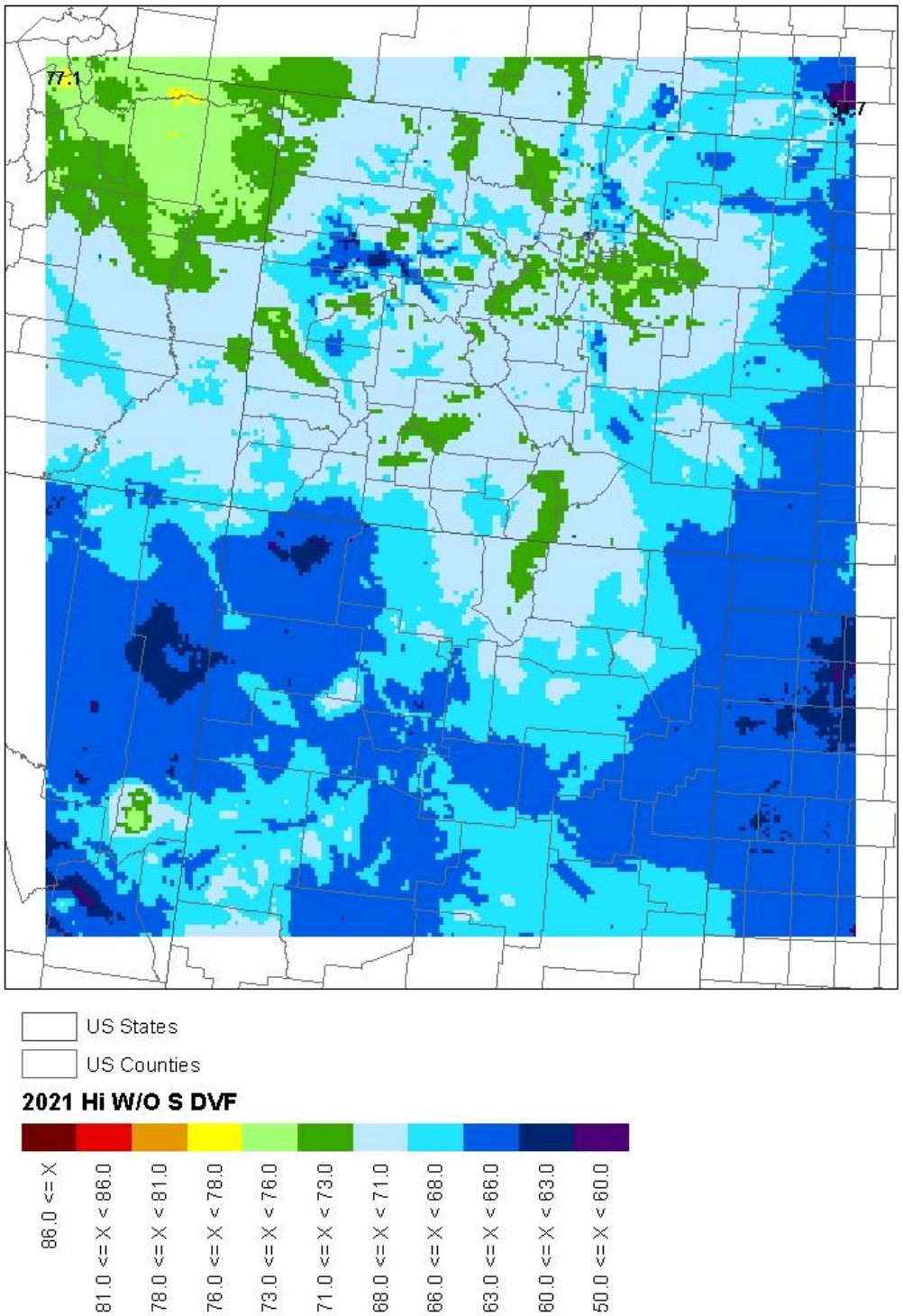


Figure 3-4 CARMMS High Scenario –Cumulative Ozone Impacts (w/o Groups R & S)


78.4
55.4
US States
US Counties
2021 Hi W/O R DVF
86.0 <= X
81.0 <= X < 86.0
78.0 <= X < 81.0
76.0 <= X < 78.0
73.0 <= X < 76.0
71.0 <= X < 73.0
68.0 <= X < 71.0
66.0 <= X < 68.0
63.0 <= X < 66.0
60.0 <= X < 63.0
50.0 <= X < 60.0



The 2021 High Development Scenario UAA ozone DVF without Source Group R (Federal O&G and mining in 13 CO BLM Planning Areas) results in reduction in the DVFs with the highest reduction of 6.4 ppb in the Piceance Basin and the peak DVF reduced from 79.3 to 78.4 ppb and

occurs just northwest of Denver. There are still areas in Denver with 2021 DVFs exceeding the NAAQS with Source Group R removed. Removing both Federal O&G and mining and non-Federal O&G (Source Group S) results in more reductions in the 2021 DVFs, especially in Weld County in the greater Denver area. There are large reductions in 2021 DVFs in the Piceance and D-J Basins (Weld County) with the largest reduction being 12.8 ppb in the Piceance Basin. There are no longer any ozone exceedances in the greater Denver area without emissions from Source Group S.

PM**2.5** Impacts

Group	Name	Max		
		Max Contribution (ug/m3)	Corresponding 8th Daily Average	% Max Contribution
I	Royal Gorge FO Area#1 (RGFO#1) -- North	0.0253	39.1	0.06%
J	Pawnee Grasslands portion of RGFO#1	0.0881	38.2	0.23%

Greenhouse Gases and Climate Change

With respect to GHG emissions, the following predictions were identified by the EPA for the Mountain West and Great Plains region:

- The region will experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.
- Earlier snowmelt means that peak stream flow will be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs will be drier.
- More frequent, more severe, and possibly longer-lasting droughts will occur.
- Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier conditions will reduce the range and health of ponderosa and lodge pole pine forests, and increase the susceptibility to fire.
- Grasslands and rangelands could expand into previously forested areas.
- Ecosystems will be stressed and wildlife such as the mountain line, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

If these predictions are realized as mounting evidence suggests is already occurring, there could be impacts to other resources within the region. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Warmer temperatures with decreased snowfall could have an impact on a particular plants ability to sustain itself within its current range. An increased length of growing season in higher elevations could lead to a corresponding variation in vegetation and change in species composition. These types of changes would be most significant for special status plants that typically occupy a very specific ecological niche. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of

endemic threatened or endangered plants may be accelerated. Invasive plant species would be more likely to out-compete native species.

Increases in winter temperatures in the mountains could have impacts on traditional big game migration patterns. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Warmer winters with less snow would impact the Canada lynx by removing a competitive advantage they have over other mountain predators. Earlier snowmelt could also have impacts on cold water fish species that occupy streams throughout the planning area. Climate change could affect seasonal frequency of flooding and alteration of floodplains, which could impact riparian conditions. More frequent and severe droughts would have impacts on many wildlife species throughout the region as well as vegetative composition and availability of livestock forage in some areas. Climate change could increase the growing season within the region, which could result in more forage production provided there is sufficient precipitation. Drier conditions could have severe impacts on forests and woodlands and could leave these areas more susceptible to insect damage and at higher risk of catastrophic wildfires. Increased fire activity and intensity would increase greenhouse gas emissions, providing for a negative feedback loop. In fact most of the predicted changes on a global scale have some level of a predicted negative feedback loop, making the problem particularly vexing.

No Action Alternative (Direct and Indirect Impacts): None of the proposed action elements would be authorized and therefore none of the potential emissions causing activities would occur, with the exception of the Antelope impacts since they have already occurred as described above. No impacts to air quality would occur. The incremental increase to global GHG burden would not happen, however it is entirely likely the predicted cumulative climatic changes will occur regardless.

Protective/Mitigation Measures: Grynburg Petroleum, Inc. will comply with the following requirements and make every effort to minimize emissions through good engineering and operating practices to the maximum extent practical.

- Grynburg Petroleum, Inc. will use industry best practices, including watering, graveling, and reseeding to reduce fugitive dust emissions from vehicular traffic and disturbed surfaces. Interim reclamation and any existing agricultural practices will be implemented in order to stabilize the site and prevent fugitive dust from being generated. No visible dust plumes should be observed leaving the site.
- All Drill Rigs will be required to meet EPA Non-Road Tier II Emissions Standards, or better, for all drilling and completion operations.
- Process equipment will be permitted by CDPHE in accordance with applicable requirements and required emissions standards to limit the facility's potential to emit and provide appropriate operating, monitoring, and recordkeeping requirements.

3.2.2. Geologic and Mineral Resources

Affected Environment:

The proposed wells are located within the Wattenberg gas field in the Denver Basin, where the primary target is the Codell/Niobrara oil and gas. Most oil and gas in the Denver Basin has been produced from Cretaceous sandstones: J-Sandstone, Codell Sandstone, Niobrara Formation,

Hygiene Sandstone, and Terry Sandstone (also known informally as the Sussex and Shannon Sandstones). The Project Area is surrounded by privately owned producing gas wells on a Colorado state spacing order of 20 acres per well.

Groundwater resources in the area include the Laramie-Fox Hills aquifer, the lowermost of the Denver Basin aquifer system. The aquifer underlies approximately 6,700 square miles and marks the areal extent of the basin for economic ground water development. The Laramie-Fox Hills aquifer is from 250 to 300 feet thick, and includes about 150 to 200 feet of fine-grained and medium-grained sandstone. Water is also present in the Upper Pierre Shale at depths of up to 1,500 feet (CDWR, 2013). Water from the aquifer is used extensively throughout the area for domestic and agricultural purposes. Well yields may be as high as 100 gallons per minute (GPM), but are generally somewhat lower. Both the Laramie-Fox Hills and Arapahoe aquifers are under artesian pressure at the present time.

In addition to oil and gas, uranium and coal resources are also found in Weld County. Uranium resources are found in the Upper Laramie Formation north of Greeley. Coal resources are found throughout the Denver Basin in the Denver Formation and the upper Laramie Formation in the Denver Basin, although most of the coal resources in the Denver Basin have come from Laramie Coals. Sand and gravel resources are also located throughout Weld County; several sand and gravel pits have also been developed within five miles of the proposed wells.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

The Proposed Action would drill through the Laramie-Fox Hills aquifer to produce hydrocarbons from underlying formations. The Laramie formation contains important coal and uranium deposits. During drilling operations on parcels, loss of circulation or problems cementing the surface casing could directly affect freshwater aquifer and mineral zones encountered. Known water-bearing zones in the APD area would be protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely.

Protective/Mitigation Measures:

Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones and prospective mineral zones. At the APD stage, geologic and engineering reviews will be completed to ensure that cementing and casing programs are adequate to protect all downhole resources. Known water bearing zones in the APD area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement would be extended well beyond fresh-water zones to ensure that drilling fluids remain within the well bore and do not enter groundwater.

Cumulative Impacts:

The hydrocarbons from the target zones will be irreversibly depleted if developed.

No Action Alternative:

Under the No Action alternative, the APDs would be denied, and no federal action would occur. Not approving the APDs could result in a situation in which reservoirs are not adequately developed, and public minerals could be drained by nearby private or state wells. The applicant could explore and develop the private land and private minerals and not access the federal minerals. Drainage cases commonly occur in northeastern Colorado where land and mineral ownership patterns are complex.

Direct and Indirect Impacts:

None.

Protective/Mitigation Measures:

None.

3.2.3. Soils

Affected Environment:

The proposed pad and access is on the Olney fine sandy loam, 0 to 6 percent slopes. The soil is derived from calcareous loamy alluvium, with root restrictive layers being greater than 80 inches deep. The calcium carbonate maximum in profile is 15 percent. The natural drainage class is well drained, with low runoff potential and no frequency of ponding. This soil does not meet hydric criteria. The Olney fine sandy loam is in the Loamy plains (R067BY002CO) Ecological site, and is of local farmland importance.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

The proposed pad would disturb 1.3 acres of land surface, and the access road would disturb .75 additional acres. Post reclamation, .75 acres would remain disturbed for the pad and .5 for the access road. This is assuming successful interim reclamation including re-contouring, seeding, and necessary stabilization. The proposed action would have a moderate to major direct impact to soils present at the construction site. Indirectly, the increased runoff from the disturbed soils could result in increased erosion and gullying down gradient. Due to the gentle slopes, high infiltration rate of the native soils, and construction standards being proposed, impacts to soils off site would be minor.

Development of the pads could result in a small percent of increased wind and water erosion during initial operations of associated with construction and drilling. A high risk of erosion will continue until those disturbed lands are hardened, reclaimed by vegetation cover, protected by tackifier, straw, or manure, or protected by other methods. Overall-negative effects to soil resources, such as loss of top soil resulting from erosion should be reduced significantly through the correct implementation of interim and final reclamation measures and the implementation of BMPs during the construction. Continued monitoring and maintenance of the pads would be required to limit any further or unnecessary impacts to soil resources.

Protective/Mitigation Measures:

After completion and/or abandonment of the wells, the soils would still be irreversibly different than they originally were. Overall, with the proposed reclamation, soil productivity would not be considerably altered if the proposed areas are abandoned. All infrastructure (roads, drill pads, etc.) being proposed, would be built to BLM Gold Book standards. No additional mitigation would be required.

Cumulative Impacts:

The area around the proposed well has a variety factors effecting soils including roads, oil and gas development, agriculture, and livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas soils. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a large amount of disturbance that could have a larger impact on soils in the future.

No Action Alternative:

Direct and Indirect Impacts:

If no action is taken, conditions on site would remain as they currently are and no new impacts to soils would occur due to the proposed action.

Protective/Mitigation Measures:

None

3.2.4. Hydrology/Water Quality

Surface, Groundwater, Floodplains

Affected Environment:

The proposed well pad and access would be located in a dry upland setting near an unnamed intermittent drainage that terminates in a playa 2.25 miles downstream. Annual rainfall is estimated between 11 and 17 inches per year. Groundwater resources in the area include the Laramie-Fox Hills aquifer, the lowermost of the Denver Basin aquifer system. The aquifer underlies approximately 6,700 square miles and marks the areal extent of the basin for economic ground water development. The Laramie-Fox Hills aquifer is from 250 to 300 feet thick, and includes about 150 to 200 feet of fine-grained and medium-grained sandstone. Water is also present in the Upper Pierre Shale at depths of up to 1,500 feet (CDWR, 2013). Water from the aquifer is used extensively throughout the area for domestic and agricultural purposes. Well yields may be as high as 100 gallons per minute (GPM), but are generally somewhat lower. Both the Laramie-Fox Hills and Arapahoe aquifers are under artesian pressure at the present time.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

Surface water impacts of the proposed wells are mainly associated with the surface disturbance associated with drilling and related infrastructure after well completion. For all proposed development, just over 2 acres would be disturbed. Most impacts to surface water from oil and gas activity is due to removal of vegetation and exposure of mineral soils. Specific impacts would be soil compaction caused by construction that would reduce the soil infiltration rates, in turn increasing runoff during precipitation events. Downstream effects of the increased runoff may include changes in downstream channel morphology such as bed and bank erosion or accretion. Due to the flat nature of the topography and infiltration rates of the soils in this area, little to no new impacts to surface water quality would result from the surface disturbance portion of drilling the proposed wells. Additional surface water impacts could result from chemicals, or other fluids, accidentally spilled or leaked during the development process and could result in the contamination of both ground and surface waters. Best management practices would be contained in the condition of approval that would mitigate this threat.

The drilling of the proposed wells would pass through usable groundwater. Groundwater in this area is relied on for agricultural uses, as well as, domestic use. Potential impacts to groundwater resources could occur if proper cementing and casing programs are not followed. This could include loss of well integrity, surface spills, or loss of fluids in the drilling and completion process. It is possible for chemical additives used in drilling activities to be introduced into the water producing formations without proper casing and cementing of the well bore. Changes in porosity or other properties of the rock being drilled through can also result in the loss of drilling fluids. When this occurs, drilling fluids can be introduced into groundwater without proper cementing and casing. Site specific conditions and drilling practices determine the probability of this occurrence and determine the groundwater resources that could be impacted. Producing the well may change the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the well bore. Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are operator and location specific. These additives are not always used in these drilling activities and some are likely to be benign such as bentonite clay and sand. Concentrations of these additives also vary considerably since different mixtures can be used for different purposes in oil and gas development and even in the same well bore. If contamination of aquifers from any source occurs, changes in groundwater quality could impact springs and water wells that are sourced from the affected aquifers. Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones.

At this stage, geologic and engineering reviews have been done to ensure that cementing and casing programs are adequate to protect all downhole resources. Known water bearing zones in the APD area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement would be extended well beyond fresh-water zones to insure that drilling fluids remain within the well bore and do not enter groundwater.

Protective/Mitigation Measures:

No additional mitigation is required to protect water resources beyond what is found in other sections of this document and other APD approval requirements.

Cumulative Impacts:

Most of the land in the watershed is largely undeveloped. In addition to oil and gas development the area is used for agriculture and cattle grazing. With proper mitigation and protective measures, cumulative impacts to surrounding areas are expected to be minimal.

No Action Alternative:

Direct and Indirect Impacts:

If no action is taken, conditions on site would remain as they currently are and no new impacts to soils would occur.

Protective/Mitigation Measures:

None

3.3. Biological Resources

3.3.1. Invasive Plants

Affected Environment: Vegetation and soils in the project area have been modified, both structurally and chemically, by long-term exposure to grazing and other agricultural practices. Invasive plants are common in the area. The project site is prone to infestation by a wide variety of weeds if severe soil surface disturbance occurs.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts: Due to the long-term exposure of the project area to grazing and other historical agricultural practices, expected impacts are thought to be minor.

Protective/Mitigation Measures: Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. Areas disturbed by project implementation will be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring and treatment (if necessary) is required for the life of the project until BLM deems final reclamation is successful, which includes lack of Colorado list A and B noxious weeds.

Cumulative Impacts: None.

No Action Alternative:

Direct and Indirect Impacts: None.

Protective/Mitigation Measures: None.

Other Alternative:

Direct and Indirect Impacts:

Protective/Mitigation Measures:

Cumulative Impacts:

3.3.2. Threatened, Endangered and Sensitive Species

Affected Environment:

No threatened or endangered species or habitats are located within the action area. BLM sensitive species with potential habitat include ferruginous hawk, mountain plover, black-tailed prairie dog, burrowing owl, swift fox, and milk snake.

Mountain Plover: Mountain Plover's are found throughout the Royal Gorge Field Office in suitable habitats. While the species is relatively rare they can be found generally in open, flat tablelands that display some function of disturbance such as drought, grazing, fire, etc.).

Black-tailed prairie dog: The BLM considers the black-tailed prairie dog a sensitive species. Black-tailed prairie dogs primarily occur in scattered colonies throughout the eastern plains of Colorado. In the summer of 2001, Colorado started aerial surveys for black-tailed prairie dogs throughout their historic range. Based on known locations of black-tailed prairie dogs, transects were developed for each county to give a 95% confidence interval to the resulting data. Statewide 631,000 acres of black-tail prairie dog colonies were documented.

Swift Fox: Swift foxes primarily occur in short-grass and mixed-grass prairie in the eastern plains of Colorado. The distribution of swift foxes became severely reduced in concert with conversion of mid- and shortgrass prairies to agriculture. Swift fox dens occur in ridges, slopes, hill tops, pastures, roadside ditches, fence rows and cultivated fields. Dens may be relatively close to human habitations and swift foxes occasionally den in human-made structures such as culverts. Swift foxes primarily consume animals, with leporids and rodents the most frequent prey.

Milk snake: Wide variety of habitats in Colorado, including shortgrass prairie, sandhills, shrubby hillsides. Hibernation sites include rock crevices that may be shared with other snake species. The species occurs throughout most of Colorado at elevations primarily below 8,000 feet and is generally scarce or at least hard to find, but locally fairly common.

Ferruginous hawks: The ferruginous hawk inhabits grasslands and semi-desert shrublands, and is rare in piñon-juniper woodlands. Breeding birds nest in isolated trees, on rock outcrops, structures such as windmills and power poles, or on the ground. Winter residents concentrate around prairie dog towns. Winter numbers and distribution fluctuate greatly according to the availability of prairie dogs; when a local prairie dog population dies off due to plague, hawk numbers decrease drastically. Migrants and winter residents may also occur in shrublands and agricultural areas.

Winter resident on eastern plains, at the same time it is a rare summer resident locally on eastern plains, and occurs very locally in Moffat and Routt counties, along the Book Cliffs, in the Grand Valley, and in the San Luis Valley.

The proposed action may impact federally-listed species in Nebraska. Operation of BLM's fluid minerals program will result in new depletions to the South Platte River, affecting habitat for the western prairie fringed orchid, whooping crane, interior least tern, northern Great Plains population of the piping plover , pallid sturgeon (collectively referred to as the target species), and designated critical habitat of the whooping crane.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

This area has been well developed for energy development, both renewable and non-renewable. The action area has experienced extensive oil and gas development. In the short term, the primary direct impacts of the proposed action will be the loss of available habitat, and an increase in human presence and activity during the drilling phase. These effects will be reduced post drilling.

Given that the proposed action would result in the depletion of approximately 1.8 acre-feet of water from within the Platte River basin, this project falls under BLM Colorado's Programmatic Biological Assessment (PBA) for water depleting activities associated with BLM's fluid minerals program in the Platte River basin in Colorado (BLM 2015).

In response to BLM's PBA, the U.S. Fish and Wildlife Service (FWS) issued a Programmatic Biological Opinion (PBO)(06E-24000-2014-F-0671) on February 2, 2015, which concurred with BLM's determination that water depletions are "Likely to Adversely Affect" the whooping crane, interior least tern, northern Great Plains population of the piping plover, pallid sturgeon (collectively referred to as the target species), and designated critical habitat of the whooping crane. However, the FWS also determined that BLM water depletions from the Platte River Basin are not likely to jeopardize the continued existence of the whooping crane, interior least tern, northern Great Plains population of the piping plover, and the pallid sturgeon, and that BLM water depletions are not likely to destroy or adversely modify designated critical habitat for the whooping crane.

The Platte River Recovery Implementation Program (PRRIP), established in 2006, is implementing actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the States of Colorado, Nebraska, and Wyoming and the U.S. Department of the Interior. The PRRIP addresses the adverse impacts of existing and certain new water related activities on the Platte target species and associated habitats, and provides ESA compliance for effects to the target species and whooping crane critical habitat from such activities including avoidance of any prohibited take of such species. The PRRIP serves as the reasonable and prudent alternative to offset the effects of water related activities that FWS found were likely to cause jeopardy to one or more of the target species or to adversely modify critical habitat.

The PBO addresses water depletions associated with fluid minerals development on BLM lands, including water used for well drilling and completion, hydrostatic

testing of pipelines, dust abatement on roads, and seismic activity. The PBO includes reasonable and prudent alternatives developed by the FWS which allow BLM to authorize oil and gas wells that result in water depletion while avoiding the likelihood of jeopardy to the endangered species and avoiding destruction or adverse modification of their critical habitat. The PBO confirms ESA compliance for water-related activities of oil and gas producers that elect to rely on the PRRIP through maintaining membership in good standing in the South Platte Water Related Activities Program, Inc. (SPWRAP) organization.

The SPWRAP organization is formally charged with certifying to the U.S. Fish and Wildlife Service that water users in Colorado are meeting the requirements to support reliance on the PRRIP for ESA compliance purposes. Among other things, SPWRAP assists the State of Colorado in complying with its financial and water requirements under the PRRIP. This includes implementation of groundwater recharge operations at times when South Platte River flows are in excess of the needs of endangered species and allowing the return of water to the river when flows are less than needed by endangered species.

Grynberg Petroleum has provided proof of current membership in SPWRAP and therefore is considered to be in compliance with the ESA as to the depletive effects of their activities on federally listed species and designated critical habitat associated with the Platte River in Nebraska.

This project has been entered into the Royal Gorge Field Office fluid minerals water depletion log which will be submitted to the Colorado State Office at the end of the Fiscal Year.

Protective/Mitigation Measures:

The project location does offer suitable habitat for mountain plover. If vegetation disturbing activities are to occur during May 15 through July 15 a clearance survey following U.S. Fish and Wildlife Service survey protocol must be completed prior to project activity.

Ferruginous hawks may nest in the project area; therefore, a raptor nest survey must be completed prior to construction and drilling efforts if actions are to occur during May 15 through July 15.

Cumulative Impacts: The area around the proposed well has few factors effecting wildlife other than livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas wildlife. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a larger amount of disturbance that could have a larger impact on wildlife in the future.

No Action Alternative:

Direct and Indirect Impacts:

None.

Protective/Mitigation Measures:

None.

3.3.3. Vegetation

Affected Environment:

This plant community evolved with repeated continuous grazing and occurs frequently throughout most of the eastern plains of Colorado. Fourwing saltbush, winterfat, American vetch and green needlegrass have been removed. Western wheatgrass may persist in minor trace amounts, greatly reduced in vigor and not readily seen. Blue grama and buffalograss dominate the community with a tight "sodbound" structure. Plains pricklypear, hairy goldaster, red threeawn, sixweeks fescue and bottlebrush squirreltail have increased.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

Generally oil and gas development involves complete removal of vegetation and at times re-contouring of the landscape to allow for resources to be retrieved. The type of ground activity associated with oil and gas development does result in increased susceptibility to adverse impacts such as soil compaction, weed infestations and erosion.

Protective/Mitigation Measures:

See 2.2 Proposed Action.

Cumulative Impacts:

None

No Action Alternative:

Direct and Indirect Impacts:

None.

Protective/Mitigation Measures:

None.

3.3.4. Wildlife Terrestrial

Affected Environment:

The habitat in the project area is classified as western Great Plains short grass prairie and is dominated by blue grama, with associated graminoids such as side oats grama, buffalo grass, purple threeawn, and needle and thread. There are small amounts of yucca, prickly pear, and annual forbs. Small groves of cottonwood and elm trees are near the action area at a homestead. This area has experienced extensive disturbance from oil and gas activity. Wildlife species that

have adapted and are common in this habitat are mule deer, pronghorn antelope, coyote, badger, fox, various rodents and an assortment of birds, including raptors such as Swainson's hawk and rough legged hawk. Colorado Parks and Wildlife have designated lands within and surround the action area as pronghorn and mule deer winter range. Trees or shrubs located within or near the action area may provide suitable nesting habitat for raptors.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

The proposed action will result in a relatively small amount of lost habitat. Habitat adjacent to the disturbance footprint may not be utilized by wildlife due to its proximity to drilling and production activity. Human activity peaks at the drilling phase, causing increased stress levels or excluding wildlife from the action area. When wells are in production there is significantly less human activity and some species will adapt to the disturbances.

A raptor nest survey must be completed prior to construction and drilling efforts if actions are to occur during May 15 through July 15.

Cumulative Impacts: The area around the proposed well has few factors effecting wildlife other than livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas wildlife. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a larger amount of disturbance that could have a larger impact on wildlife in the future.

No Action Alternative:

Direct and Indirect Impacts: None.

Protective/Mitigation Measures: None.

Finding on the Public Land Health Standard for Plant and Animal Communities:

Public land health standards do not apply on private lands.

3.3.5. Migratory Birds

Affected Environment:

The habitat in the project area is classified as western Great Plains short grass prairie and is dominated by blue grama, with associated graminoids such as side oats grama, buffalo grass, purple threeawn, and needle and thread. There are small amounts of yucca, prickly pear, and annual forbs. Small groves of cottonwood and elm trees are near the action area at a homestead. Lark bunting, McCown's longspur and chestnut-collared longspur are on the US Fish and Wildlife Services "Birds of Conservation Concern-2008 List for BCR-18 (Shortgrass Prairie) and may occur in the project area based on their habitat requirements.

The lark bunting and chestnut-collared longspur use habitat in a similar way and/or respond similarly to threats, management, and conservation activities. They are common in open

shortgrass prairie with few or no bushes. Birds arrive on the eastern plains in late April-early May, with nesting initiated during mid-May to June and young fledged during June and July. Migration from Colorado to the winter grounds occurs by late September although some birds may overwinter; they winter in the southern U.S. and Mexico. They feed on grasshoppers and other invertebrates and on grass and forb seeds.

The McCown's longspur breed in shortgrass, especially where vegetation cover is sparse due to low soil moisture or grazing, or is interspersed with shrubs or taller grasses. They also nest in grazed mixed-grass prairies. Longspurs arrive in Colorado in late March, and often linger into November. They initiate nesting by mid-May, and most young fledge by mid-July. Attempts to produce second broods may account for their extended residence in Colorado. They winter in the southern U.S. and northern Mexico. Their diet consists primarily of grass and forb seeds, but also includes grasshoppers, moths, beetles, and ants.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

Surface disturbing activities associated with oil and gas development, such as road building, pipeline installation or pad construction may "take" nests if such activity where to occur during the nesting season. Noise generated during construction, drilling, and production phases will likely result in a larger impact footprint then the disturbance footprint alone. Migratory birds may be burned or killed by exhaust vents, heater-treaters, flare stacks, etc., if perched at the opening while in operation. An increase is activity, i.e. road traffic, will likely result in an increase in vehicular collisions with migratory birds.

The location and surrounding area is highly disturbed by oil and gas development. While the habitat may not be ideal, some plains birds have adapted to and currently use habitat patches within well fields for reproduction and growth. However, it is likely that species richness and diversity have been forfeited to some degree as a result of this conversion. In this case, it is unlikely the proposed action will cause an additive negative impact to migratory birds currently present at the site.

Protective/Mitigation Measures:

To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a "take" of migratory birds. Under the MBTA, "take" means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative.

Pursuant to BLM Instruction Memorandum 2008-050, to reduce impacts to Birds of Conservation Concern (BCC), no habitat disturbance (removal of vegetation such as timber, brush, or grass) is allowed during the periods of May 15 - July 15, during the breeding and brood rearing season for most Colorado migratory birds. An exception to this TL will be granted if nesting surveys conducted no more than

one week prior to surface-disturbing activities indicate no nesting within 30 meters (100 feet) of the area to be disturbed Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period.

Any secondary containment system will be covered in a manner to prevent access by migratory birds. The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may result in a "take" of individual migratory birds or nests that are protected by MBTA will not be allowed.

Cumulative Impacts: The area around the proposed well has few factors effecting migratory birds other than livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas migratory birds. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a larger amount of disturbance that could have a larger impact on migratory birds in the future.

No Action Alternative:

Direct and Indirect Impacts:

None.

Protective/Mitigation Measures:

None.

3.4. Heritage Resources and Human Environment

3.4.2. Paleontological Resources

Affected Environment:

The proposed wells are geographically located in grassland overlying part of the geologic feature that is the eastern flank of the Denver Basin. The Basin consists of a large asymmetric syncline of Paleozoic, Mesozoic, and Cenozoic sedimentary rock layers, trending north to south along the east side of the Front Range from about Pueblo north to Wyoming. The basin is deepest near Denver and ascends gradually to its eastern outcrop in central Kansas. Cretaceous Laramie Formation deposits underlie the proposed well locations. These deposits are a Class 3 geologic formation, according to the BLM's Potential Fossil Yield Classification (PFYC) System, which was created to assist in determining proper mitigation approaches for surface disturbing activities (WO IM2008-009). This is a Class 3 formation because it has moderate potential to produce vertebrate fossils such as dinosaurs.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

Potential impacts to fossil localities would be both direct and indirect. Direct impacts to or destruction of fossils would occur from unmitigated activities conducted on formations with high potential for important scientific fossil resources. Indirect impacts would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by workers or the public due to increased access to fossil localities in the Project Area. Adverse impacts to important fossil resources would be long-term and significant since fossils removed or destroyed would be lost to science. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources.

Protective/Mitigation Measures:

Although the project area does not contain any known fossil resources, there is a possibility that ground disturbing work in the area may uncover fossil resources. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources.

Paleontologic resources will be protected as long as the following recommended conditions of approval are followed.

Recommended COA: In order to prevent potential impacts to paleontologic resources, a condition of approval will be attached to the APD that directs the holder to notify the BLM RGFO immediately if any vertebrate fossils or their traces are discovered during operations. Operations may continue as long as the fossil specimen would not be damaged or destroyed by the activity. Within 5 working days of notification, the BLM RGFO shall evaluate or have evaluated such discoveries and shall notify the operator what action shall be taken with respect to such discoveries. Since the APD is on split estate, the fossils are owned by the surface owner, BLM can recommend these measures but cannot require them.

Cumulative Impacts:

No Action Alternative:

Under the No Action alternative, the applicant could explore and develop the private land and private minerals and not access the federal minerals. Direct and indirect impacts to paleontological resources would be the same as those described for the Proposed Action.

Direct and Indirect Impacts:

None.

Protective/Mitigation Measures:

None.

3.4.3. Wastes, Hazardous and Solid

Affected Environment:

It is assumed that conditions associated with the proposed project site, both surface and subsurface, are currently clean and that there is no known contamination. A determination will be made by the operator prior to initiating the project, if there is evidence that demonstrates otherwise (such as solid or hazardous wastes have been previously used, stored, or disposed of at the project site).

Nothing in the analysis or approval of this action by BLM authorizes or in any way permits a release or threat of a release of hazardous materials (as defined under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations) into the environment that will require a response action or result in the incurrence of response costs.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts: Possible contaminant sources associated with the drilling operations are:

- Storage, use and transfer of petroleum, oil and lubricants
- Produced fluids
- General hazardous substances, chemicals and/or wastes
- Concrete washout water
- Drilling water, mud and cuttings

Protective/Mitigation Measures:

The following mitigation will assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).
- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of non E&P wastes on site is allowed on Federal Lands.

- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary. State and/or Federal regulations may apply to pit construction and removal.

Cumulative Impacts:

Cumulative impacts will be reduced to negligible if protective mitigation measures are followed.

No Action Alternative:

Direct and Indirect Impacts:

None.

Protective/Mitigation Measures:

none

3.5. Cumulative Impact Summary

The proposed project is located in Weld County, Colorado. Weld County's economy is based primarily on oil and gas development and agriculture. Due to this, much of the natural landscape of Weld County has been modified. Weld County has over 20,000active oil or gas wells. Most of these wells are located on privately owned surface and produce entirely privately owned minerals. Because of the comparatively small number of federally owned mineral parcels in this area, the cumulative impact of the drilling and operation of this oil well would add incrementally to the cumulative impacts of oil and gas development in Weld County. These include minor impacts to air, fluid minerals (geology), soils and vegetation and soils.

Air: The area currently has a high degree of alteration in the form of agricultural fields and roads. The addition of the infrastructure needed to construct and drill the additional proposed wells would have a minimal cumulative impact to the area's air quality given the location of the proposed action and the total cumulative emissions level for the area.

Geology: Cumulative impacts on geology and fluid minerals resources would primarily occur as a result of development, which would irreversibly deplete recoverable hydrocarbons from the producing formations.

Soils: Construction of the pad extension would result in minor, temporary destabilization of soils in the project area, until the soils are recontoured and revegetated at interim and final reclamation stages. This may result in a slight loss of some topsoil due to wind and water erosion.

Vegetation: The removal of vegetation necessary for the construction of the pad will result in a minor decrease in native vegetation in the project area, however much of the vegetation in the general project area is already highly modified for oil and gas development and agricultural uses.

Chapter 4 Consultation and Coordination

4.1. List of Preparers and Participants

Please see Interdisciplinary Team Review list for BLM Participants.

4.2. Tribes, Individuals, Organizations or Agencies Consulted

Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Tribe of Oklahoma, Crow Creek Sioux, Eastern Shoshone, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern Cheyenne Tribe, the Ute Tribe, Oglala Sioux Tribe, Pawnee Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe.

Bureau of Land Management. 1986. Northeast Resource Area Management Plan and Record of Decision. Lakewood, Colorado.

Bureau of Land Management. 1991. Colorado Oil and Gas Leasing Environmental Impact Statement. Lakewood, Colorado.

Bureau of Land Management. 2008 H-1790-1 National Environmental Policy Handbook. Washington, D.C.

Finding Of No Significant Impact
(FONSI)

DOI-BLM-CO-F020-2015-0004 EA

Based on review of the EA and the supporting documents, I have determined that the project is not a major federal action and will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects from any alternative assessed or evaluated meet the definition of significance in context or intensity, as defined by 43 CFR 1508.27. Therefore, an environmental impact statement is not required. This finding is based on the context and intensity of the project as described below:

RATIONALE:

Context: The BLM has received one Application for Permit to Drill (APD) proposing the construction of one well pad and access road, and the drilling of one vertical oil well on private surface over federal minerals (split estate).

The project is in Weld County, approximately 12 miles east of the Town of Ault, Colorado. The federal mineral estate is leased and subject to oil and gas development.

The general area description would be defined as rural rangeland located in the northeastern plains of Colorado, used primarily for livestock production and oil and gas development. There are a few county roads in the project area.

There is no public land or public roads or other public access in the project area.

Extensive oil and gas development has occurred in the area, mostly on private (fee) surface and private (fee) mineral estate.

Intensity:
I have considered the potential intensity/severity of the impacts anticipated from the proposed Tigertail Federal 2-3 APD project**.** Project decision relative to each of the areas suggested for consideration by the CEQ. With regard to each:

> **Impacts that may be beneficial and adverse:**
> There would be minor impacts to air quality from the proposed project. Most of this would occur during the drilling phase. Potential impacts might occur to ground water; however such impacts should not occur if strict drilling requirements are followed. Other minor impacts might occur to wildlife and migratory birds but would be mitigated through the use of timing stipulations. Positive impacts include benefits in royalties and revenue generated to the federal government from productive wells. Other indirect effects could include effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to

state and county governments related to royalty payments and severance taxes. Other beneficial impacts from the action would be the potential for productive wells being created that would add, albeit in a small way to national energy independence.

Public health and safety:
The proposed action will have a temporary negative impact to air quality through the generation of fugitive dust during the construction phase. Utilization of the road, surface disturbance, and construction activities such as drilling, well completion, and equipment installation will all impact air quality through the generation of dust related to travel, transport, and general construction. This phase will also produce short term emissions of criteria, hazardous, and greenhouse gas pollutants from vehicle and construction equipment exhausts. Once construction is complete the daily activities at the site will be reduced to operational and maintenance checks which may be as frequent as a daily visit. Emissions will result from vehicle exhausts from the maintenance and process technician visits. The pad can be expected to produce fugitive emissions of well gas, which contains mostly methane and a minor fraction of volatile organic compounds. Fugitive emissions may also result from pressure relief valves and working and breathing losses from any tanks located at the site, as well as any flanges, seals, valves, other infrastructure connections used at the site. Liquid product load-out operations will also generate fugitive emissions of VOCs and vehicular emissions. If the operator is unable to sell any produced gas from the well, then gas flaring will also produce emissions of criteria, HAP, and GHG emissions.

Unique characteristics of the geographic area:
The EA evaluated the area of the proposed action and determined that no unique geographic characteristics such as: wild and scenic rivers, prime or unique farmlands, Areas of Critical Environmental Concern, designated wilderness areas, wilderness study areas or Lands with Wilderness Characteristics; were present.

Degree to which effects are likely to be highly controversial:
The potential for controversy associated with the effects of the proposed action is low. There is no disagreement or controversy among ID team members or reviewers over the nature of the effects on the resource values on public land by the proposed action.

Degree to which effects are highly uncertain or involve unique or unknown risks:
The drilling of oil and gas wells has occurred historically over the past century and although the potential risks involved can be controversial, they are neither unique nor unknown. There is low potential of unknown or unique risks associated with this project due to numerous other well locations having been successfully drilled in this area of Weld County.

Consideration of whether the action may establish a precedent for future actions with significant impacts:
The proposed APDs will be limited to standard construction procedures associated with pad/road construction and drilling in Weld County and have occurred historically on split

and private mineral estate. There are no aspects of the current proposal that are precedent setting.

Consideration of whether the action is related to other actions with cumulatively significant impacts:
The action is a continuation of oil and gas activities that have historically occurred in the area. Continued oil and gas activity in the area will have minor but additive impacts to air and the production greenhouse gas emissions. The project area having been subject to historic drilling activity will continue to experience gradual depletion of the recoverable oil and gas products. Although past cattle grazing had contributed to cumulative impacts, there have been no other recent activities besides oil and gas that has contributed to cumulative impacts.

Scientific, cultural or historical resources, including those listed in or eligible for listing in the National Register of Historic Places:
No historic properties were recorded during the cultural resources inventories.

Threatened and endangered species and their critical habitat:
There are no known populations of T&E species in the action area; however the proposed action may have an indirect impact on federally-listed species in Nebraska by potentially resulting in new depletions to the South Platte River. This could affect habitat for the western prairie fringed orchid, whooping crane, interior least tern, northern Great Plains population of the piping plover , pallid sturgeon (collectively referred to as the target species), and designated critical habitat of the whooping crane.

Due to the potential depletions to the South Platte River, this project falls under BLM Colorado's Programmatic Biological Assessment (PBA) for water depleting activities associated with BLM's fluid minerals program in the Platte River basin in Colorado (BLM 2015).

In response to BLM's PBA, the U.S. Fish and Wildlife Service (FWS) issued a Programmatic Biological Opinion (PBO)(06E-24000-2014-F-0671) on February 2, 2015, which concurred with BLM's determination that water depletions are "Likely to Adversely Affect" the whooping crane, interior least tern, northern Great Plains population of the piping plover, pallid sturgeon (collectively referred to as the target species), and designated critical habitat of the whooping crane. However, the FWS also determined that BLM water depletions from the Platte River Basin are not likely to jeopardize the continued existence of the whooping crane, interior least tern, northern Great Plains population of the piping plover, and the pallid sturgeon, and that BLM water depletions are not likely to destroy or adversely modify designated critical habitat for the whooping crane.

The Platte River Recovery Implementation Program (PRRIP), is implementing actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the States of Colorado, Nebraska, and Wyoming

and the U.S. Department of the Interior. The PRRIP addresses the adverse impacts of existing and certain new water related activities on the Platte target species and associated habitats, and provides ESA compliance for effects to the target species and whooping crane critical habitat from such activities including avoidance of any prohibited take of such species. The PRRIP serves as the reasonable and prudent alternative to offset the effects of water related activities that FWS found were likely to cause jeopardy to one or more of the target species or to adversely modify critical habitat.

The PBO addresses water depletions associated with fluid minerals development on BLM lands, including water used for well drilling and completion, hydrostatic testing of pipelines, dust abatement on roads, and seismic activity. The PBO includes reasonable and prudent alternatives developed by the FWS which allow BLM to authorize oil and gas wells that result in water depletion while avoiding the likelihood of jeopardizing endangered species and avoiding destruction or adverse modification of their critical habitat. The PBO confirms ESA compliance for water-related activities of oil and gas producers that elect to rely on the PRRIP through maintaining membership in good standing in the South Platte Water Related Activities Program, Inc. (SPWRAP) organization.

The SPWRAP organization is formally charged with certifying to the U.S. Fish and Wildlife Service that water users in Colorado are meeting the requirements to support reliance on the PRRIP for ESA compliance purposes.

Grynberg Petroleum has provided proof of current membership in SPWRAP and therefore is considered to be in compliance with the ESA as to the depletive effects of their activities on federally listed species and designated critical habitat associated with the Platte River in Nebraska.

Any effects that threaten a violation of Federal, State or local law or requirements imposed for the protection of the environment: The proposed action conforms with the provisions of NEPA (U.S.C. 4321-4346) and FLPMA (43 U.S.C. 1701 et seq.) and is compliant with the Clean Water Act and The Clean Air Act, the National Historic Preservation Act, Migratory Bird Treaty Act (MBTA) and the Endangered Species Act.

NAME OF PREPARER: Aaron Richter

SUPERVISORY REVIEW: Jay Raiford

NAME OF ENVIRONMENTAL COORDINATOR: Martin Weimer

DATE: 5/6/2015

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 5/18/15

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROYAL GORGE FIELD OFFICE

DECISION RECORD

Tigertail Federal 2-3 APD

DOI-BLM-CO-F020-2015-0004-EA

DECISION: It is my decision to authorize the Proposed Action as described in the attached EA. The proposed action is the construction of one well pad and access road, and the drilling of one vertical oil well on private surface over federal minerals (split estate).

The project is in Weld County, approximately 12 miles east of the Town of Ault, Colorado. The federal mineral estate is leased and subject to oil and gas development.

The proposed action was analyzed in the Environmental Assessment (EA) DOI-BLM-CO-F020-2015-0004 and a Finding of No Significant Impact was reached and an EIS will not be prepared.

RATIONALE: This APD will develop oil and gas resources on Federal minerals Lease COC 67169 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended. Extensive oil and gas development has occurred throughout the project area, mostly on private mineral estate.

The project area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. The addition of the infrastructure needed to construct and drill the proposed well would have mostly temporary and overall minor impacts on resources present in the project area.

MITIGATION MEASURES\MONITORING:

Air Quality:

Grynberg Petroleum, Inc. will use industry best practices, including watering, graveling, and reseeding to reduce fugitive dust emissions from vehicular traffic and disturbed surfaces. Interim reclamation and any existing agricultural practices will be implemented in order to stabilize the site and prevent fugitive dust from being generated. No visible dust plumes should be observed leaving the site.

All Drill Rigs will be required to meet EPA Non-Road Tier II Emissions Standards, or better, for all drilling and completion operations.

Process equipment will be permitted by CDPHE in accordance with applicable requirements and required emissions standards to limit the facility's potential to emit and provide appropriate operating, monitoring, and recordkeeping requirements.
VOC emissions controls achieving at least 90% control efficiency will be applied to all storage tanks.

Geology and Mineral Resources:

Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones and prospective mineral zones. At the APD stage, geologic and engineering reviews will be completed to ensure that cementing and casing programs are adequate to protect all downhole resources. Known water bearing zones in the APD area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement would be extended well beyond fresh-water zones to ensure that drilling fluids remain within the well bore and do not enter groundwater.

Invasive Plants:

Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. Areas disturbed by project implementation will be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring and treatment (if necessary) is required for the life of the project until BLM deems final reclamation is successful, which includes lack of Colorado list A and B noxious weeds.

Threatened, Endangered and Sensitive Species:

The project location does offer suitable habitat for mountain plover. If vegetation disturbing activities are to occur during May 15 through July 15 a clearance survey following U.S. Fish and Wildlife Service survey protocol must be completed prior to project activity.

Ferruginous hawks may nest in the project area; therefore, a raptor nest survey must be completed prior to construction and drilling efforts if actions are to occur during May 15 through July 15.

Wildlife Terrestrial:

A raptor nest survey must be completed prior to construction and drilling efforts if actions are to occur during May 15 through July 15.

Migratory Birds:

To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a “take” of migratory birds. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative.

Pursuant to BLM Instruction Memorandum 2008-050, to reduce impacts to Birds of Conservation Concern (BCC), no habitat disturbance (removal of vegetation such as timber, brush, or grass) is allowed during the periods of May 15 - July 15, during the breeding and brood rearing season for most Colorado migratory birds. An exception to

this timing limitation will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate no nesting within 30 meters (100 feet) of the area to be disturbed. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period.

Any secondary containment system will be covered in a manner to prevent access by migratory birds. The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may result in a "take" of individual migratory birds or nests that are protected by MBTA will not be allowed.

Paleontologic Resources:

In order to prevent potential impacts to paleontologic resources, a condition of approval will be attached to the APD that directs the holder to notify the BLM RGFO immediately if any vertebrate fossils or their traces are discovered during operations. Operations may continue as long as the fossil specimen would not be damaged or destroyed by the activity. Within 5 working days of notification, the BLM RGFO shall evaluate or have evaluated such discoveries and shall notify the operator what action shall be taken with respect to such discoveries. Since the APD is on split estate, the fossils are owned by the surface owner, BLM can recommend these measures but cannot require them.

Wastes, Hazardous or Solid:

The following mitigation will assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).
- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of wastes on site is allowed on Federal Lands.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary. State and/or Federal regulations may apply to pit construction and removal.

PROTEST/APPEALS: This decision shall take effect immediately upon the date it is signed by the Authorized Officer, and shall remain in effect while any appeal is pending unless the Interior Board of Land Appeals issues a stay (43 CFR 2801.10(b)). Any appeal of this decision must follow the procedures set forth in 43 CFR Part 4. Within 30 days of the decision, a notice of appeal must be filed in the office of the Authorized Officer at the Royal Gorge Field Office, 3028 E. Main, Cañon City, Colorado, 81212. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203 within 30 days after the notice of appeal is filed with the Authorized Officer.

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 5/18/15