

**U.S. Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 E. Main Street
Canon City, CO 81212**

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-2012-0003 EA

CASEFILE/PROJECT NUMBER (optional):

PROJECT NAME: Aristocrat Angus Federal 0-4-10

PLANNING UNIT:

LEGAL DESCRIPTION: Weld County, T.3N., R. 65W., Sec. 10.,

APPLICANT: Encana Oil & Gas (USA) Inc

ISSUES AND CONCERNS:

- a) Oil and Gas development on private surface/federal mineral estate in an ozone nonattainment area
- b) Ground water protection
- c) Development of non-renewable resources for American Public benefit
- d) Close proximity to Milton Reservoir

INTRODUCTION/BACKGROUND:

The BLM has received application for permit to drill a well and related construction for a locations in the central part of Weld County, 7 miles southeast of the City of Gilcrest, Colorado. The federal mineral estate targeted for production (down hole) in this project is leased and subject to oil and gas development.

The general area description would be defined as rural farmland and ranchland north of the South Platte River. There are few county roads in the project area, however, most access is limited to private landowner or oil and gas developed roadways. The roadways vary in development but most are dirt/primitive roads. Extensive oil and gas development has occurred on the private mineral estate in the western portion of the project area.

BLMs PURPOSE AND NEED: The purpose of the action is to provide the applicant the opportunity to develop their leases for the production of oil and gas. The need for the action is to

develop oil and gas resources on Federal Lease COC10009 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

Proposed Action:

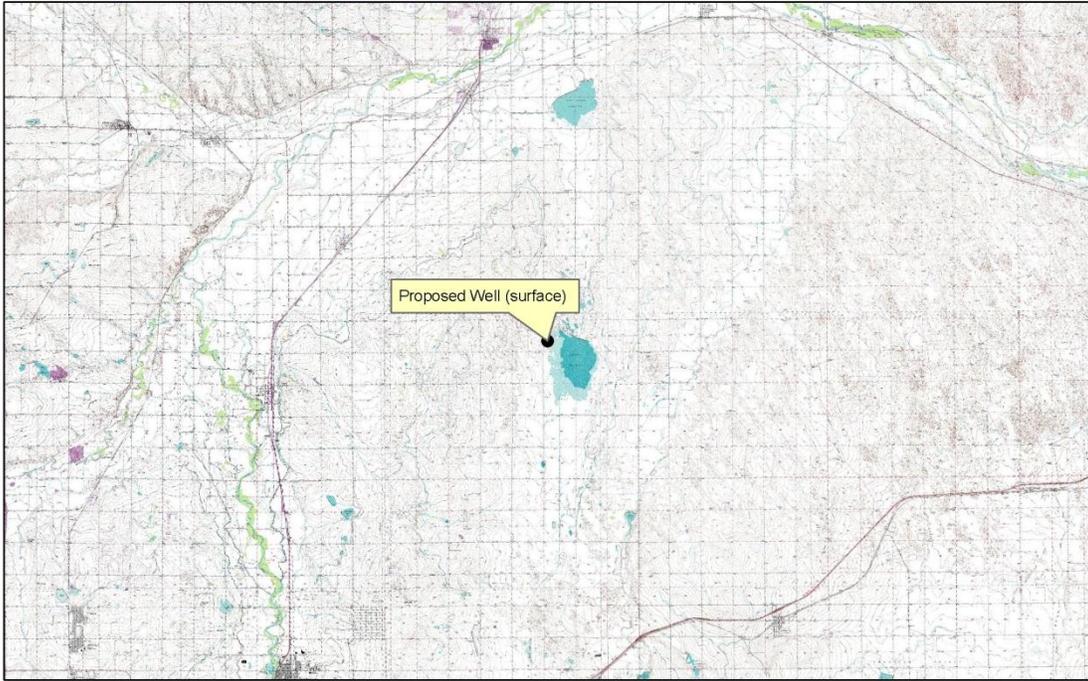
The proposed action is to directionally drill a well on an existing well pad that is located on fee surface and over fee minerals that will produce Federal minerals. The existing pad will be extended approximately 150 feet on all corners. If the well is capable of production in paying quantities, the oil & gas measuring facilities will be installed on the existing tank battery located east of the well site and the pipeline will be installed in the existing road. All appropriate soil stabilization and reclamation procedures will be applied to protect soils and vegetation. All disturbance is confined to areas that were previously subject to drilling operations and analyzed through NEPA.

Aristocrat Angus Federal 0-4-10 proposed well pad is located approximately 7 miles southeast of the City of Gilcrest, Colorado.

The proposed action would include well pad expansion/preparation, drilling and completion operations, and interim reclamation measures and is expected to take approximately 50 days. In the event of a dry hole the pads and access roads will be graded to original contour, topsoil replaced and the entire area reseeded. The Application for Permit to Drill (APD) for each new well includes a drilling program and a multi-point surface use and operations plan that describe details of well pad construction and interim and final reclamation. The proposed action would be implemented consistent with the terms of Federal Lease COC10009 and with Conditions of Approval (COAs) attached to the APDs.

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 to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APD associated with the proposed action. Under the no action alternative, therefore, none of the proposed developments described in the proposed action would take place.

Regional Map.



Aristocrat Angus Federal 0-4-10

DOI-BLM-CO-200-2012-0003 EA

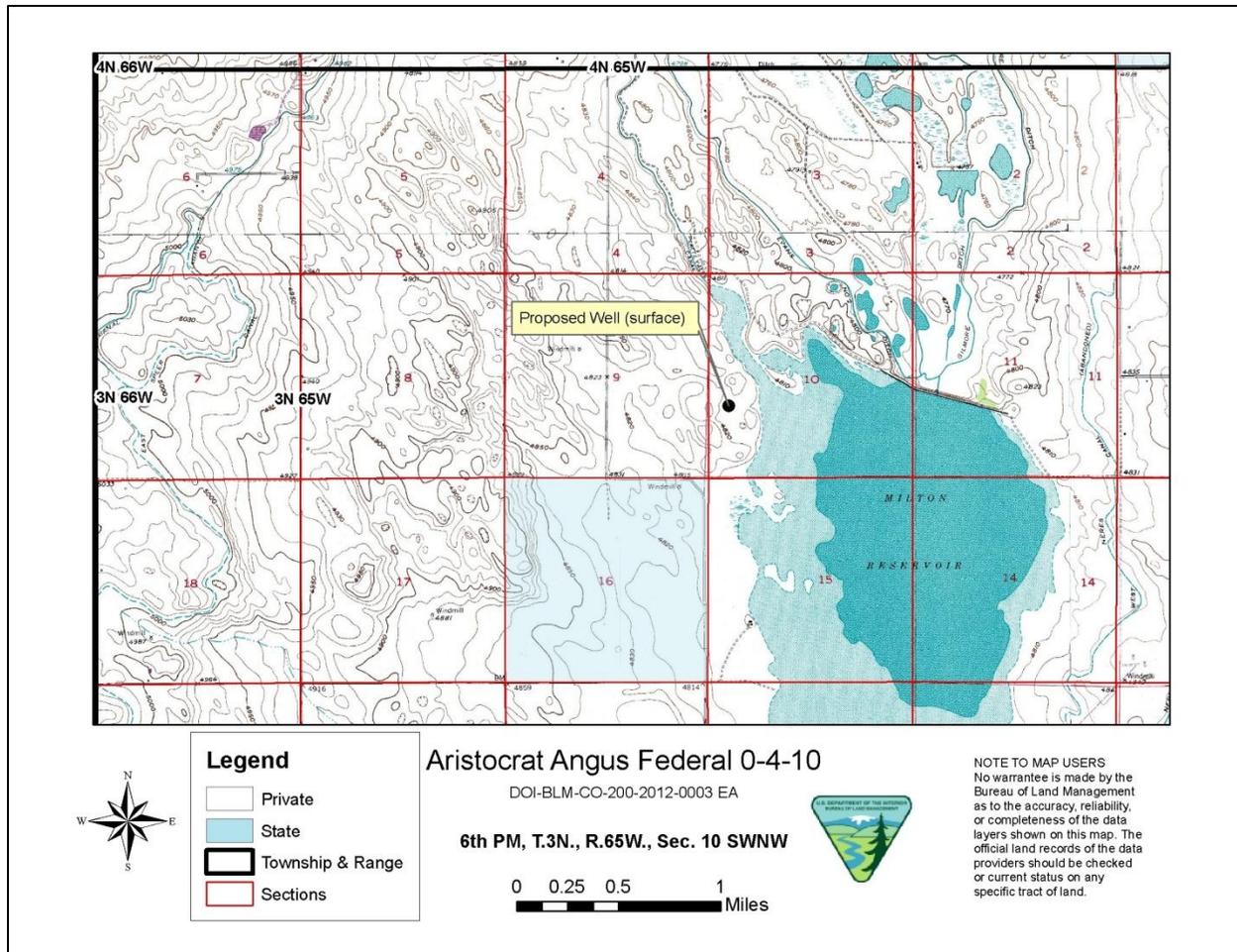
6th PM, T.3N., R.65W., Sec. 10 SWNW

0 1.5 3 6
Miles



NOTE TO MAP USERS
No warranty 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.

Site Specific Map (Proposed Well Pad Locations, Access, and Facilities).



PLAN CONFORMANCE REVIEW:

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: O&G Resources, Issue 21

Decision Language: Standard (21A) - These 2 10,410 acres of surface and subsurface may be leased and developed for oil and gas with the standard stipulations included in leases and other standard site-specific stipulations included in any use authorization.

Standards for Public Land Health: In January 1997, Colorado BLM approved the Standards for Public Land Health. These standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Because a standard exists for these five categories, a finding must be made for each of them in an environmental analysis. These findings are located in specific elements listed below.

AFFECTED ENVIRONMENT / ENVIRONMENTAL EFFECTS / MITIGATION MEASURES:

PHYSICAL RESOURCES

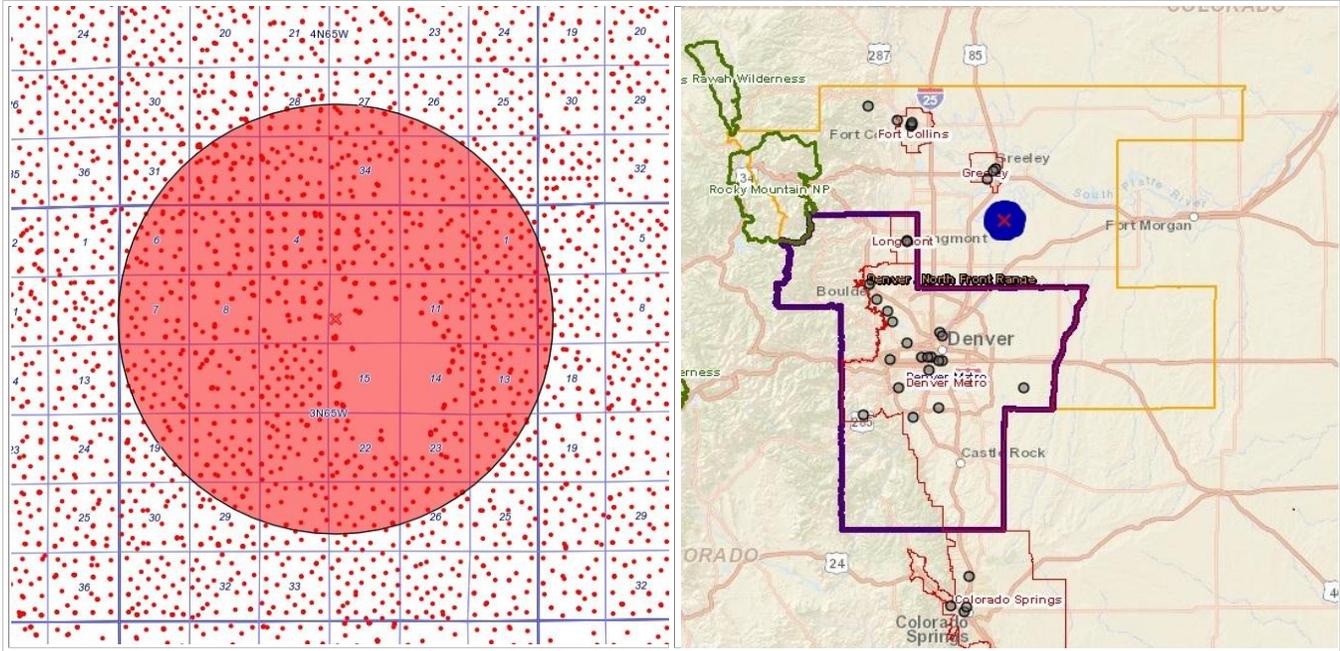
AIR QUALITY AND CLIMATE

Affected Environment: The proposed action 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 some 17,000 active wells within its boundaries. There are approximately 1,038 producing oil and gas wells in the immediate vicinity of the proposed Aristocrat Angus location (5km boundary - Latitude N 40.23773, Longitude W -104.65720).

Air quality within the region is marginal, and has experienced problems with attaining the National Ambient Air Quality Standards in the past for Ozone and Carbon Monoxide. The population density of Weld County within the proposed action area is generally dispersed, with less than 25 people per square mile. Mean temperatures in the area range from 15.6 degrees in January to 88.7 degrees in July. The area receives average annual precipitation of approximately 14.22 inches. Frequent winds in the area provide excellent dispersion characteristics for anthropogenic emissions.

Activities occurring within the area that affect air quality include exhaust emission from cars, drilling rigs, agricultural equipment, other vehicles, and oil and gas development activities, as well as fugitive dust from roads, agriculture, and energy development.

Figure 3-1. COGCC GIS Location Development and APCD Boundary Maps (Aristocrat Angus 0-4-10)¹



¹ Aristocrat Angus development boundary is 5km.

² Air Quality Designations are outlined as follows: Yellow – 8 hr. O₃ Non-attainment Area, Purple – PM₁₀ Maintenance Area, Red – CO Maintenance Area.

³ Air monitor locations are designated by grey circles on maps.

⁴ Class 1 areas are outlined in green.

Regulatory Framework: 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) (40 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 & 2.5 microns (PM₁₀ & PM_{2.5}), ozone (O₃), and nitrogen dioxide (NO₂).

The CAA established 2 types of NAAQS:

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

Secondary standards: – Secondary standards set limits in order 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 incidence rates are evaluated in order to re-propose any NAAQS to a lower limit if the data supports the finding.

The Colorado Air Pollution Control Commission, by means of an approved State Implementation Plan (SIP) and/or delegation by EPA, can established state ambient air quality standards for any criteria pollutant that is at least as stringent as, or more so, than the federal standards. Ambient air quality standards must not be exceeded in areas where the general public has access. Table 3.1 lists the federal and state ambient air quality standards.

Table 3-2. Ambient Air Quality Standards (EPA 2011)

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m ³	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
Particle Pollution [71 FR 61144, Oct 17, 2006]	PM _{2.5}	primary and secondary	Annual	15 µg/m ³	Annual mean, averaged over 3 years
			24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary	Annual	0.03 ppm	Arithmetic Average
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

The nearest APCD air monitors to the project sites are the Weld County West Annex (CO), County Tower (O₃), and Hospital (PM₁₀ & PM_{2.5}) sites located in Greeley, and the Platteville Middle School site (PM_{2.5}).

Table 3-1. Ambient Air Quality Monitoring Data Trends (CDPHE 2007 – 2010, EPA Forms)

Monitor	Pollutant (Standard)	2007	2008	2009	2010
West Annex	CO (1 Hour - ppm)	4.0	5.0	4.3	2.3
	CO (8 Hour - ppm)	2.5	2.3	2.3	1.8
County Tower	O ₃ (8 Hour - ppm)	0.078	0.076	0.075	0.074
Hospital	PM ₁₀ (24 Hour - µg/m ³)	89	68	63.0	44.0

	PM _{2.5} (24 Hour - µg/m ³)	24.0	25.2	24.7	22.0
	PM _{2.5} (Annual - µg/m ³)	9.5	7.67	8.36	7.6
Platteville	PM _{2.5} (24 Hour - µg/m ³)	24.0	25.2	25.7	21.1
	PM _{2.5} (Annual - µg/m ³)	10.3	8.23	8.24	7.8

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)].

The BLM, as the federal entity with jurisdiction for the subject activity, is bound by the requirements of the General Conformity rule under section 176(c) of the Clean Air Act for authorizing activities within a designated nonattainment or maintenance air quality area/region. The subject activity will be located within the Denver-metropolitan and North Front Range Ozone Nonattainment Area (Marginal), and thus a positive General Conformity demonstration or non-applicability analysis is required before the BLM can authorize the applicant’s permit to drill. This process ensures that a Federal action conforms to a State, Tribal, or Federal Implementation Plan. The proposed well is not located within the North Front Range CO or PM₁₀ maintenance areas, and therefore conformity analysis requirements for those pollutants do not apply. Emissions estimates for direct and indirect Oxides of Nitrogen (NO_x) and Reactive Volatile Organic Compounds (VOC), precursors for the formation of ground level ozone, was prepared for reasonably foreseeable oil and gas development activities for the well site, and includes emissions from construction, production, and maintenance operations. 40 CFR 93.153 defines the *de minimis* thresholds for NO_x and VOC in a marginal or moderate ozone nonattainment area, and outside of any designated transport region, as 100 tons per year (tpy). The subject activity is scheduled to commence in 2013 with the construction phase lasting approximately 3-6 months. The life of the well, 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 in 2013 (see results below).

The lease area is designated as a Class II Area, as defined by the Federal Prevention of Significant Deterioration (PSD) provision of the CAA. The PSD Class II designation allows for moderate growth or degradation of air quality within certain limits above baseline air quality. The closest Class I area to the proposed well site locations is Rocky Mountain National Park, which lies approximately 68 miles to the west.

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, hydraulic fracturing, 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 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 pads can be expected to produce fugitive emissions of well gas and liquid flashing gases, which can contain 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 sites, as well as any flanges, seals, valves, or other infrastructure connections used at the sites. Liquid product load-out operations will also generate fugitive emissions of VOCs.

Ozone is not directly emitted like other criteria pollutants. Ozone is chemically formed in the atmosphere via interactions of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NO_x and VOCs are ozone precursors). Ozone formation and prediction is complex, generally results from a combination of significant quantities of VOCs and NO_x 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 minor project on potential regional ozone formation and transport. However, the State of Colorado assesses potential ozone impacts from its authorizing activities on a regional basis when an adequate amount of data is available and where such analysis has been deemed appropriate. For this reason (inappropriate scale of analysis), ozone will not be further addressed in this document beyond the related precursor discussions, general conformity analysis, and an appropriate qualitative analysis/comparison to background emissions inventories for the county and SIP (see cumulative impacts).

Emission estimates from the proposed well sites were calculated for this EA, and are disclosed in Table 3.2 below. The emissions inventories (EI) considered reasonably foreseeable oil and gas development activities for the proposed wells within the Denver-metropolitan Northern Front Range Nonattainment Area, and includes emissions from both construction and production operations. The following pollutants were inventoried where an appropriate basis, methodology, and sufficient data exists: CO, NO_x (includes NO₂), PM_{2.5}, 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 the entire year (2013), and since this will not be the case in reality, the production emissions are considered conservative. Potential emissions were calculated for each 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.

The following assumptions were applied consistently to all potential activities:

- Given the lack of reasonably foreseeable activity on existing roads (lack of location, timing, activity volume, and types of vehicles), it was assumed current vehicular emissions would continue indefinitely, and at minimum would conform to growth outlined in the Draft (07/28/11) Denver-North Front Range (Northern Subarea) 8-Hour Ozone Conformity Determination. Although some or all of the traffic associated with this action would be included within the above reference conformity determination, no credit was taken to exclude vehicular traffic emissions from this analysis.
- The EI used a disturbed surface area of 5.05 acres for the well pad, access road, and pipeline construction. All disturbed surfaces would receive appropriate application of water (during construction) or dust palliatives (during operations), but were calculated to achieve a 0 % dust control factor to be conservative.
- All diesel fuel would be standard #2 grade (500 ppm sulfur).
- The well pad equipment would include tanks and separation equipment, but no compression,

dehydration or desulfurization units.

- 'Natural gas' would be piped directly into a 3rd party gathering system. 100% green completions assumed as provided. Flaring assumed to be limited to 5% of total tank and separator flash gas volumes.
- Drill rigs emissions were based on EPA Non-road Tier 0 emissions standards.
- The EI used an applicant provided average 'Well Gas' analysis to estimate VOC and HAP speciation percentages.
- Fugitive well emissions are based on an applicant provided well component counts.
- No New Source Review (minor) credit was taken (i.e. all emissions estimates are included in the analysis) for project stationary sources likely to receive permitting from APCD.

Table 3-2. Estimated Maximum Annual Emissions (2013) from Aristocrat Angus 0-4-10

Activity	Annual Emissions (tons)												
	PM ₁₀	PM _{2.5}	NO _x	SO ₂	CO	VOC	HAPs	H ₂ S	CO ₂	CH ₄	N ₂ O	CO _{2eq}	CO _{2eq} metric tonnes
Well Pad Construction - Fugitive Dust	0.23	0.02	---	---	---	---	---	---	---	---	---	---	---
Heavy Equipment Exhaust Emissions	0.81	0.79	13.31	0.26	6.22	1.22	0.12	---	762.28	0.01	0.01	765.09	694.27
Commuting Vehicles - Construction	2.00	0.21	0.12	0.00	0.03	0.01	0.00	---	856.17	0.05	0.02	863.93	783.96
Wind Erosion	4.42	0.66	---	---	---	---	---	---	---	---	---	---	---
Completion Venting	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Construction	7.46	1.68	13.43	0.26	6.25	1.22	0.12	0.00	1,618.45	0.05	0.03	1,629.02	1,478.24
Well Workover Operations - Fugitive Dust	0.08	0.01	---	---	---	---	---	---	---	---	---	---	---
Well Workover Operations - Exhaust	0.14	0.14	5.19	0.10	0.98	0.28	0.03	---	762.63	0.01	0.01	765.45	694.60
Wellpad Visits for Inspection & Repair	2.08	0.21	0.03	0.00	0.16	0.01	0.00	---	10.60	0.00	0.00	10.67	9.68
Wellhead and Compressor Equipment Leaks	---	---	---	---	---	3.51	0.24	0.00	1.53	9.87	0.00	208.76	189.44
Wellhead Compressor Engines Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Oil Wellhead Pumps (Artificial Lift)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Condensate Storage	---	---	---	---	---	0.90	0.22	---	0.21	0.00	0.00	0.22	0.20
Condensate Related Traffic	0.06	0.01	0.01	0.00	0.00	0.00	0.00	---	1.45	0.00	0.00	1.45	1.32
Oil Tanks	---	---	---	---	---	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Oil Related Traffic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Water Tanks	---	---	---	---	---	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Water Related Traffic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Water Disposal Pumps	0.00	0.00	0.01	0.00	0.00	0.00	0.00	---	0.12	0.00	0.00	0.12	0.11
Well Pad Heaters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Recompletion Traffic	0.78	0.08	0.06	0.00	0.02	0.00	0.00	---	8.46	0.00	0.00	8.47	7.68
Re-Completion Venting	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blowdown Venting	---	---	---	---	---	0.47	0.05	0.00	0.21	1.33	0.00	28.04	25.44
Gas Flaring	---	---	0.03	---	0.14	0.05	---	---	38.13	0.45	---	47.51	43.12
Gas Plant Emissions	0.01	0.01	0.45	0.00	0.24	0.24	0.01	0.00	---	0.13	0.01	0.00	0.00
Field Dehydrators	---	---	0.00	---	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00
Sub-total: Operations	3.15	0.45	5.77	0.10	1.55	5.46	0.54	0.00	823.34	11.78	0.02	1,070.69	971.59
Resource Road Maintenance	0.01	0.00	0.00	0.00	0.00	0.00	0.00	---	0.51	0.00	0.00	0.51	0.46
Sub-total: Maintenance	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.51	0.46
Resource Road Reclamation	0.01	0.00	0.01	0.00	0.01	0.00	0.00	---	1.23	0.00	0.00	1.24	1.13
Wellpad Reclamation	0.01	0.00	0.02	0.00	0.02	0.00	0.00	---	2.39	0.00	0.00	2.41	2.19
Sub-total: Reclamation	0.02	0.00	0.03	0.00	0.02	0.00	0.00	0.00	3.62	0.00	0.00	3.65	3.31
Total Emissions (tons)	10.65	2.14	19.24	0.37	7.83	6.69	0.66	0.00	2,445.92	11.83	0.05	2,703.87	2,453.60

Table 3-4 below demonstrates a relative comparison of the project emissions to Weld County’s total emissions from 2008. It also shows Weld County’s oil and gas area and point source emissions for the same period.

Table 3-4. Proposed Action & Weld County Emissions Comparisons¹

Pollutant	Emissions, Tons per year			
	Aristocrat Angus	Weld County Total Emissions (2008)	Weld County Oil & Gas Area Source Emissions	Weld County, Oil & Gas Point Source Emissions
NO _x	19.24	29,295	7,763	5,910
CO	7.83	74,544	4,968	5,138
VOC	6.69	82,714	30,810	21,580
PM ₁₀	10.65	40,718	375	129
PM _{2.5}	2.14	ND	ND	ND
SO _x	0.37	474	ND	4
HAPs	0.66	242	ND	66

¹ CDPHE 2008 APEN Database/Emissions Inventory (most current available). ND = No Data. CDPHE HAP inventory is for benzene only.

The APD projects, 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):

Aristocrat Angus 0-4-10:

- [X] Potential maximum total Direct and Indirect emissions are below *de minimis* threshold levels:
 - Ozone (NO_x): 19.24 tpy in 2013 (Maximum Year)
 - Ozone (VOC): 6.69 tpy in 2013 (Maximum Year)

The project emissions are relatively small compared to the aggregate County emissions, less than 0.066%. APCD published modeling guidance (Colorado Modeling Guideline for Air Quality Permits - January 2002, April 2010) that established thresholds for requiring additional analysis when emissions are exceeded on an annual or short term basis. The modeling thresholds were developed to identify new sources and modifications that would have relatively small impacts on ambient air quality and would not warrant further analysis with respect to applicable standards with a few exceptions. The thresholds (de minimis emissions) establish levels of emissions which have a low probability of causing or contributing to an exceedance of an air quality standard. Each of the pollutant emissions calculated for the APD are below the APCD established thresholds. Although not specifically a stationary source (i.e. most of the sources are mobile), the context allows for a reasonable analysis of the estimated worst case emissions that suggests the projects would have insignificant impacts to regional air quality.

Greenhouse Gas Emissions and Climate Change: According to the U.S. Global Change Research Program (2009), global warming is unequivocal, and the global warming that has occurred over the past 50 years is primarily human-caused. Standardized protocols designed to measure factors that may contribute to climate change, and to quantify climatic impacts, are presently unavailable. Moreover, specific levels of significance have not yet been established by regulatory agencies. Predicting the degree of impact any single emitter of GHGs may have on global climate, or on the changes to biotic and

abiotic systems that accompany climate change is highly complex, has considerable uncertainty, and requires intense computer modeling (i.e., super computers). As such, no readily available tools exist to predict impacts a project’s emissions would have on the global, regional, or local climate. This analysis is therefore limited to comparing the context of total project GHG emissions, and to emissions recently analyzed by EPA. The analysis also discloses readily available information regarding expected changes to the global climatic system and any empirical evidence of climate change that has occurred to date (see cumulative impacts).

The implementation of the Proposed Action Alternative is estimated to contribute 2,704 tons of carbon dioxide equivalent (CO₂e) in the maximum year (2013). Annual operating GHG emissions will be 40% of the total emissions shown for the maximum year. Over a 25 year project timeframe the total GHG emissions expected are approximately 28,396 tons. The total provided 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 the estimated production values (provided by the proponent), could vary significantly over the life of the project, making any prediction of the quantities of GHG emitted highly speculative.

In 2007, the state of Colorado’s GHG emissions were 124,000,000 metric tons. The proposed action’s GHG emissions represent about 0.0045 % of the state of Colorado’s GHG emissions.

To provide additional context, 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 uncertainty 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 EPA’s 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.

Table 3-5. Greenhouse Gas Emission Comparisons

Inventory Description	CO₂e Emissions (10⁶ mtpy)	Proposed Action Percentage
Colorado (2007)	124	0.00002
Total US Greenhouse Gases ¹	6,957	0.0000004

¹*Inventory of US Greenhouse Gas Emissions and Sinks: 1990–2008 (EPA 2010a) EPA Emissions*

Cumulative Impacts: 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 well's impact would be very minor. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled on Federal, State, and private lands. This could result in a larger impact to air quality in the future. However, given that the area is currently designated as a nonattainment area for ozone, the state requires additional, more stringent pollution control measures for oil and gas activities in such areas.

With respect to ozone, the current nonattainment area episodic anthropogenic emissions budget approved by the Colorado Air Quality Control Commission (December 12, 2008) for NO_x and VOCs (ozone precursors) is 334.6tpd and 425.4tpd respectively. These emissions represent reductions projected to be realized (in 2010) from the implementation of additional rules which are now a part of the Colorado Air Quality Control Regulations (AQCRs). The reductions were modeled to show progress towards attaining the ozone standard for the worst ozone days. The emissions inventory included a comprehensive speciation of point, mobile (on-road and non-road), oil and gas (point and area), and biogenic sources. The Technical Support Document (TSD) for the inventory provides the basis for the inventory and includes broad cross sections of the economy. As such, and given the projected pace of development for the inventory, it is likely that the project emissions for the Aristocrat Angus APD was adequately covered and evaluated in the APCD episodic analysis. Given the likely coverage, it is not anticipated the project will have a measurable negative impact on regional ozone formation or produce results inconsistent with the those of the modeled parameters.

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

(<http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf>):

- 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 lion, 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 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, however, so longer growing season in theory would result in more forage production provided there is sufficient precipitation. Drier conditions could have severe impacts on forests and woodlands. This could leave these forests and woodlands more susceptible to insect damage and at higher risk of catastrophic wildfires. Increased fire activity and intensity would increase greenhouse gas emissions.

Protective/Mitigation Measures: Encana would use industry best practices, including watering, graveling, and reseeded to reduce fugitive dust emissions from vehicular traffic and disturbed surfaces. Interim reclamation and existing agricultural practices will be implemented in order to stabilize the site and prevent fugitive dust from being generated. In addition the following BLM requirements will apply:

- 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.
- The company will perform 'Green Completions' for the well.

It is expected that the operator will comply with these requirements and make every effort to minimize emissions through good engineering and operating practices to the maximum extent practical.

No Action Alternative (Direct and Indirect Impacts): None of the proposed action elements would be authorized and therefore none of the potential emissions would occur. No impacts to air quality would occur. The incremental increase to global GHG burden would not happen, however it is entirely likely the predicted climatic changes will occur regardless.

Protective/Mitigation Measures: NA

GEOLOGIC AND MINERAL RESOURCES

Affected Environment: The Proposed APDs are located within the Denver-Julesburg Basin, a geologic structural basin centered in eastern Colorado and extending to Wyoming, Nebraska, and western Kansas. The basin consists of a large asymmetric syncline of Paleozoic, Mesozoic, and Cenozoic sedimentary rock layers. The basin is deepest near Denver and most shallow in Kansas. Coal, Uranium, and oil and gas are found primarily in the Mesozoic strata within the Denver Basin. Coal has been mined from the Cretaceous Laramie Formation along the western edge of the Denver Basin. The coal deposits in the area north of Greeley are relatively thin and discontinuous, and therefore limited exploration for coal has been conducted in the area. Uranium has been identified in the Cretaceous Fox Hills and Laramie formations in the northern part of Denver Basin, near Grover in Weld County. 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 proposed APDs are located within the Wattenberg gas field where the primary target is the Codell/ Niobrara oil and gas. The proposed 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 four Denver Basin aquifers which 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 generally between 250 and 300 feet thick, and includes about 150 to 200 feet of fine-grained and medium-grained sandstone. The aquifer typically yields water in quantities sufficient for commercial development and is extensively utilized throughout the basin. Well yields may be as high as 100 gpm, but are typically somewhat lower. Both the Laramie-Fox Hills and Arapahoe aquifers are generally under artesian pressure at the present time.

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.

Cumulative Impacts: The proposed action would drill through the Laramie-Fox Hills aquifer to produce hydrocarbons from underlying formations.

Mitigation/Residual Effects: Recommended Mitigation as follows

BLM Onshore Order #2 (OO#2) requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. A review at the Application for Permit to Drill stage includes a geologic evaluation of the potential subsurface formations that will be penetrated by the wellbore, followed by an engineering analysis of the drilling program to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist, and all known or anticipated zones with potential risks.

BLM will require that the surface casing be run across the aquifer, and placed at least 100 feet into the underlying Pierre Shale - a formation that should not fracture or breakdown with the

maximum weighting of mud that may be needed when drilling to total depth or to the next set of casing string.

No Action Alternative Under the no action alternative APDs would be denied and no action would occur. Although, Federal subsurface minerals are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the leases.

Direct and Indirect Impacts: The proposed wells are surrounded by privately held, producing oil and gas wells. If the proposed APDs are denied, the federal mineral estate will eventually be drained by surrounding oil and gas wells with no compensation to the federal government.

Cumulative Impacts: The proposed wells are surrounded by privately held, producing oil and gas wells. If the proposed APDs are denied, the federal mineral estate will eventually be drained by surrounding oil and gas wells with no compensation to the federal government.

Mitigation/Residual Effects: The BLM may be required to take protective action to prevent drainage of federal minerals in accordance with 43 CFR §3162.

WATER QUALITY, SURFACE AND GROUND (includes a finding on Standard 5)

Affected Environment: The well would be drilled from an existing pad that would be enlarged to accommodate an additional well. The existing pad is in an upland location approximately ¼ mile from the extreme high water mark of Milton reservoir. Groundwater here is located in the Laramie-Fox Hills aquifer and is good quality. This aquifer is heavily used for many uses including both domestic and agricultural. The geology section of this document further describes the groundwater of the area.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Surface water impacts of the proposed wells are associated with the surface disturbance associated with drilling and related infrastructure after well completion. In this instance, the proposed well would be drilled on an existing pad that would be expanded 150' in all directions and any related infrastructure would be placed in existing disturbances. Due to the historic uses of the area, little new impacts to surface water quality would result from drilling the proposed wells.

Ground water is relied on heavily in this area for irrigation and domestic uses. 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 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. In addition to changing the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the well bore; hydraulic fracturing can also introduce chemical additives into the producing formations. 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 residential 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.

Cumulative Impacts: The area currently has a high degree of alteration in the form of reservoirs, roads, houses, and oil and gas production. At the watershed scale, the addition of the proposed well would have an immeasurable impact to the water quality of the area in the future.

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

No Action Alternative

Direct and Indirect Impacts: If no action is taken, the wells would not be drilled and no new impacts to water quality would occur.

Cumulative Impacts: There would be no new impacts to water quality, at any level, if the wells are not drilled.

Mitigation/Residual Effects: None

Finding on the Public Land Health Standard for Water Quality: Currently, water quality in the area is meeting standards. The implementation of the proposed action with mitigations and other APD approval requirements would not change this finding.

OTHER ELEMENTS:

Resource/Issue	Rationale for dismissal
Soils	Private Surface/Private Minerals (per IM 2009-078)

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BIOLOGICAL RESOURCES

THREATENED, ENDANGERED, AND SENSITIVE SPECIES (includes a finding on Std. 4)

Affected Environment: The field area is dominated by agriculture, primarily grazing, and existing well pads. The proposed action will occur on an existing pad. There are no records of T&E species for the area and only one BLM sensitive species is likely to occur in the area, the ferruginous hawk. A search of Division of Wildlife and Colorado Natural Heritage Program databases shows no Potential Conservation Areas for the area and no black-tailed prairie dog colonies.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: There will be no impacts to T&E and sensitive species from this field development. Attempts should be made to avoid any structures such as trees and abandoned farmsteads where ferruginous hawks may nest.

Cumulative Impacts: The location and surrounding area is highly disturbed by agricultural production and oil and gas development. If oil is found in economically feasible quantities, it is likely additional development will occur.

Mitigation/Residual Effects: In this instance, information memorandum 2009-078 precludes the BLM from suggesting mitigation because BLM is not the surface owner.

No Action Alternative

Direct and Indirect Impacts: None.
Cumulative Impacts: None.
Mitigation/Residual Effects: None.

Finding on the Public Land Health Standard for Threatened & Endangered species:
Public land health standards for T&E species will not be affected by this field development.

MIGRATORY BIRDS

Affected Environment: The field area is dominated by agriculture, primarily grazing. The following species are on the US Fish and Wildlife Services "Birds of Conservation Concern-2008 List for BCR-16 (Shortgrass Prairie) and might occur in the project area based on their habitat requirements: ferruginous hawk, prairie falcon, and Cassin's sparrow.

Ferruginous hawks nest in isolated trees or small groves of trees, and on other elevated sites such as rock outcrops, buttes, large shrubs, haystacks, and low cliffs. Nests are situated adjacent to open areas such as grassland or shrubsteppe. These hawks are closely associated with prairie dog colonies, especially in winter.

Prairie falcons breed on cliffs and rock outcrops, and hunt in adjacent open areas such as grasslands and shrubsteppe. Adults arrive on the breeding grounds in February or March and initiate nesting in late April; young fledge in June and July. Their diet during the breeding season is a mix of passerines and small mammals. Birds wintering in Colorado prey on passerines, especially horned larks.

Cassin's sparrows breed in northeastern Colorado and throughout the eastern plains with highest concentrations in the southeast. These sparrows inhabit shortgrass prairie with scattered shrubs (including sand sagebrush, yucca, and rabbitbrush), that they use for song perches and nest cover. Breeding birds will accept a wide range of shrub densities as long as grass cover exists. Cassin's sparrows arrive in Colorado in early to mid-April, but most do not initiate nesting until late May. Incubation and brooding take place in June, and most young fledge by mid-July. Their diet consists of invertebrates (beetles, grasshoppers, crickets) and seeds.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The proposed action will occur on an existing pad. The eastern plains of Colorado provide a relatively arid landscape, and sources of water may congregate several species of migratory birds that require free water. If an open pit is to be used for produced water, petroleum based products that accumulate on the surface will result in death of migratory birds. Birds may use this water source to rest, feed, preen, or drink. As a result, petroleum products would likely coat the bird causing it to lose its buoyancy, flight, and insulating capabilities resulting in death. Ingestion of petroleum products could also be lethal.

Furthermore, equipment and infrastructure needed in the development of oil and natural gas products could have a negative impact. 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 in human activity, i.e. road traffic, will likely result in an increase in vehicular collisions with migratory birds.

Cumulative Impacts: The location and surrounding area is highly disturbed by agricultural production and oil and gas development. While the habitat may not be ideal, plains birds have adapted to and currently use agricultural fields and grazed lands 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. The addition of oil and gas development will likely cause an additional negative impact to most species of migratory birds currently present at the site. If oil is found in economically feasible quantities, it is likely additional development will occur.

Mitigation/Residual Effects: In this instance, information memorandum 2009-078 precludes the BLM from suggesting mitigation because BLM is not the surface owner.

No Action Alternative
 Direct and Indirect Impacts: None.
 Cumulative Impacts: None.
 Mitigation/Residual Effects: None.

OTHER ELEMENTS:

Resource/Issue	Rationale for dismissal
Invasive Plants	Private Surface/Private Minerals (per IM 2009-078)
Vegetation	Private Surface/Private Minerals (per IM 2009-078)
Wetland & Riparian Zones	Private Surface/Private Minerals (per IM 2009-078)
Wildlife Aquatic	Private Surface/Private Minerals (per IM 2009-078)
Wildlife Terrestrial	Private Surface/Private Minerals (per IM 2009-078)

HERITAGE RESOURCES AND HUMAN ENVIRONMENT

CULTURAL RESOURCES

Affected Environment: Both prehistoric and historic sites are present near the area of potential effect, although the site density is quite low. Pursuant to BLM IM 2009-078, “Processing Oil and Gas Applications for Permit to Drill for Directional Drilling into Federal Mineral Estate”, cultural resources inventories are not necessarily required unless the act of drilling, completing, and/or operating the Federal well has the potential to impact a historic property. Because it was determined that a cultural resources inventory was not necessary, only a literature review was conducted [see Report CR-RG-12-72 (L)].

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment: Because no cultural resources inventory has been performed for this undertaking, it is not known with absolute certainty whether any traditional or sacred cultural properties are present on the relevant acreage. However, it is highly unlikely that any such sites are present, and an inventory will be conducted before initiation of any undertakings that might affect sites of concern to Native Americans.

PALEONTOLOGICAL RESOURCES

Affected Environment: The Proposed APD is located within the Denver-Julesburg Basin, a geologic structural basin centered in eastern Colorado and extending to Wyoming, Nebraska, and western Kansas. The basin consists of a large asymmetric syncline of Paleozoic, Mesozoic, and Cenozoic sedimentary rock layers. The basin is deepest near Denver and most shallow in Kansas. Coal, Uranium, and oil and gas are found primarily in the Mesozoic strata within the Denver Basin. Coal has been mined from the Cretaceous Laramie Formation along the western edge of the Denver Basin. The coal deposits in the area north of Greeley are relatively thin and discontinuous, and therefore limited exploration for coal has been conducted in the area. Uranium has been identified in the Cretaceous Fox Hills and Laramie formations in the northern part of Denver Basin, near Grover in Weld County. Most oil and gas production in the Denver Basin has been produced from Cretaceous sandstones: J-Sandstone, Codell Sandstone, Niobrara Formation, Hygiene Sandstone, and Terry Sandstone.

Paleontologic resources are present in the Laramie Formation that is exposed at the surface in the vicinity of the proposed APDs. The Laramie Formation is a Class 3 paleontologic resource according to the Royal Gorge Field Office Potential Fossil Yield Classification (RGFO PFYC) because it is a fossiliferous sedimentary geologic unit where fossil content varies in significance, abundance, and predictable occurrence. Vertebrate fossils including fish, dinosaur, and mammal fossils have all been found in the Laramie Formation.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The proposed action involves surface disturbing activities such as well pad and road construction and burial of pipeline. Any surface disturbing activity has the potential to uncover paleontologic resources. The BLM manages paleontological resources by the authorities granted in FLPMA (P.L. 94-579) and NEPA (P.L. 91-190) and the Paleontologic Resources Preservation Act that was passed by congress in March 2009. It is unlawful to collect or damage protected paleontologic resources without a Paleontological Resources Use Permit (43 CFR 3165.1-5).

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 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.

Cumulative Impacts: Past and current impacts to important fossil resources could be long-term and significant since fossils removed or destroyed would be lost to science. Impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed activity would have a beneficial impact in that ground disturbing activities may result in the discovery of important fossil resources.

Mitigation/Residual Effects: Ground-disturbing activities would require sufficient monitoring to determine whether significant paleoresources occur in the area of a proposed action. Mitigation beyond initial findings can range from no further mitigation necessary to full and continuous monitoring of significant localities during the action. Initial findings, based on

review of the geologic formations in the area are that the proposed APDS are within a formation that contains Class 3 paleoresources. Current land use in the proposed area is farming and ranch land and the surface of the land has already been heavily disturbed thus a preliminary paleo survey would not be necessary. Since the well is going to be drilled from an existing well pad, a paleo survey will not be recommended. 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.

No Action Alternative: No wells would be drilled, therefore no surface disturbance.

Direct and Indirect Impacts: None

Cumulative Impacts: None

Mitigation/Residual Effects: None

OTHER ELEMENTS:

Resource/Issue	Rationale for dismissal
Visual Resources	Private Surface/Private Minerals (per IM 2009-078)
Tribal and Native American Religious Concerns	Private Surface/Private Minerals (per IM 2009-078)
Environmental Justice	Private Surface/Private Minerals (per IM 2009-078)
Waste, Hazardous or Solid	Private Surface/Private Minerals (per IM 2009-078)

OTHER ELEMENTS:

Resource/Issue	Rationale for dismissal
Cadastral Survey	Private Surface/Private Minerals (per IM 2009-078)
Fire	Private Surface/Private Minerals (per IM 2009-078)
Forest Management	Private Surface/Private Minerals (per IM 2009-078)
Law Enforcement	Private Surface/Private Minerals (per IM 2009-078)
Noise	Private Surface/Private Minerals (per IM 2009-078)
Socio-Economics	Private Surface/Private Minerals (per IM 2009-078)

Lands and Realty	Private Surface/Private Minerals (per IM 2009-078)
Recreation	Private Surface/Private Minerals (per IM 2009-078)
Range Management	Private Surface/Private Minerals (per IM 2009-078)
Farmlands, Prime and Unique	Private Surface/Private Minerals (per IM 2009-078)

CUMULATIVE IMPACTS SUMMARY:

Air Resources: 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 three additional pads and wells would have a cumulative impact to the area's air quality; however, given the existing level of development in the area, the proposed wells' impact would be very minor.

Geology: The proposed action would drill through the Laramie-Fox Hills aquifer to produce hydrocarbons from underlying formations. Impacts to the aquifer will be reduced to negligible by following recommended mitigation.

Soils: The area around the proposed wells has a variety factors effecting soils including roads, housing, agriculture, oil and gas production, and livestock grazing. The addition of the infrastructure needed to extend the pad would have a small and limited additional impact to the areas soils. At the watershed scale, the addition of the pad extension would have an immeasurable impact to the soils of the area in the future given the current uses of in the proposed project area.

Water Quality: The area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. At the watershed scale, the addition of the proposed well would have an immeasurable impact to the water quality of the area in the future.

Migratory Birds: The location and surrounding area is highly disturbed by agricultural production and oil and gas development. While the habitat may not be ideal, plains birds have adapted to and currently use agricultural fields and grazed lands 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. The addition of oil and gas development will likely cause an additional negative impact to most species of migratory birds currently present at the site. If oil is found in economically feasible quantities, it is likely additional development will occur.

Paleontology: Impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed activity would have a beneficial impact in that ground disturbing activities may result in the discovery of important fossil resources.

PERSONS / AGENCIES CONSULTED:

INTERDISCIPLINARY TEAM REVIEW

NAME	TITLE	AREA OF RESPONSIBILITY
Matt Rustand	Wildlife Biologist	Terrestrial Wildlife, T&E, Migratory Birds
Jeff Williams	Range Management Spec.	Range, Vegetation
Chris Cloninger	Range Management Spec.	Range, Vegetation
John Lamman	Range Management Spec.	Range, Vegetation, Farmland, Weeds
Dave Gilbert	Fisheries Biologist	Aquatic Wildlife, Riparian/Wetlands
Tomas Kamienski	Natural Resource Specialist	Soils
Stephanie Carter	Geologist	Minerals, Paleontology, Waste Hazardous or Solid
Melissa Smeins	Geologist	Minerals, Paleontology
John Smeins	Hydrologist	Hydrology, Water Quality/Rights
Ty Webb	Prescribed Fire Specialist	Air Quality
Tony Mule'	Cadastral Surveyor	Cadastral Survey
Kalem Lenard	Recreation	Recreation, Wilderness, Visual, ACEC, W&S Rivers, LWCs
John Nahomenuk	Recreation, River Manager	Recreation, Wilderness, Visual, ACEC, W&S Rivers, LWCs
Ken Reed	Forester	Forestry
Martin Weimer	NEPA Coordinator	Environmental Justice, Noise, SocioEconomics
Monica Weimer	Archaeologist	Cultural, Native American
Erin Watkins	Archaeologist	Cultural, Native American
Vera Matthews	Realty Specialist	Realty
Debbie Bellew	Realty Specialist	Realty
Steve Cunningham	Law Enforcement Ranger	Law Enforcement
Bob Hurley	Fire Management Officer	Fire Management

FONSI

DOI-BLM-CO-200-2012-0003 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:

Proposed project area is located in Weld County, 7 miles southeast of the City of Gilcrest, Colorado. The federal mineral estate targeted for production (down hole) in this project is leased and subject to oil and gas development.

The general area description would be defined as rural farmland and ranchland south of the South Platte River. There are few county roads in the project area, and most access is limited to private landowner or oil and gas developed roadways.

Extensive oil and gas development has occurred on the private mineral estate in the western portion of the project area.

Proposed action location is within an ozone nonattainment area, a general conformity analysis for ozone was completed for this proposed activity.

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 three additional pads and wells would have a cumulative impact to the area's air quality; however, given the existing level of development in the area, the proposed wells' impact would be very minor. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled on Federal, State, and private lands. This could result in a larger impact to air quality in the future. However, given that the area is currently designated as a nonattainment area for ozone, the state requires additional, more stringent pollution control measures for oil and gas activities in such areas.

As a result of the location of the proposed action, in the nonattainment area, the significant level is considered on the regional scale for air quality resource and local significance on other resources analyzed.

Intensity:

Impacts that may be beneficial and adverse: There would be minor impacts to air quality from the proposed wells. Most of this would occur during the drilling phase. Potential impacts might occur to groundwater, 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. 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 minor short term impacts to air quality during the construction phase. Once construction is complete the daily activities of the site will not impact air quality above ambient conditions. The operator will design, construct, and maintain enclosure fencing for all open cellars and fluids pits containing freestanding fluids to protect public health and safety, wildlife, and livestock.

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 or 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 Aristocrat Angus Federal 0-4-10 will be limited to standard construction procedures associated with pad/road construction and drilling in Weld County and have occurred historically on split 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. The lease area that these wells are in is designated as a Class II Area, as defined by the Federal Prevention of Significant Deterioration (PSD) provision of the CAA. The PSD Class II designation allows for moderate growth or degradation of air quality within certain limits above baseline air quality. Because the proposed action location is within an ozone nonattainment area, a general conformity analysis for ozone was completed for this proposed activity. Potential emissions of VOCs and NO_x were calculated, and were determined to conform with the applicable laws and statutes, including the CDPHE Denver Metro Area And North Front Range

Ozone Action Plan because the potential total emissions were determined to be below *de minimis* levels.

Scientific, cultural or historical resources, including those listed in or eligible for listing in the National Register of Historic Places: Both prehistoric and historic sites are present near the area of potential effect, although the site density is quite low. Pursuant to BLM IM 2009-078, "Processing Oil and Gas Applications for Permit to Drill for Directional Drilling into Federal Mineral Estate", cultural resources inventories are not necessarily required unless the act of drilling, completing, and/or operating the Federal well has the potential to impact a historic property. Because it was determined that a cultural resources inventory was not necessary, only a literature review was conducted [see Report CR-RG-12-72 (L)].

Threatened and endangered species and their critical habitat: There are no known listed species protected under the Endangered Species Act (ESA) in the proposed project area. There is no known critical habitat associated with Threatened and Endangered Species identified within the project area.

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 and the Endangered Species Act.

NAME OF PREPARER: Tomas Kamienski

SUPERVISORY REVIEW: Jay Raiford

NAME OF ENVIRONMENTAL COORDINATOR: Martin Weimer

DATE:

SIGNATURE OF AUTHORIZED OFFICIAL _____ /s/ Melissa Garcia for
Keith E. Berger, Field Manager

DATE SIGNED: 1/10/13

APPENDICES:

ATTACHMENTS:

DECISION RECORD
DOI-BLM-CO-200-2012-0003 EA
Aristocrat Angus Federal 0-4-10

DECISION: It is my decision to approve the APD for the Aristocrat Angus Federal 0-4-10 well pad, access road, and well-tie pipeline in order to drill and develop federal minerals from a private surface. In addition this includes an associated production facility.

RATIONALE: This APD will develop oil and gas resources on Federal Lease COC10009 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended. The action will take place in an ozone nonattainment area and conform with the applicable laws and statutes, including the CDPHE Denver Metro Area And North Front Range Ozone Action Plan because the potential total emissions were determined to be below *de minimis* levels.

MITIGATION MEASURES:

Air Quality: Since the region is in non-attainment for ozone, many well development activities are subject to a specific list of mitigation requirements per the CDPHE Air Quality Control Commission, including Regulation Number 7 (5 CCR 1001-9. See <http://www.cdphe.state.co.us/regulations/airregs/5CCR1001-9.pdf>). Examples of these requirements include, but are not limited to:

- For atmospheric condensate storage tanks at oil and gas exploration and production operations, a default emission factor of 13.7 pounds of volatile organic compounds per barrel of condensate shall be used unless a more specific emission factor has been established pursuant to Section XII.C.2.a.(ii)(B).¹
- All pneumatic controllers placed in service on or after February 1, 2009, shall emit VOCs in an amount equal to or less than a low-bleed pneumatic controller, unless allowed pursuant to Section XVIII.C.3.²
- All high-bleed pneumatic controllers in service prior to February 1, 2009 shall be replaced or retrofit such that VOC emissions are reduced to an amount equal to or less than a low-bleed pneumatic controller, by May 1, 2009, unless allowed pursuant to Section XVIII.C.3.³
- All condensate collection, storage, processing and handling operations, regardless of size, shall be designed, operated and maintained so as to minimize leakage of volatile organic compounds to the atmosphere to the maximum extent practicable.

¹ See CDPHE AQCC Regulation Number 7 for specifics on section referenced

² Ibid.

³ Ibid.

- If a combustion device is used to control emissions of volatile organic compounds to comply with Section XII.D. it shall be enclosed, have no visible emissions, and be designed so that an observer can, by means of visual observation from the outside of the enclosed combustion device

Geology: BLM Onshore Order #2 (OO#2) requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. A review at the Application for Permit to Drill stage includes a geologic evaluation of the potential subsurface formations that will be penetrated by the wellbore, followed by an engineering analysis of the drilling program to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist, and all known or anticipated zones with potential risks.

BLM will require that the surface casing be run across the aquifer, and placed at least 100 feet into the underlying Pierre Shale - a formation that should not fracture or breakdown with the maximum weighting of mud that may be needed when drilling to total depth or to the next set of casing string.

Soils: All infrastructure (roads, drill pads, etc.) being proposed, should be built to BLM Gold Book standards.

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 that are not subject to continuing agricultural practices should be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring is required for the life of the project and for three years following completion and/or abandonment of the wells and elimination of identified Colorado State Noxious Weeds list A and B species.

The operator **should** design, construct, and maintain enclosure fencing for all open cellars and fluids pits containing freestanding fluids to protect public health and safety, wildlife, and livestock.

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. 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. If vegetation removal can be planned and accomplished prior to May 15, then other operations (pad construction, drilling operations, and production operations) may proceed.

To be in compliance with the Bald and Golden Eagle Protection Act (BGEPA) a visual survey for raptor nests will be conducted in surrounding trees and uplands within a quarter mile of the project site. If a nest is found, a no surface use timing limitation from February 1 through August 15 will be implemented.

All open pits will be netted to prevent access by migratory birds until produced water is absent. It is the responsibility of the operator to ensure the net remains in a functional condition while liquid material is present. 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.

Paleontology: 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.

Hazardous Waste:

- 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.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.

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 substances into the environment that will require a response action or result in the incurrence of response costs.

COMPLIANCE/MONITORING (optional):

SIGNATURE OF AUTHORIZED OFFICIAL:

/s/ Melissa Garcia for
Keith E. Berger, Field Manager

DATE SIGNED: 1/10/13

Attached: Air Quality Analysis Doc.s