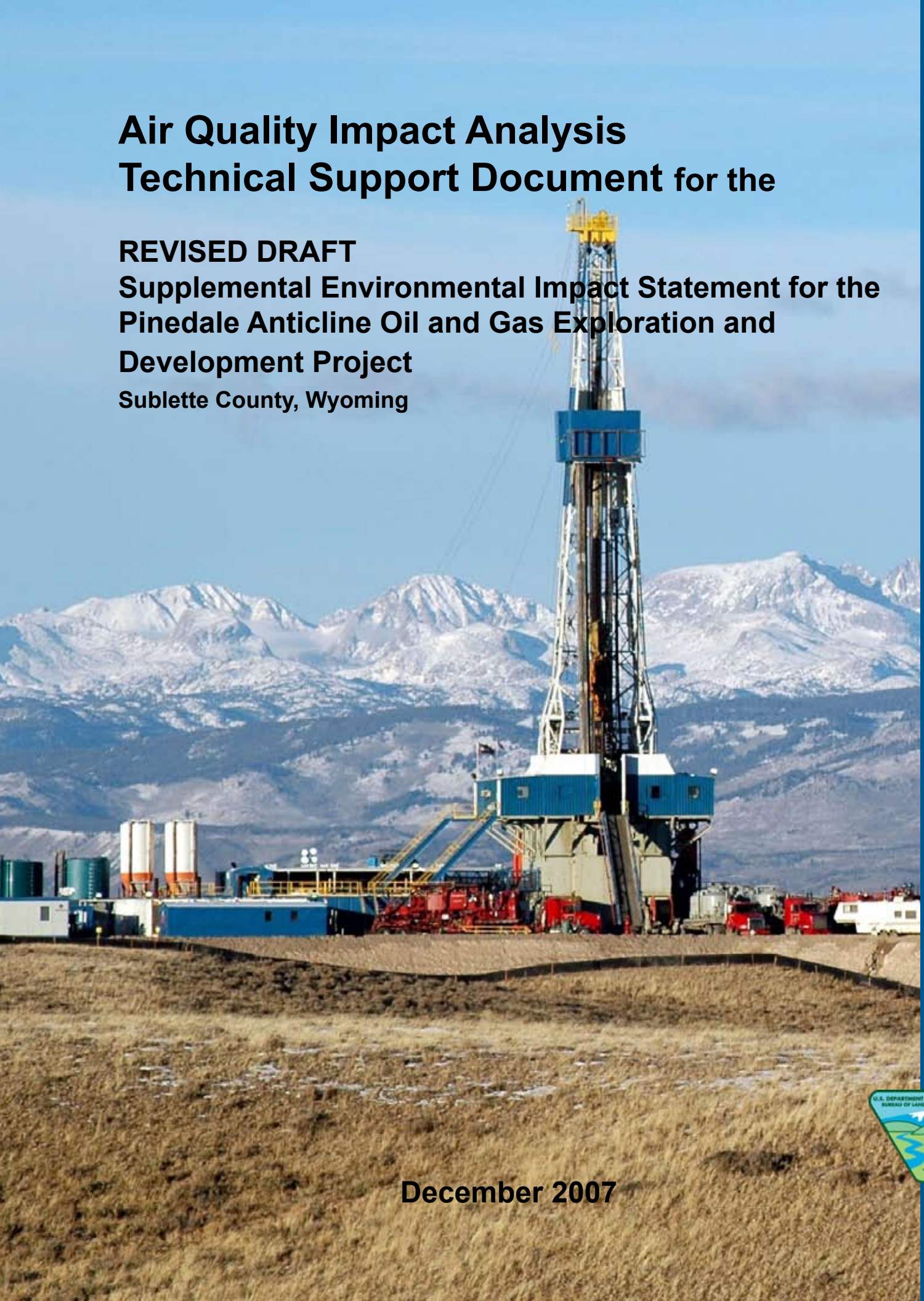
Air Quality Impact Analysis Technical Support Document for the

REVISED DRAFT
Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project

Sublette County, Wyoming



December 2007

MISSION STATEMENT

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

BLM/WY/PL-08/001+1310

Air Quality Impact Analysis
Technical Support Document

REVISED DRAFT
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
PINEDALE ANTICLINE OIL AND GAS EXPLORATION AND DEVELOPMENT PROJECT
SUBLETTE COUNTY, WYOMING

Bureau of Land Management
Wyoming State Office
Cheyenne, Wyoming

Pinedale Field Office
Pinedale, Wyoming

In Cooperation with

State of Wyoming
Sublette County

December 2007

Air Quality Impact Analysis TSD Report

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List of Acronyms and Abbreviations

µeq/l	Microequivalents per liter
µg/m^3	Micrograms per cubic meter
ANC	Acid neutralizing capacity
AQD	Air Quality Division
AQRV	Air Quality Related Value
AQTSD	Air Quality Technical Support Document
ARS	Air Resource Specialists
BACT	Best available control technology
BLM	Bureau of Land Management
BTEX	Benzene, toluene, ethylbenzene, and xylene
C.F.R.	*Code of Federal Regulations*
CDPHE/APCD	Colorado Department of Public Health and Environment/Air Pollution Control Division
CO	Carbon monoxide
COGCC	Colorado Oil and Gas Conservation Commission
DAT	Deposition analysis thresholds
DEM	Digital elevation model
dv	Deciview
EIS	Environmental impact statement
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FLM	Federal Land Managers
f(RH)	Relative humidity factor
GRI	Gas Research Institute
HAP	Hazardous air pollutant
HNO_3	Nitric acid
hp	Horsepower
hp-hr	Horsepower-hour
IDEQ	Idaho Division of Environment Quality
IDLH	Immediately dangerous to life or health
IOGCC	Idaho Oil and Gas Conservation Commission
IWAQM	Interagency Workgroup on Air Quality Modeling
JIDP	Jonah Infill Drilling Project
kg/ha-yr	Kilograms per hectare per year
LAC	Level of Acceptable Change
LOP	Life of Project
LULC	Land use and land cover
MEI	Maximum exposed individual

MLE	Most likely exposure
MM5	Mesoscale meteorological model
N	Nitrogen
NAAQS	National Ambient Air Quality Standards
NEPA	*National Environmental Policy Act*
NH_3	Ammonia
NIOSH	National Institute for Occupational Safety and Health
NO_2	Nitrogen dioxide
NO_3	Nitrate
NOI	Notice of Installation
NO_x	Nitrogen oxides
NPS	National Park Service
NSR	New Source Review
NWS	National Weather Service
O_3	Ozone
PAPA	Pinedale Anticline Project Area
PFO	Pinedale Field Office
PM_{10}	Particulate matter less than or equal to 10 microns in size
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in size
Ppb	Parts per billion
Protocol	Air Quality Impact Assessment Protocol
PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance/Quality Control
REL	Reference exposure level
RfC	Reference Concentrations for Chronic Inhalation
RFD	Reasonably foreseeable development
RFFA	Reasonably foreseeable future action
RMP	Resource Management Plan
ROD	Record of Decision
S	Sulfur
SO_2	Sulfur dioxide
SO_4	Sulfate
tpy	Tons per year
TRC	TRC Environmental Corporation
UDEQ-AQD	Utah Department of Environmental Quality-Air Quality Division
UDNR-DOGM	Utah Department of Natural Resources-Division of Oil, Gas, and Mining
URF	Unit risk factor
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey

VOC	Volatile organic compound
WAAQS	Wyoming Ambient Air Quality Standards
WAQSR	Wyoming Air Quality Standards and Regulations
WDEQ	Wyoming Department of Environmental Quality
WOGCC	Wyoming Oil and Gas Conservation Commission
WRAP	Western Regional Air Partnership
WYDOT	Wyoming Department of Transportation

1.0 INTRODUCTION

This Air Quality Impact Analysis Technical Support Document (Air Quality TSD) was prepared to summarize analyses performed to quantify impacts from the proposed project in the Pinedale Anticline Project Area (PAPA) to ambient air quality and Air Quality Related Values (AQRVs) from: 1) air emissions resulting from development and production activities within the PAPA during 2005; 2) potential air emissions from development and production within the PAPA after 2005 that could occur under the Proposed Action and Alternative C; 3) potential air emissions after 2005 resulting from continued development and production activities under the No Action Alternative; and 4) air emissions from other documented regional emissions sources within the study area.

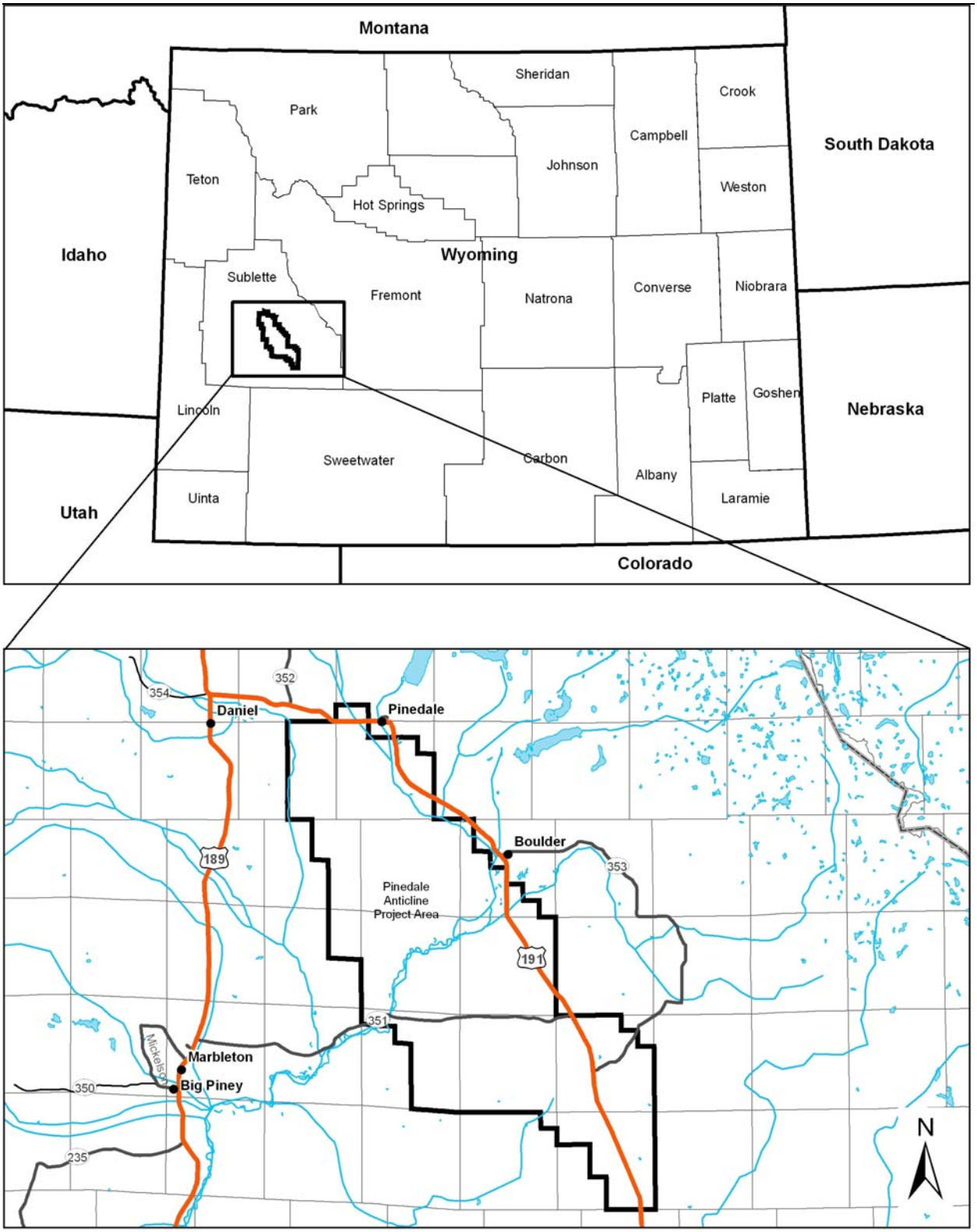
Ambient air quality impacts were quantified and compared to applicable state and federal standards. AQRV impacts (visibility [regional haze], acid deposition, and potential increases in acidification to acid sensitive lakes) were quantified and compared to applicable thresholds as defined in the Federal Land Managers' (FLMs') Air Quality Related Values Workgroup (FLAG), IWAQM guidance documents (FLAG, 2000 and IWAQM, 1998), and other state and federal agency guidance.

The methodologies utilized in the analysis were originally defined in an air quality impact assessment protocol (Protocol) prepared by TRC Environmental Corporation with input from the lead agency, U.S. Department of Interior, Bureau of Land Management (BLM), and project stakeholders including the U.S. Environmental Protection Agency (EPA), National Park Service (NPS), U.S. Department of Agriculture, Forest Service (USDA-FS), and Wyoming Department of Environmental Quality - Air Quality Division (WDEQ-AQD). The protocol is included in Appendix A.

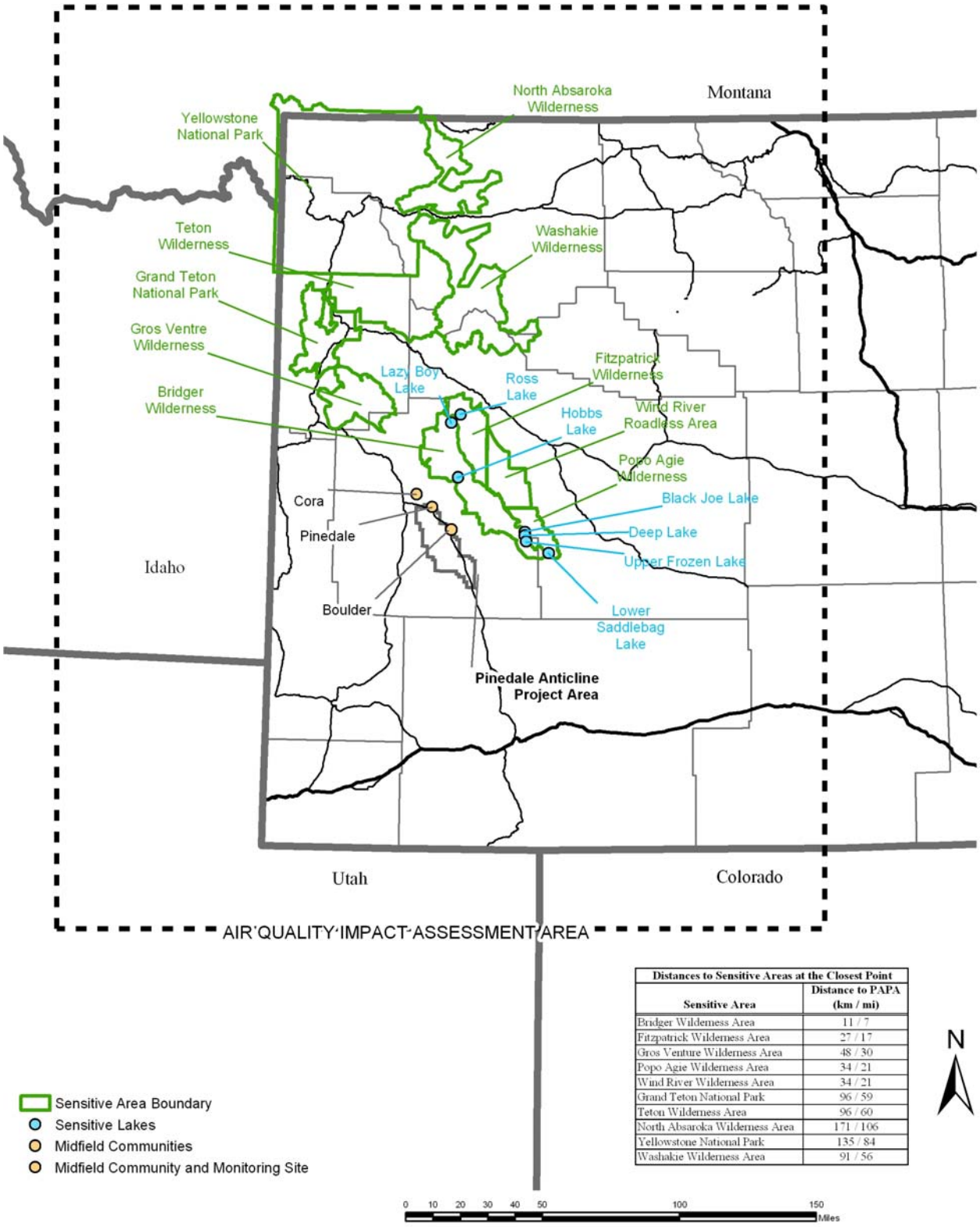
The project's location in west-central Wyoming required the examination of project and cumulative source impacts in Wyoming, northwestern Colorado, northeastern Utah, and southeastern Idaho within a defined study area (modeling domain) (Maps 1.1 and 1.2). The analysis area includes the area surrounding the proposed PAPA and all of the Bridger, Fitzpatrick, Gros Ventre, North Absaroka, Popo Agie, Teton, and Washakie Wilderness Areas; the Wind River Roadless Area; and Grand Teton and Yellowstone National Parks.

The remainder of this Air Quality TSD describes the project in further detail, provides a description of the alternatives evaluated, and presents a list of tasks performed for the study. Descriptions of the near-field air quality impact assessment methodology and impacts are provided in Chapter 3.0, and Chapter 4.0 describes the CALPUFF analyses performed for assessment of near-field and far-field (includes in-field and mid-field) direct and cumulative impacts.

Map 1.1
Pinedale Anticline Project Location, Sublette County Wyoming



Map 1.2
Air Quality Impact Assessment Area



Distances to Sensitive Areas at the Closest Point	
Sensitive Area	**Distance to PAPA (km / mi)**
Bridger Wilderness Area	11 / 7
Fitzpatrick Wilderness Area	27 / 17
Gros Venture Wilderness Area	48 / 30
Popo Agie Wilderness Area	34 / 21
Wind River Wilderness Area	34 / 21
Grand Teton National Park	96 / 59
Teton Wilderness Area	96 / 60
North Absaroka Wilderness Area	171 / 106
Yellowstone National Park	135 / 84
Washakie Wilderness Area	91 / 56

Analyses of potential ozone formation from project alternative sources and regional sources were performed using the Comprehensive Air Quality Model with extensions (CAMx) photochemical grid model.

The Air Quality TSD contains eight appendices; Appendix A (Air Quality Impact Analysis Protocol); Appendices B, C, and D, which provide supplemental air quality model parameter information; Appendix E (model results summary tables); Appendix F (PAPA emissions inventory); Appendix G (regional emissions inventories); and Appendix H (Regional Ozone Assessment of the Pinedale Anticline Project and other New Source in the Region).

1.1 PROJECT DESCRIPTION

Jointly referred to as the Operators, Ultra Resources, Inc. (Ultra), Shell Exploration & Production Company (Shell), Questar Market Resources including Wexpro Company (Questar), BP America Production Company, Stone Energy Corporation, Yates Petroleum Corporation, and others who agree to participate, have notified the BLM Pinedale Field Office (PFO) that they propose a new long-term development plan that includes limited year-round drilling and completions of natural gas wells within their leaseholds in the PAPA.

As of December 31, 2005, there were approximately 322 producing well pads and 457 producing wells in the PAPA. An additional 26 pads and 205 producing wells are proposed by the Operators in 2006. The Proposed Action consists of drilling approximately 4,400 new wells (in addition to the 662 wells drilled through 2006) within the PAPA, beginning in 2007. As part of the Proposed Action, there would be up to 48 drilling rigs operating in the PAPA after 2007. The Operators propose to install emissions controls to achieve Tier 2 equivalent emissions on approximately 60 percent of the drilling rig engines by 2009. Questar has previously committed (BLM, 2005a) to install Tier 2 equivalent emission controls on all year-round drilling rigs by 2008. In 2005, a liquids (condensate and produced water) gathering system was installed in the northern leaseholds in the PAPA, reducing overall emissions through reduction in truck traffic. As part of the Proposed Action, the Operators propose to install a liquids gathering system in the central and southern portions of the PAPA. Operation of the liquids gathering system would require installation of central gathering facilities within the PAPA which would have associated emissions. Condensate would be gathered within the PAPA and the crude petroleum would be transported via pipeline to processing facilities in southwestern Wyoming. Produced water would be gathered and trucked from a central location within the PAPA. Operators are currently investigating options for produced water disposal both within and outside of the PAPA. Questar Gas Management (QGM) is proposing to install an additional 7,440 horsepower (hp) of compression at the Pinedale/Gobblers Knob Compressor Station within the PAPA in 2006. QGM also intends to install an additional compression of 31,000 hp in 2009 and 15,500 hp in 2015 at the Pinedale/Gobblers Knob Compressor Station. Jonah Gas Gathering Company (JGGC) is proposing to install an additional 184,000 hp of compression at the Paradise Compressor Station, an additional 37,366 hp at the Falcon Compressor Station and 14,672 hp at the Bird Canyon Compressor Station (outside of the PAPA) all in 2011 as part of the Proposed Action. One 30-inch gas sales pipeline (the Rendezvous Phase 6 – R6) is proposed by Rendezvous Gas Services (RGS) to transport natural gas from the PAPA to the Granger and Blacks Fork processing plants in southwestern Wyoming. JGGC is proposing the 36-inch (Paradise to Bird Canyon or PBC Pipeline) and a connecting 45.5-mile long, 30-inch pipeline (Opal Loop III Pipeline) which would transport gas from the PAPA to the Opal and Pioneer gas processing plants. In conjunction with the proposed R6 Pipeline Project, RGS proposes to expand the existing 33.6-acre Granger Gas Processing Plant by 86.4 acres, for a total of 120 acres on BLM-administered federal lands in Section 16, T. 18 N., R. 111 W. The purpose of the proposed expansion is to construct and operate additional natural gas processing facilities to sufficiently increase processing capacity for an anticipated increased input of 600 million

standard cubic feet per day (MMSCF/D) of natural gas and crude petroleum. The current Granger Gas Processing Plant capacity is 600 MMSCF/D. The expansion would represent a 100 percent increase in treatment capacity.

BLM is also analyzing the No Action Alternative (Alternative A) in addition to the Proposed Action Alternative (Alternative B) and a third alternative (Alternative C). The No Action Alternative is defined as continued development of the PAPA under current BLM management practices. The Operators have provided estimates of new pads, expansion pads, and proposed number of wells that would be drilled under the No Action Alternative with continued management practices under the PAPA ROD (BLM, 2000b). However, at some point, the limits of the PAPA Record of Decision (BLM, 2000b) would be reached for maximum allowed well pads within specific Management Areas and further NEPA (National Environmental Policy Act) analysis would be required for continued development. The liquids gathering systems in the southern and central portions of the PAPA would not be installed under the No Action Alternative. The R6, PBC, and Opal Loop III pipelines would be constructed under the No Action Alternative.

Alternative C includes provisions for concentrating development activities to allow for maintenance of wildlife habitat, seasonal wildlife stipulations, as well as additional mitigation for air quality impacts. All components included in the Proposed Action Alternative are also a part of Alternative C, and therefore, emissions and associated impacts for the two alternatives would be similar, except that Alternative C includes additional mitigation.

1.2 RELATIONSHIP TO EXISTING PLANS AND DOCUMENTS

Potential impacts to air quality resulting from exploration and development of natural gas within the PAPA was previously analyzed in the Pinedale Anticline Oil and Gas Exploration and Development Environmental Impact Statement (PAPA EIS) (BLM, 2000a).

In 2004, Questar submitted a proposal to BLM for limited year-round drilling within their lease holdings in the PAPA. As part of their proposal for mitigation, Questar would install a gathering system to remove condensate and water from the PAPA (reducing truck traffic) and utilize Tier 2 compliant engines or alternate fuels on all drilling rig engines by 2007. In November 2004, BLM issued a Decision Record (BLM, 2004) approving Questar's limited year-round drilling proposal. Although potential emissions from the proposal were disclosed, a complete air quality impact analysis was not conducted because the operator-committed mitigation would cause the impacts to be reduced. In 2005, BLM issued a Decision Record (BLM, 2005a) which allowed for modification of the proposed condensate (crude petroleum) pipeline route and extended the requirement for the drilling rig engines to become Tier 2 compliant to 2008. Again, potential emissions were disclosed but a complete air quality impact analysis was not conducted.

Also in 2005, Anschutz, Shell and Ultra (ASU) submitted a proposal to BLM for a year-round demonstration project within the PAPA. In September, 2005, BLM issued a Decision Record (BLM, 2005b) that allowed each operator to have two drilling rigs on one pad each within crucial winter range during the winter of 2005-2006. For mitigation of the air quality impacts, the operators committed to reduce emissions by testing selective catalytic reduction on two of the drilling rigs and testing bi-fuel technology on the other four drilling rigs. Because the proposal represented an overall reduction in emissions (the rigs would have operated in the PAPA outside of crucial winter range if the proposal were not approved), potential emissions were disclosed but a complete air quality impact analysis was not conducted.

In November of 2005, BLM issued a Decision Record (BLM, 2005c) that allowed Questar to have one additional winter drill rig. Four winter completions and one drill rig move were also approved.

Since the PAPA ROD (BLM, 2000b) was issued in July 2000, natural gas development within the PAPA has occurred at a pace greater than was analyzed in the PAPA DEIS (BLM, 1999) as disclosed in the subsequent NEPA documents. The PAPA ROD authorized the development of 700 producing wells and/or well pads, however, the ROD was ambiguous at to whether the limit was wells or well pads. The air quality impact analysis for the PAPA DEIS assumed 700 producing wells and up to eight drilling rigs operating in the PAPA at any one time. As of December 2005, there were approximately 457 producing wells in the PAPA with an additional 205 wells projected for 2006. Twenty-nine of the existing wells were drilled prior to the PAPA ROD, therefore, there would be potentially 633 producing wells by the end of 2006. The PAPA ROD also set an analysis threshold of 376.59 tpy NO_x emissions from compression and 693.5 tpy of NO_x emissions from all sources in the field. The PAPA ROD stated that additional environmental analysis would be conducted if the analysis thresholds were exceeded. Even though the limit of 700 producing wells and/or well pads has not been exceeded, the NO_x emissions from all sources in the PAPA currently exceeds the 693.5 tpy analysis limit specified in the PAPA ROD. For this reason, and to analyze the current proposal, BLM has determined that it is necessary to prepare a Supplemental Environmental Impact Statement (SEIS) which includes a complete and accurate air quality impact analysis.

The BLM Pinedale Resource Management Plan (RMP) (BLM, 1988) issued in 1988, amended in 2000, and currently under revision, directs the management of BLM administered lands within the PAPA. Management of oil and gas resources, as stated in the RMP, provides for leasing, exploration, and development of oil and gas while protecting other resource values. According to the RMP, all public lands in the PAPA are suitable for oil and gas leasing and development, subject to certain stipulations.

The most recent EIS completed in Sublette County is the Final EIS, Jonah Infill Drilling Project (JIDP), Sublette County, Wyoming (BLM, 2006). This Protocol represents a new and separate analyses from that performed for the JIDP EIS. With the exception of shared methodologies common to many regional modeling analyses, no portions of the JIDP air quality analysis were utilized in this study.

The BLM is currently developing a state-wide cumulative air quality analysis deemed the BLM State of the Atmosphere air quality analysis. That study is in the early development stages, and will utilize a 1-year 2002 Western Regional Air Partnership (WRAP) meteorological dataset and a separate inventory that is not yet available. No portions of the BLM State of the Atmosphere air quality analysis were utilized in this analysis.

Analyses of potential ozone formation from project alternative sources and regional sources were performed for the Pinedale Anticline Project Draft SEIS using the CALGRID model. Results from the CALGRID modeling analysis were published as a supplement (BLM, 2007) to the *Draft Supplemental Pinedale Anticline Oil and Gas Exploration and Development Environmental Impact Statement, Air Quality Impact Analysis Technical Support Document* (BLM, 2006). This Air Quality TSD includes a more refined modeling analysis for ozone using the CAMx modeling system.

1.3 STUDY TASKS

The assessment of impacts will include the completion of the following tasks:

1. **Direct Project Air Emissions Inventory.** Development of air pollutant emissions inventories for the project.
2. **Regional Source Air Emissions Inventory.** Development of an air pollutant emissions inventory for other regional sources not represented by background air quality measurements, including sources from the following:
    - state-permitted sources
    - reasonably foreseeable future actions (RFFA, and
    - reasonably foreseeable development (RFD).
3. **Direct Project Near-Field Analysis.** Assessment of near-field air quality concentration impacts resulting from activities proposed within the PAPA.
4. **Direct Project Far-Field Impact Analysis.** Assessment of far-field air quality concentration and AQRV impacts resulting from proposed project activities.
5. **Direct Project In-Field Analysis.** Assessment of concentration impacts within the PAPA resulting from the project.
6. **Direct Project Mid-Field Analysis.** Assessment of mid-field visibility impacts to regional communities resulting from the project.
7. **Cumulative Far-Field Impact Analysis.** Assessment of far-field air quality concentration and AQRV impacts resulting from proposed project activities and other regional sources.
8. **Cumulative In-Field Analysis.** Assessment of concentration impacts within the PAPA resulting from the project and other regional sources.
9. **Cumulative Mid-Field Impact Analysis.** Assessment of mid-field air quality concentration and AQRV impacts resulting from activities proposed within the PAPA and other regional sources.
10. **Ozone Analysis.** Assessment of ozone from the PAPA and other new sources in the region.

2.0 EMISSIONS INVENTORY

2.1 PROJECT EMISSIONS

The direct project emissions inventory for the PAPA is divided into four sections in Appendix:

- 2005 Actual Emissions Inventory (Section.1),
- 2005 Potential Emissions Inventory (Section 2),
- Proposed Action Emissions Inventory (Section 3), and
- No Action Emissions Inventory (Section 4).

Calculation methods are similar for each emissions inventory except as noted in the following sections. Specific details for each inventory are provided in the respective sections of Appendix F.

Criteria pollutant and hazardous air pollutant (HAP) emissions were inventoried for construction activities, production activities, and ancillary facilities. Criteria pollutants included nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOCs), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). HAPs consist of n-hexane; benzene, toluene, ethylbenzene, and xylene (BTEX); and formaldehyde. All emission calculations were completed in accordance with WDEQ-AQD oil and gas guidance (WDEQ-AQD 2001), WDEQ-AQD additional guidance for the Jonah and Pinedale Anticline Gas Fields (WDEQ-AQD 2004), stack test data, EPA's AP-42, or other accepted engineering methods (see Appendix F, Section1). Actual 2005 emissions were obtained from emissions inventories submitted by PAPA Operators to WDEQ-AQD, when available. Emissions not quantified in these inventories were conservatively assumed to be equal to those calculated for the 2005 potential emissions inventory.

2.1.1 Construction Emissions

Construction activities are a source of primarily criteria pollutants. Emissions would occur from construction (well pads, roads, gathering pipelines, and ancillary facilities), drilling, completion/testing, traffic, and wind erosion. Well development rates were provided by the Operators based on their future projections for both the Proposed Action Alternative and the No Action Alternative. These well development rates vary by alternative. Detailed well development rates per year can be found in the tables of Appendix F.

Emissions from construction of well pads and roads and traffic include fugitive PM_{10} and $PM_{2.5}$. Other criteria pollutant emissions would occur from diesel combustion in haul trucks and heavy construction equipment. On well pads and resource roads, water would be used for fugitive dust control, with a control efficiency of 50%. On local roads, magnesium chloride would be used for dust control, with a control efficiency of 85%.

After the well pad is constructed, rig-move/drilling would begin. Emissions would include fugitives from unpaved road travel to and from the drilling site. There would be emissions from diesel drilling engines and from boilers in the winter months. Emissions from well completion and testing would include fugitive PM_{10} and $PM_{2.5}$ from traffic. It would also include combustion emissions from diesel fracturing engines and haul truck tailpipes. All completions would be “green completions” with no flaring other than for upset/emergency conditions.

Pollutant emissions would also occur from gathering pipeline installation activities, including general construction activities, travel to and from the pipeline construction site, and diesel combustion from on-site construction equipment.

Construction emission calculations are provided in detail, showing all emission factors, input parameters, and assumptions, in Appendix F.

2.1.2 Production Emissions

Field production equipment and operations would be a source of criteria pollutants and HAPs including BTEX, n-hexane, and formaldehyde. Pollutant emission sources during field production would include:

- combustion engine emissions and fugitive dust from road travel to and from production sites;
- diesel combustion emissions from haul trucks;
- combustion emissions from production site heaters;
- fugitive VOC/HAP emissions from production site equipment leaks;
- condensate storage tank flashing and flashing control;
- glycol dehydrator still vent flashing;
- wind erosion from well pad disturbed areas
- processing units at gas plants; and
- natural gas-fired reciprocating internal combustion compressor engines

Fugitive PM_{10} and $PM_{2.5}$ emissions would occur from road travel and wind erosion from well pad disturbances. Criteria pollutant emissions would occur from diesel combustion in haul trucks traveling in the field during production.

Heaters required at production facilities include separator/indirect line heaters and dehydrator reboiler heaters. These heaters are sources of mainly NO_x and CO as well as small amounts of VOCs. Emissions from these sources were calculated on run-time percentages for both the summer and winter seasons based on data provided by Operators.

VOC and HAP emissions would occur from fugitive equipment leaks (i.e., valves, flanges, connections, pump seals, and opened lines). Condensate storage tank flashing and glycol dehydrator still vent flashing emissions also would include VOC/HAP emissions. VOC and HAP emissions would decrease over the life of an individual well due to declines in condensate and gas production. Emissions from these sources were based on information provided by Operators.

Production emission calculations are provided in detail, showing all emission factors, input parameters, and assumptions, in Appendix F.

2.1.3 Total Field Emissions

Estimates of maximum potential annual emissions in the PAPA under the No Action and Proposed Action alternatives, and for year 2005 are shown in Table 2.1. Maximum potential annual emissions assume construction and production occurring simultaneously in the field for the maximum emissions year for each project alternative.

Table 2.1 Estimated Potential Emissions by Alternative (tpy), Pinedale Anticline Project.

Source	Pollutant	Year 2005	Alternative A (No Action) 2007	Alternative B (Proposed Action) 2009
Construction Emissions				
Drill Rigs	NO_x	2590.9	4066.5	3232.6
	CO	2031.6	2445.2	2307.0
	SO_2	221.0	48.5	55.7
	PM_{10}	133.5	160.4	130.3
	$PM_{2.5}$	133.5	160.4	130.3
	VOC	244.5	292.9	271.3
Fugitives (Pad/Road Construction, Traffic, Completions, etc...)	NO_x	427.4	641.8	559.4
	CO	305.3	493.5	428.1
	SO_2	10.6	15.6	14.4
	PM_{10}	682.2	712.6	415.9
	$PM_{2.5}$	144.8	143.7	82.7
	VOC	192.9	66.1	57.0
Production Emissions				
Compression:	NO_x	421.9	472.2	532.1
	CO	157.7	175.7	235.5
	SO_2	0.0	0.0`	0.0
	PM_{10}	0.0	0.0	0.0
	$PM_{2.5}$	0.0	0.0	0.0
	VOC	320.5	353..5	357.1
Granger Gas Plant (Expansion)	NO_x	301.7	301.7	301.7
	CO	322.8	322.8	322.8
	SO_2	0.0	0.0	0.0
	PM_{10}	0.0	0.0	0.0
	$PM_{2.5}$	0.0	0.0	0.0
	VOC	140.2	140.2	140.2
Wind Erosion	PM_{10}	254.8	357.2	440.8
	$PM_{2.5}$	101.9	142.9	176.3
Fugitives (Heaters, dehys, tanks, traffic, other production equipment, etc…)	NO_x	72.2	119.8	108.8
	CO	251.1	318.7	54.8
	SO_2	0.2	0.5	0.6
	PM_{10}	128.5	311.7	73.7
	$PM_{2.5}$	21.2	51.3	17.8
	VOC	1736.5	1396.2	1150.7
Total	NO_x	3512.4	5602.0	4734.6
	CO	2745.7	3755.9	2978.3
	SO_2	231.8	64.6	70.7
	PM_{10}	1199.0	1541.9	1060.7
	$PM_{2.5}$	401.4	498.3	407.1
	VOC	2494.4	2248.9	1976.3

Well pad construction emissions were based on the number of pads proposed per year and their estimated size and scale. Drilling, drilling traffic, completions, and completion traffic were based on the number of wells developed per year.

Production emissions were calculated based on the total number of producing wells in the field. Total producing wells were equal to the difference in number of wells proposed and the number of wells constructed per year. A production decline factor was applied to all wells in production based on actual data from current wells provided by the Operators. This allows estimation of emissions from these sources as production volumes decrease over time. Annual emissions estimates for each project alternative for each year of field development are provided in Appendix F.

2.2 REGIONAL EMISSIONS INVENTORY

An emissions inventory of industrial sources within the PAPA cumulative modeling domain was prepared for use in the cumulative air quality analysis. The modeling domain included portions of Wyoming, Colorado, Utah, and Idaho (see Map 1.2). Industrial sources and oil and gas wells permitted within a defined time frame (January 1, 2005 through February 1, 2006) through state air quality regulatory agencies and state oil and gas permitting agencies were researched. The subset of these sources which had begun operation as of the inventory end-date was classified as state-permitted sources, and those not yet in operation were classified as RFFA. Also included in the regional inventory were industrial sources proposed under NEPA in the State of Wyoming. The developed portions of these projects were assumed to be either included in monitored ambient background or included in the state-permitted source inventory. The undeveloped portions of projects proposed under NEPA were classified as RFD. In accordance with definitions agreed upon by BLM, EPA, WDEQ-AQD, and USDA FS for use in EIS projects, RFD was defined as 1) the NEPA-authorized but not yet developed portions of Wyoming NEPA projects, and 2) not yet authorized NEPA projects for which air quality analyses were in progress and for which emissions had been quantified.

A summary of the regional inventory is shown in Table 2.2. Values presented in Table 2.2 represent the change in emissions between the inventory start-date (January 1, 2005) and the inventory end-date (February 1, 2006).

The regional inventory, including methodologies used to compile the regional source emissions, are provided in Appendix G and includes a description of the data collected, the period of record for the data collected, inclusion and exclusion methodology, stack parameter processing methods, and the state-specific methodologies required due to significant differences in the content and completeness of data obtained from each state.

Table 2.2 Regional Inventory Summary of Emissions Changes from January 1, 2005 to February 1, 2006.

State	Source Category	Quantity of Sources	Emissions			
			NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Colorado	State-permitted[1]	5	97.8	1.4	2.0	2.0
	RFD	0	--	--	--	--
	Excluded	82	--	--	--	--
Idaho	State-permitted[2]	4	18.9	4.0	45.9	45.9
	RFD	0	--	--	--	--
	Excluded	9	--	--	--	--
Utah	State-permitted[3]	34	13.7	(40.4)	10.0	10.0
	RFD	0	--	--	--	--
	Excluded	1	--	--	--	--
Wyoming	State-permitted[4]	150	(2,705.0)	145.7	418.6	418.6
	RFD[5]	46	6,427.8	406.1	2923.9	802.8
	Excluded	1452	--	--	--	--
Total	State Permitted	193	(2,574.6)	110.7	476.4	476.4
	RFD	46	6,465.3	406.1	2923.9	802.8
	Excluded	1,544	--	--	--	--
Total Change		--	3,853.2	516.8	3,400.4	1,279.3

1 See Appendix G, Tables G.1 and G.9.
2 See Appendix G, Table G.3.
3 See Appendix G, Tables G.5 and G.9.
4 See Appendix G, Tables G.7 and G.9.
5 See Appendix G, Table G.10.

3.0 NEAR-FIELD MODELING ANALYSES

3.1 MODELING METHODOLOGY

A near-field ambient air quality impact analysis was performed to quantify the maximum criteria pollutants (PM_{10}, $PM_{2.5}$, SO_2, NO_2, and CO) and HAPs (BTEX, n-hexane, and formaldehyde) impacts that could occur within and near the PAPA. These impacts would result from emissions associated with project construction and production activities, and are compared to applicable ambient air quality standards and significance thresholds. All modeling analyses were performed in general accordance with the Protocol presented in Appendix A with input from the BLM and members of the Air Quality Stakeholders Group, including the EPA, USDA-FS, NPS, and WDEQ-AQD.

Ozone may develop from NO_x, VOC, and CO emissions. Analyses of potential ozone formation from project alternative sources and regional sources were performed using the CAMx photochemical grid model. Detailed information regarding the modeling methodologies used in the CAMx ozone analyses is provided in Appendix H.

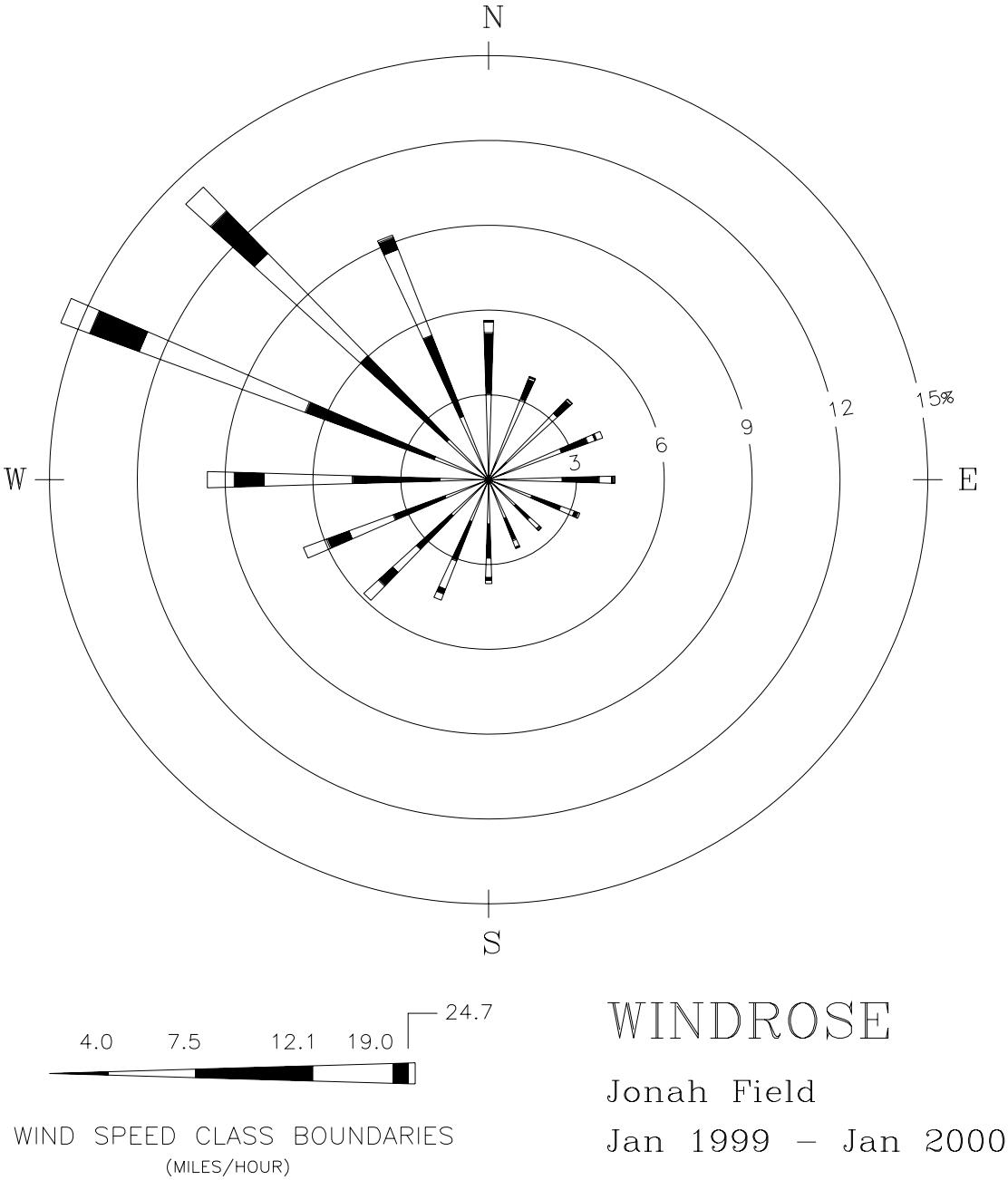
The EPA's guideline dispersion model, AERMOD (version 04300), was used to assess near-field impacts of criteria pollutants PM_{10}, $PM_{2.5}$, SO_2, NO_2 and CO, and to estimate short-term and long-term HAP impacts. One year of meteorology data collected in the Jonah Field was used with the AERMOD dispersion model to estimate these pollutant impacts. Various construction and production activities were modeled to provide analyses for a complete range of alternatives and activities. For each pollutant, the magnitude and duration of emissions from each project phase (i.e., construction or production) emissions activity were examined to determine the maximum emissions scenario for modeling.

Modeling analyses were performed to quantify near-field pollutant concentrations within and nearby the PAPA from project-related emissions sources for a range of scenarios to assure that the maximum near-field impacts were estimated. Impacts from scenarios including the construction of well pads, well drilling activities, and field compression were modeled. Drill rig with emissions at EPA Tier 0 (AP-42 levels), Tier 1, and Tier 2 levels were evaluated.

3.2 METEOROLOGY DATA

One year of surface meteorological data, collected in Jonah Field from January 1999 through January 2000, was used in the analysis. A wind rose for these data is presented in Figure 3.1. The Jonah Field meteorology data included hourly surface measurements of wind speed, wind direction, standard deviation of wind direction [sigma theta], and temperature. These data were processed using the AERMET preprocessor to produce a dataset compatible with the AERMOD dispersion model. AERMET was used to combine the Jonah Field surface measurements with twice daily sounding data from Riverton, Wyoming, cloud cover data collected at Big Piney, Wyoming, and solar radiation measurements collected at Pinedale, Wyoming. Seasonal values for albedo, Bowen ratio and surface roughness length, for land use type “desert shrubland”, were selected from tables in the AERMET user’s guide and used in processing the meteorological data.

Figure 3.1 Jonah Field Meteorological Data Windrose



3.3 BACKGROUND POLLUTANT CONCENTRATIONS

Background concentration data collected for criteria pollutants at regional monitoring sites were added to concentrations modeled in the near-field analysis to establish total pollutant concentrations for comparison to ambient air quality standards. The most representative monitored regional background concentrations available for criteria pollutants as identified by WDEQ-AQD are shown in Table 3.1.

Table 3.1 Near-Field Analysis Background Ambient Air Quality Concentrations (Micrograms per Cubic Meter [μg/m^3])

Pollutant	Averaging Period	Measured Background Concentration
CO[1]	1-hour	1,979
	8-hour	931
NO_2[2]	Annual	8
O_3[3]	8-hour	148
PM_{10}[2]	24-hour	32
	Annual	9
$PM_{2.5}$[4]	24-hour	15
	Annual	6
SO_2[5]	3-hour	132
	24-hour	43
	Annual	9

1 Background data collected during 2005 in Yellowstone National Park, Wyoming, monitoring site near "Old Faithful."
2 Background data collected approximately 5 miles south-west of Boulder, Wyoming during the period April 2005 – March 2006.
3 Background data collected approximately 5 miles south-west of Boulder, Wyoming during 2005 and 2006.
4 Background data collected by WDEQ-AQD in Pinedale, Wyoming during the period July 2005 – June 2006.
5 Data collected at LaBarge Study Area, Wyoming at the Northwest Pipeline Craven Creek Site 1982-1983.

3.4 CRITERIA POLLUTANT IMPACT ASSESSMENT

The near-field criteria pollutant impact assessment was performed to estimate maximum potential impacts of PM_{10}, $PM_{2.5}$, SO_2, NO_2, and CO from project emissions sources including well site and compressor station emissions. Maximum predicted concentrations in the vicinity of project emissions sources were compared with the Wyoming Ambient Air Quality Standards (WAAQS), National Ambient Air Quality Standards (NAAQS), and applicable Prevention of Significant Deterioration (PSD) Class II increments shown in Table 3.2. This NEPA analysis compared potential air quality impacts from project alternatives to applicable ambient air quality standards and PSD increments. The comparisons to the PSD Class I and II increments are intended to evaluate a threshold of concern for potential impacts, and does not represent a regulatory PSD increment comparison. Such a regulatory analysis is the responsibility of the state air quality agency (under EPA oversight).

Table 3.2 Ambient Air Quality Standards and Class II PSD Increments for Comparison to Near-Field Analysis Results (µg/m^3).

Pollutant/Averaging Time	NAAQS	WAAQS	PSD Class II Increment[1]
CO			
1-hour[2]	40,000	40,000	--[3]
8-hour[2]	10,000	10,000	--[3]
NO_2			
Annual[4]	100	100	25
PM_{10}			
24-hour[2]	150	150	30
Annual[4]	--[5]	50	17
$PM_{2.5}$			
24-hour	35[6]	65[7]	--[3]
Annual[4]	15	15	--[3]
SO_2			
3-hour[2]	1,300	1,300	512
24-hour[2]	365	260	91
Annual[4]	80	60	20

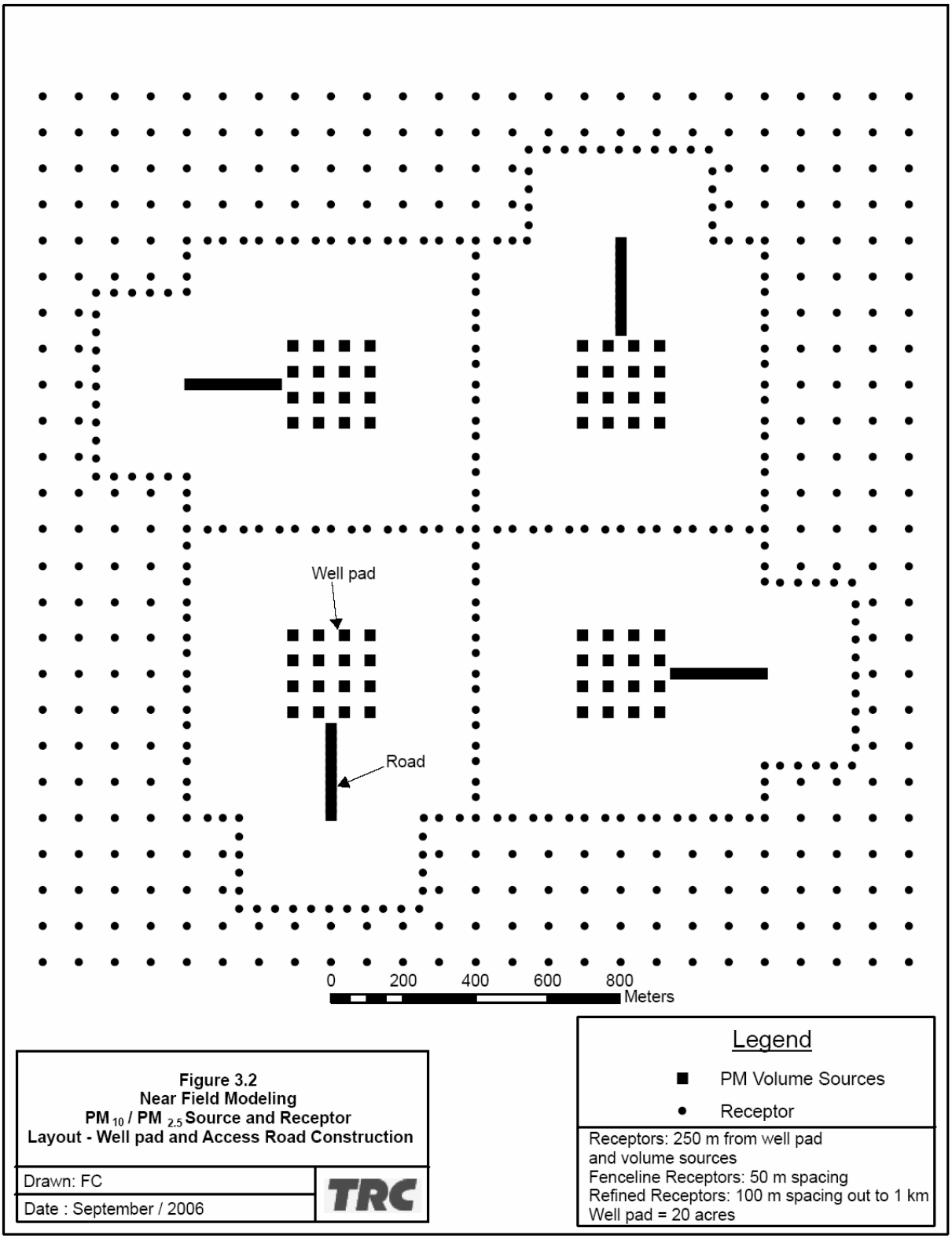
1 The PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis.
2 No more than one exceedance per year.
3 No PSD Class II increment has been established for this pollutant.
4 Annual arithmetic mean.
5 Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.
6 Revised NAAQS effective December 18, 2006. An area is in compliance with the standard if the 98th percentile of 24-hour $PM_{2.5}$ concentrations in a year, averaged over three years, is less than or equal to the level of the standard.
7 EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

The AERMOD model was used to estimate the near-field concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_2, and. CO. AERMOD was run using 1 year of AERMET preprocessed Jonah Field meteorology data following all regulatory default switch settings. Short-term (24-hour) $PM_{10}/PM_{2.5}$ emissions would be greatest during the resource road/well pad construction phase of field development, and were modeled to determine compliance with the 24-hour $PM_{10}/PM_{2.5}$ WAAQS and NAAQS. For determining compliance with the annual $PM_{10}/PM_{2.5}$ WAAQS and annual $PM_{2.5}$ NAAQS well drilling operations were modeled. Similarly, SO_2 emissions would be greatest from well drilling operations and were modeled for WAAQS and NAAQS compliance. Impact analyses of CO emissions from field compression and NO_x emissions from both field compression and drilling activities were evaluated.

3.4.1 $PM_{10}/PM_{2.5}$

Maximum localized $PM_{10}/PM_{2.5}$ impacts would result from well pad and road construction activities and from wind erosion. These emissions would be temporary in nature, and the impacts would be greatest at and immediately adjacent to their source and would decrease rapidly with distance. A modeling scenario to evaluate well pad and road construction activities for short-term (24-hour) $PM_{10}/PM_{2.5}$ impacts was developed assuming a one-section land area (1 square mile (mi^2)) and placing well pad and access road construction activities in each of four quarter sections. Twenty-acre well pads with 3/16 mile resource roads were used. Model receptors were placed, beginning 250 meters from the well pads and resources roads, at 50 meter spacing for a single row, then at 100 meter intervals out to 1 km. Flat terrain was assumed for this modeling scenario. Figure 3.2 presents the configuration used to model the well pad and resource road scenario. Volume sources were used to represent emissions from

Figure 3.2 Near Field Modeling $PM_{10}/PM_{2.5}$ Source and Receptor Layout – Well pad and Access Road Construction



well pads and roads. The emissions used for modeling the well pad and resource road construction are provided in Appendix B and are further detailed in Appendix F. Hourly emission rate adjustment factors were applied to limit construction emissions to daytime hours. Wind erosion emissions were modeled for all hours where the wind speed exceeded a threshold velocity defined by emissions calculations performed using AP-42 Section 13.2.5, Industrial Wind Erosion (EPA 2004a).

Two modeling scenarios to evaluate well drilling activities for long-term (annual) PM_{10}/$PM_{2.5}$ impacts were also developed using a one-section land area and placing well drilling activities in each of four quarter sections. One scenario considered single drill rigs in each of four quarter sections (one per well pad), and the other scenario had two pairs of drill rigs placed in two of the four quarter sections, with the drill rigs in each pair spaced 1/8 mile apart (2 drill rigs per well pad). Model receptors were placed, beginning 250 meters from the drill rigs, at 50 meter spacing for a single row, then at 100 meter intervals out to 1 km and 250 meter spacing out to 10 km. Flat terrain was assumed for these modeling scenarios. Figures 3.3 and 3.4 illustrate the configurations used to model the drill rigs. Drilling rigs were modeled as point sources, with aerodynamic building downwash from the rig structures. For each of these scenarios drill rig emissions at EPA Tier 1 and Tier 2 levels were modeled. An additional model run was performed with drill rig emissions at Tier 0 (AP-42 levels) assuming two drill rigs on a single well pad spaced 1/8 mile apart. The emissions used for modeling the drill rigs are provided in Appendix B and are further detailed in Appendix F.

Table 3.3 presents the maximum modeled PM_{10}/$PM_{2.5}$ concentrations, for each modeling scenario. When the maximum modeled concentration was added to representative background concentrations, it was demonstrated that PM_{10} and $PM_{2.5}$ concentrations for all scenarios comply with the WAAQS and NAAQS for PM_{10} and $PM_{2.5}$.

Emissions associated with temporary construction activities do not consume PSD increment; therefore, the PM_{10} emissions are excluded from increment consumption comparison.

Figure 3.3 Near Field Modeling $PM_{10}/PM_{2.5}$ NO_x and SO_2 Source and Receptor Layout – 2 Drill rigs per well pad, 4 Drill rigs per section

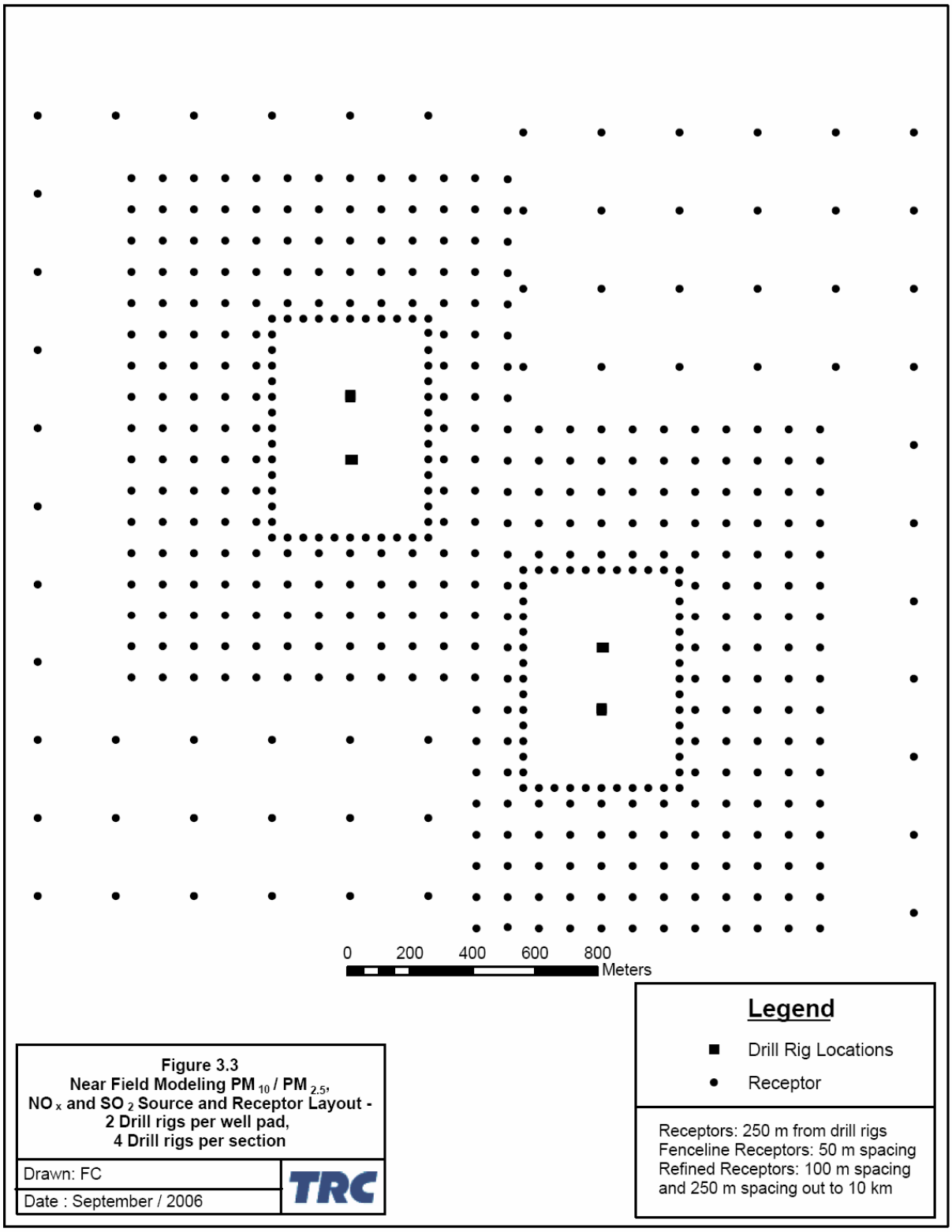


Figure 3.4 Near Field Modeling for $PM_{10}/PM_{2.5}$ NO_x and SO_2 Source and Receptor Layout – 1 Drill rig per well pad, 4 Drill rigs per section

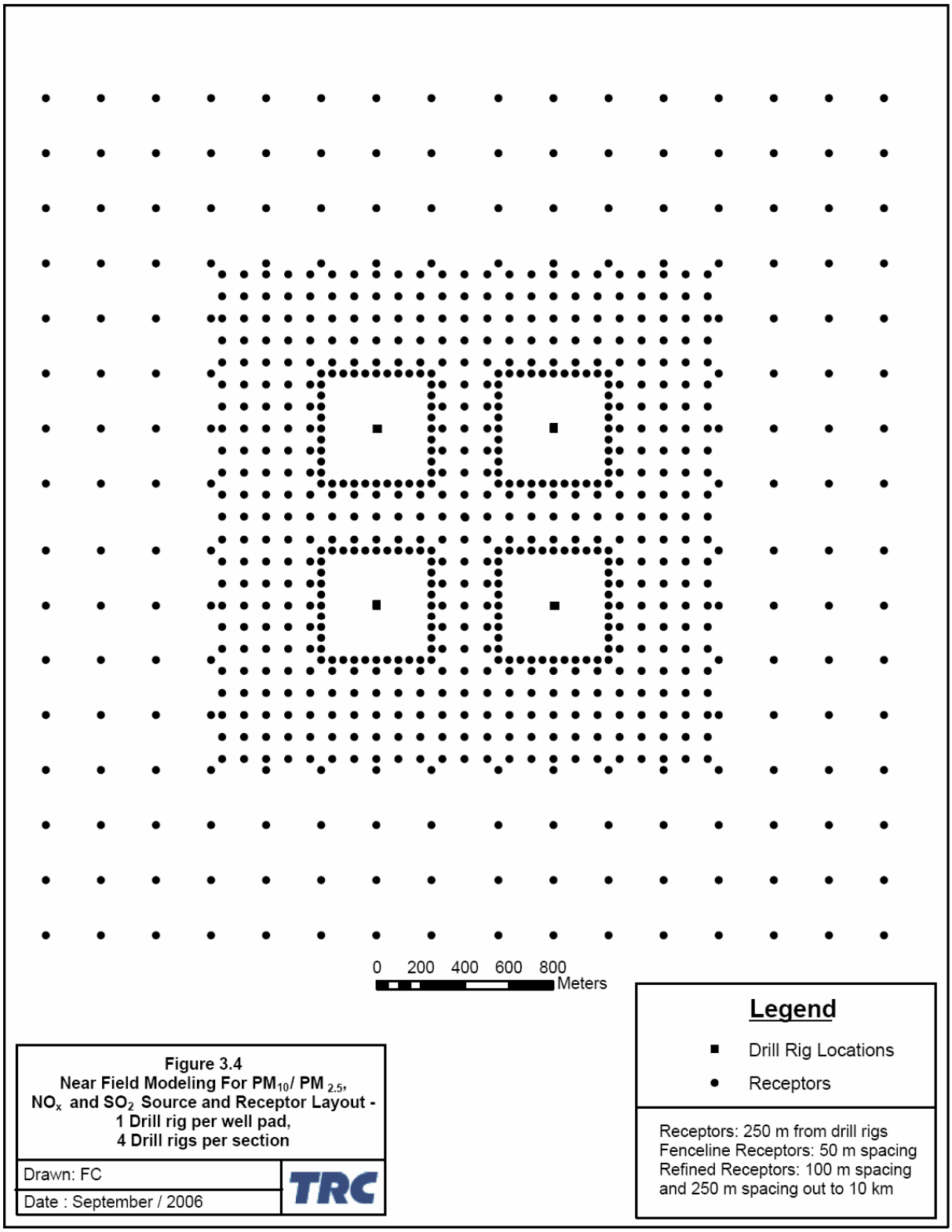


Table 3.3 Maximum Modeled $PM_{10}/PM_{2.5}$ Concentrations, Pinedale Anticline Project.

Scenario	Pollutant	Averaging Time	Direct Modeled ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Predicted ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
20-acre well pad, 4 well pads per section	PM_{10}	24-Hour	74.2	32	106.2	150	150
	$PM_{2.5}$	24-Hour	14.3	15	29.3	65[1]	35[2]
2 drill rigs per well pad Tier 0 emissions	PM_{10}	24-Hour	7.3	32	39.3	150	150
		Annual	1.6	9	10.6	50	--[3]
	$PM_{2.5}$	24-Hour	4.9	15	19.9	65[1]	35[2]
		Annual	1.6	5	6.6	15	15
2 drill rigs per well pad/ 4 drill rigs Per section Tier 1 emissions	PM_{10}	24-Hour	9.8	32	41.8	150	150
		Annual	2.1	9	11.1	50	--[3]
	$PM_{2.5}$	24-Hour	6.3	15	21.3	65[1]	35[2]
		Annual	2.1	5	7.1	15	15
2 drill rigs per well pad/ 4 drill rigs Per section Tier 2 emissions	PM_{10}	24-Hour	3.7	32	35.7	150	150
		Annual	0.8	9	9.8	50	--[3]
	$PM_{2.5}$	24-Hour	2.4	15	17.4	65[1]	35[2]
		Annual	0.8	5	5.8	15	15
1 drill rig per well pad/ 4 drill rigs per section Tier 1 Emissions	PM_{10}	24-Hour	8.1	32	40.1	150	150
		Annual	1.7	9	9.7	50	--[3]
	$PM_{2.5}$	24-Hour	5.5	15	20.5	65[1]	35[2]
		Annual	1.7	5	6.7	15	15
1 drill rig per well pad/ 4 drill rigs per section Tier 2 emissions	PM_{10}	24-Hour	6.0	32	38.0	150	150
		Annual	1.1	9	10.1	50	--[3]
	$PM_{2.5}$	24-Hour	4.1	15	19.1	65[1]	35[2]
		Annual	1.1	5	6.1	15	15

1 EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.
2 Revised NAAQS effective December 18, 2006.
3 Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

3.4.2 SO_2

Well drilling activities were modeled using AERMOD to determine maximum SO_2 concentration impacts. The model scenarios and source parameters used to evaluate long-term $PM_{10}/PM_{2.5}$ impacts were also to estimate maximum SO_2 concentrations (see Figures 3.2 and 3.4). Drill rig emissions at Tier 0 (AP-42 levels), EPA Tier 1 and Tier 2 levels were modeled. The SO_2 emissions used for modeling the drill rigs are provided in Appendix B and are further detailed in Appendix F.

The Maximum modeled SO_2 concentrations for each modeling scenario are shown in Table 3.4. When the maximum modeled concentration was added to representative background concentrations, it was demonstrated that SO_2 concentrations for all scenarios comply with the WAAQS and NAAQS.

As with PM_{10} construction emissions, emissions from drilling rigs are temporary and do not consume SO_2 PSD increment and as a result are excluded from increment consumption comparison.

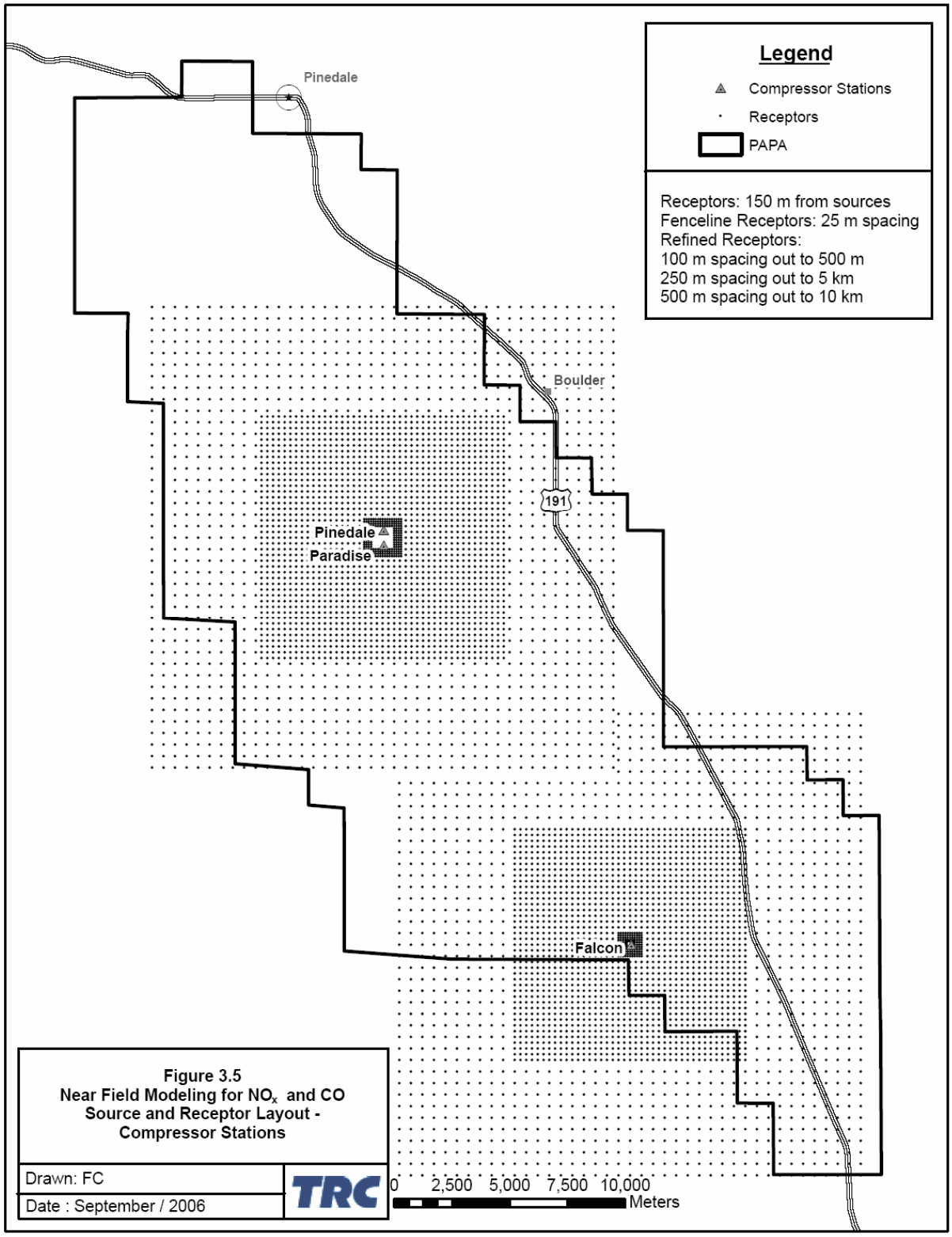
Table 3.4 Maximum Modeled SO_2 Concentrations, Pinedale Anticline Project.

Scenario	Pollutant	Averaging Time	Direct Modeled ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Predicted ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
2 drill rigs per well pad Tier 0 emissions	SO_2	3-Hour	13.5	132	145.5	1,300	1,300
		24-Hour	2.9	43	45.9	260	365
		Annual	0.6	9	9.6	60	80
2 drill rigs per well pad/ 4 drill rigs per section Tier 1 emissions	SO_2	3-Hour	13.5	132	145.5	1,300	1,300
		24-Hour	3.2	43	46.2	260	365
		Annual	0.7	9	9.7	60	80
2 drill rigs per well pad/ 4 drill rigs per section Tier 2 emissions	SO_2	3-Hour	13.5	132	145.5	1,300	1,300
		24-Hour	3.2	43	46.2	260	365
		Annual	0.7	9	9.7	60	80
1 drill rig per well pad/ 4 drill rigs per section Tier 1 emissions	SO_2	3-Hour	10.8	132	142.8	1,300	1,300
		24-Hour	2.6	43	45.6	260	365
		Annual	0.6	9	9.6	60	80
1 drill rig per well pad/ 4 drill rigs per section Tier 2 emissions	SO_2	3-Hour	10.8	132	142.8	1,300	1,300
		24-Hour	2.6	43	45.6	260	365
		Annual	0.6	9	9.6	60	80

3.4.3 NO_2

Analyses were performed using AERMOD to quantify the maximum NO_2 impacts that could occur within and nearby the PAPA with the emissions from existing in-field and nearby compressor stations and proposed compression expansions. The compressor stations analyzed include the in-field Pinedale/Gobblers Knob, Paradise and Falcon stations, and the nearby Bird Canyon facility. The compressor stations were modeled as point sources, using aerodynamic building downwash parameters. Model receptors were placed using 25 meter spacing along assumed fencelines placed 150 meters from the compressor stations, at 100 meter intervals out to 500 meters, then at 250 meter intervals out to 5 km, and 500 meter intervals out to 10 km. AERMAP was used to determine receptor height parameters from digital elevation model (DEM) data. Figure 3.5 illustrates the compressor station model configuration.

Figure 3.5 Near Field Modeling for NO_x and CO Source and Receptor Layout – Compressor Stations



Well drilling activities were also modeled using AERMOD to determine maximum NO_x concentration impacts. The model scenarios and source parameters used to evaluate long-term $PM_{10}/PM_{2.5}$ impacts and SO_2 concentrations were used (see Figures 3.2 and 3.4). Drill rig emissions at EPA Tier 0 (AP-42 levels), EPA Tier 1 and Tier 2 levels were modeled.

The NO_x emissions and parameters used for modeling the compressor stations and the drill rigs are provided in Appendix B and are further detailed in Appendix F.

The AERMOD model was used to predict maximum NO_x impacts for each modeling scenario. Maximum modeled NO_2 concentrations were determined by multiplying maximum predicted NO_x concentrations by 0.75, in accordance with EPA's Tier 2 NO_x to NO_2 conversion method (EPA 2003a). Maximum predicted NO_2 concentrations are given in Table 3.5.

As shown in Table 3.5, when the maximum modeled NO_2 concentrations are combined with representative background NO_2 concentrations, the predicted impacts for all scenarios are below the applicable WAAQS and NAAQS. Predicted direct project NO_2 impacts from the compressor station modeling scenario are above the PSD Class II increment; however, all NEPA PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis, which may be completed as necessary by the WDEQ-AQD. In addition, because the emissions from drilling rigs are temporary and do not consume PSD increment, and as a result, are excluded from increment consumption comparison.

Table 3.5 Maximum Modeled Annual NO_2 Concentrations, Pinedale Anticline Project.

Scenario	Pollutant	Direct Modeled ($\mu g/m^3$)	PSD Class II Increment[1,2] ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Predicted ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
Compressor stations	NO_2	34.5	25	8	42.5	100	100
2 drill rigs per well pad - Tier 0 emissions	NO_2	39.9	--[3]	8	47.9	100	100
2 drill rigs per well pad/ 4 drill rigs per section -Tier 1 emissions	NO_2	27.6	--[3]	8	35.6	100	100
2 drill rigs per well pad/ 4 drill rigs per section -Tier 2 emissions	NO_2	18.0	--[3]	8	26.0	100	100
1 drill rig per well pad/ 4 drill rigs per section -Tier 1 emissions	NO_2	22.5	--[3]	8	30.5	100	100
1 drill rig per well pad/ 4 drill rigs per section -Tier 2 emissions	NO_2	14.6	--[3]	8	22.6	100	100

1 The PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis.
2 Background concentrations are not added to modeled concentrations for comparison to the PSD increment.
3 Drilling rigs are temporary and do not consume NO_2 PSD increment and are excluded from increment consumption comparison.

3.4.4 CO

Maximum CO emissions were determined using the same compressor station model scenario that was developed and used for modeling NO_2 (see Figure 3.5). AERMOD was used to predict the maximum CO impacts at receptor location within and nearby the PAPA. Maximum predicted CO concentrations are shown in Table 3.6. As indicated in Table 3.6, maximum modeled CO concentrations, when combined with representative background CO concentrations, are below the applicable WAAQS and NAAQS.

Table 3.6 Maximum Modeled CO Concentrations, Pinedale Anticline Project.

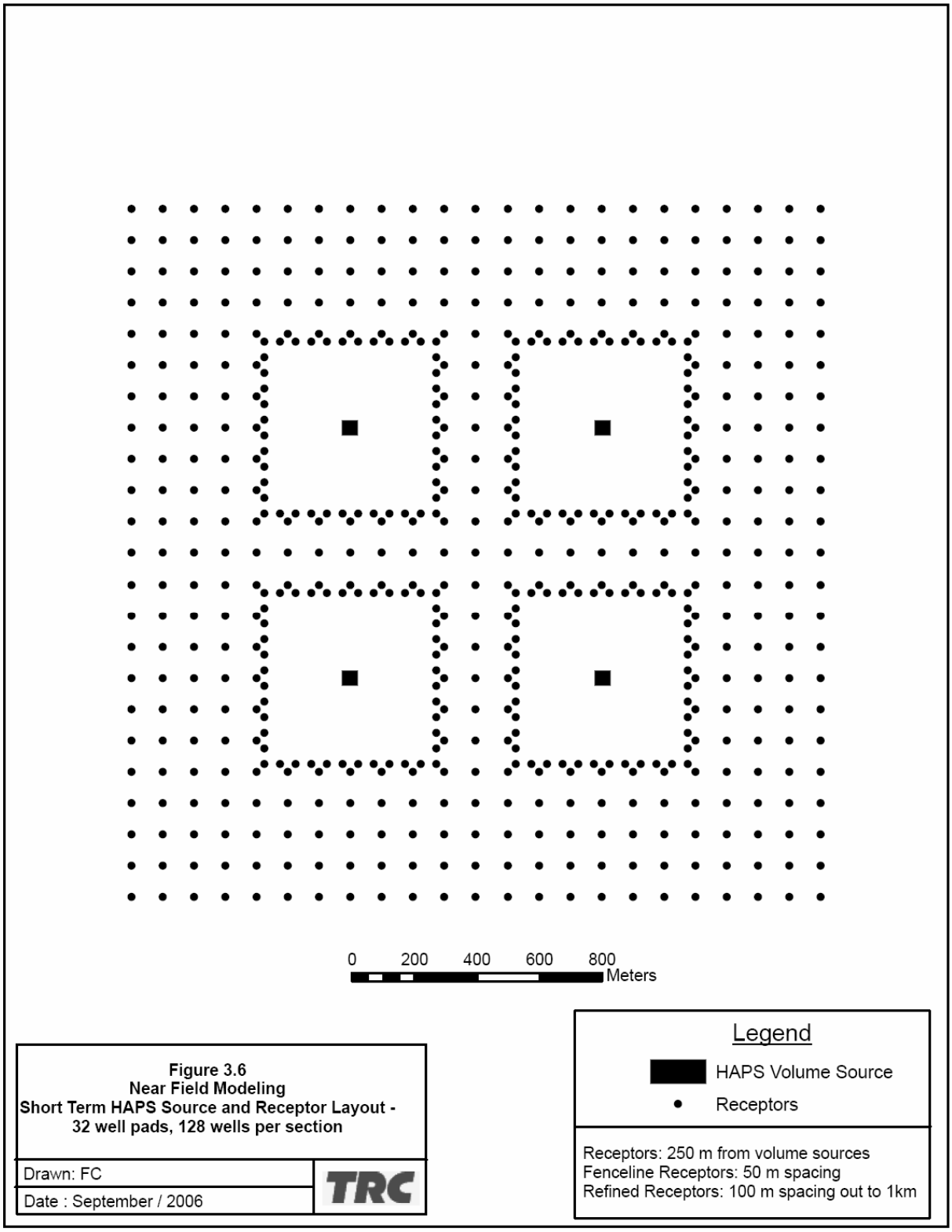
Scenario	Pollutant	Averaging Time	Direct Modeled ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Predicted ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
Compressor stations	CO	1-Hour	328.5	1,979	2,307.5	40,000	40,000
		8-Hour	231.7	931	1,162.7	10,000	10,000

3.5 HAP IMPACT ASSESSMENT

AERMOD was used to determine HAP impacts in the immediate vicinity of the PAPA emission sources for short-term (acute) exposure assessment and at residence locations that are within the PAPA for calculation of long-term risk. Sources of HAPs include well-site fugitive emissions (BTEX and n-hexane) and compressor station combustion emissions (formaldehyde). Because maximum field-wide annual emissions of HAPs occur during the production phase, only HAP emissions from production were analyzed for long-term risk assessment. For long-term risk assessment, estimated field development scenarios were developed for the No Action and Proposed Action project alternatives. Short-term exposure assessments were performed for production HAP emissions using a maximum emissions scenario that included four, multi-well pads, placed in the center of each quarter section of a one-section area (similar to drill rig modeling analyses).

HAPs (BTEX, and n-hexane) from well-site fugitive emissions were modeled with AERMOD to determine the maximum HAP short-term (1-hour) impacts that could occur within and near the PAPA. Volume sources were used for modeling the well-site fugitive HAP emissions. Flat terrain receptors were spaced at 50 m intervals at a minimum distance of 250 m from a well-site in each quarter section, and at 100 m intervals out to 1 km from the well-sites. The source and receptor layouts utilized for the short-term fugitive source HAP modeling are presented in Figure 3.6. For modeling short-term formaldehyde emissions from compressor station sources, an analysis similar to that performed for NO_2 and CO (see Sections 3.4.3 and 3.4.4) was used. The compressor stations analyzed include the in-field Pinedale/Gobblers Knob, Paradise and Falcon stations. The HAP emissions are summarized in Appendix B and further detailed in Appendix F.

Figure 3.6 Near Field Modeling Short Term HAPS Source and Receptor Layout – 32 well pads, 128 wells per section



Long-term (annual) HAPs were analyzed at residential locations within the PAPA. Maximum projected formaldehyde emissions from compressor station sources including Pinedale/Gobblers Knob, Paradise, and Falcon stations were modeled at each residence location. Compressor stations were modeled as point source emissions. The formaldehyde emissions are provided in Appendix B. Receptor elevations at residence locations were determined from USGS DEM data using AERMAP.

Model scenarios for the No Action and Proposed Action alternatives were developed for modeling long-term fugitive HAP emissions. Estimated project field development areas for year 2007 (No Action) and year 2019 (Proposed Action) were used to estimate fugitive HAP source locations. These years were selected for modeling because the maximum HAP emissions are expected to occur during these years under each project alternative. The emissions for the long-term HAPs analyses are provided in Appendix F. Area sources dimensioned using 1-mile sections were used for modeling the fugitive HAPs. Figures 3.7 (No Action) and 3.8 (Proposed Action) illustrate the modeling scenarios used for the long-term HAPs analyses. These figures indicate the projected development areas for the project, the compressor stations, and the residence locations.

Reference Exposure Levels (RELs) are defined as concentrations at or below which no adverse health effects are expected. Since no RELs are available for ethylbenzene and n-hexane, the available Immediately Dangerous to Life or Health (IDLH) values, divided by 10, were used. These REL and IDLH values are determined by the National Institute for Occupational Safety and Health (NIOSH) and were obtained from EPA's Air Toxics Database (EPA 2007a). Modeled short-term HAP concentrations are compared to REL and IDLH values in Table 3.7. As shown in Table 3.7 the maximum predicted short-term HAP impacts within and near the PAPA would be below the REL or IDLH values under all project alternatives.

Table 3.7 Maximum Modeled 1-Hour HAP Concentrations, Pinedale Anticline Project.

	Direct Modeled Concentration by Modeling Scenario ($\mu g/m^3$)		REL or IDLH[1] ($\mu g/m^3$)
HAP	**No Action**	**Proposed Action**	
Benzene	128.5	128.5	1,300[2]
Toluene	248.9	248.9	37,000[2]
Ethylbenzene	15.4	15.4	350,000[3]
Xylene	189.7	189.7	22,000[2]
n-Hexane	82.2	82.2	390,000[3]
Formaldehyde	79.3	79.3	94[2]

1 EPA (2007a).
2 Reference Exposure Level
3 Immediately Dangerous to Life or Health value divided by 10.

Figure 3.7 Near Field Modeling for Long Term HAPS Source and Receptor Layout – No Action

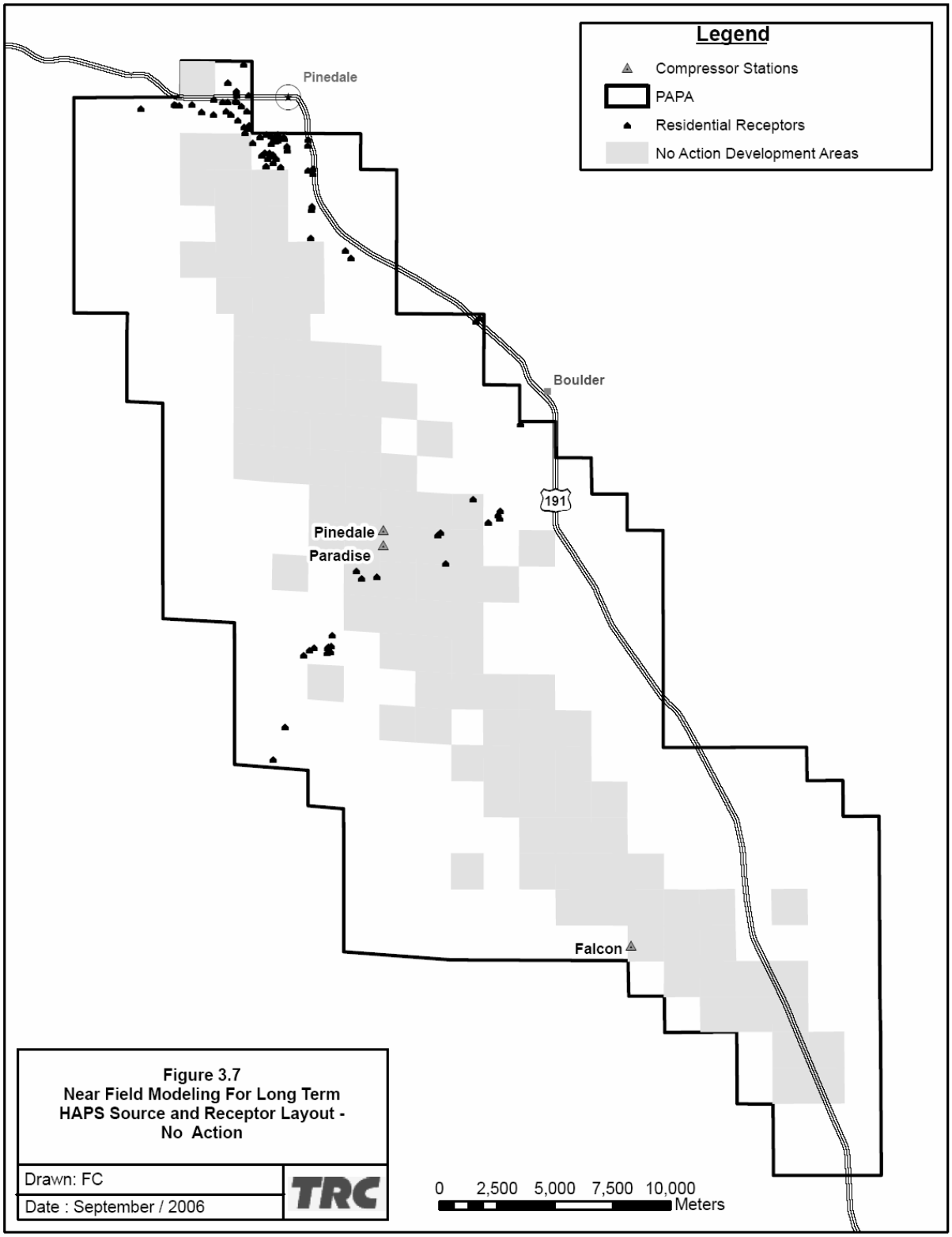
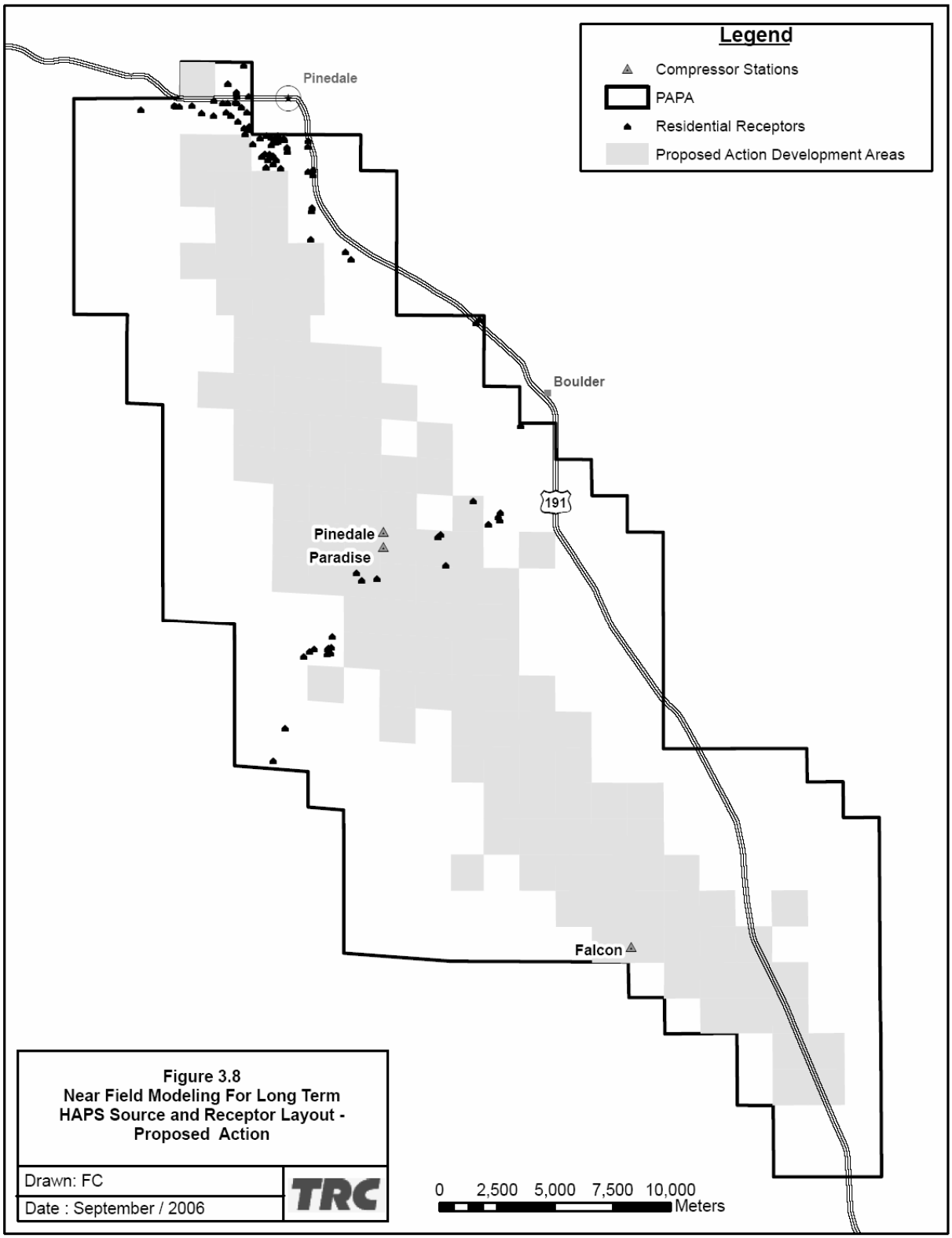


Figure 3.8 Near Field Modeling for Long Term HAPS Source and Receptor Layout – Proposed Action



Long-term (annual) modeled HAP concentrations at the nearest residence are compared to Reference Concentrations for Chronic Inhalation (RfCs). A RfC is defined by EPA 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 (EPA 2007b). The maximum predicted annual HAP concentrations at the nearest residential area are compared to the corresponding non-carcinogenic RfC in Table 3.8.

As shown in Table 3.8 the maximum predicted long-term (annual) HAP impacts at the nearest residence locations within the PAPA would be below the RfCs for all alternatives.

Table 3.8 Maximum Modeled Long-term (Annual) HAP Concentrations, Pinedale Anticline Project.

	Direct Modeled Concentration by Modeling Scenario ($\mu g/m^3$)		Non-carcinogenic RfC[1] ($\mu g/m^3$)
HAP	**No Action**	**Proposed Action**	
Benzene	0.2	0.5	30
Toluene	0.6	1.2	5,000
Ethylbenzene	0.03	0.06	1,000
Xylene	0.4	1.0	100
n-Hexane	0.1	0.1	700
Formaldehyde	0.2	0.2	9.8

1 EPA (2007b).

Long-term exposures to emissions of suspected carcinogens (benzene and formaldehyde) were evaluated based on estimates of the increased latent cancer risk over a 70-year lifetime. This analysis presents the potential incremental risk from these pollutants, and does not represent a total risk analysis. The cancer risks were calculated using the maximum predicted annual concentrations and EPA's chronic inhalation unit risk factors (URF) for carcinogenic constituents (EPA 2007a). Estimated cancer risks were evaluated based on the Superfund National Oil and Hazardous Substances Pollution Contingency Plan (EPA 1990a), where a cancer risk range of 1 to 100 x 10^{-6} is generally acceptable. Two estimates of cancer risk are presented: 1) a most likely exposure (MLE) scenario; and 2) a maximum exposed individual (MEI) scenario. The estimated cancer risks are adjusted to account for duration of exposure and time spent at home.

The adjustment for the MLE scenario is assumed to be 9 years, which corresponds to the mean duration that a family remains at a residence (EPA 1993). This duration corresponds to an adjustment factor of 9/70 = 0.13. The duration of exposure for the MEI scenario is assumed to be 60 years (i.e., the LOP), corresponding to an adjustment factor of 60/70 = 0.86. A second adjustment is made for time spent at home versus time spent elsewhere. For the MLE scenario, the at-home time fraction is 0.64 (EPA 1993), and it is assumed that during the rest of the day the individual would remain in an area where annual HAP concentrations would be one quarter as large as the maximum annual average concentration. Therefore, the final MLE adjustment factor is (0.13) x [(0.64 x 1.0) + (0.36 x 0.25)] = 0.0949. The MEI scenario assumes that the individual is at home 100% of the time, for a final MEI adjustment factor of (0.86 x 1.0) = 0.86.

For each constituent, the cancer risk is computed by multiplying the maximum predicted annual concentration by the URF and by the overall exposure adjustment factor. The cancer risks for both constituents are then summed to provide an estimate of the total inhalation cancer risk.

The modeled long-term risk from benzene and formaldehyde are shown in Table 3.9. The maximum predicted formaldehyde concentration representative of cumulative impacts was used. Under the MLE scenario, the estimated cancer risk associated with long-term exposure to benzene and formaldehyde is below 1 x 10^{-6}. Under the MEI analyses, the incremental risk for formaldehyde is less than 1 x 10^{-6}, and both the incremental risk for benzene and the combined incremental risk fall at the lower end of the presumptively acceptable cancer risk range of 1 to 100 x 10^{-6} as stated by EPA (EPA 1990a).

Table 3.9 Long-term Modeled MLE and MEI Cancer Risk Analyses, Pinedale Anticline Project.

Modeling Scenario	Analysis	HAP Constituent	Modeled Concentration (µg/m^3)	Unit Risk Factor 1/(µg/m^3)	Exposure Adjustment Factor	Cancer Risk
No Action	MLE	Benzene	0.24	7.8 x 10^{-6}	0.0949	0.18 x 10^{-6}
		Formaldehyde	0.18	1.3 x 10^{-5}	0.0949	0.22 x 10^{-6}
Total Combined[1]						0.4 x 10^{-6}
No Action	MEI	Benzene	0.24	7.8 x 10^{-6}	0.86	1.6 x 10^{-6}
		Formaldehyde	0.18	1.3 x 10^{-5}	0.86	2.0 x 10^{-6}
Total Combined[1]						3.6 x 10^{-6}
Proposed Action	MLE	Benzene	0.45	7.8 x 10^{-6}	0.0949	0.33 x 10^{-6}
		Formaldehyde	0.18	1.3 x 10^{-5}	0.0949	0.22 x 10^{-6}
Total Combined[1]						0.55 x 10^{-6}
Proposed Action	MEI	Benzene	0.45	7.8 x 10^{-6}	0.86	3.0 x 10^{-6}
		Formaldehyde	0.18	1.3 x 10^{-5}	0.86	2.0 x 10^{-6}
Total Combined[1]						5.0 x 10^{-6}

[1] Total risk is calculated here; however, the additive effects of multiple chemicals are not fully understood and this should be taken into account when viewing these results.

4.0 FAR-FIELD ANALYSES

The purpose of the far-field analysis is to quantify potential air quality impacts on PSD Class I and sensitive PSD Class II areas from air pollutant emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$ expected to result from the development of the project. The analyses were performed using the EPA CALMET/CALPUFF modeling system to predict air quality impacts from project and regional sources at far-field PSD Class I and sensitive PSD Class II areas and at several mid-field PSD Class II areas. The PSD Class I areas and sensitive PSD Class II areas analyzed are shown on Map 1.2 and include:

- Bridger Wilderness Area (Class I);
- Fitzpatrick Wilderness Area (Class I);
- Gros Ventre Wilderness Area (Class II);
- Popo Agie Wilderness Area (Class II);
- Wind River Roadless Area (Class II)
- Grand Teton National Park (Class I);
- Teton Wilderness Area (Class I);
- North Absaroka Wilderness Area (Class I);
- Yellowstone National Park (Class I); and
- Washakie Wilderness Area (Class I).

Modeled pollutant concentrations at these sensitive areas were compared to applicable WAAQS, NAAQS, and PSD Class I and Class II increments, and were used to assess potential impacts to AQRVs (i.e., visibility [regional haze] and atmospheric deposition). Note that visibility is protected in Class I areas only; Class II areas have no visibility protection and are included here only to further define impacts in potentially sensitive areas. In addition, analyses were performed for seven lakes designated as acid sensitive located within the sensitive PSD Class I and Class II wilderness areas to assess potential lake acidification from atmospheric deposition impacts (see Map 1.2). These lakes include:

- Deep Lake in the Bridger Wilderness Area;
- Black Joe Lake in the Bridger Wilderness Area;
- Hobbs Lake in the Bridger Wilderness Area;
- Upper Frozen Lake in the Bridger Wilderness Area;
- Lazy Boy Lake in the Bridger Wilderness Area;
- Ross Lake in the Fitzpatrick Wilderness Area; and
- Lower Saddlebag Lake in the Popo Agie Wilderness Area.

The far-field analysis also includes in-field analysis. Impacts were assessed for direct project and regional source impacts at in-field locations within the PAPA. It also includes mid-field analysis in which impacts were assessed at mid-field locations (regional communities) (see Map 1.2), which include the Wyoming communities of:

- Boulder;
- Cora; and
- Pinedale.

Predicted pollutant impacts at in-field locations were compared to applicable ambient air quality standards. At mid-field Wyoming community locations impacts to visibility (regional haze) were assessed, although these communities are classified as PSD Class II areas where no visibility protection exits under local, state, or federal law.

4.1 MODELING METHODOLOGY

The EPA-approved CALMET/CALPUFF modeling system (CALMET Version 5.53b and CALPUFF Version 5.711b dated December 16, 2005) was used for the mid-field and far-field modeling analyses. The CALMET meteorological model was used to develop windfields for 3 years of meteorological data (2001, 2002, and 2003) and the CALPUFF dispersion model combined these wind fields with project-specific and regional emissions inventories of NO_x, SO_2, NO_x, PM_{10}, and $PM_{2.5}$ to estimate ambient concentrations and AQRV impacts at in-field, mid-field, and far-field receptor locations. The study area is shown in Map 1.2.

The CALMET and CALPUFF models were utilized in this analysis following the methods described in the Protocol (Appendix A) and the following guidance sources:

- *Guideline on Air Quality Models*, 40 *Code of Federal Regulations* (C.F.R.), Part 51, Appendix W (EPA 2003a);
- *Interagency Work Group on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts*, EPA-454/R-98-019, Office of Air Quality Planning and Standards, December 1998 (IWAQM 1998); and
- *Federal Land Managers - Air Quality Related Values Workgroup (FLAG), Phase I Report*, December 2000 (FLAG 2000).

4.2 PROJECT ALTERNATIVE MODELING SCENARIOS

Modeling scenarios were developed for the proposed project development scenarios including the No Action (Alternative A) Proposed Action (Alternative B), and Alternative C and for the level of project development that occurred during year 2005. Project alternative modeling scenarios were based on the maximum emissions year determined for each alternative. Emissions calculations were performed for each project alternative for each year over the LOP (see Appendix F). The project year under each alternative that is expected to have to overall largest pounds per hour emissions of pollutants NO_x, SO_2, and PM_{10}/$PM_{2.5}$ was selected for modeling to assure that the maximum impacts under each alternative were quantified. For the No Action Alternative, year 2007 was selected, and for the Proposed Action, year 2009. Alternative C is similar to the Proposed Action (Alternative B), however it includes mitigation options. For Alternative C, two mitigation options were modeled, Phase 1 and Phase 2. Phase 1 is Alternative B with emissions levels mitigated to year 2005 levels, and under Phase 2 the emissions levels mitigated to year 2005 levels are further reduced by mitigating the drill rig emissions an additional 80 percent.

The PAPA field activities in year 2005 and both the No Action and Proposed Action maximum emissions years include both field development (construction) and field operation (production) emissions. An additional modeling scenario was developed for the Proposed Action when the field is in full production, which is expected to occur in 2026. The modeled emissions for year 2005 project activities and the analyzed project alternatives are shown in Table 4.1.

Note that the modeled emissions for these scenarios assume continuous operation of drill rigs and other PAPA sources that operate intermittently throughout the year and therefore are not comparable to annual field-wide emissions estimates provided in Table 2.1. The field-wide emissions provided in Table 2.1 include source emissions duration in the annual emissions total. The Project Alternative emissions modeled and shown in Table 4.1 represent conservative estimates of the annual emission that could potentially occur under each alternative. These modeling analyses are used to quantify the maximum short-term impacts (24-hour) that could occur under project alternatives because visibility impairment has been

identified as a major concern and visibility impairment calculations are performed on a 24-hour average basis.

Table 4.1 Summary of Maximum Modeled Field-Wide Emissions (tpy), Pinedale Anticline Project.

Emissions	PAP 2005	Alternative A 2007	Alternative B 2009	Alternative C (Phase 1)	Alternative C (Phase 2)	Alternative B 2026
Field Compression						
NO_x	379.7	425.0	478.9	379.7	379.7	1537.7
SO_2	0.0	0.0	0.0	0.0	0.0	0.0
PM_{10}	0.0	0.0	0.01	0.0	0.0	0.04
$PM_{2.5}$	0.0	0.0	0.01	0.0	0.0	0.04
Granger Gas Plant						
NO_x	0.0	301.7	301.7	301.7	301.7	301.7
SO_2	0.0	0.0	0.0	0.0	0.0	0.0
PM_{10}	0.0	0.0	0.0	0.0	0.0	0.0
$PM_{2.5}$	0.0	0.0	0.0	0.0	0.0	0.0
Drill Rigs						
NO_x	2632.2	4748.2	4390.0	2632.2	526.4	0.0
SO_2	222.9	54.8	64.2	222.9	44.6	0.0
PM_{10}	141.6	184.9	185.7	141.6	28.3	0.0
$PM_{2.5}$	141.6	184.9	185.7	141.6	28.3	0.0
Fugitives						
NO_x	495.7	731.1	661.3	495.7	495.7	414.7
SO_2	10.8	16	15.1	10.8	10.8	2.5
PM_{10}	730.9	1024.9	531.8	730.9	730.9	384.9
$PM_{2.5}$	154.1	193.2	107.0	154.1	154.1	85.7
Wind Erosion						
PM_{10}	254.8	357.2	440.8	440.8	440.8	764.2
$PM_{2.5}$	101.9	142.9	176.3	176.3	176.3	305.7
Total						
NO_x	3507.6	6206.0	5831.9	3809.3	1703.5	2254.1
SO_2	233.7	70.8	79.3	233.7	55.4	2.5
PM_{10}	1127.3	1567.0	1158.3	872.5	759.2	1149.2
$PM_{2.5}$	397.6	521.0	469.0	295.7	182.4	391.4

4.3 METEOROLOGICAL MODEL INPUT AND OPTIONS

The CALMET model was used to develop windfields for the study area shown in Map 1.2. The modeling domain covers the PAPA and PSD Class I and other sensitive PSD Class II areas within 200-km of the PAPA with a sufficient buffer zone to allow for potential recirculation or flow reversal effects to be evaluated. The modeling domain follows IWAQM guidance that recommends that the horizontal domain of the model grid extend 50 to 80 km beyond the receptors and sources being modeled, for modeling potential recirculation wind flow effects.

Three years of CALMET windfield data were developed and used for the modeling analysis. The years 2001, 2002, and 2003, were selected based on the availability of representative MM5 mesoscale model data for the analysis. The 2001, 2002 and 2003 MM5 data were developed for EPA or for a Regional Planning Organization (RPO), have undergone significant QA/QC verification and peer review, and are the most recent available consecutive 3 years of prognostic data that are available. The MM5 data sets that were used for the analysis include year 2001 data processed at 36-km spacing for EPA (Alpine Geophysics, LLC, 2003), year 2002 data processed at 36-km spacing for WRAP (ENVIRON, 2005) and year 2003 data processed at 36-km spacing for the Midwest RPO (Baker, 2005).

Surface meteorology data for sites throughout the modeling domain obtained from National Climatic Data Center (NCDC) integrated surface observation data sets, Clean Air Status and Trends Network (CASTNET) sites, and from onsite data collected by BP America Production Company in the Jonah Field were incorporated into the windfields. In addition, upper air rawinsonde meteorology data, and precipitation data for applicable observation sites throughout the modeling domain were obtained from NCDC and included in the analysis. Listings of the surface and upper air meteorological stations that were used in this analysis are provided in Appendix C.

The modeling domain was processed to a uniform horizontal grid using 4-km resolution, based on a Lambert Conformal Projection defined with a central longitude/latitude at (-109.80°/43.05°) and first and second latitude parallels at 30° and 60°. The modeling grid consisted of 116 x 138 4-km grid cells that cover the project area and all analyzed PSD Class I and sensitive PSD Class II areas. Ten vertical layers were used, with heights of 20, 40, 100, 160, 320, 560, 1,000, 1,500, 2,250, and 3,200 meters.

The CALMET analysis utilized the MM5 data, surface meteorological data, precipitation data, and upper air meteorological stations to supplement MM5 upper air estimates. USGS 1:250,000-scale Land Use and Land Cover (LULC) data, and USGS 1º DEM data were used for land use and terrain data in the development of the CALMET wind fields. All CALMET model control switch settings follow IWAQM guidance.

4.4 DISPERSION MODEL INPUT AND OPTIONS

The CALPUFF model was used to model project-specific and regional emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$. CALPUFF was run using the IWAQM-recommended default control file switch settings for all parameters. Chemical transformations were modeled based on the MESOPUFF II chemistry mechanism for conversion of SO_2 to sulfate (SO_4) and NO_x to nitric acid (HNO_3) and nitrate (NO_3). Each of these pollutant species was included in the CALPUFF model runs. NO_x, HNO_3, and SO_2 were modeled with gaseous deposition, and SO_4, NO_3, PM_{10}, and $PM_{2.5}$ were modeled using particle deposition. The PM_{10} emissions input to CALPUFF included only the PM_{10} emissions greater than the $PM_{2.5}$ (i.e., modeled PM_{10} = PM_{10} emission rate – $PM_{2.5}$ emission rate). Total PM_{10} impacts were determined in the post-processing of modeled impacts, as discussed in Section 4.5.

4.4.1 Chemical Species

The CALPUFF chemistry algorithms require hourly estimates of background O_3 and ammonia (NH_3) concentrations for the conversion of SO_2 and NO/NO_2 to sulfates and nitrates, respectively. Background hourly O_3 data, for monitoring stations within the modeling domain were used in the CALPUFF modeling for each of the three modeling years. A list of the O_3 monitoring stations is provided in Appendix C. Monthly averaged O_3 data from these stations for each year were used as default values for missing hours. A background NH_3 concentration of 1.0 ppb was used as suggested in the IWAQM guidance for arid lands.

4.4.2 Model Receptors

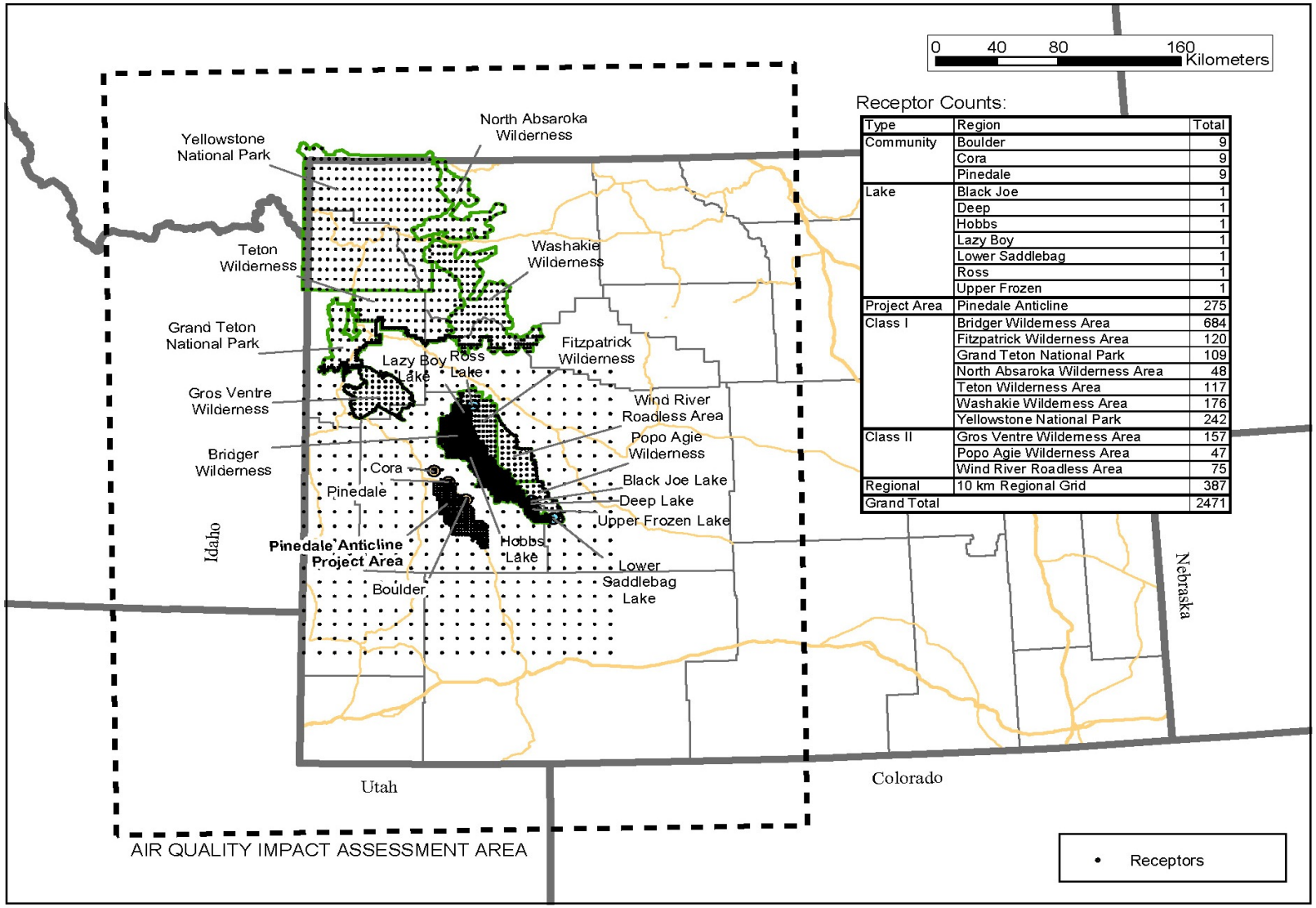
Receptor sets available from the NPS for PSD Class I areas were used as a basis for determining modeling receptors for all PSD Class I and sensitive PSD Class II areas. The complete NPS receptor set was used for modeling the nearby Bridger Wilderness Area, however the receptor grid densities were thinned at the more distant PSD Class I areas, while maintaining adequate area coverage, for consideration of model run times. For the three sensitive PSD Class II areas located within the modeling domain (Gros Ventre and Popo Agie Wilderness Areas, and Wind River Roadless Area), receptor sets were developed using 2-km spacing along the wilderness area boundaries and at 4-km spacing within each area. Receptors were placed within the PAPA using 2-km spacing, and out to 100 km from the PAPA using 10-km spacing. For the regional communities of Boulder, Pinedale and Cora receptors 3 x 3, 1-km grids were used. Receptor elevations for the sensitive PSD Class II area receptors, the regional communities, the receptors within the PAPA and extending outward 100 km were determined from 1:250,000 scale USGS DEM data. Discrete receptors were placed at the seven lakes identified as sensitive to acid deposition. Elevations for the sensitive lake receptors were derived from 7.5-minute USGS maps.

All model receptors utilized in the CALPUFF modeling are shown in Figure 4.1.

4.4.3 Source Parameters

CALPUFF source parameters were determined for all project and regional source emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$. Project sources were input to CALPUFF using point sources to idealize the Granger Gas Plant expansion, compressor stations and drilling rig engines. Additionally, 1-mi^2 area sources were placed throughout the PAPA to idealize fugitive emissions from well-site heaters, vehicle traffic, well completion activities and wind erosion. Source locations for each modeled scenario were estimated from the current PAPA development and future projected expansion. The source locations used for each modeled scenario are provided in Appendix C, in Tables C.4 through C.11. Compressor station, gas plant, and drill rig emissions are provided in Appendix F. Parameters used for modeling the gas plant, compressor stations and drill rigs are in Appendix C. Monthly emissions scalars were used to adjust the heater and drill rig emissions for seasonal variations.

Figure 4.1 CALPUFF Model Receptors



Receptor Counts:

Type	Region	Total
Community	Boulder	9
	Cora	9
	Pinedale	9
Lake	Black Joe	1
	Deep	1
	Hobbs	1
	Lazy Boy	1
	Lower Saddlebag	1
	Ross	1
	Upper Frozen	1
Project Area	Pinedale Anticline	275
Class I	Bridger Wilderness Area	684
	Fitzpatrick Wilderness Area	120
	Grand Teton National Park	109
	North Absaroka Wilderness Area	48
	Teton Wilderness Area	117
	Washakie Wilderness Area	176
	Yellowstone National Park	242
Class II	Gros Ventre Wilderness Area	157
	Popo Agie Wilderness Area	47
	Wind River Roadless Area	75
Regional	10 km Regional Grid	387
Grand Total		2471

Non-project regional emissions were input to CALPUFF using area sources to idealize non-compression RFD sources, county-wide well emissions, and point sources to idealize state-permitted sources, RFD compression sources, and RFFA. The source parameters used in modeling all state-permitted and RFFA sources are provided in Appendix G. Non-compression RFD emissions were modeled using area sources developed for each proposed field development as a "best fit" to the respective project area. The source parameters used for modeling the compression sources for each RFD project are provided in Appendix G. County-wide well emissions were modeled using area sources developed as a “best fit” to the respective county area. Seasonal emission-rate adjustment factors were applied to emissions from well site heaters to account for seasonal variations in heater use. Source elevations for all RFD and county-wide area sources were determined from 1:250,000 scale USGS DEM data.

4.5 BACKGROUND DATA

4.5.1 Criteria Pollutants

Ambient air concentration data collected at monitoring sites in the region provide a measure of the background conditions during the most recent available time period. The most representative regional monitoring-based background values for criteria pollutants (NO_2, PM_{10}, $PM_{2.5}$, and SO_2), as identified by WDEQ-AQD, collected at monitoring sites in Wyoming, are summarized in Table 4.2. The ambient air background concentrations provided in Table 4.2 were added to modeled pollutant concentrations (expressed in µg/m^3) to arrive at total ambient air quality impacts for comparison to NAAQS and WAAQS.

Table 4.2 Far-field Analysis Background of Ambient Air Quality Concentrations (µg/m^3).

Pollutant	Averaging Period	Measured Background Concentration
NO_2[1]	Annual	8
PM_{10}[1]	24-hour	32
	Annual	9
$PM_{2.5}$[2]	24-hour	15
	Annual	6
SO_2[3]	3-hour	132
	24-hour	43
	Annual	9

[1] Background data collected by WDEQ-AQD approximately 5 miles south-west of Boulder, Wyoming during the period April 2005 - March 2006.

[2] Background data collected by WDEQ-AQD in Pinedale, Wyoming during the period July 2005 - June 2006.

[3] Data collected at LaBarge Study Area, Wyoming at the Northwest Pipeline Craven Creek Site 1982-1983.

4.5.2 Visibility

Background visibility data representative of the study area were collected from IMPROVE monitoring sites located at the Bridger Wilderness Area, North Absaroka Wilderness Area and at Yellowstone National Park (Table 4.3). These background visibility data are used in combination with modeled pollutant impacts to estimate change in visibility conditions (measured as change in light extinction) at PSD Class I and sensitive PSD Class II areas. The IMPROVE background visibility data are provided as reconstructed aerosol total extinction data, based on the quarterly mean of the 20% cleanest days measured at the Bridger Wilderness Area and Yellowstone National Park IMPROVE sites for a 5 year period, years 2000 through 2004.

Table 4.3 IMPROVE Background Aerosol Extinction Values.[1]

IMPROVE Site	Quarter	Hygroscopic (Mm^{-1})[2]	Non-hygroscopic (Mm^{-1})[2]
Bridger	1	0.775	1.233
	2	1.565	3.283
	3	1.791	4.965
	4	0.704	1.192
North Absaroka	1	0.774	1.565
	2	1.326	2.249
	3	1.360	4.931
	4	0.600	1.368
Yellowstone	1	1.104	1.588
	2	1.453	2.983
	3	1.550	5.414
	4	0.738	1.544

1 Cooperative Institute for Research in the Atmosphere (2006).
2 Mm^{-1} = inverse megameters.

Background visibility data were also collected at a nephelometer monitoring site near Boulder beginning in late January 2005. Quarterly averages of the cleanest 20th percent days were determined from daily averaged extinction measurements and from transmissometer extinction data and IMPROVE aerosol data collected at the Bridger Wilderness Area (ARS, 2006) for the 1 year period, March 1, 2005 through February 28, 2006. These data are shown in Table 4.4. These background visibility data were used in combination with modeled pollutant impacts to estimate change in visibility conditions for the Wyoming regional community locations (Boulder, Cora, and Pinedale).

Table 4.4 Boulder Background Extinction Data.

Quarter	20th Cleanest Days (Mm-1)
1	14.0
2	14.7
3	19.0
4	14.3

4.5.3 Deposition

Background total sulfur (S) and nitrogen (N) deposition data (expressed in kilograms per hectare per year [kg/ha-yr]) collected at National Acid Deposition Program (NADP) National Trends Network (NTN) and Clean Air Status and Trends Network (CASTNET) station monitoring locations near Pinedale, Wyoming, and Yellowstone National Park are provided in Table 4.5. These background S and N deposition data are added to modeled cumulative (project alternative and regional sources) deposition impacts to estimate total S and N deposition impacts.

Table 4.5 Background N and S Deposition Values (kg/ha-yr).

Site Location	Nitrogen Deposition	Sulfur Deposition	Year of Monitoring
Pinedale	1.4	0.74	2004
Yellowstone National Park	1.3	0.70	2003

4.5.4 Lake Chemistry

The most recent lake chemistry background acid neutralizing capacity (ANC) data were obtained for each sensitive lake included in the analysis. The 10th percentile lowest ANC values were calculated for each lake following procedures provided by the USDA Forest Service. These ANC values and the number of samples used in the calculation of the 10th percentile lowest ANC values are provided in Table 4.6.

Table 4.6 Background ANC Values for Acid Sensitive Lakes.[1]

Wilderness Area	Lake	Latitude (Deg-Min-Sec)	Longitude (Deg-Min-Sec)	10th Percentile Lowest ANC Value (μeq/l)[2]	Number of Samples	Monitoring Period
Bridger	Black Joe	42º44'22"	109º10'16"	67.1	67	1984-2005
Bridger	Deep	42º43'10"	109º10'15"	59.7	64	1984-2005
Bridger	Hobbs	43º02'08"	109º40'20"	69.9	71	1984-2005
Bridger	Lazy Boy	43º19'57"	109º43'47"	10.8	3	1997-2004
Bridger	Upper Frozen	42º41'13"	109º09'39"	6.0	8	1997-2005
Fitzpatrick	Ross	43º22'41"	109º39'30"	53.7	49	1988-2005
Popo Agie	Lower Saddlebag	42º37'24"	108º59'38"	55.2	48	1989-2005

1 From USFS (2006).
2 10th Percentile Lowest ANC Values reported.

4.6 IMPACT ASSESSMENT

CALPUFF modeling was performed to compute direct project impacts from direct project emissions for year 2005, direct project impacts for each of the alternatives, and for estimating cumulative impacts from potential project alternative emissions and regional sources. The alternatives, as described in Section 4.2, include Alternative A (No Action), Alternative B (Proposed Action), and Alternative C (Proposed Action mitigation to year 2005 emissions levels – Phase 1), and Alterative C (Proposed Action mitigation to year 2005 emissions levels with an additional 80 percent mitigation on drill rig emissions – Phase 2). Maximum emissions scenarios for each alternative were analyzed which included year 2007 emissions for the No Action Alternative and year 2009 emissions for the Proposed Action Alternative. An additional full-field development emissions scenario was developed for the Proposed Action assuming that PAPA field development is complete and the project is operating at maximum production (Year 2026). Regional emissions inventories of existing state-permitted RFD and RFFA sources, as described in Chapter 2.0, were modeled in combination with project alternatives to provide cumulative impact estimates for each alternative. A total of 11 modeling scenarios were evaluated in this analysis. A list of these scenarios is summarized in Table 4.7.

Table 4.7 Modeling Scenarios Analyzed for the Pinedale Anticline Project.

Modeling Scenario	Source Impacts Evaluated	Project Alternative
1	Direct Project	PAPA Year 2005 actual emissions from field activities
2	Direct Project	No Action Alternative (Alternative A) – Year 2007
3	Direct Project	Proposed Action Alternative (Alternative B) – Year 2009
4	Direct Project	Alternative C – Phase 1 (Proposed Action mitigated to 2005 levels)
5	Direct Project	Alternative C – Phase 2 (Proposed Action mitigated to 2005 levels, additional 80 % control on drill rig emissions)
6	Direct Project	Proposed Action Alternative (Alternative B) – Year 2026
7	Cumulative	No Action Alternative (Alternative A) – Year 2007 and regional sources
8	Cumulative	Proposed Action Alternative (Alternative B) – Year 2009 and regional sources
9	Cumulative	Alternative C – Phase 1 (Proposed Action mitigated to 2005 levels) and regional sources
10	Cumulative	Alternative C – Phase 2 (Proposed Action mitigated to 2005 levels, additional 80 % control on drill rig emissions) and regional sources
11	Cumulative	Proposed Action Alternative (Alternative B) – Year 2026 and regional sources

For each far-field sensitive area, CALPUFF-modeled concentration impacts were post-processed with POSTUTIL and CALPOST to derive: 1) concentrations for comparison to ambient air quality standards (WAAQS and NAAQS), PSD Class I and II increments; 2) deposition rates for comparison to sulfur (S) and nitrogen (N) deposition levels of concern and to calculate changes to ANC at sensitive lakes; and 3) light extinction changes for comparison to visibility impact thresholds. For the mid-field analyses, CALPOST concentrations were post-processed to estimate light extinction changes at regional communities for comparison to the visibility impact thresholds. For in-field locations, CALPUFF concentrations were post-processed to compute maximum concentration impacts for comparison to WAAQS and NAAQS.

An additional modeling analysis was performing using CALPUFF to test whether sources located in particular areas or zones within the PAPA may have a larger influence on impacts at the Bridger Wilderness Area. This test was performed due to the close proximity and physical alignment of the PAPA to the Bridger Wilderness Area. The results of the sensitivity modeling are provided in Appendix D.

4.6.1 Concentration

The CALPOST and POSTUTIL post-processors were used to summarize concentration impacts of NO_2, SO_2, PM_{10}, and $PM_{2.5}$ at PSD Class I and sensitive PSD Class II areas, and at in-field locations. Predicted impacts are compared to applicable ambient air quality standards and PSD Class I and Class II increments as shown in Table 4.8. All NEPA PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis, which may be completed as necessary by the WDEQ-AQD.

Table 4.8 NAAQS, WAAQS, and PSD Class I and Class II Increments for Comparison to Far-field Analysis Results (µg/m^3).

Pollutant/Averaging Time	NAAQS	WAAQS	PSD Class I Increment	PSD Class II Increment
NO_2				
Annual[1]	100	100	2.5	25
SO_2				
3-hour[2]	1,300	1,300	25	512
24-hour[2]	365	260	5	91
Annual[1]	80	60	2	20
PM_{10}				
24-hour[2]	150	150	8	30
Annual[1]	--[3]	50	4	17
$PM_{2.5}$				
24-hour[3]	35[4]	65[5]	--	--
Annual[3]	15	15	--	--

1 Annual arithmetic mean.
2 No more than one exceedance per year is allowed.
3 Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.
4 Revised NAAQS effective December 18, 2006.
5 EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

PM_{10} concentrations were computed by adding predicted CALPUFF concentrations of PM_{10} (fraction of PM greater than $PM_{2.5}$), $PM_{2.5}$, SO_4, and NO_3. $PM_{2.5}$ concentrations were calculated as the sum of modeled $PM_{2.5}$, SO_4, and NO_3 concentrations. In post-processing the PM_{10} impacts at all far-field receptor locations, project alternative traffic emissions of PM_{10} (production and construction) were not included in the total estimated impacts, only the $PM_{2.5}$ impacts were considered. This assumption was based on supporting documentation from the Western Regional Air Partnership (WRAP) analyses of mechanically generated fugitive dust emissions that suggest that particles larger than $PM_{2.5}$ tend to deposit out rapidly near the emissions source and do not transport over long distances (Countess et al., 2001). This phenomenon is not modeled adequately in CALPUFF; therefore, to avoid overestimates of PM_{10} impacts at far-field locations, these sources were not considered in the total modeled impacts. However, the total PM_{10} impacts from traffic emissions were included in all in-field concentration estimates.

Far-field Results

The maximum predicted concentrations of NO_2, SO_2, PM_{10}, and $PM_{2.5}$ at each of the analyzed PSD Class I and sensitive Class II areas, for year 2005 PAPA sources and each of the modeled direct project alternatives and cumulative source modeling scenarios, are provided in Appendix E. Predicted direct impacts are compared to applicable PSD Class I and Class II increments, and when added to representative background pollutant concentrations (see Table 4.2), the total concentration is compared to applicable NAAQS and WAAQS. Cumulative impacts from all alternatives are compared directly to applicable PSD Class I and Class II increments, and to the NAAQS and WAAQS when background pollutant concentrations are added. Tables E.1.1 through E.1.11 provide the maximum modeled NO_2 concentrations at each of the sensitive

areas. The maximum modeled SO_2 concentrations are provided in Tables E.2.1 through E.2.11, and the maximum modeled PM_{10} and $PM_{2.5}$ impacts are provided in Tables E.3.1 through E.3.11, and Tables E.4.1 through E.4.11, respectively.

As shown in these tables there were no predicted exceedances of the NAAQS, WAAQS, or the applicable PSD increments at any of the analyzed PSD Class I and sensitive PSD Class II areas resulting from year 2005 project source emissions. The modeling results also indicate that neither direct project impacts nor cumulative source impacts would exceed any ambient air quality standards (WAAQS and NAAQS) or be above PSD increment.

In-Field Results

The maximum predicted concentrations of NO_2, SO_2, PM_{10}, and $PM_{2.5}$ within and nearby the PAPA, for each of the modeled direct project and cumulative scenarios are provided in Appendix E, Tables E.5.1 through E.5.11, Tables E.6.1 through E.6.11, Tables E.7.1 through E.7.11, and Tables E.8.1 through E.8.11, for NO_2, SO_2, PM_{10}, and $PM_{2.5}$, respectively. Direct project and cumulative impacts are compared to applicable PSD increments. Predicted direct project and cumulative impacts are added to representative background pollutant concentrations and are compared to applicable NAAQS and WAAQS. As shown in these tables there were no exceedances of the NAAQS or WAAQS within and nearby the PAPA resulting from year 2005 project source emissions. In addition there would be no exceedances of the NAAQS or WAAQS within and nearby the PAPA from project alternative field-wide project sources or cumulative sources. This analysis further supports the compliance demonstrations shown in Section 3.4 for maximum near-field impacts.

Predicted impacts resulting from year 2005 emissions are above the annual NO_2 PSD Class II increment and both the 24-hour and annual PM_{10} Class II increments. Predicted direct project and cumulative impacts resulting from project alternative emissions are above the annual NO_2 PSD Class II increment under the Alternative A (No Action), Alternative B (Proposed Action) and Alternative C (Phase 1 - mitigation to 2005 emissions levels) and below the NO_2 increment for all other analyzed alternatives. Predicted direct project and cumulative impacts resulting from Alternative A (No Action) project alternative emissions are above the annual and 24-hour PM_{10} PSD Class II increments, and predicted cumulative impacts under the Alternative C (Phase 1 - mitigation to 2005 emissions levels) are above the 24-hour PM_{10} PSD Class II increment. Predicted direct project and cumulative impacts are below the applicable PM_{10} increments for all other analyzed alternatives. Modeled direct project and cumulative impacts from all analyzed alternatives are below the applicable SO_2 increments. All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD Increment Consumption Analysis.

4.6.2 Deposition

Maximum predicted S and N deposition impacts were estimated for year 2005 PAPA impacts, project alternatives, and cumulative source scenario. The POSTUTIL utility was used to estimate total S and N fluxes from CALPUFF predicted wet and dry fluxes of SO_2, SO_4, NO_x, NO_3, and HNO_3. CALPOST was then used to summarize the annual S and N deposition values from the POSTUTIL program. Predicted direct project impacts were compared to the NPS deposition analysis thresholds (DATs) for total N and S deposition in the western U.S., which are defined as 0.005 kilograms per hectare per year (kg/ha-year) for both N and S. Cumulative deposition impacts from project alternative and regional sources were compared to USDA-FS levels of concern, defined as 5 kg/ha-yr for S and 3 kg/ha-yr for N (Fox et al. 1989) below which no adverse impacts from atmospheric deposition are likely.

The maximum predicted N and S deposition impacts for each of the modeled scenarios are provided in Appendix E, Tables E.9.1 through E.9.11 (N deposition) and Tables E.10.1 through E.10.11 (S deposition). Model results for project year 2005 sources indicate N deposition impacts above the DAT at the Bridger, Fitzpatrick, Gros Ventre, Popo Agie Wilderness Areas and at Yellowstone National Park, and S deposition impacts above the DAT at the Bridger Wilderness Area. Modeling results for project sources under each alternative indicate that there would be no direct project S deposition impacts above the DAT, and that all cumulative N and S deposition impacts, including background N and S deposition values, would be well below the cumulative analysis levels of concern. Modeling results do indicate that for Alternative A (No Action) direct project N deposition impacts are above the DAT at the Bridger, Fitzpatrick, Gros Ventre, Popo Agie, Teton, and Washakie Wilderness Areas and at Grand Teton National Park and the Wind River Roadless Area. For Alternative B (Proposed Action) direct project N deposition impacts are above the DAT at the Bridger, Fitzpatrick, Gros Ventre, and Popo Agie Wilderness Areas and at Grand Teton National Park and the Wind River Roadless Area. Under Alternative C direct project N deposition impacts are above the DAT at the Bridger, Fitzpatrick, Gros Ventre, and Popo Agie Wilderness Areas and at the Wind River Roadless Area, and for Alternative C (Phase 2 - 80 percent drill rig mitigation) direct project N deposition impacts are above the DAT at the Bridger, and Popo Agie Wilderness Areas and at the Wind River Roadless Area.

4.6.3 Sensitive Lakes

The CALPUFF-predicted annual deposition fluxes of S and N at sensitive lake receptors listed in Section 4.2.3 were used to estimate the change in ANC. The change in ANC was calculated following the January 2000, USDA-FS Rocky Mountain Region's *Screening Methodology for Calculating ANC Change to High Elevation Lakes, User's Guide* (USDA Forest Service, 2000). The predicted changes in ANC are compared with the USDA Forest Service's Level of Acceptable Change (LAC) thresholds of 10% for lakes with ANC values greater than 25 microequivalents per liter (µeq/l) and 1 µeq/l for lakes with background ANC values of 25 µeq/l or less. Of the seven lakes listed in Table 4.5 and identified by the USDA-FS as acid sensitive, Upper Frozen and Lazy Boy lakes are considered extremely acid sensitive.

ANC calculations were performed for each of modeled source scenarios, with the results presented in Appendix E, Tables E.11.1 through E.11.11. The modeling results indicate that deposition impacts from year 2005 direct project sources, alternative sources, and cumulative sources would not exceed the LAC threshold for ANC at any of the sensitive lakes.

4.6.4 Visibility

The CALPUFF model-predicted concentration impacts at far-field PSD Class I and sensitive PSD Class II areas and at mid-field regional community locations were post-processed with CALPOST to estimate potential impacts to visibility (regional haze) for year 2005 PAPA source impacts and for each alternative and cumulative source scenario for comparison to visibility impact thresholds. CALPOST estimated visibility impacts from predicted concentrations of PM_{10}, $PM_{2.5}$, SO_4, and NO_3. PM_{10} emissions from project traffic emissions were not included in the total estimated impacts (see Section 4.6.1), only the impacts to visibility from $PM_{2.5}$ were considered.

At the request of the BLM, WDEQ, and USDA-FS visibility impairment calculations for the PSD Class I and sensitive PSD Class II areas were performed using three separate methods using FLAG and IMPROVE background visibility data. Two methods which follow recent CALPUFF modeling guidance for Best Available Retrofit Technology (BART) analyses developed for the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) RPO were also performed (VISTAS, 2006) for the PSD Class I and sensitive PSD Class II areas. For the mid-

field, regional community locations visibility impairment was calculated with a method that used background visibility data determined from nephelometer data measured at Boulder (Table 4.4).

The BLM visibility calculation method uses CALPOST visibility method 6 (CALPOST model switch setting “MVISBK” set to 6) for computing light extinction change in combination with FLAG background data. The WDEQ visibility calculation method uses CALPOST visibility method 6 (MVISBK=6) in combination with IMPROVE background data. The two BART screening calculation procedures use CALPOST method 6 combined with background visibility conditions as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule* (EPA, 2003b). Method 6 uses monthly averaged humidity factors, and it is not sensitive to synoptic weather events that lead to high extinction events and subsequent explanation as to why certain events should be discounted. The USFS visibility calculation method uses the FLAG background data in combination with hourly relative humidity data from the CALMET windfields (MVISBK=2).

For the FLAG method 6, estimated natural background visibility values as provided in Appendix .B of FLAG (2000), and monthly relative humidity factors as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule* (EPA 2003b) were used. FLAG method 2 uses the natural background visibility conditions and hourly relative humidity data from surface observations in the CALMET wind field data. The natural background visibility data used with the FLAG visibility analysis for each area analyzed are shown in Table 4.9. Table 4.10 provides the relative humidity factors (f[RH]) that were used for the FLAG method 6 tests.

The IMPROVE method uses the measured background conditions at the Bridger Wilderness Area, North Absaroka Wilderness Area and at the Yellowstone National Park site (see Table 4.3), and the monthly relative humidity factors as provided in EPA (2003b) (Table 4.10). Visibility data from the Bridger Wilderness Area IMPROVE site were used for the Bridger, Fitzpatrick, Gros Ventre, and Popo Agie Wilderness Areas and for the Wind River Roadless Area. Visibility data from the Yellowstone National Park IMPROVE site were used for the Teton Wilderness Area and for Grand Teton and Yellowstone National Parks. Data from the North Absaroka site were used for the North Absaroka and Washakie Wilderness Areas.

Table 4.9 FLAG Report Background Extinction Values.[1]

Site	Season	Hygroscopic (Mm^{-1})[2]	Non-hygroscopic (Mm^{-1})[2]
Bridger Wilderness Area (Will also be used for Popo Agie Wilderness Area and Wind River Roadless Area)	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Fitzpatrick Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
North Absaroka Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Teton Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Washakie Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Grand Teton National Park (will also be used for Gros Ventre Wilderness Area)	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Yellowstone National Park	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5

1 FLAG (2000).
2 Mm^{-1} = inverse megameters

Table 4.10 Monthly f(RH) Factors from Regional Haze Rule Guidance.

IMPROVE Site	Quarter	Months	f(RH) Values
Bridger Wilderness Area[1]	1	Jan, Feb, Mar	2.5, 2.3, 2.3
	2	Apr, May, Jun	2.1, 2.1, 1.8
	3	Jul, Aug, Sep	1.5, 1.5, 1.8
	4	Oct, Nov, Dec	2.0, 2.5, 2.4
Fitzpatrick Wilderness Area	1	Jan, Feb, Mar	2.5, 2.3, 2.3
	2	Apr, May, Jun	2.1, 2.1, 1.8
	3	Jul, Aug, Sep	1.5, 1.5, 1.8
	4	Oct, Nov, Dec	2.0, 2.5, 2.4
Grand Teton National Park	1	Jan, Feb, Mar	2.5, 2.3, 2.2
	2	Apr, May, Jun	2.1, 2.1, 1.9
	3	Jul, Aug, Sep	1.7, 1.6, 1.8
	4	Oct, Nov, Dec	2.1, 2.4, 2.5
North Absaroka Wilderness Area	1	Jan, Feb, Mar	2.4, 2.2, 2.2
	2	Apr, May, Jun	2.1, 2.1, 1.9
	3	Jul, Aug, Sep	1.6, 1.5, 1.8
	4	Oct, Nov, Dec	2.0, 2.3, 2.4
Teton Wilderness Area	1	Jan, Feb, Mar	2.5, 2.3, 2.2
	2	Apr, May, Jun	2.1, 2.1, 1.9
	3	Jul, Aug, Sep	1.7, 1.6, 1.8
	4	Oct, Nov, Dec	2.1, 2.4, 2.5
Waskakie Wilderness Area	1	Jan, Feb, Mar	2.4, 2.2, 2.2
	2	Apr, May, Jun	2.1, 2.1, 1.9
	3	Jul, Aug, Sep	1.6, 1.5, 1.8
	4	Oct, Nov, Dec	2.0, 2.3, 2.4
Yellowstone National Park	1	Jan, Feb, Mar	2.5, 2.3, 2.2
	2	Apr, May, Jun	2.1, 2.1, 1.9
	3	Jul, Aug, Sep	1.7, 1.6, 1.8
	4	Oct, Nov, Dec	2.1, 2.4, 2.5

[1] Also used for Gros Ventre, and Popo Agie Wilderness Areas, Wind River Roadless Area, and regional communities.

The two BART screening methods use the background visibility data provided in Appendix B of the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule.* These methods use CALPOST visibility method 6. The first test uses the "best days" background visibility condition and the second test uses the annual average background. These background data given in deciview (dv) units are shown in Table 4.11. The BART methods also utilize monthly relative humidity factors as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule* (Table 4.10).

Table 4.11 Default Natural Conditions.[1]

Site	Annual Average (dv)	Best Days (dv)
Bridger Wilderness[2]	4.52	1.96
Fitzpatrick Wilderness	4.53	1.97
North Absaroka Wilderness	4.53	1.97
Teton Wilderness	4.53	1.97
Washakie Wilderness	4.53	1.97
Grand Teton National Park	4.53	1.97
Yellowstone National Park	4.56	2.00

[1] Default natural conditions from Appendix B (EPA, 2003b).
[2] Also used for Gros Ventre and Popo Agie Wilderness Areas, and Wind River Roadless Area

For the Wyoming regional community locations (Boulder, Cora, and Pinedale) adjusted nephelometer data collected at Boulder (see Table 4.4) were used to estimate visibility impairment. This visibility test uses CALPOST method 6 with quarterly averaged background visibility data and monthly averaged relative humidity factors to estimate the change in light extinction from CALPUFF modeled impacts. Relative humidity data factors for the Bridger Wilderness Area (EPA, 2003b) were used.

Change in atmospheric light extinction relative to background conditions is used to measure regional haze. Analysis thresholds for atmospheric light extinction are set forth in FLAG (2000), with the results reported in percent change in light extinction and change in dv. The thresholds are defined as 5% and 10% of the reference background visibility or 0.5 and 1.0 dv for project sources alone and cumulative source impacts, respectively. FLAG (2000) also identifies a goal that any specific project combined with cumulative new source growth will have 0 days of visibility impairment at or above 1.0 dv in any PSD Class I area. The BLM considers a 1.0 dv change as a perceptible significance threshold; however, there are no applicable local, state, tribal, or federal regulatory visibility standards. It is the responsibility of the Federal Land Manager or Tribal government responsible for that land to determine when adverse impacts are significant or not, and these may differ from BLM levels for significant adverse impacts (e.g., the USDA-FS considers a 0.5 dv change as a threshold in order to protect visibility in sensitive areas). The BLM recognizes that other federal agencies may use alternative methods to calculate visibility impairment.

Visibility impact assessments following FLAG guidance are typically based on the maximum predicted daily (24-hour) visibility impacts on an annual basis. The maximum number of days above threshold values and the maximum predicted impacts are reported. Visibility impact assessments following EPA's regional haze rule guidance (EPA, 2005) use the annual 98th percentile maximum predicted daily values (8th highest daily value) for assessing visibility impacts.

Far-Field Results

The maximum predicted far-field visibility impacts for each of the modeled scenarios are provided in Appendix E, Tables E.12.1 through E.12.11 (FLAG Method 6 test), Tables E.13.1 through E.13.11 (IMPROVE data test), Tables E.14.1 through E.14.11 (FLAG Method 2 test), Tables E.15.1 through E.15.11 (BART Regional Haze Rule Best Days test), and Tables E.16.1 through E.16.11 (BART Regional Haze Rule Average Days test). For each PSD Class I and sensitive PSD Class II area the predicted change in dv and the estimated number of days per year that could potentially exceed 0.5 and 1.0 dv thresholds are provided. For the FLAG and IMPROVE visibility tests the maximum visibility impact and the maximum number of days per year that could potentially exceed the 0.5 and 1.0 dv thresholds are reported. For the two BART visibility tests, the impacts reported are the 98th percentile values. The maximum predicted change in dv represents the 8th highest value in any of the modeling years, and the number of days per year reported that could potentially exceed the 0.5 and 1.0 dv thresholds exclude 7 events, i.e., these values represent the additional number of days above the 8th highest values that are above the thresholds.. The largest number of days of visibility impairment from both direct project sources and from cumulative sources were predicted to occur at Bridger Wilderness Area, under the Proposed Action Alternative (Alternative B).

Mid-Field Results

The maximum predicted mid-field visibility impacts for each of the modeled scenarios are provided in Appendix E, Tables E.17.1 through F.17.11. The maximum predicted visibility impacts (change in dv) at regional communities and the estimated number of days per year that could potentially exceed the 1.0 dv threshold are provided for each community location. The highest frequency of predicted visibility impacts from direct project and cumulative sources occurred at Boulder under the Proposed Action Alternative (Alternative B) where there were 138 days per year (direct project) and 153 days per year (cumulative) predicted to be above the 1.0 dv threshold (Table E.17.3).

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Appendix A

Air Quality Impact Analysis Protocol

Air Quality Impact Analysis Protocol

Draft Supplemental
Pinedale Anticline Oil and Gas Exploration and Development
Environmental Impact Statement

Bureau of Land Management
Wyoming State Office
Cheyenne, Wyoming

Pinedale Field Office
Pinedale, Wyoming

In Cooperation with

State of Wyoming
Sublette County

August 2006

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List of Acronyms and Abbreviations

ANC	Acid neutralizing capacity
Anschutz	Anschutz Pinedale Corporation
APD	Application for Permit to Drill
AQD	Air Quality Division
AQRV	Air Quality Related Value
AR	Atlantic Rim
ASU	Anschutz, Shell and Ultra
BACT	Best Available Control Technology
BLM	Bureau of Land Management
CASTNET	Clean Air Status and Trends Network
C.F.R.	Code of Federal Regulations
CDPHE/APCD	Colorado Department of Public Health and Environment/Air Pollution Control Division
CO	Carbon monoxide
COGCC	Colorado Oil and Gas Conservation Commission
DEM	Digital Elevation Model
dv	Deciview
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FLM	Federal Land Managers
GRI	Gas Research Institute
HAP	Hazardous air pollutant
HNO_3	Nitric acid
Hp	Horsepower
IDEQ	Idaho Division of Environment Quality
IDLH	Immediately Dangerous to Life or Health
IMPROVE	Interagency Modeling of Protected Visual Environment
IOGCC	Idaho Oil and Gas Conservation Commission
IWAQM	Interagency Workgroup on Air Quality Modeling
JIDP	Jonah Infill Drilling Project
kg/ha/yr	Kilograms per hectare per year
km	Kilometer
LAC	Level of Acceptable Change
LOP	Life of Project
LULC	Land Use Land Cover
m	Meter
MEI	Maximally Exposed Individual
MLE	Most Likely Exposure
Mm^{-1}	Inverse Megameters
N	Nitrogen

NAAQS	National Ambient Air Quality Standards
NADP	National Acid Deposition Program
NCDC	National Climate Data Center
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NO_2	Nitrogen dioxide
NO_3	Nitrate
NO_x	Oxides of nitrogen
NPS	National Park Service
NSR	New Source Review
NTN	National Trends Network
NWS	National Weather Service
O_3	Ozone
Operators	Shell Exploration & Production Company, Ultra Resources, Inc., Questar Exploration & Production Company, Anschutz Pinedale Corporation and other others
PAPA	Pinedale Anticline Project Area
PFO	Pinedale Field Office
PM_{10}	Particulate matter less than or equal to 10 microns in size
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in size
ppb	Parts per billion
Project	Pinedale Anticline Project
Protocol	Air Quality Impact Assessment Protocol
PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance/Quality Control
QGM	Questar Gas Management
Questar	Questar Exploration & Production Company
REL	Reference exposure level
RfC	Reference Concentrations for Chronic Inhalation
RFD	Reasonably foreseeable development
RFFA	Reasonably foreseeable future actions
RMP	Resource Management Plan
ROD	Record of Decision
RPO	Regional Planning Office
S	Sulfur
SEIS	Supplemental Environmental Impact Statement
Shell	Shell Exploration & Production Company
SO_2	Sulfur dioxide
SO_4	Sulfate
tpy	Tons per year
TRC	TRC Environmental Corporation
UDEQ-AQD	Utah Department of Environmental Quality-Air Quality Division
UDNR-DOGM	Utah Department of Natural Resources-Division of Oil, Gas, and Mining

Ultra	Ultra Resources, Inc.
URF	Unit risk factor
USFS	United States Forest Service
USGS	United States Geological Survey
VOC	Volatile organic compound
WAAQS	Wyoming Ambient Air Quality Standards
WAQSR	Wyoming Air Quality Standards and Regulations
WDEQ	Wyoming Department of Environmental Quality
WOGCC	Wyoming Oil and Gas Conservation Commission
WRAP	Western Regional Air Partnership
µeq/l	Microequivalents per liter
$\mu g/m^3$	Micrograms per cubic meter

1.0 INTRODUCTION

This Air Quality Impact Assessment Protocol (Protocol) identifies the methodologies for quantifying potential air quality impacts from the continued developed in the Pinedale Anticline Project Area (PAPA), herein referred to as the Project. These methodologies are being provided prior to study initiation to ensure that the approach, input data, and computation methods are acceptable to the Bureau of Land Management (BLM) and other air quality stakeholders, and that all air quality stakeholders have the opportunity to review the Protocol and provide input before the study is initiated. The location of the Project in west-central Wyoming requires the examination of Project and cumulative source impacts within the study area shown on Map 1.1 from emission sources in Wyoming, northwestern Colorado, northeastern Utah, and southeastern Idaho.

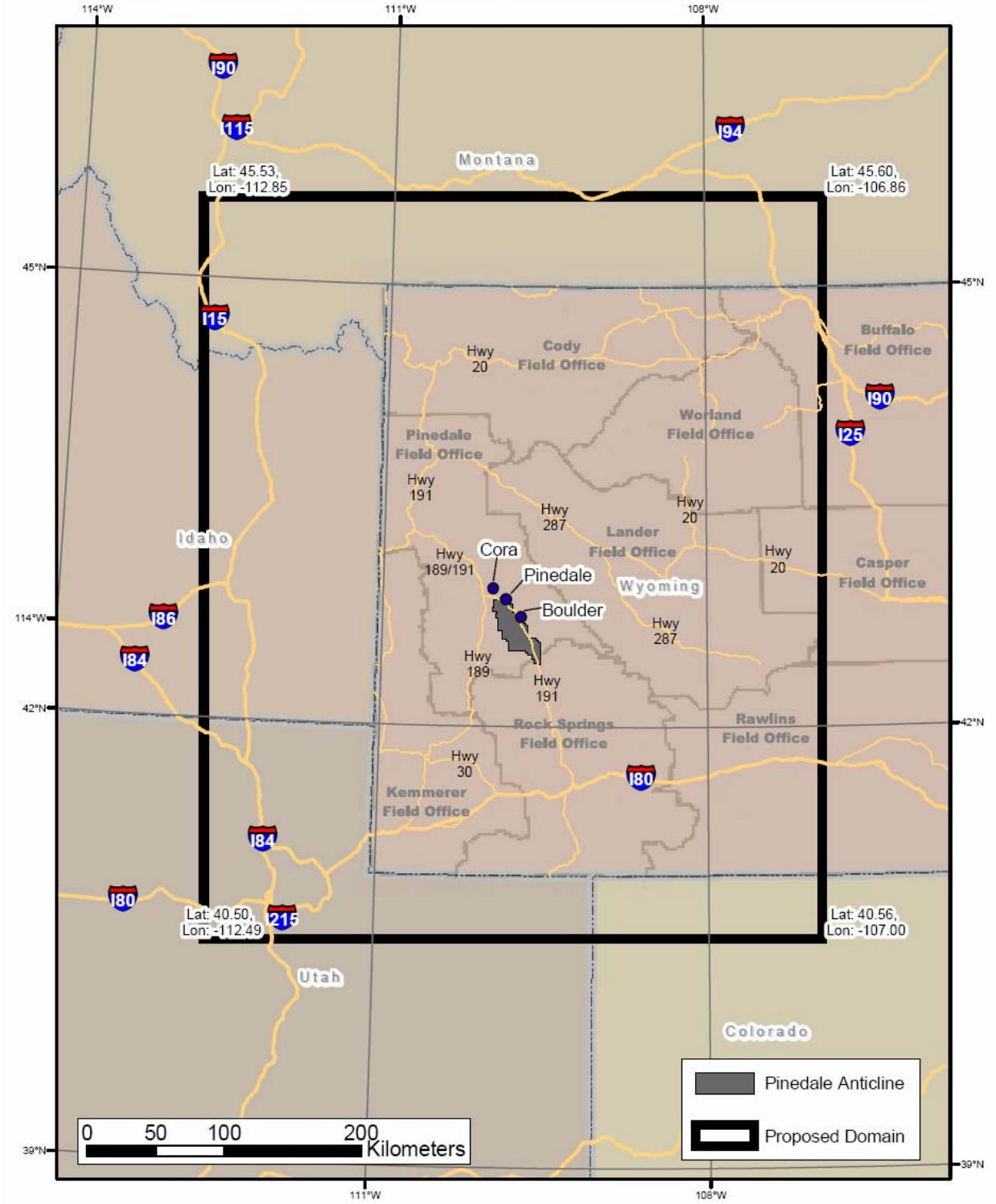
The analysis described in this Protocol differs significantly from previous natural gas development air quality analyses performed in western Wyoming. The study area has been enlarged to the north to include all of Yellowstone National Park and dimensioned in accordance with Interagency Workgroup on Air Quality Modeling (IWAQM) guidance (IWAQM, 1998) to ensure adequate wind flow characterization around each analyzed sensitive area. The analysis will utilize ambient air background data collected in Sublette County since early 2005, and the regional emissions inventory start-date is updated to reflect the use of this recent and representative data. Finally, the far-field modeling analysis utilizes the CALMET/CALPUFF modeling system with 3 years of mesoscale model (MM5 model) meteorological data in accordance with 40 CFR 51 Appendix W, Guideline on Air Quality Models (EPA, 2005a), supplemented with regional NWS meteorological data. The MM5 data are national data sets for years 2001-2003, and are the most current consecutive 3 years that are readily available for CALMET model simulations. These differences from previous analyses will result in an updated analysis that reflects current science and analysis methodologies.

1.1 PROJECT DESCRIPTION

Jointly referred to as the Operators, Ultra Resources, Inc. (Ultra), Shell Exploration & Production Company (Shell), Questar Market Resources including Wexpro Company (Questar), BP America Production Company, Stone Energy Corporation, Yates Petroleum Corporation, and others who agree to participate, have notified the BLM Pinedale Field Office (PFO) that they propose a new long-term development plan that includes limited year-round drilling and completions of natural gas wells within their leaseholdings in the PAPA.

As of December 31, 2005, there were approximately 322 producing well pads and 457 producing wells in the PAPA. An additional 26 pads and 205 producing wells are proposed by the Operators in 2006. The Proposed Action consists of drilling approximately 4,400 new wells (in addition to the 662 wells drilled through 2006) within the PAPA, beginning in 2007. As part of the Proposed Action, there would be up to 48 drilling rigs operating in the PAPA after 2007. The Operators propose to install emissions controls to achieve Tier 2 equivalent emissions on approximately 60 percent of the drilling rig engines by 2009. Questar has previously committed (BLM, 2005a) to install Tier 2 equivalent emission controls on all year-round drilling rigs by 2008. In 2005, a liquids (condensate and produced water) gathering system was installed in the northern leaseholds in the PAPA, reducing overall emissions through reduction in truck traffic.

Map 1.1 Project Location and Study Area.



As part of the Proposed Action, the Operators propose to install a liquids gathering system in the central and southern portions of the PAPA. Operation of the liquids gathering system would require installation of central gathering facilities within the PAPA which would have associated emissions. Condensate would be gathered within the PAPA and the crude petroleum would be transported via pipeline to processing facilities in southwest Wyoming. Produced water would be gathered and trucked from a central location within the PAPA. Operators are currently investigating options for produced water disposal both within and outside of the PAPA. Questar Gas Management (QGM) is proposing to install an additional 7,440 horsepower (hp) of compression at the Pinedale/Gobblers Knob Compressor Station within the PAPA in 2006. QGM also intends to install an additional 31,000 hp in 2009 and 15,500 hp in 2015 at the Pinedale/Gobblers Knob Compressor Station. Jonah Gas Gathering Company (JGGC) is proposing to install an additional 184,000 hp of compression at the Paradise Compressor Station, an additional 37,366 hp at the Falcon Compressor Station and 14,672 hp at the Bird Canyon Compressor Station (outside of the PAPA) all in 2011 as part of the Proposed Action. One 30-inch gas sales pipeline (the Rendezvous Phase 6 – R6) is proposed by Rendezvous Gas Services (RGS) to transport natural gas from the PAPA to the Granger and Blacks Fork processing plants in southwest Wyoming. JGGC is proposing the 36-inch (Paradise to Bird Canyon or PBC Pipeline) and a connecting 45.5-mile long, 30-inch pipeline (Opal Loop III Pipeline) which would transport gas from the PAPA to the Opal and Pioneer gas processing plants. In conjunction with the proposed R6 Pipeline Project, RGS proposes to expand the existing 33.6-acre Granger Gas Processing Plant by 86.4 acres, for a total of 120 acres on BLM-administered federal lands in Section 16, T. 18 N., R. 111 W. The purpose of the proposed expansion is to construct and operate additional natural gas processing facilities to sufficiently increase processing capacity for an anticipated increased input of 600 million standard cubic feet per day (MMSCF/D) of natural gas and crude petroleum. The current Granger Gas Processing Plant capacity is 600 MMSCF/D. The expansion would represent a 100 percent increase in treatment capacity.

BLM will be analyzing the No Action Alternative (Alternative A) in addition to the Proposed Action Alternative (Alternative B) and a third alternative (Alternative C). The No Action Alternative is defined as continued development of the PAPA under current BLM management practices. The Operators have provided estimates of new pads, expansion pads and proposed number of wells that would be drilled under the No Action Alternative with continued management practices under the PAPA ROD. However, at some point, the limits of the PAPA Record of Decision (BLM, 2000b) would be reached for maximum allowed well pads within specific Management Areas and further NEPA (National Environmental Policy Act) analysis will be required for continued development. The liquids gathering systems in the southern and central portions of the PAPA would not be installed under the No Action Alternative. The R6, PBC, and Opal Loop III pipelines would be constructed under the No Action Alternative.

A third alternative will be analyzed (for all resources), as determined by BLM, and would include provisions for concentrating development activities to allow for maintenance of wildlife habitat, seasonal wildlife stipulations, and other environmental impacts. All components included in the Proposed Action Alternative are also a part of Alternative C, and therefore, emissions and associated impacts for the two alternatives would be similar.

1.2 RELATIONSHIP TO EXISTING PLANS AND DOCUMENTS

Potential impacts to air quality resulting from exploration and development of natural gas within the PAPA was previously analyzed in the Pinedale Anticline Oil and Gas Exploration and Development Environmental Impact Statement (PAPA EIS) (BLM, 2000a).

In 2004, Questar submitted a proposal to BLM for limited year-round drilling within their lease holdings in the PAPA. As part of their proposal for mitigation, Questar would install a gathering system to remove condensate and water from the PAPA (reducing truck traffic) and utilize Tier 2 compliant engines or alternate fuels on all drilling rig engines by 2007. In November 2004, BLM issued a Decision Record (BLM, 2004) approving Questar's limited year-round drilling proposal. Although potential emissions from the proposal were disclosed, a complete air quality impact analysis was not conducted because the operator-committed mitigation would cause the impacts to be reduced. In 2005, BLM issued a Decision Record (BLM, 2005a) which allowed for modification of the proposed condensate pipeline route and extended the requirement for the drilling rig engines to become Tier 2 compliant to 2008. Again, potential emissions were disclosed but a complete air quality impact analysis was not conducted.

Also in 2005, Anschutz, Shell and Ultra (ASU) submitted a proposal to BLM for a year-round demonstration project within the PAPA. In September, 2005, BLM issued a Decision Record (BLM, 2005b) that allowed each operator to have two drill rigs on one pad each within crucial winter range during the winter of 2005-2006. For mitigation of the air quality impacts, the operators committed to reduce emissions by testing selective catalytic reduction on two of the drill rigs and testing bi-fuel technology on the other four drilling rigs. Because the proposal represented an overall reduction in emissions (the rigs would have operated in the PAPA outside of crucial winter range if the proposal were not approved), potential emissions were disclosed but a complete air quality impact analysis was not conducted.

In November of 2005, BLM issued a Decision Record (BLM, 2005c) that allowed Questar to have one additional winter drill rig. Four winter completions and one drill rig move were also approved.

Since the PAPA ROD (BLM, 2000b) was issued in July 2000, natural gas development within the PAPA has occurred at a pace greater than was analyzed in the PAPA DEIS as disclosed in the subsequent NEPA documents. The PAPA ROD authorized the development of 700 producing wells and/or well pads, however, the ROD was ambiguous at to whether the limit was wells or well pads. The air quality impact analysis for the PAPA DEIS assumed 700 producing wells and up to eight drilling rigs operating in the PAPA at any one time. As of December 2005, there were approximately 457 producing wells in the PAPA with an additional 205 wells projected for 2006. Twenty-nine of the existing wells were drilled prior to the PAPA ROD, therefore, there would be potentially 633 producing wells by the end of 2006. The PAPA ROD also set an analysis threshold of 376.59 tpy NO_x emissions from compression and 693.5 tpy of NO_x emissions from all sources in the field. The PAPA ROD stated that additional environmental analysis would be conducted if the analysis threshold were exceeded. Even though the limit of 700 producing wells and/or well pads has not been exceeded, the NO_x emissions from all sources in the PAPA currently exceeds the 693.5 tpy analysis limit specified in the PAPA ROD. For this reason, and to analyze the current proposal, BLM has determined that it is necessary to prepare a Supplemental Environmental Impact Statement (SEIS) which includes a complete and accurate air quality impact analysis.

The BLM Pinedale Resource Management Plan (RMP) (BLM, 1988) issued in 1988, amended in 2000, and currently under revision, directs the management of BLM administered lands within the PAPA. Management of oil and gas resources, as stated in the RMP, provides for leasing, exploration, and development of oil and gas while protecting other resource values. According to the RMP, all public lands in the PAPA are suitable for oil and gas leasing and development, subject to certain stipulations.

The most recent EIS completed in Sublette County is the Final EIS, Jonah Infill Drilling Project (JIDP), Sublette County, Wyoming (BLM, 2006). This Protocol represents a new and separate analyses from that performed for the JIDP EIS. With the exception of shared methodologies common to many regional modeling analyses, no portions of the JIDP air quality analysis were utilized in this study.

The BLM is currently developing a state-wide cumulative air quality analysis deemed the BLM State of the Atmosphere air quality analysis. That study is in the early development stages, and will utilize a 1-year 2002 Western Regional Air Partnership (WRAP) meteorological dataset and a separate inventory that is not yet available. No portions of the BLM State of the Atmosphere air quality analysis will be utilized in this analysis.

1.3 PROPOSED WORK TASKS

The air quality analysis will address the impacts on ambient air quality and Air Quality Related Values (AQRVs) from: 1) air emissions that have resulted from development and production activities within the PAPA during 2005; 2) potential air emissions from development and production with the PAPA after 2005 that could occur under the Proposed Action and Alternative C; 3) potential air emissions after 2005 resulting from continued development and production activities under the No Action Alternative; and 4) air emissions from other documented regional emissions sources within the study area. Ambient air quality impacts will be quantified and compared to applicable state and federal standards, and AQRV impacts (impacts on visibility [regional haze], acid deposition, and potential increases in acidification to acid sensitive lakes) will be quantified and compared to applicable thresholds as defined in the Federal Land Managers' (FLMs') Air Quality Related Values Workgroup (FLAG), IWAQM guidance documents (FLAG, 2000 and IWAQM, 1998), and other state and federal agency guidance. Impact assessment criteria are discussed in further detail in Section 5.0 of this Protocol.

The assessment of impacts will include the completion of the following tasks:

- Generate Project development and production emissions inventories (see Section 2.1).
- Compile a regional emissions inventory including specified permitted sources, reasonably foreseeable development (RFD), and reasonably foreseeable future actions (RFFA) (see Section 2.2).
- Assess near-field ambient impacts from Project emissions sources (see Sections 3.0 and 5.1).
- Assess far-field ambient direct project (Project emissions sources) and cumulative impacts (Project plus regional emissions sources), including pollutant concentration, visibility and acid deposition impacts, and potential increases in acidification to acid sensitive lakes, within the modeling domain and at PSD Class I and other sensitive areas (see Sections 4.0 and 5.2).

2.0 EMISSIONS INVENTORY

The Proposed Action for the project includes the development of approximately 4,400 additional natural gas wells within the PAPA beginning in 2007. The No Action Alternative includes continued development under current BLM field authorizations. Under the Proposed Action, drilling would continue for approximately 17 years, with an approximate 60-year life of project (LOP). Production facilities at each well/pad site would include dehydration units, separators, gathering pipelines, and blowdown tanks, with centralized condensate collection facilities (central gathering facilities) at several locations within the PAPA. Ancillary facilities would include new compressor engines at existing compressor stations inside and outside the PAPA.

An emission inventory of oxides of nitrogen (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter less than or equal to 10 microns in size (PM_{10}), particulate matter less than or equal to 2.5 microns in size ($PM_{2.5}$), volatile organic compounds (VOC), and hazardous air pollutants (HAPs) (benzene, toluene, ethyl benzene, xylene, n-hexane, and formaldehyde) will be developed for well development activities, production activities, and ancillary facilities planned as part of the Project. Lead emissions will be considered negligible and not calculated in the inventory. The emissions inventory will be developed based on the Proposed Action and field operations data provided by the Operators. The inventory will be developed using field-specific emission test results, manufacturer's emissions data, AP-42 (EPA, 1995), Gas Research Institute (GRI) emission factors, and other accepted engineering methods as described in this section.

2.1 PROJECT EMISSIONS

2.1.1 Field Development Emissions

Emissions-generating activities during field development include: well pad and access road construction; drilling; frac/completion; vehicle travel during the drilling and completion phase; and construction and vehicle travel during installation of the condensate and water gathering system and natural gas pipeline installation. Emission calculations for these and other potential emissions-generating activities will utilize 2005 annual operator emissions reports submitted to the Wyoming Department of Environmental Quality, Air Quality Division (WDEQ-AQD) whenever possible, depending upon availability and applicability by individual emissions source. Drilling engine emissions will be calculated using the following methods, presented in order of preference: field-specific stack test results, EPA Tier emission factors (EPA 2006), or AP-42 emission factors (EPA 1995). AP-42 emission factors will utilize AP-42 Table 3.3-1 for engines less than 600 hp in size and Table 3.4-1 for engines greater than 600 hp in size. Emissions estimates will consider operator-committed emission control devices. An engine usage and operating load factor of 0.42, as used in previous EIS analyses, will be applied for drilling engines. Fugitive particulate emissions from vehicle travel and construction activities and wind erosion emissions from areas disturbed during construction will be calculated using AP-42 emission factors. HAP emissions from combustion sources will be calculated using GRI-HAPCalc® (GRI, 1999) if no manufacturer’s or testing data is available. Fugitive dust control efficiencies will be utilized for any watering or dust suppressants applied.

2.1.2 Production Emissions

Sources of pollutant emissions during field production include combustion emissions from wells and compressor engines, and VOC and HAP emissions from gas transmission operations. Fugitive particulate emissions from unpaved road travel and from wind erosion on disturbed areas (such as well pads) will also occur. Emission rates will be developed in accordance with WDEQ-AQD oil and gas permitting guidance (WDEQ, 2001, WDEQ, 2004) where applicable guidance exists.

Combustion equipment emissions will be calculated using EPA Tier emission factors, Best Available Control Technology (BACT) emission rates, manufacturer emission factors, and/or GRI emission factors. Fugitive dust from unpaved roads and wind erosion emissions from disturbed areas will be calculated using AP-42 emission factors. VOC and HAP emissions from production (aside from those arising from combustion sources) will be generated by well-site dehydrators, fugitive leaks, and flashing emissions from liquids stored at Centralized Gathering Facilities. Both fugitive and flashing emissions will be calculated using representative constituent analyses of natural gas and stored liquids. A discussion of BACT applicability and requirements will be included for emissions sources as appropriate, in accordance with WDEQ-AQD oil and gas permitting guidance (WDEQ, 2001 and WDEQ, 2004).

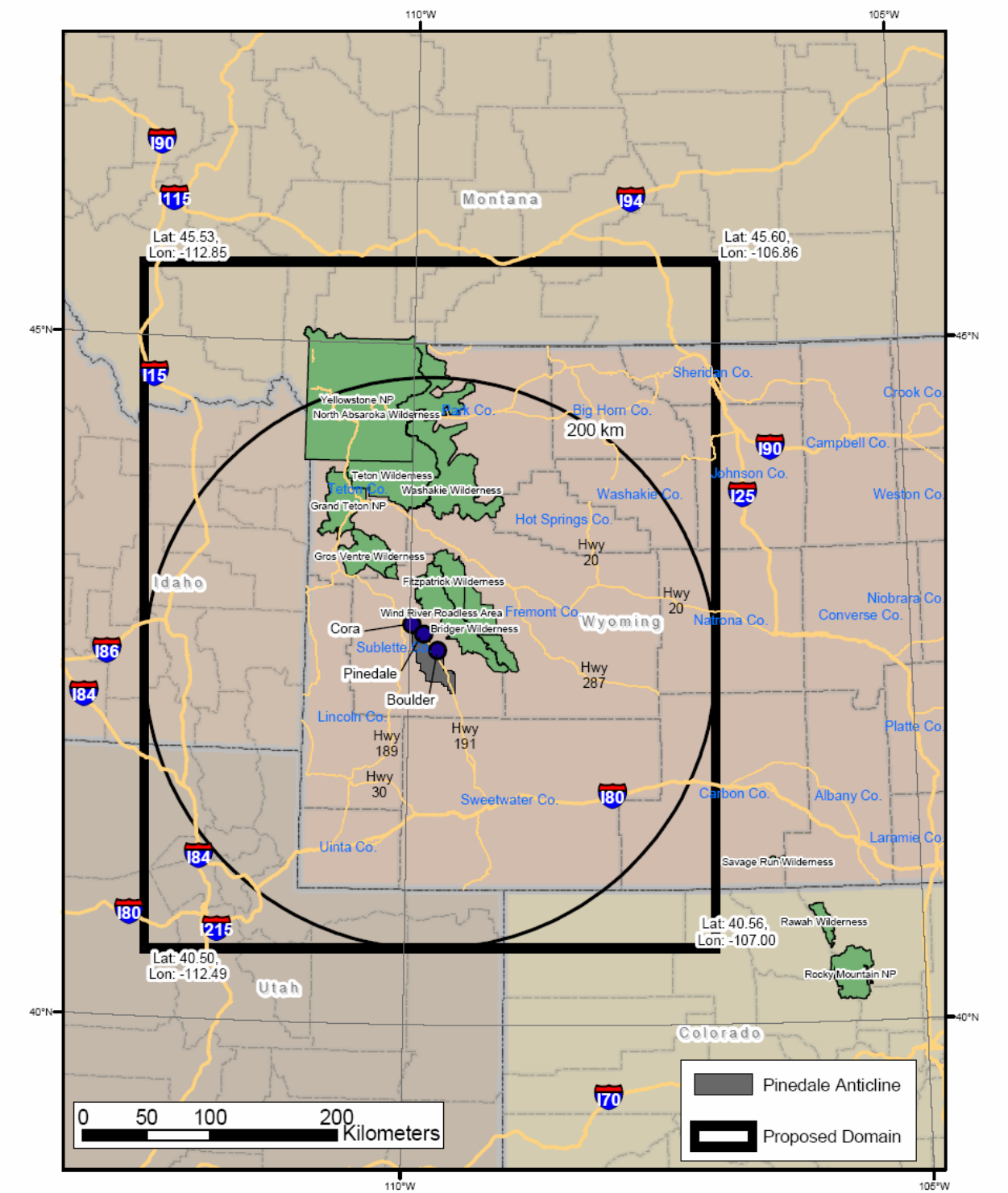
2.2 REGIONAL EMISSIONS INVENTORY

An inventory of existing and proposed emissions sources within a defined area and meeting defined criteria will be conducted and will include the identification of permitted sources, permitted oil and gas wells, RFD, and RFFA. The inventory will be developed using data obtained from WDEQ-AQD, Wyoming Oil and Gas Conservation Commission (WOGCC), Colorado Department of Public Health and Environment/Air Pollution Control Division (CDPHE/APCD), Colorado Oil and Gas Conservation Commission (COGCC), Utah Department of Environmental Quality-Air Quality Division (UDEQ-AQD), Utah Department of Natural Resources-Division of Oil, Gas, and Mining (UDNR-DOGM), Idaho Division of Environmental Quality (IDEQ), Idaho Oil and Gas Conservation Commission (IOGCC), BLM, and other agencies as required.

The inventory period proposed in this Protocol has been selected to be consistent with the availability of recent (2005/2006) ambient background data collected in Sublette County, Wyoming. The inventory is proposed to begin on January 1, 2005 and end on February 1, 2006 - 13 months. Due to a typical 30-day lag in availability of permitted source data at state agencies, this end-date will ensure that the data collection can be completed by February 28 to allow timely progression of the dispersion modeling analysis. Some overlap between emission sources which began operating in 2005 and background data monitored during 2005 will exist.

Sources of PM_{10}, $PM_{2.5}$, NO_X, and SO_2 emissions within the study area (the CALPUFF/CALMET modeling domain), will be inventoried. The study area is shown in Map 2.1.

Map 2.1 CALPUFF/CALMET Modeling Domain and Major/Minor Source Inventory Area.



2.2.1 Existing Inventories

No overlap exists between the inventory timeframe for this Project and the emissions inventories performed for either the JIDP EIS or the Atlantic Rim Natural Gas Development Project EIS (AR EIS), the most recent regional emissions inventories developed in southwest Wyoming. As a result, no portions of the inventories developed for the JIDP EIS or the AR EIS are proposed to be utilized.

A Prevention of Significant Deterioration (PSD) Increment Analysis for NO_2 has been completed by WDEQ-AQD for Sublette County and is currently being performed by WDEQ-AQD for a 300 kilometer radius of the Bridger and Fitzpatrick Wilderness Area. The emissions inventory data compiled by WDEQ-AQD as part of this analysis will not be of use in this inventory effort due to differences in increment inventory requirements and the methodologies set forth in the Protocol.

2.2.2 State Agency Permitted Sources

The regional emissions inventory for the Project will include:

- Major sources located within the inventory area;
- Minor sources located within the inventory area;
- Sources that emit NO_x, SO_2, or PM_{10}/$PM_{2.5}$;
- Sources that began operation on or after January 1, 2005;
- Sources that began operation or were permitted before February 1, 2006; and
- Sources that were permitted within 18 months of January 1, 2005, but are not yet operating (will be inventoried and included as RFFA [see Section 2.2.4]).

The major source inventory area is proposed to be comprised of a 200 kilometer (km) radius from the Project Area, as shown in Map 2.1. The 200 km radius proposed reflects current FLM New Source Review (NSR) regional analysis guidance which requests PSD Class I AQRV analysis for major sources within 200 km of a PSD Class I area. Major sources are defined as those considered major under PSD regulations; i.e., emissions of any one pollutant greater than 250 tpy, or emissions of any pollutant greater than 100 tpy if the source meets certain criteria as outlined in 40 CFR 52.21 or Wyoming Air Quality Standards and Regulations (WAQSR) Chapter 6, Section 4. All increases or decreases in NO_x, SO_2, or PM_{10}/$PM_{2.5}$ at the major sources within this area would be inventoried. In addition, a request would be made to state agencies to indicate any additional major sources outside of the inventory area that may have had large changes in permitted emissions during the inventory period, and these changes would be researched and included in the regional inventory.

The minor source inventory area is proposed to encompass a 200 km radius from the Project Area, as shown in Map 2.1. Minor sources are defined as those sources considered minor under NSR regulations outlined in 40 CFR 52.21. Therefore, the analysis proposed further ensures that regional non-background emissions will be analyzed.

Potential-to-emit (maximum permitted) emission rates will be inventoried. Actual emissions will not be inventoried because work on the regional emissions inventory has indicated that actual emissions are not readily available for most state-permitted sources. In addition, for those sources required to submit them to the permitting agency, actual emissions would not be available immediately following close of the calendar year. Permitted emissions decreases will be included only if the decrease occurs at a PSD major source and if the decrease is verifiable by appropriate state air regulatory authority (WDEQ-AQD, IDEQ, UDEQ-AQD, or CDPHE-

APCD). Sources operating under permit waivers not related to oil and gas production will not be inventoried due to their insignificant nature, and a qualitative discussion of waivers will be presented in the Technical Support Document. Waivers issued to oil and gas wells or production sites will be examined based on emission threshold criteria and will either be included as a production site (>3 tpy total emissions) or assumed to be included in permitted well totals obtained from the oil and gas permitting authority. Mobile source emissions not directly resulting from the Proposed Action, biogenic sources, urban sources, and other non-industrial emission sources are assumed to be included in monitored background concentrations and are not specifically included in this inventory.

A list of well drilling permits issued between January 1, 2005, and February 1, 2006, will be compiled using permit data obtained from the appropriate oil and gas permitting authority (WOGCC, COGCC, UDNR-DOGM, or IOGCC). Information regarding well type and equipment, and historic and current field production will be used to create a representative emission factor in pounds per well for all emitted pollutants. This average emission factor will be multiplied by the number of wells installed during the study period in each county within the study area to calculate total well emissions by county.

2.2.3 RFD

An inventory of RFD sources will be performed for inclusion in the cumulative dispersion modeling. RFD is defined as 1) air emissions from the undeveloped portions of authorized NEPA projects, and 2) air emissions from not-yet-authorized NEPA projects (if emissions are quantified when modeling commences). RFD information from not-yet-authorized projects will be obtained from contractors working on ongoing air quality analyses for NEPA projects. RFD information for authorized development will be obtained from final NEPA documents that have been submitted to BLM for planned project development, specifically, from the air quality analyses performed for these projects. Undeveloped portions of projects within the PFO will be obtained from BLM PFO project development tracking. For other field offices, total wells or other equipment yet undeveloped will be determined based on plotting state-agency permitted sources spatially and subtracting from authorized totals the number of developed wells and/or total horsepower or emissions from permitted compression that are plotted within each project area. These calculated values will be submitted to BLM for a review of reasonableness prior to use in the modeling analysis.

As an example how RFD would be determined, in an authorized gas field development area for which 2,000 wells were projected and analyzed but only 250 wells have been developed as of the inventory end-date of this study, the 250 developed wells would be included under the permitted source inventory and the remaining 1,750 would be considered RFD. No authorized development would be excluded unless it was permitted and operating outside of the inventory dates outlined in Section 2.1.

Full development of proposed projects inventoried as RFD may or may not coincide with full development of the Project. As a result, the assumption that all RFD are fully developed during the maximum year of Project development may result in some conservatism in the cumulative impact analysis. A preliminary listing of RFD projects which may be examined in this study, as defined in the paragraph above, is presented in Table 2.1. All development areas will be reviewed for inclusion, and those projects generating pollutant emissions during production activities will be included as RFD. The BLM will be consulted to determine the existence of additional NEPA-authorized projects.

More detailed development and operations data will be compiled for all RFD and presented in the Technical Support Document. To ensure a timely, complete modeling analysis, only development authorized through the inventory end-date of February 1, 2006, or for which emissions have been quantified as of the beginning of the modeling analysis, will be included in this analysis. RFD quantified after the inventory end-date will be acknowledged with a qualitative discussion describing the proposed development(s). Similarly, a qualitative discussion and link to the appropriate BLM website will be presented for development currently proposed in the Powder River Basin Coalbed Methane Development Project, located outside of the study domain in northeast Wyoming's Powder River Basin.

2.2.4 RFFA

An inventory of RFFA sources will be performed for inclusion in the cumulative dispersion modeling. For the purposes of this project, RFFA is defined as a source which possesses an unexpired air permit issued on or after July 1, 2003 (18 months prior to January 1, 2005), but the source is not yet operating. The primary source of RFFA information will be state permit records obtained through a file data search.

Table 2.1 Potential RFD in the Study Area.

Atlantic Rim	Jonah II
Big Piney-LaBarge	Jonah Infill
Bird Canyon	Kennedy Oil Pilot
Bird-Opal Loop Pipeline	Merna Pipeline
Black Butte Mine Pit 14	Monnell Oil Recovery
BTA Bravo	Moxa Arch
Burley	Moxa Arch Infill
Castle Creek	Mulligan Draw
Continental Divide/Wamsutter II	Opal Loop Pipeline
Continental Divide/Creston	Pappy Draw
Copper Ridge	Piceance Basin
Creston-Blue Gap	Pinedale Anticline
Desolation Flats	Pioneer Gas Plant
Dripping Rock/Cedar Breaks	Riley Ridge
East LaBarge	Riverton Dome
Essex Mountain	Road Hollow
Fontenelle II	Seminoe Road
Hanna Draw	Sierra Madre
Hanna Draw Pilot	Soda Unit
Hay Reservoir	South Baggs
Hay Reservoir Pilot	South Piney
Hickey-Table Mountain	Stagecoach
Horse Trap	Vermillion Basin
Jack Morrow Hills	Wind River

3.0 NEAR-FIELD ANALYSIS

3.1 MODELING METHODOLOGY

The near-field ambient air quality impact assessment will be performed to quantify maximum pollutant impacts in the vicinity of the Project resulting from development and production emissions. EPA's guideline model, AERMOD (version 04300), will be used to assess these near-field impacts. Regulatory model settings will be utilized with the exception of the non-regulatory setting MSGPRO, which is necessary to handle missing data in the meteorological dataset. Flat terrain will be utilized in the near-field analysis.

One year of meteorological data will be used that includes hourly surface meteorology data (wind speed, wind direction, standard deviation of wind direction [sigma theta], and temperature) collected in the Jonah Field from January 1999 through January 2000, consistent with current WDEQ-AQD permit modeling analysis guidance. A wind rose for these data is presented in Figure 3.1.

The AERMOD preprocessor AERMET will be used to process the Jonah Field meteorological data into a dataset compatible with the AERMOD dispersion model. AERMET will be used to combine the Jonah Field surface measurements with twice daily sounding data from the Riverton, Wyoming NWS site, cloud cover data collected at the Big Piney, Wyoming NWS ASOS site, and solar radiation measurements collected at the Pinedale, Wyoming CASTNET site. Seasonal values for albedo, Bowen ratio and surface roughness length, for land use type “desert shrubland”, selected from tables in the AERMET user’s guide, will be used in processing the meteorological data.

3.2 BACKGROUND DATA

Background pollutant concentrations are used as an indicator of existing conditions in the region, and are assumed to include emissions from industrial emission sources in operation and from mobile, urban, biogenic, and other non-industrial emission sources. These background concentrations are added to modeled near-field Project impacts to calculate total ambient air quality impacts.

Ambient air monitoring is currently being conducted at several locations in Sublette County. Monitoring sites in the Jonah Field and near Boulder and Daniel collect varying ambient concentration, visibility, and meteorological data parameters. Data from one or more of these sites are proposed to replace data collected at the Green River Basin Visibility Study site through 2001 because the Sublette County data are not only more current, but are more representative of conditions in and near the Pinedale Anticline field.

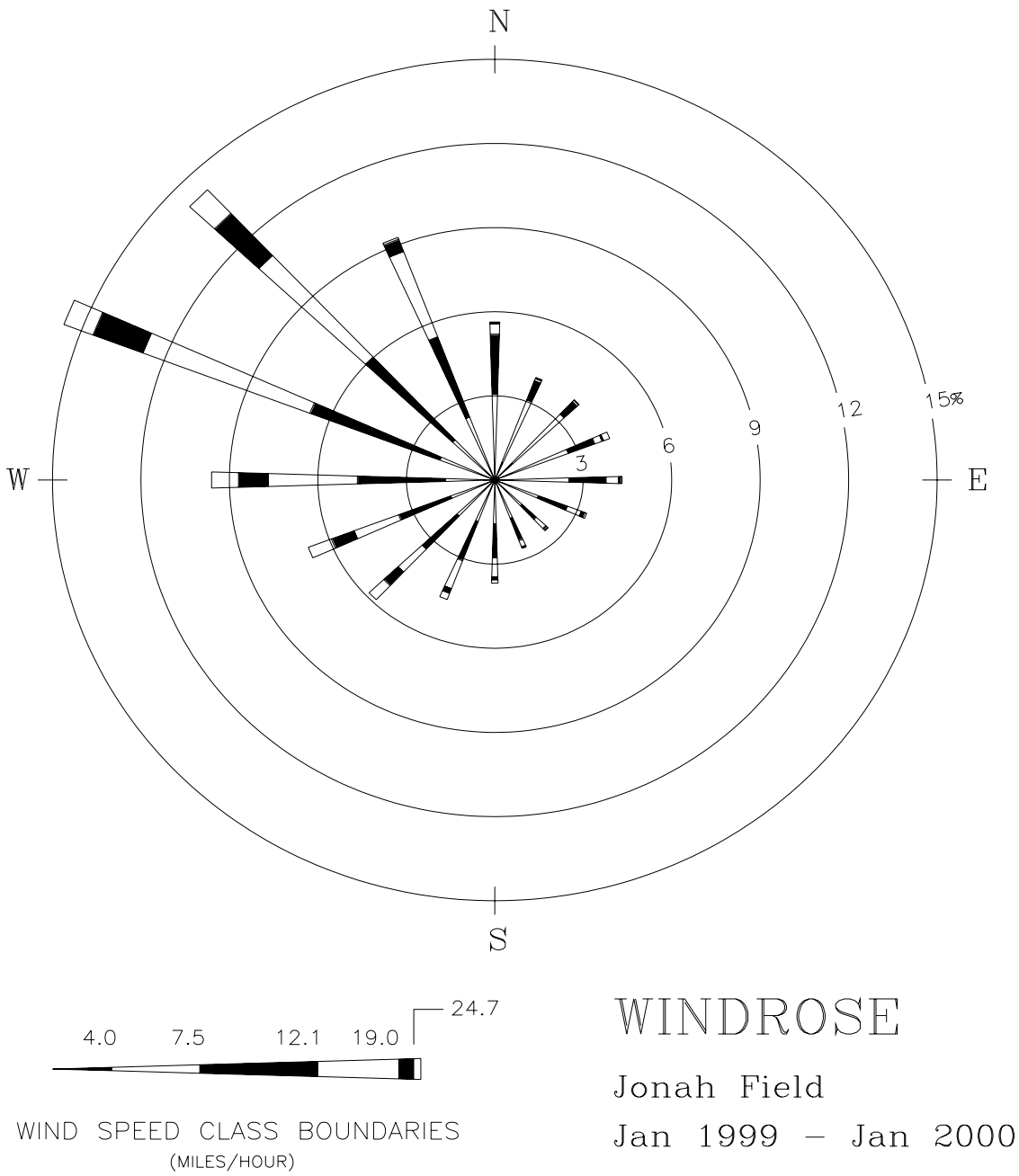


Figure 3.1 Jonah Meteorological Data Windrose

Table 3.1 summarizes the locations, date of start-up, and pollutants monitored for each monitoring site. Monitor locations are shown in relation to the Pinedale Anticline natural gas field in Map 3.1.

Table 3.1 Sublette County Ambient Monitoring Summary.

Monitor	Location	Operator	Start Date	Parameters Monitored
Jonah	Jonah Field	EnCana	1/15/05	PM_{10}, O_3, NO_2, Met, Camera
Boulder	5 mi S and W of Boulder	Shell/WDEQ	2/06/05	PM_{10}, O_3, NO_2, Met, Camera, Nephelometer
Daniel	5 mi S of Daniel	WDEQ	7/01/05	PM_{10}, O_3, NO_2, Met, Camera

As of the date this Protocol was prepared, none of the sites listed in Table 3.1 had available a full year of QA/QC'd data. For review purposes, these limited datasets, representing the data available at this time, are given in this Protocol. Table 3.2 shows ambient concentrations reported for these monitoring sites on the EPA AIRS website on June 8, 2006. WDEQ is developing recommendations for the background site(s) to utilize for this modeling analysis, and the site(s) selected and basis for that selection will be included in the AQTSD. All available monitored data will be reported in Chapter 3 (Affected Environment) of the SEIS.

Map 3.1 Sublette County Monitoring Site Locations.

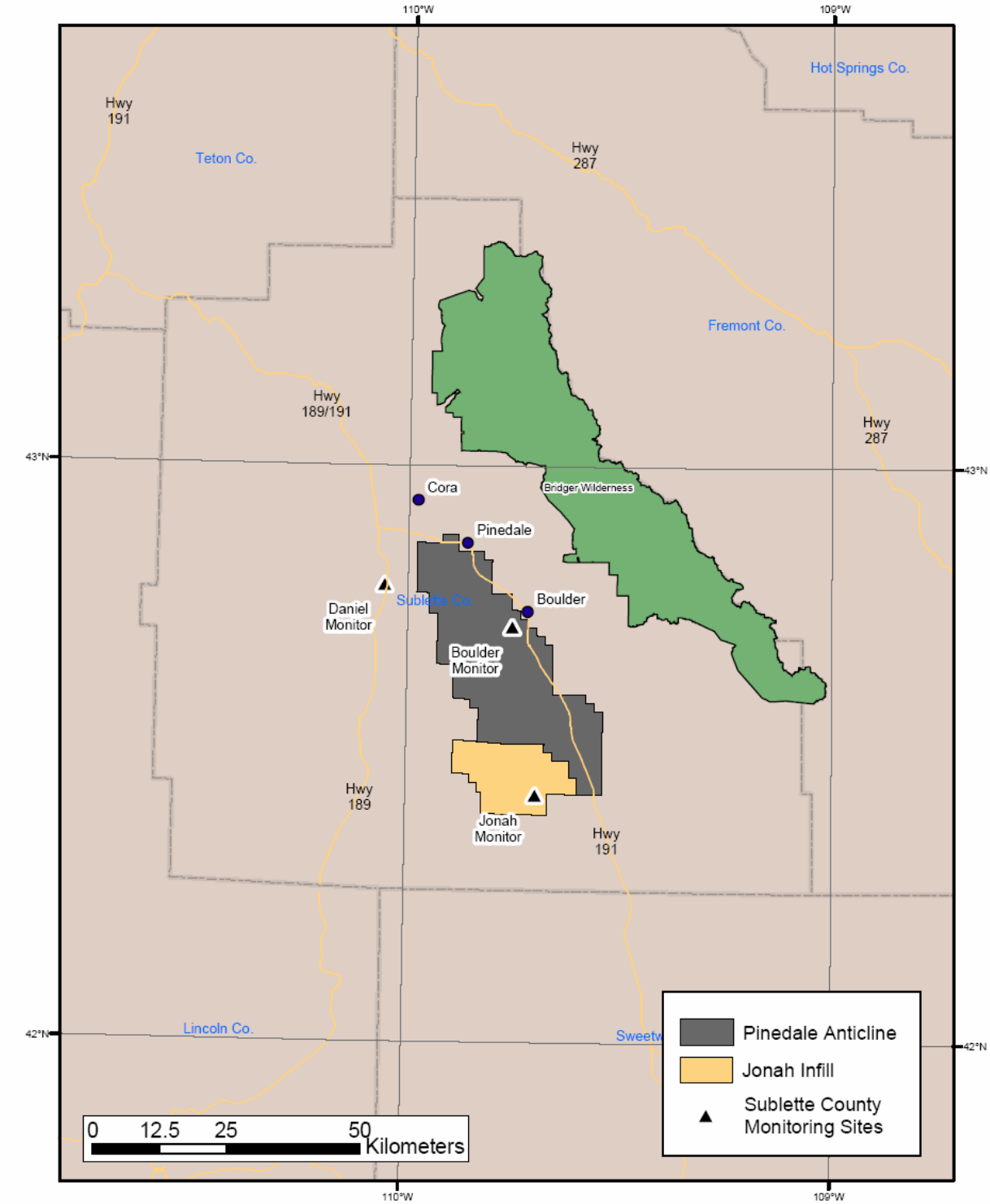


Table 3.2 Ambient Concentrations, Sublette County Monitoring Stations.

Site	Pollutant	Averaging Period	Monitored Concentration ($\mu g/m^3$)
Jonah [1]	NO_2	Annual	19.1
	O_3	1-Hour[2]	214
		8-Hour[2]	152
	PM_{10}	Annual	10
		24-Hour[3]	51
Boulder [4]	NO_2	Annual	7.6
	O_3	1-Hour[2]	186
		8-Hour[2]	158
	PM_{10}	Annual	11
		24-Hour[3]	32
Daniel [5]	NO_2	Annual	5.7
	O_3	1-Hour[2]	138
		8-Hour[2]	132
	PM_{10}	Annual	11
		24-Hour[3]	23
Ryckman Creek [6]	CO	8-Hour[7]	1,381
		1-Hour[3]	3,336
Craven Creek [8]	SO_2	Annual	9
		24-Hour[3]	43
		3-Hour[3]	132

1 Data reflects partial year 2005 (Jan 15-Dec 31). Monitor located in Jonah Field, 40 mi NW of Farson, WY.
2 Highest, fourth highest monitored value.
3 Highest, second highest monitored value.
4 Data reflects quarters 2, 3 and 4, 2005. Monitor 5 mi S and W of Boulder, WY.
5 Data reflects quarters 3 and 4 2005. Monitor 5 mi south of Daniel, WY off Hwy. 18.
6 Data collected by Amoco at Ryckman Creek site for 8-month period 1978-1979, from Riley Ridge EIS (BLM 1983).
7 Second-highest non-overlapping average.
8 Data collected at LaBarge Study Area, Northwest Pipeline Craven Creek Site 1982-1983.

3.3 CRITERIA POLLUTANT IMPACT ASSESSMENT

Criteria pollutants PM_{10}, $PM_{2.5}$, NO_x, SO_2, and CO will be modeled with AERMOD. Ozone (O_3) formation and impacts will not be modeled using AERMOD; rather, ozone impacts will be estimated from a screening methodology using VOC and NO_x screening tables developed by Scheffe (1988). Ozone models are designed for urban areas, are very expensive and time-consuming to implement, and are not applicable for use in rural areas such as southwest Wyoming. The VOC/NO_x screening tables have been used in other EIS analyses and the BLM supports their use in this application. In recognition of the importance of ozone concentrations, monitoring programs have been implemented by WDEQ-AQD in several areas of Sublette County. The VOC/NO_x screening tables will be used to evaluate potential ozone impacts from various maximum emissions activities that could occur within the PAPA.

Emissions of each pollutant analyzed will be examined to determine 1) the maximum emissions phase during well/field development and 2) the maximum emissions phase during production, and it will be these scenarios that will be modeled to determine near-field project impacts. Based on previous analyses performed for the Jonah Infill Project, Atlantic Rim Project, and Continental Divide Project, it is expected that road construction will generate the greatest PM_{10} and $PM_{2.5}$, and drilling will generate the greatest NO_x, CO, and SO_2 emissions during development. It is anticipated that compressor stations in the field will generate the greatest NO_x, CO, and SO_2 emissions during production. No PM_{10} and $PM_{2.5}$ will be modeled in the near-field analysis for a single pad during production unless it is determined that unpaved road emissions during production are greater than those from a single pad during development.

For development activities, a representative well pad and resource/access road will be developed for modeling. Hourly emission rate adjustment factors will be applied to sources emitting only during specific diurnal periods. For PM_{10} and $PM_{2.5}$ this layout will be modeled, using the meteorological data described above, 36 times, once at each of 36 10º rotations to ensure that impacts from all directional layout configurations and meteorological conditions are assessed. In accordance with averaging periods for which ambient standards exist, PM_{10} and $PM_{2.5}$ concentrations will be calculated for 24-hour and annual averaging periods. Representative sections of drilling engine operations will be modeled at maximum Project Alternative projected pad and drill rig densities. NO_2 concentrations will be calculated for annual averaging periods, CO concentrations for 1-hour and 8-hour averaging periods, and SO_2 concentrations for 3-hour, 24-hour, and annual averaging periods.

One production scenario will be analyzed representing one section of producing wells centered on one compressor station. The compressor station will be modeled equal to the largest station anticipated to operate in the field during the LOP. For the production scenario, annual average nitrogen dioxide (NO_2) concentrations, 1-hour and 8-hour CO concentrations, and SO_2 concentrations for 3-hour, 24-hour, and annual averaging periods will be predicted.

Point sources will be used for modeling emissions from compressors, well-site combustion equipment, and drilling rigs. Volume sources will be used for modeling PM_{10} and $PM_{2.5}$ emissions from road travel and wind erosion during development activities. Model receptors will be located a minimum of 100 meters (m) from development emission sources at 100-m grid spacing. Following WDEQ-AQD compressor modeling guidance, model receptors will be placed at 25-m intervals along anticipated compressor facility fencelines. Compressor stack heights will be set at actual or proposed heights but no greater than 1.5 times compressor building heights. Receptors beyond the compressor facility fenceline will be placed at 100-m intervals or at intervals appropriate to decreased well spacing.

3.4 HAP IMPACT ASSESSMENT

Near-field HAP concentrations will be calculated for assessing impacts both in the immediate vicinity of Project area emission sources for short-term (acute) exposure assessment and at greater distances for calculation of long-term risk. HAPs emissions are expected to include those from well-site fugitives, Central Gathering Facilities and natural gas combustion at compressor stations. Because HAPs will be emitted predominantly during the production phase, only HAP emissions from production will be analyzed.

The modeling methodology for the short-term and long-term HAP impact assessments is nearly identical to the methodology outlined in Section 3.1. Volume sources will be used for modeling well-site fugitive HAP emissions during production, and point sources will be used to represent compressor engine emissions. A maximum emissions case will be developed for each HAP and that case modeled. A single section of wells under development, or a single section of producing wells centered on a compressor station, whichever produces maximum emissions, is expected to be analyzed. If following emission inventory development another scenario during development or production results in greater total emissions, that scenario will be analyzed.

Receptors will be placed a minimum of 100 m from production wells and at 100-m spacing beyond. Receptors will be placed at 25-m intervals along compressor fence lines and at 100-m spacing beyond. The short-term HAP assessment will consist of modeling formaldehyde emissions from a representative natural gas-fired compressor station and modeling all other natural gas constituent-based HAPs in the representative area developed for the criteria pollutant modeling as described in Section 3.3. For the long-term assessment, receptors will be placed on a polar grid at 10º intervals equidistant from the emissions source and the nearest residence or expected residence.

Short-term (1-hour) HAP concentrations will be compared to acute Reference Exposure Levels (RELs), shown in Table 3.3. RELs are defined as concentrations at or below which no adverse health effects are expected. No RELs are available for ethylbenzene and n-hexane; instead, the available Immediately Dangerous to Life or Health divided by 10 (IDLH/10) values are used. These IDLH values are determined by the National Institute for Occupational Safety and Health (NIOSH) and were obtained from EPA's Air Toxics Database (EPA, 2005b). These values are approximately comparable to mild effects levels for 1-hour exposures.

Long-term exposure to HAPs emitted by the Proposed Action will be compared to Reference Concentrations for Chronic Inhalation (RfCs). An RfC is defined by EPA 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 (EPA, 2005c). Annual modeled HAP concentrations for all HAPs emitted will be compared directly to the non-carcinogenic RfCs shown in Table 3.4.

Table 3.3 Acute RELs.

HAP	REL (mg/m^3)
Benzene	1.3 [1]
Toluene	37 [1]
Ethylbenzene	350 [2]
Xylene	22 [1]
n-Hexane	390 [2]
Formaldehyde	0.094 [1]

[1] EPA Air Toxics Database, Table 2 (EPA, 2005b).
[2] No REL available for these HAPs. Values shown are from Immediately Dangerous to Life or Health (IDLH/10), EPA Air Toxics Database, Table 2 (EPA, 2005b).

Table 3.4 Non-Carcinogenic HAP RfCs. [1]

HAP	Non-Carcinogenic RfC [1] (g/m^3)
Benzene	30
Toluene	400
Ethylbenzene	1,000
Xylenes	100
n-Hexane	200
Formaldehyde	9.8

[1] EPA Air Toxics Database, Table 1 (EPA, 2005c).

RfCs for suspected carcinogens benzene and formaldehyde are expressed as unit risk factors, shown in Table 3.5. Accepted methods for risk assessment will be used to evaluate the incremental cancer risk for these pollutants.

Annual modeled concentrations will be multiplied by EPA's unit risk factors (URF) (based on 70-year exposure) for those pollutants, and then the product will be multiplied by an adjustment factor which represents the ratio of projected exposure time to 70 years. The adjustment factors represent two scenarios: a most likely exposure (MLE) scenario and one reflective of the maximally exposed individual (MEI).

Table 3.5 Carcinogenic HAP RfCs and Exposure Adjustment Factors.

Analysis [1]	HAP Constituent	Carcinogenic RfC (Risk Factor) [2] 1/(g/m^3)	Exposure Adjustment Factor
MLE	Benzene	7.8×10^{-6}	0.0949
MLE	Formaldehyde	5.5×10^{-9}	0.0949
MEI	Benzene	7.8×10^{-6}	0.86
MEI	Formaldehyde	5.5×10^{-9}	0.86

[1] MLE = most likely exposure; MEI = maximally exposed individual.
[2] EPA Air Toxics Database, Table 1 (EPA, 2005c).

The MLE duration will be assumed to be 9 years, which corresponds to the mean duration that a family remains at a residence (EPA, 1993). This duration corresponds to an adjustment factor of 9/70 = 0.13. The duration of exposure for the MEI is assumed to be 60 years (i.e., the LOP), corresponding to an adjustment factor of 60/70 = 0.86.

A second adjustment will be made for time spent at home versus time spent elsewhere. For the MLE scenario, the at-home time fraction is 0.64 (EPA, 1993), and it will be assumed that during the rest of the day the individual would remain in an area where annual HAP concentrations would be one quarter as large as the maximum annual average concentration. Therefore, the MLE adjustment factor will be (0.13) x [(0.64 x 1.0) + (0.36 x 0.25)] = 0.0949. The MEI scenario assumes that the individual is at home 100% of the time, for a final adjustment factor of (0.86 x 1.0) = 0.86. EPA unit risk factors and adjustment factors are shown in Table 3.5.

4.0 MID-FIELD AND FAR-FIELD ANALYSIS

The purpose of the mid-field and far-field analysis is to quantify potential air quality impacts to both ambient air concentrations and AQRVs from air pollutant emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$ expected to result from the development of the project. Ambient air quality impacts beyond the immediate project area and throughout the study area will be analyzed and AQRVs will be analyzed at PSD Class I and sensitive PSD Class II areas. Cumulative impacts also will be quantified by including in the analysis other documented sources of air pollutant emissions within a defined study area. The analyses will be performed using the EPA-approved CALMET/CALPUFF modeling system to predict air quality direct and cumulative impacts at far-field PSD Class I and sensitive PSD Class II areas, and at several mid-field PSD Class II areas including locations within the PAPA. The PSD Class I areas and sensitive PSD Class II areas to be analyzed are shown on Map 2.1 and include the following:

- Bridger Wilderness Area (Class I);
- Fitzpatrick Wilderness Area (Class I);
- Gros Ventre Wilderness Area (Class II);
- Popo Agie Wilderness Area (Class II);
- Wind River Roadless Area (Class II);
- Grand Teton National Park (Class I);
- Teton Wilderness Area (Class I);
- North Absaroka Wilderness Area (Class I);
- Yellowstone National Park (Class I); and
- Washakie Wilderness Area (Class I).

In addition, analyses will be performed for seven lakes designated as acid sensitive located within the sensitive PSD Class I and Class II wilderness areas to assess potential lake acidification from atmospheric deposition impacts. These lakes include the following:

- Deep Lake in the Bridger Wilderness Area;
- Black Joe Lake in the Bridger Wilderness Area;
- Hobbs Lake in the Bridger Wilderness Area;
- Upper Frozen Lake in the Bridger Wilderness Area;
- Lazy Boy Lake in the Bridger Wilderness Area;
- Ross Lake in the Fitzpatrick Wilderness Area; and
- Lower Saddlebag Lake in the Popo Agie Wilderness Area.

The proposed mid-field analysis will assess direct project and cumulative air quality impacts at in-field locations within the PAPA and at other mid-field locations defined as Class II areas (Wyoming regional communities). Mid-field locations to be analyzed were identified by air quality stakeholders group members, and include the Wyoming communities of:

- Boulder;
- Cora; and
- Pinedale.

Air emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$ from proposed wells and their associated development activity, as well as from regional emissions as described in Section 2.2, will be modeled. A description of the emissions inventory procedures to be implemented is included in Section 2.0 of this Protocol. The idealization of these emissions sources for input to the CALPUFF model is described in Section 4.3.

CALPUFF results will be post-processed with POSTUTIL and CALPOST to derive air concentrations for comparison to ambient air standards, significance thresholds, and Class I and II Increments; AQRV impacts due to deposition rates for comparison to sulfur (S) and nitrogen (N) deposition thresholds and to calculate acid neutralizing capacity (ANC) for sensitive water bodies; and AQRV impacts due to light extinction change for comparison to visibility impact thresholds in Class I and other sensitive areas. A discussion of the post-processing methodology to be used is provided in Section 4.5 of this Protocol.

4.1 MODELING METHODOLOGY

The most recent versions of the EPA approved CALMET/CALPUFF modeling system (CALMET Version 5.53b and CALPUFF Version 5.711b dated December 16, 2005) will be used to develop windfields and calculate both ambient concentrations and AQRV impacts. The CALMET meteorological model will be used to develop windfields for 3 years of meteorological data (2001, 2002, and 2003) and the CALPUFF dispersion model will be used to combine these windfields with project-specific and regional emissions inventories of SO_2, NO_x, PM_{10}, and $PM_{2.5}$ to estimate ambient concentrations and AQRV impacts at mid-field and far-field receptor locations. The study area is shown in Map 1.1

The CALMET and CALPUFF models will be used in this analysis following the methods described herein and the following guidance sources:

- *Guideline on Air Quality Models*, 40 *Code of Federal Regulations* (C.F.R.), Part 51, Appendix W (EPA, 2003a);
- *Interagency Work Group on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts*, EPA-454/R-98-019, Office of Air Quality Planning and Standards, December 1998 (IWAQM, 1998); and
- *Federal Land Managers - Air Quality Related Values Workgroup (FLAG), Phase I Report*, December 2000 (FLAG, 2000).

4.2 METEOROLOGICAL MODEL INPUT AND OPTIONS

The CALMET model will be used to develop windfields for the study area shown in Map 1.1. The model domain extent was selected following a 200-km radius criteria (see Map 2.1), centered around the PAPA, for inclusion of PSD Class I and sensitive PSD Class II wilderness areas in the air quality analyses. The proposed modeling domain covers the PAPA and Class I and other sensitive areas within 200-km of the PAPA with a sufficient buffer zone to allow for potential recirculation or flow reversal effects to be evaluated. The selection of a 200-km radius is consistent with other NEPA regional analyses performed for southwest Wyoming and current FLM recommendations for PSD Class I area analyses. The proposed modeling domain follows IWAQM guidance that recommends that the horizontal domain of the model grid extend 50 to 80 km beyond the receptors and sources being modeled, for modeling potential recirculation wind flow effects. All model inputs will be based on a Lambert Conformal Projection given the size of the proposed domain.

Following current EPA modeling guidance and at the request of the BLM, 3 years of windfield data will be developed and used for the modeling analysis. The selected years are 2001, 2002, and 2003, based on the availability of representative MM5 mesoscale model data for the analysis. The 2001, 2002 and 2003 MM5 data were developed for EPA or for a Regional Planning Organization (RPO), have undergone significant QA/QC verification and peer review,

and are the most recent available consecutive 3 years of prognostic data that are available. The MM5 data sets that will be used for the analysis include year 2001 data processed at 36-km spacing for EPA (Alpine Geophysics, LLC, 2003), year 2002 data processed at 36-km spacing for WRAP (ENVIRON, 2005) and year 2003 data processed at 36-km spacing for the Midwest RPO (Baker, 2005).

The MM5 data will be used to provide an initial guess field in CALMET. These data will be further processed to 4-km resolution by CALMET to produce a step 1 windfield. Ten vertical layers will be used. Surface meteorology data for observation sites throughout the modeling domain available from National Climatic Data Center (NCDC) integrated surface observation data sets, Clean Air Status and Trends Network (CASTNET) sites, and from onsite data collected by BP America Production Company in the Jonah Field will be incorporated into the windfields. In addition, upper air rawinsonde meteorology data, and precipitation data for applicable observation sites throughout the modeling domain have been obtained from NCDC and will be included in the analysis. USGS 1:250,000-Scale Land Use and Land Cover (LULC) data, and USGS 1º DEM data will be used for land use and terrain data in the development of the CALMET windfields. The CALMET model control switch settings will follow IWAQM guidance. A sample CALMET input control file is included in Attachment A.

Windfields developed for years 2001, 2002 and 2003, at a 4-km grid spacing, will be used to assess impacts from project sources and regional sources at all PSD Class I and sensitive PSD Class II areas and at mid field locations.

4.3 DISPERSION MODEL INPUT AND OPTIONS

CALPUFF will be used to model project-specific and regional emissions of NO_x, SO_2, PM_{10}, and $PM_{2.5}$. The CALPUFF model will be run for each year of CALMET windfields (2001, 2002, and 2003) following IWAQM-recommended default switch settings. A sample CALPUFF input control file is included in Attachment A. Chemical transformations will be modeled based on the MESOPUFF II chemistry mechanism for conversion of SO_2 to sulfate (SO_4) and NO_x to nitric acid (HNO_3) and nitrate (NO_3). Each of these pollutant species will be included in the CALPUFF model runs. NO_x, HNO_3, and SO_2 will be modeled with gaseous deposition, and SO_4, NO_3, PM_{10}, and $PM_{2.5}$ will be modeled using particle deposition. The PM_{10} emissions input to CALPUFF will include only the PM_{10} emissions greater than the $PM_{2.5}$ (i.e., modeled PM_{10} = PM_{10} emission rate – $PM_{2.5}$ emission rate) since $PM_{2.5}$ is modeled as a separate species. Total PM_{10} impacts will be determined in the post-processing of modeled impacts, as discussed in Section 4.5.

4.3.1 Chemical Species

The CALPUFF chemistry algorithms require hourly estimates of background ammonia and ozone concentrations for the conversion of SO_2 and NO/NO_2 to sulfates and nitrates, respectively. A review of background ozone monitoring data available for the three years proposed for analysis has indicated that data from the following sites are available for years 2001, 2002, and 2003:

- Pinedale, Wyoming;
- Centennial, Wyoming;
- Yellowstone National Park, Wyoming;
- Craters of the Moon National Park, Idaho; and
- Highland, Utah.

Hourly ozone data sets will be developed from these stations and will be included in the CALPUFF modeling. A representative default value will be determined from data statistics upon review of these data sets and used for missing hours. A background ammonia concentration of 1.0 ppb, as suggested in IWAQM for “arid lands”, will be used.

4.3.2 Receptors

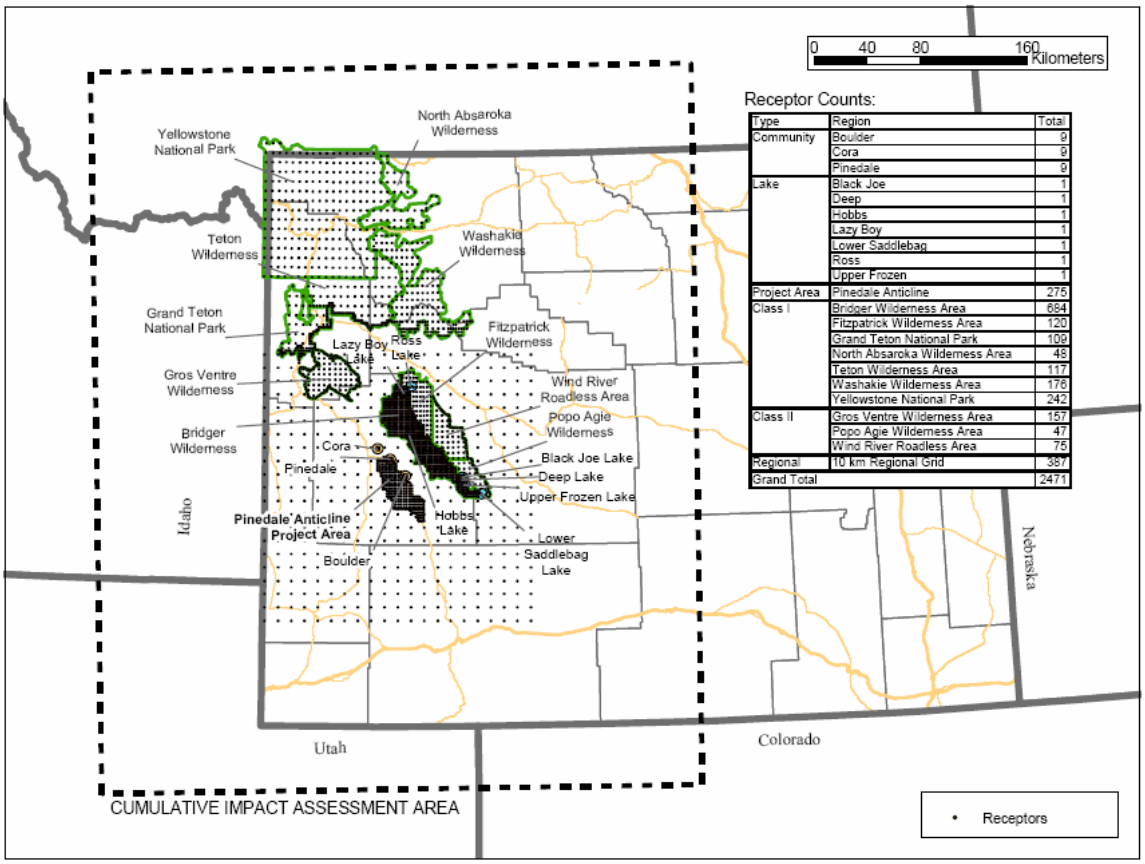
Model receptors will be input to CALPUFF, at which concentration, deposition, and other impacts will be calculated. Receptors at a 2-km grid resolution will be placed throughout the PAPA to calculate in-field cumulative ambient air impacts. Receptors will also be placed at 10-km grid resolution extending out 100 km from the PAPA to calculate cumulative ambient air impacts. At the PSD Class I, and other sensitive PSD Class II areas located within the modeling domain, ambient air and AQRV impacts will be determined. The PSD Class I areas within the modeling domain to be evaluated include:

- Bridger Wilderness Area,
- Fitzpatrick Wilderness Area,
- Teton Wilderness Area,
- Washakie Wilderness Area,
- Grand Teton National Park,
- Yellowstone National Park, and
- North Absaroka Wilderness Area.

Receptor sets available from the National Park Service for PSD Class I areas will be used as a basis for determining modeling receptors for all of these Class I areas. The complete National Park Service receptor set will be used for modeling the nearby Bridger Wilderness Area, however the receptor grid densities will be thinned at the more distance Class I areas, while maintaining adequate area coverage, for consideration of model run times. For the three sensitive PSD Class II areas located within the modeling domain (Gros Ventre and Popo Agie Wilderness Areas, and Wind River Roadless Area), receptor sets will be developed using 2-km spacing along the Wilderness area boundaries and at 4-km spacing within each area. Receptor elevations for the sensitive Class II area receptors and for the receptors within the PAPA and extending outward 100 km will be determined from 1:250,000 scale USGS DEM data.

Discrete receptors will be placed at the seven lakes identified as sensitive to acid deposition. Elevations for the sensitive lake receptors will be derived from 7.5-minute USGS maps. In addition, for the Wyoming regional community locations of Boulder, Pinedale and Cora, receptors will be placed using 3 x 3, 1-km grids for analyses of visibility (AQRV) impacts. At these mid-field Wyoming community locations impacts to visibility (regional haze) will be assessed although these communities are classified as PSD Class II areas where no visibility protection exits under local, state, or federal law. Elevations for the regional community locations will be determined from 1:250:000 scale USGS DEM data. The proposed CALPUFF model receptors are shown in Figure 4.1.

Figure 4.1 CALPUFF Model Receptors



Type	Region	Total
Community	Boulder	9
	Cora	9
	Pinedale	9
Lake	Black Joe	1
	Deep	1
	Hobbs	1
	Lazy Boy	1
	Lower Saddlebag	1
	Ross	1
	Upper Frozen	1
Project Area	Pinedale Anticline	275
Class I	Bridger Wilderness Area	684
	Fitzpatrick Wilderness Area	120
	Grand Teton National Park	109
	North Absaroka Wilderness Area	48
	Teton Wilderness Area	117
	Washakie Wilderness Area	176
	Yellowstone National Park	242
Class II	Gros Ventre Wilderness Area	157
	Popo Agie Wilderness Area	47
	Wind River Roadless Area	75
Regional	10 km Regional Grid	387
Grand Total		2471

4.3.3 Source Parameters

4.3.3.1 Project Emissions

Pollutant emission rates estimated as described in Section 2.0 will be input to CALPUFF to predict air quality impacts from the Project. Emissions scenarios for year 2005 (current conditions), the Proposed Action and No Action Alternatives will be developed and modeled. Emissions for the Proposed Action from both the development phase and well production (field operation) phase will be modeled. For the Proposed Action and No Action alternatives, project emissions after 2005 that could occur from development and production activities over the LOP will be examined to determine an annual period representing a maximum combination of production and development. An additional emissions scenario representing the Proposed Action at maximum production (full field operation) will be modeled. Based upon model results of the modeled maximum emissions scenarios, alternative emissions scenarios considering possible mitigation techniques will be developed and modeled.

Hourly emission-rate adjustment factors will be applied to emissions that occur only during specific diurnal periods, such as travel on unpaved roads. Seasonal adjustment factors will be applied to compensate for increased gas well-heater use in the winter months. Well locations will be modeled as area sources within the specific area of the PAPA they are projected to be

located in, on a rectangular grid not exceeding 4 x 4 km spacing and possessing a total area not exceeding the total area of the PAPA.

The analysis will include future compression requirements projected by the Operators. Compressor engine emissions will be input as point sources with actual expected stack parameters at their anticipated locations.

Due to the close proximity and physical alignment of the PAPA to the Bridger Wilderness sensitivity "zone" modeling will be performed for Project source emissions to determine whether there are any areas within the PAPA that could potentially result in much greater impacts at the Bridger Wilderness. The PAPA will be divided into 3 distinct zones, south, north, and central with emissions spread evenly throughout each area, for these sensitivity runs. Emissions from each zone will be modeled separately and the predicted impacts from each will be compared to determine whether there are any significant differences.

4.3.3.2 Regional Source Emissions

Regional sources, including permitted sources, RFD, and RFFA inventoried according to the methodology described in Section 2.2, will be input to the CALPUFF model as point sources or area sources as appropriate. As part of the emissions inventory, source location and exit parameter data will be obtained.

Pollutant emissions from stacks will be modeled as point sources in the CALPUFF model. Multiple stacks within single facilities will be combined into a single, representative stack to reduce model run-time. This procedure was followed in the Pinedale Anticline Oil and Gas Exploration and Development EIS and other EIS regional source inventories. Stack parameters will be selected based on the potential for the greatest long-range impacts (i.e., greater stack height, greater exhaust flow rate).

Fugitive emissions (i.e., well heaters, surface mines, gravel pits, etc.) will be aggregated into area sources in the model, either source location-specific or regional, depending upon the nature of the fugitive emissions sources. The locations of area sources input to the model will be documented in the technical support document. Regional paved and unpaved roadway travel, urban, biogenic, and other non-industrial sources are considered to be included in the ambient air background concentrations described in this Protocol; therefore, those fugitive sources will not be modeled.

4.4 BACKGROUND DATA

4.4.1 Criteria Pollutants

Background values for criteria pollutants will be used as described in Section 3.2.

4.4.2 Visibility

The proposed analysis differs from previous Wyoming NEPA cumulative air quality impact studies in its update of visibility background to include the most current data available at the time of this Protocol. The proposed analysis also uses representative monitoring data collected from the Interagency Modeling of Protected Visual Environment (IMPROVE) network for the time period (2000 to 2004) which coincides with the time period that will be used to establish "baseline conditions" under the EPA Regional Haze Rule (EPA, 2003a). Monitored visibility

background data that have undergone QA/QC are currently available through December 31, 2004.

CALPOST will be used to estimate change in light extinction from CALPUFF model concentration results. At the request of the BLM, WDEQ, and USFS three separate methods are proposed for this analysis using FLAG and IMPROVE background visibility data. Two methods which follow recent CALPUFF modeling guidance for Best Available Retrofit Technology (BART) analyses developed for the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) RPO are also proposed (VISTAS, 2006). An additional visibility test using background visibility data determined from nephelometer data measured at Boulder will be performed. The BLM visibility calculation method will utilize CALPOST visibility method 6 (CALPOST model switch setting "MVISBK" set to 6) for computing light extinction change in combination with FLAG background data. The WDEQ visibility calculation method will utilize CALPOST visibility method 6 (MVISBK=6) in combination with IMPROVE background data. The two BART screening calculation procedures will also use CALPOST method 6 combined with background visibility conditions as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule* (EPA, 2003b). Method 6 uses monthly averaged humidity factors, and it is not sensitive to synoptic weather events that lead to high extinction events and subsequent explanation as to why certain events should be discounted. The USFS visibility calculation method will use the FLAG background data in combination with hourly relative humidity data from the CALMET windfields (MVISBK=2).

The FLAG method 6 uses seasonal natural background visibility conditions and relative humidity factors at Class I areas. FLAG method 2 uses the seasonal natural background visibility conditions and hourly relative humidity data from surface observations in the CALMET wind field data. For the FLAG methods proposed for this analysis, estimated natural background visibility values as provided in Appendix 2.B of FLAG (2000) will be used. For FLAG method 6, monthly relative humidity factors as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule* (EPA, 2003b) will be used. Because natural background data are provided for PSD Class I areas only, data from the nearest PSD Class I area will be used for the sensitive PSD Class II areas. The natural background visibility data, in units of inverse megameters (Mm^{-1}), that will be used with the FLAG visibility analysis for each area analyzed are shown in Table 4.1.

The IMPROVE method as requested by the WDEQ uses reconstructed IMPROVE aerosol total extinction data. The IMPROVE background visibility data are provided as reconstructed aerosol total extinction data, based on the quarterly mean of the 20% cleanest days measured at the Bridger and North Absaroka Wilderness Areas and Yellowstone National Park IMPROVE sites for the 5-year period, years 2000 through 2004, as shown in Table 4.2. These 5 years are defined as "baseline conditions" years for tracking progress under EPA Regional Haze Rule guidance (EPA, 2003a). The IMPROVE method will also utilize monthly relative humidity factors as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*.

Table 4.1 FLAG Report Background Extinction Values.[1]

Site	Season	Hygroscopic (Mm^{-1})	Non-hygroscopic (Mm^{-1})
Bridger Wilderness Area (Will also be used for Popo Agie Wilderness Area and Wind River Roadless Area)	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Fitzpatrick Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
North Absaroka Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Teton Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Washakie Wilderness Area	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Grand Teton National Park (will also be used for Gros Ventre Wilderness Area)	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5
Yellowstone National Park	Winter	0.6	4.5
	Spring	0.6	4.5
	Summer	0.6	4.5
	Fall	0.6	4.5

[1] FLAG (2000).

Table 4.2 IMPROVE Background Aerosol Extinction Values.[1]

IMPROVE Site	Quarter	Hygroscopic (Mm^{-1})	Non-hygroscopic (Mm^{-1})
Bridger	1	0.775	1.233
	2	1.565	3.283
	3	1.791	4.965
	4	0.704	1.192
North Absaroka	1	0.774	1.565
	2	1.326	2.249
	3	1.360	4.931
	4	0.600	1.368
Yellowstone	1	1.104	1.588
	2	1.453	2.983
	3	1.550	5.414
	4	0.738	1.544

[1] Cooperative Institute for Research in the Atmosphere (2006).

Visibility data from the Bridger Wilderness Area IMPROVE site will be used for the Bridger, Fitzpatrick, Gros Ventre, and Popo Agie Wilderness Areas and for the Wind River Roadless Area. Visibility data from the Yellowstone National Park IMPROVE site will be used for the Teton Wilderness Area and for Grand Teton and Yellowstone National Parks. Data from the North Absaroka site will be used for the North Absaroka and Washakie Wilderness Areas. Monthly relative humidity factors are available for the Bridger, Fitzpatrick, Teton, and Washakie Wilderness Areas, and for Grand Teton and Yellowstone National Parks. Relative humidity data for the Bridger Wilderness Area will also be used for the Gros Ventre and Popo Agie Wilderness Areas and for the Wind River Roadless Area analyses.

The two BART screening methods will use the background visibility data provided in Appendix B of the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule.* These methods use CALPOST visibility method 6. The first test will use the "best days" background visibility condition and the second test will use the annual average background. These background data given in deciview (dv) units are shown in Table 4.3. The BART methods will also utilize monthly relative humidity factors as provided in the *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*. Because the background visibility and relative humidity data are provided for PSD Class I areas only, data from the nearest PSD Class I area will be used for the sensitive PSD Class II areas.

Table 4.3 Default Natural Conditions.[1]

Site	Annual Average (dv)	Best Days (dv)
Bridger Wilderness	4.52	1.96
Fitzpatrick Wilderness	4.53	1.97
North Absaroka Wilderness	4.53	1.97
Teton Wilderness	4.53	1.97
Washakie Wilderness	4.53	1.97
Grand Teton National Park	4.53	1.97
Yellowstone National Park	4.56	2.00

[1] Default natural conditions from Appendix B (EPA, 2003b).

Background visibility data for the Wyoming regional community locations (Boulder, Cora, and Pinedale) were determined from current nephelometer visibility data collected at Boulder and from transmissometer extinction data and IMPROVE aerosol data collected at the Bridger Wilderness Area (ARS, 2006), since there are no applicable aerosol extinction data collected at these community locations. Quarterly averages of the average days and cleanest 20th percent days were developed from daily averaged extinction measurements for the 1-year period, March 1, 2005 through February 28, 2006. These data are shown in Table 4.4. Relative humidity data factors for the Bridger Wilderness Area will be used for the regional community locations.

Table 4.4 Boulder Background Extinction Data.

Quarter	Annual Average (Mm-1)	20th Cleanest Days (Mm-1)
1	25.6	14.0
2	21.2	14.7
3	24.3	19.0
4	21.4	14.3

4.4.3 Deposition

Background total sulfur (S) and nitrogen (N) deposition data (expressed in kilograms per hectare per year [kg/ha-yr]) collected at National Acid Deposition Program (NADP) National Trends

Network (NTN) and CASTNET station monitoring locations near Pinedale, Wyoming and in Yellowstone National Park are provided in Table 4.5. These background S and N deposition data will be added to modeled cumulative (project alternative and regional sources) deposition impacts to estimate total S and N deposition impacts.

Table 4.5 Background N and S Deposition Values (kg/ha-yr).

Site Location	Nitrogen Deposition	Sulfur Deposition	Year of Monitoring
Pinedale	1.4	0.74	2004
Yellowstone National Park	1.3	0.70	2003

4.4.4 Lake Chemistry

The most recent lake chemistry background ANC data have been obtained from the FLMs for each sensitive lake listed in Section 4.0. The 10th percentile lowest ANC values were calculated for each lake following procedures provided from the USFS. The ANC values proposed for use in this analysis, and the number of samples used in the calculation of the 10th percentile lowest ANC values, are provided in Table 4.6. Of the seven lakes listed in Table 4.6, two lakes (Lazy Boy and Upper Frozen) are considered by the USFS as extremely sensitive to acid deposition since the background ANC values are less than 25 microequivalents per liter (µeq/l).

Table 4.6 Background ANC Values for Acid Sensitive Lakes[1]

Wilderness Area	Lake	Latitude (Deg-Min-Sec)	Longitude (Deg-Min-Sec)	10th Percentile Lowest ANC Value (μeq/l)[2]	Number of Samples	Monitoring Period
Bridger	Black Joe	42º44'22"	109º10'16"	67.1	67	1984-2005
Bridger	Deep	42º43'10"	109º10'15"	59.7	64	1984-2005
Bridger	Hobbs	43º02'08"	109º40'20"	69.9	71	1984-2005
Bridger	Lazy Boy	43º19'57"	109º43'47"	10.8	3	1997-2004
Bridger	Upper Frozen	42º41'13"	109º09'39"	6.0	8	1997-2005
Fitzpatrick	Ross	43º22'41"	109º39'30"	53.7	49	1988-2005
Popo Agie	Lower Saddlebag	42º37'24"	108º59'38"	55.2	48	1989-2005

1 From USFS (2006).
2 10th Percentile Lowest ANC Values reported.

4.5 POST-PROCESSING

For each far-field sensitive area, CALPUFF-modeled concentration impacts will be post-processed with POSTUTIL and CALPOST to derive: 1) concentrations for comparison to ambient air quality standards (WAAQS and NAAQS), and PSD Class I and II Increments; 2) deposition rates for comparison to sulfur (S) and nitrogen (N) deposition levels of concern and to calculate changes to ANC at sensitive lakes; and 3) light extinction changes for comparison to visibility impact thresholds. For the mid-field analyses, CALPOST concentrations will be post-processed to estimate light extinction changes at regional communities for comparison to the visibility impact thresholds. For in-field locations, CALPUFF concentrations will be post-processed to compute applicable concentration impacts for comparison to WAAQS and NAAQS.

In post-processing the PM_{10} impacts at all far-field receptor locations, project alternative traffic emissions of PM_{10} (production and development) will not be included in the total estimated impacts, only the $PM_{2.5}$ impacts will be considered. This is based on supporting documentation from the WRAP analyses of mechanically generated fugitive dust emissions that suggest that particles larger than $PM_{2.5}$ tend to deposit out rapidly near the emissions source and do not transport over long distances (Countess et al., 2001). The WRAP findings suggest that nearly 90 percent of PM_{10} particles from unpaved road emissions are depleted within approximately 50 meters. In addition, even if the PM_{10} particles were in a well mixed 10 meter layer, with an average wind speed of 5 meters per second, only 10 percent of the PM_{10} particles could travel up to 36 kilometers. Since this phenomenon is not modeled adequately in CALPUFF; therefore, to avoid overestimates of PM_{10} impacts at far-field locations, these sources will not be considered in the total modeled impacts. However, the total PM_{10} impacts from traffic emissions will be included in all in-field concentration estimates.

4.5.1 Concentration

CALPOST will be used to process the CALPUFF concentration output file to compute appropriate concentration values for SO_2 (3-hour, 24-hour, and annual average), $PM_{2.5}$ (24-hour and annual average), PM_{10} (24-hour and annual average) and NO_2 (annual average).

4.5.2 Visibility

As discussed in Section 4.4.2, visibility impacts (measured as change in light extinction) will be calculated using five separate methods, which differ primarily by the background data used to derive the percent change in visibility. Changes in light extinction will be estimated for both Project emissions and regional source emissions at receptor locations outlined in Section 4.3.2 of this Protocol.

CALPOST will be run using the FLAG data to calculate the change in light extinction from natural background conditions. This procedure computes light extinction changes from seasonal estimates of natural background aerosol concentrations and either monthly relative humidity factors (BLM test) or hourly relative humidity data from the CALMET wind fields (USFS test), due to CALPUFF-predicted particle species concentrations. Seasonal background extinction values used for the FLAG method are shown in Table 4.1. Those values will be input to CALPOST as variables $BKSO_4$ (dry hygroscopic) and BKSOIL (non-hygroscopic). Using these parameters, CALPOST will compute the change in daily (24-hour) visibility at each receptor, with the results reported as change in deciview (dv). The CALPOST switch 'MVISBK' is set to 6 for the BLM test and is set to 2 for the USFS method. The relative humidity data cutoff in CALPOST will be set to 98 for the USFS test. The FLAG method conservatively assumes that the seasonal natural visibility conditions occur on every day during the entire season.

CALPOST will also be run using the IMPROVE data (WDEQ test) to calculate the change in daily (24-hour) light extinction using the quarterly mean of the 20% cleanest days particle mass data as background conditions. Quarterly speciated aerosol data for the 20% cleanest days, measured at the Bridger and North Absaroka wilderness areas and Yellowstone National Park IMPROVE sites will be used. This method uses the quarterly background aerosol concentrations and monthly averaged relative humidity factors to estimate the change in light extinction. The CALPOST switch 'MVISBK' is also set to 6 for this method. Similar to the FLAG method, the IMPROVE method also conservatively assumes that the cleanest visibility conditions occur on every day during each day of the year.

For the BART screening methods CALPOST will also be run using the annual background visibility data from Appendix B of (EPA, 200b) provided in Table 4.3. The first test will use the "best days" background visibility condition and the second test will use the annual average background. The background extinction data given in dv units will be converted to values in Mm^{-1} using the haze index equation ($HI=10\ln(b_{ext}/10)$ given in EPA, 2003b. These methods use the annual background extinction values and monthly averaged relative humidity factors to estimate the change in light extinction. The CALPOST switch 'MVISBK' is set to 6 for these methods. The extinction values will be input to CALPOST as BKSOIL (non-hygroscopic). Using these parameters, CALPOST will be used to compute the change in daily (24-hour) visibility for each method.

For the Wyoming regional community locations (Boulder, Cora, and Pinedale) adjusted nephelometer data collected at Boulder will be used to calculate the change in daily (24-hour)

light extinction. The CALPOST switch 'MVISBK' will be set to 6 for this method. This method uses quarterly averaged background visibility data and monthly averaged relative humidity factors to estimate the change in light extinction. The quarterly averaged extinction data for the cleanest 20th percent days (Table 4.4) will be used for this visibility test. Relative humidity data factors for the Bridger Wilderness Area (EPA, 2003b) will be used for the regional community locations.

4.5.3 Deposition

The POSTUTIL utility provided with the CALPUFF modeling system will be used following IWAQM guidance to estimate total S and N fluxes from CALPUFF-predicted wet and dry fluxes of SO_2, SO_4, NO_x, NO_3, and HNO_3. CALPOST will be used to summarize the annual S and N deposition values from the POSTUTIL program.

5.0 AIR QUALITY IMPACTS

5.1 NEAR-FIELD

Maximum predicted concentrations in the vicinity of project emissions sources will be compared with the Wyoming Ambient Air Quality Standards (WAAQS), National Ambient Air Quality Standards (NAAQS), and applicable Prevention of Significant Deterioration (PSD) Class II increments shown in Table 5.1. Maximum modeled concentrations will be added to the existing ambient air quality background concentrations shown in Table 3.2, and the total concentrations will be compared to corresponding NAAQS and WAAQS as shown in Table 5.1. Direct project impacts will be compared to Class II PSD Increments. This PSD demonstration is for information only and is not a regulatory PSD Increment consumption analysis, which would be completed as necessary during the WDEQ-AQD permitting process. Near-field HAP impacts from short-term (acute) exposure and for calculation of long-term risk are assessed as described in Section 3.4.

5.2 FAR-FIELD

5.2.1 Ambient Concentration Impacts

Modeled concentrations predicted in PSD Class I and sensitive Class II areas from direct project and regional sources will be compared to ambient air quality standards and PSD increments, shown in Table 5.2. Modeled impacts including applicable background concentrations will be compared with ambient air quality standards. Direct project and cumulative impacts will be compared to applicable PSD increments. The PSD demonstrations are for information only and are not regulatory PSD Increment consumption analyses, which would be completed as necessary by the WDEQ-AQD.

Table 5.1 Ambient Air Quality Standards and PSD Class II Increments for Comparison to Near-Field Analysis Results (µg/m^3).

Pollutant/Averaging Time		NAAQS	WAAQS	PSD Class II Increment[1]
CO				
	1-hour[2]	40,000	40,000	--[3]
	8-hour[2]	10,000	10,000	--
NO_2				
	Annual[4]	100	100	25
O_3				
	1-hour [2]	235	235	--
	8-hour[5]	157	157	--
PM_{10}				
	24-hour[2]	150	150	30
	Annual[4]	50	50	17
$PM_{2.5}$				
	24-hour[2]	65	65	--
	Annual[4]	15	15	--
SO_2				
	3-hour[2]	1,300	1,300	512
	24-hour[2]	365	260	91
	Annual[4]	80	60	20

1 The PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis.
2 No more than one exceedance per year.
3 -- = No PSD Class II increment has been established for this pollutant.
4 Annual arithmetic mean.
5 Average of annual fourth-highest daily maximum 8-hour average.

Table 5.2 NAAQS, WAAQS, and PSD Class I and Class II Increments for Comparison to Far-field Analysis Results (µg/m^3).

Pollutant/Averaging Time		NAAQS	WAAQS	PSD Class I Increment [1]	PSD Class II Increment [1]
NO_2					
	Annual[2]	100	100	2.5	25
SO_2					
	3-hour[3]	1,300	1,300	25	512
	24-hour[3]	365	260	5	91
	Annual[2]	80	60	2	20
PM_{10}					
	24-hour[3]	150	150	8	30
	Annual[2]	50	50	4	17
$PM_{2.5}$					
	24-hour	65	65	--	--
	Annual	15	15	--	--

[1] The PSD demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis.
[2] Annual arithmetic mean.
[3] No more than one exceedance per year is allowed.

5.2.2 Visibility

Change in atmospheric light extinction relative to background conditions is used to measure regional haze. Analysis thresholds for atmospheric light extinction are set forth in FLAG (2000), with the results reported in percent change in light extinction and change in deciview (dv). The thresholds are defined as 5% and 10% of the reference background visibility or 0.5 and 1.0 dv for project sources alone and cumulative source impacts, respectively. FLAG (2000) also identifies a goal that any specific project combined with cumulative new source growth will have no days of visibility impairment at or above 1.0 dv in any Class I area. These thresholds and the FLAG guidelines were developed for NSR applications where an AQRV analysis is required, as part of a PSD permit application. The BLM considers a 1.0 dv change as a significant adverse impact; however, there are no applicable local, state, tribal, or federal regulatory visibility standards. The USFS considers a 0.5-dv change as a threshold in order to protect visibility in sensitive areas. It is the responsibility of the jurisdictional Federal Land Manager or Tribal government responsible for that land to determine when adverse impacts are significant or not, and these may differ from BLM levels for significant adverse impacts.

Visibility impact assessments following FLAG guidance are typically based on the maximum predicted daily (24-hour) visibility impacts on an annual basis. The maximum number of days above threshold values and the maximum predicted impacts are reported. Visibility impact assessments following EPA's regional haze rule guidance (EPA, 2005d) use the annual 98th percentile maximum predicted daily values (8th highest daily value) for assessing visibility impacts.

For each PSD Class I and sensitive Class II area, comparisons of direct project and cumulative change in light extinction impacts to 1.0 and 0.5-dv change thresholds will be provided in the technical support document. Maximum annual predicted visibility impacts will be reported for the BLM, WDEQ, USFS, and regional community location visibility tests along with the corresponding 98th percentile values. For the two BART screening tests only the annual 98th percentile values will be reported.

5.2.3 Deposition

Maximum predicted S and N deposition impacts will be estimated for each analyzed direct project and cumulative source scenario. Predicted direct project impacts will be compared to the National Park Service (NPS) deposition analysis thresholds (DATs) for total N and S deposition in the western U.S., which are defined as 0.005 kilograms per hectare per year (kg/ha-year) for both N and S (NPS, 2001). Total deposition impacts, including background deposition values, from direct project and regional sources will be compared to USFS levels of concern, defined as 5 kg/ha-yr for S and 3 kg/ha-yr for N (Fox et al., 1989). It is understood that the USFS no longer considers these levels of concern to be protective; however, in the absence of alternative FLM-approved values, comparisons with these values will be made.

5.2.4 ANC

The CALPUFF-predicted annual deposition fluxes of S and N at sensitive lake receptors listed in Section 4.4.4 will be used to estimate the change in ANC. The change in ANC will be calculated following the January 2000, USFS Rocky Mountain Region's *Screening Methodology for Calculating ANC Change to High Elevation Lakes, User's Guide* (USFS, 2000). The predicted changes in ANC will be compared with the USFS's Level of Acceptable Change (LAC) thresholds of 10% for lakes with ANC values greater than 25 µeq/l and 1 µeq/l for lakes with background ANC values of 25 µeq/l and less. Lake impacts will be assessed with consideration of limited data points available for several analyzed lakes. ANC calculations will be performed for both Project emissions and for cumulative source emissions.

5.3 MID-FIELD

5.3.1 Ambient Concentration Impacts

Modeled concentrations predicted within PAPA in-field locations from direct project and regional sources will be compared to ambient air quality standards and applicable PSD Class II increments, shown in Table 5.2. Modeled impacts including applicable background concentrations will be compared with ambient air quality standards. Direct project and cumulative impacts will be compared to applicable PSD Class II increments. The PSD demonstrations are for information only and are not regulatory PSD Increment consumption analyses, which would be completed as necessary by the WDEQ-AQD.

5.3.2 Visibility

For each Wyoming regional community location included in the modeling analyses (Boulder, Cora, and Pinedale), comparisons of direct project and cumulative change in light extinction impacts to 1.0-dv change thresholds will be provided. At these mid-field Wyoming community locations impacts to visibility will be assessed, at the request of the Stakeholders group, although these communities are classified as PSD Class II areas where no visibility protection exits under local, state, or federal law.

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Attachment A

Sample CALMET and CALPUFF Input Control Files

CALMET Input Control File

```
Pinedale Anticline Project Sample CALMET Input File, April
Meteorological Data - 2001 MM5 Data, 34 sfc, 61 precip, & 2 ua stations
116 x 138 Modeling Domain w/ 4 km spacing - Lambert Conformal Coordinates
---------------- Run title (3 lines) ----------------------------------------

                    CALMET MODEL CONTROL FILE
                    -------------------------

-------------------------------------------------------------------------------

INPUT GROUP: 0 -- Input and Output File Names


Subgroup (a)
------------
Default Name  Type          File Name
------------  ----          ---------
GEO.DAT       input    ! GEODAT= GEO4KMC.DAT       !
SURF.DAT      input    ! SRFDAT= SURF01_final.DAT  !
CLOUD.DAT     input    * CLDDAT=                   *
PRECIP.DAT    input    ! PRCDAT= PRECIP01.DAT      !
MM4.DAT       input    ! MM4DAT= pinedale_2001-04.mm5 !
WT.DAT        input    * WTDAT=                  *
CALMET.LST    output   ! METLST= apr01.LST     !
CALMET.DAT    output   ! METDAT= apr01.DAT     !
PACOUT.DAT    output   * PACDAT=               *

All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
         T = lower case      ! LCFILES = T !
         F = UPPER CASE

NUMBER OF UPPER AIR & OVERWATER STATIONS:

    Number of upper air stations (NUSTA)  No default     ! NUSTA =  2   !
    Number of overwater met stations
                                 (NOWSTA) No default     ! NOWSTA =  0  !

                       !END!
-------------------------------------------------------------------------------
Subgroup (b)
---------------------------------
Upper air files (one per station)
---------------------------------
Default Name  Type       File Name
------------  ----       ---------
UP1.DAT       input     1  ! UPDAT=upriw01_rev.dat! !END!
UP2.DAT       input     2  ! UPDAT=upslc01_rev.dat! !END!
-------------------------------------------------------------------------------
Subgroup (c)
----------------------------------------
Overwater station files (one per station)
----------------------------------------
Default Name  Type       File Name
------------  ----       ---------
-------------------------------------------------------------------------------
Subgroup (d)
----------------
Other file names
----------------

Default Name  Type       File Name
------------  ----       ---------
DIAG.DAT      input      * DIADAT=                  *
PROG.DAT      input      * PRGDAT=                  *
TEST.PRT      output     * TSTPRT=                  *
TEST.OUT      output     * TSTOUT=                  *
TEST.KIN      output     * TSTKIN=                  *
TEST.FRD      output     * TSTFRD=                  *
TEST.SLP      output     * TSTSLP=                  *
```

```
-------------------------------------------------------------------------------
NOTES: (1) File/path names can be up to 70 characters in length
       (2) Subgroups (a) and (d) must have ONE 'END' (surround by
           delimiters) at the end of the group
       (3) Subgroups (b) and (c) must have an 'END' (surround by
           delimiters) at the end of EACH LINE

                        !END!


-------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
--------------

     Starting date:   Year (IBYR) -- No default       ! IBYR=  2001  !
                     Month (IBMO) -- No default       ! IBMO=  4  !
                       Day (IBDY) -- No default       ! IBDY=  1  !
                      Hour (IBHR) -- No default       ! IBHR=  0  !

     Base time zone        (IBTZ) -- No default       ! IBTZ=  7  !
        PST = 08, MST = 07
        CST = 06, EST = 05

     Length of run (hours) (IRLG) -- No default       ! IRLG=  720  !

     Run type            (IRTYPE) -- Default: 1       ! IRTYPE=  1  !

        0 = Computes wind fields only
        1 = Computes wind fields and micrometeorological variables
            (u*, w*, L, zi, etc.)
        (IRTYPE must be 1 to run CALPUFF or CALGRID)

     Compute special data fields required
     by CALGRID (i.e., 3-D fields of W wind
     components and temperature)
     in additional to regular            Default: T    ! LCALGRD = T !
     fields ? (LCALGRD)
     (LCALGRD must be T to run CALGRID)

      Flag to stop run after
      SETUP phase (ITEST)             Default: 2       ! ITEST=  2   !
      (Used to allow checking
      of the model inputs, files, etc.)
      ITEST = 1 - STOPS program after SETUP phase
      ITEST = 2 - Continues with execution of
                  COMPUTATIONAL phase after SETUP

!END!

-------------------------------------------------------------------------------

INPUT GROUP: 2 -- Map Projection and Grid control parameters
--------------

     Projection for all (X,Y):
     -------------------------

     Map projection
     (PMAP)                     Default: UTM    ! PMAP = LCC  !

         UTM :  Universal Transverse Mercator
         TTM :  Tangential Transverse Mercator
         LCC :  Lambert Conformal Conic
          PS :  Polar Stereographic
          EM :  Equatorial Mercator
        LAZA :  Lambert Azimuthal Equal Area

     False Easting and Northing (km) at the projection origin
     (Used only if PMAP= TTM, LCC, or LAZA)
     (FEAST)                    Default=0.0     ! FEAST  = 0.000  !
```

```
(FNORTH)                  Default=0.0     ! FNORTH = 0.000  !

UTM zone (1 to 60)
(Used only if PMAP=UTM)
(IUTMZN)                  No Default      ! IUTMZN =  12   !

Hemisphere for UTM projection?
(Used only if PMAP=UTM)
(UTMHEM)                  Default: N      ! UTMHEM = N  !
    N   :  Northern hemisphere projection
    S   :  Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin
(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)
(RLAT0)                   No Default      ! RLAT0 = 43.05N  !
(RLON0)                   No Default      ! RLON0 = 109.80W  !

    TTM :  RLON0 identifies central (true N/S) meridian of projection
           RLAT0 selected for convenience
    LCC :  RLON0 identifies central (true N/S) meridian of projection
           RLAT0 selected for convenience
    PS  :  RLON0 identifies central (grid N/S) meridian of projection
           RLAT0 selected for convenience
    EM  :  RLON0 identifies central meridian of projection
           RLAT0 is REPLACED by 0.0N (Equator)
    LAZA:  RLON0 identifies longitude of tangent-point of mapping plane
           RLAT0 identifies latitude of tangent-point of mapping plane

Matching parallel(s) of latitude (decimal degrees) for projection
(Used only if PMAP= LCC or PS)
(XLAT1)                   No Default      ! XLAT1 = 30.000N  !
(XLAT2)                   No Default      ! XLAT2 = 60.000N  !

    LCC :  Projection cone slices through Earth's surface at XLAT1 and XLAT2
    PS  :  Projection plane slices through Earth at XLAT1
           (XLAT2 is not used)

----------
Note:  Latitudes and longitudes should be positive, and include a
       letter N,S,E, or W indicating north or south latitude, and
       east or west longitude.  For example,
       35.9  N Latitude  =  35.9N
       118.7 E Longitude = 118.7E


Datum-region
------------

The Datum-Region for the coordinates is identified by a character
string.  Many mapping products currently available use the model of the
Earth known as the World Geodetic System 1984 (WGS-G ).  Other local
models may be in use, and their selection in CALMET will make its output
consistent with local mapping products.  The list of Datum-Regions with
official transformation parameters provided by the National Imagery and
Mapping Agency (NIMA).

NIMA Datum - Regions(Examples)
-------------------------------------------------------------------------------
WGS-G     WGS-84 GRS 80, Global coverage
NAS-C     NORTH AMERICAN 1927 Clarke 1866, MEAN FOR (CONUS)
NWS-27    NWS 6370KM Radius, Global Sphere (NAD27)
NWS-84    NWS 6370KM Radius, Global Sphere (WGS84)
ESR-S     ESRI REFERENCE Normal Sphere (6371KM Radius), Global Reference Sphere

Datum-region for output coordinates
(DATUM)                   Default: WGS-G     ! DATUM = WGS-G   !


Horizontal grid definition:
---------------------------
```

```
     Rectangular grid defined for projection PMAP,
     with X the Easting and Y the Northing coordinate

            No. X grid cells (NX)      No default     ! NX =   116  !
            No. Y grid cells (NY)      No default     ! NY =   138  !

     Grid spacing (DGRIDKM)            No default     ! DGRIDKM = 4. !
                                       Units: km

     Reference grid coordinate of
     SOUTHWEST corner of grid cell (1,1)

        X coordinate (XORIGKM)         No default     ! XORIGKM = -232.000 !
        Y coordinate (YORIGKM)         No default     ! YORIGKM = -272.000 !
                                       Units: km


     Vertical grid definition:
     -------------------------

        No. of vertical layers (NZ)    No default     ! NZ =  10  !

        Cell face heights in arbitrary
        vertical grid (ZFACE(NZ+1))    No defaults
                                       Units: m
        ! ZFACE = 0.,20.,40.,100.,160.,320.,560.,1000.,1500.,2250.,3200. !

!END!


------------------------------------------------------------------------------

INPUT GROUP: 3 -- Output Options
--------------


    DISK OUTPUT OPTION

       Save met. fields in an unformatted
       output file ?              (LSAVE)  Default: T     ! LSAVE = T !
       (F = Do not save, T = Save)

       Type of unformatted output file:
       (IFORMO)                            Default: 1    ! IFORMO =  1  !

            1 = CALPUFF/CALGRID type file (CALMET.DAT)
            2 = MESOPUFF-II type file     (PACOUT.DAT)


    LINE PRINTER OUTPUT OPTIONS:

       Print met. fields ?  (LPRINT)       Default: F     ! LPRINT = F !
       (F = Do not print, T = Print)
       (NOTE: parameters below control which
              met. variables are printed)

       Print interval
       (IPRINF) in hours                   Default: 1     ! IPRINF =  1  !
       (Meteorological fields are printed
        every  1  hours)


       Specify which layers of U, V wind component
       to print (IUVOUT(NZ)) -- NOTE: NZ values must be entered
       (0=Do not print, 1=Print)
       (used only if LPRINT=T)        Defaults: NZ*0
       ! IUVOUT =  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0  !
       -----------------------


       Specify which levels of the W wind component to print
```

```
(NOTE: W defined at TOP cell face --  10  values)
(IWOUT(NZ)) -- NOTE: NZ values must be entered
(0=Do not print, 1=Print)
(used only if LPRINT=T & LCALGRD=T)
-----------------------------------
                                     Defaults: NZ*0
 ! IWOUT =  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0  !


Specify which levels of the 3-D temperature field to print
(ITOUT(NZ)) -- NOTE: NZ values must be entered
(0=Do not print, 1=Print)
(used only if LPRINT=T & LCALGRD=T)
-----------------------------------
                                     Defaults: NZ*0
 ! ITOUT =  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0  !

Specify which meteorological fields
to print
(used only if LPRINT=T)             Defaults: 0 (all variables)
-----------------------


  Variable            Print ?
                 (0 = do not print,
                  1 = print)
  --------        ------------------

!  STABILITY  =          0           ! - PGT stability class
!  USTAR      =          0           ! - Friction velocity
!  MONIN      =          0           ! - Monin-Obukhov length
!  MIXHT      =          0           ! - Mixing height
!  WSTAR      =          0           ! - Convective velocity scale
!  PRECIP     =          0           ! - Precipitation rate
!  SENSHEAT   =          0           ! - Sensible heat flux
!  CONVZI     =          0           ! - Convective mixing ht.


Testing and debug print options for micrometeorological module

   Print input meteorological data and
   internal variables (LDB)         Default: F       ! LDB = F !
   (F = Do not print, T = print)
   (NOTE: this option produces large amounts of output)

   First time step for which debug data
   are printed (NN1)                Default: 1       ! NN1 =  1  !

   Last time step for which debug data
   are printed (NN2)                Default: 1       ! NN2 =  2  !


Testing and debug print options for wind field module
(all of the following print options control output to
 wind field module's output files: TEST.PRT, TEST.OUT,
 TEST.KIN, TEST.FRD, and TEST.SLP)

   Control variable for writing the test/debug
   wind fields to disk files (IOUTD)
   (0=Do not write, 1=write)        Default: 0       ! IOUTD =  0  !

   Number of levels, starting at the surface,
   to print (NZPRN2)                Default: 1       ! NZPRN2 =  1  !

   Print the INTERPOLATED wind components ?
   (IPR0) (0=no, 1=yes)             Default: 0       !  IPR0 =  0  !

   Print the TERRAIN ADJUSTED surface wind
   components ?
   (IPR1) (0=no, 1=yes)             Default: 0       !  IPR1 =  0  !
```

```
          Print the SMOOTHED wind components and
          the INITIAL DIVERGENCE fields ?
          (IPR2) (0=no, 1=yes)            Default: 0       !  IPR2 =  0  !

          Print the FINAL wind speed and direction
          fields ?
          (IPR3) (0=no, 1=yes)            Default: 0       !  IPR3 =  0  !

          Print the FINAL DIVERGENCE fields ?
          (IPR4) (0=no, 1=yes)            Default: 0       !  IPR4 =  0  !

          Print the winds after KINEMATIC effects
          are added ?
          (IPR5) (0=no, 1=yes)            Default: 0       !  IPR5 =  0  !

          Print the winds after the FROUDE NUMBER
          adjustment is made ?
          (IPR6) (0=no, 1=yes)            Default: 0       !  IPR6 =  0  !

          Print the winds after SLOPE FLOWS
          are added ?
          (IPR7) (0=no, 1=yes)            Default: 0       !  IPR7 =  0  !

          Print the FINAL wind field components ?
          (IPR8) (0=no, 1=yes)            Default: 0       !  IPR8 =  0  !

!END!


------------------------------------------------------------------------------

INPUT GROUP: 4 -- Meteorological data options
--------------

    NO OBSERVATION MODE             (NOOBS)  Default: 0     ! NOOBS =  0   !
          0 = Use surface, overwater, and upper air stations
          1 = Use surface and overwater stations (no upper air observations)
              Use MM5 for upper air data
          2 = No surface, overwater, or upper air observations
              Use MM5 for surface, overwater, and upper air data

    NUMBER OF SURFACE & PRECIP. METEOROLOGICAL STATIONS

       Number of surface stations   (NSSTA)  No default     ! NSSTA =  34  !

       Number of precipitation stations
       (NPSTA=-1: flag for use of MM5 precip data)
                                    (NPSTA)  No default     ! NPSTA =  61  !

    CLOUD DATA OPTIONS
       Gridded cloud fields:
                                  (ICLOUD)  Default: 0     ! ICLOUD =  0  !
       ICLOUD = 0 - Gridded clouds not used
       ICLOUD = 1 - Gridded CLOUD.DAT generated as OUTPUT
       ICLOUD = 2 - Gridded CLOUD.DAT read as INPUT
       ICLOUD = 3 - Gridded cloud cover from Prognostic Rel. Humidity

    FILE FORMATS

       Surface meteorological data file format
                                  (IFORMS)  Default: 2     ! IFORMS =  2  !
       (1 = unformatted (e.g., SMERGE output))
       (2 = formatted   (free-formatted user input))

       Precipitation data file format
                                  (IFORMP)  Default: 2     ! IFORMP =  2  !
       (1 = unformatted (e.g., PMERGE output))
       (2 = formatted   (free-formatted user input))

       Cloud data file format
                                  (IFORMC)  Default: 2     ! IFORMC =  2  !
```

```
       (1 = unformatted - CALMET unformatted output)
       (2 = formatted   - free-formatted CALMET output or user input)

!END!


------------------------------------------------------------------------------

INPUT GROUP: 5 -- Wind Field Options and Parameters
--------------


    WIND FIELD MODEL OPTIONS
       Model selection variable (IWFCOD)     Default: 1      ! IWFCOD =  1  !
          0 = Objective analysis only
          1 = Diagnostic wind module

       Compute Froude number adjustment
       effects ? (IFRADJ)                    Default: 1      ! IFRADJ =  1  !
       (0 = NO, 1 = YES)

       Compute kinematic effects ? (IKINE)   Default: 0      ! IKINE  =  0  !
       (0 = NO, 1 = YES)

       Use O'Brien procedure for adjustment
       of the vertical velocity ? (IOBR)     Default: 0      ! IOBR =  0  !
       (0 = NO, 1 = YES)

       Compute slope flow effects ? (ISLOPE) Default: 1      ! ISLOPE  =  1  !
       (0 = NO, 1 = YES)

       Extrapolate surface wind observations
       to upper layers ? (IEXTRP)            Default: -4     ! IEXTRP = -4  !
       (1 = no extrapolation is done,
        2 = power law extrapolation used,
        3 = user input multiplicative factors
            for layers 2 - NZ used (see FEXTRP array)
        4 = similarity theory used
        -1, -2, -3, -4 = same as above except layer 1 data
            at upper air stations are ignored

       Extrapolate surface winds even
       if calm? (ICALM)                      Default: 0      ! ICALM  =  0  !
       (0 = NO, 1 = YES)

       Layer-dependent biases modifying the weights of
       surface and upper air stations (BIAS(NZ))
         -1<=BIAS<=1
       Negative BIAS reduces the weight of upper air stations
         (e.g. BIAS=-0.1 reduces the weight of upper air stations
       by 10%; BIAS= -1, reduces their weight by 100 %)
       Positive BIAS reduces the weight of surface stations
         (e.g. BIAS= 0.2 reduces the weight of surface stations
       by 20%; BIAS=1 reduces their weight by 100%)
       Zero BIAS leaves weights unchanged (1/R**2 interpolation)
       Default: NZ*0
                               ! BIAS =  -1 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0 ,  0  !

       Minimum distance from nearest upper air station
       to surface station for which extrapolation
       of surface winds at surface station will be allowed
       (RMIN2: Set to -1 for IEXTRP = 4 or other situations
        where all surface stations should be extrapolated)
                                              Default: 4.    ! RMIN2 = -1.0 !

       Use gridded prognostic wind field model
       output fields as input to the diagnostic
       wind field model (IPROG)              Default: 0      ! IPROG =  14  !
       (0 = No, [IWFCOD = 0 or 1]
        1 = Yes, use CSUMM prog. winds as Step 1 field, [IWFCOD = 0]
        2 = Yes, use CSUMM prog. winds as initial guess field [IWFCOD = 1]
```

```
        3 = Yes, use winds from MM4.DAT file as Step 1 field [IWFCOD = 0]
        4 = Yes, use winds from MM4.DAT file as initial guess field [IWFCOD = 1]
        5 = Yes, use winds from MM4.DAT file as observations [IWFCOD = 1]
        13 = Yes, use winds from MM5.DAT file as Step 1 field [IWFCOD = 0]
        14 = Yes, use winds from MM5.DAT file as initial guess field [IWFCOD = 1]
        15 = Yes, use winds from MM5.DAT file as observations [IWFCOD = 1]

      Timestep (hours) of the prognostic
      model input data   (ISTEPPG)          Default: 1      ! ISTEPPG =  1   !

   RADIUS OF INFLUENCE PARAMETERS

      Use varying radius of influence       Default: F      ! LVARY =  F!
      (if no stations are found within RMAX1,RMAX2,
       or RMAX3, then the closest station will be used)

      Maximum radius of influence over land
      in the surface layer (RMAX1)          No default      ! RMAX1 = 20. !
                                            Units: km
      Maximum radius of influence over land
      aloft (RMAX2)                         No default      ! RMAX2 = 40. !
                                            Units: km
      Maximum radius of influence over water
      (RMAX3)                               No default      ! RMAX3 = 40. !
                                            Units: km


   OTHER WIND FIELD INPUT PARAMETERS

      Minimum radius of influence used in
      the wind field interpolation (RMIN)   Default: 0.1    ! RMIN = 0.1 !
                                            Units: km
      Radius of influence of terrain
      features (TERRAD)                     No default      ! TERRAD = 15. !

                                            Units: km
      Relative weighting of the first
      guess field and observations in the
      SURFACE layer (R1)                    No default      ! R1 = 5. !
      (R1 is the distance from an           Units: km
      observational station at which the
      observation and first guess field are
      equally weighted)

      Relative weighting of the first
      guess field and observations in the
      layers ALOFT (R2)                     No default      ! R2 = 15. !
      (R2 is applied in the upper layers    Units: km
      in the same manner as R1 is used in
      the surface layer).

      Relative weighting parameter of the
      prognostic wind field data (RPROG)    No default      ! RPROG = 0. !
      (Used only if IPROG = 1)              Units: km
      ------------------------

      Maximum acceptable divergence in the
      divergence minimization procedure
      (DIVLIM)                              Default: 5.E-6  ! DIVLIM= 5.0E-06 !

      Maximum number of iterations in the
      divergence min. procedure (NITER)     Default: 50     ! NITER =  50  !

      Number of passes in the smoothing
      procedure (NSMTH(NZ))
      NOTE: NZ values must be entered
           Default: 2,(mxnz-1)*4 ! NSMTH =
 2 ,  4 ,  4 ,  4 ,  4 ,  4 ,  4 ,  4 ,  4 ,  4  !

      Maximum number of stations used in
      each layer for the interpolation of
```

```
   data to a grid point (NINTR2(NZ))
   NOTE: NZ values must be entered       Default: 99.    ! NINTR2 =
   99 ,  99 ,  99 ,  99 ,  99 ,  99 ,  99 ,  99 ,  99 ,  99  !

   Critical Froude number (CRITFN)       Default: 1.0    ! CRITFN = 1. !

   Empirical factor controlling the
   influence of kinematic effects
   (ALPHA)                               Default: 0.1    ! ALPHA = 0.1 !

   Multiplicative scaling factor for
   extrapolation of surface observations
   to upper layers (FEXTR2(NZ))          Default: NZ*0.0
   ! FEXTR2 = 0., 0., 0., 0., 0., 0., 0., 0., 0., 0. !
   (Used only if IEXTRP = 3 or -3)


BARRIER INFORMATION

   Number of barriers to interpolation
   of the wind fields (NBAR)             Default: 0      ! NBAR =  0  !

   THE FOLLOWING 4 VARIABLES ARE INCLUDED
   ONLY IF NBAR > 0
   NOTE: NBAR values must be entered     No defaults
         for each variable               Units: km

      X coordinate of BEGINNING
      of each barrier (XBBAR(NBAR))      ! XBBAR = 0. !
      Y coordinate of BEGINNING
      of each barrier (YBBAR(NBAR))      ! YBBAR = 0. !

      X coordinate of ENDING
      of each barrier (XEBAR(NBAR))      ! XEBAR = 0. !
      Y coordinate of ENDING
      of each barrier (YEBAR(NBAR))      ! YEBAR = 0. !


DIAGNOSTIC MODULE DATA INPUT OPTIONS

   Surface temperature (IDIOPT1)         Default: 0      ! IDIOPT1 =  0  !
      0 = Compute internally from
          hourly surface observations
      1 = Read preprocessed values from
          a data file (DIAG.DAT)

      Surface met. station to use for
      the surface temperature (ISURFT)   No default     ! ISURFT =  18  !
      (Must be a value from 1 to NSSTA)
      (Used only if IDIOPT1 = 0)
      --------------------------

   Domain-averaged temperature lapse
   rate (IDIOPT2)                        Default: 0     ! IDIOPT2 =  0  !
      0 = Compute internally from
          twice-daily upper air observations
      1 = Read hourly preprocessed values
          from a data file (DIAG.DAT)

      Upper air station to use for
      the domain-scale lapse rate (IUPT) No default     ! IUPT   =  1 !
      (Must be a value from 1 to NUSTA)
      (Used only if IDIOPT2 = 0)
      --------------------------

      Depth through which the domain-scale
      lapse rate is computed (ZUPT)      Default: 200.  ! ZUPT = 200. !
      (Used only if IDIOPT2 = 0)         Units: meters
      --------------------------

   Domain-averaged wind components
```

```
(IDIOPT3)                              Default: 0     ! IDIOPT3 =  0  !
   0 = Compute internally from
       twice-daily upper air observations
   1 = Read hourly preprocessed values
       a data file (DIAG.DAT)

   Upper air station to use for
   the domain-scale winds (IUPWND)    Default: -1    ! IUPWND = -1  !
   (Must be a value from -1 to NUSTA)
   (Used only if IDIOPT3 = 0)
   --------------------------

   Bottom and top of layer through
   which the domain-scale winds
   are computed
   (ZUPWND(1), ZUPWND(2))        Defaults: 1., 1000. ! ZUPWND= 1., 1000. !
   (Used only if IDIOPT3 = 0)    Units: meters
   --------------------------

Observed surface wind components
for wind field module (IDIOPT4)  Default: 0     ! IDIOPT4 =  0  !
   0 = Read WS, WD from a surface
       data file (SURF.DAT)
   1 = Read hourly preprocessed U, V from
       a data file (DIAG.DAT)

Observed upper air wind components
for wind field module (IDIOPT5)  Default: 0     ! IDIOPT5 =  0  !
   0 = Read WS, WD from an upper
       air data file (UP1.DAT, UP2.DAT, etc.)
   1 = Read hourly preprocessed U, V from
       a data file (DIAG.DAT)

LAKE BREEZE INFORMATION

   Use Lake Breeze Module  (LLBREZE)
                                     Default: F      ! LLBREZE = F !

    Number of lake breeze regions (NBOX)            ! NBOX =  0  !

 X Grid line 1 defining the region of interest
                                                     ! XG1 = 0. !
 X Grid line 2 defining the region of interest
                                                     ! XG2 = 0. !
 Y Grid line 1 defining the region of interest
                                                     ! YG1 = 0. !
 Y Grid line 2 defining the region of interest
                                                     ! YG2 = 0. !

  X Point defining the coastline (Straight line)
            (XBCST)  (KM)   Default: none    ! XBCST = 0. !

  Y Point defining the coastline (Straight line)
            (YBCST)  (KM)   Default: none    ! YBCST = 0. !

  X Point defining the coastline (Straight line)
            (XECST)  (KM)   Default: none    ! XECST = 0. !

  Y Point defining the coastline (Straight line)
            (YECST)  (KM)   Default: none    ! YECST = 0. !


Number of stations in the region     Default: none ! NLB =  0 !
(Surface stations + upper air stations)

Station ID's  in the region   (METBXID(NLB))
(Surface stations first, then upper air stations)
  ! METBXID =  0 !

!END!
```

```
------------------------------------------------------------------------------

INPUT GROUP: 6 -- Mixing Height, Temperature and Precipitation Parameters
--------------

    EMPIRICAL MIXING HEIGHT CONSTANTS

       Neutral, mechanical equation
       (CONSTB)                              Default: 1.41   ! CONSTB = 1.41 !
       Convective mixing ht. equation
       (CONSTE)                              Default: 0.15   ! CONSTE = 0.15 !
       Stable mixing ht. equation
       (CONSTN)                              Default: 2400.  ! CONSTN = 2400.!
       Overwater mixing ht. equation
       (CONSTW)                              Default: 0.16   ! CONSTW = 0.16 !
       Absolute value of Coriolis
       parameter (FCORIOL)                   Default: 1.E-4  ! FCORIOL = 1.0E-04!
                                             Units: (1/s)

    SPATIAL AVERAGING OF MIXING HEIGHTS

       Conduct spatial averaging
       (IAVEZI)  (0=no, 1=yes)               Default: 1      ! IAVEZI =  1  !

       Max. search radius in averaging
       process (MNMDAV)                      Default: 1      ! MNMDAV =  1  !
                                             Units: Grid
                                                    cells
       Half-angle of upwind looking cone
       for averaging (HAFANG)                Default: 30.    ! HAFANG = 30. !
                                             Units: deg.
       Layer of winds used in upwind
       averaging (ILEVZI)                    Default: 1      ! ILEVZI =  1  !
       (must be between 1 and NZ)

    OTHER MIXING HEIGHT VARIABLES

       Minimum potential temperature lapse
       rate in the stable layer above the
       current convective mixing ht.         Default: 0.001  ! DPTMIN = 0.001 !
       (DPTMIN)                              Units: deg. K/m
       Depth of layer above current conv.
       mixing height through which lapse     Default: 200.   ! DZZI = 200. !
       rate is computed (DZZI)               Units: meters

       Minimum overland mixing height        Default:  50.   ! ZIMIN = 50. !
       (ZIMIN)                               Units: meters
       Maximum overland mixing height        Default: 3000.  ! ZIMAX = 3000. !
       (ZIMAX)                               Units: meters
       Minimum overwater mixing height       Default:   50.  ! ZIMINW = 50. !
       (ZIMINW) -- (Not used if observed     Units: meters
       overwater mixing hts. are used)
       Maximum overwater mixing height       Default: 3000.  ! ZIMAXW = 3000. !
       (ZIMAXW) -- (Not used if observed     Units: meters
       overwater mixing hts. are used)


    TEMPERATURE PARAMETERS

       3D temperature from observations or
       from prognostic data? (ITPROG)        Default:0         !ITPROG =  0   !

          0 = Use Surface and upper air stations
              (only if NOOBS = 0)
          1 = Use Surface stations (no upper air observations)
              Use MM5 for upper air data
              (only if NOOBS = 0,1)
          2 = No surface or upper air observations
              Use MM5 for surface and upper air data
              (only if NOOBS = 0,1,2)
```

```
       Interpolation type
       (1 = 1/R ; 2 = 1/R**2)                Default:1         ! IRAD =  1  !

       Radius of influence for temperature
       interpolation (TRADKM)                Default: 500.     ! TRADKM = 500. !
                                             Units: km

       Maximum Number of stations to include
       in temperature interpolation (NUMTS)  Default: 5        ! NUMTS = 5  !

       Conduct spatial averaging of temp-
       eratures (IAVET)  (0=no, 1=yes)         Default: 1     ! IAVET =  1  !
       (will use mixing ht MNMDAV,HAFANG
        so make sure they are correct)

       Default temperature gradient        Default: -.0098 ! TGDEFB = -0.0098 !
       below the mixing height over
       water (K/m) (TGDEFB)

       Default temperature gradient        Default: -.0045 ! TGDEFA = -0.0045 !
       above the mixing height over
       water (K/m) (TGDEFA)

       Beginning (JWAT1) and ending (JWAT2)
       land use categories for temperature                   ! JWAT1 =  999  !
       interpolation over water -- Make                      ! JWAT2 =  999  !
       bigger than largest land use to disable

   PRECIP INTERPOLATION PARAMETERS

       Method of interpolation (NFLAGP)      Default = 2    ! NFLAGP =  2  !
        (1=1/R,2=1/R**2,3=EXP/R**2)
       Radius of Influence (km) (SIGMAP)     Default = 100.0  ! SIGMAP = 100. !
        (0.0 => use half dist. btwn
         nearest stns w & w/out
         precip when NFLAGP = 3)
       Minimum Precip. Rate Cutoff (mm/hr)   Default = 0.01  ! CUTP = 0.01 !
        (values < CUTP = 0.0 mm/hr)
!END!


-------------------------------------------------------------------------------

INPUT GROUP: 7 -- Surface meteorological station parameters
--------------

     SURFACE STATION VARIABLES
     (One record per station --  34  records in all)


             1     2
         Name   ID            X coord.   Y coord.   Time   Anem.
                               (km)       (km)      zone   Ht.(m)
       ---------------------------------------------------------
! SS1  ='KPIH' 25780      -218.40091   -10.51052  7     10.0 !
! SS2  ='KIDA' 25785      -177.12294    52.6585   7      7.9 !
! SS3  ='KMLD' 25786      -198.54764   -93.61361  7      7.9 !
! SS4  ='KU78' 25868      -141.38824   -41.39212  7      9.1 !
! SS5  ='KRXE' 26818      -155.41907    86.02029  7     10.0 !
! SS6  ='KRKS' 25744        59.16297  -155.54793  7     10.0 !
! SS7  ='KRWL' 25745       209.12218  -130.91878  7     10.1 !
! SS8  ='KLND' 25760        84.37669   -24.46433  7     10.0 !
! SS9  ='KRIW' 25765       104.96267     2.69977  7     10.1 !
! SS10 ='KEVW' 25775      -100.06805  -190.8622   7     10.1 !
! SS11 ='KJAC' 25776       -72.8003     59.48678  7     10.1 !
! SS12 ='KBYG' 26654       237.27166   147.69128  7     10.0 !
! SS13 ='KSHR' 26660       216.58147   188.17299  7     10.0 !
! SS14 =' P60' 26664       -47.35795   161.23067  7     10.1 !
! SS15 ='KWRL' 26665       143.43285   100.12221  7      6.1 !
! SS16 ='KGEY' 26667       131.85671   158.91996  7     10.0 !
```

```
! SS17 ='KCOD' 26700        60.13412   157.80002  7     10.0 !
! SS18 ='KBPI' 26710       -23.81807   -50.12008  7     10.1 !
! SS19 ='KWEY' 26763       -99.60432   172.59078  7      9.8 !
! SS20 ='KWYS' 26764      -100.84845   176.15375  7     10.0 !
! SS21 ='KBIL' 26770        93.84694   295.95191  7     10.0 !
! SS22 ='KDLN' 26796      -208.45779   239.76404  7     10.1 !
! SS23 ='KBZN' 26797      -102.66088   294.27092  7     10.1 !
! SS24 ='KLVM' 26798       -47.61005   284.67335  7     10.1 !
! SS25 ='KCAG' 25700       187.62061  -271.50088  7     10.1 !
! SS26 ='KHDN' 25715       209.55603  -270.83858  7     10.1 !
! SS27 ='KLGU' 24796      -164.94212  -134.03061  7     10.1 !
! SS28 ='KVEL' 25705        20.5709   -281.35837  7     10.1 !
! SS29 ='KSLC' 25720      -177.26493  -241.31181  7     10.0 !
! SS30 ='KOGD' 25750      -180.11159  -196.34621  7     10.1 !
! SS31 ='KHIF' 25755      -176.2922   -205.38351  7      4.0 !
! SS32 ='YEL ' 40800       -46.12183   162.29469  7     10.0 !
! SS33 ='PND ' 16500         0.9474    -12.99608  7     10.0 !
! SS34 ='BP  ' 88888        17.81917   -62.49556  7     10.0 !
-------------------
      1
        Four character string for station name
        (MUST START IN COLUMN 9)

      2
        Five digit integer for station ID

!END!


-------------------------------------------------------------------------------

INPUT GROUP: 8 -- Upper air meteorological station parameters
--------------

     UPPER AIR STATION VARIABLES
     (One record per station --  2  records in all)

             1     2
         Name    ID      X coord.   Y coord.  Time zone
                           (km)       (km)
        ----------------------------------------------
! US1  ='KRIW'   24061   104.96267    2.69977   7  !
! US2  ='KSLC'   24127  -177.26493 -241.31181   7  !
-------------------
      1
        Four character string for station name
        (MUST START IN COLUMN 9)

      2
        Five digit integer for station ID

!END!


-------------------------------------------------------------------------------

INPUT GROUP: 9 -- Precipitation station parameters
--------------

     PRECIPITATION STATION VARIABLES
     (One record per station -- 61  records in all)
     (NOT INCLUDED IF NPSTA = 0)

            1          2
         Name   Station    X coord.  Y coord.
                  Code       (km)      (km)
        -----------------------------------
! PS1  ='wy01'   480697    -25.18903     -55.48678   !
! PS2  ='wy02'   481000    127.85275      38.89125   !
! PS3  ='wy03'   482715     11.71824      51.87955   !
! PS4  ='wy04'   483100    -93.33238    -190.96246   !
```

```
! PS5  ='wy05'   484910    -75.60488      46.95638   !
! PS6  ='wy06'   485345    -46.03946     163.04547   !
! PS7  ='wy07'   485390     84.37669     -24.46433   !
! PS8  ='wy08'   486440    -60.83393      86.2015    !
! PS9  ='wy09'   486555    -43.25857    -191.4888    !
! PS10 ='wy10'   486597     71.60517    -185.85961   !
! PS11 ='wy11'   486875    128.4441      -52.41299   !
! PS12 ='wy12'   487375    221.908         2.07873   !
! PS13 ='wy13'   487388     78.96463     186.56739   !
! PS14 ='wy14'   487533    209.12218    -130.91878   !
! PS15 ='wy15'   487760    112.90137      -0.81532   !
! PS16 ='wy16'   487845     59.16297    -155.54793   !
! PS17 ='wy17'   488155    216.58147     188.17299   !
! PS18 ='wy18'   488626    222.41663     168.61917   !
! PS19 ='wy19'   488852    187.05716     112.02419   !
! PS20 ='wy20'   488858    189.11058      85.23487   !
! PS21 ='wy21'   488875    124.73298      65.67754   !
! PS22 ='wy22'   488888     85.65817      72.21319   !
! PS23 ='wy23'   489770    141.99217     105.45823   !
! PS24 ='mt01'   238880     31.4484      268.46619   !
! PS25 ='mt02'   241102     66.84776     245.46093   !
! PS26 ='mt03'   241995    -12.7135      211.18771   !
! PS27 ='mt04'   242414   -214.10091     223.85037   !
! PS28 ='mt05'   244038   -117.00852     196.19446   !
! PS29 ='mt06'   244820   -154.6657      168.36357   !
! PS30 ='mt07'   245030   -213.25997     173.66436   !
! PS31 ='mt08'   245106    184.21809     246.17434   !
! PS32 ='mt09'   248866    -99.57469     174.41529   !
! PS33 ='mt10'   249240    141.37159     245.0234    !
! PS34 ='id01'   102707   -185.15259     131.62072   !
! PS35 ='id02'   103732   -154.80382     -48.27933   !
! PS36 ='id03'   104230   -132.85674     -12.88857   !
! PS37 ='id04'   104456   -155.3827       34.14257   !
! PS38 ='id05'   104598   -120.54867     147.9516    !
! PS39 ='id06'   107211   -218.40091     -10.51052   !
! PS40 ='id07'   109065   -115.21477      86.97115   !
! PS41 ='id08'   109158   -181.07979     -42.21091   !
! PS42 ='ut01'   420342   -154.37442    -256.21165   !
! PS43 ='ut02'   420820   -170.20753    -234.28564   !
! PS44 ='ut03'   421590   -110.16865    -226.63895   !
! PS45 ='ut04'   421759   -162.65911    -259.56512   !
! PS46 ='ut05'   422385   -133.18577    -222.55076   !
! PS47 ='ut06'   422726   -173.81347    -216.21337   !
! PS48 ='ut07'   423348   -221.51477    -259.67418   !
! PS49 ='ut08'   424538   -173.81347    -216.21337   !
! PS50 ='ut09'   425186   -161.0086     -137.67918   !
! PS51 ='ut10'   425194   -167.92116    -146.42983   !
! PS52 ='ut11'   425815    -57.47079    -266.71134   !
! PS53 ='ut12'   425892   -156.9036     -245.38432   !
! PS54 ='ut13'   426374   -117.32655    -248.04269   !
! PS55 ='ut14'   426404   -174.52533    -191.1179    !
! PS56 ='ut15'   426414   -181.31211    -192.76148   !
! PS57 ='ut16'   426648   -140.72813    -254.68803   !
! PS58 ='ut17'   426757   -180.66118    -169.42997   !
! PS59 ='ut18'   426938   -188.80849    -124.34066   !
! PS60 ='ut19'   427598   -177.26493    -241.31181   !
! PS61 ='ut20'   427846   -146.29735    -261.78067   !

-------------------
      1
        Four character string for station name
        (MUST START IN COLUMN 9)

      2
        Six digit station code composed of state
        code (first 2 digits) and station ID (last
        4 digits)

!END!
```

CALPUFF Input Control File

```
Pinedale Anticline – Sample CALPUFF Input File


---------------- Run title (3 lines) ----------------------------------------

                    CALPUFF MODEL CONTROL FILE
                    --------------------------

------------------------------------------------------------------------------

INPUT GROUP: 0 -- Input and Output File Names

--------------
Default Name  Type          File Name
------------  ----          ---------
CALMET.DAT    input    * METDAT =             *
    or
ISCMET.DAT    input    * ISCDAT =             *
    or
PLMMET.DAT    input    * PLMDAT =             *
    or
PROFILE.DAT   input    * PRFDAT =             *
SURFACE.DAT   input    * SFCDAT =             *
RESTARTB.DAT  input    * RSTARTB=             *
------------------------------------------------------------------------------
CALPUFF.LST   output   ! PUFLST =CALPUFF.LST   !
CONC.DAT      output   ! CONDAT =CONC.DAT      !
DFLX.DAT      output   ! DFDAT  =DFLX.DAT      !
WFLX.DAT      output   ! WFDAT  =WFLX.DAT      !

VISB.DAT      output   * VISDAT =  *
RESTARTE.DAT  output   * RSTARTE=             *
------------------------------------------------------------------------------
Emission Files
--------------
PTEMARB.DAT   input    * PTDAT  =             *
VOLEMARB.DAT  input    * VOLDAT =             *
BAEMARB.DAT   input    * ARDAT  =             *
LNEMARB.DAT   input    * LNDAT  =             *
------------------------------------------------------------------------------
Other Files
-----------
OZONE.DAT     input    ! OZDAT  =2001ozone.dat    !
VD.DAT        input    * VDDAT  =             *
CHEM.DAT      input    * CHEMDAT=             *
H2O2.DAT      input    * H2O2DAT=             *
HILL.DAT      input    * HILDAT=             *
HILLRCT.DAT   input    * RCTDAT=             *
COASTLN.DAT   input    * CSTDAT=             *
FLUXBDY.DAT   input    * BDYDAT=             *
BCON.DAT      input    * BCNDAT=             *
DEBUG.DAT     output   * DEBUG =             *
MASSFLX.DAT   output   * FLXDAT=             *
MASSBAL.DAT   output   * BALDAT=             *
FOG.DAT       output   * FOGDAT=             *
------------------------------------------------------------------------------
All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
         T = lower case      ! LCFILES = T !
         F = UPPER CASE
NOTE: (1) file/path names can be up to 70 characters in length


Provision for multiple input files
----------------------------------

     Number of CALMET.DAT files for run (NMETDAT)
                                    Default: 1       ! NMETDAT =   12 !

     Number of PTEMARB.DAT files for run (NPTDAT)
                                    Default: 0       ! NPTDAT =  0  !

     Number of BAEMARB.DAT files for run (NARDAT)
                                    Default: 0       ! NARDAT =  0  !

     Number of VOLEMARB.DAT files for run (NVOLDAT)
                                    Default: 0       ! NVOLDAT =  0  !

!END!
```

```
-------------
Subgroup (0a)
-------------

  The following CALMET.DAT filenames are processed in sequence if NMETDAT>1

Default Name  Type          File Name
------------  ----          ---------
 none         input    ! METDAT=jan01.dat     !  !END!
 none         input    ! METDAT=feb01.dat     !  !END!
 none         input    ! METDAT=mar01.dat     !  !END!
 none         input    ! METDAT=apr01.dat     !  !END!
 none         input    ! METDAT=may01.dat     !  !END!
 none         input    ! METDAT=jun01.dat     !  !END!
 none         input    ! METDAT=jul01.dat     !  !END!
 none         input    ! METDAT=aug01.dat     !  !END!
 none         input    ! METDAT=sep01.dat     !  !END!
 none         input    ! METDAT=oct01.dat     !  !END!
 none         input    ! METDAT=nov01.dat     !  !END!
 none         input    ! METDAT=dec01.dat     !  !END!

--------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
--------------

    Option to run all periods found
    in the met. file     (METRUN)   Default: 0       ! METRUN =   0  !

         METRUN = 0 - Run period explicitly defined below
         METRUN = 1 - Run all periods in met. file

     Starting date:   Year (IBYR) -- No default       ! IBYR =  2001  !
     (used only if   Month (IBMO) -- No default       ! IBMO =  1  !
      METRUN = 0)      Day (IBDY) -- No default       ! IBDY =  1  !
                      Hour (IBHR) -- No default       ! IBHR =  1  !

     Base time zone        (XBTZ) -- No default       ! XBTZ = 7.0  !
        PST = 8., MST = 7.
        CST = 6., EST = 5.

     Length of run (hours) (IRLG) -- No default       ! IRLG =  8760 !

     Number of chemical species (NSPEC)
                                     Default: 5       ! NSPEC =  7   !

     Number of chemical species
     to be emitted  (NSE)            Default: 3       ! NSE =  4     !

     Flag to stop run after
     SETUP phase (ITEST)             Default: 2       ! ITEST =  2   !
     (Used to allow checking
     of the model inputs, files, etc.)
           ITEST = 1 - STOPS program after SETUP phase
           ITEST = 2 - Continues with execution of program
                       after SETUP

     Restart Configuration:

        Control flag (MRESTART)      Default: 0       ! MRESTART =  0   !

           0 = Do not read or write a restart file
           1 = Read a restart file at the beginning of
               the run
           2 = Write a restart file during run
           3 = Read a restart file at beginning of run
               and write a restart file during run

        Number of periods in Restart
        output cycle (NRESPD)        Default: 0       ! NRESPD =  0   !

           0 = File written only at last period
          >0 = File updated every NRESPD periods

     Meteorological Data Format (METFM)
                                     Default: 1       ! METFM =  1   !

           METFM = 1 - CALMET binary file (CALMET.MET)
           METFM = 2 - ISC ASCII file (ISCMET.MET)
           METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
```

```
          METFM = 4 - CTDM plus tower file (PROFILE.DAT) and
                      surface parameters file (SURFACE.DAT)

     PG sigma-y is adjusted by the factor (AVET/PGTIME)**0.2
     Averaging Time (minutes) (AVET)
                                    Default: 60.0    ! AVET = 60. !
     PG Averaging Time (minutes) (PGTIME)
                                    Default: 60.0    ! PGTIME = 60. !


!END!


-------------------------------------------------------------------------------

INPUT GROUP: 2 -- Technical options
--------------


     Vertical distribution used in the
     near field (MGAUSS)                  Default: 1     ! MGAUSS =  1   !
        0 = uniform
        1 = Gaussian

     Terrain adjustment method
     (MCTADJ)                             Default: 3     ! MCTADJ =  3   !
        0 = no adjustment
        1 = ISC-type of terrain adjustment
        2 = simple, CALPUFF-type of terrain
            adjustment
        3 = partial plume path adjustment

     Subgrid-scale complex terrain
     flag (MCTSG)                         Default: 0     ! MCTSG =  0   !
        0 = not modeled
        1 = modeled

     Near-field puffs modeled as
     elongated 0 (MSLUG)                  Default: 0     ! MSLUG =  0   !
        0 = no
        1 = yes (slug model used)

     Transitional plume rise modeled ?
     (MTRANS)                             Default: 1     ! MTRANS =  1   !
        0 = no  (i.e., final rise only)
        1 = yes (i.e., transitional rise computed)

     Stack tip downwash? (MTIP)           Default: 1     ! MTIP =  1  !
        0 = no  (i.e., no stack tip downwash)
        1 = yes (i.e., use stack tip downwash)

     Vertical wind shear modeled above
     stack top? (MSHEAR)                  Default: 0     ! MSHEAR =  0  !
        0 = no  (i.e., vertical wind shear not modeled)
        1 = yes (i.e., vertical wind shear modeled)

     Puff splitting allowed? (MSPLIT)     Default: 0     ! MSPLIT =  0  !
        0 = no (i.e., puffs not split)
        1 = yes (i.e., puffs are split)

     Chemical mechanism flag (MCHEM)      Default: 1     ! MCHEM =  1   !
        0 = chemical transformation not
            modeled
        1 = transformation rates computed
            internally (MESOPUFF II scheme)
        2 = user-specified transformation
            rates used
        3 = transformation rates computed
            internally (RIVAD/ARM3 scheme)
        4 = secondary organic aerosol formation
            computed (MESOPUFF II scheme for OH)

     Aqueous phase transformation flag (MAQCHEM)
     (Used only if MCHEM = 1, or 3)       Default: 0     ! MAQCHEM =  0   !
        0 = aqueous phase transformation
            not modeled
        1 = transformation rates adjusted
            for aqueous phase reactions

     Wet removal modeled ? (MWET)         Default: 1     ! MWET =  1   !
        0 = no
```

```
   1 = yes

Dry deposition modeled ? (MDRY)       Default: 1     ! MDRY =  1   !
   0 = no
   1 = yes
   (dry deposition method specified
    for each species in Input Group 3)

Method used to compute dispersion
coefficients (MDISP)                  Default: 3     ! MDISP =  3   !

   1 = dispersion coefficients computed from measured values
       of turbulence, sigma v, sigma w
   2 = dispersion coefficients from internally calculated
       sigma v, sigma w using micrometeorological variables
       (u*, w*, L, etc.)
   3 = PG dispersion coefficients for RURAL areas (computed using
       the ISCST multi-segment approximation) and MP coefficients in
       urban areas
   4 = same as 3 except PG coefficients computed using
       the MESOPUFF II eqns.
   5 = CTDM sigmas used for stable and neutral conditions.
       For unstable conditions, sigmas are computed as in
       MDISP = 3, described above.  MDISP = 5 assumes that
       measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)
(Used only if MDISP = 1 or 5)         Default: 3     ! MTURBVW =  3  !
   1 = use sigma-v or sigma-theta measurements
       from PROFILE.DAT to compute sigma-y
       (valid for METFM = 1, 2, 3, 4)
   2 = use sigma-w measurements
       from PROFILE.DAT to compute sigma-z
       (valid for METFM = 1, 2, 3, 4)
   3 = use both sigma-(v/theta) and sigma-w
       from PROFILE.DAT to compute sigma-y and sigma-z
       (valid for METFM = 1, 2, 3, 4)
   4 = use sigma-theta measurements
       from PLMMET.DAT to compute sigma-y
       (valid only if METFM = 3)

Back-up method used to compute dispersion
when measured turbulence data are
missing (MDISP2)                      Default: 3     ! MDISP2 =  3  !
(used only if MDISP = 1 or 5)
   2 = dispersion coefficients from internally calculated
       sigma v, sigma w using micrometeorological variables
       (u*, w*, L, etc.)
   3 = PG dispersion coefficients for RURAL areas (computed using
       the ISCST multi-segment approximation) and MP coefficients in
       urban areas
   4 = same as 3 except PG coefficients computed using
       the MESOPUFF II eqns.

PG sigma-y,z adj. for roughness?      Default: 0     ! MROUGH =  0  !
(MROUGH)
   0 = no
   1 = yes

Partial plume penetration of          Default: 1     ! MPARTL =  1  !
elevated inversion?
(MPARTL)
   0 = no
   1 = yes

Strength of temperature inversion     Default: 0     ! MTINV =  0  !
provided in PROFILE.DAT extended records?
(MTINV)
   0 = no (computed from measured/default gradients)
   1 = yes

PDF used for dispersion under convective conditions?
                                      Default: 0     ! MPDF =  0  !
(MPDF)
   0 = no
   1 = yes

Sub-Grid TIBL module used for shore line?
                                      Default: 0     ! MSGTIBL = 0  !
(MSGTIBL)
   0 = no
```

```
        1 = yes

     Boundary conditions (concentration) modeled?
                                          Default: 0     ! MBCON = 0  !
     (MBCON)
        0 = no
        1 = yes


     Analyses of fogging and icing impacts due to emissions from
     arrays of mechanically-forced cooling towers can be performed
     using CALPUFF in conjunction with a cooling tower emissions
     processor (CTEMISS) and its associated postprocessors.  Hourly
     emissions of water vapor and temperature from each cooling tower
     cell are computed for the current cell configuration and ambient
     conditions by CTEMISS. CALPUFF models the dispersion of these
     emissions and provides cloud information in a specialized format
     for further analysis. Output to FOG.DAT is provided in either
     'plume mode' or 'receptor mode' format.

     Configure for FOG Model output?
                                          Default: 0     ! MFOG =  0   !
     (MFOG)
        0 = no
        1 = yes  - report results in PLUME Mode format
        2 = yes  - report results in RECEPTOR Mode format


     Test options specified to see if
     they conform to regulatory
     values? (MREG)                       Default: 1     ! MREG =  0   !

        0 = NO checks are made
        1 = Technical options must conform to USEPA
            Long Range Transport (LRT) guidance
                        METFM    1 or 2
                        AVET     60. (min)
                        PGTIME   60. (min)
                        MGAUSS   1
                        MCTADJ   3
                        MTRANS   1
                        MTIP     1
                        MCHEM    1 or 3 (if modeling SOx, NOx)
                        MWET     1
                        MDRY     1
                        MDISP    2 or 3
                        MPDF     0 if MDISP=3
                                 1 if MDISP=2
                        MROUGH   0
                        MPARTL   1
                        SYTDEP   550. (m)
                        MHFTSZ   0


!END!


------------------------------------------------------------------------------

INPUT GROUP: 3a, 3b -- Species list
-------------------

------------
Subgroup (3a)
------------

  The following species are modeled:

! CSPEC =          SO2 !         !END!
! CSPEC =          SO4 !         !END!
! CSPEC =          NOX !         !END!
! CSPEC =         HNO3 !         !END!
! CSPEC =          NO3 !         !END!
! CSPEC =          PMF !         !END!
! CSPEC =          PMC !         !END!


                                                     Dry                OUTPUT GROUP
    SPECIES          MODELED          EMITTED       DEPOSITED              NUMBER
     NAME         (0=NO, 1=YES)    (0=NO, 1=YES)    (0=NO,               (0=NONE,
   (Limit: 12                                        1=COMPUTED-GAS       1=1st CGRUP,
```

```
    Characters                                        2=COMPUTED-PARTICLE   2=2nd CGRUP,
    in length)                                        3=USER-SPECIFIED)     3= etc.)

!          SO2  =         1,               1,           1,                 0   !
!          SO4  =         1,               0,           2,                 0   !
!          NOX  =         1,               1,           1,                 0   !
!         HNO3  =         1,               0,           1,                 0   !
!          NO3  =         1,               0,           2,                 0   !
!          PMF  =         1,               1,           2,                 0   !
!          PMC  =         1,               1,           2,                 0   !

!END!

-------------
Subgroup (3b)
-------------
  The following names are used for Species-Groups in which results
  for certain species are combined (added) prior to output.  The
  CGRUP name will be used as the species name in output files.
  Use this feature to model specific particle-size distributions
  by treating each size-range as a separate species.
  Order must be consistent with 3(a) above.



-------------------------------------------------------------------------------


INPUT GROUP: 4 -- Map Projection and Grid control parameters
--------------

     Projection for all (X,Y):
     -------------------------

     Map projection
     (PMAP)                     Default: UTM    ! PMAP = LCC  !

         UTM :  Universal Transverse Mercator
         TTM :  Tangential Transverse Mercator
         LCC :  Lambert Conformal Conic
          PS :  Polar Stereographic
          EM :  Equatorial Mercator
        LAZA :  Lambert Azimuthal Equal Area

     False Easting and Northing (km) at the projection origin
     (Used only if PMAP= TTM, LCC, or LAZA)
     (FEAST)                    Default=0.0     ! FEAST  = 0.000  !
     (FNORTH)                   Default=0.0     ! FNORTH = 0.000  !

     UTM zone (1 to 60)
     (Used only if PMAP=UTM)
     (IUTMZN)                   No Default      ! IUTMZN =  12   !

     Hemisphere for UTM projection?
     (Used only if PMAP=UTM)
     (UTMHEM)                   Default: N      ! UTMHEM = N  !
         N   :  Northern hemisphere projection
         S   :  Southern hemisphere projection

     Latitude and Longitude (decimal degrees) of projection origin
     (Used only if PMAP= TTM, LCC, PS, EM, or LAZA)
     (RLAT0)                    No Default      ! RLAT0 =  43.05N  !
     (RLON0)                    No Default      ! RLON0 =  109.80W  !

         TTM :  RLON0 identifies central (true N/S) meridian of projection
                RLAT0 selected for convenience
         LCC :  RLON0 identifies central (true N/S) meridian of projection
                RLAT0 selected for convenience
         PS  :  RLON0 identifies central (grid N/S) meridian of projection
                RLAT0 selected for convenience
         EM  :  RLON0 identifies central meridian of projection
                RLAT0 is REPLACED by 0.0N (Equator)
         LAZA:  RLON0 identifies longitude of tangent-point of mapping plane
                RLAT0 identifies latitude of tangent-point of mapping plane

     Matching parallel(s) of latitude (decimal degrees) for projection
     (Used only if PMAP= LCC or PS)
     (XLAT1)                    No Default      ! XLAT1 =  30N  !
     (XLAT2)                    No Default      ! XLAT2 =  60N  !

         LCC :  Projection cone slices through Earth's surface at XLAT1 and XLAT2
```

```
         PS  :  Projection plane slices through Earth at XLAT1
                (XLAT2 is not used)

     ----------
     Note:  Latitudes and longitudes should be positive, and include a
            letter N,S,E, or W indicating north or south latitude, and
            east or west longitude.  For example,
            35.9  N Latitude  =  35.9N
            118.7 E Longitude = 118.7E


     Datum-region
     ------------

     The Datum-Region for the coordinates is identified by a character
     string.  Many mapping products currently available use the model of the
     Earth known as the World Geodetic System 1984 (WGS-G ).  Other local
     models may be in use, and their selection in CALMET will make its output
     consistent with local mapping products.  The list of Datum-Regions with
     official transformation parameters provided by the National Imagery and
     Mapping Agency (NIMA).

     NIMA Datum - Regions(Examples)
     ------------------------------------------------------------------------------
     WGS-G     WGS-84 GRS 80, Global coverage
     NAS-C     NORTH AMERICAN 1927 Clarke 1866, MEAN FOR (CONUS)
     NWS-27    NWS 6370KM Radius, Global Sphere (NAD27)
     NWS-84    NWS 6370KM Radius, Global Sphere (WGS84)
     ESR-S     ESRI REFERENCE Normal Sphere (6371KM Radius), Global Reference Sphere

     Datum-region for output coordinates
     (DATUM)                    Default: WGS-G     ! DATUM = WGS-G  !


METEOROLOGICAL Grid:

     Rectangular grid defined for projection PMAP,
     with X the Easting and Y the Northing coordinate

            No. X grid cells (NX)      No default     ! NX =  116   !
            No. Y grid cells (NY)      No default     ! NY =  138  !
        No. vertical layers (NZ)       No default     ! NZ =  10   !

          Grid spacing (DGRIDKM)       No default     ! DGRIDKM = 4. !
                                       Units: km

               Cell face heights
                   (ZFACE(nz+1))       No defaults
                                       Units: m
        ! ZFACE = 0.,20.,40.,100.,160.,320.,560.,1000.,1500.,2250.,3200. !


            Reference Coordinates
          of SOUTHWEST corner of
                grid cell(1, 1):

        X coordinate (XORIGKM)         No default     ! XORIGKM = -232.000 !
        Y coordinate (YORIGKM)         No default     ! YORIGKM = -272.000 !
                                      Units: km


COMPUTATIONAL Grid:

     The computational grid is identical to or a subset of the MET. grid.
     The lower left (LL) corner of the computational grid is at grid point
     (IBCOMP, JBCOMP) of the MET. grid.  The upper right (UR) corner of the
     computational grid is at grid point (IECOMP, JECOMP) of the MET. grid.
     The grid spacing of the computational grid is the same as the MET. grid.

        X index of LL corner (IBCOMP)      No default     ! IBCOMP =  1   !
                  (1 <= IBCOMP <= NX)

        Y index of LL corner (JBCOMP)      No default     ! JBCOMP =  1   !
                  (1 <= JBCOMP <= NY)


        X index of UR corner (IECOMP)      No default     ! IECOMP =  116   !
                  (1 <= IECOMP <= NX)

        Y index of UR corner (JECOMP)      No default     ! JECOMP =  138   !
                  (1 <= JECOMP <= NY)
```

```
SAMPLING Grid (GRIDDED RECEPTORS):

     The lower left (LL) corner of the sampling grid is at grid point
     (IBSAMP, JBSAMP) of the MET. grid.  The upper right (UR) corner of the
     sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid.
     The sampling grid must be identical to or a subset of the computational
     grid.  It may be a nested grid inside the computational grid.
     The grid spacing of the sampling grid is DGRIDKM/MESHDN.

        Logical flag indicating if gridded
        receptors are used (LSAMP)         Default: T     ! LSAMP = F !
        (T=yes, F=no)

        X index of LL corner (IBSAMP)      No default     ! IBSAMP =   1  !
         (IBCOMP <= IBSAMP <= IECOMP)

        Y index of LL corner (JBSAMP)      No default     ! JBSAMP =   1  !
         (JBCOMP <= JBSAMP <= JECOMP)


        X index of UR corner (IESAMP)      No default     ! IESAMP =   1  !
         (IBCOMP <= IESAMP <= IECOMP)

        Y index of UR corner (JESAMP)      No default     ! JESAMP =   1  !
         (JBCOMP <= JESAMP <= JECOMP)


       Nesting factor of the sampling
        grid (MESHDN)                      Default: 1     ! MESHDN =  2  !
        (MESHDN is an integer >= 1)

!END!


-------------------------------------------------------------------------------


INPUT GROUP: 5 -- Output Options
--------------
                                          *                          *
     FILE                        DEFAULT VALUE             VALUE THIS RUN
     ----                        -------------             --------------

   Concentrations (ICON)               1                   !  ICON =  1   !
   Dry Fluxes (IDRY)                   1                   !  IDRY =  1   !
   Wet Fluxes (IWET)                   1                   !  IWET =  1   !
   Relative Humidity (IVIS)            1                   !  IVIS =  1   !
    (relative humidity file is
     required for visibility
     analysis)
   Use data compression option in output file?
   (LCOMPRS)                            Default: T         ! LCOMPRS = T !

   *
    0 = Do not create file, 1 = create file


    DIAGNOSTIC MASS FLUX OUTPUT OPTIONS:

       Mass flux across specified boundaries
       for selected species reported hourly?
       (IMFLX)                          Default: 0         ! IMFLX =  0  !
         0 = no
         1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames
                  are specified in Input Group 0)

       Mass balance for each species
       reported hourly?
       (IMBAL)                          Default: 0         ! IMBAL =  0  !
         0 = no
         1 = yes (MASSBAL.DAT filename is
              specified in Input Group 0)


    LINE PRINTER OUTPUT OPTIONS:

       Print concentrations (ICPRT)     Default: 0         ! ICPRT =  0   !
       Print dry fluxes (IDPRT)         Default: 0         ! IDPRT =  0   !
```

```
       Print wet fluxes (IWPRT)        Default: 0         ! IWPRT =  0   !
       (0 = Do not print, 1 = Print)

       Concentration print interval
       (ICFRQ) in hours                Default: 1         ! ICFRQ =  1   !
       Dry flux print interval
       (IDFRQ) in hours                Default: 1         ! IDFRQ =  1   !
       Wet flux print interval
       (IWFRQ) in hours                Default: 1         ! IWFRQ =  1   !

       Units for Line Printer Output
       (IPRTU)                         Default: 1         ! IPRTU =  3   !
                      for            for
                 Concentration    Deposition
           1 =       g/m**3         g/m**2/s
           2 =      mg/m**3        mg/m**2/s
           3 =      ug/m**3        ug/m**2/s
           4 =      ng/m**3        ng/m**2/s
           5 =     Odour Units

       Messages tracking progress of run
       written to the screen ?
       (IMESG)                         Default: 2         ! IMESG =  2   !
         0 = no
         1 = yes (advection step, puff ID)
         2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)


     SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

                  ---- CONCENTRATIONS ----   ------ DRY FLUXES ------   ------ WET FLUXES ------   -- MASS FLUX
--
   SPECIES
   /GROUP          PRINTED?  SAVED ON DISK?   PRINTED?  SAVED ON DISK?   PRINTED?  SAVED ON DISK?   SAVED ON
DISK?
   -------        ------------------------   ------------------------   ------------------------   -------------
--
!          SO2 =     0,           1,           0,           1,           0,           1,           0   !
!          SO4 =     0,           1,           0,           1,           0,           1,           0   !
!          NOX =     0,           1,           0,           1,           0,           1,           0   !
!         HNO3 =     0,           1,           0,           1,           0,           1,           0   !
!          NO3 =     0,           1,           0,           1,           0,           1,           0   !
!          PMF =     0,           1,           0,           1,           0,           1,           0
!
!          PMC =     0,           1,           0,           1,           0,           1,           0   !

     OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

       Logical for debug output
       (LDEBUG)                                Default: F     ! LDEBUG = F !

       First puff to track
       (IPFDEB)                                Default: 1     ! IPFDEB =  1  !

       Number of puffs to track
       (NPFDEB)                                Default: 1     ! NPFDEB =  1  !

       Met. period to start output
       (NN1)                                   Default: 1     ! NN1 =  1   !

       Met. period to end output
       (NN2)                                   Default: 10    ! NN2 =  10  !

!END!


-------------------------------------------------------------------------------


INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs
-------------------------

---------------
Subgroup (6a)
---------------
       Number of terrain features (NHILL)      Default: 0     ! NHILL =  0   !

       Number of special complex terrain
       receptors  (NCTREC)                     Default: 0     ! NCTREC =  0   !

       Terrain and CTSG Receptor data for
```

```
       CTSG hills input in CTDM format ?
       (MHILL)                                  No Default     ! MHILL =  0   !
       1 = Hill and Receptor data created
           by CTDM processors & read from
           HILL.DAT and HILLRCT.DAT files
       2 = Hill data created by OPTHILL &
           input below in Subgroup (6b);
           Receptor data in Subgroup (6c)

       Factor to convert horizontal dimensions  Default: 1.0   ! XHILL2M = 1. !
       to meters (MHILL=1)

       Factor to convert vertical dimensions    Default: 1.0   ! ZHILL2M = 1. !
       to meters (MHILL=1)

       X-origin of CTDM system relative to      No Default     ! XCTDMKM = 0.0E00 !
       CALPUFF coordinate system, in Kilometers (MHILL=1)

       Y-origin of CTDM system relative to      No Default     ! YCTDMKM = 0.0E00 !
       CALPUFF coordinate system, in Kilometers (MHILL=1)

! END !

---------------
Subgroup (6b)
---------------

                      1 **
     HILL information


HILL            XC         YC        THETAH  ZGRID  RELIEF    EXPO 1    EXPO 2   SCALE 1    SCALE 2    AMAX1
AMAX2
 NO.           (km)       (km)       (deg.)   (m)     (m)       (m)       (m)       (m)        (m)       (m)
(m)
----          ----       ----      ------  -----  ------    ------    ------   -------    -------    -----     -
----

---------------
Subgroup (6c)
---------------

    COMPLEX TERRAIN RECEPTOR INFORMATION

                      XRCT         YRCT        ZRCT          XHH
                      (km)         (km)         (m)
                     ------        -----      ------         ----


-------------------
1
     Description of Complex Terrain Variables:
          XC, YC  = Coordinates of center of hill
          THETAH  = Orientation of major axis of hill (clockwise from
                    North)
          ZGRID   = Height of the  0  of the grid above mean sea
                    level
          RELIEF  = Height of the crest of the hill above the grid elevation
          EXPO 1  = Hill-shape exponent for the major axis
          EXPO 2  = Hill-shape exponent for the major axis
          SCALE 1 = Horizontal length scale along the major axis
          SCALE 2 = Horizontal length scale along the minor axis
          AMAX    = Maximum allowed axis length for the major axis
          BMAX    = Maximum allowed axis length for the major axis

          XRCT, YRCT = Coordinates of the complex terrain receptors
          ZRCT    = Height of the ground (MSL) at the complex terrain
                    Receptor
          XHH     = Hill number associated with each complex terrain receptor
                    (NOTE: MUST BE ENTERED AS A REAL NUMBER)

   **
     NOTE: DATA for each hill and CTSG receptor are treated as a separate
           input subgroup and therefore must end with an input group terminator.

-------------------------------------------------------------------------------


INPUT GROUP: 7 -- Chemical parameters for dry deposition of gases
--------------
```

```
      SPECIES       DIFFUSIVITY        ALPHA  STAR        REACTIVITY     MESOPHYLL  RESISTANCE       HENRY'S  LAW
COEFFICIENT
       NAME        (cm**2/s)                                            (s/cm)                (dimensionless)
      -------     -----------      ----------      ----------    --------------------     ----------

!          SO2 =     0.1509,         1000.,            8.,                0.,                  0.04 !
!          NOX =     0.1656,            1.,            8.,                5.,                   3.5 !
!         HNO3 =     0.1628,            1.,           18.,                0.,            0.00000008 !

!END!


--------------------------------------------------------------------------------


INPUT GROUP: 8 -- Size parameters for dry deposition of particles
--------------

     For SINGLE SPECIES, the mean and standard deviation are used to
     compute a deposition velocity for NINT (see group 9) size-ranges,
     and these are then averaged to obtain a mean deposition velocity.

     For GROUPED SPECIES, the size distribution should be explicitly
     specified (by the 'species' in the group), and the standard deviation
     for each should be entered as 0.  The model will then use the
     deposition velocity for the stated mean diameter.

      SPECIES      GEOMETRIC MASS MEAN        GEOMETRIC STANDARD
       NAME             DIAMETER                  DEVIATION
                        (microns)                 (microns)
      -------      -------------------        ------------------
!          SO4 =          0.48,                      2.   !
!          NO3 =          0.48,                      2.   !
!          PMF =          0.48,                      2.   !
!          PMC =          3.00,                      2.   !

!END!


--------------------------------------------------------------------------------


INPUT GROUP: 9 -- Miscellaneous dry deposition parameters
--------------

     Reference cuticle resistance (s/cm)
     (RCUTR)                          Default: 30    !  RCUTR = 30.0 !
     Reference ground resistance  (s/cm)
     (RGR)                            Default: 10    !    RGR = 10.0 !
     Reference pollutant reactivity
     (REACTR)                         Default: 8     ! REACTR = 8.0 !

     Number of particle-size intervals used to
     evaluate effective particle deposition velocity
     (NINT)                           Default: 9     !   NINT =  9  !

     Vegetation state in unirrigated areas
     (IVEG)                           Default: 1     !   IVEG =  1   !
        IVEG=1 for active and unstressed vegetation
        IVEG=2 for active and stressed vegetation
        IVEG=3 for inactive vegetation

!END!


--------------------------------------------------------------------------------


INPUT GROUP: 10 -- Wet Deposition Parameters
---------------


                      Scavenging Coefficient -- Units: (sec)**(-1)

       Pollutant      Liquid Precip.       Frozen Precip.
       ---------      --------------       --------------
!          SO2 =         3.0E-05,              0.0E00 !
!          SO4 =         1.0E-04,             3.0E-05 !
!         HNO3 =         6.0E-05,              0.0E00 !
!          NO3 =         1.0E-04,             3.0E-05 !
!         PM10 =         1.0E-04,             3.0E-05 !
```

```
!END!

------------------------------------------------------------------------------

INPUT GROUP: 11 -- Chemistry Parameters
---------------

     Ozone data input option (MOZ)     Default: 1            ! MOZ =  1   !
     (Used only if MCHEM = 1, 3, or 4)
        0 = use a monthly background ozone value
        1 = read hourly ozone concentrations from
            the OZONE.DAT data file

     Monthly ozone concentrations
     (Used only if MCHEM = 1, 3, or 4 and
      MOZ = 0 or MOZ = 1 and all hourly O3 data missing)
     (BCKO3) in ppb                    Default: 12*80.
     !  BCKO3 = 44.70, 44.70, 44.70, 44.70, 44.70, 44.70, 44.70, 44.70, 44.70, 44.70, 44.70, 44.70 !

     Monthly ammonia concentrations
     (Used only if MCHEM = 1, or 3)
     (BCKNH3) in ppb                   Default: 12*10.
     !  BCKNH3 = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !

     Nighttime SO2 loss rate (RNITE1)
     in percent/hour                   Default: 0.2          ! RNITE1 = .2 !

     Nighttime NOx loss rate (RNITE2)
     in percent/hour                   Default: 2.0          ! RNITE2 = 2.0 !

     Nighttime HNO3 formation rate (RNITE3)
     in percent/hour                   Default: 2.0          ! RNITE3 = 2.0 !

     H2O2 data input option (MH2O2)    Default: 1            ! MH2O2 =  1   !
     (Used only if MAQCHEM = 1)
        0 = use a monthly background H2O2 value
        1 = read hourly H2O2 concentrations from
            the H2O2.DAT data file

     Monthly H2O2 concentrations
     (Used only if MQACHEM = 1 and
      MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)
     (BCKH2O2) in ppb                  Default: 12*1.
     !  BCKH2O2 = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !


 --- Data for SECONDARY ORGANIC AEROSOL (SOA) Option
     (used only if MCHEM = 4)

     The SOA module uses monthly values of:
          Fine particulate concentration in ug/m^3 (BCKPMF)
          Organic fraction of fine particulate     (OFRAC)
          VOC / NOX ratio (after reaction)         (VCNX)
     to characterize the air mass when computing
     the formation of SOA from VOC emissions.
     Typical values for several distinct air mass types are:

        Month    1    2    3    4    5    6    7    8    9   10   11   12
                Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

     Clean Continental
        BCKPMF   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
        OFRAC  .15  .15  .20  .20  .20  .20  .20  .20  .20  .20  .20  .15
        VCNX    50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.

     Clean Marine (surface)
        BCKPMF  .5   .5   .5   .5   .5   .5   .5   .5   .5   .5   .5   .5
        OFRAC  .25  .25  .30  .30  .30  .30  .30  .30  .30  .30  .30  .25
        VCNX    50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.

     Urban - low biogenic (controls present)
        BCKPMF  30.  30.  30.  30.  30.  30.  30.  30.  30.  30.  30.  30.
        OFRAC  .20  .20  .25  .25  .25  .25  .25  .25  .20  .20  .20  .20
        VCNX     4.   4.   4.   4.   4.   4.   4.   4.   4.   4.   4.   4.

     Urban - high biogenic (controls present)
        BCKPMF  60.  60.  60.  60.  60.  60.  60.  60.  60.  60.  60.  60.
        OFRAC  .25  .25  .30  .30  .30  .55  .55  .55  .35  .35  .35  .25
```

```
        VCNX    15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.

     Regional Plume
        BCKPMF  20.  20.  20.  20.  20.  20.  20.  20.  20.  20.  20.  20.
        OFRAC  .20  .20  .25  .35  .25  .40  .40  .40  .30  .30  .30  .20
        VCNX    15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.

     Urban - no controls present
        BCKPMF 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100.
        OFRAC  .30  .30  .35  .35  .35  .55  .55  .55  .35  .35  .35  .30
        VCNX     2.   2.   2.   2.   2.   2.   2.   2.   2.   2.   2.   2.

     Default: Clean Continental
     !  BCKPMF = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !
     !  OFRAC  = 0.15, 0.15, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.15 !
     !  VCNX   = 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00 !


!END!


------------------------------------------------------------------------------


INPUT GROUP: 12 -- Misc. Dispersion and Computational Parameters
---------------

     Horizontal size of puff (m) beyond which
     time-dependent dispersion equations (Heffter)
     are used to determine sigma-y and
     sigma-z (SYTDEP)                          Default: 550.   ! SYTDEP = 5.5E02 !

     Switch for using Heffter equation for sigma z
     as above (0 = Not use Heffter; 1 = use Heffter
     (MHFTSZ)                                  Default: 0      ! MHFTSZ =  0   !

     Stability class used to determine plume
     growth rates for puffs above the boundary
     layer (JSUP)                              Default: 5      ! JSUP =  5   !

     Vertical dispersion constant for stable
     conditions (k1 in Eqn. 2.7-3)  (CONK1)    Default: 0.01   ! CONK1 = .01 !

     Vertical dispersion constant for neutral/
     unstable conditions (k2 in Eqn. 2.7-4)
     (CONK2)                                   Default: 0.1    ! CONK2 = .1 !

     Factor for determining Transition-point from
     Schulman-Scire to Huber-Snyder Building Downwash
     scheme (SS used for Hs < Hb + TBD * HL)
     (TBD)                                     Default: 0.5    ! TBD = .5 !
        TBD < 0   ==> always use Huber-Snyder
        TBD = 1.5 ==> always use Schulman-Scire
        TBD = 0.5 ==> ISC Transition-point

     Range of land use categories for which
     urban dispersion is assumed
     (IURB1, IURB2)                            Default: 10     ! IURB1 =  10  !
                                                        19     ! IURB2 =  19  !

     Site characterization parameters for single-point Met data files ---------
     (needed for METFM = 2,3,4)

        Land use category for modeling domain
        (ILANDUIN)                             Default: 20     ! ILANDUIN =  20  !

        Roughness length (m) for modeling domain
        (Z0IN)                                 Default: 0.25   ! Z0IN = .25 !

        Leaf area index for modeling domain
        (XLAIIN)                               Default: 3.0    ! XLAIIN = 3.0 !

        Elevation above sea level (m)
        (ELEVIN)                               Default: 0.0    ! ELEVIN = .0 !

        Latitude (degrees) for met location
        (XLATIN)                               Default: -999.  ! XLATIN = -999.0 !

        Longitude (degrees) for met location
        (XLONIN)                               Default: -999.  ! XLONIN = -999.0 !
```

```
Specialized information for interpreting single-point Met data files -----

   Anemometer height (m) (Used only if METFM = 2,3)
   (ANEMHT)                                Default: 10.    ! ANEMHT = 10.0 !

   Form of lateral turbulance data in PROFILE.DAT file
   (Used only if METFM = 4 or MTURBVW = 1 or 3)
   (ISIGMAV)                               Default: 1      ! ISIGMAV =  0  !
       0 = read sigma-theta
       1 = read sigma-v

   Choice of mixing heights (Used only if METFM = 4)
   (IMIXCTDM)                              Default: 0      ! IMIXCTDM =  0  !
       0 = read PREDICTED mixing heights
       1 = read OBSERVED mixing heights

Maximum length of a slug (met. grid units)
(XMXLEN)                                   Default: 1.0    ! XMXLEN = 1.0 !

Maximum travel distance of a puff/slug (in
grid units) during one sampling step
(XSAMLEN)                                  Default: 1.0    ! XSAMLEN = 1.0 !

Maximum Number of slugs/puffs release from
one source during one time step
(MXNEW)                                    Default: 99     ! MXNEW =  99   !

Maximum Number of sampling steps for
one puff/slug during one time step
(MXSAM)                                    Default: 99     ! MXSAM =  99   !

Number of iterations used when computing
the transport wind for a sampling step
that includes gradual rise (for CALMET
and PROFILE winds)
(NCOUNT)                                   Default: 2      ! NCOUNT =  2   !

Minimum sigma y for a new puff/slug (m)
(SYMIN)                                    Default: 1.0    ! SYMIN = 1.0  !

Minimum sigma z for a new puff/slug (m)
(SZMIN)                                    Default: 1.0    ! SZMIN = 1.0  !

Default minimum turbulence velocities
sigma-v and sigma-w for each
stability class (m/s)
(SVMIN(6) and SWMIN(6))     Default SVMIN : .50,  .50,  .50,  .50,  .50,  .50
                            Default SWMIN : .20,  .12,  .08,  .06,  .03,  .016

                         Stability Class :  A     B     C     D     E     F
                                           ---   ---   ---   ---   ---   ---
                                  ! SVMIN = 0.500, 0.500, 0.500, 0.500, 0.500, 0.500!
                                  ! SWMIN = 0.200, 0.120, 0.080, 0.060, 0.030, 0.016!

Divergence criterion for dw/dz across puff
used to initiate adjustment for horizontal
convergence (1/s)
Partial adjustment starts at CDIV(1), and
full adjustment is reached at CDIV(2)
(CDIV(2))                                  Default: 0.0,0.0  ! CDIV = .0, .0 !

Minimum wind speed (m/s) allowed for
non-calm conditions. Also used as minimum
speed returned when using power-law
extrapolation toward surface
(WSCALM)                                   Default: 0.5    ! WSCALM = .5 !

Maximum mixing height (m)
(XMAXZI)                                   Default: 3000.  ! XMAXZI = 3000.0 !

Minimum mixing height (m)
(XMINZI)                                   Default: 50.    ! XMINZI = 50.0 !

Default wind speed classes --
5 upper bounds (m/s) are entered;
the 6th class has no upper limit
(WSCAT(5))                     Default   :
                               ISC RURAL : 1.54, 3.09, 5.14, 8.23, 10.8 (10.8+)

                          Wind Speed Class :  1     2     3     4     5
                                             ---   ---   ---   ---   ---
```

```
                                  ! WSCAT = 1.54, 3.09, 5.14, 8.23, 10.80 !

Default wind speed profile power-law
exponents for stabilities 1-6
(PLX0(6))                       Default   : ISC RURAL values
                                ISC RURAL : .07, .07, .10, .15, .35, .55
                                ISC URBAN : .15, .15, .20, .25, .30, .30

                          Stability Class :  A     B     C     D     E     F
                                             ---   ---   ---   ---   ---   ---
                                     ! PLX0 = 0.07, 0.07, 0.10, 0.15, 0.35, 0.55 !

Default potential temperature gradient
for stable classes E, F (degK/m)
(PTG0(2))                       Default: 0.020, 0.035
                                     ! PTG0 = 0.020,   0.035 !

Default plume path coefficients for
each stability class (used when option
for partial plume height terrain adjustment
is selected -- MCTADJ=3)
(PPC(6))                  Stability Class :  A     B     C     D     E     F
                             Default  PPC : .50,  .50,  .50,  .50,  .35,  .35
                                             ---   ---   ---   ---   ---   ---
                                     !  PPC = 0.50, 0.50, 0.50, 0.50, 0.35, 0.35 !

Slug-to-puff transition criterion factor
equal to sigma-y/length of slug
(SL2PF)                                Default: 10.        ! SL2PF = 10.0 !

Puff-splitting control variables ------------------------

  VERTICAL SPLIT
  --------------

  Number of puffs that result every time a puff
  is split - nsplit=2 means that 1 puff splits
  into 2
  (NSPLIT)                             Default:   3        ! NSPLIT =  3  !

  Time(s) of a day when split puffs are eligible to
  be split once again; this is typically set once
  per day, around sunset before nocturnal shear develops.
  24 values: 0 is midnight (00:00) and 23 is 11 PM (23:00)
  0=do not re-split    1=eligible for re-split
  (IRESPLIT(24))                       Default:  Hour 17 = 1
  !  IRESPLIT = 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0 !

  Split is allowed only if last hour's mixing
  height (m) exceeds a minimum value
  (ZISPLIT)                            Default: 100.       ! ZISPLIT = 100.0 !

  Split is allowed only if ratio of last hour's
  mixing ht to the maximum mixing ht experienced
  by the puff is less than a maximum value (this
  postpones a split until a nocturnal layer develops)
  (ROLDMAX)                            Default: 0.25       ! ROLDMAX = 0.25 !


  HORIZONTAL SPLIT
  ----------------

  Number of puffs that result every time a puff
  is split - nsplith=5 means that 1 puff splits
  into 5
  (NSPLITH)                            Default:   5        ! NSPLITH =  5  !

  Minimum sigma-y (Grid Cells Units) of puff
  before it may be split
  (SYSPLITH)                           Default:  1.0       ! SYSPLITH = 1.0 !

  Minimum puff elongation rate (SYSPLITH/hr) due to
  wind shear, before it may be split
  (SHSPLITH)                           Default:  2.        ! SHSPLITH = 2.0 !

  Minimum concentration (g/m^3) of each
  species in puff before it may be split
  Enter array of NSPEC values; if a single value is
  entered, it will be used for ALL species
  (CNSPLITH)                           Default:  1.0E-07   ! CNSPLITH = 1.0E-07 !
```

```
     Integration control variables ------------------------

       Fractional convergence criterion for numerical SLUG
       sampling integration
       (EPSSLUG)                          Default:   1.0e-04  ! EPSSLUG = 1.0E-04 !

       Fractional convergence criterion for numerical AREA
       source integration
       (EPSAREA)                          Default:   1.0e-06  ! EPSAREA = 1.0E-06 !

       Trajectory step-length (m) used for numerical rise
       integration
       (DSRISE)                           Default:   1.0      ! DSRISE = 1.0 !

!END!


-------------------------------------------------------------------------------


INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters
--------------------------------

---------------
Subgroup (13a)
---------------

     Number of point sources with
     parameters provided below      (NPT1)  No default  !  NPT1 =  0 !

     Units used for point source
     emissions below                (IPTU)  Default: 1  !  IPTU =   1  !
           1 =        g/s
           2 =       kg/hr
           3 =       lb/hr
           4 =     tons/yr
           5 =     Odour Unit * m**3/s  (vol. flux of odour compound)
           6 =     Odour Unit * m**3/min
           7 =     metric tons/yr

     Number of source-species
     combinations with variable
     emissions scaling factors
     provided below in (13d)        (NSPT1) Default: 0  !  NSPT1 =  0  !

     Number of point sources with
     variable emission parameters
     provided in external file      (NPT2)  No default  !  NPT2 =  0  !

     (If NPT2 > 0, these point
     source emissions are read from
     the file: PTEMARB.DAT)

!END!

---------------
Subgroup (13b)
---------------
                                       a
          POINT SOURCE: CONSTANT DATA
          ----------------------------
                                                                          b          c
  Source      X UTM     Y UTM     Stack   Base     Stack    Exit  Exit    Bldg.  Emission
   No.     Coordinate Coordinate Height Elevation Diameter  Vel.  Temp.   Dwash   Rates
              (km)      (km)       (m)      (m)       (m)  (m/s) (deg. K)
  ------   ---------- ---------- ------  ------   -------- ----- -------- ----- --------



--------

    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.

     SRCNAM  is a 12-character name for a source
             (No default)
     X       is an array holding the source data listed by the column headings
             (No default)
     SIGYZI  is an array holding the initial sigma-y and sigma-z (m)
             (Default: 0.,0.)
```

```
     FMFAC   is a vertical momentum flux factor (0. or 1.0) used to represent
             the effect of rain-caps or other physical configurations that
             reduce momentum rise associated with the actual exit velocity.
             (Default: 1.0  -- full momentum used)

    b
     0. = No building downwash modeled, 1. = downwash modeled
     NOTE: must be entered as a REAL number (i.e., with decimal point)

    c
     An emission rate must be entered for every pollutant modeled.
     Enter emission rate of zero for secondary pollutants that are
     modeled, but not emitted.  Units are specified by IPTU
     (e.g. 1 for g/s).

---------------
Subgroup (13c)
---------------

           BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH
           -------------------------------------------------------
Source                                                                  a
 No.       Effective building width and height (in meters) every 10 degrees
------     ---------------------------------------------------------------

--------

    a
     Each pair of width and height values is treated as a separate input
     subgroup and therefore must end with an input group terminator.

---------------
Subgroup (13d)
---------------
                                                a
          POINT SOURCE: VARIABLE EMISSIONS DATA
          -------------------------------------

     Use this subgroup to describe temporal variations in the emission
     rates given in 13b.  Factors entered multiply the rates in 13b.
     Skip sources here that have constant emissions.  For more elaborate
     variation in source parameters, use PTEMARB.DAT and NPT2 > 0.

     IVARY determines the type of variation, and is source-specific:
     (IVARY)                                Default: 0
           0 =       Constant
           1 =       Diurnal cycle (24 scaling factors: hours 1-24)
           2 =       Monthly cycle (12 scaling factors: months 1-12)
           3 =       Hour & Season (4 groups of 24 hourly scaling factors,
                                    where first group is DEC-JAN-FEB)
           4 =       Speed & Stab. (6 groups of 6 scaling factors, where
                                    first group is Stability Class A,
                                    and the speed classes have upper
                                    bounds (m/s) defined in Group 12
           5 =       Temperature   (12 scaling factors, where temperature
                                    classes have upper bounds (C) of:
                                    0, 5, 10, 15, 20, 25, 30, 35, 40,
                                    45, 50, 50+)



--------
    a
     Data for each species are treated as a separate input subgroup
     and therefore must end with an input group terminator.


--------------------------------------------------------------------------------


INPUT GROUPS: 14a, 14b, 14c, 14d -- Area source parameters
--------------------------------

---------------
Subgroup (14a)
---------------

     Number of polygon area sources with
     parameters specified below (NAR1)       No default  !  NAR1 =  0   !

     Units used for area source
```

```
     emissions below            (IARU)       Default: 1  !  IARU =   1  !
           1 =        g/m**2/s
           2 =       kg/m**2/hr
           3 =       lb/m**2/hr
           4 =     tons/m**2/yr
           5 =     Odour Unit * m/s  (vol. flux/m**2 of odour compound)
           6 =     Odour Unit * m/min
           7 =     metric tons/m**2/yr

     Number of source-species
     combinations with variable
     emissions scaling factors
     provided below in (14d)        (NSAR1) Default: 0  !  NSAR1 =  0  !

     Number of buoyant polygon area sources
     with variable location and emission
     parameters (NAR2)                      No default  !  NAR2 =  0   !
     (If NAR2 > 0, ALL parameter data for
     these sources are read from the file: BAEMARB.DAT)

!END!

---------------
Subgroup (14b)
---------------
                                    a
          AREA SOURCE: CONSTANT DATA
          ----------------------------
                                                          b
Source           Effect.    Base      Initial    Emission
 No.             Height   Elevation   Sigma z     Rates
                   (m)       (m)        (m)
-------          ------    ------     --------   ---------
Subgroup (14b)


--------
    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.
    b
     An emission rate must be entered for every pollutant modeled.
     Enter emission rate of zero for secondary pollutants that are
     modeled,  but not emitted.  Units are specified by IARU
     (e.g. 1 for g/m**2/s).

---------------
Subgroup (14c)
---------------

           COORDINATES (UTM-km) FOR EACH VERTEX(4) OF EACH POLYGON
           -------------------------------------------------------
Source                                                              a
 No.       Ordered list of X followed by list of Y,  grouped by source
------     ---------------------------------------------------------


--------
    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.


---------------
Subgroup (14d)
---------------
                                          a
          AREA SOURCE: VARIABLE EMISSIONS DATA
          ------------------------------------

     Use this subgroup to describe temporal variations in the emission
     rates given in 14b.  Factors entered multiply the rates in 14b.
     Skip sources here that have constant emissions.  For more elaborate
     variation in source parameters, use BAEMARB.DAT and NAR2 > 0.

     IVARY determines the type of variation, and is source-specific:
     (IVARY)                                Default: 0
           0 =       Constant
           1 =       Diurnal cycle (24 scaling factors: hours 1-24)
           2 =       Monthly cycle (12 scaling factors: months 1-12)
           3 =       Hour & Season (4 groups of 24 hourly scaling factors,
```

```
                                 where first group is DEC-JAN-FEB)
           4 =       Speed & Stab. (6 groups of 6 scaling factors, where
                                 first group is Stability Class A,
                                 and the speed classes have upper
                                 bounds (m/s) defined in Group 12
           5 =       Temperature   (12 scaling factors, where temperature
                                 classes have upper bounds (C) of:
                                 0, 5, 10, 15, 20, 25, 30, 35, 40,
                                 45, 50, 50+)



--------
    a
     Data for each species are treated as a separate input subgroup
     and therefore must end with an input group terminator.


-------------------------------------------------------------------------------

INPUT GROUPS: 15a, 15b, 15c -- Line source parameters
---------------------------

---------------
Subgroup (15a)
---------------

     Number of buoyant line sources
     with variable location and emission
     parameters (NLN2)                             No default  !  NLN2 =  0   !

     (If NLN2 > 0, ALL parameter data for
      these sources are read from the file: LNEMARB.DAT)

     Number of buoyant line sources (NLINES)       No default   ! NLINES =  0  !

     Units used for line source
     emissions below               (ILNU)          Default: 1  !  ILNU =   1  !
           1 =        g/s
           2 =       kg/hr
           3 =       lb/hr
           4 =     tons/yr
           5 =     Odour Unit * m**3/s  (vol. flux of odour compound)
           6 =     Odour Unit * m**3/min
           7 =     metric tons/yr

     Number of source-species
     combinations with variable
     emissions scaling factors
     provided below in (15c)       (NSLN1) Default: 0  !  NSLN1 =  0  !

     Maximum number of segments used to model
     each line (MXNSEG)                            Default: 7   ! MXNSEG =  7  !

     The following variables are required only if NLINES > 0.  They are
     used in the buoyant line source plume rise calculations.

        Number of distances at which               Default: 6   ! NLRISE =  6  !
        transitional rise is computed

        Average building length (XL)               No default   ! XL = .0 !
                                                   (in meters)

        Average building height (HBL)              No default   ! HBL = .0 !
                                                   (in meters)

        Average building width (WBL)               No default   ! WBL = .0 !
                                                   (in meters)

        Average line source width (WML)            No default   ! WML = .0 !
                                                   (in meters)

        Average separation between buildings (DXL) No default   ! DXL = .0 !
                                                   (in meters)

        Average buoyancy parameter (FPRIMEL)       No default   ! FPRIMEL = .0 !
                                                   (in m**4/s**3)

!END!

---------------
```

```
Subgroup (15b)
---------------

          BUOYANT LINE SOURCE: CONSTANT DATA
          ----------------------------------
                                                                                a
Source     Beg. X      Beg. Y      End. X    End. Y     Release    Base        Emission
 No.     Coordinate  Coordinate  Coordinate Coordinate  Height    Elevation      Rates
            (km)        (km)        (km)       (km)       (m)       (m)
------   ----------  ----------  ---------  ----------  -------   ---------    ---------

    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.

    b
     An emission rate must be entered for every pollutant modeled.
     Enter emission rate of zero for secondary pollutants that are
     modeled, but not emitted.  Units are specified by ILNTU
     (e.g. 1 for g/s).

---------------
Subgroup (15c)
---------------
                                                        a
          BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA
          --------------------------------------------

     Use this subgroup to describe temporal variations in the emission
     rates given in 15b.  Factors entered multiply the rates in 15b.
     Skip sources here that have constant emissions.

     IVARY determines the type of variation, and is source-specific:
     (IVARY)                                Default: 0
           0 =       Constant
           1 =       Diurnal cycle (24 scaling factors: hours 1-24)
           2 =       Monthly cycle (12 scaling factors: months 1-12)
           3 =       Hour & Season (4 groups of 24 hourly scaling factors,
                                    where first group is DEC-JAN-FEB)
           4 =       Speed & Stab. (6 groups of 6 scaling factors, where
                                    first group is Stability Class A,
                                    and the speed classes have upper
                                    bounds (m/s) defined in Group 12
           5 =       Temperature   (12 scaling factors, where temperature
                                    classes have upper bounds (C) of:
                                    0, 5, 10, 15, 20, 25, 30, 35, 40,
                                    45, 50, 50+)


--------
    a
     Data for each species are treated as a separate input subgroup
     and therefore must end with an input group terminator.


-------------------------------------------------------------------------------


INPUT GROUPS: 16a, 16b, 16c -- Volume source parameters
---------------------------

---------------
Subgroup (16a)
---------------

     Number of volume sources with
     parameters provided in 16b,c (NVL1)     No default  !  NVL1 =  0   !

     Units used for volume source
     emissions below in 16b       (IVLU)     Default: 1  !  IVLU =   4  !
           1 =        g/s
           2 =       kg/hr
           3 =       lb/hr
           4 =     tons/yr
           5 =     Odour Unit * m**3/s  (vol. flux of odour compound)
           6 =     Odour Unit * m**3/min
           7 =     metric tons/yr

     Number of source-species
     combinations with variable
```

```
     emissions scaling factors
     provided below in (16c)      (NSVL1)    Default: 0  !  NSVL1 =  0  !

     Number of volume sources with
     variable location and emission
     parameters                   (NVL2)     No default  !  NVL2 =   0   !

     (If NVL2 > 0, ALL parameter data for
      these sources are read from the VOLEMARB.DAT file(s) )

!END!

---------------
Subgroup (16b)
---------------
                                        a
           VOLUME SOURCE: CONSTANT DATA
           ----------------------------
                                                                          b
        X UTM      Y UTM      Effect.    Base     Initial    Initial    Emission
     Coordinate  Coordinate   Height   Elevation  Sigma y    Sigma z     Rates
        (km)       (km)        (m)       (m)        (m)        (m)
     ----------  ----------   ------    ------    --------   --------   --------


--------
    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.

    b
     An emission rate must be entered for every pollutant modeled.
     Enter emission rate of zero for secondary pollutants that are
     modeled, but not emitted.  Units are specified by IVLU
     (e.g. 1 for g/s).

---------------
Subgroup (16c)
---------------
                                              a
          VOLUME SOURCE: VARIABLE EMISSIONS DATA
          --------------------------------------

     Use this subgroup to describe temporal variations in the emission
     rates given in 16b.  Factors entered multiply the rates in 16b.
     Skip sources here that have constant emissions.  For more elaborate
     variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

     IVARY determines the type of variation, and is source-specific:
     (IVARY)                                Default: 0
           0 =       Constant
           1 =       Diurnal cycle (24 scaling factors: hours 1-24)
           2 =       Monthly cycle (12 scaling factors: months 1-12)
           3 =       Hour & Season (4 groups of 24 hourly scaling factors,
                                    where first group is DEC-JAN-FEB)
           4 =       Speed & Stab. (6 groups of 6 scaling factors, where
                                    first group is Stability Class A,
                                    and the speed classes have upper
                                    bounds (m/s) defined in Group 12
           5 =       Temperature   (12 scaling factors, where temperature
                                    classes have upper bounds (C) of:
                                    0, 5, 10, 15, 20, 25, 30, 35, 40,
                                    45, 50, 50+)



--------
    a
     Data for each species are treated as a separate input subgroup
     and therefore must end with an input group terminator.


-------------------------------------------------------------------------------

INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information
-----------------------

---------------
Subgroup (17a)
---------------
```

```
     Number of non-gridded receptors (NREC)  No default  !  NREC =  0   !

!END!

---------------
Subgroup (17b)
---------------
                                                    a
           NON-GRIDDED (DISCRETE) RECEPTOR DATA
           ------------------------------------

                  X UTM       Y UTM        Ground        Height   b
Receptor       Coordinate   Coordinate    Elevation   Above Ground
  No.             (km)        (km)           (m)           (m)
--------       ----------   ----------    ---------   ------------
-------------
    a
     Data for each receptor are treated as a separate input subgroup
     and therefore must end with an input group terminator.

    b
     Receptor height above ground is optional.  If no value is entered,
     the receptor is placed on the ground.
```

Appendix B

Near-Field Modeling Analysis AERMOD Parameters

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Table B.1- Pinedale Anticline Near-Field Modeling PM10 Source Emissions and Modeling Parameters

Table B.2 – Pinedale Anticline Near-Field Modeling PM2.5 Source Emissions and Modeling Parameters

Table B.3 – Pinedale Anticline Near-Field Modeling Drill Rig and Modeling Parameters

Table B.4 – Pinedale Anticline Near-Field Modeling Compression Modeling Summary

Table B.5 – Pinedale Anticline Near-Field Modeling HAPs Sources Emissions and Modeling Parameters

Table B.1
Pinedale Anticline Near-Field Modeling
PM_{10} Source Emissions and Modeling Parameters

PM_{10} Sources	Modeled Emission Rate	Modeled Area Source	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Area Source Release Height	Area Source X_{int}	Area Source Y_{int}	Volume Source Release Height	Volume Source s y_{int}	Volume Source s z_{int}
	(lb/hr)	(m^2)	($g/s/m^2$)	(g/s)			(m)	(m)	(m)	(m)	(m)	(m)
Well Pad Construction	0.750			0.095	Volume	16 volume sources representing the well pad area. Information given for one volume source.				5	33.1	4.65
Road Construction	0.338			0.052	Volume	13 volume sources representing the newly constructed road (~3/16 mile). Information given for one volume source.				5	9.3	4.65
Well Pad Construction Traffic	0.053			0.007	Volume	Heavy equipment exhaust added in volume source representing the well pad area.				5	33.1	4.65
Road Construction Traffic	0.065			0.008	Volume	Heavy equipment exhaust added in volume source representing the newly constructed road.				5	9.3	4.65
Well Pad Wind Erosion	7.560	80980	1.18E-05		Area	Area source centered around the well pad.	0	284.57	284.57			
Access Road Wind Erosion	1.580	2600	7.66E-05		Area	Area source covering the newly constructed road.	0	260	10			

Table B.2
Pinedale Anticline Near-Field Modeling
$PM_{2.5}$ Source Emissions and Modeling Parameters

$PM_{2.5}$ Sources	Modeled Emission Rate	Modeled Area Source	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Area Source Release Height	Area Source X_{int}	Area Source Y_{int}	Volume Source Release Height	Volume Source s y_{int}	Volume Source s z_{int}
	(lb/hr)	(m^2)	($g/s/m^2$)	(g/s)			(m)	(m)	(m)	(m)	(m)	(m)
Well Pad Construction	0.198			0.095	Volume	16 volume sources representing the well pad area. Information given for one volume source.				5	33.1	4.65
Road Construction	0.089			0.052	Volume	13 volume sources representing the newly constructed road (~3/16 mile). Information given for one volume source.				5	9.3	4.65
Well Pad Construction Traffic	0.053			0.007	Volume	Heavy equipment exhaust added in volume source representing the well pad area.				5	33.1	4.65
Road Construction Traffic	0.065			0.008	Volume	Heavy equipment exhaust added in volume source representing the newly constructed road.				5	9.3	4.65
Well Pad Wind Erosion	3.020	80980	4.70E-06		Area	Area source centered around the well pad.	0	284.57	284.57			
Access Road Wind Erosion	0.630	2600	3.05E-05		Area	Area source covering the newly constructed road.	0	260	10			

Table B.3
Pinedale Anticline Near-Field Modeling
Drill Rig and Modeling Parameters

SO_2 Sources	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Stack Height	Stack Temperature	Stack Velocity	Stack Diameter
	(lb/hr)	(g/s)			(m)	(K)	(m/s)	(m)
Drilling Rig (stack 1)	0.157	0.020	Point	Three stacks per drill rig centered on pad. See additional comment.	6.1	675	30	0.2
Drilling Rig (stack 2)	0.157	0.020	Point		6.1	700	25	0.2
Drilling Rig (stack 3)	0.157	0.020	Point		6.1	725	20	0.2

All three stack parameter scenarios are for each drill rig.
There are a total of four drill rigs per section for tier 1and 2 (12 stacks) and two drill rigs for tier 0 analysis (6 stacks).

Table B.4
Pinedale Anticline Near-Field Modeling
Compression Modeling Summary

			Source Location UTM Zone 13		Stack Parameters					Modeled Emissions		
Facility	Stack ID	Source Type	Easting	Northing	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	Stack Parameter and Emissions Source	NOx (g/s)	CO (g/s)	Formaldehyde (g/s)
Paradise C.S.	PE1	Point	597497.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE2	Point	597505.9	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE3	Point	597515.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE4	Point	597524.2	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE5	Point	597533.3	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE6	Point	597542.5	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE7	Point	597551.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE8	Point	597560.0	4726451.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.713	0.256	0.081
Paradise C.S.	PE9	Point	597569.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE10	Point	597578.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE11	Point	597587.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE12	Point	597596.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE13	Point	597605.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE14	Point	597614.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE15	Point	597623.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE16	Point	597632.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE17	Point	597641.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE18	Point	597650.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE19	Point	597659.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE20	Point	597668.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PE21	Point	597677.0	4726416.7	14.80	726.50	28.65	0.71	Paradise Permit Application	0.717	0.257	0.082
Paradise C.S.	PG1	Point	597575.2	4726393.7	12.80	808.00	21.67	0.50	Paradise Permit Application	0.500	0.129	0.035
Paradise C.S.	PG2	Point	597581.3	4726393.7	12.80	808.00	21.67	0.50	Paradise Permit Application	0.500	0.129	0.035
Paradise C.S.	PVRU	Point	597593.4	4726491.5	9.10	832.00	16.70	0.20	Paradise Permit Application	0.070	0.014	0.005
Paradise C.S.	PH1	Point	597567.6		5.50	561.00	2.09	0.61	Paradise Permit Application	0.050	0.041	0.001
Paradise C.S.	PEF1	Point	597623.4	4726526.5	11.00	1273.00	0.27	2.18	Paradise Permit Application	0.070	0.140	0.000
Paradise C.S.	PT1	Point	597497.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT2	Point	597505.9	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT3	Point	597515.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT4	Point	597524.2	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT5	Point	597533.3	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT6	Point	597542.5	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT7	Point	597551.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT8	Point	597560.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT9	Point	597569.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT10	Point	597578.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT11	Point	597587.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT12	Point	597596.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Paradise C.S.	PT13	Point	597605.0	4726358.7	14.80	802.00	33.49	1.22	Paradise Permit Application	1.068	1.335	0.003
Pinedale C.S.	QPE1	Point	597642.9	4727057.5	15.24	721.3	30	0.51	Pinedale Permit Application	0.363	0.156	0.0250
Pinedale C.S.	QPE2	Point	597647.6	4727050.0	15.24	721.3	30	0.51	Pinedale Permit Application	0.363	0.156	0.0250
Pinedale C.S.	QPE3a	Point	597666.9	4727027.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315
Pinedale C.S.	QPE3b	Point	597612.1	4727125.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315
Pinedale C.S.	QPE4a	Point	597672.0	4727018.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315

Table B.4
Pinedale Anticline Near-Field Modeling
Compression Modeling Summary

			Source Location UTM Zone 13		Stack Parameters					Modeled Emissions		
Facility	Stack ID	Source Type	Easting	Northing	Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	Stack Parameter and Emissions Source	NOx (g/s)	CO (g/s)	Formaldehyde (g/s)
Pinedale C.S.	QPE4b	Point	597673.3	4727016.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.155	0.0315
Pinedale C.S.	QPE5a	Point	597604.9	4727138.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPE5b	Point	597606.1	4727136.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPE6a	Point	597610.8	4727127.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPE6b	Point	597612.1	4727125.0	15.24	713.71	72.54	0.46	Pinedale Permit Application	0.361	0.129	0.0315
Pinedale C.S.	QPT1	Point	597606.1	4727160.0	15.24	802.00	33.49	1.22	Pinedale Permit Application	0.861	0.861	0.0600
Pinedale C.S.	QPT2	Point	597610.8	4727160.0	15.24	802.00	33.49	1.22	Pinedale Permit Application	0.861	0.861	0.0600
Pinedale C.S.	QPT3	Point	597612.1	4727160.0	15.24	802.00	33.49	1.22	Pinedale Permit Application	0.861	0.861	0.0600
Falcon C.S.	FE1	Point	608976.3	4708663.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE2	Point	608970.4	4708656.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE3	Point	608964.5	4708649.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE4	Point	608958.6	4708642.6	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE5	Point	608942.8	4708635.7	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE6	Point	608936.8	4708711.0	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FG5	Point	608991.8	4708715.0	7.62	808.00	21.67	0.50	Falcon Permit Application	0.505	0.129	0.035
Falcon C.S.	FG6	Point	608987.0	4708715.0	7.62	808.00	21.67	0.50	Falcon Permit Application	0.505	0.129	0.035
Falcon C.S.	FVRU	Point	608938.7	4708621.9	6.10	832.00	16.70	0.20	Falcon Permit Application	0.068	0.014	0.005
Falcon C.S.	FH1	Point	608903.0	4708636.7	4.60	561.00	2.10	0.61	Falcon Permit Application	0.048	0.040	0.000
Falcon C.S.	FH2	Point	608908.4	4708656.9	5.50	561.00	0.60	0.30	Falcon Permit Application	0.003	0.003	0.000
Falcon C.S.	FCU1	Point	608874.6	4708632.9	10.97	1273.00	0.44	1.22	Falcon Permit Application	0.038	0.210	0.000
Falcon C.S.	FEF1	Point	608858.8	4708624.0	10.97	1273.00	0.27	2.18	Falcon Permit Application	0.065	0.129	0.000
Falcon C.S.	FE7	Point	608976.3	4708589.0	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FE8	Point	608970.4	4708589.0	14.00	726.50	28.65	0.71	Falcon Permit Application	0.713	0.256	0.081
Falcon C.S.	FT1	Point	608964.5	4708589.0	14.80	802.00	33.49	1.22	Falcon Permit Application	1.110	1.389	0.003
Falcon C.S.	FT2	Point	608958.6	4708589.0	14.80	802.00	33.49	1.22	Falcon Permit Application	1.110	1.389	0.003
Falcon C.S.	FT3	Point	608942.8	4708589.0	14.80	802.00	33.49	1.22	Falcon Permit Application	1.110	1.389	0.003
Bird Canyon C.S.	BE1	Point	580414.5	4681474.3	14.80	738.70	37.18	0.50	Bird Canyon Permit Application	0.480	0.172	0.048
Bird Canyon C.S.	BE2	Point	580419.2	4681481.2	14.80	738.70	37.18	0.50	Bird Canyon Permit Application	0.480	0.172	0.048
Bird Canyon C.S.	BE3	Point	580424.9	4681486.6	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE4	Point	580487.1	4681544.9	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE5	Point	580493.6	4681550.9	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE6	Point	580500.6	4681556.6	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE7	Point	580469.3	4681387.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE8	Point	580475.7	4681393.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE9	Point	580482.2	4681399.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE10	Point	580488.7	4681405.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE11	Point	580494.9	4681411.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BG5	Point	580460.7	4681460.0	14.80	808.00	21.67	0.50	Bird Canyon Permit Application	0.500	0.129	0.035
Bird Canyon C.S.	BG6	Point	580464.8	4681463.8	14.80	808.00	21.67	0.50	Bird Canyon Permit Application	0.500	0.129	0.035
Bird Canyon C.S.	BCU1	Point	580505.4	4681605.7	11.00	637.00	0.44	1.22	Bird Canyon Permit Application	0.080	0.378	0.000
Bird Canyon C.S.	BH1	Point	580462.3	4681523.4	3.70	561.00	2.96	0.10	Bird Canyon Permit Application	0.002	0.002	0.000
Bird Canyon C.S.	BE12	Point	580414.5	4681352.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081
Bird Canyon C.S.	BE13	Point	580419.2	4681358.4	14.80	726.50	28.65	0.71	Bird Canyon Permit Application	0.713	0.256	0.081

Table B.5
Pinedale Anticline Near-Field Modeling
HAPS Source Emissions and Modeling Parameters

HAP Pollutants	Modeled Emission Rate	Modeled Emission Rate	Source Type	Source Layout	Release Height	Volume Source s y_{int}	Volume Source s z_{int}
	(lb/hr)	(g/s)			(m)	(m)	(m)
Benzene	0.661	0.083	Volume	Each pollutant was modeled using 4 volume sources (1 in each quarter section - 1 section modeled). Each volume source represents a well pad with 32 wells (128 total). Includes gas dehydration emissions and condensate storage tank emissions.	5.0	11.63	4.65
Toluene	1.281	0.161	Volume		5.0	11.63	4.65
Ethylbenzene	0.079	0.010	Volume		5.0	11.63	4.65
Xylene	0.976	0.123	Volume		5.0	11.63	4.65
n-Hexane	0.423	0.053	Volume		5.0	11.63	4.65
Formaldehyde	See Table B.4 (Compressors)						

Appendix C

CALMET and CALPUFF Input Data

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Table C.1
Surface Meteorological Stations Used in the Development of the CALMET Wind Fields

Station Name	Station Type	Call Sign	Model ID	Anemometer Height (m)	Lambert Conformal Coordinates		CALMET Year		
					X (km)	Y (km)	2001	2002	2003
Pocatello, ID	NWS	KPIH	25780	10	-218.401	-10.511	X	X	X
Idaho Falls, ID	NWS	KIDA	25785	7.9	-177.123	52.659	X	X	X
Malad City, ID	NWS	KMLD	25786	7.9	-198.548	-93.614	X	X	X
Soda Springs, ID	NWS	KU78	25868	9.1	-141.388	-41.392	X	X	X
Rexburg, ID	NWS	KRXE	26818	10	-155.419	86.020	X		X
Rock Springs, WY	NWS	KRKS	25744	10	59.163	-155.548	X	X	X
Rawlins, WY	NWS	KRWL	25745	10	209.122	-130.919	X	X	X
Lander Hunt Field, WY	NWS	KLND	25760	10	84.377	-24.464	X	X	X
Riverton, WY	NWS	KRIW	25765	10	104.963	2.700	X	X	X
Evanston/Burns Field, WY	NWS	KEVW	25775	10	-100.068	-190.862	X	X	X
Jackson Hole, WY	NWS	KJAC	25776	10	-72.800	59.487	X	X	X
Johnson Co Arpt, WY	NWS	KBYG	26654	10	237.272	147.691	X	X	X
Sheridan CO Arpt, WY	NWS	KSHR	26660	10	216.581	188.173	X	X	X
Yellowstone Lake, WY	NWS	P60	26664	10	-47.358	161.231	X	X	X
Worland, WY	NWS	KWRL	26665	6.1	143.433	100.122	X	X	X
South Big Horn Co, WY	NWS	KGEY	26667	10	131.857	158.920	X	X	X
Cody, WY	NWS	KCOD	26700	10	60.134	157.800	X	X	X
Big Piney, WY	NWS	KBPI	26710	10	-23.818	-50.120	X		X
West Yellowstone, MT	NWS	KWEY	26763	9.8	-99.604	172.591	X		X
Yellowstone, MT	NWS	KWYS	26764	10	-100.848	176.154	X		X
Billings, MT	NWS	KBIL	26770	10	93.847	295.952	X	X	X
Dillon Arpt, MT	NWS	KDLN	26796	10	-208.458	239.764	X	X	X
Bozeman Gallatin, MT	NWS	KBZN	26797	10	-102.661	294.271	X	X	X
Livingston Mission, MT	NWS	KLVM	26798	10	-47.610	284.673	X	X	X
Craig-Moffat, CO	NWS	KCAG	25700	10	187.621	-271.501	X	X	X
Hayden/Yampa, CO	NWS	KHDN	25715	10	209.556	-270.839	X	X	X
Logan-Cache Arpt, UT	NWS	KLGU	24796	10	-164.942	-134.031	X		X
Vernal, UT	NWS	KVEL	25705	10	20.571	-281.358	X	X	X
Salt Lake City, UT	NWS	KSLC	25720	10	-177.265	-241.312	X	X	X
Ogden-Hinckley Arpt, UT	NWS	KOGD	25750	10	-180.112	-196.346	X	X	X
Ogden Hill AFB, UT	NWS	KHIF	25755	4	-176.292	-205.384	X	X	X
Yellowstone, WY	CASTNET	YEL	40800	10	-46.122	162.295	X	X	X
Pinedale, WY	CASTNET	PND	16500	10	0.947	-12.996	X	X	X
Jonah Field (BP), WY	Industrial	BP	88888	10	17.819	-62.496	X	X	X

Table C.2
Supper Air Meteorological Stations Used in the Development of the CALMET Wind Fields

Station Name	Station Type	Call Sign	Model ID	Lambert Conformal Coordinates		CALMET Year		
				X (km)	Y (km)	2001	2002	2003
Riverton, WY	NWS	KRIW	24061	104.963	2.700	X	X	X
Salt Lake City, UT	NWS	KSLC	24127	-177.265	-241.312	X	X	X

Table C.3
Ozone Monitoring Stations Used for CALPUFF Modeling

Station Name	State	Monitor ID Number	Source	Lambert Conformal Coordinates		2001	2002	2003
				X(km)	Y(km)			
Craters of the Moon NP	ID	160230101	AIRS	-294.162	51.003	X	X	X
	UT	490030003	AIRS	-168.049	-256.235	X	X	X
	UT	490050004	AIRS	-164.141	-139.639	X	X	X
	UT	490570007	AIRS	-177.414	-198.603	X	X	X
Yellowstone NP	WY	YEL408	CASTNET	-46.091	162.262	X	X	X
Pinedale	WY	PND165	CASTNET	0.947	-13.018	X	X	X
Centennial	WY	CNT169	CASTNET	288.384	-174.765	X	X	X
	WY	560391011	AIRS	-46.041	162.861	X	X	X

Table C.4
Modeling Parameters for Project Area Point Sources Used for CALPUFF Modeling

Source	Stack Height	Stack Temperature	Stack Velocity	Stack Diameter
	(m)	(K)	(m/s)	(m)
Drilling Rig	5.0	675.0	30.0	0.2
Drilling Rig	5.0	700.0	25.0	0.2
Granger Gas Plant Expansion	13.7	689.0	34.1	0.6
Pinedale Compressor Station	15.2	713.7	72.5	0.5
Pinedale Compressor Station	16.0	758.0	9.8	2.2
Paradise Compressor Station	14.8	726.5	28.7	0.7
Paradise Compressor Station	16.0	758.0	9.8	2.2
Falcon Compressor Station	14.8	726.5	28.7	0.7
Falcon Compressor Station	16.0	758.0	9.8	2.2
Bird Canyon Compressor Station	14.8	726.5	28.7	0.7

Figure C.1 - Surface and Upper Air Meteorological Stations Used for Year 2001 CALMET Windfields

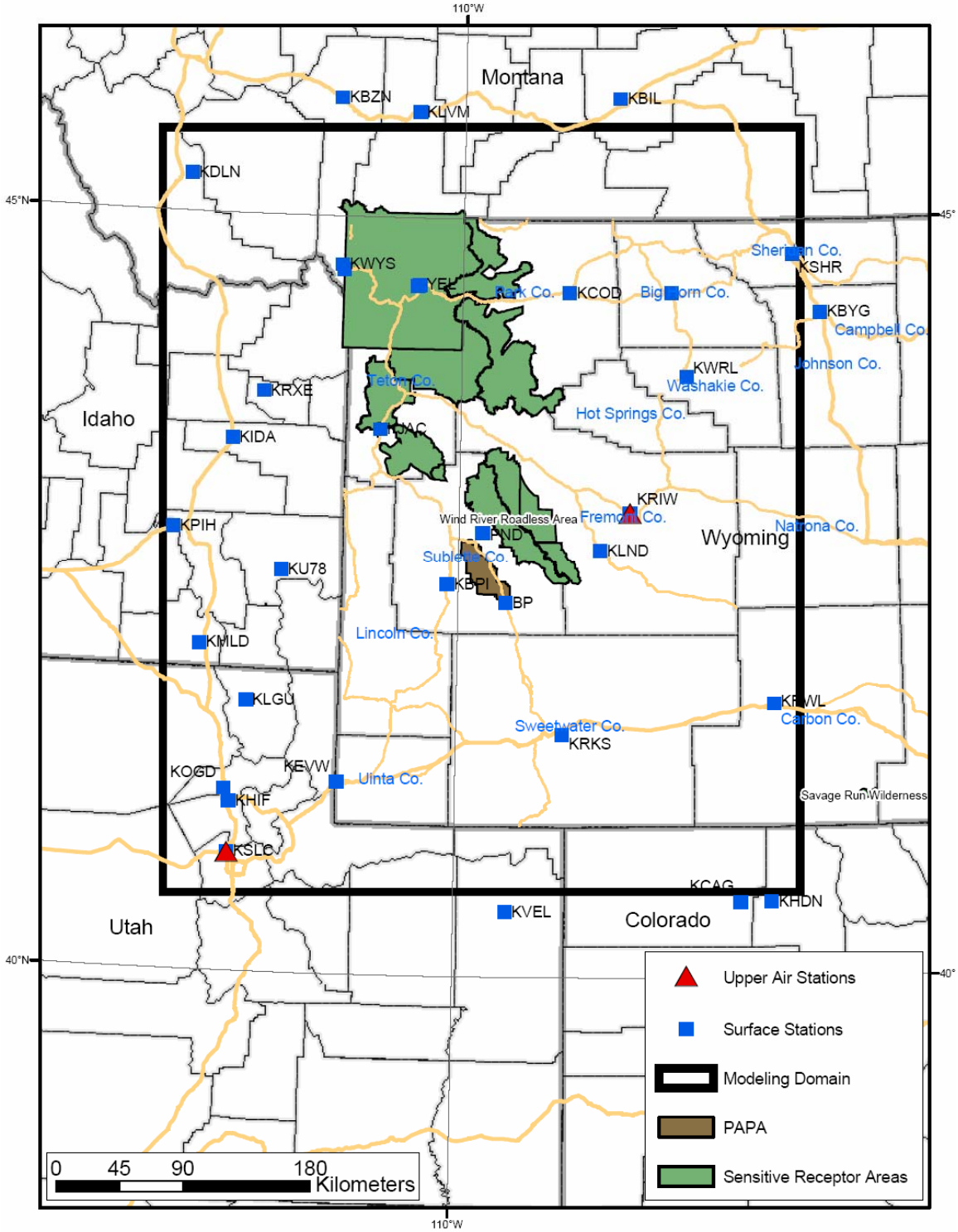


Figure C.2 - Surface and Upper Air Meteorological Stations Used for Year 2002 CALMET Windfields

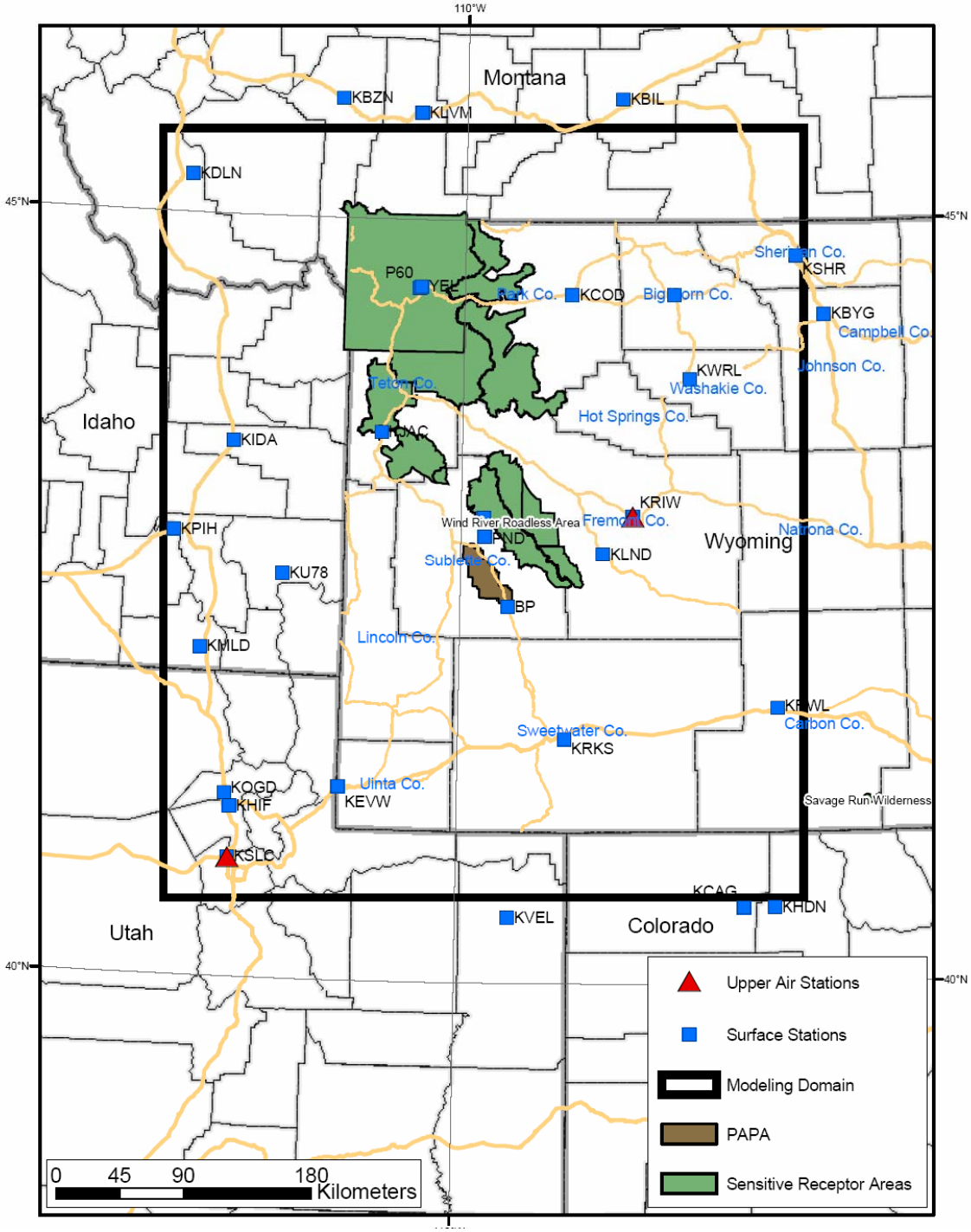


Figure C.3 - Surface and Upper Air Meteorological Stations Used for Year 2003 CALMET Windfields

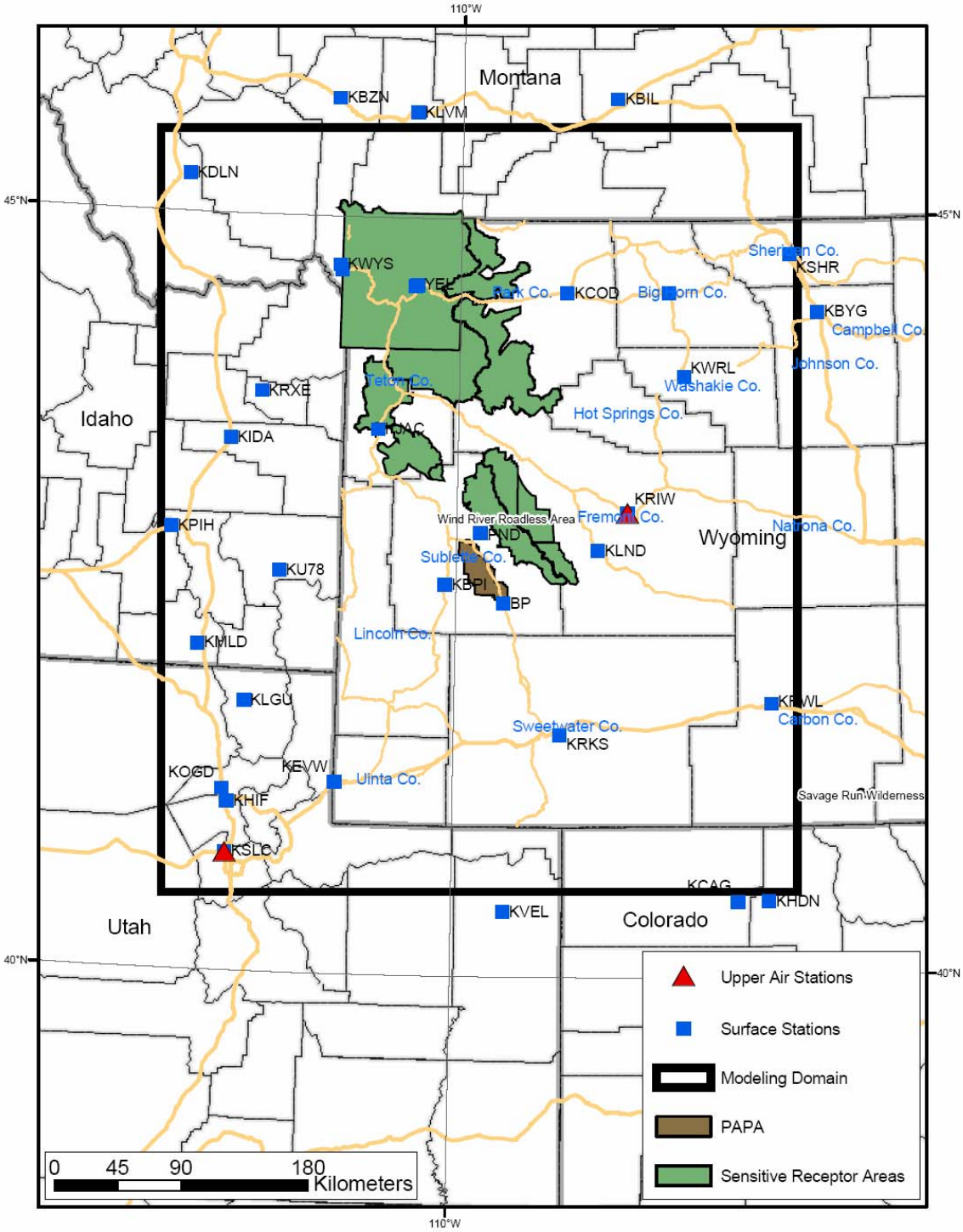


Figure C.4 - Area Sources Modeled for Year 2005

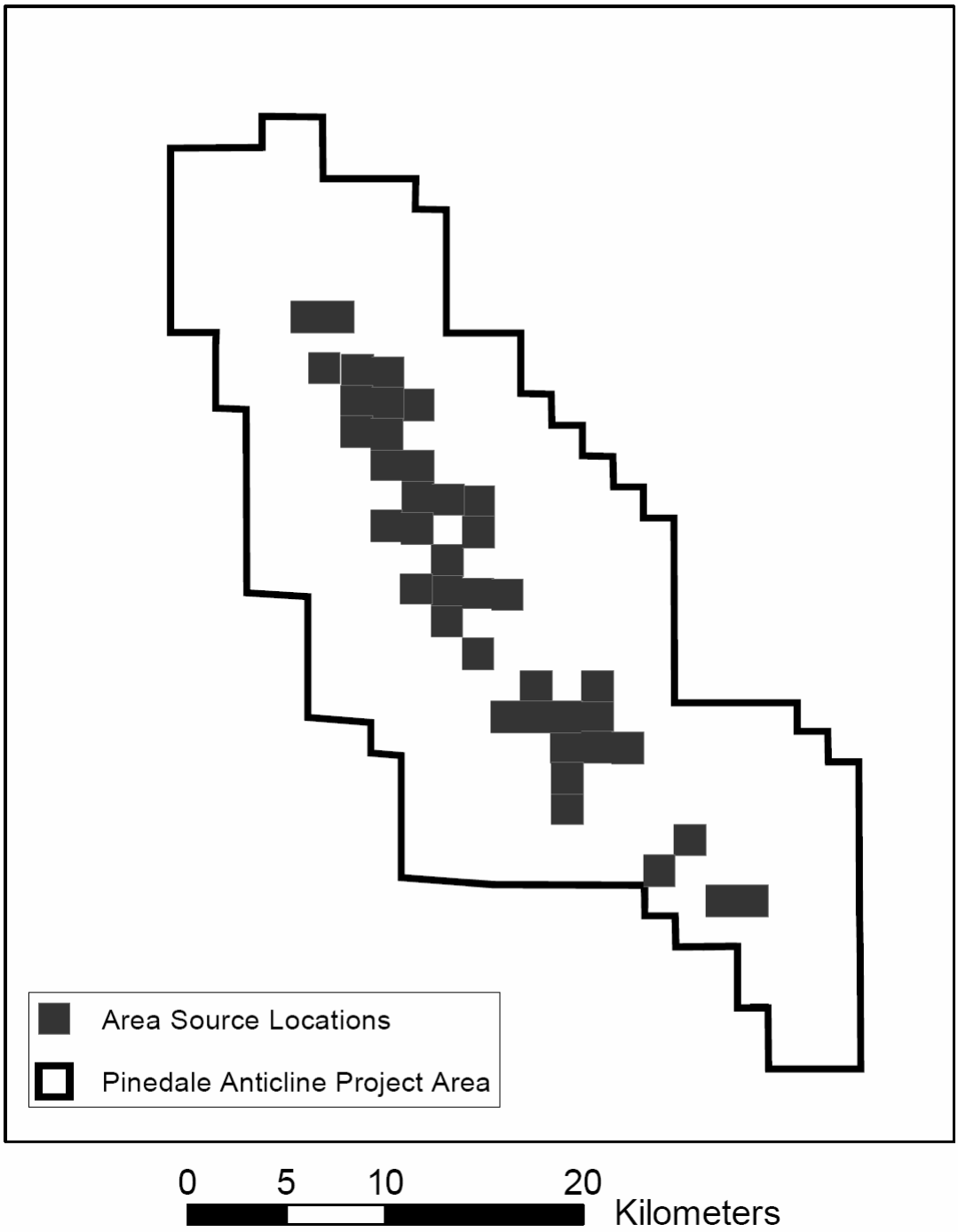


Figure C.5 - Area Sources Modeled for Year 2007

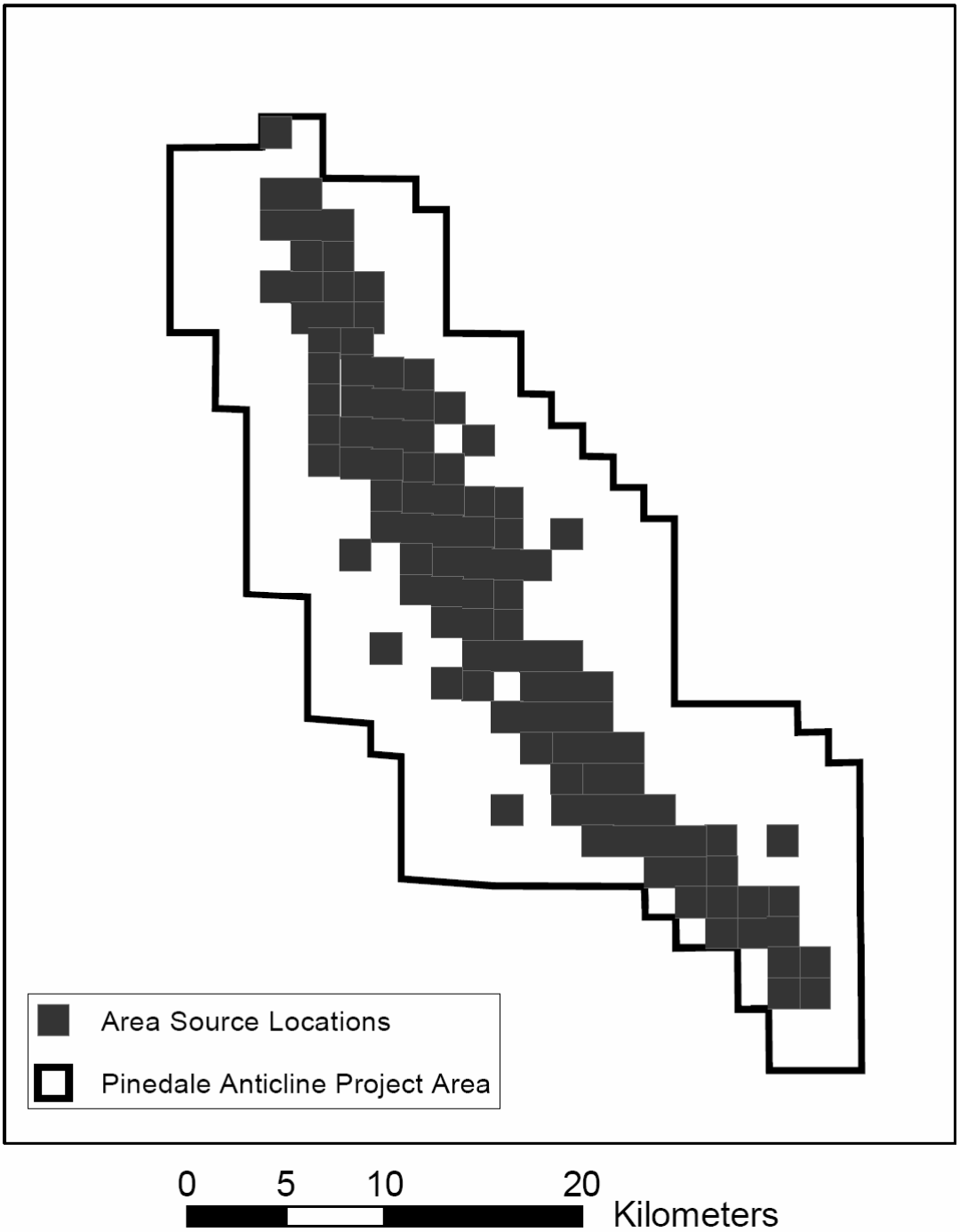


Figure C.6 - Area Sources Modeled for Year 2009

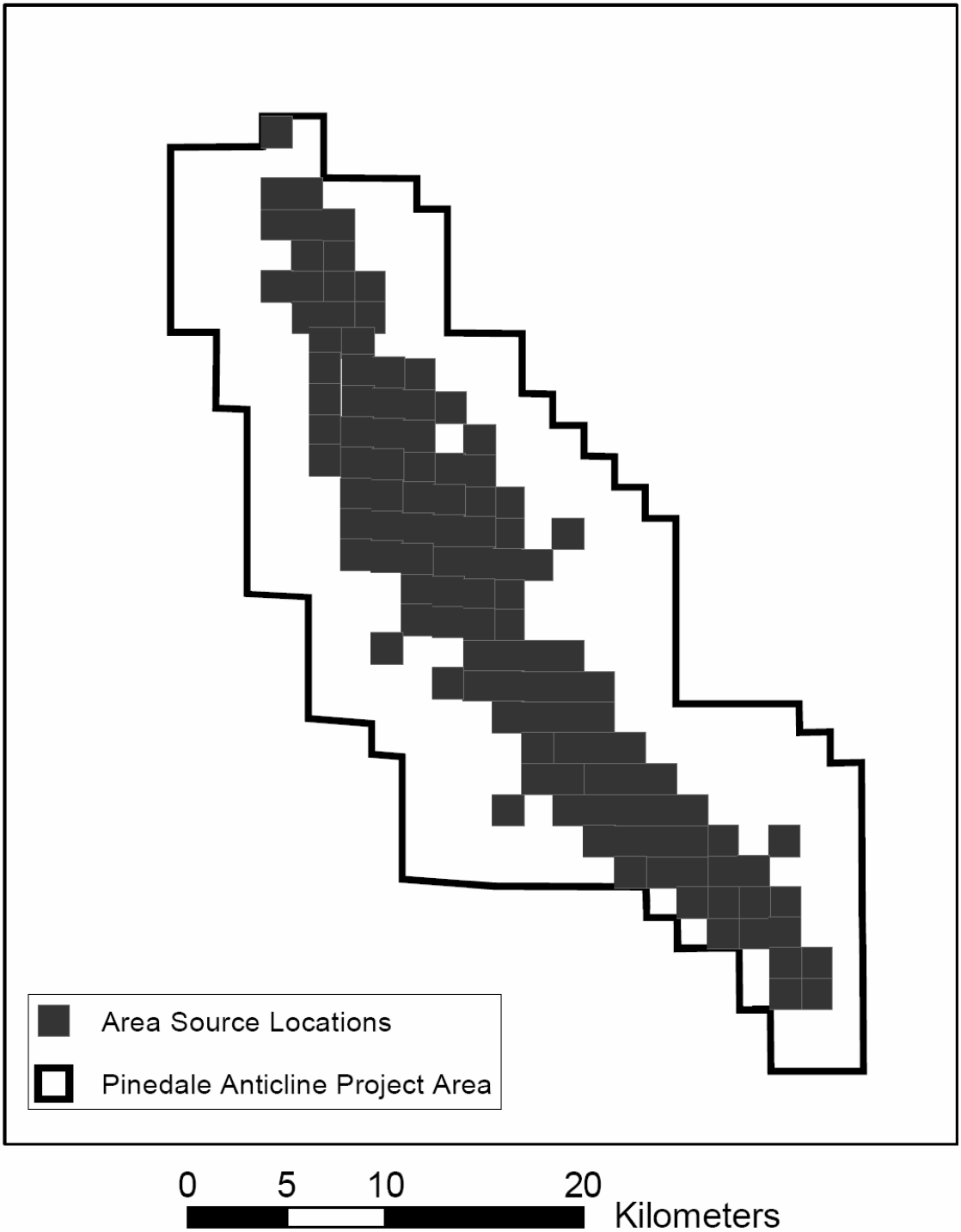


Figure C.7 - Area Sources Modeled for Year 2026

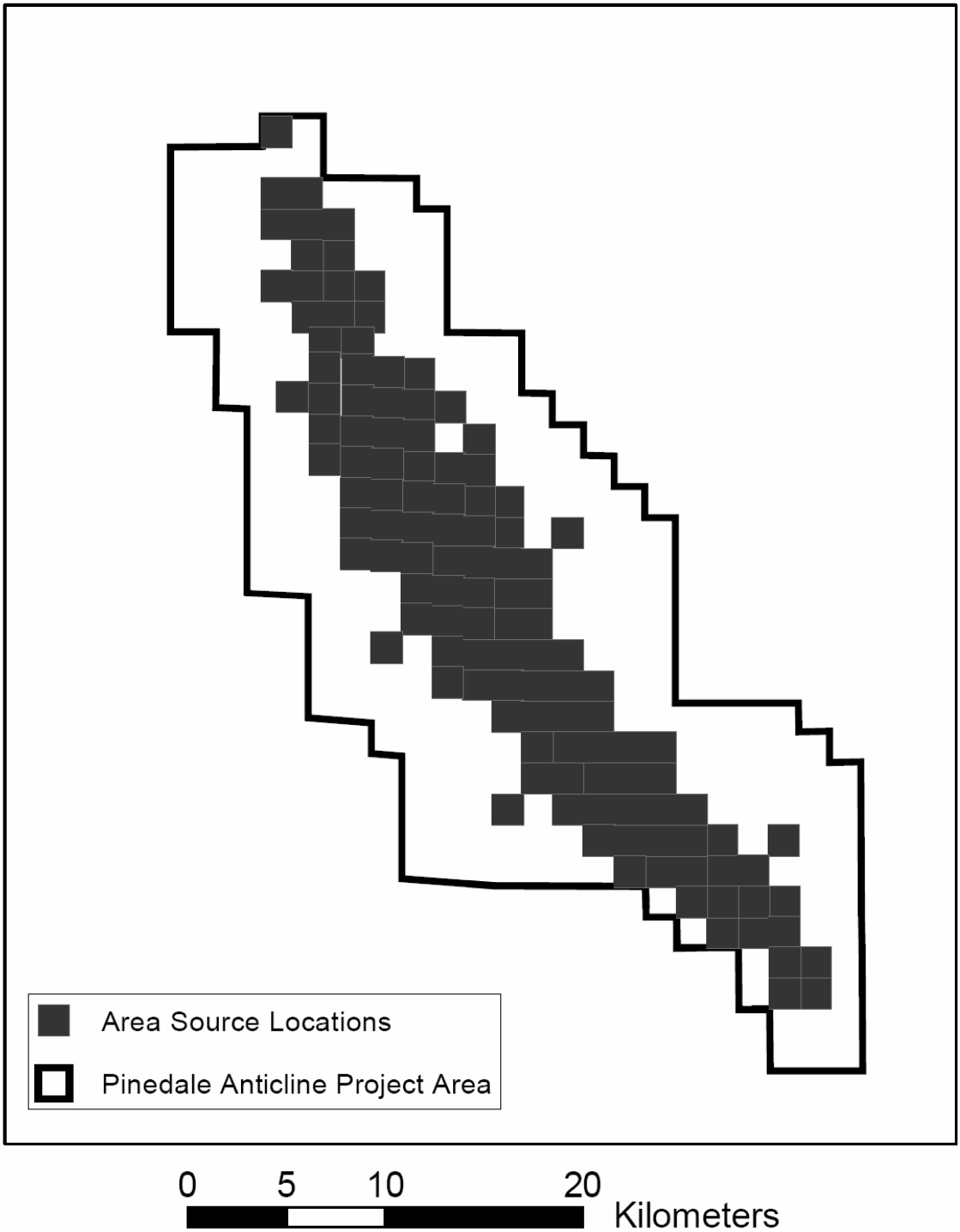


Figure C.8 - Drill Rig and Compressor Stations Modeled for Year 2005

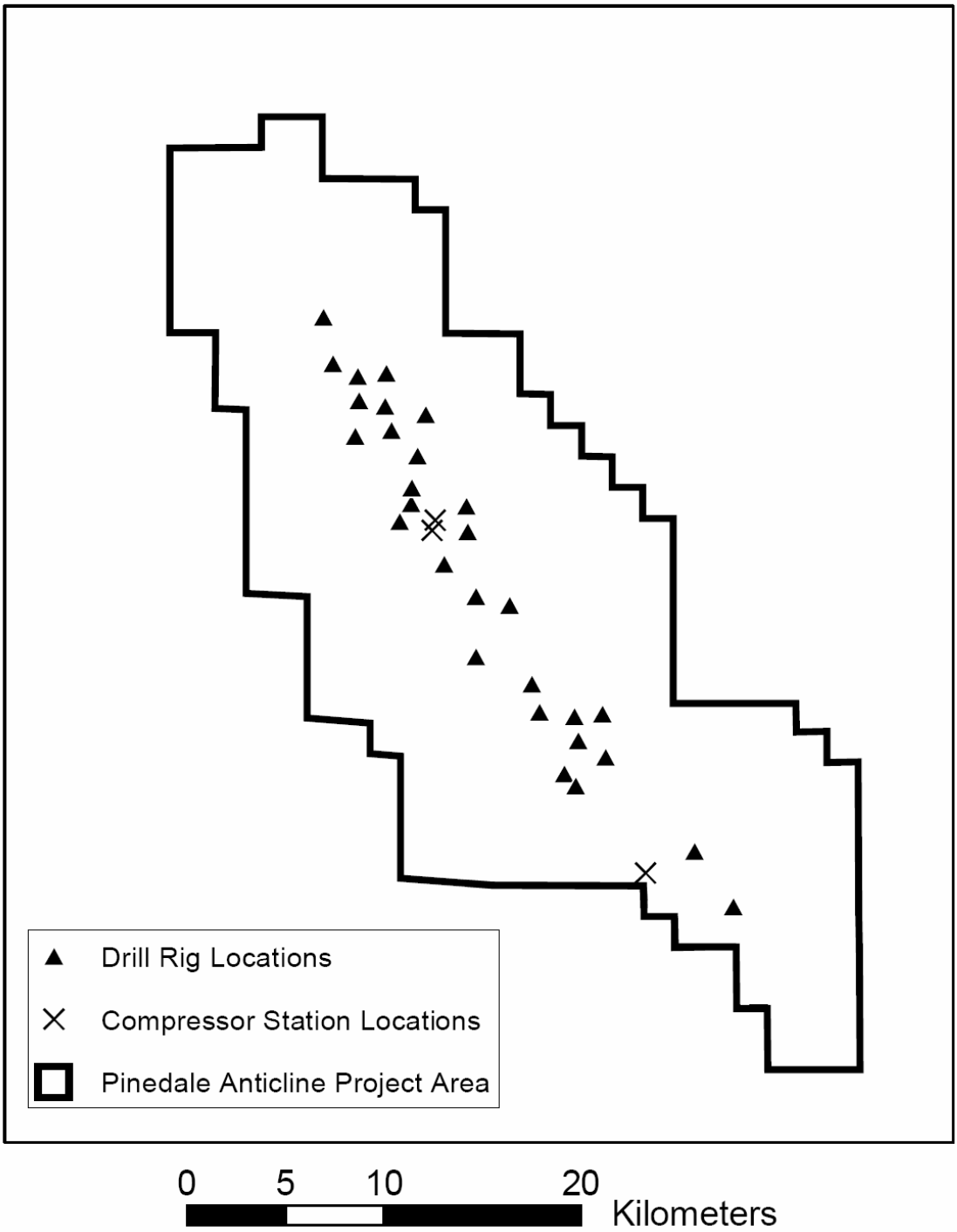


Figure C.9 - Drill Rig and Compressor Stations Modeled for Year 2007

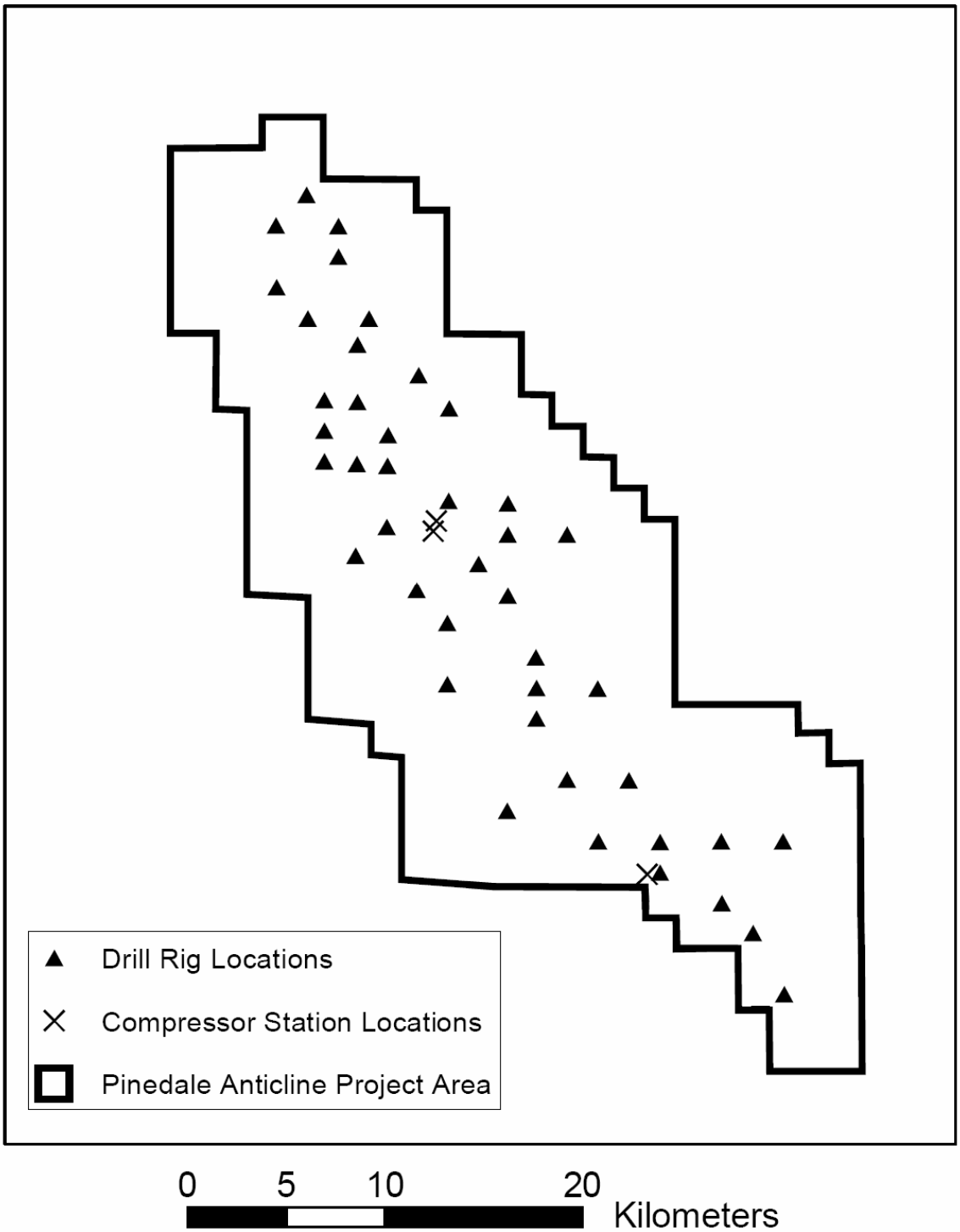


Figure C.10 - Drill Rig and Compressor Stations Modeled for Year 2009

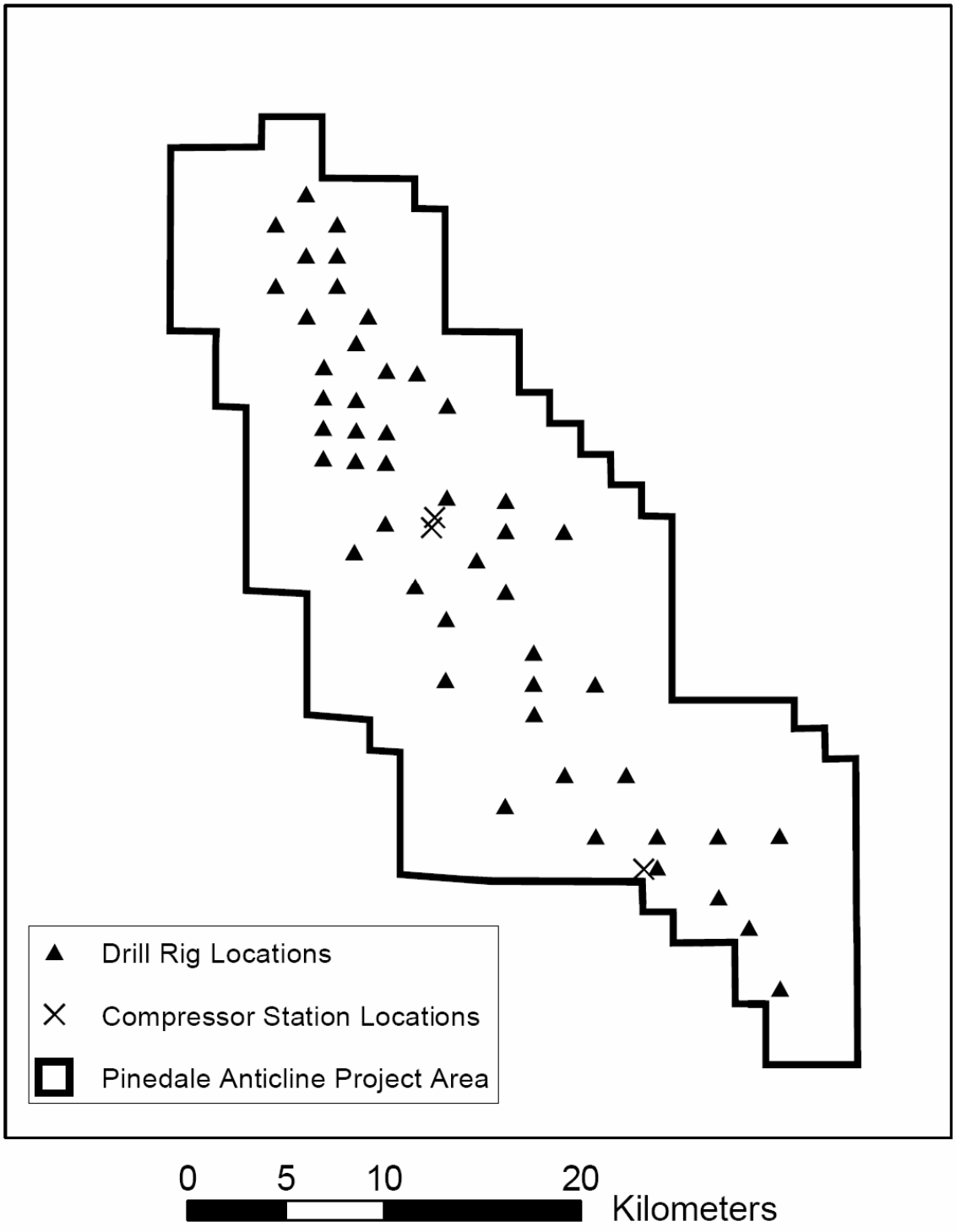
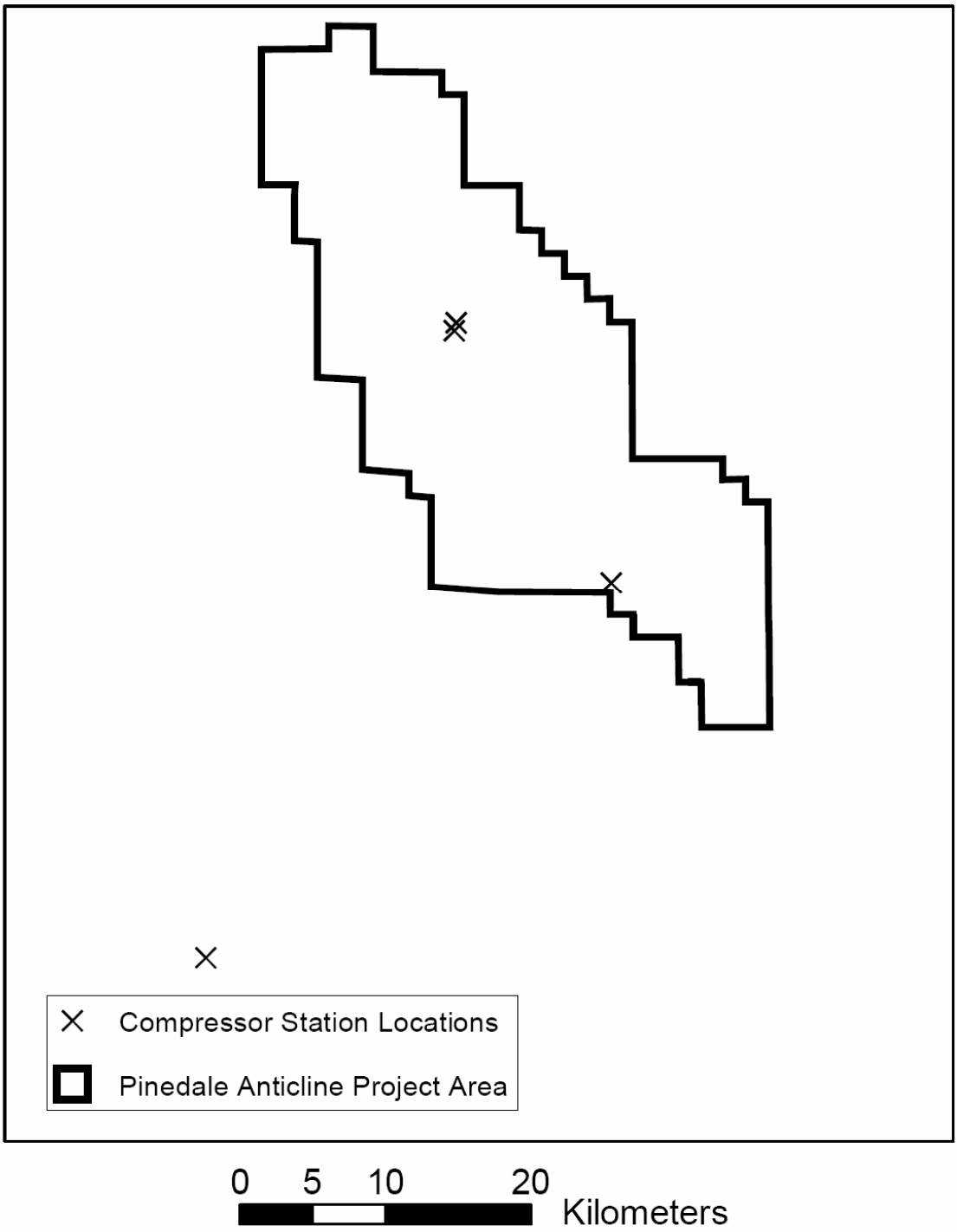


Figure C.11 - Compressor Stations Modeled for Year 2026



Appendix D

Pinedale Anticline Zone Test Analysis

Pinedale Anticline Zone Test Modeling

Due to the close proximity and physical alignment of the PAPA to the Bridger Wilderness sensitivity "zone" modeling was performed using CALPUFF to determine whether there are any areas within the PAPA that could potentially result in much greater impacts at the Bridger Wilderness as a result of the meteorology and source location. Visibility impairment was used as the impact criteria to test the zone influence. CALPOST method 6 for visibility processing combined with FLAG natural background data and regional haze rule monthly relative humidity factors applicable to the Bridger Wilderness were used.

The PAPA was divided into three distinct zones, south, north, and central. 10 drill rigs were randomly placed in each of the three zones. Emissions for a 4000 hp, Tier 1 emissions level, drill rig were used (NO_x – 25.6 lb/hr, SO_2 – 0.5 lb/hr, PM_{10}/$PM_{2.5}$ – 1.5 lb/hr).

Three years of CALMET wind fields were used (2001 – 2003). CALPUFF was used to model the 10 drill rigs for each of the three zones for the three years of meteorology data. CALPOST was used to process visibility impacts at the Bridger Wilderness.

Figures D.1 through D.6 present the results for the zone test analysis. Results are presented as the number of days per year above a 1.0 deciview (dv) change (Figures D1, D2, and D3) and the maximum dv change (Figures D4, D5, D6) at each receptor in the Bridger Wilderness. The values are the maximum results from any of the three modeled years. Figures D.1 and D.4 present the modeling results at the Bridger Wilderness for the 10 drill rigs when modeled from the south zone. Figures D.2 and D.5 present the model results for the drill rigs in the central zone, and Figures D.3 and D.6 illustrate the results for drill rig impacts from the north zone.

These modeling results indicate that the PAPA sources tend to have a larger impact at areas in the Bridger Wilderness that are northeast of the PAPA.

Figure D.1
Pinedale Anticline Zone Analysis for Drill Rigs in South Zone
Maximum Number of Days/Year Above 1.0 Delta Deciview Over Three Years (2001-2003)

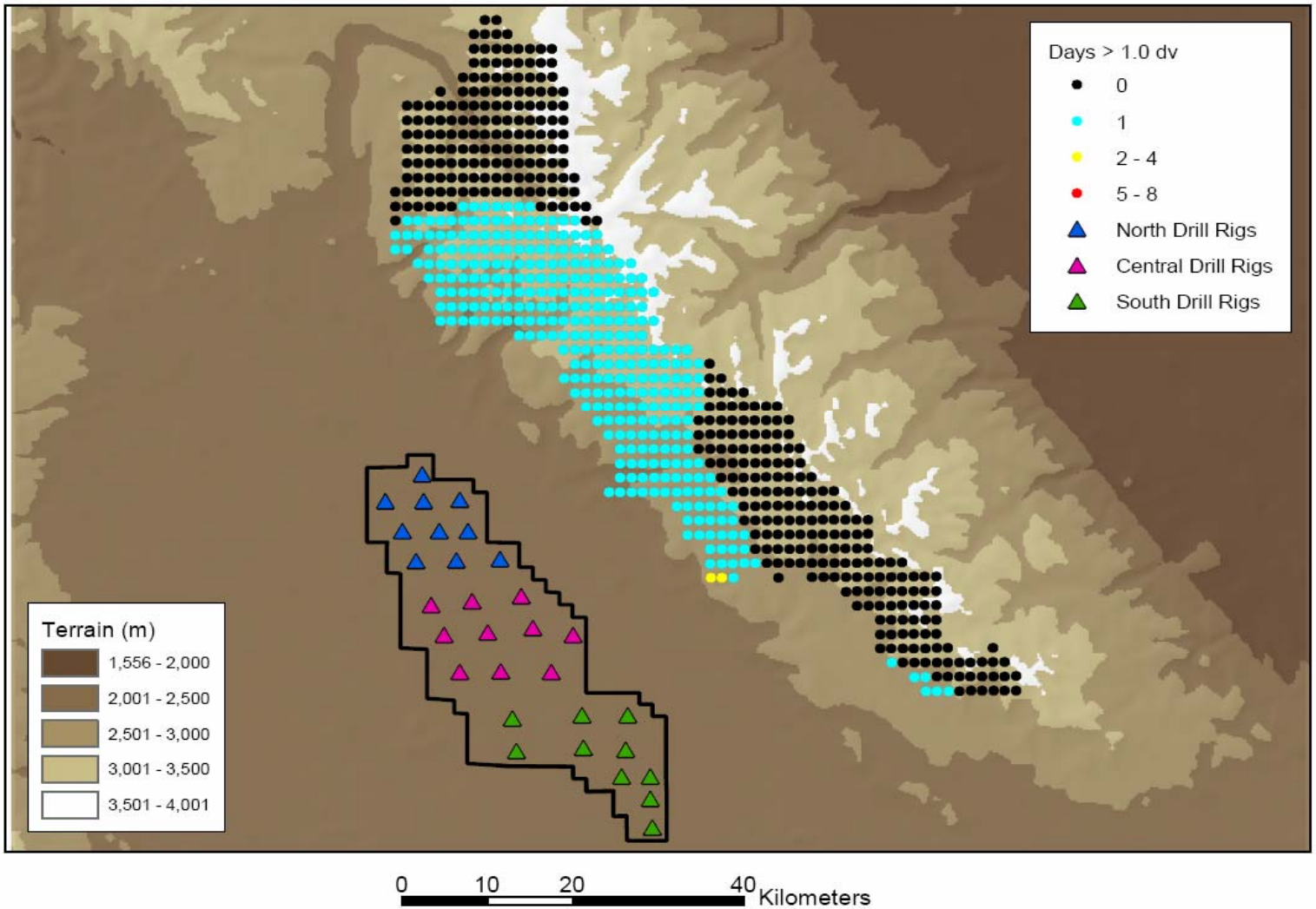


Figure D.2
Pinedale Anticline Zone Analysis for Drill Rigs in Central Zone
Maximum Number of Days/Year Above 1.0 Delta Deciview Over Three Years (2001-2003)

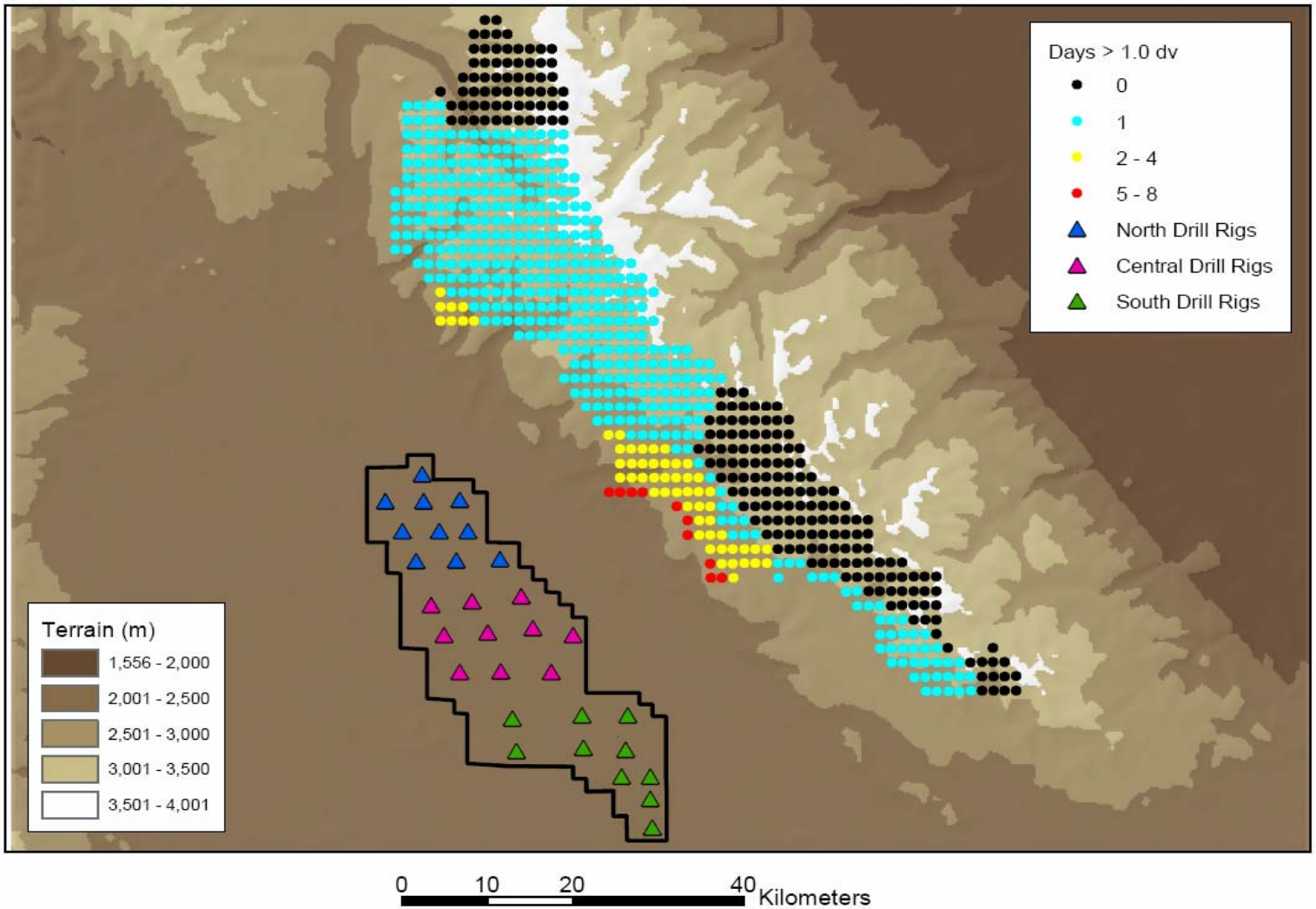


Figure D.3
Pinedale Anticline Zone Analysis for Drill Rigs in North Zone
Maximum Number of Days/Year Above 1.0 Delta Deciview Over Three Years (2001-2003)

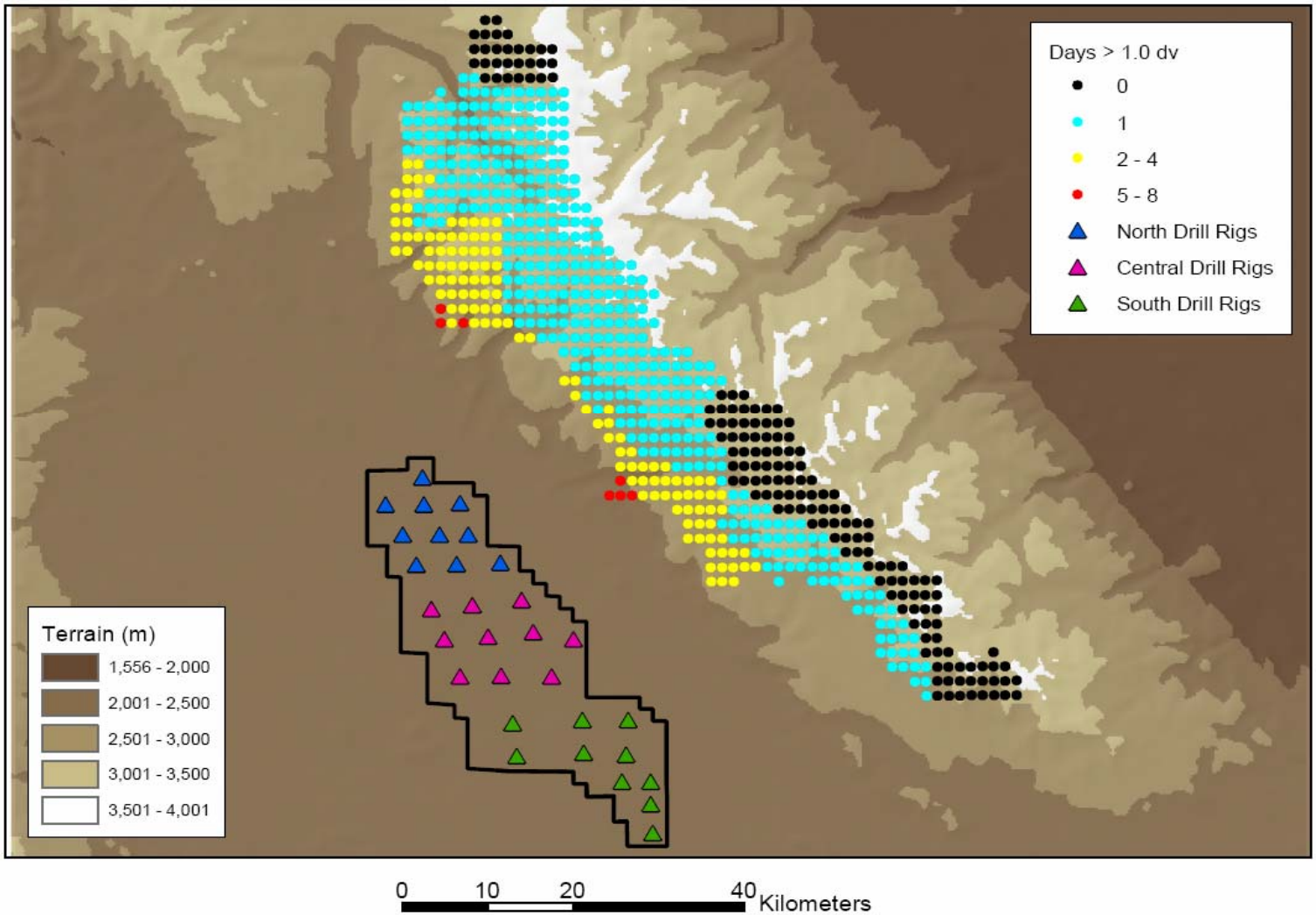


Figure D.4
Pinedale Anticline Zone Analysis for Drill Rigs in South Zone
Maximum Predicted Delta Deciview Over Three Years (2001-2003)

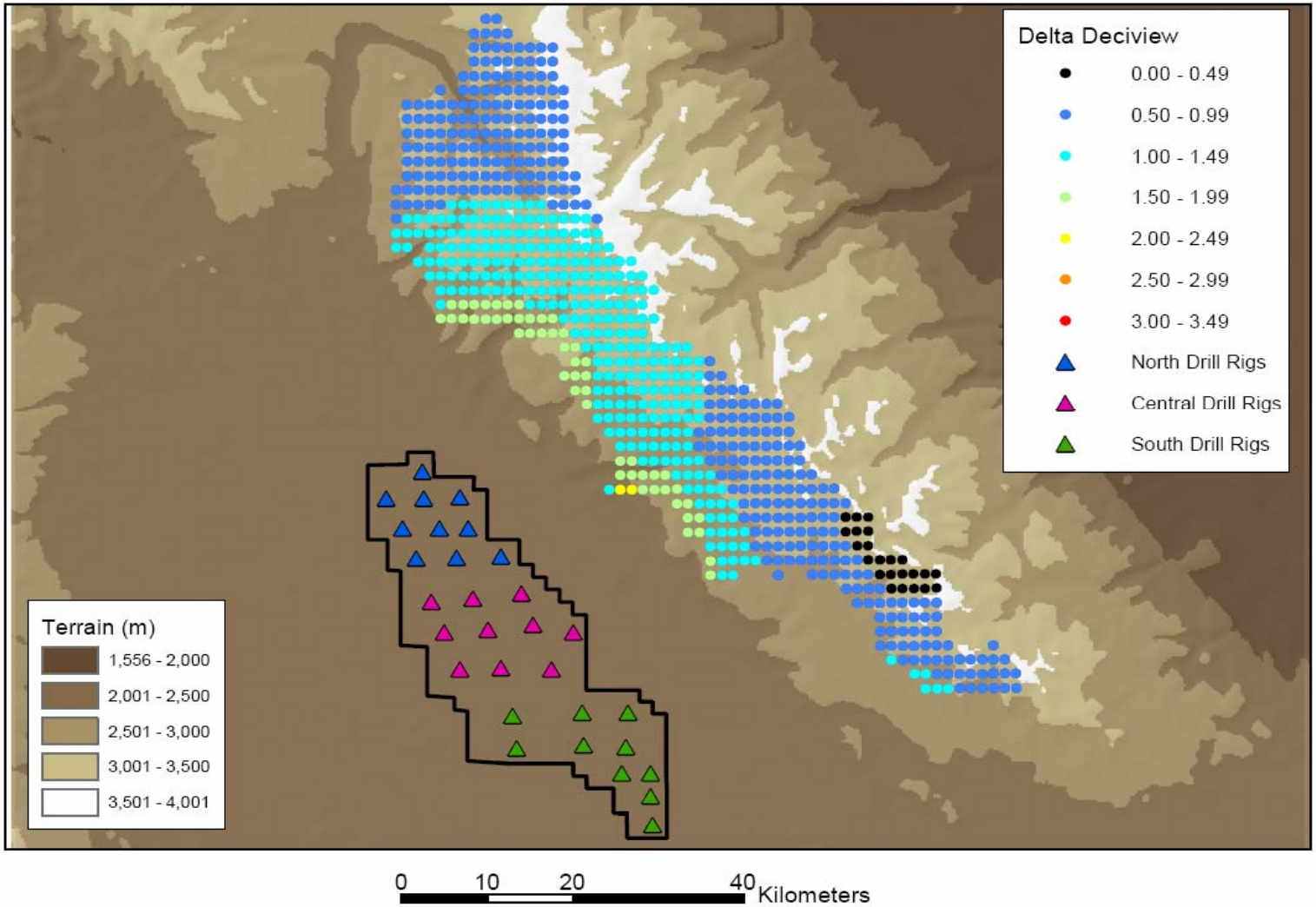


Figure D.5
Pinedale Anticline Zone Analysis for Drill Rigs in Central Zone
Maximum Predicted Delta Deciview Over Three Years (2001-2003)

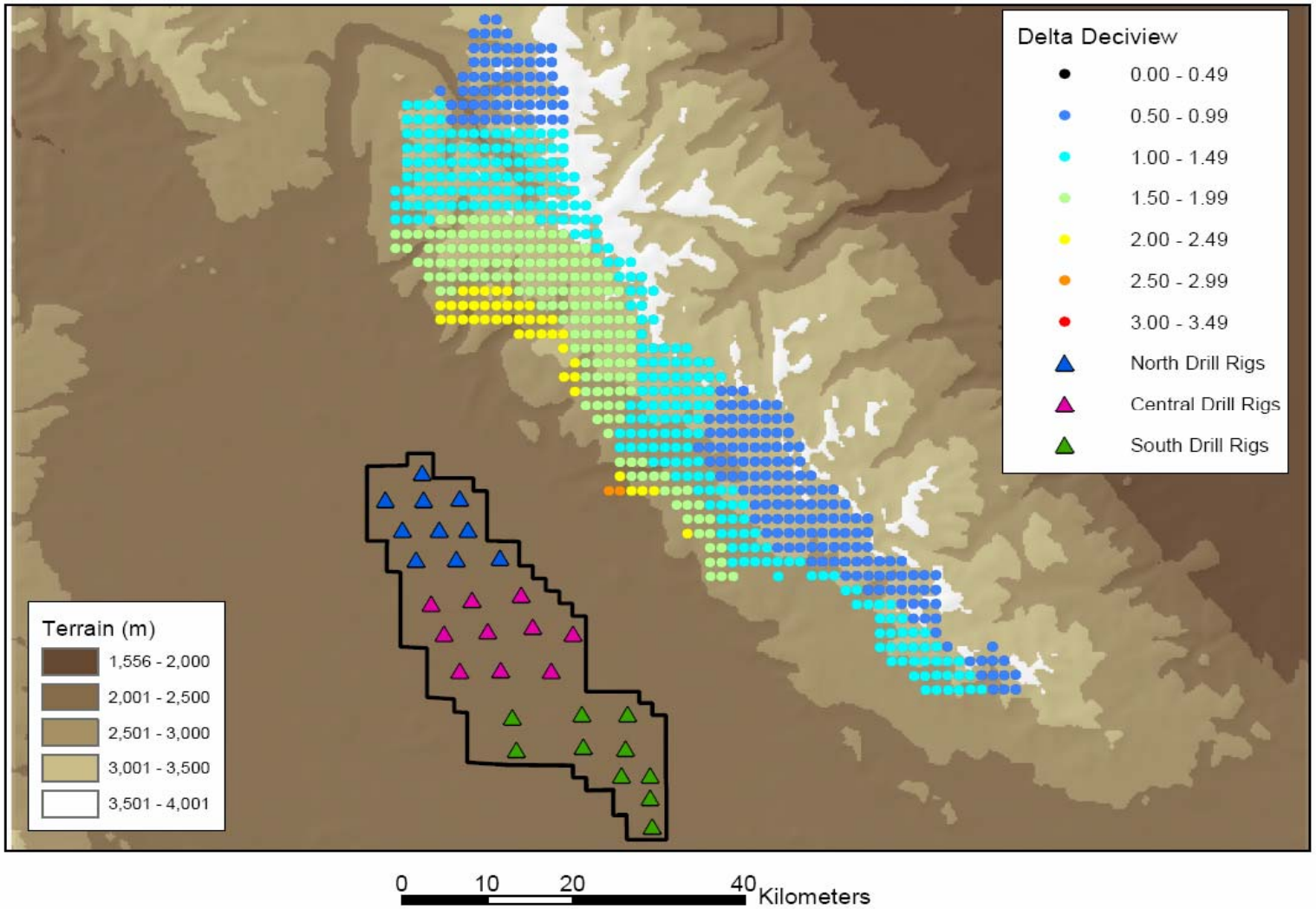
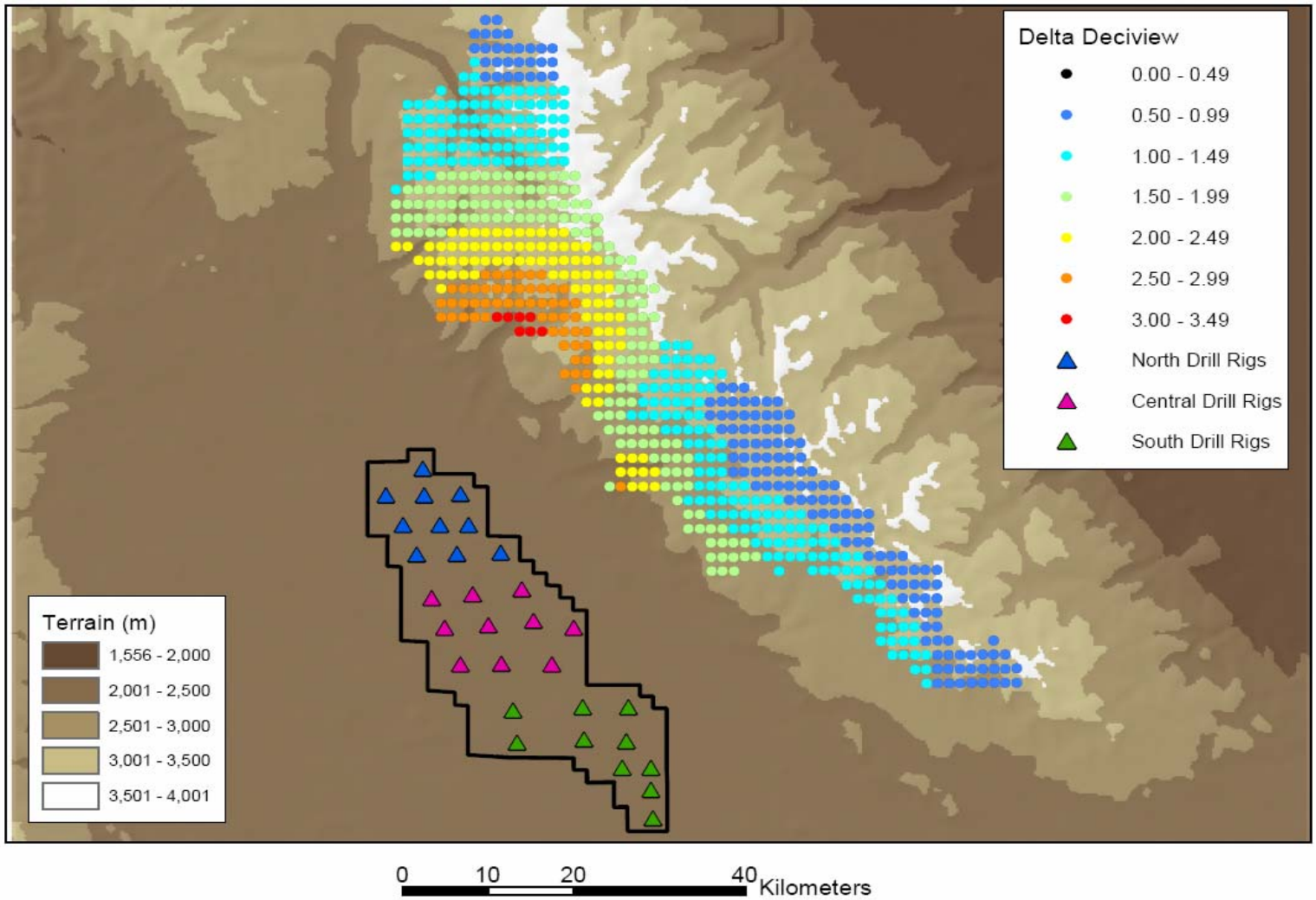


Figure D.6
Pinedale Anticline Zone Analysis for Drill Rigs in North Zone
Maximum Predicted Delta Deciview Over Three Years (2001-2003)



Appendix E

CALPUFF Modeling Results

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Table E.1.7 - Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 – 2003

Table E.1.8 - Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 – 2003

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Table E.1.10 - Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 – 2003

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Table E.2.1 - Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 – 2003

Table E.2.2 - Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 – 2003

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E.9 – Modeled Nitrogen Deposition Impacts

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E.10 – Modeled Sulfur Deposition Impacts

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E.11 – Modeled Change in Acid Neutralizing Capacity

Table E.11.1 - Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

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E.12 – Far-field Visibility Impacts – FLAG Background Data (MVISBK=6)

Table E.12.1 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

Table E.12.2 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

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E.13 – Far-field Visibility Impacts – IMPROVE Background Data

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Table E.13.3 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

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Table E.13.9 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

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Table E.13.11 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

E.14 – Far-field Visibility Impacts – FLAG Background Data (MVISBK=2)

Table E.14.1 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.2 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.3 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.4 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.5 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.6 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.7 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.8 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.9 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.10 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

Table E.14.11 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

E.15 – Far-field Visibility Impacts – Regional Haze Rule – Best Days – Background Data

Table E.15.1 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.2 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.3 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.4 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.5 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.6 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.7 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.8 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case -

Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.9 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.10 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

Table E.15.11 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

E.16 – Far-field Visibility Impacts – Regional Haze Rule – Average Days – Background Data

Table E.16.1 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.2 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.3 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.4 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.5 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.6 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.7 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.8 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case -

Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.9 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.10 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

Table E.16.11 - Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

E.17 – Modeled Visibility Impacts at Wyoming Regional Community Locations

Table E.17.1 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.2 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.3 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.4 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.5 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.6 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.7 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.8 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.9 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.10 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.17.11 - Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

Table E.1.1
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
NO_2	Annual	Bridger WA	0.2211	0.1458	0.1919	0.2211	2.5	8	8.22	100	100
		Fitzpatrick WA	0.0153	0.0112	0.0140	0.0153	2.5	8	8.02	100	100
		Grand Teton NP	0.0045	0.0057	0.0040	0.0057	2.5	8	8.01	100	100
		Gros Venture WA	0.0191	0.0137	0.0147	0.0191	25	8	8.02	100	100
		North Absoroka WA	0.0005	0.0004	0.0004	0.0005	2.5	8	8.00	100	100
		Popo Agie WA	0.0461	0.0344	0.0379	0.0461	25	8	8.05	100	100
		Teton WA	0.0027	0.0020	0.0017	0.0027	2.5	8	8.00	100	100
		Washakie WA	0.0023	0.0017	0.0021	0.0023	2.5	8	8.00	100	100
		Wind River RA	0.0325	0.0170	0.0280	0.0325	25	8	8.03	100	100
		Yellowstone NP	0.0012	0.0014	0.0009	0.0014	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 $\mu g/m^3$ from Boulder monitor.

Table E.1.2
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.3508	0.2347	0.2922	0.3508	2.5	8	8.35	100	100
		Fitzpatrick WA	0.0245	0.0198	0.0232	0.0245	2.5	8	8.02	100	100
		Grand Teton NP	0.0069	0.0107	0.0067	0.0107	2.5	8	8.01	100	100
		Gros Venture WA	0.0303	0.0253	0.0248	0.0303	25	8	8.03	100	100
		North Absoroka WA	0.0008	0.0007	0.0007	0.0008	2.5	8	8.00	100	100
		Popo Agie WA	0.0760	0.0592	0.0623	0.0760	25	8	8.08	100	100
		Teton WA	0.0041	0.0037	0.0027	0.0041	2.5	8	8.00	100	100
		Washakie WA	0.0035	0.0031	0.0032	0.0035	2.5	8	8.00	100	100
		Wind River RA	0.0535	0.0290	0.0435	0.0535	25	8	8.05	100	100
		Yellowstone NP	0.0017	0.0026	0.0014	0.0026	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.1.3
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.3442	0.2398	0.3002	0.3442	2.5	8	8.34	100	100
		Fitzpatrick WA	0.0242	0.0197	0.0230	0.0242	2.5	8	8.02	100	100
		Grand Teton NP	0.0077	0.0095	0.0065	0.0095	2.5	8	8.01	100	100
		Gros Venture WA	0.0320	0.0235	0.0247	0.0320	25	8	8.03	100	100
		North Absoroka WA	0.0009	0.0007	0.0008	0.0009	2.5	8	8.00	100	100
		Popo Agie WA	0.0704	0.0546	0.0600	0.0704	25	8	8.07	100	100
		Teton WA	0.0044	0.0034	0.0028	0.0044	2.5	8	8.00	100	100
		Washakie WA	0.0037	0.0029	0.0034	0.0037	2.5	8	8.00	100	100
		Wind River RA	0.0507	0.0283	0.0451	0.0507	25	8	8.05	100	100
		Yellowstone NP	0.0019	0.0023	0.0015	0.0023	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.1.4
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.2165	0.1504	0.1885	0.2165	2.5	8	8.22	100	100
		Fitzpatrick WA	0.0153	0.0124	0.0145	0.0153	2.5	8	8.02	100	100
		Grand Teton NP	0.0048	0.0060	0.0041	0.0060	2.5	8	8.01	100	100
		Gros Venture WA	0.0201	0.0148	0.0156	0.0201	25	8	8.02	100	100
		North Absoroka WA	0.0005	0.0004	0.0005	0.0005	2.5	8	8.00	100	100
		Popo Agie WA	0.0446	0.0346	0.0379	0.0446	25	8	8.04	100	100
		Teton WA	0.0028	0.0021	0.0018	0.0028	2.5	8	8.00	100	100
		Washakie WA	0.0023	0.0018	0.0021	0.0023	2.5	8	8.00	100	100
		Wind River RA	0.0320	0.0178	0.0284	0.0320	25	8	8.03	100	100
		Yellowstone NP	0.0012	0.0015	0.0009	0.0015	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.1.5
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m^3)	2002 (μg/m^3)	2003 (μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)
NO_2	Annual	Bridger WA	0.0798	0.0536	0.0682	0.0798	2.5	8	8.08	100	100
		Fitzpatrick WA	0.0057	0.0046	0.0054	0.0057	2.5	8	8.01	100	100
		Grand Teton NP	0.0017	0.0023	0.0015	0.0023	2.5	8	8.00	100	100
		Gros Venture WA	0.0073	0.0055	0.0058	0.0073	25	8	8.01	100	100
		North Absoroka WA	0.0002	0.0002	0.0002	0.0002	2.5	8	8.00	100	100
		Popo Agie WA	0.0171	0.0134	0.0145	0.0171	25	8	8.02	100	100
		Teton WA	0.0010	0.0008	0.0007	0.0010	2.5	8	8.00	100	100
		Washakie WA	0.0009	0.0007	0.0008	0.0009	2.5	8	8.00	100	100
		Wind River RA	0.0121	0.0066	0.0103	0.0121	25	8	8.01	100	100
		Yellowstone NP	0.0005	0.0006	0.0004	0.0006	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 μg/m^3 from Boulder monitor.

Table E.1.6
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
NO_2	Annual	Bridger WA	0.1177	0.0791	0.1031	0.1177	2.5	8	8.12	100	100
		Fitzpatrick WA	0.0093	0.0065	0.0077	0.0093	2.5	8	8.01	100	100
		Grand Teton NP	0.0026	0.0032	0.0024	0.0032	2.5	8	8.00	100	100
		Gros Venture WA	0.0109	0.0079	0.0091	0.0109	25	8	8.01	100	100
		North Absoroka WA	0.0003	0.0003	0.0003	0.0003	2.5	8	8.00	100	100
		Popo Agie WA	0.0265	0.0208	0.0232	0.0265	25	8	8.03	100	100
		Teton WA	0.0016	0.0012	0.0012	0.0016	2.5	8	8.00	100	100
		Washakie WA	0.0015	0.0011	0.0015	0.0015	2.5	8	8.00	100	100
		Wind River RA	0.0190	0.0108	0.0159	0.0190	25	8	8.02	100	100
		Yellowstone NP	0.0008	0.0008	0.0006	0.0008	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m³ from Boulder monitor.

Table E.1.7
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.3981	0.2649	0.3257	0.3981	2.5	8	8.40	100	100
		Fitzpatrick WA	0.0309	0.0250	0.0285	0.0309	2.5	8	8.03	100	100
		Grand Teton NP	0.0921	0.1157	0.1122	0.1157	2.5	8	8.12	100	100
		Gros Venture WA	0.0403	0.0328	0.0324	0.0403	25	8	8.04	100	100
		North Absoroka WA	0.0016	0.0017	0.0014	0.0017	2.5	8	8.00	100	100
		Popo Agie WA	0.0915	0.0692	0.0766	0.0915	25	8	8.09	100	100
		Teton WA	0.0052	0.0049	0.0039	0.0052	2.5	8	8.01	100	100
		Washakie WA	0.0046	0.0045	0.0044	0.0046	2.5	8	8.00	100	100
		Wind River RA	0.0644	0.0357	0.0509	0.0644	25	8	8.06	100	100
		Yellowstone NP	0.0024	0.0032	0.0020	0.0032	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.1.8
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
NO_2	Annual	Bridger WA	0.3914	0.2700	0.3336	0.3914	2.5	8	8.39	100	100
		Fitzpatrick WA	0.0306	0.0248	0.0283	0.0306	2.5	8	8.03	100	100
		Grand Teton NP	0.0923	0.1147	0.1119	0.1147	2.5	8	8.11	100	100
		Gros Venture WA	0.0420	0.0308	0.0322	0.0420	25	8	8.04	100	100
		North Absoroka WA	0.0016	0.0017	0.0015	0.0017	2.5	8	8.00	100	100
		Popo Agie WA	0.0859	0.0649	0.0743	0.0859	25	8	8.09	100	100
		Teton WA	0.0055	0.0045	0.0041	0.0055	2.5	8	8.01	100	100
		Washakie WA	0.0048	0.0042	0.0045	0.0048	2.5	8	8.00	100	100
		Wind River RA	0.0616	0.0350	0.0525	0.0616	25	8	8.06	100	100
		Yellowstone NP	0.0026	0.0029	0.0020	0.0029	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 $\mu g/m^3$ from Boulder monitor.

Table E.1.9
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.2638	0.1806	0.2220	0.2638	2.5	8	8.26	100	100
		Fitzpatrick WA	0.0217	0.0176	0.0198	0.0217	2.5	8	8.02	100	100
		Grand Teton NP	0.0908	0.1122	0.1103	0.1122	2.5	8	8.11	100	100
		Gros Venture WA	0.0301	0.0222	0.0231	0.0301	25	8	8.03	100	100
		North Absoroka WA	0.0014	0.0015	0.0013	0.0015	2.5	8	8.00	100	100
		Popo Agie WA	0.0601	0.0448	0.0523	0.0601	25	8	8.06	100	100
		Teton WA	0.0039	0.0033	0.0030	0.0039	2.5	8	8.00	100	100
		Washakie WA	0.0034	0.0032	0.0033	0.0034	2.5	8	8.00	100	100
		Wind River RA	0.0429	0.0246	0.0358	0.0429	25	8	8.04	100	100
		Yellowstone NP	0.0019	0.0021	0.0015	0.0021	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.1.10
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.1270	0.0838	0.1017	0.1270	2.5	8	8.13	100	100
		Fitzpatrick WA	0.0121	0.0098	0.0107	0.0121	2.5	8	8.01	100	100
		Grand Teton NP	0.0892	0.1095	0.1087	0.1095	2.5	8	8.11	100	100
		Gros Venture WA	0.0173	0.0130	0.0138	0.0173	25	8	8.02	100	100
		North Absoroka WA	0.0011	0.0013	0.0011	0.0013	2.5	8	8.00	100	100
		Popo Agie WA	0.0341	0.0237	0.0289	0.0341	25	8	8.03	100	100
		Teton WA	0.0022	0.0020	0.0019	0.0022	2.5	8	8.00	100	100
		Washakie WA	0.0021	0.0021	0.0020	0.0021	2.5	8	8.00	100	100
		Wind River RA	0.0230	0.0134	0.0178	0.0230	25	8	8.02	100	100
		Yellowstone NP	0.0011	0.0012	0.0009	0.0012	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.1.11
Maximum Modeled NO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001	2002	2003						
			(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Bridger WA	0.1650	0.1094	0.1366	0.1650	2.5	8	8.16	100	100
		Fitzpatrick WA	0.0155	0.0117	0.0130	0.0155	2.5	8	8.02	100	100
		Grand Teton NP	0.0897	0.1102	0.1092	0.1102	2.5	8	8.11	100	100
		Gros Venture WA	0.0209	0.0154	0.0166	0.0209	25	8	8.02	100	100
		North Absoroka WA	0.0012	0.0014	0.0011	0.0014	2.5	8	8.00	100	100
		Popo Agie WA	0.0422	0.0312	0.0363	0.0422	25	8	8.04	100	100
		Teton WA	0.0028	0.0024	0.0024	0.0028	2.5	8	8.00	100	100
		Washakie WA	0.0027	0.0025	0.0027	0.0027	2.5	8	8.00	100	100
		Wind River RA	0.0300	0.0175	0.0233	0.0300	25	8	8.03	100	100
		Yellowstone NP	0.0014	0.0014	0.0011	0.0014	2.5	8	8.00	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.2.1
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0222	0.0159	0.0204	0.0222	4	9	9.02	60	80
		Fitzpatrick WA	0.0030	0.0023	0.0025	0.0030	4	9	9.00	60	80
		Grand Teton NP	0.0007	0.0009	0.0006	0.0009	4	9	9.00	60	80
		Gros Venture WA	0.0023	0.0019	0.0017	0.0023	17	9	9.00	60	80
		North Absoroka WA	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Popo Agie WA	0.0067	0.0062	0.0063	0.0067	17	9	9.01	60	80
		Teton WA	0.0006	0.0005	0.0004	0.0006	4	9	9.00	60	80
		Washakie WA	0.0007	0.0007	0.0006	0.0007	4	9	9.00	60	80
		Wind River RA	0.0050	0.0034	0.0045	0.0050	17	9	9.01	60	80
		Yellowstone NP	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.1684	0.1642	0.2301	0.2301	5	43	43.23	260	365
		Fitzpatrick WA	0.0308	0.0622	0.0326	0.0622	5	43	43.06	260	365
		Grand Teton NP	0.0158	0.0174	0.0154	0.0174	5	43	43.02	260	365
		Gros Venture WA	0.0288	0.0317	0.0389	0.0389	91	43	43.04	260	365
		North Absoroka WA	0.0047	0.0082	0.0057	0.0082	5	43	43.01	260	365
		Popo Agie WA	0.0431	0.0408	0.0413	0.0431	91	43	43.04	260	365
		Teton WA	0.0101	0.0100	0.0093	0.0101	5	43	43.01	260	365
		Washakie WA	0.0102	0.0086	0.0110	0.0110	5	43	43.01	260	365
		Wind River RA	0.0482	0.0480	0.0486	0.0486	91	43	43.05	260	365
		Yellowstone NP	0.0089	0.0088	0.0073	0.0089	5	43	43.01	260	365
SO_2	3-hour	Bridger WA	0.6693	0.5127	0.8016	0.8016	25	132	132.80	1300	1300
		Fitzpatrick WA	0.1214	0.1947	0.1197	0.1947	25	132	132.19	1300	1300
		Grand Teton NP	0.0695	0.0661	0.0756	0.0756	25	132	132.08	1300	1300
		Gros Venture WA	0.1524	0.1121	0.1705	0.1705	512	132	132.17	1300	1300
		North Absoroka WA	0.0247	0.0305	0.0184	0.0305	25	132	132.03	1300	1300
		Popo Agie WA	0.1510	0.1820	0.1533	0.1820	512	132	132.18	1300	1300
		Teton WA	0.0495	0.0389	0.0380	0.0495	25	132	132.05	1300	1300
		Washakie WA	0.0488	0.0348	0.0437	0.0488	25	132	132.05	1300	1300
		Wind River RA	0.1315	0.1793	0.1851	0.1851	512	132	132.19	1300	1300
		Yellowstone NP	0.0511	0.0275	0.0340	0.0511	25	132	132.05	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.2
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0063	0.0045	0.0055	0.0063	4	9	9.01	60	80
		Fitzpatrick WA	0.0008	0.0007	0.0007	0.0008	4	9	9.00	60	80
		Grand Teton NP	0.0002	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Gros Venture WA	0.0006	0.0006	0.0005	0.0006	17	9	9.00	60	80
		North Absoroka WA	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
		Popo Agie WA	0.0020	0.0019	0.0018	0.0020	17	9	9.00	60	80
		Teton WA	0.0002	0.0002	0.0001	0.0002	4	9	9.00	60	80
		Washakie WA	0.0002	0.0002	0.0002	0.0002	4	9	9.00	60	80
		Wind River RA	0.0015	0.0010	0.0013	0.0015	17	9	9.00	60	80
		Yellowstone NP	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0447	0.0442	0.0553	0.0553	5	43	43.06	260	365
		Fitzpatrick WA	0.0075	0.0138	0.0085	0.0138	5	43	43.01	260	365
		Grand Teton NP	0.0036	0.0061	0.0038	0.0061	5	43	43.01	260	365
		Gros Venture WA	0.0095	0.0105	0.0127	0.0127	91	43	43.01	260	365
		North Absoroka WA	0.0013	0.0022	0.0014	0.0022	5	43	43.00	260	365
		Popo Agie WA	0.0136	0.0119	0.0152	0.0152	91	43	43.02	260	365
		Teton WA	0.0028	0.0036	0.0022	0.0036	5	43	43.00	260	365
		Washakie WA	0.0032	0.0029	0.0037	0.0037	5	43	43.00	260	365
		Wind River RA	0.0135	0.0123	0.0172	0.0172	91	43	43.02	260	365
		Yellowstone NP	0.0019	0.0031	0.0018	0.0031	5	43	43.00	260	365
SO_2	3-hour	Bridger WA	0.1490	0.1428	0.2438	0.2438	25	132	132.24	1300	1300
		Fitzpatrick WA	0.0287	0.0471	0.0377	0.0471	25	132	132.05	1300	1300
		Grand Teton NP	0.0143	0.0247	0.0238	0.0247	25	132	132.02	1300	1300
		Gros Venture WA	0.0397	0.0307	0.0546	0.0546	512	132	132.05	1300	1300
		North Absoroka WA	0.0056	0.0086	0.0041	0.0086	25	132	132.01	1300	1300
		Popo Agie WA	0.0494	0.0513	0.0547	0.0547	512	132	132.05	1300	1300
		Teton WA	0.0147	0.0129	0.0094	0.0147	25	132	132.01	1300	1300
		Washakie WA	0.0147	0.0118	0.0128	0.0147	25	132	132.01	1300	1300
		Wind River RA	0.0448	0.0441	0.0675	0.0675	512	132	132.07	1300	1300
		Yellowstone NP	0.0114	0.0095	0.0094	0.0114	25	132	132.01	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 mg/m^3, 43 mg/m^3 and 9mg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.3
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009
Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0073	0.0053	0.0065	0.0073	4	9	9.01	60	80
		Fitzpatrick WA	0.0010	0.0008	0.0008	0.0010	4	9	9.00	60	80
		Grand Teton NP	0.0002	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Gros Venture WA	0.0008	0.0006	0.0006	0.0008	17	9	9.00	60	80
		North Absoroka WA	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
		Popo Agie WA	0.0022	0.0021	0.0021	0.0022	17	9	9.00	60	80
		Teton WA	0.0002	0.0002	0.0001	0.0002	4	9	9.00	60	80
		Washakie WA	0.0002	0.0002	0.0002	0.0002	4	9	9.00	60	80
		Wind River RA	0.0016	0.0012	0.0015	0.0016	17	9	9.00	60	80
		Yellowstone NP	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0492	0.0549	0.0792	0.0792	5	43	43.08	260	365
		Fitzpatrick WA	0.0099	0.0195	0.0087	0.0195	5	43	43.02	260	365
		Grand Teton NP	0.0051	0.0058	0.0049	0.0058	5	43	43.01	260	365
		Gros Venture WA	0.0089	0.0099	0.0123	0.0123	91	43	43.01	260	365
		North Absoroka WA	0.0015	0.0027	0.0019	0.0027	5	43	43.00	260	365
		Popo Agie WA	0.0128	0.0144	0.0143	0.0144	91	43	43.01	260	365
		Teton WA	0.0033	0.0034	0.0030	0.0034	5	43	43.00	260	365
		Washakie WA	0.0034	0.0028	0.0037	0.0037	5	43	43.00	260	365
		Wind River RA	0.0137	0.0152	0.0163	0.0163	91	43	43.02	260	365
		Yellowstone NP	0.0027	0.0030	0.0023	0.0030	5	43	43.00	260	365
SO_2	3-hour	Bridger WA	0.2196	0.1494	0.2339	0.2339	25	132	132.23	1300	1300
		Fitzpatrick WA	0.0344	0.0636	0.0393	0.0636	25	132	132.06	1300	1300
		Grand Teton NP	0.0207	0.0231	0.0235	0.0235	25	132	132.02	1300	1300
		Gros Venture WA	0.0480	0.0328	0.0540	0.0540	512	132	132.05	1300	1300
		North Absoroka WA	0.0080	0.0095	0.0059	0.0095	25	132	132.01	1300	1300
		Popo Agie WA	0.0467	0.0583	0.0518	0.0583	512	132	132.06	1300	1300
		Teton WA	0.0156	0.0122	0.0127	0.0156	25	132	132.02	1300	1300
		Washakie WA	0.0160	0.0112	0.0134	0.0160	25	132	132.02	1300	1300
		Wind River RA	0.0454	0.0581	0.0615	0.0615	512	132	132.06	1300	1300
		Yellowstone NP	0.0164	0.0093	0.0115	0.0164	25	132	132.02	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.4
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0215	0.0156	0.0193	0.0215	4	9	9.02	60	80
		Fitzpatrick WA	0.0029	0.0024	0.0024	0.0029	4	9	9.00	60	80
		Grand Teton NP	0.0007	0.0009	0.0006	0.0009	4	9	9.00	60	80
		Gros Venture WA	0.0022	0.0019	0.0017	0.0022	17	9	9.00	60	80
		North Absoroka WA	0.0002	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Popo Agie WA	0.0066	0.0062	0.0063	0.0066	17	9	9.01	60	80
		Teton WA	0.0006	0.0005	0.0004	0.0006	4	9	9.00	60	80
		Washakie WA	0.0007	0.0007	0.0006	0.0007	4	9	9.00	60	80
		Wind River RA	0.0049	0.0034	0.0044	0.0049	17	9	9.00	60	80
		Yellowstone NP	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.1435	0.1578	0.2349	0.2349	5	43	43.23	260	365
		Fitzpatrick WA	0.0300	0.0597	0.0265	0.0597	5	43	43.06	260	365
		Grand Teton NP	0.0156	0.0171	0.0141	0.0171	5	43	43.02	260	365
		Gros Venture WA	0.0255	0.0282	0.0371	0.0371	91	43	43.04	260	365
		North Absoroka WA	0.0044	0.0082	0.0058	0.0082	5	43	43.01	260	365
		Popo Agie WA	0.0376	0.0422	0.0392	0.0422	91	43	43.04	260	365
		Teton WA	0.0098	0.0098	0.0090	0.0098	5	43	43.01	260	365
		Washakie WA	0.0102	0.0080	0.0108	0.0108	5	43	43.01	260	365
		Wind River RA	0.0396	0.0468	0.0404	0.0468	91	43	43.05	260	365
		Yellowstone NP	0.0083	0.0087	0.0068	0.0087	5	43	43.01	260	365
SO_2	3-hour	Bridger WA	0.6562	0.4741	0.6658	0.6658	25	132	132.67	1300	1300
		Fitzpatrick WA	0.1025	0.1952	0.1154	0.1952	25	132	132.20	1300	1300
		Grand Teton NP	0.0629	0.0670	0.0684	0.0684	25	132	132.07	1300	1300
		Gros Venture WA	0.1456	0.1017	0.1581	0.1581	512	132	132.16	1300	1300
		North Absoroka WA	0.0240	0.0288	0.0178	0.0288	25	132	132.03	1300	1300
		Popo Agie WA	0.1348	0.1773	0.1304	0.1773	512	132	132.18	1300	1300
		Teton WA	0.0470	0.0351	0.0374	0.0470	25	132	132.05	1300	1300
		Washakie WA	0.0486	0.0322	0.0400	0.0486	25	132	132.05	1300	1300
		Wind River RA	0.1224	0.1766	0.1363	0.1766	512	132	132.18	1300	1300
		Yellowstone NP	0.0495	0.0271	0.0348	0.0495	25	132	132.05	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.5
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0051	0.0037	0.0045	0.0051	4	9	9.01	60	80
		Fitzpatrick WA	0.0007	0.0006	0.0006	0.0007	4	9	9.00	60	80
		Grand Teton NP	0.0002	0.0002	0.0001	0.0002	4	9	9.00	60	80
		Gros Venture WA	0.0005	0.0005	0.0004	0.0005	17	9	9.00	60	80
		North Absoroka WA	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
		Popo Agie WA	0.0015	0.0015	0.0015	0.0015	17	9	9.00	60	80
		Teton WA	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
		Washakie WA	0.0002	0.0002	0.0001	0.0002	4	9	9.00	60	80
		Wind River RA	0.0011	0.0008	0.0010	0.0011	17	9	9.00	60	80
		Yellowstone NP	0.0001	0.0001	0.0001	0.0001	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0343	0.0384	0.0552	0.0552	5	43	43.06	260	365
		Fitzpatrick WA	0.0069	0.0136	0.0061	0.0136	5	43	43.01	260	365
		Grand Teton NP	0.0036	0.0041	0.0034	0.0041	5	43	43.00	260	365
		Gros Venture WA	0.0062	0.0069	0.0086	0.0086	91	43	43.01	260	365
		North Absoroka WA	0.0010	0.0019	0.0013	0.0019	5	43	43.00	260	365
		Popo Agie WA	0.0090	0.0100	0.0100	0.0100	91	43	43.01	260	365
		Teton WA	0.0023	0.0024	0.0021	0.0024	5	43	43.00	260	365
		Washakie WA	0.0023	0.0019	0.0026	0.0026	5	43	43.00	260	365
		Wind River RA	0.0095	0.0106	0.0114	0.0114	91	43	43.01	260	365
		Yellowstone NP	0.0019	0.0021	0.0016	0.0021	5	43	43.00	260	365
SO_2	3-hour	Bridger WA	0.1530	0.1044	0.1635	0.1635	25	132	132.16	1300	1300
		Fitzpatrick WA	0.0240	0.0443	0.0274	0.0443	25	132	132.04	1300	1300
		Grand Teton NP	0.0145	0.0161	0.0164	0.0164	25	132	132.02	1300	1300
		Gros Venture WA	0.0335	0.0229	0.0377	0.0377	512	132	132.04	1300	1300
		North Absoroka WA	0.0056	0.0066	0.0041	0.0066	25	132	132.01	1300	1300
		Popo Agie WA	0.0326	0.0406	0.0362	0.0406	512	132	132.04	1300	1300
		Teton WA	0.0109	0.0085	0.0089	0.0109	25	132	132.01	1300	1300
		Washakie WA	0.0112	0.0078	0.0093	0.0112	25	132	132.01	1300	1300
		Wind River RA	0.0316	0.0405	0.0434	0.0434	512	132	132.04	1300	1300
		Yellowstone NP	0.0114	0.0065	0.0080	0.0114	25	132	132.01	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.6
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
SO_2	Annual	Bridger WA	2.47E-04	1.80E-04	2.31E-04	2.47E-04	4	9	9.00	60	80
		Fitzpatrick WA	3.58E-05	2.64E-05	2.68E-05	3.58E-05	4	9	9.00	60	80
		Grand Teton NP	8.92E-06	7.01E-06	5.65E-06	8.92E-06	4	9	9.00	60	80
		Gros Venture WA	2.81E-05	1.98E-05	1.75E-05	2.81E-05	17	9	9.00	60	80
		North Absoroka WA	2.73E-06	2.92E-06	2.65E-06	2.92E-06	4	9	9.00	60	80
		Popo Agie WA	6.57E-05	6.29E-05	6.58E-05	6.58E-05	17	9	9.00	60	80
		Teton WA	6.99E-06	4.61E-06	4.32E-06	6.99E-06	4	9	9.00	60	80
		Washakie WA	7.63E-06	6.00E-06	5.87E-06	7.63E-06	4	9	9.00	60	80
		Wind River RA	5.18E-05	3.65E-05	4.91E-05	5.18E-05	17	9	9.00	60	80
		Yellowstone NP	3.87E-06	2.98E-06	2.92E-06	3.87E-06	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0024	0.0016	0.0024	0.0024	5	43	43.00	260	365
		Fitzpatrick WA	0.0005	0.0009	0.0004	0.0009	5	43	43.00	260	365
		Grand Teton NP	0.0002	0.0002	0.0002	0.0002	5	43	43.00	260	365
		Gros Venture WA	0.0005	0.0004	0.0005	0.0005	91	43	43.00	260	365
		North Absoroka WA	0.0001	0.0001	0.0001	0.0001	5	43	43.00	260	365
		Popo Agie WA	0.0005	0.0006	0.0006	0.0006	91	43	43.00	260	365
		Teton WA	0.0002	0.0001	0.0001	0.0002	5	43	43.00	260	365
		Washakie WA	0.0002	0.0001	0.0002	0.0002	5	43	43.00	260	365
		Wind River RA	0.0006	0.0007	0.0005	0.0007	91	43	43.00	260	365
		Yellowstone NP	0.0001	0.0001	0.0001	0.0001	5	43	43.00	260	365
SO_2	3-hour	Bridger WA	0.0093	0.0073	0.0094	0.0094	25	132	132.01	1300	1300
		Fitzpatrick WA	0.0018	0.0028	0.0017	0.0028	25	132	132.00	1300	1300
		Grand Teton NP	0.0010	0.0005	0.0009	0.0010	25	132	132.00	1300	1300
		Gros Venture WA	0.0022	0.0017	0.0022	0.0022	512	132	132.00	1300	1300
		North Absoroka WA	0.0004	0.0005	0.0003	0.0005	25	132	132.00	1300	1300
		Popo Agie WA	0.0019	0.0023	0.0020	0.0023	512	132	132.00	1300	1300
		Teton WA	0.0008	0.0005	0.0006	0.0008	25	132	132.00	1300	1300
		Washakie WA	0.0008	0.0004	0.0007	0.0008	25	132	132.00	1300	1300
		Wind River RA	0.0015	0.0028	0.0020	0.0028	512	132	132.00	1300	1300
		Yellowstone NP	0.0008	0.0003	0.0006	0.0008	25	132	132.00	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m³, 43 µg/m³ and 9µg/m³, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.7
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0082	0.0059	0.0069	0.0082	4	9	9.01	60	80
		Fitzpatrick WA	0.0013	0.0012	0.0012	0.0013	4	9	9.00	60	80
		Grand Teton NP	0.0004	0.0005	0.0004	0.0005	4	9	9.00	60	80
		Gros Venture WA	0.0010	0.0010	0.0008	0.0010	17	9	9.00	60	80
		North Absoroka WA	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Popo Agie WA	0.0032	0.0031	0.0030	0.0032	17	9	9.00	60	80
		Teton WA	0.0004	0.0003	0.0002	0.0004	4	9	9.00	60	80
		Washakie WA	0.0005	0.0005	0.0004	0.0005	4	9	9.00	60	80
		Wind River RA	0.0022	0.0017	0.0019	0.0022	17	9	9.00	60	80
		Yellowstone NP	0.0002	0.0002	0.0002	0.0002	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0617	0.0632	0.0816	0.0816	5	43	43.08	260	365
		Fitzpatrick WA	0.0105	0.0200	0.0121	0.0200	5	43	43.02	260	365
		Grand Teton NP	0.0062	0.0093	0.0067	0.0093	5	43	43.01	260	365
		Gros Venture WA	0.0121	0.0137	0.0167	0.0167	91	43	43.02	260	365
		North Absoroka WA	0.0075	0.0052	0.0046	0.0075	5	43	43.01	260	365
		Popo Agie WA	0.0165	0.0233	0.0190	0.0233	91	43	43.02	260	365
		Teton WA	0.0062	0.0052	0.0042	0.0062	5	43	43.01	260	365
		Washakie WA	0.0064	0.0052	0.0074	0.0074	5	43	43.01	260	365
		Wind River RA	0.0144	0.0208	0.0211	0.0211	91	43	43.02	260	365
		Yellowstone NP	0.0051	0.0047	0.0033	0.0051	5	43	43.01	260	365
SO_2	3-hour	Bridger WA	0.2098	0.1694	0.2540	0.2540	25	132	132.25	1300	1300
		Fitzpatrick WA	0.0371	0.0681	0.0453	0.0681	25	132	132.07	1300	1300
		Grand Teton NP	0.0217	0.0333	0.0303	0.0333	25	132	132.03	1300	1300
		Gros Venture WA	0.0590	0.0382	0.0716	0.0716	512	132	132.07	1300	1300
		North Absoroka WA	0.0198	0.0155	0.0102	0.0198	25	132	132.02	1300	1300
		Popo Agie WA	0.0554	0.0831	0.0631	0.0831	512	132	132.08	1300	1300
		Teton WA	0.0213	0.0178	0.0178	0.0213	25	132	132.02	1300	1300
		Washakie WA	0.0243	0.0163	0.0216	0.0243	25	132	132.02	1300	1300
		Wind River RA	0.0557	0.0920	0.0728	0.0920	512	132	132.09	1300	1300
		Yellowstone NP	0.0192	0.0132	0.0146	0.0192	25	132	132.02	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.8
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
SO_2	Annual	Bridger WA	0.0092	0.0067	0.0079	0.0092	4	9	9.01	60	80
		Fitzpatrick WA	0.0015	0.0013	0.0012	0.0015	4	9	9.00	60	80
		Grand Teton NP	0.0005	0.0006	0.0004	0.0006	4	9	9.00	60	80
		Gros Venture WA	0.0012	0.0010	0.0009	0.0012	17	9	9.00	60	80
		North Absoroka WA	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Popo Agie WA	0.0034	0.0033	0.0032	0.0034	17	9	9.00	60	80
		Teton WA	0.0004	0.0003	0.0003	0.0004	4	9	9.00	60	80
		Washakie WA	0.0005	0.0005	0.0004	0.0005	4	9	9.00	60	80
		Wind River RA	0.0024	0.0018	0.0020	0.0024	17	9	9.00	60	80
		Yellowstone NP	0.0003	0.0002	0.0002	0.0003	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0620	0.0657	0.0879	0.0879	5	43	43.09	260	365
		Fitzpatrick WA	0.0136	0.0252	0.0138	0.0252	5	43	43.03	260	365
		Grand Teton NP	0.0076	0.0090	0.0064	0.0090	5	43	43.01	260	365
		Gros Venture WA	0.0121	0.0132	0.0181	0.0181	91	43	43.02	260	365
		North Absoroka WA	0.0075	0.0051	0.0052	0.0075	5	43	43.01	260	365
		Popo Agie WA	0.0173	0.0231	0.0185	0.0231	91	43	43.02	260	365
		Teton WA	0.0076	0.0050	0.0046	0.0076	5	43	43.01	260	365
		Washakie WA	0.0074	0.0054	0.0075	0.0075	5	43	43.01	260	365
		Wind River RA	0.0158	0.0249	0.0199	0.0249	91	43	43.02	260	365
		Yellowstone NP	0.0053	0.0047	0.0038	0.0053	5	43	43.01	260	365
SO_2	3-hour	Bridger WA	0.2638	0.1797	0.2959	0.2959	25	132	132.30	1300	1300
		Fitzpatrick WA	0.0409	0.0872	0.0512	0.0872	25	132	132.09	1300	1300
		Grand Teton NP	0.0262	0.0319	0.0292	0.0319	25	132	132.03	1300	1300
		Gros Venture WA	0.0720	0.0418	0.0742	0.0742	512	132	132.07	1300	1300
		North Absoroka WA	0.0200	0.0164	0.0109	0.0200	25	132	132.02	1300	1300
		Popo Agie WA	0.0536	0.0904	0.0629	0.0904	512	132	132.09	1300	1300
		Teton WA	0.0244	0.0170	0.0182	0.0244	25	132	132.02	1300	1300
		Washakie WA	0.0272	0.0166	0.0219	0.0272	25	132	132.03	1300	1300
		Wind River RA	0.0552	0.1018	0.0652	0.1018	512	132	132.10	1300	1300
		Yellowstone NP	0.0237	0.0134	0.0180	0.0237	25	132	132.02	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 μg/m³, 43 μg/m³ and 9μg/m³, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.9
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alterntive C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
SO_2	Annual	Bridger WA	0.0235	0.0171	0.0207	0.0235	4	9	9.02	60	80
		Fitzpatrick WA	0.0034	0.0028	0.0029	0.0034	4	9	9.00	60	80
		Grand Teton NP	0.0009	0.0011	0.0008	0.0011	4	9	9.00	60	80
		Gros Venture WA	0.0026	0.0023	0.0020	0.0026	17	9	9.00	60	80
		North Absoroka WA	0.0005	0.0005	0.0004	0.0005	4	9	9.00	60	80
		Popo Agie WA	0.0077	0.0074	0.0074	0.0077	17	9	9.01	60	80
		Teton WA	0.0008	0.0007	0.0005	0.0008	4	9	9.00	60	80
		Washakie WA	0.0010	0.0009	0.0008	0.0010	4	9	9.00	60	80
		Wind River RA	0.0056	0.0041	0.0049	0.0056	17	9	9.01	60	80
		Yellowstone NP	0.0005	0.0004	0.0004	0.0005	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.1573	0.1686	0.2391	0.2391	5	43	43.24	260	365
		Fitzpatrick WA	0.0338	0.0653	0.0305	0.0653	5	43	43.07	260	365
		Grand Teton NP	0.0180	0.0203	0.0157	0.0203	5	43	43.02	260	365
		Gros Venture WA	0.0290	0.0317	0.0428	0.0428	91	43	43.04	260	365
		North Absoroka WA	0.0079	0.0102	0.0090	0.0102	5	43	43.01	260	365
		Popo Agie WA	0.0403	0.0501	0.0449	0.0501	91	43	43.05	260	365
		Teton WA	0.0139	0.0114	0.0105	0.0139	5	43	43.01	260	365
		Washakie WA	0.0138	0.0105	0.0143	0.0143	5	43	43.01	260	365
		Wind River RA	0.0413	0.0567	0.0427	0.0567	91	43	43.06	260	365
		Yellowstone NP	0.0093	0.0103	0.0084	0.0103	5	43	43.01	260	365
SO_2	3-hour	Bridger WA	0.6995	0.4734	0.7563	0.7563	25	132	132.76	1300	1300
		Fitzpatrick WA	0.1096	0.2194	0.1275	0.2194	25	132	132.22	1300	1300
		Grand Teton NP	0.0684	0.0753	0.0742	0.0753	25	132	132.08	1300	1300
		Gros Venture WA	0.1644	0.1125	0.1777	0.1777	512	132	132.18	1300	1300
		North Absoroka WA	0.0271	0.0343	0.0227	0.0343	25	132	132.03	1300	1300
		Popo Agie WA	0.1408	0.1932	0.1448	0.1932	512	132	132.19	1300	1300
		Teton WA	0.0577	0.0403	0.0420	0.0577	25	132	132.06	1300	1300
		Washakie WA	0.0587	0.0359	0.0472	0.0587	25	132	132.06	1300	1300
		Wind River RA	0.1338	0.1926	0.1484	0.1926	512	132	132.19	1300	1300
		Yellowstone NP	0.0566	0.0311	0.0413	0.0566	25	132	132.06	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m³, 43 µg/m³ and 9µg/m³, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.10
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Bridger WA	0.0070	0.0051	0.0060	0.0070	4	9	9.01	60	80
		Fitzpatrick WA	0.0012	0.0010	0.0010	0.0012	4	9	9.00	60	80
		Grand Teton NP	0.0004	0.0005	0.0003	0.0005	4	9	9.00	60	80
		Gros Venture WA	0.0009	0.0008	0.0007	0.0009	17	9	9.00	60	80
		North Absoroka WA	0.0003	0.0002	0.0002	0.0003	4	9	9.00	60	80
		Popo Agie WA	0.0027	0.0027	0.0026	0.0027	17	9	9.00	60	80
		Teton WA	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Washakie WA	0.0005	0.0004	0.0004	0.0005	4	9	9.00	60	80
		Wind River RA	0.0019	0.0014	0.0016	0.0019	17	9	9.00	60	80
		Yellowstone NP	0.0002	0.0002	0.0002	0.0002	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0478	0.0492	0.0673	0.0673	5	43	43.07	260	365
		Fitzpatrick WA	0.0106	0.0199	0.0111	0.0199	5	43	43.02	260	365
		Grand Teton NP	0.0062	0.0072	0.0050	0.0072	5	43	43.01	260	365
		Gros Venture WA	0.0095	0.0102	0.0142	0.0142	91	43	43.01	260	365
		North Absoroka WA	0.0075	0.0045	0.0045	0.0075	5	43	43.01	260	365
		Popo Agie WA	0.0139	0.0187	0.0145	0.0187	91	43	43.02	260	365
		Teton WA	0.0062	0.0041	0.0041	0.0062	5	43	43.01	260	365
		Washakie WA	0.0064	0.0048	0.0065	0.0065	5	43	43.01	260	365
		Wind River RA	0.0115	0.0206	0.0146	0.0206	91	43	43.02	260	365
		Yellowstone NP	0.0051	0.0040	0.0032	0.0051	5	43	43.01	260	365
SO_2	3-hour	Bridger WA	0.1971	0.1358	0.2405	0.2405	25	132	132.24	1300	1300
		Fitzpatrick WA	0.0325	0.0674	0.0380	0.0674	25	132	132.07	1300	1300
		Grand Teton NP	0.0216	0.0255	0.0221	0.0255	25	132	132.03	1300	1300
		Gros Venture WA	0.0586	0.0315	0.0572	0.0586	512	132	132.06	1300	1300
		North Absoroka WA	0.0198	0.0140	0.0095	0.0198	25	132	132.02	1300	1300
		Popo Agie WA	0.0425	0.0792	0.0483	0.0792	512	132	132.08	1300	1300
		Teton WA	0.0202	0.0133	0.0150	0.0202	25	132	132.02	1300	1300
		Washakie WA	0.0231	0.0141	0.0196	0.0231	25	132	132.02	1300	1300
		Wind River RA	0.0415	0.0889	0.0528	0.0889	512	132	132.09	1300	1300
		Yellowstone NP	0.0192	0.0107	0.0145	0.0192	25	132	132.02	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.2.11
Maximum Modeled SO_2 Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
SO_2	Annual	Bridger WA	0.0022	0.0016	0.0016	0.0022	4	9	9.00	60	80
		Fitzpatrick WA	0.0005	0.0005	0.0004	0.0005	4	9	9.00	60	80
		Grand Teton NP	0.0003	0.0003	0.0002	0.0003	4	9	9.00	60	80
		Gros Venture WA	0.0004	0.0004	0.0003	0.0004	17	9	9.00	60	80
		North Absoroka WA	0.0002	0.0002	0.0001	0.0002	4	9	9.00	60	80
		Popo Agie WA	0.0013	0.0013	0.0012	0.0013	17	9	9.00	60	80
		Teton WA	0.0002	0.0002	0.0001	0.0002	4	9	9.00	60	80
		Washakie WA	0.0003	0.0003	0.0003	0.0003	4	9	9.00	60	80
		Wind River RA	0.0008	0.0007	0.0006	0.0008	17	9	9.00	60	80
		Yellowstone NP	0.0002	0.0001	0.0001	0.0002	4	9	9.00	60	80
SO_2	24-hour	Bridger WA	0.0216	0.0175	0.0314	0.0314	5	43	43.03	260	365
		Fitzpatrick WA	0.0054	0.0103	0.0059	0.0103	5	43	43.01	260	365
		Grand Teton NP	0.0036	0.0032	0.0025	0.0036	5	43	43.00	260	365
		Gros Venture WA	0.0046	0.0046	0.0057	0.0057	91	43	43.01	260	365
		North Absoroka WA	0.0073	0.0037	0.0033	0.0073	5	43	43.01	260	365
		Popo Agie WA	0.0077	0.0087	0.0077	0.0087	91	43	43.01	260	365
		Teton WA	0.0050	0.0026	0.0031	0.0050	5	43	43.01	260	365
		Washakie WA	0.0052	0.0036	0.0058	0.0058	5	43	43.01	260	365
		Wind River RA	0.0063	0.0099	0.0058	0.0099	91	43	43.01	260	365
		Yellowstone NP	0.0032	0.0024	0.0025	0.0032	5	43	43.00	260	365
SO_2	3-hour	Bridger WA	0.0814	0.0702	0.1039	0.1039	25	132	132.10	1300	1300
		Fitzpatrick WA	0.0152	0.0250	0.0156	0.0250	25	132	132.03	1300	1300
		Grand Teton NP	0.0132	0.0124	0.0100	0.0132	25	132	132.01	1300	1300
		Gros Venture WA	0.0297	0.0121	0.0198	0.0297	512	132	132.03	1300	1300
		North Absoroka WA	0.0195	0.0096	0.0079	0.0195	25	132	132.02	1300	1300
		Popo Agie WA	0.0246	0.0551	0.0293	0.0551	512	132	132.06	1300	1300
		Teton WA	0.0145	0.0063	0.0072	0.0145	25	132	132.01	1300	1300
		Washakie WA	0.0194	0.0085	0.0142	0.0194	25	132	132.02	1300	1300
		Wind River RA	0.0192	0.0611	0.0225	0.0611	512	132	132.06	1300	1300
		Yellowstone NP	0.0101	0.0068	0.0070	0.0101	25	132	132.01	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m³, 43 µg/m³ and 9µg/m³, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.3.1
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.0975	0.0796	0.0931	0.0975	4	9	9.10	50	--[4]
		Fitzpatrick WA	0.0203	0.0193	0.0170	0.0203	4	9	9.02	50	--[4]
		Grand Teton NP	0.0064	0.0080	0.0049	0.0080	4	9	9.01	50	--[4]
		Gros Venture WA	0.0174	0.0146	0.0140	0.0174	17	9	9.02	50	--[4]
		North Absoroka WA	0.0020	0.0034	0.0022	0.0034	4	9	9.00	50	--[4]
		Popo Agie WA	0.0310	0.0350	0.0320	0.0350	17	9	9.04	50	--[4]
		Teton WA	0.0050	0.0047	0.0036	0.0050	4	9	9.01	50	--[4]
		Washakie WA	0.0054	0.0055	0.0044	0.0055	4	9	9.01	50	--[4]
		Wind River RA	0.0260	0.0226	0.0254	0.0260	17	9	9.03	50	--[4]
		Yellowstone NP	0.0028	0.0035	0.0023	0.0035	4	9	9.00	50	--[4]
PM_{10}	24-hour	Bridger WA	1.1785	1.4278	1.7955	1.7955	8	32	33.80	150	150
		Fitzpatrick WA	0.3130	0.6011	0.3779	0.6011	8	32	32.60	150	150
		Grand Teton NP	0.1347	0.1764	0.1265	0.1764	8	32	32.18	150	150
		Gros Venture WA	0.2474	0.3590	0.3275	0.3590	30	32	32.36	150	150
		North Absoroka WA	0.0526	0.1340	0.0577	0.1340	8	32	32.13	150	150
		Popo Agie WA	0.3042	0.3301	0.4596	0.4596	30	32	32.46	150	150
		Teton WA	0.1158	0.1327	0.0777	0.1327	8	32	32.13	150	150
		Washakie WA	0.1710	0.1288	0.1304	0.1710	8	32	32.17	150	150
		Wind River RA	0.2589	0.5398	0.4167	0.5398	30	32	32.54	150	150
		Yellowstone NP	0.0836	0.1178	0.0615	0.1178	8	32	32.12	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.2
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.1306	0.1086	0.1233	0.1306	4	9	9.13	50	--[4]
		Fitzpatrick WA	0.0270	0.0275	0.0250	0.0275	4	9	9.03	50	--[4]
		Grand Teton NP	0.0089	0.0126	0.0075	0.0126	4	9	9.01	50	--[4]
		Gros Venture WA	0.0242	0.0216	0.0209	0.0242	17	9	9.02	50	--[4]
		North Absoroka WA	0.0028	0.0050	0.0030	0.0050	4	9	9.00	50	--[4]
		Popo Agie WA	0.0428	0.0486	0.0444	0.0486	17	9	9.05	50	--[4]
		Teton WA	0.0070	0.0069	0.0053	0.0070	4	9	9.01	50	--[4]
		Washakie WA	0.0073	0.0079	0.0064	0.0079	4	9	9.01	50	--[4]
		Wind River RA	0.0352	0.0322	0.0349	0.0352	17	9	9.04	50	--[4]
		Yellowstone NP	0.0039	0.0055	0.0034	0.0055	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	1.5652	2.4080	2.5413	2.5413	8	32	34.54	150	150
		Fitzpatrick WA	0.4031	0.7500	0.5238	0.7500	8	32	32.75	150	150
		Grand Teton NP	0.1639	0.3127	0.2234	0.3127	8	32	32.31	150	150
		Gros Venture WA	0.3120	0.5987	0.5473	0.5987	30	32	32.60	150	150
		North Absoroka WA	0.0659	0.1636	0.0946	0.1636	8	32	32.16	150	150
		Popo Agie WA	0.4055	0.4923	0.6051	0.6051	30	32	32.61	150	150
		Teton WA	0.1468	0.1787	0.1386	0.1787	8	32	32.18	150	150
		Washakie WA	0.2232	0.1767	0.1914	0.2232	8	32	32.22	150	150
		Wind River RA	0.3324	0.6995	0.6428	0.6995	30	32	32.70	150	150
		Yellowstone NP	0.1027	0.1658	0.0838	0.1658	8	32	32.17	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.3
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
PM_{10}	Annual	Bridger WA	0.1323	0.1131	0.1266	0.1323	4	9	9.13	50	--[4]
		Fitzpatrick WA	0.0295	0.0281	0.0253	0.0295	4	9	9.03	50	--[4]
		Grand Teton NP	0.0101	0.0113	0.0071	0.0113	4	9	9.01	50	--[4]
		Gros Venture WA	0.0263	0.0208	0.0202	0.0263	17	9	9.03	50	--[4]
		North Absoroka WA	0.0029	0.0047	0.0031	0.0047	4	9	9.00	50	--[4]
		Popo Agie WA	0.0423	0.0485	0.0442	0.0485	17	9	9.05	50	--[4]
		Teton WA	0.0076	0.0066	0.0053	0.0076	4	9	9.01	50	--[4]
		Washakie WA	0.0078	0.0076	0.0062	0.0078	4	9	9.01	50	--[4]
		Wind River RA	0.0359	0.0324	0.0352	0.0359	17	9	9.04	50	--[4]
		Yellowstone NP	0.0042	0.0050	0.0035	0.0050	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	1.8477	1.9583	2.6937	2.6937	8	32	34.69	150	150
		Fitzpatrick WA	0.4749	0.8759	0.5536	0.8759	8	32	32.88	150	150
		Grand Teton NP	0.2049	0.2647	0.1815	0.2647	8	32	32.26	150	150
		Gros Venture WA	0.4181	0.4884	0.4579	0.4884	30	32	32.49	150	150
		North Absoroka WA	0.0779	0.2026	0.0831	0.2026	8	32	32.20	150	150
		Popo Agie WA	0.4669	0.5146	0.7004	0.7004	30	32	32.70	150	150
		Teton WA	0.1797	0.1999	0.1147	0.1999	8	32	32.20	150	150
		Washakie WA	0.2591	0.1938	0.1742	0.2591	8	32	32.26	150	150
		Wind River RA	0.3701	0.8135	0.4781	0.8135	30	32	32.81	150	150
		Yellowstone NP	0.1247	0.1724	0.0974	0.1724	8	32	32.17	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m^3 and 9 µg/m^3, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.4
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.0982	0.0819	0.0932	0.0982	4	9	9.10	50	--[4]
		Fitzpatrick WA	0.0210	0.0199	0.0182	0.0210	4	9	9.02	50	--[4]
		Grand Teton NP	0.0070	0.0081	0.0051	0.0081	4	9	9.01	50	--[4]
		Gros Venture WA	0.0186	0.0150	0.0144	0.0186	17	9	9.02	50	--[4]
		North Absoroka WA	0.0022	0.0034	0.0023	0.0034	4	9	9.00	50	--[4]
		Popo Agie WA	0.0313	0.0352	0.0326	0.0352	17	9	9.04	50	--[4]
		Teton WA	0.0054	0.0047	0.0038	0.0054	4	9	9.01	50	--[4]
		Washakie WA	0.0056	0.0056	0.0045	0.0056	4	9	9.01	50	--[4]
		Wind River RA	0.0263	0.0232	0.0257	0.0263	17	9	9.03	50	--[4]
		Yellowstone NP	0.0030	0.0036	0.0025	0.0036	4	9	9.00	50	--[4]
PM_{10}	24-hour	Bridger WA	1.2963	1.4064	1.9301	1.9301	8	32	33.93	150	150
		Fitzpatrick WA	0.3262	0.6042	0.3757	0.6042	8	32	32.60	150	150
		Grand Teton NP	0.1389	0.1835	0.1244	0.1835	8	32	32.18	150	150
		Gros Venture WA	0.2819	0.3405	0.3159	0.3405	30	32	32.34	150	150
		North Absoroka WA	0.0534	0.1398	0.0583	0.1398	8	32	32.14	150	150
		Popo Agie WA	0.3197	0.3465	0.4763	0.4763	30	32	32.48	150	150
		Teton WA	0.1218	0.1396	0.0784	0.1396	8	32	32.14	150	150
		Washakie WA	0.1774	0.1341	0.1223	0.1774	8	32	32.18	150	150
		Wind River RA	0.2524	0.5578	0.3775	0.5578	30	32	32.56	150	150
		Yellowstone NP	0.0862	0.1208	0.0665	0.1208	8	32	32.12	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.5
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.0447	0.0357	0.0418	0.0447	4	9	9.04	50	--[4]
		Fitzpatrick WA	0.0090	0.0084	0.0078	0.0090	4	9	9.01	50	--[4]
		Grand Teton NP	0.0029	0.0036	0.0022	0.0036	4	9	9.00	50	--[4]
		Gros Venture WA	0.0079	0.0066	0.0063	0.0079	17	9	9.01	50	--[4]
		North Absoroka WA	0.0009	0.0015	0.0010	0.0015	4	9	9.00	50	--[4]
		Popo Agie WA	0.0144	0.0156	0.0147	0.0156	17	9	9.02	50	--[4]
		Teton WA	0.0023	0.0021	0.0016	0.0023	4	9	9.00	50	--[4]
		Washakie WA	0.0024	0.0025	0.0020	0.0025	4	9	9.00	50	--[4]
		Wind River RA	0.0117	0.0101	0.0115	0.0117	17	9	9.01	50	--[4]
		Yellowstone NP	0.0013	0.0016	0.0011	0.0016	4	9	9.00	50	--[4]
PM_{10}	24-hour	Bridger WA	0.5180	0.5899	0.8475	0.8475	8	32	32.85	150	150
		Fitzpatrick WA	0.1305	0.2472	0.1409	0.2472	8	32	32.25	150	150
		Grand Teton NP	0.0526	0.0768	0.0526	0.0768	8	32	32.08	150	150
		Gros Venture WA	0.1013	0.1439	0.1791	0.1791	30	32	32.18	150	150
		North Absoroka WA	0.0210	0.0576	0.0241	0.0576	8	32	32.06	150	150
		Popo Agie WA	0.1264	0.1381	0.1839	0.1839	30	32	32.18	150	150
		Teton WA	0.0483	0.0581	0.0309	0.0581	8	32	32.06	150	150
		Washakie WA	0.0712	0.0557	0.0519	0.0712	8	32	32.07	150	150
		Wind River RA	0.1021	0.2217	0.1622	0.2217	30	32	32.22	150	150
		Yellowstone NP	0.0350	0.0511	0.0250	0.0511	8	32	32.05	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.6
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.0396	0.0333	0.0391	0.0396	4	9	9.04	50	--[4]
		Fitzpatrick WA	0.0097	0.0089	0.0072	0.0097	4	9	9.01	50	--[4]
		Grand Teton NP	0.0035	0.0037	0.0025	0.0037	4	9	9.00	50	--[4]
		Gros Venture WA	0.0084	0.0067	0.0059	0.0084	17	9	9.01	50	--[4]
		North Absoroka WA	0.0011	0.0017	0.0011	0.0017	4	9	9.00	50	--[4]
		Popo Agie WA	0.0144	0.0162	0.0152	0.0162	17	9	9.02	50	--[4]
		Teton WA	0.0027	0.0024	0.0017	0.0027	4	9	9.00	50	--[4]
		Washakie WA	0.0029	0.0028	0.0021	0.0029	4	9	9.00	50	--[4]
		Wind River RA	0.0113	0.0104	0.0110	0.0113	17	9	9.01	50	--[4]
		Yellowstone NP	0.0015	0.0018	0.0012	0.0018	4	9	9.00	50	--[4]
PM_{10}	24-hour	Bridger WA	0.4305	0.4090	0.5468	0.5468	8	32	32.55	150	150
		Fitzpatrick WA	0.1767	0.3689	0.1526	0.3689	8	32	32.37	150	150
		Grand Teton NP	0.0710	0.0987	0.0655	0.0987	8	32	32.10	150	150
		Gros Venture WA	0.1206	0.1461	0.1033	0.1461	30	32	32.15	150	150
		North Absoroka WA	0.0305	0.0666	0.0331	0.0666	8	32	32.07	150	150
		Popo Agie WA	0.1420	0.1943	0.2461	0.2461	30	32	32.25	150	150
		Teton WA	0.0660	0.0750	0.0408	0.0750	8	32	32.08	150	150
		Washakie WA	0.0995	0.0754	0.0495	0.0995	8	32	32.10	150	150
		Wind River RA	0.1435	0.3024	0.1586	0.3024	30	32	32.30	150	150
		Yellowstone NP	0.0466	0.0646	0.0314	0.0646	8	32	32.06	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.7
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.1745	0.1415	0.1576	0.1745	4	9	9.17	50	--[4]
		Fitzpatrick WA	0.0415	0.0427	0.0366	0.0427	4	9	9.04	50	--[4]
		Grand Teton NP	0.0587	0.0664	0.0589	0.0664	4	9	9.07	50	--[4]
		Gros Venture WA	0.0377	0.0328	0.0310	0.0377	17	9	9.04	50	--[4]
		North Absoroka WA	0.0068	0.0098	0.0061	0.0098	4	9	9.01	50	--[4]
		Popo Agie WA	0.0723	0.0824	0.0736	0.0824	17	9	9.08	50	--[4]
		Teton WA	0.0382	0.0280	0.0259	0.0382	4	9	9.04	50	--[4]
		Washakie WA	0.0168	0.0184	0.0145	0.0184	4	9	9.02	50	--[4]
		Wind River RA	0.0727	0.0840	0.0617	0.0840	17	9	9.08	50	--[4]
		Yellowstone NP	0.0081	0.0100	0.0067	0.0100	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	2.0930	2.6174	3.2829	3.2829	8	32	35.28	150	150
		Fitzpatrick WA	0.6635	1.0481	0.6226	1.0481	8	32	33.05	150	150
		Grand Teton NP	0.8063	0.9971	0.4964	0.9971	8	32	33.00	150	150
		Gros Venture WA	0.4858	0.6355	0.6971	0.6971	30	32	32.70	150	150
		North Absoroka WA	0.1332	0.2743	0.1518	0.2743	8	32	32.27	150	150
		Popo Agie WA	0.6784	0.8346	0.8941	0.8941	30	32	32.89	150	150
		Teton WA	0.5616	0.4346	0.3423	0.5616	8	32	32.56	150	150
		Washakie WA	0.3794	0.2997	0.2809	0.3794	8	32	32.38	150	150
		Wind River RA	0.6074	1.1387	0.7050	1.1387	30	32	33.14	150	150
		Yellowstone NP	0.2009	0.2687	0.1291	0.2687	8	32	32.27	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.8
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.1762	0.1461	0.1609	0.1762	4	9	9.18	50	--[4]
		Fitzpatrick WA	0.0440	0.0433	0.0369	0.0440	4	9	9.04	50	--[4]
		Grand Teton NP	0.0598	0.0651	0.0586	0.0651	4	9	9.07	50	--[4]
		Gros Venture WA	0.0398	0.0317	0.0302	0.0398	17	9	9.04	50	--[4]
		North Absoroka WA	0.0069	0.0095	0.0062	0.0095	4	9	9.01	50	--[4]
		Popo Agie WA	0.0718	0.0822	0.0734	0.0822	17	9	9.08	50	--[4]
		Teton WA	0.0388	0.0277	0.0259	0.0388	4	9	9.04	50	--[4]
		Washakie WA	0.0173	0.0181	0.0143	0.0181	4	9	9.02	50	--[4]
		Wind River RA	0.0735	0.0841	0.0617	0.0841	17	9	9.08	50	--[4]
		Yellowstone NP	0.0084	0.0095	0.0068	0.0095	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	2.3755	2.1662	2.9791	2.9791	8	32	34.98	150	150
		Fitzpatrick WA	0.7245	1.1117	0.6507	1.1117	8	32	33.11	150	150
		Grand Teton NP	0.8736	0.9995	0.4964	0.9995	8	32	33.00	150	150
		Gros Venture WA	0.5039	0.5552	0.5669	0.5669	30	32	32.57	150	150
		North Absoroka WA	0.1386	0.3067	0.1548	0.3067	8	32	32.31	150	150
		Popo Agie WA	0.7506	0.8655	0.9889	0.9889	30	32	32.99	150	150
		Teton WA	0.5601	0.4191	0.3461	0.5601	8	32	32.56	150	150
		Washakie WA	0.4167	0.3253	0.2438	0.4167	8	32	32.42	150	150
		Wind River RA	0.6586	1.2562	0.6514	1.2562	30	32	33.26	150	150
		Yellowstone NP	0.2179	0.2413	0.1236	0.2413	8	32	32.24	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.9
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.1421	0.1148	0.1276	0.1421	4	9	9.14	50	--[4]
		Fitzpatrick WA	0.0356	0.0351	0.0298	0.0356	4	9	9.04	50	--[4]
		Grand Teton NP	0.0570	0.0620	0.0567	0.0620	4	9	9.06	50	--[4]
		Gros Venture WA	0.0322	0.0280	0.0245	0.0322	17	9	9.03	50	--[4]
		North Absoroka WA	0.0062	0.0082	0.0054	0.0082	4	9	9.01	50	--[4]
		Popo Agie WA	0.0608	0.0691	0.0619	0.0691	17	9	9.07	50	--[4]
		Teton WA	0.0365	0.0259	0.0244	0.0365	4	9	9.04	50	--[4]
		Washakie WA	0.0153	0.0160	0.0128	0.0160	4	9	9.02	50	--[4]
		Wind River RA	0.0684	0.0779	0.0577	0.0779	17	9	9.08	50	--[4]
		Yellowstone NP	0.0072	0.0081	0.0058	0.0081	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	1.8241	1.6143	2.2155	2.2155	8	32	34.22	150	150
		Fitzpatrick WA	0.5858	0.8887	0.4926	0.8887	8	32	32.89	150	150
		Grand Teton NP	0.7227	0.9734	0.4964	0.9734	8	32	32.97	150	150
		Gros Venture WA	0.4806	0.4427	0.4448	0.4806	30	32	32.48	150	150
		North Absoroka WA	0.1212	0.2462	0.1331	0.2462	8	32	32.25	150	150
		Popo Agie WA	0.5931	0.7227	0.7658	0.7658	30	32	32.77	150	150
		Teton WA	0.5601	0.4060	0.3394	0.5601	8	32	32.56	150	150
		Washakie WA	0.3351	0.2718	0.2110	0.3351	8	32	32.34	150	150
		Wind River RA	0.5936	1.0107	0.5099	1.0107	30	32	33.01	150	150
		Yellowstone NP	0.1825	0.1850	0.1021	0.1850	8	32	32.19	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.10
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.0886	0.0686	0.0761	0.0886	4	9	9.09	50	--[4]
		Fitzpatrick WA	0.0238	0.0240	0.0197	0.0240	4	9	9.02	50	--[4]
		Grand Teton NP	0.0531	0.0578	0.0541	0.0578	4	9	9.06	50	--[4]
		Gros Venture WA	0.0215	0.0233	0.0187	0.0233	17	9	9.02	50	--[4]
		North Absoroka WA	0.0050	0.0064	0.0042	0.0064	4	9	9.01	50	--[4]
		Popo Agie WA	0.0439	0.0501	0.0440	0.0501	17	9	9.05	50	--[4]
		Teton WA	0.0335	0.0232	0.0223	0.0335	4	9	9.03	50	--[4]
		Washakie WA	0.0124	0.0129	0.0106	0.0129	4	9	9.01	50	--[4]
		Wind River RA	0.0607	0.0689	0.0513	0.0689	17	9	9.07	50	--[4]
		Yellowstone NP	0.0055	0.0061	0.0044	0.0061	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	1.0458	0.7977	1.1329	1.1329	8	32	33.13	150	150
		Fitzpatrick WA	0.3929	0.6911	0.2655	0.6911	8	32	32.69	150	150
		Grand Teton NP	0.6331	0.8700	0.4963	0.8700	8	32	32.87	150	150
		Gros Venture WA	0.4503	0.3637	0.4080	0.4503	30	32	32.45	150	150
		North Absoroka WA	0.0994	0.1682	0.0897	0.1682	8	32	32.17	150	150
		Popo Agie WA	0.4591	0.6429	0.4745	0.6429	30	32	32.64	150	150
		Teton WA	0.5582	0.3377	0.3300	0.5582	8	32	32.56	150	150
		Washakie WA	0.2274	0.2246	0.1555	0.2274	8	32	32.23	150	150
		Wind River RA	0.5250	0.7029	0.4328	0.7029	30	32	32.70	150	150
		Yellowstone NP	0.1301	0.1251	0.0705	0.1301	8	32	32.13	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.3.11
Maximum Modeled PM_{10} Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Bridger WA	0.0835	0.0662	0.0734	0.0835	4	9	9.08	50	--[4]
		Fitzpatrick WA	0.0244	0.0247	0.0190	0.0247	4	9	9.02	50	--[4]
		Grand Teton NP	0.0536	0.0579	0.0543	0.0579	4	9	9.06	50	--[4]
		Gros Venture WA	0.0219	0.0234	0.0190	0.0234	17	9	9.02	50	--[4]
		North Absoroka WA	0.0051	0.0066	0.0043	0.0066	4	9	9.01	50	--[4]
		Popo Agie WA	0.0439	0.0508	0.0445	0.0508	17	9	9.05	50	--[4]
		Teton WA	0.0339	0.0235	0.0224	0.0339	4	9	9.03	50	--[4]
		Washakie WA	0.0127	0.0133	0.0107	0.0133	4	9	9.01	50	--[4]
		Wind River RA	0.0612	0.0696	0.0512	0.0696	17	9	9.07	50	--[4]
		Yellowstone NP	0.0057	0.0063	0.0045	0.0063	4	9	9.01	50	--[4]
PM_{10}	24-hour	Bridger WA	0.9275	0.6761	0.9693	0.9693	8	32	32.97	150	150
		Fitzpatrick WA	0.4421	0.7285	0.2803	0.7285	8	32	32.73	150	150
		Grand Teton NP	0.6331	0.8924	0.4963	0.8924	8	32	32.89	150	150
		Gros Venture WA	0.4574	0.3637	0.4080	0.4574	30	32	32.46	150	150
		North Absoroka WA	0.1076	0.1947	0.0987	0.1947	8	32	32.19	150	150
		Popo Agie WA	0.4662	0.6693	0.5338	0.6693	30	32	32.67	150	150
		Teton WA	0.5571	0.3574	0.3320	0.5571	8	32	32.56	150	150
		Washakie WA	0.2561	0.2256	0.1679	0.2561	8	32	32.26	150	150
		Wind River RA	0.5492	0.7540	0.4280	0.7540	30	32	32.75	150	150
		Yellowstone NP	0.1466	0.1428	0.0777	0.1466	8	32	32.15	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.4.1
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.0975	0.0796	0.0931	0.0975	6	6.10	15	15
		Fitzpatrick WA	0.0203	0.0193	0.0170	0.0203	6	6.02	15	15
		Grand Teton NP	0.0064	0.0080	0.0049	0.0080	6	6.01	15	15
		Gros Venture WA	0.0174	0.0146	0.0140	0.0174	6	6.02	15	15
		North Absoroka WA	0.0020	0.0034	0.0022	0.0034	6	6.00	15	15
		Popo Agie WA	0.0310	0.0350	0.0320	0.0350	6	6.04	15	15
		Teton WA	0.0050	0.0047	0.0036	0.0050	6	6.01	15	15
		Washakie WA	0.0054	0.0055	0.0044	0.0055	6	6.01	15	15
		Wind River RA	0.0260	0.0226	0.0254	0.0260	6	6.03	15	15
		Yellowstone NP	0.0028	0.0035	0.0023	0.0035	6	6.00	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.5993	0.4762	0.7221	0.7221	15	15.72	65[2]	[3]
		Fitzpatrick WA	0.1845	0.1881	0.1544	0.1881	15	15.19	65[2]	[3]
		Grand Teton NP	0.0669	0.1124	0.0565	0.1124	15	15.11	65[2]	[3]
		Gros Venture WA	0.1429	0.1540	0.1450	0.1540	15	15.15	65[2]35	[3]
		North Absoroka WA	0.0212	0.0497	0.0275	0.0497	15	15.05	65[2]35	[3]
		Popo Agie WA	0.2038	0.1818	0.2562	0.2562	15	15.26	65[2]35	[3]
		Teton WA	0.0583	0.0616	0.0393	0.0616	15	15.06	65[2]35	35[3]
		Washakie WA	0.0487	0.0654	0.0550	0.0654	15	15.07	65[2]35	[3]
		Wind River RA	0.1738	0.1769	0.2582	0.2582	15	15.26	65[2]35	[3]
		Yellowstone NP	0.0395	0.0563	0.0276	0.0563	15	15.06	65[2]	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.2
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.1306	0.1086	0.1233	0.1306	6	6.13	15	15
		Fitzpatrick WA	0.0270	0.0275	0.0250	0.0275	6	6.03	15	15
		Grand Teton NP	0.0089	0.0126	0.0075	0.0126	6	6.01	15	15
		Gros Venture WA	0.0242	0.0216	0.0209	0.0242	6	6.02	15	15
		North Absoroka WA	0.0028	0.0050	0.0030	0.0050	6	6.00	15	15
		Popo Agie WA	0.0428	0.0486	0.0444	0.0486	6	6.05	15	15
		Teton WA	0.0070	0.0069	0.0053	0.0070	6	6.01	15	15
		Washakie WA	0.0073	0.0079	0.0064	0.0079	6	6.01	15	15
		Wind River RA	0.0352	0.0322	0.0349	0.0352	6	6.04	15	15
		Yellowstone NP	0.0039	0.0055	0.0034	0.0055	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.7763	0.6560	0.9605	0.9605	15	15.96	65[2]	[3]
		Fitzpatrick WA	0.2299	0.2376	0.2046	0.2376	15	15.24	65[2]	[3]
		Grand Teton NP	0.0951	0.1825	0.0768	0.1825	15	15.18	65[2]	[3]
		Gros Venture WA	0.2072	0.2504	0.2054	0.2504	15	15.25	65[2]35	[3]
		North Absoroka WA	0.0281	0.0663	0.0365	0.0663	15	15.07	65[2]35	[3]
		Popo Agie WA	0.2802	0.2547	0.3102	0.3102	15	15.31	65[2]35	[3]
		Teton WA	0.0760	0.1090	0.0508	0.1090	15	15.11	65[2]35	[3]
		Washakie WA	0.0670	0.0969	0.0780	0.0969	15	15.10	65[2]35	[3]
		Wind River RA	0.2723	0.2550	0.3067	0.3067	15	15.31	65[2]35	[3]
		Yellowstone NP	0.0509	0.0898	0.0399	0.0898	15	15.09	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.3
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.1323	0.1131	0.1266	0.1323	6	6.13	15	15
		Fitzpatrick WA	0.0295	0.0281	0.0253	0.0295	6	6.03	15	15
		Grand Teton NP	0.0101	0.0113	0.0071	0.0113	6	6.01	15	15
		Gros Venture WA	0.0263	0.0208	0.0202	0.0263	6	6.03	15	15
		North Absoroka WA	0.0029	0.0047	0.0031	0.0047	6	6.00	15	15
		Popo Agie WA	0.0423	0.0485	0.0442	0.0485	6	6.05	15	15
		Teton WA	0.0076	0.0066	0.0053	0.0076	6	6.01	15	15
		Washakie WA	0.0078	0.0076	0.0062	0.0078	6	6.01	15	15
		Wind River RA	0.0359	0.0324	0.0352	0.0359	6	6.04	15	15
		Yellowstone NP	0.0042	0.0050	0.0035	0.0050	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.8843	0.7333	1.0768	1.0768	15	16.08	65[2]	[3]
		Fitzpatrick WA	0.2728	0.2463	0.2379	0.2728	15	15.27	65[2]	[3]
		Grand Teton NP	0.1209	0.1585	0.0900	0.1585	15	15.16	65[2]	[3]
		Gros Venture WA	0.2026	0.2108	0.2153	0.2153	15	15.22	65[2]35	[3]
		North Absoroka WA	0.0318	0.0753	0.0407	0.0753	15	15.08	65[2]35	[3]
		Popo Agie WA	0.3153	0.2687	0.3154	0.3154	15	15.32	65[2]35	[3]
		Teton WA	0.0889	0.0891	0.0578	0.0891	15	15.09	65[2]35	[3]
		Washakie WA	0.0751	0.0961	0.0774	0.0961	15	15.10	65[2]35	[3]
		Wind River RA	0.2477	0.2416	0.3189	0.3189	15	15.32	65[2]35	[3]
		Yellowstone NP	0.0658	0.0846	0.0424	0.0846	15	15.08	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.4
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.0982	0.0819	0.0932	0.0982	6	6.10	15	15
		Fitzpatrick WA	0.0210	0.0199	0.0182	0.0210	6	6.02	15	15
		Grand Teton NP	0.0070	0.0081	0.0051	0.0081	6	6.01	15	15
		Gros Venture WA	0.0186	0.0150	0.0144	0.0186	6	6.02	15	15
		North Absoroka WA	0.0022	0.0034	0.0023	0.0034	6	6.00	15	15
		Popo Agie WA	0.0313	0.0352	0.0326	0.0352	6	6.04	15	15
		Teton WA	0.0054	0.0047	0.0038	0.0054	6	6.01	15	15
		Washakie WA	0.0056	0.0056	0.0045	0.0056	6	6.01	15	15
		Wind River RA	0.0263	0.0232	0.0257	0.0263	6	6.03	15	15
		Yellowstone NP	0.0030	0.0036	0.0025	0.0036	6	6.00	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.6247	0.5083	0.7729	0.7729	15	15.77	65[2]	[3]
		Fitzpatrick WA	0.1856	0.1740	0.1627	0.1856	15	15.19	65[2]	[3]
		Grand Teton NP	0.0815	0.1084	0.0615	0.1084	15	15.11	65[2]	[3]
		Gros Venture WA	0.1510	0.1551	0.1570	0.1570	15	15.16	65[2]35	[3]
		North Absoroka WA	0.0221	0.0528	0.0289	0.0528	15	15.05	65[2]35	[3]
		Popo Agie WA	0.2183	0.1880	0.2200	0.2200	15	15.22	65[2]35	[3]
		Teton WA	0.0613	0.0613	0.0401	0.0613	15	15.06	65[2]35	[3]
		Washakie WA	0.0511	0.0679	0.0545	0.0679	15	15.07	65[2]35	[3]
		Wind River RA	0.1718	0.1666	0.2215	0.2215	15	15.22	65[2]35	[3]
		Yellowstone NP	0.0442	0.0604	0.0281	0.0604	15	15.06	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.5
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources – Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.0447	0.0357	0.0418	0.0447	6	6.04	15	15
		Fitzpatrick WA	0.0090	0.0084	0.0078	0.0090	6	6.01	15	15
		Grand Teton NP	0.0029	0.0036	0.0022	0.0036	6	6.00	15	15
		Gros Venture WA	0.0079	0.0066	0.0063	0.0079	6	6.01	15	15
		North Absoroka WA	0.0009	0.0015	0.0010	0.0015	6	6.00	15	15
		Popo Agie WA	0.0144	0.0156	0.0147	0.0156	6	6.02	15	15
		Teton WA	0.0023	0.0021	0.0016	0.0023	6	6.00	15	15
		Washakie WA	0.0024	0.0025	0.0020	0.0025	6	6.00	15	15
		Wind River RA	0.0117	0.0101	0.0115	0.0117	6	6.01	15	15
		Yellowstone NP	0.0013	0.0016	0.0011	0.0016	6	6.00	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.2559	0.1952	0.3222	0.3222	15	15.32	65[2]	[3]
		Fitzpatrick WA	0.0732	0.0720	0.0630	0.0732	15	15.07	65[2]	[3]
		Grand Teton NP	0.0306	0.0505	0.0245	0.0505	15	15.05	65[2]	[3]
		Gros Venture WA	0.0621	0.0706	0.0649	0.0706	15	15.07	65[2]35	[3]
		North Absoroka WA	0.0092	0.0227	0.0126	0.0227	15	15.02	65[2]35	[3]
		Popo Agie WA	0.0897	0.0766	0.0935	0.0935	15	15.09	65[2]35	[3]
		Teton WA	0.0252	0.0262	0.0173	0.0262	15	15.03	65[2]35	[3]
		Washakie WA	0.0221	0.0298	0.0232	0.0298	15	15.03	65[2]35	[3]
		Wind River RA	0.0773	0.0695	0.0912	0.0912	15	15.09	65[2]35	[3]
		Yellowstone NP	0.0168	0.0257	0.0118	0.0257	15	15.03	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.6
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Bridger WA	0.0396	0.0333	0.0391	0.0396	6	6.04	15	15
		Fitzpatrick WA	0.0097	0.0089	0.0072	0.0097	6	6.01	15	15
		Grand Teton NP	0.0035	0.0037	0.0025	0.0037	6	6.00	15	15
		Gros Venture WA	0.0084	0.0067	0.0059	0.0084	6	6.01	15	15
		North Absoroka WA	0.0011	0.0017	0.0011	0.0017	6	6.00	15	15
		Popo Agie WA	0.0144	0.0162	0.0152	0.0162	6	6.02	15	15
		Teton WA	0.0027	0.0024	0.0017	0.0027	6	6.00	15	15
		Washakie WA	0.0029	0.0028	0.0021	0.0029	6	6.00	15	15
		Wind River RA	0.0113	0.0104	0.0110	0.0113	6	6.01	15	15
		Yellowstone NP	0.0015	0.0018	0.0012	0.0018	6	6.00	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.2644	0.2308	0.3241	0.3241	15	15.32	65[2]	[3]
		Fitzpatrick WA	0.1050	0.0804	0.0653	0.1050	15	15.10	65[2]	[3]
		Grand Teton NP	0.0396	0.0462	0.0339	0.0462	15	15.05	65[2]	[3]
		Gros Venture WA	0.0713	0.0827	0.0655	0.0827	15	15.08	65[2]35	[3]
		North Absoroka WA	0.0125	0.0237	0.0157	0.0237	15	15.02	65[2]35	[3]
		Popo Agie WA	0.0975	0.1012	0.1020	0.1020	15	15.10	65[2]35	[3]
		Teton WA	0.0308	0.0355	0.0219	0.0355	15	15.04	65[2]35	[3]
		Washakie WA	0.0326	0.0411	0.0274	0.0411	15	15.04	65[2]35	[3]
		Wind River RA	0.0885	0.0758	0.1075	0.1075	15	15.11	65[2]35	[3]
		Yellowstone NP	0.0219	0.0313	0.0168	0.0313	15	15.03	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.7
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
$PM_{2.5}$	Annual	Bridger WA	0.1673	0.1374	0.1526	0.1673	6	6.17	15	15
		Fitzpatrick WA	0.0403	0.0416	0.0357	0.0416	6	6.04	15	15
		Grand Teton NP	0.0585	0.0660	0.0587	0.0660	6	6.07	15	15
		Gros Venture WA	0.0369	0.0324	0.0302	0.0369	6	6.04	15	15
		North Absoroka WA	0.0067	0.0097	0.0060	0.0097	6	6.01	15	15
		Popo Agie WA	0.0692	0.0798	0.0707	0.0798	6	6.08	15	15
		Teton WA	0.0379	0.0278	0.0258	0.0379	6	6.04	15	15
		Washakie WA	0.0165	0.0181	0.0142	0.0181	6	6.02	15	15
		Wind River RA	0.0718	0.0831	0.0610	0.0831	6	6.08	15	15
		Yellowstone NP	0.0080	0.0098	0.0066	0.0098	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.9618	0.8374	1.0756	1.0756	15	16.08	65[2]	[3]
		Fitzpatrick WA	0.3221	0.3343	0.2873	0.3343	15	15.33	65[2]	[3]
		Grand Teton NP	0.2969	0.4108	0.2699	0.4108	15	15.41	65[2]	[3]
		Gros Venture WA	0.3154	0.3148	0.2802	0.3154	15	15.32	65[2]35	[3]
		North Absoroka WA	0.0613	0.1026	0.0772	0.1026	15	15.10	65[2]35	[3]
		Popo Agie WA	0.4086	0.4924	0.4003	0.4924	15	15.49	65[2]35	[3]
		Teton WA	0.3025	0.2551	0.1924	0.3025	15	15.30	65[2]35	[3]
		Washakie WA	0.1123	0.1463	0.1252	0.1463	15	15.15	65[2]35	[3]
		Wind River RA	0.3470	0.5507	0.4191	0.5507	15	15.55	65[2]35	[3]
		Yellowstone NP	0.0735	0.1290	0.0643	0.1290	15	15.13	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 $\mu g/m^3$ and 6 $\mu g/m^3$, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.8
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Bridger WA	0.1690	0.1420	0.1560	0.1690	6	6.17	15	15
		Fitzpatrick WA	0.0428	0.0423	0.0360	0.0428	6	6.04	15	15
		Grand Teton NP	0.0596	0.0647	0.0584	0.0647	6	6.06	15	15
		Gros Venture WA	0.0390	0.0309	0.0295	0.0390	6	6.04	15	15
		North Absoroka WA	0.0068	0.0093	0.0061	0.0093	6	6.01	15	15
		Popo Agie WA	0.0687	0.0797	0.0705	0.0797	6	6.08	15	15
		Teton WA	0.0385	0.0275	0.0258	0.0385	6	6.04	15	15
		Washakie WA	0.0171	0.0178	0.0141	0.0178	6	6.02	15	15
		Wind River RA	0.0726	0.0832	0.0610	0.0832	6	6.08	15	15
		Yellowstone NP	0.0083	0.0093	0.0067	0.0093	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	1.0145	0.9169	1.2520	1.2520	15	16.25	65[2]	[3]
		Fitzpatrick WA	0.3608	0.3269	0.3217	0.3608	15	15.36	65[2]	[3]
		Grand Teton NP	0.3193	0.4108	0.2635	0.4108	15	15.41	65[2]	[3]
		Gros Venture WA	0.3254	0.3289	0.2909	0.3289	15	15.33	65[2]35	[3]
		North Absoroka WA	0.0592	0.1125	0.0719	0.1125	15	15.11	65[2]35	[3]
		Popo Agie WA	0.4369	0.5206	0.3950	0.5206	15	15.52	65[2]35	[3]
		Teton WA	0.2994	0.2638	0.2017	0.2994	15	15.30	65[2]35	[3]
		Washakie WA	0.1320	0.1580	0.1398	0.1580	15	15.16	65[2]35	[3]
		Wind River RA	0.3610	0.5777	0.4045	0.5777	15	15.58	65[2]35	[3]
		Yellowstone NP	0.0802	0.1262	0.0639	0.1262	15	15.13	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.9
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.1348	0.1107	0.1226	0.1348	6	6.13	15	15
		Fitzpatrick WA	0.0344	0.0341	0.0289	0.0344	6	6.03	15	15
		Grand Teton NP	0.0567	0.0617	0.0565	0.0617	6	6.06	15	15
		Gros Venture WA	0.0313	0.0276	0.0238	0.0313	6	6.03	15	15
		North Absoroka WA	0.0061	0.0081	0.0053	0.0081	6	6.01	15	15
		Popo Agie WA	0.0578	0.0666	0.0589	0.0666	6	6.07	15	15
		Teton WA	0.0363	0.0256	0.0242	0.0363	6	6.04	15	15
		Washakie WA	0.0150	0.0157	0.0126	0.0157	6	6.02	15	15
		Wind River RA	0.0675	0.0770	0.0570	0.0770	6	6.08	15	15
		Yellowstone NP	0.0071	0.0079	0.0057	0.0079	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.7906	0.7166	0.9541	0.9541	15	15.95	65[2]	[3]
		Fitzpatrick WA	0.2732	0.2531	0.2445	0.2732	15	15.27	65[2]	[3]
		Grand Teton NP	0.2948	0.4031	0.2579	0.4031	15	15.40	65[2]	[3]
		Gros Venture WA	0.2733	0.2710	0.2294	0.2733	15	15.27	65[2]35	[3]
		North Absoroka WA	0.0506	0.0900	0.0601	0.0900	15	15.09	65[2]35	[3]
		Popo Agie WA	0.3310	0.4454	0.3195	0.4454	15	15.45	65[2]35	[3]
		Teton WA	0.2995	0.2361	0.1918	0.2995	15	15.30	65[2]35	[3]
		Washakie WA	0.0990	0.1273	0.1105	0.1273	15	15.13	65[2]35	[3]
		Wind River RA	0.3237	0.4992	0.3120	0.4992	15	15.50	65[2]35	[3]
		Yellowstone NP	0.0638	0.1013	0.0521	0.1013	15	15.10	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.10
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Bridger WA	0.0814	0.0645	0.0712	0.0814	6	6.08	15	15
		Fitzpatrick WA	0.0226	0.0230	0.0187	0.0230	6	6.02	15	15
		Grand Teton NP	0.0529	0.0574	0.0539	0.0574	6	6.06	15	15
		Gros Venture WA	0.0207	0.0228	0.0185	0.0228	6	6.02	15	15
		North Absoroka WA	0.0049	0.0062	0.0041	0.0062	6	6.01	15	15
		Popo Agie WA	0.0408	0.0477	0.0411	0.0477	6	6.05	15	15
		Teton WA	0.0332	0.0230	0.0221	0.0332	6	6.03	15	15
		Washakie WA	0.0121	0.0127	0.0104	0.0127	6	6.01	15	15
		Wind River RA	0.0598	0.0680	0.0506	0.0680	6	6.07	15	15
		Yellowstone NP	0.0054	0.0059	0.0043	0.0059	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.4561	0.3908	0.5083	0.5083	15	15.51	65[2]	[3]
		Fitzpatrick WA	0.1586	0.1925	0.1484	0.1925	15	15.19	65[2]	[3]
		Grand Teton NP	0.2858	0.3595	0.2499	0.3595	15	15.36	65[2]	[3]
		Gros Venture WA	0.1709	0.1699	0.1405	0.1709	15	15.17	65[2]35	[3]
		North Absoroka WA	0.0375	0.0599	0.0443	0.0599	15	15.06	65[2]35	[3]
		Popo Agie WA	0.2351	0.3374	0.2125	0.3374	15	15.34	65[2]35	[3]
		Teton WA	0.2804	0.2327	0.1710	0.2804	15	15.28	65[2]35	[3]
		Washakie WA	0.0820	0.0897	0.0938	0.0938	15	15.09	65[2]35	[3]
		Wind River RA	0.3068	0.4429	0.2994	0.4429	15	15.44	65[2]35	[3]
		Yellowstone NP	0.0422	0.0657	0.0359	0.0657	15	15.07	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.4.11
Maximum Modeled $PM_{2.5}$ Concentration Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
$PM_{2.5}$	Annual	Bridger WA	0.0762	0.0621	0.0684	0.0762	6	6.08	15	15
		Fitzpatrick WA	0.0232	0.0237	0.0181	0.0237	6	6.02	15	15
		Grand Teton NP	0.0534	0.0575	0.0541	0.0575	6	6.06	15	15
		Gros Venture WA	0.0211	0.0229	0.0187	0.0229	6	6.02	15	15
		North Absoroka WA	0.0050	0.0064	0.0042	0.0064	6	6.01	15	15
		Popo Agie WA	0.0408	0.0484	0.0415	0.0484	6	6.05	15	15
		Teton WA	0.0336	0.0232	0.0222	0.0336	6	6.03	15	15
		Washakie WA	0.0125	0.0130	0.0105	0.0130	6	6.01	15	15
		Wind River RA	0.0603	0.0687	0.0505	0.0687	6	6.07	15	15
		Yellowstone NP	0.0056	0.0062	0.0044	0.0062	6	6.01	15	15
$PM_{2.5}$	24-hour	Bridger WA	0.5091	0.4093	0.5009	0.5091	15	15.51	65[2]	[3]
		Fitzpatrick WA	0.1904	0.1925	0.1510	0.1925	15	15.19	65[2]	[3]
		Grand Teton NP	0.2850	0.3595	0.2500	0.3595	15	15.36	65[2]	[3]
		Gros Venture WA	0.1774	0.1738	0.1493	0.1774	15	15.18	65[2]35	[3]
		North Absoroka WA	0.0402	0.0684	0.0468	0.0684	15	15.07	65[2]35	[3]
		Popo Agie WA	0.2359	0.3710	0.2260	0.3710	15	15.37	65[2]35	[3]
		Teton WA	0.2948	0.2318	0.1805	0.2948	15	15.29	65[2]35	[3]
		Washakie WA	0.0864	0.1032	0.0933	0.1032	15	15.10	65[2]35	[3]
		Wind River RA	0.3107	0.4494	0.3026	0.4494	15	15.45	65[2]35	[3]
		Yellowstone NP	0.0477	0.0698	0.0394	0.0698	15	15.07	65[2]35	[3]
									35	
									35	
									35	

[1] Background $PM_{2.5}$ concentration values of 15 $\mu g/m^3$ and 6 $\mu g/m^3$, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.5.1
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	2.10	1.26	1.85	2.10	25	8	10.10	100	100
		Cora	0.20	0.27	0.20	0.27	25	8	8.27	100	100
		Pinedale	0.49	0.48	0.43	0.49	25	8	8.49	100	100
		PAPA	30.00	31.60	29.82	31.60	25	8	39.60	100	100
		10km Regional Grid	1.99	2.37	2.26	2.37	25	8	10.37	100	100
		Jonah Monitor	1.01	1.12	1.06	1.12	25	8	9.12	100	100
		Boulder Monitor	4.99	3.02	4.22	4.99	25	8	12.99	100	100
		Daniel Monitor	0.52	0.54	0.39	0.54	25	8	8.54	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.5.2
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
NO_2	Annual	Boulder	3.23	2.08	2.81	3.23	25	8	11.23	100	100
		Cora	0.44	0.54	0.43	0.54	25	8	8.54	100	100
		Pinedale	1.67	1.54	1.69	1.69	25	8	9.69	100	100
		PAPA	48.18	42.84	52.76	52.76	25	8	60.76	100	100
		10km Regional Grid	4.67	5.22	5.07	5.22	25	8	13.22	100	100
		Jonah Monitor	1.88	2.14	2.01	2.14	25	8	10.14	100	100
		Boulder Monitor	7.14	5.08	6.35	7.14	25	8	15.14	100	100
		Daniel Monitor	1.01	1.14	0.80	1.14	25	8	9.14	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 $\mu g/m^3$ from Boulder monitor.

Table E.5.3
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2009
Proposed Action Case Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	3.39	2.22	3.08	3.39	25	8	11.39	100	100
		Cora	0.49	0.56	0.45	0.56	25	8	8.56	100	100
		Pinedale	1.75	1.45	1.67	1.75	25	8	9.75	100	100
		PAPA	54.11	48.69	60.48	60.48	25	8	68.48	100	100
		10km Regional Grid	3.82	4.35	4.09	4.35	25	8	12.35	100	100
		Jonah Monitor	1.62	1.81	1.66	1.81	25	8	9.81	100	100
		Boulder Monitor	7.31	5.45	6.80	7.31	25	8	15.31	100	100
		Daniel Monitor	1.05	1.12	0.81	1.12	25	8	9.12	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.5.4
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
NO_2	Annual	Boulder	2.12	1.38	1.92	2.12	25	8	10.12	100	100
		Cora	0.30	0.35	0.28	0.35	25	8	8.35	100	100
		Pinedale	1.10	0.91	1.04	1.10	25	8	9.10	100	100
		PAPA	33.09	30.04	37.02	37.02	25	8	45.02	100	100
		10km Regional Grid	2.44	2.78	2.61	2.78	25	8	10.78	100	100
		Jonah Monitor	1.03	1.15	1.05	1.15	25	8	9.15	100	100
		Boulder Monitor	4.61	3.41	4.28	4.61	25	8	12.61	100	100
		Daniel Monitor	0.65	0.70	0.50	0.70	25	8	8.70	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 $\mu g/m^3$ from Boulder monitor.

Table E.5.5
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	0.75	0.46	0.67	0.75	25	8	8.75	100	100
		Cora	0.10	0.12	0.09	0.12	25	8	8.12	100	100
		Pinedale	0.40	0.33	0.38	0.40	25	8	8.40	100	100
		PAPA	9.11	9.31	10.31	10.31	25	8	18.31	100	100
		10km Regional Grid	1.03	1.17	1.10	1.17	25	8	9.17	100	100
		Jonah Monitor	0.40	0.46	0.42	0.46	25	8	8.46	100	100
		Boulder Monitor	1.76	1.20	1.60	1.76	25	8	9.76	100	100
		Daniel Monitor	0.22	0.24	0.17	0.24	25	8	8.24	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.5.6
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
NO_2	Annual	Boulder	0.77	0.42	0.67	0.77	25	8	8.77	100	100
		Cora	0.10	0.12	0.09	0.12	25	8	8.12	100	100
		Pinedale	0.32	0.27	0.29	0.32	25	8	8.32	100	100
		PAPA	7.43	8.29	6.90	8.29	25	8	16.29	100	100
		10km Regional Grid	1.09	1.24	1.17	1.24	25	8	9.24	100	100
		Jonah Monitor	0.47	0.51	0.49	0.51	25	8	8.51	100	100
		Boulder Monitor	1.75	1.06	1.56	1.75	25	8	9.75	100	100
		Daniel Monitor	0.24	0.24	0.17	0.24	25	8	8.24	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 $\mu g/m^3$ from Boulder monitor.

Table E.5.7
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	3.39	2.18	2.95	3.39	25	8	11.39	100	100
		Cora	0.48	0.58	0.46	0.58	25	8	8.58	100	100
		Pinedale	1.73	1.60	1.75	1.75	25	8	9.75	100	100
		PAPA	48.50	43.19	53.05	53.05	25	8	61.05	100	100
		10km Regional Grid	8.41	8.89	9.10	9.10	25	8	17.10	100	100
		Jonah Monitor	4.58	4.60	4.57	4.60	25	8	12.60	100	100
		Boulder Monitor	7.44	5.29	6.63	7.44	25	8	15.44	100	100
		Daniel Monitor	1.09	1.24	0.87	1.24	25	8	9.24	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 g/m^3 from Boulder monitor.

Table E.5.8
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	3.55	2.32	3.22	3.55	25	8	11.55	100	100
		Cora	0.53	0.60	0.49	0.60	25	8	8.60	100	100
		Pinedale	1.81	1.51	1.72	1.81	25	8	9.81	100	100
		PAPA	54.43	49.04	60.77	60.77	25	8	68.77	100	100
		10km Regional Grid	7.56	8.03	8.13	8.13	25	8	16.13	100	100
		Jonah Monitor	4.32	4.27	4.22	4.32	25	8	12.32	100	100
		Boulder Monitor	7.61	5.66	7.08	7.61	25	8	15.61	100	100
		Daniel Monitor	1.13	1.22	0.89	1.22	25	8	9.22	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.5.9
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m^3)	2002 (μg/m^3)	2003 (μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)	(μg/m^3)
NO_2	Annual	Boulder	2.28	1.48	2.06	2.28	25	8	10.28	100	100
		Cora	0.34	0.39	0.32	0.39	25	8	8.39	100	100
		Pinedale	1.16	0.97	1.10	1.16	25	8	9.16	100	100
		PAPA	33.42	30.39	37.31	37.31	25	8	45.31	100	100
		10km Regional Grid	6.18	6.45		6.65	25	8	14.65	100	100
		Jonah Monitor	3.73	3.61	3.61	3.73	25	8	11.73	100	100
		Boulder Monitor	4.91	3.62	4.56	4.91	25	8	12.91	100	100
		Daniel Monitor	0.74	0.80	0.58	0.80	25	8	8.80	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 μg/m^3 from Boulder monitor.

Table E.5.10
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	0.91	0.56	0.81	0.91	25	8	8.91	100	100
		Cora	0.13	0.16	0.13	0.16	25	8	8.16	100	100
		Pinedale	0.46	0.39	0.44	0.46	25	8	8.46	100	100
		PAPA	9.43	10.00	10.60	10.60	25	8	18.60	100	100
		10km Regional Grid	4.77	4.85	5.14	5.14	25	8	13.14	100	100
		Jonah Monitor	3.10	2.92	2.97	3.10	25	8	11.10	100	100
		Boulder Monitor	2.06	1.41	1.88	2.06	25	8	10.06	100	100
		Daniel Monitor	0.31	0.34	0.25	0.34	25	8	8.34	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.5.11
Maximum Modeled NO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
NO_2	Annual	Boulder	0.93	0.53	0.81	0.93	25	8	8.93	100	100
		Cora	0.14	0.16	0.13	0.16	25	8	8.16	100	100
		Pinedale	0.38	0.33	0.34	0.38	25	8	8.38	100	100
		PAPA	8.63	9.24	7.86	9.24	25	8	17.24	100	100
		10km Regional Grid	4.82	4.91	5.20	5.20	25	8	13.20	100	100
		Jonah Monitor	3.18	2.97	3.04	3.18	25	8	11.18	100	100
		Boulder Monitor	2.05	1.27	1.84	2.05	25	8	10.05	100	100
		Daniel Monitor	0.32	0.33	0.24	0.33	25	8	8.33	100	100

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Annual background NO_2 concentration value of 8 µg/m^3 from Boulder monitor.

Table E.6.1
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.151	0.096	0.133	0.151	20	9	9.15	60	80
		Cora	0.017	0.022	0.016	0.022	20	9	9.02	60	80
		Pinedale	0.035	0.037	0.031	0.037	20	9	9.04	60	80
		PAPA	2.258	2.205	2.085	2.258	20	9	11.26	60	80
		10km Regional Grid	0.144	0.180	0.168	0.180	20	9	9.18	60	80
		Jonah Monitor	0.087	0.096	0.090	0.096	20	9	9.10	60	80
		Boulder Monitor	0.343	0.216	0.288	0.343	20	9	9.34	60	80
		Daniel Monitor	0.039	0.040	0.029	0.040	20	9	9.04	60	80
SO_2	24-hour	Boulder	1.590	0.918	1.127	1.590	91	43	44.59	260	365
		Cora	0.262	0.374	0.305	0.374	91	43	43.37	260	365
		Pinedale	0.516	0.561	0.480	0.561	91	43	43.56	260	365
		PAPA	14.862	10.407	11.681	14.862	91	43	57.86	260	365
		10km Regional Grid	0.964	1.169	0.885	1.169	91	43	44.17	260	365
		Jonah Monitor	0.754	0.676	0.582	0.754	91	43	43.75	260	365
		Boulder Monitor	2.941	1.412	2.017	2.941	91	43	45.94	260	365
		Daniel Monitor	0.450	0.422	0.417	0.450	91	43	43.45	260	365
SO_2	3-hour	Boulder	5.591	4.007	3.512	5.591	512	132	137.59	1300	1300
		Cora	1.041	1.592	1.352	1.592	512	132	133.59	1300	1300
		Pinedale	2.345	2.697	2.136	2.697	512	132	134.70	1300	1300
		PAPA	69.427	76.139	52.138	76.139	512	132	208.14	1300	1300
		10km Regional Grid	4.264	4.872	4.421	4.872	512	132	136.87	1300	1300
		Jonah Monitor	3.318	2.554	2.674	3.318	512	132	135.32	1300	1300
		Boulder Monitor	8.387	5.578	8.991	8.991	512	132	140.99	1300	1300
		Daniel Monitor	2.033	1.950	1.720	2.033	512	132	134.03	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.2
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.044	0.029	0.037	0.044	20	9	9.04	60	80
		Cora	0.006	0.008	0.006	0.008	20	9	9.01	60	80
		Pinedale	0.024	0.022	0.024	0.024	20	9	9.02	60	80
		PAPA	0.737	0.738	0.737	0.738	20	9	9.74	60	80
		10km Regional Grid	0.067	0.075	0.073	0.075	20	9	9.07	60	80
		Jonah Monitor	0.029	0.033	0.030	0.033	20	9	9.03	60	80
		Boulder Monitor	0.097	0.069	0.085	0.097	20	9	9.10	60	80
		Daniel Monitor	0.012	0.014	0.010	0.014	20	9	9.01	60	80
SO_2	24-hour	Boulder	0.327	0.296	0.262	0.327	91	43	43.33	260	365
		Cora	0.066	0.133	0.089	0.133	91	43	43.13	260	365
		Pinedale	0.148	0.243	0.247	0.247	91	43	43.25	260	365
		PAPA	4.802	3.716	5.293	5.293	91	43	48.29	260	365
		10km Regional Grid	0.274	0.298	0.282	0.298	91	43	43.30	260	365
		Jonah Monitor	0.159	0.170	0.148	0.170	91	43	43.17	260	365
		Boulder Monitor	0.849	0.585	0.445	0.849	91	43	43.85	260	365
		Daniel Monitor	0.112	0.130	0.106	0.130	91	43	43.13	260	365
SO_2	3-hour	Boulder	1.312	1.117	0.901	1.312	512	132	133.31	1300	1300
		Cora	0.410	0.465	0.496	0.496	512	132	132.50	1300	1300
		Pinedale	0.749	0.796	1.101	1.101	512	132	133.10	1300	1300
		PAPA	19.208	19.574	32.766	32.766	512	132	164.77	1300	1300
		10km Regional Grid	1.059	1.003	1.317	1.317	512	132	133.32	1300	1300
		Jonah Monitor	0.635	0.589	0.747	0.747	512	132	132.75	1300	1300
		Boulder Monitor	4.977	2.734	1.687	4.977	512	132	136.98	1300	1300
		Daniel Monitor	0.495	0.573	0.334	0.573	512	132	132.57	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.3
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.051	0.034	0.044	0.051	20	9	9.05	60	80
		Cora	0.007	0.009	0.007	0.009	20	9	9.01	60	80
		Pinedale	0.028	0.024	0.027	0.028	20	9	9.03	60	80
		PAPA	0.706	0.700	0.744	0.744	20	9	9.74	60	80
		10km Regional Grid	0.074	0.083	0.078	0.083	20	9	9.08	60	80
		Jonah Monitor	0.033	0.037	0.034	0.037	20	9	9.04	60	80
		Boulder Monitor	0.112	0.082	0.100	0.112	20	9	9.11	60	80
		Daniel Monitor	0.014	0.016	0.011	0.016	20	9	9.02	60	80
SO_2	24-hour	Boulder	0.367	0.283	0.365	0.367	91	43	43.37	260	365
		Cora	0.091	0.126	0.108	0.126	91	43	43.13	260	365
		Pinedale	0.208	0.309	0.279	0.309	91	43	43.31	260	365
		PAPA	4.678	3.815	5.443	5.443	91	43	48.44	260	365
		10km Regional Grid	0.329	0.406	0.325	0.406	91	43	43.41	260	365
		Jonah Monitor	0.225	0.243	0.169	0.243	91	43	43.24	260	365
		Boulder Monitor	0.828	0.549	0.604	0.828	91	43	43.83	260	365
		Daniel Monitor	0.114	0.123	0.122	0.123	91	43	43.12	260	365
SO_2	3-hour	Boulder	1.282	1.266	0.924	1.282	512	132	133.28	1300	1300
		Cora	0.424	0.474	0.534	0.534	512	132	132.53	1300	1300
		Pinedale	0.802	1.065	1.178	1.178	512	132	133.18	1300	1300
		PAPA	19.367	19.389	32.591	32.591	512	132	164.59	1300	1300
		10km Regional Grid	1.106	1.100	1.202	1.202	512	132	133.20	1300	1300
		Jonah Monitor	0.940	0.635	0.698	0.940	512	132	132.94	1300	1300
		Boulder Monitor	4.840	2.711	2.312	4.840	512	132	136.84	1300	1300
		Daniel Monitor	0.480	0.548	0.467	0.548	512	132	132.55	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.4
Maximum Modeled Change in SO_2 Concentration Impacts from Year 2005 at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.148	0.099	0.127	0.148	20	9	9.15	60	80
		Cora	0.021	0.025	0.020	0.025	20	9	9.02	60	80
		Pinedale	0.076	0.068	0.075	0.076	20	9	9.08	60	80
		PAPA	2.095	2.089	2.279	2.279	20	9	11.28	60	80
		10km Regional Grid	0.219	0.243	0.233	0.243	20	9	9.24	60	80
		Jonah Monitor	0.100	0.110	0.101	0.110	20	9	9.11	60	80
		Boulder Monitor	0.316	0.236	0.283	0.316	20	9	9.32	60	80
		Daniel Monitor	0.040	0.045	0.032	0.045	20	9	9.05	60	80
SO_2	24-hour	Boulder	1.173	0.870	1.097	1.173	91	43	44.17	260	365
		Cora	0.261	0.355	0.318	0.355	91	43	43.35	260	365
		Pinedale	0.634	0.943	0.880	0.943	91	43	43.94	260	365
		PAPA	15.780	12.502	18.188	18.188	91	43	61.19	260	365
		10km Regional Grid	1.032	1.207	1.002	1.207	91	43	44.21	260	365
		Jonah Monitor	0.713	0.779	0.517	0.779	91	43	43.78	260	365
		Boulder Monitor	2.591	1.638	1.950	2.591	91	43	45.59	260	365
		Daniel Monitor	0.351	0.364	0.350	0.364	91	43	43.36	260	365
SO_2	3-hour	Boulder	4.139	4.276	2.775	4.276	512	132	136.28	1300	1300
		Cora	1.323	1.462	1.587	1.587	512	132	133.59	1300	1300
		Pinedale	2.722	3.342	3.881	3.881	512	132	135.88	1300	1300
		PAPA	66.536	66.686	112.560	112.560	512	132	244.56	1300	1300
		10km Regional Grid	3.607	3.474	3.700	3.700	512	132	135.70	1300	1300
		Jonah Monitor	2.870	1.962	2.095	2.870	512	132	134.87	1300	1300
		Boulder Monitor	15.943	8.789	7.675	15.943	512	132	147.94	1300	1300
		Daniel Monitor	1.415	1.586	1.406	1.586	512	132	133.59	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.5
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.036	0.024	0.031	0.036	20	9	9.04	60	80
		Cora	0.005	0.006	0.005	0.006	20	9	9.01	60	80
		Pinedale	0.019	0.017	0.019	0.019	20	9	9.02	60	80
		PAPA	0.492	0.490	0.519	0.519	20	9	9.52	60	80
		10km Regional Grid	0.051	0.058	0.055	0.058	20	9	9.06	60	80
		Jonah Monitor	0.023	0.026	0.023	0.026	20	9	9.03	60	80
		Boulder Monitor	0.078	0.057	0.070	0.078	20	9	9.08	60	80
		Daniel Monitor	0.010	0.011	0.008	0.011	20	9	9.01	60	80
SO_2	24-hour	Boulder	0.255	0.197	0.254	0.255	91	43	43.26	260	365
		Cora	0.064	0.088	0.075	0.088	91	43	43.09	260	365
		Pinedale	0.145	0.215	0.195	0.215	91	43	43.22	260	365
		PAPA	3.250	2.654	3.783	3.783	91	43	46.78	260	365
		10km Regional Grid	0.230	0.283	0.227	0.283	91	43	43.28	260	365
		Jonah Monitor	0.157	0.169	0.118	0.169	91	43	43.17	260	365
		Boulder Monitor	0.577	0.383	0.420	0.577	91	43	43.58	260	365
		Daniel Monitor	0.079	0.085	0.085	0.085	91	43	43.09	260	365
SO_2	3-hour	Boulder	0.892	0.880	0.645	0.892	512	132	132.89	1300	1300
		Cora	0.295	0.331	0.373	0.373	512	132	132.37	1300	1300
		Pinedale	0.557	0.742	0.819	0.819	512	132	132.82	1300	1300
		PAPA	13.446	13.461	22.623	22.623	512	132	154.62	1300	1300
		10km Regional Grid	0.770	0.766	0.840	0.840	512	132	132.84	1300	1300
		Jonah Monitor	0.655	0.443	0.487	0.655	512	132	132.66	1300	1300
		Boulder Monitor	3.366	1.886	1.606	3.366	512	132	135.37	1300	1300
		Daniel Monitor	0.335	0.383	0.326	0.383	512	132	132.38	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.6
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.002	0.001	0.002	0.002	20	9	9.00	60	80
		Cora	0.000	0.000	0.000	0.000	20	9	9.00	60	80
		Pinedale	0.001	0.001	0.001	0.001	20	9	9.00	60	80
		PAPA	0.025	0.031	0.029	0.031	20	9	9.03	60	80
		10km Regional Grid	0.002	0.003	0.002	0.003	20	9	9.00	60	80
		Jonah Monitor	0.001	0.001	0.001	0.001	20	9	9.00	60	80
		Boulder Monitor	0.004	0.003	0.004	0.004	20	9	9.00	60	80
		Daniel Monitor	0.000	0.000	0.000	0.000	20	9	9.00	60	80
SO_2	24-hour	Boulder	0.020	0.011	0.019	0.020	91	43	43.02	260	365
		Cora	0.005	0.007	0.006	0.007	91	43	43.01	260	365
		Pinedale	0.013	0.011	0.015	0.015	91	43	43.02	260	365
		PAPA	0.125	0.142	0.139	0.142	91	43	43.14	260	365
		10km Regional Grid	0.013	0.021	0.016	0.021	91	43	43.02	260	365
		Jonah Monitor	0.009	0.009	0.008	0.009	91	43	43.01	260	365
		Boulder Monitor	0.033	0.023	0.029	0.033	91	43	43.03	260	365
		Daniel Monitor	0.005	0.005	0.004	0.005	91	43	43.01	260	365
SO_2	3-hour	Boulder	0.056	0.039	0.045	0.056	512	132	132.06	1300	1300
		Cora	0.018	0.028	0.019	0.028	512	132	132.03	1300	1300
		Pinedale	0.043	0.039	0.039	0.043	512	132	132.04	1300	1300
		PAPA	0.361	0.435	0.462	0.462	512	132	132.46	1300	1300
		10km Regional Grid	0.048	0.043	0.041	0.048	512	132	132.05	1300	1300
		Jonah Monitor	0.038	0.027	0.025	0.038	512	132	132.04	1300	1300
		Boulder Monitor	0.094	0.061	0.055	0.094	512	132	132.09	1300	1300
		Daniel Monitor	0.017	0.023	0.019	0.023	512	132	132.02	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.7
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.048	0.032	0.041	0.048	20	9	9.05	60	80
		Cora	0.008	0.009	0.007	0.009	20	9	9.01	60	80
		Pinedale	0.026	0.024	0.026	0.026	20	9	9.03	60	80
		PAPA	0.754	0.753	0.751	0.754	20	9	9.75	60	80
		10km Regional Grid	0.276	0.375	0.375	0.375	20	9	9.38	60	80
		Jonah Monitor	0.154	0.147	0.148	0.154	20	9	9.15	60	80
		Boulder Monitor	0.102	0.074	0.090	0.102	20	9	9.10	60	80
		Daniel Monitor	0.015	0.018	0.012	0.018	20	9	9.02	60	80
SO_2	24-hour	Boulder	0.340	0.296	0.277	0.340	91	43	43.34	260	365
		Cora	0.072	0.154	0.105	0.154	91	43	43.15	260	365
		Pinedale	0.160	0.263	0.266	0.266	91	43	43.27	260	365
		PAPA	4.818	3.745	5.295	5.295	91	43	48.30	260	365
		10km Regional Grid	2.769	3.277	2.621	3.277	91	43	46.28	260	365
		Jonah Monitor	0.738	0.479	0.605	0.738	91	43	43.74	260	365
		Boulder Monitor	0.840	0.607	0.498	0.840	91	43	43.84	260	365
		Daniel Monitor	0.126	0.150	0.119	0.150	91	43	43.15	260	365
SO_2	3-hour	Boulder	1.391	1.186	0.917	1.391	512	132	133.39	1300	1300
		Cora	0.417	0.518	0.551	0.551	512	132	132.55	1300	1300
		Pinedale	0.750	0.881	1.161	1.161	512	132	133.16	1300	1300
		PAPA	19.232	19.574	32.767	32.767	512	132	164.77	1300	1300
		10km Regional Grid	15.901	13.942	10.322	15.901	512	132	147.90	1300	1300
		Jonah Monitor	2.408	1.635	2.168	2.408	512	132	134.41	1300	1300
		Boulder Monitor	4.981	2.739	1.836	4.981	512	132	136.98	1300	1300
		Daniel Monitor	0.514	0.593	0.349	0.593	512	132	132.59	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.8
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.055	0.037	0.048	0.055	20	9	9.05	60	80
		Cora	0.009	0.010	0.008	0.010	20	9	9.01	60	80
		Pinedale	0.030	0.026	0.029	0.030	20	9	9.03	60	80
		PAPA	0.723	0.715	0.752	0.752	20	9	9.75	60	80
		10km Regional Grid	0.276	0.375	0.375	0.375	20	9	9.38	60	80
		Jonah Monitor	0.159	0.151	0.151	0.159	20	9	9.16	60	80
		Boulder Monitor	0.117	0.087	0.106	0.117	20	9	9.12	60	80
		Daniel Monitor	0.016	0.019	0.013	0.019	20	9	9.02	60	80
SO_2	24-hour	Boulder	0.406	0.301	0.379	0.406	91	43	43.41	260	365
		Cora	0.101	0.145	0.125	0.145	91	43	43.14	260	365
		Pinedale	0.216	0.342	0.301	0.342	91	43	43.34	260	365
		PAPA	4.694	3.844	5.446	5.446	91	43	48.45	260	365
		10km Regional Grid	2.769	3.277	2.621	3.277	91	43	46.28	260	365
		Jonah Monitor	0.815	0.553	0.638	0.815	91	43	43.82	260	365
		Boulder Monitor	0.820	0.571	0.656	0.820	91	43	43.82	260	365
		Daniel Monitor	0.122	0.143	0.133	0.143	91	43	43.14	260	365
SO_2	3-hour	Boulder	1.427	1.310	1.024	1.427	512	132	133.43	1300	1300
		Cora	0.470	0.551	0.586	0.586	512	132	132.59	1300	1300
		Pinedale	0.851	1.175	1.254	1.254	512	132	133.25	1300	1300
		PAPA	19.391	19.389	32.592	32.592	512	132	164.59	1300	1300
		10km Regional Grid	15.901	13.942	10.322	15.901	512	132	147.90	1300	1300
		Jonah Monitor	2.456	1.847	2.271	2.456	512	132	134.46	1300	1300
		Boulder Monitor	4.845	2.717	2.301	4.845	512	132	136.85	1300	1300
		Daniel Monitor	0.499	0.568	0.472	0.568	512	132	132.57	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.9
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.152	0.102	0.131	0.152	20	9	9.15	60	80
		Cora	0.023	0.026	0.021	0.026	20	9	9.03	60	80
		Pinedale	0.079	0.071	0.077	0.079	20	9	9.08	60	80
		PAPA	2.113	2.130	2.288	2.288	20	9	11.29	60	80
		10km Regional Grid	0.415	0.434	0.450	0.450	20	9	9.45	60	80
		Jonah Monitor	0.226	0.225	0.218	0.226	20	9	9.23	60	80
		Boulder Monitor	0.320	0.241	0.288	0.320	20	9	9.32	60	80
		Daniel Monitor	0.043	0.048	0.035	0.048	20	9	9.05	60	80
SO_2	24-hour	Boulder	1.212	0.893	1.111	1.212	91	43	44.21	260	365
		Cora	0.271	0.356	0.337	0.356	91	43	43.36	260	365
		Pinedale	0.642	0.979	0.902	0.979	91	43	43.98	260	365
		PAPA	15.796	12.530	18.190	18.190	91	43	61.19	260	365
		10km Regional Grid	2.769	3.277	2.621	3.277	91	43	46.28	260	365
		Jonah Monitor	1.184	1.088	0.941	1.184	91	43	44.18	260	365
		Boulder Monitor	2.582	1.660	2.002	2.582	91	43	45.58	260	365
		Daniel Monitor	0.352	0.384	0.361	0.384	91	43	43.38	260	365
SO_2	3-hour	Boulder	4.284	4.320	2.827	4.320	512	132	136.32	1300	1300
		Cora	1.369	1.532	1.640	1.640	512	132	133.64	1300	1300
		Pinedale	2.727	3.452	3.957	3.957	512	132	135.96	1300	1300
		PAPA	66.560	66.686	112.560	112.560	512	132	244.56	1300	1300
		10km Regional Grid	15.901	13.942	10.322	15.901	512	132	147.90	1300	1300
		Jonah Monitor	3.915	2.440	3.514	3.915	512	132	135.92	1300	1300
		Boulder Monitor	15.947	8.794	7.612	15.947	512	132	147.95	1300	1300
		Daniel Monitor	1.434	1.606	1.411	1.606	512	132	133.61	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.10
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.039	0.027	0.034	0.039	20	9	9.04	60	80
		Cora	0.006	0.007	0.006	0.007	20	9	9.01	60	80
		Pinedale	0.022	0.019	0.021	0.022	20	9	9.02	60	80
		PAPA	0.510	0.505	0.527	0.527	20	9	9.53	60	80
		10km Regional Grid	0.276	0.375	0.375	0.375	20	9	9.38	60	80
		Jonah Monitor	0.149	0.140	0.141	0.149	20	9	9.15	60	80
		Boulder Monitor	0.083	0.063	0.075	0.083	20	9	9.08	60	80
		Daniel Monitor	0.012	0.014	0.010	0.014	20	9	9.01	60	80
SO_2	24-hour	Boulder	0.295	0.217	0.269	0.295	91	43	43.29	260	365
		Cora	0.073	0.108	0.093	0.108	91	43	43.11	260	365
		Pinedale	0.153	0.248	0.216	0.248	91	43	43.25	260	365
		PAPA	3.266	2.682	3.785	3.785	91	43	46.79	260	365
		10km Regional Grid	2.769	3.277	2.621	3.277	91	43	46.28	260	365
		Jonah Monitor	0.734	0.480	0.611	0.734	91	43	43.73	260	365
		Boulder Monitor	0.568	0.405	0.473	0.568	91	43	43.57	260	365
		Daniel Monitor	0.089	0.106	0.096	0.106	91	43	43.11	260	365
SO_2	3-hour	Boulder	1.037	0.924	0.735	1.037	512	132	133.04	1300	1300
		Cora	0.342	0.405	0.425	0.425	512	132	132.42	1300	1300
		Pinedale	0.611	0.852	0.895	0.895	512	132	132.90	1300	1300
		PAPA	13.470	13.461	22.624	22.624	512	132	154.62	1300	1300
		10km Regional Grid	15.901	13.942	10.322	15.901	512	132	147.90	1300	1300
		Jonah Monitor	2.391	1.635	2.177	2.391	512	132	134.39	1300	1300
		Boulder Monitor	3.370	1.892	1.582	3.370	512	132	135.37	1300	1300
		Daniel Monitor	0.354	0.406	0.331	0.406	512	132	132.41	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.6.11
Maximum Modeled SO_2 Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
SO_2	Annual	Boulder	0.005	0.004	0.005	0.005	20	9	9.01	60	80
		Cora	0.002	0.002	0.002	0.002	20	9	9.00	60	80
		Pinedale	0.004	0.003	0.003	0.004	20	9	9.00	60	80
		PAPA	0.165	0.173	0.173	0.173	20	9	9.17	60	80
		10km Regional Grid	0.276	0.375	0.375	0.375	20	9	9.37	60	80
		Jonah Monitor	0.127	0.115	0.118	0.127	20	9	9.13	60	80
		Boulder Monitor	0.009	0.008	0.009	0.009	20	9	9.01	60	80
		Daniel Monitor	0.003	0.004	0.003	0.004	20	9	9.00	60	80
SO_2	24-hour	Boulder	0.045	0.040	0.057	0.057	91	43	43.06	260	365
		Cora	0.015	0.031	0.023	0.031	91	43	43.03	260	365
		Pinedale	0.027	0.056	0.035	0.056	91	43	43.06	260	365
		PAPA	1.320	1.040	2.158	2.158	91	43	45.16	260	365
		10km Regional Grid	2.769	3.277	2.621	3.277	91	43	46.28	260	365
		Jonah Monitor	0.557	0.412	0.554	0.557	91	43	43.56	260	365
		Boulder Monitor	0.063	0.063	0.067	0.067	91	43	43.07	260	365
		Daniel Monitor	0.019	0.024	0.018	0.024	91	43	43.02	260	365
SO_2	3-hour	Boulder	0.163	0.152	0.180	0.180	512	132	132.18	1300	1300
		Cora	0.061	0.090	0.084	0.090	512	132	132.09	1300	1300
		Pinedale	0.104	0.166	0.113	0.166	512	132	132.17	1300	1300
		PAPA	6.283	6.345	9.538	9.538	512	132	141.54	1300	1300
		10km Regional Grid	15.901	13.942	10.322	15.901	512	132	147.90	1300	1300
		Jonah Monitor	2.251	1.555	2.038	2.251	512	132	134.25	1300	1300
		Boulder Monitor	0.228	0.248	0.331	0.331	512	132	132.33	1300	1300
		Daniel Monitor	0.077	0.089	0.071	0.089	512	132	132.09	1300	1300

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background SO_2 concentration values of 132 µg/m^3, 43 µg/m^3 and 9µg/m^3, from Craven Creek used for 3-hour, 24-hour, and annual averaging periods, respectively.

Table E.7.1
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
PM_{10}	Annual	Boulder	0.83	0.56	0.72	0.83	17	9	9.83	50	--[4]
		Cora	0.13	0.17	0.13	0.17	17	9	9.17	50	--[4]
		Pinedale	0.23	0.27	0.22	0.27	17	9	9.27	50	--[4]
		PAPA	16.22	20.86	19.49	20.86	17	9	29.86	50	--[4]
		10km Regional Grid	0.83	1.06	0.96	1.06	17	9	10.06	50	--[4]
		Jonah Monitor	0.45	0.56	0.51	0.56	17	9	9.56	50	--[4]
		Boulder Monitor	1.81	1.07	1.44	1.81	17	9	10.81	50	--[4]
		Daniel Monitor	0.26	0.29	0.22	0.29	17	9	9.29	50	--[4]
PM_{10}	24-hour	Boulder	6.84	4.72	6.66	6.84	30	32	38.84	150	150
		Cora	2.01	5.23	2.63	5.23	30	32	37.23	150	150
		Pinedale	2.62	6.52	4.41	6.52	30	32	38.52	150	150
		PAPA	54.43	76.32	76.31	76.32	30	32	108.32	150	150
		10km Regional Grid	4.49	5.59	6.00	6.00	30	32	38.00	150	150
		Jonah Monitor	2.76	3.87	3.24	3.87	30	32	35.87	150	150
		Boulder Monitor	17.04	7.80	12.04	17.04	30	32	49.04	150	150
		Daniel Monitor	2.80	2.75	2.64	2.80	30	32	34.80	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 μg/m³ and 9 μg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.2
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
PM_{10}	Annual	Boulder	1.11	0.77	0.97	1.11	17	9	10.11	50	--[4]
		Cora	0.22	0.28	0.22	0.28	17	9	9.28	50	--[4]
		Pinedale	0.71	0.61	0.71	0.71	17	9	9.71	50	--[4]
		PAPA	13.94	18.32	16.25	18.32	17	9	27.32	50	--[4]
		10km Regional Grid	1.44	1.78	1.59	1.78	17	9	10.78	50	--[4]
		Jonah Monitor	0.71	0.87	0.76	0.87	17	9	9.87	50	--[4]
		Boulder Monitor	2.28	1.59	1.99	2.28	17	9	11.28	50	--[4]
		Daniel Monitor	0.39	0.45	0.34	0.45	17	9	9.45	50	--[4]
PM_{10}	24-hour	Boulder	8.78	5.72	8.18	8.78	30	32	40.78	150	150
		Cora	2.45	7.51	4.23	7.51	30	32	39.51	150	150
		Pinedale	4.54	8.97	7.62	8.97	30	32	40.97	150	150
		PAPA	41.35	51.36	47.89	51.36	30	32	83.36	150	150
		10km Regional Grid	5.92	9.22	8.02	9.22	30	32	41.22	150	150
		Jonah Monitor	4.32	4.97	4.07	4.97	30	32	36.97	150	150
		Boulder Monitor	16.15	8.37	11.26	16.15	30	32	48.15	150	150
		Daniel Monitor	3.32	3.85	3.48	3.85	30	32	35.85	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 μg/m³ and 9 μg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.3
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2009
Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	0.85	0.63	0.76	0.85	17	9	9.85	50	--[4]
		Cora	0.20	0.23	0.20	0.23	17	9	9.23	50	--[4]
		Pinedale	0.52	0.44	0.49	0.52	17	9	9.52	50	--[4]
		PAPA	6.63	8.53	7.41	8.53	17	9	17.53	50	--[4]
		10km Regional Grid	0.91	1.15	0.97	1.15	17	9	10.15	50	--[4]
		Jonah Monitor	0.51	0.62	0.51	0.62	17	9	9.62	50	--[4]
		Boulder Monitor	1.59	1.21	1.45	1.59	17	9	10.59	50	--[4]
		Daniel Monitor	0.33	0.35	0.28	0.35	17	9	9.35	50	--[4]
PM_{10}	24-hour	Boulder	8.23	4.78	7.96	8.23	30	32	40.23	150	150
		Cora	2.62	5.06	4.87	5.06	30	32	37.06	150	150
		Pinedale	4.19	7.37	6.20	7.37	30	32	39.37	150	150
		PAPA	20.69	23.73	24.56	24.56	30	32	56.56	150	150
		10km Regional Grid	6.19	8.51	8.63	8.63	30	32	40.63	150	150
		Jonah Monitor	4.08	4.95	3.96	4.95	30	32	36.95	150	150
		Boulder Monitor	10.04	5.87	7.57	10.04	30	32	42.04	150	150
		Daniel Monitor	3.63	3.19	3.73	3.73	30	32	35.73	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.4
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	0.88	0.62	0.78	0.88	17	9	9.88	50	--[4]
		Cora	0.18	0.21	0.17	0.21	17	9	9.21	50	--[4]
		Pinedale	0.56	0.45	0.53	0.56	17	9	9.56	50	--[4]
		PAPA	8.36	10.83	9.58	10.83	17	9	19.83	50	--[4]
		10km Regional Grid	0.99	1.25	1.07	1.25	17	9	10.25	50	--[4]
		Jonah Monitor	0.50	0.61	0.51	0.61	17	9	9.61	50	--[4]
		Boulder Monitor	1.83	1.34	1.66	1.83	17	9	10.83	50	--[4]
		Daniel Monitor	0.30	0.33	0.26	0.33	17	9	9.33	50	--[4]
PM_{10}	24-hour	Boulder	6.96	4.26	7.17	7.17	30	32	39.17	150	150
		Cora	2.15	4.57	3.91	4.57	30	32	36.57	150	150
		Pinedale	4.10	6.38	5.92	6.38	30	32	38.38	150	150
		PAPA	23.08	28.85	29.93	29.93	30	32	61.93	150	150
		10km Regional Grid	5.63	7.89	7.39	7.89	30	32	39.89	150	150
		Jonah Monitor	3.46	4.00	3.54	4.00	30	32	36.00	150	150
		Boulder Monitor	11.12	6.73	8.35	11.12	30	32	43.12	150	150
		Daniel Monitor	2.71	2.88	2.93	2.93	30	32	34.93	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.5
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	0.68	0.44	0.59	0.68	17	9	9.68	50	--[4]
		Cora	0.11	0.14	0.11	0.14	17	9	9.14	50	--[4]
		Pinedale	0.44	0.34	0.42	0.44	17	9	9.44	50	--[4]
		PAPA	7.75	9.69	9.00	9.69	17	9	18.69	50	--[4]
		10km Regional Grid	0.78	0.99	0.86	0.99	17	9	9.99	50	--[4]
		Jonah Monitor	0.36	0.44	0.38	0.44	17	9	9.44	50	--[4]
		Boulder Monitor	1.53	1.07	1.39	1.53	17	9	10.53	50	--[4]
		Daniel Monitor	0.20	0.23	0.17	0.23	17	9	9.23	50	--[4]
PM_{10}	24-hour	Boulder	5.12	3.06	5.09	5.12	30	32	37.12	150	150
		Cora	1.44	2.95	2.05	2.95	30	32	34.95	150	150
		Pinedale	3.02	3.95	4.07	4.07	30	32	36.07	150	150
		PAPA	22.03	27.01	29.56	29.56	30	32	61.56	150	150
		10km Regional Grid	3.71	5.35	4.41	5.35	30	32	37.35	150	150
		Jonah Monitor	2.26	2.25	2.25	2.26	30	32	34.26	150	150
		Boulder Monitor	9.37	5.81	7.23	9.37	30	32	41.37	150	150
		Daniel Monitor	1.75	1.76	1.62	1.76	30	32	33.76	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.6
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2026
Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	0.37	0.23	0.33	0.37	17	9	9.37	50	--[4]
		Cora	0.07	0.23	0.07	0.23	17	9	9.23	50	--[4]
		Pinedale	0.23	0.23	0.21	0.23	17	9	9.23	50	--[4]
		PAPA	4.02	0.23	4.62	4.62	17	9	13.62	50	--[4]
		10km Regional Grid	0.39	0.23	0.42	0.42	17	9	9.42	50	--[4]
		Jonah Monitor	0.21	0.26	0.22	0.26	17	9	9.26	50	--[4]
		Boulder Monitor	0.77	0.56	0.70	0.77	17	9	9.77	50	--[4]
		Daniel Monitor	0.12	0.13	0.10	0.13	17	9	9.13	50	--[4]
PM_{10}	24-hour	Boulder	3.28	1.73	3.52	3.52	30	32	35.52	150	150
		Cora	0.92	1.37	1.21	1.37	30	32	33.37	150	150
		Pinedale	1.97	2.80	2.14	2.80	30	32	34.80	150	150
		PAPA	15.75	17.50	15.52	17.50	30	32	49.50	150	150
		10km Regional Grid	2.54	3.49	3.13	3.49	30	32	35.49	150	150
		Jonah Monitor	1.77	1.98	1.76	1.98	30	32	33.98	150	150
		Boulder Monitor	4.63	3.19	4.28	4.63	30	32	36.63	150	150
		Daniel Monitor	1.12	0.98	1.11	1.12	30	32	33.12	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.7
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	1.18	0.83	1.04	1.18	17	9	10.18	50	--[4]
		Cora	0.25	0.31	0.26	0.31	17	9	9.31	50	--[4]
		Pinedale	0.76	0.66	0.75	0.76	17	9	9.76	50	--[4]
		PAPA	14.46	18.85	16.73	18.85	17	9	27.85	50	--[4]
		10km Regional Grid	4.36	5.21	4.83	5.21	17	9	14.21	50	--[4]
		Jonah Monitor	2.57	2.92	2.65	2.92	17	9	11.92	50	--[4]
		Boulder Monitor	2.36	1.67	2.07	2.36	17	9	11.36	50	--[4]
		Daniel Monitor	0.45	0.50	0.39	0.50	17	9	9.50	50	--[4]
PM_{10}	24-hour	Boulder	8.90	6.04	8.31	8.90	30	32	40.90	150	150
		Cora	2.55	7.67	4.79	7.67	30	32	39.67	150	150
		Pinedale	4.78	9.17	8.25	9.17	30	32	41.17	150	150
		PAPA	42.21	51.52	48.92	51.52	30	32	83.52	150	150
		10km Regional Grid	12.05	14.35	14.41	14.41	30	32	46.41	150	150
		Jonah Monitor	9.24	10.51	8.96	10.51	30	32	42.51	150	150
		Boulder Monitor	16.31	8.60	11.41	16.31	30	32	48.31	150	150
		Daniel Monitor	3.62	4.01	3.84	4.01	30	32	36.01	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.8
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
PM_{10}	Annual	Boulder	0.92	0.69	0.82	0.92	17	9	9.92	50	--[4]
		Cora	0.24	0.26	0.23	0.26	17	9	9.26	50	--[4]
		Pinedale	0.56	0.48	0.53	0.56	17	9	9.56	50	--[4]
		PAPA	7.16	9.06	7.88	9.06	17	9	18.06	50	--[4]
		10km Regional Grid	4.15	4.88	4.52	4.88	17	9	13.88	50	--[4]
		Jonah Monitor	2.37	2.67	2.40	2.67	17	9	11.67	50	--[4]
		Boulder Monitor	1.67	1.29	1.52	1.67	17	9	10.67	50	--[4]
		Daniel Monitor	0.38	0.41	0.33	0.41	17	9	9.41	50	--[4]
PM_{10}	24-hour	Boulder	8.83	5.00	8.99	8.99	30	32	40.99	150	150
		Cora	2.81	5.22	5.43	5.43	30	32	37.43	150	150
		Pinedale	4.70	8.45	6.44	8.45	30	32	40.45	150	150
		PAPA	22.19	24.98	25.10	25.10	30	32	57.10	150	150
		10km Regional Grid	11.33	13.36	14.42	14.42	30	32	46.42	150	150
		Jonah Monitor	9.01	10.42	8.89	10.42	30	32	42.42	150	150
		Boulder Monitor	10.17	6.15	7.89	10.17	30	32	42.17	150	150
		Daniel Monitor	4.06	3.38	4.37	4.37	30	32	36.37	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 μg/m³ and 9 μg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.9
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	0.96	0.68	0.85	0.96	17	9	9.96	50	--[4]
		Cora	0.21	0.24	0.20	0.24	17	9	9.24	50	--[4]
		Pinedale	0.60	0.49	0.57	0.60	17	9	9.60	50	--[4]
		PAPA	8.65	11.36	9.79	11.36	17	9	20.36	50	--[4]
		10km Regional Grid	4.14	4.88	4.53	4.88	17	9	13.88	50	--[4]
		Jonah Monitor	2.36	2.66	2.40	2.66	17	9	11.66	50	--[4]
		Boulder Monitor	1.91	1.41	1.74	1.91	17	9	10.91	50	--[4]
		Daniel Monitor	0.36	0.39	0.31	0.39	17	9	9.39	50	--[4]
PM_{10}	24-hour	Boulder	7.55	4.47	8.27	8.27	30	32	40.27	150	150
		Cora	2.36	4.73	4.47	4.73	30	32	36.73	150	150
		Pinedale	4.53	7.47	6.16	7.47	30	32	39.47	150	150
		PAPA	23.46	30.10	30.01	30.10	30	32	62.10	150	150
		10km Regional Grid	10.98	13.36	14.39	14.39	30	32	46.39	150	150
		Jonah Monitor	8.45	9.54	8.44	9.54	30	32	41.54	150	150
		Boulder Monitor	11.36	7.08	8.67	11.36	30	32	43.36	150	150
		Daniel Monitor	3.14	3.07	3.50	3.50	30	32	35.50	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.10
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
PM_{10}	Annual	Boulder	0.75	0.51	0.66	0.75	17	9	9.75	50	--[4]
		Cora	0.15	0.17	0.14	0.17	17	9	9.17	50	--[4]
		Pinedale	0.48	0.38	0.46	0.48	17	9	9.48	50	--[4]
		PAPA	7.83	10.22	9.09	10.22	17	9	19.22	50	--[4]
		10km Regional Grid	3.99	4.69	4.36	4.69	17	9	13.69	50	--[4]
		Jonah Monitor	2.22	2.50	2.27	2.50	17	9	11.50	50	--[4]
		Boulder Monitor	1.61	1.15	1.47	1.61	17	9	10.61	50	--[4]
		Daniel Monitor	0.25	0.29	0.22	0.29	17	9	9.29	50	--[4]
PM_{10}	24-hour	Boulder	5.30	3.41	5.62	5.62	30	32	37.62	150	150
		Cora	1.69	3.10	2.61	3.10	30	32	35.10	150	150
		Pinedale	3.38	4.95	4.31	4.95	30	32	36.95	150	150
		PAPA	22.41	27.12	29.65	29.65	30	32	61.65	150	150
		10km Regional Grid	9.92	13.36	14.35	14.35	30	32	46.35	150	150
		Jonah Monitor	7.27	7.57	7.48	7.57	30	32	39.57	150	150
		Boulder Monitor	9.50	6.17	7.32	9.50	30	32	41.50	150	150
		Daniel Monitor	2.03	2.06	2.07	2.07	30	32	34.07	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 μg/m³ and 9 μg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.7.11
Maximum Modeled PM_{10} Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources – Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact[1]			Maximum Direct Modeled Impact	Applicable PSD Increment[2]	Background Concentration[3]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	Annual	Boulder	0.45	0.32	0.40	0.45	17	9	9.45	50	--[4]
		Cora	0.10	0.11	0.10	0.11	17	9	9.11	50	--[4]
		Pinedale	0.27	0.22	0.25	0.27	17	9	9.27	50	--[4]
		PAPA	4.10	4.94	4.70	4.94	17	9	13.94	50	--[4]
		10km Regional Grid	3.83	4.60	4.36	4.60	17	9	13.60	50	--[4]
		Jonah Monitor	2.07	2.31	2.11	2.31	17	9	11.31	50	--[4]
		Boulder Monitor	0.86	0.64	0.78	0.86	17	9	9.86	50	--[4]
		Daniel Monitor	0.17	0.19	0.15	0.19	17	9	9.19	50	--[4]
PM_{10}	24-hour	Boulder	3.48	2.07	4.29	4.29	30	32	36.29	150	150
		Cora	1.29	2.00	1.77	2.00	30	32	34.00	150	150
		Pinedale	2.35	3.23	2.59	3.23	30	32	35.23	150	150
		PAPA	16.02	17.93	15.82	17.93	30	32	49.93	150	150
		10km Regional Grid	9.66	13.36	14.36	14.36	30	32	46.36	150	150
		Jonah Monitor	6.76	6.89	7.00	7.00	30	32	39.00	150	150
		Boulder Monitor	4.97	3.41	4.60	4.97	30	32	36.97	150	150
		Daniel Monitor	1.40	1.40	1.58	1.58	30	32	33.58	150	150

[1] Background concentrations are not added to modeled concentrations for comparison to the PSD increment.

[2] All NEPA analysis comparisons to the PSD increments are intended to evaluate a threshold of concern and do not represent a regulatory PSD increment consumption analysis.

[3] Background PM_{10} concentration values of 32 µg/m³ and 9 µg/m³, from Boulder used for 24-hour and annual averaging periods, respectively.

[4] Annual NAAQS for PM_{10} was revoked by EPA effective December 18, 2006.

Table E.8.1
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
$PM_{2.5}$	Annual	Boulder	0.44	0.32	0.39	0.44	6	6.44	15	15
		Cora	0.09	0.11	0.09	0.11	6	6.11	15	15
		Pinedale	0.15	0.17	0.14	0.17	6	6.17	15	15
		PAPA	4.39	5.38	5.07	5.38	6	11.38	15	15
		10km Regional Grid	0.40	0.53	0.45	0.53	6	6.53	15	15
		Jonah Monitor	0.27	0.33	0.28	0.33	6	6.33	15	15
		Boulder Monitor	0.79	0.55	0.66	0.79	6	6.79	15	15
		Daniel Monitor	0.17	0.16	0.14	0.17	6	6.17	15	15
$PM_{2.5}$	24-hour	Boulder	2.68	2.00	2.21	2.68	15	17.68	65[2]	35[3]
		Cora	0.76	0.98	0.84	0.98	15	15.98	65[2]	35[3]
		Pinedale	1.15	1.19	1.22	1.22	15	16.22	65[2]	35[3]
		PAPA	12.60	14.41	15.04	15.04	15	30.04	65[2]	35[3]
		10km Regional Grid	2.29	2.45	2.25	2.45	15	17.45	65[2]	35[3]
		Jonah Monitor	1.99	1.88	1.52	1.99	15	16.99	65[2]	35[3]
		Boulder Monitor	3.94	2.65	3.09	3.94	15	18.94	65[2]	35[3]
		Daniel Monitor	1.29	1.08	1.15	1.29	15	16.29	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 μg/m³ and 6 μg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.2
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources – Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.55	0.42	0.49	0.55	6	6.55	15	15
		Cora	0.14	0.17	0.15	0.17	6	6.17	15	15
		Pinedale	0.31	0.31	0.31	0.31	6	6.31	15	15
		PAPA	4.40	5.23	4.79	5.23	6	11.23	15	15
		10km Regional Grid	0.68	0.83	0.72	0.83	6	6.83	15	15
		Jonah Monitor	0.40	0.49	0.41	0.49	6	6.49	15	15
		Boulder Monitor	0.93	0.72	0.83	0.93	6	6.93	15	15
		Daniel Monitor	0.24	0.26	0.21	0.26	6	6.26	15	15
$PM_{2.5}$	24-hour	Boulder	3.44	2.41	2.91	3.44	15	18.44	65[2]	35[3]
		Cora	1.23	1.56	1.31	1.56	15	16.56	65[2]	35[3]
		Pinedale	1.66	1.85	2.08	2.08	15	17.08	65[2]	35[3]
		PAPA	13.20	13.74	14.13	14.13	15	29.13	65[2]	35[3]
		10km Regional Grid	2.75	3.16	2.86	3.16	15	18.16	65[2]	35[3]
		Jonah Monitor	2.52	2.40	2.08	2.52	15	17.52	65[2]	35[3]
		Boulder Monitor	4.77	3.13	3.59	4.77	15	19.77	65[2]	35[3]
		Daniel Monitor	1.53	1.39	1.69	1.69	15	16.69	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.3
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources – Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.54	0.43	0.49	0.54	6	6.54	15	15
		Cora	0.16	0.17	0.15	0.17	6	6.17	15	15
		Pinedale	0.31	0.29	0.29	0.31	6	6.31	15	15
		PAPA	3.01	3.42	3.09	3.42	6	9.42	15	15
		10km Regional Grid	0.54	0.68	0.56	0.68	6	6.68	15	15
		Jonah Monitor	0.36	0.43	0.35	0.43	6	6.43	15	15
		Boulder Monitor	0.84	0.70	0.76	0.84	6	6.84	15	15
		Daniel Monitor	0.25	0.25	0.21	0.25	6	6.25	15	15
$PM_{2.5}$	24-hour	Boulder	2.91	2.20	2.64	2.91	15	17.91	65[2]	35[3]
		Cora	1.45	1.47	1.44	1.47	15	16.47	65[2]	35[3]
		Pinedale	2.24	2.05	2.36	2.36	15	17.36	65[2]	35[3]
		PAPA	11.18	9.76	12.11	12.11	15	27.11	65[2]	35[3]
		10km Regional Grid	2.87	3.03	2.95	3.03	15	18.03	65[2]	35[3]
		Jonah Monitor	2.55	2.43	2.12	2.55	15	17.55	65[2]	35[3]
		Boulder Monitor	4.19	3.02	3.31	4.19	15	19.19	65[2]	35[3]
		Daniel Monitor	1.66	1.58	1.33	1.66	15	16.66	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.4
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.44	0.34	0.40	0.44	6	6.44	15	15
		Cora	0.12	0.13	0.11	0.13	6	6.13	15	15
		Pinedale	0.26	0.23	0.24	0.26	6	6.26	15	15
		PAPA	2.91	3.47	3.10	3.47	6	9.47	15	15
		10km Regional Grid	0.45	0.57	0.48	0.57	6	6.57	15	15
		Jonah Monitor	0.28	0.34	0.28	0.34	6	6.34	15	15
		Boulder Monitor	0.75	0.59	0.68	0.75	6	6.75	15	15
		Daniel Monitor	0.19	0.19	0.16	0.19	6	6.19	15	15
$PM_{2.5}$	24-hour	Boulder	2.29	1.70	2.07	2.29	15	17.29	65[2]	35[3]
		Cora	1.04	1.10	1.01	1.10	15	16.10	65[2]	35[3]
		Pinedale	1.74	1.37	1.80	1.80	15	16.80	65[2]	35[3]
		PAPA	9.52	8.57	9.92	9.92	15	24.92	65[2]	35[3]
		10km Regional Grid	2.07	2.28	2.09	2.28	15	17.28	65[2]	35[3]
		Jonah Monitor	1.86	1.77	1.57	1.86	15	16.86	65[2]	35[3]
		Boulder Monitor	3.67	2.50	2.69	3.67	15	18.67	65[2]	35[3]
		Daniel Monitor	1.19	1.14	1.06	1.19	15	16.19	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.5
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.23	0.34	0.40	0.40	6	6.40	15	15
		Cora	0.05	0.13	0.11	0.13	6	6.13	15	15
		Pinedale	0.14	0.23	0.24	0.24	6	6.24	15	15
		PAPA	1.77	3.47	3.10	3.47	6	9.47	15	15
		10km Regional Grid	0.25	0.57	0.48	0.57	6	6.57	15	15
		Jonah Monitor	0.14	0.17	0.14	0.17	6	6.17	15	15
		Boulder Monitor	0.45	0.33	0.41	0.45	6	6.45	15	15
		Daniel Monitor	0.08	0.09	0.07	0.09	6	6.09	15	15
$PM_{2.5}$	24-hour	Boulder	1.31	0.84	0.93	1.31	15	16.31	65[2]	35[3]
		Cora	0.43	0.54	0.48	0.54	15	15.54	65[2]	35[3]
		Pinedale	0.77	0.73	0.84	0.84	15	15.84	65[2]	35[3]
		PAPA	4.58	5.74	5.18	5.74	15	20.74	65[2]	35[3]
		10km Regional Grid	0.91	1.12	1.03	1.12	15	16.12	65[2]	35[3]
		Jonah Monitor	0.84	0.83	0.68	0.84	15	15.84	65[2]	35[3]
		Boulder Monitor	1.97	1.32	1.61	1.97	15	16.97	65[2]	35[3]
		Daniel Monitor	0.52	0.48	0.46	0.52	15	15.52	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.6
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project Sources - Year 2026
Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.15	0.12	0.14	0.15	6	6.15	15	15
		Cora	0.04	0.04	0.04	0.04	6	6.04	15	15
		Pinedale	0.09	0.08	0.08	0.09	6	6.09	15	15
		PAPA	0.99	1.23	1.11	1.23	6	7.23	15	15
		10km Regional Grid	0.16	0.21	0.16	0.21	6	6.21	15	15
		Jonah Monitor	0.10	0.13	0.10	0.13	6	6.13	15	15
		Boulder Monitor	0.26	0.21	0.24	0.26	6	6.26	15	15
		Daniel Monitor	0.06	0.06	0.05	0.06	6	6.06	15	15
$PM_{2.5}$	24-hour	Boulder	0.95	0.71	0.89	0.95	15	15.95	65[2]	35[3]
		Cora	0.38	0.35	0.40	0.40	15	15.40	65[2]	35[3]
		Pinedale	0.67	0.55	0.56	0.67	15	15.67	65[2]	35[3]
		PAPA	3.56	4.04	3.73	4.04	15	19.04	65[2]	35[3]
		10km Regional Grid	0.90	1.24	0.90	1.24	15	16.24	65[2]	35[3]
		Jonah Monitor	0.74	0.80	0.68	0.80	15	15.80	65[2]	35[3]
		Boulder Monitor	1.22	1.05	1.23	1.23	15	16.23	65[2]	35[3]
		Daniel Monitor	0.54	0.47	0.36	0.54	15	15.54	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.7
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.61	0.48	0.55	0.61	6	6.61	15	15
		Cora	0.17	0.20	0.18	0.20	6	6.20	15	15
		Pinedale	0.35	0.35	0.35	0.35	6	6.35	15	15
		PAPA	4.62	5.45	4.98	5.45	6	11.45	15	15
		10km Regional Grid	3.45	4.60	4.37	4.60	6	10.60	15	15
		Jonah Monitor	1.18	1.27	1.17	1.27	6	7.27	15	15
		Boulder Monitor	1.00	0.79	0.89	1.00	6	7.00	15	15
		Daniel Monitor	0.29	0.31	0.25	0.31	6	6.31	15	15
$PM_{2.5}$	24-hour	Boulder	3.55	2.74	3.16	3.55	15	18.55	65[2]	35[3]
		Cora	1.36	1.73	1.45	1.73	15	16.73	65[2]	35[3]
		Pinedale	1.88	1.94	2.32	2.32	15	17.32	65[2]	35[3]
		PAPA	13.50	14.24	14.49	14.49	15	29.49	65[2]	35[3]
		10km Regional Grid	7.45	10.08	11.05	11.05	15	26.05	65[2]	35[3]
		Jonah Monitor	4.87	4.05	4.15	4.87	15	19.87	65[2]	35[3]
		Boulder Monitor	4.93	3.32	3.83	4.93	15	19.93	65[2]	35[3]
		Daniel Monitor	1.69	1.73	1.83	1.83	15	16.83	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.8
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (μg/m³)	2002 (μg/m³)	2003 (μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
$PM_{2.5}$	Annual	Boulder	0.60	0.49	0.55	0.60	6	6.60	15	15
		Cora	0.19	0.20	0.18	0.20	6	6.20	15	15
		Pinedale	0.35	0.32	0.33	0.35	6	6.35	15	15
		PAPA	3.23	3.63	3.28	3.63	6	9.63	15	15
		10km Regional Grid	3.46	4.60	4.37	4.60	6	10.60	15	15
		Jonah Monitor	1.13	1.21	1.10	1.21	6	7.21	15	15
		Boulder Monitor	0.91	0.77	0.83	0.91	6	6.91	15	15
		Daniel Monitor	0.30	0.30	0.25	0.30	6	6.30	15	15
$PM_{2.5}$	24-hour	Boulder	3.01	2.40	2.93	3.01	15	18.01	65 [2]	35 [3]
		Cora	1.67	1.58	1.61	1.67	15	16.67	65 [2]	35 [3]
		Pinedale	2.44	2.13	2.65	2.65	15	17.65	65 [2]	35 [3]
		PAPA	12.19	10.44	12.16	12.19	15	27.19	65 [2]	35 [3]
		10km Regional Grid	7.45	10.08	11.06	11.06	15	26.06	65 [2]	35 [3]
		Jonah Monitor	4.83	4.20	4.30	4.83	15	19.83	65 [2]	35 [3]
		Boulder Monitor	4.32	3.29	3.65	4.32	15	19.32	65 [2]	35 [3]
		Daniel Monitor	1.87	1.96	1.55	1.96	15	16.96	65 [2]	35 [3]

[1] Background $PM_{2.5}$ concentration values of 15 μg/m³ and 6 μg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.9
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m³)	2002 (µg/m³)	2003 (µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
$PM_{2.5}$	Annual	Boulder	0.50	0.39	0.46	0.50	6	6.50	15	15
		Cora	0.15	0.16	0.14	0.16	6	6.16	15	15
		Pinedale	0.30	0.27	0.28	0.30	6	6.30	15	15
		PAPA	3.13	3.69	3.29	3.69	6	9.69	15	15
		10km Regional Grid	3.45	4.60	4.36	4.60	6	10.60	15	15
		Jonah Monitor	1.05	1.12	1.03	1.12	6	7.12	15	15
		Boulder Monitor	0.82	0.66	0.75	0.82	6	6.82	15	15
		Daniel Monitor	0.23	0.24	0.20	0.24	6	6.24	15	15
$PM_{2.5}$	24-hour	Boulder	2.52	1.97	2.24	2.52	15	17.52	65 [2]	35 [3]
		Cora	1.23	1.22	1.16	1.23	15	16.23	65 [2]	35 [3]
		Pinedale	1.90	1.58	2.01	2.01	15	17.01	65 [2]	35 [3]
		PAPA	9.89	9.17	9.98	9.98	15	24.98	65 [2]	35 [3]
		10km Regional Grid	7.45	10.08	11.04	11.04	15	26.04	65 [2]	35 [3]
		Jonah Monitor	4.16	3.80	3.70	4.16	15	19.16	65 [2]	35 [3]
		Boulder Monitor	3.94	2.66	2.99	3.94	15	18.94	65 [2]	35 [3]
		Daniel Monitor	1.40	1.47	1.21	1.47	15	16.47	65 [2]	35 [3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m³ and 6 µg/m³, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.10
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 (µg/m^3)	2002 (µg/m^3)	2003 (µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
$PM_{2.5}$	Annual	Boulder	0.29	0.22	0.27	0.29	6	6.29	15	15
		Cora	0.08	0.09	0.08	0.09	6	6.09	15	15
		Pinedale	0.18	0.16	0.17	0.18	6	6.18	15	15
		PAPA	1.95	2.55	2.18	2.55	6	8.55	15	15
		10km Regional Grid	3.44	4.59	4.36	4.59	6	10.59	15	15
		Jonah Monitor	0.91	0.95	0.89	0.95	6	6.95	15	15
		Boulder Monitor	0.52	0.40	0.47	0.52	6	6.52	15	15
		Daniel Monitor	0.13	0.14	0.12	0.14	6	6.14	15	15
$PM_{2.5}$	24-hour	Boulder	1.41	1.04	1.22	1.41	15	16.41	65[2]	35[3]
		Cora	0.57	0.64	0.66	0.66	15	15.66	65[2]	35[3]
		Pinedale	0.96	0.96	1.13	1.13	15	16.13	65[2]	35[3]
		PAPA	4.92	6.20	5.46	6.20	15	21.20	65[2]	35[3]
		10km Regional Grid	7.45	10.08	11.01	11.01	15	26.01	65[2]	35[3]
		Jonah Monitor	3.13	2.66	2.91	3.13	15	18.13	65[2]	35[3]
		Boulder Monitor	2.40	1.52	1.86	2.40	15	17.40	65[2]	35[3]
		Daniel Monitor	0.78	0.76	0.68	0.78	15	15.78	65[2]	35[3]

[1] Background $PM_{2.5}$ concentration values of 15 µg/m^3 and 6 µg/m^3, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.8.11
Maximum Modeled $PM_{2.5}$ Concentration Impacts at Mid-Field and In-Field Locations from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Pollutant	Averaging Time	Receptor Area	Direct Modeled Impact			Maximum Direct Modeled Impact	Background Concentration[1]	Maximum Total Concentration	WAAQS	NAAQS
			2001 ($\mu g/m^3$)	2002 ($\mu g/m^3$)	2003 ($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
$PM_{2.5}$	Annual	Boulder	0.22	0.17	0.20	0.22	6	6.22	15	15
		Cora	0.07	0.07	0.06	0.07	6	6.07	15	15
		Pinedale	0.13	0.11	0.12	0.13	6	6.13	15	15
		PAPA	1.12	1.32	1.21	1.32	6	7.32	15	15
		10km Regional Grid	3.44	4.59	4.36	4.59	6	10.59	15	15
		Jonah Monitor	0.88	0.91	0.85	0.91	6	6.91	15	15
		Boulder Monitor	0.33	0.28	0.31	0.33	6	6.33	15	15
		Daniel Monitor	0.11	0.11	0.09	0.11	6	6.11	15	15
$PM_{2.5}$	24-hour	Boulder	1.17	0.94	1.09	1.17	15	16.17	65 [2]	35 [3]
		Cora	0.53	0.54	0.53	0.54	15	15.54	65 [2]	35 [3]
		Pinedale	0.83	0.74	0.88	0.88	15	15.88	65 [2]	35 [3]
		PAPA	3.92	4.40	4.20	4.40	15	19.40	65 [2]	35 [3]
		10km Regional Grid	7.45	10.08	11.02	11.02	15	26.02	65 [2]	35 [3]
		Jonah Monitor	3.08	2.66	2.95	3.08	15	18.08	65 [2]	35 [3]
		Boulder Monitor	1.53	1.37	1.41	1.53	15	16.53	65 [2]	35 [3]
		Daniel Monitor	0.82	0.73	0.58	0.82	15	15.82	65 [2]	35 [3]

[1] Background $PM_{2.5}$ concentration values of 15 $\mu g/m^3$ and 6 $\mu g/m^3$, from Pinedale used for 24-hour and annual averaging periods, respectively.

[2] EPA has revised the NAAQS effective December 18, 2006. The State of Wyoming will enter rulemaking to revise the WAAQS.

[3] Revised NAAQS effective December 18, 2006.

Table E.9.1
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	5.8E-02	4.1E-02	5.2E-02	5.8E-02	0.005	1.42	1.48	3.0
Fitzpatrick WA	7.3E-03	6.3E-03	6.4E-03	7.3E-03	0.005	1.42	1.43	3.0
Grand Teton NP	2.9E-03	3.7E-03	3.5E-03	3.7E-03	0.005	1.29	1.29	3.0
Gros Ventre WA	7.9E-03	7.8E-03	6.9E-03	7.9E-03	0.005	1.42	1.43	3.0
North Absaroka WA	1.3E-03	2.7E-03	1.5E-03	2.7E-03	0.005	1.29	1.29	3.0
Popo Agie WA	2.0E-02	2.0E-02	1.9E-02	2.0E-02	0.005	1.42	1.44	3.0
Teton WA	2.8E-03	2.8E-03	3.1E-03	3.1E-03	0.005	1.29	1.29	3.0
Washakie WA	2.6E-03	3.1E-03	2.7E-03	3.1E-03	0.005	1.29	1.29	3.0
Wind River RA	1.2E-02	1.2E-02	1.2E-02	1.2E-02	0.005	1.42	1.43	3.0
Yellowstone NP	1.6E-03	2.2E-03	1.7E-03	2.2E-03	0.005	1.29	1.29	3.0

[1] National Park Service (2001).
[2] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004. Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.9.2
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	9.7E-02	7.0E-02	8.5E-02	9.7E-02	0.005	1.42	1.52	3.0
Fitzpatrick WA	1.2E-02	1.1E-02	1.2E-02	1.2E-02	0.005	1.42	1.43	3.0
Grand Teton NP	4.7E-03	6.8E-03	6.0E-03	6.8E-03	0.005	1.29	1.30	3.0
Gros Ventre WA	1.3E-02	1.4E-02	1.2E-02	1.4E-02	0.005	1.42	1.43	3.0
North Absaroka WA	2.2E-03	4.4E-03	2.4E-03	4.4E-03	0.005	1.29	1.29	3.0
Popo Agie WA	3.5E-02	3.6E-02	3.4E-02	3.6E-02	0.005	1.42	1.46	3.0
Teton WA	4.5E-03	4.7E-03	5.1E-03	5.1E-03	0.005	1.29	1.30	3.0
Washakie WA	4.4E-03	5.3E-03	4.5E-03	5.3E-03	0.005	1.29	1.30	3.0
Wind River RA	2.1E-02	2.2E-02	2.0E-02	2.2E-02	0.005	1.42	1.44	3.0
Yellowstone NP	2.5E-03	3.8E-03	2.9E-03	3.8E-03	0.005	1.29	1.29	3.0

[1] National Park Service (2001).
[2] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004. Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.9.3
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	8.9E-02	6.7E-02	8.1E-02	8.9E-02	0.005	1.42	1.51	3.0
Fitzpatrick WA	1.2E-02	1.0E-02	1.1E-02	1.2E-02	0.005	1.42	1.43	3.0
Grand Teton NP	4.7E-03	6.0E-03	5.5E-03	6.0E-03	0.005	1.29	1.30	3.0
Gros Ventre WA	1.3E-02	1.3E-02	1.1E-02	1.3E-02	0.005	1.42	1.43	3.0
North Absaroka WA	2.0E-03	4.1E-03	2.4E-03	4.1E-03	0.005	1.29	1.29	3.0
Popo Agie WA	3.0E-02	3.2E-02	3.0E-02	3.2E-02	0.005	1.42	1.45	3.0
Teton WA	4.5E-03	4.4E-03	4.7E-03	4.7E-03	0.005	1.29	1.29	3.0
Washakie WA	4.2E-03	4.8E-03	4.2E-03	4.8E-03	0.005	1.29	1.29	3.0
Wind River RA	1.9E-02	2.0E-02	1.8E-02	2.0E-02	0.005	1.42	1.44	3.0
Yellowstone NP	2.5E-03	3.7E-03	2.8E-03	3.7E-03	0.005	1.29	1.29	3.0

[1] National Park Service (2001).
[2] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.9.4
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	5.6E-02	4.2E-02	5.1E-02	5.6E-02	0.005	1.42	1.48	3.0
Fitzpatrick WA	7.5E-03	6.5E-03	6.8E-03	7.5E-03	0.005	1.42	1.43	3.0
Grand Teton NP	3.0E-03	3.8E-03	3.6E-03	3.8E-03	0.005	1.29	1.29	3.0
Gros Ventre WA	8.2E-03	8.3E-03	7.1E-03	8.3E-03	0.005	1.42	1.43	3.0
North Absaroka WA	1.3E-03	2.7E-03	1.6E-03	2.7E-03	0.005	1.29	1.29	3.0
Popo Agie WA	1.9E-02	2.0E-02	1.9E-02	2.0E-02	0.005	1.42	1.44	3.0
Teton WA	2.9E-03	2.9E-03	3.1E-03	3.1E-03	0.005	1.29	1.29	3.0
Washakie WA	2.7E-03	3.1E-03	2.7E-03	3.1E-03	0.005	1.29	1.29	3.0
Wind River RA	1.2E-02	1.3E-02	1.2E-02	1.3E-02	0.005	1.42	1.43	3.0
Yellowstone NP	1.6E-03	2.4E-03	1.8E-03	2.4E-03	0.005	1.29	1.29	3.0

[1] National Park Service (2001).
[2] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.9.5
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	2.1E-02	1.5E-02	1.9E-02	2.1E-02	0.005	1.42	1.44	3.0
Fitzpatrick WA	2.8E-03	2.5E-03	2.5E-03	2.8E-03	0.005	1.42	1.42	3.0
Grand Teton NP	1.1E-03	1.5E-03	1.4E-03	1.5E-03	0.005	1.29	1.29	3.0
Gros Ventre WA	3.1E-03	3.2E-03	2.7E-03	3.2E-03	0.005	1.42	1.42	3.0
North Absaroka WA	5.2E-04	1.1E-03	6.1E-04	1.1E-03	0.005	1.29	1.29	3.0
Popo Agie WA	7.7E-03	8.0E-03	7.5E-03	8.0E-03	0.005	1.42	1.43	3.0
Teton WA	1.1E-03	1.1E-03	1.2E-03	1.2E-03	0.005	1.29	1.29	3.0
Washakie WA	1.0E-03	1.2E-03	1.0E-03	1.2E-03	0.005	1.29	1.29	3.0
Wind River RA	4.6E-03	4.8E-03	4.4E-03	4.8E-03	0.005	1.42	1.42	3.0
Yellowstone NP	6.3E-04	9.1E-04	7.0E-04	9.1E-04	0.005	1.29	1.29	3.0

[1] National Park Service (2001).
[2] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.9.6
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.1E-02	2.0E-02	2.7E-02	3.1E-02	0.005	1.42	1.45	3.0
Fitzpatrick WA	4.2E-03	3.5E-03	3.3E-03	4.2E-03	0.005	1.42	1.42	3.0
Grand Teton NP	1.6E-03	2.0E-03	2.0E-03	2.0E-03	0.005	1.29	1.29	3.0
Gros Ventre WA	4.4E-03	4.3E-03	3.9E-03	4.4E-03	0.005	1.42	1.42	3.0
North Absaroka WA	7.1E-04	1.5E-03	8.5E-04	1.5E-03	0.005	1.29	1.29	3.0
Popo Agie WA	1.1E-02	1.1E-02	1.0E-02	1.1E-02	0.005	1.42	1.43	3.0
Teton WA	1.6E-03	1.6E-03	1.7E-03	1.7E-03	0.005	1.29	1.29	3.0
Washakie WA	1.6E-03	1.8E-03	1.4E-03	1.8E-03	0.005	1.29	1.29	3.0
Wind River RA	6.3E-03	6.7E-03	6.4E-03	6.7E-03	0.005	1.42	1.43	3.0
Yellowstone NP	8.8E-04	1.2E-03	9.5E-04	1.2E-03	0.005	1.29	1.29	3.0

[1] National Park Service (2001).
[2] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.9.7
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case – Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	1.1E-01	7.9E-02	9.4E-02	1.1E-01	1.42	1.53	3.0
Fitzpatrick WA	1.5E-02	1.4E-02	1.4E-02	1.5E-02	1.42	1.43	3.0
Grand Teton NP	2.4E-02	3.1E-02	2.9E-02	3.1E-02	1.29	1.32	3.0
Gros Ventre WA	1.7E-02	2.0E-02	1.6E-02	2.0E-02	1.42	1.44	3.0
North Absaroka WA	3.1E-03	6.3E-03	3.2E-03	6.3E-03	1.29	1.30	3.0
Popo Agie WA	4.2E-02	4.4E-02	4.2E-02	4.4E-02	1.42	1.46	3.0
Teton WA	6.0E-03	6.8E-03	6.2E-03	6.8E-03	1.29	1.30	3.0
Washakie WA	5.8E-03	7.3E-03	5.7E-03	7.3E-03	1.29	1.30	3.0
Wind River RA	2.6E-02	2.8E-02	2.4E-02	2.8E-02	1.42	1.45	3.0
Yellowstone NP	3.6E-03	5.4E-03	4.0E-03	5.4E-03	1.29	1.30	3.0

[1] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.9.8
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	1.0E-01	7.6E-02	9.1E-02	1.0E-01	1.42	1.52	3.0
Fitzpatrick WA	1.4E-02	1.4E-02	1.3E-02	1.4E-02	1.42	1.43	3.0
Grand Teton NP	2.4E-02	3.0E-02	2.9E-02	3.0E-02	1.29	1.32	3.0
Gros Ventre WA	1.7E-02	1.8E-02	1.5E-02	1.8E-02	1.42	1.44	3.0
North Absaroka WA	2.9E-03	6.0E-03	3.2E-03	6.0E-03	1.29	1.30	3.0
Popo Agie WA	3.7E-02	3.9E-02	3.8E-02	3.9E-02	1.42	1.46	3.0
Teton WA	6.0E-03	6.4E-03	5.8E-03	6.4E-03	1.29	1.30	3.0
Washakie WA	5.6E-03	6.9E-03	5.4E-03	6.9E-03	1.29	1.30	3.0
Wind River RA	2.3E-02	2.6E-02	2.2E-02	2.6E-02	1.42	1.45	3.0
Yellowstone NP	3.5E-03	5.3E-03	3.8E-03	5.3E-03	1.29	1.30	3.0

[1] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.9.9
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	6.8E-02	5.1E-02	6.1E-02	6.8E-02	1.42	1.49	3.0
Fitzpatrick WA	1.0E-02	1.0E-02	9.2E-03	1.0E-02	1.42	1.43	3.0
Grand Teton NP	2.3E-02	2.9E-02	2.7E-02	2.9E-02	1.29	1.32	3.0
Gros Ventre WA	1.2E-02	1.3E-02	1.1E-02	1.3E-02	1.42	1.43	3.0
North Absaroka WA	2.2E-03	4.6E-03	2.4E-03	4.6E-03	1.29	1.29	3.0
Popo Agie WA	2.6E-02	2.8E-02	2.7E-02	2.8E-02	1.42	1.45	3.0
Teton WA	4.4E-03	4.9E-03	4.2E-03	4.9E-03	1.29	1.29	3.0
Washakie WA	4.1E-03	5.2E-03	3.9E-03	5.2E-03	1.29	1.30	3.0
Wind River RA	1.6E-02	1.9E-02	1.5E-02	1.9E-02	1.42	1.44	3.0
Yellowstone NP	2.7E-03	4.0E-03	2.9E-03	4.0E-03	1.29	1.29	3.0

[1] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.9.10
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.3E-02	2.4E-02	2.8E-02	3.3E-02	1.42	1.45	3.0
Fitzpatrick WA	5.4E-03	6.1E-03	5.0E-03	6.1E-03	1.42	1.43	3.0
Grand Teton NP	2.2E-02	2.7E-02	2.6E-02	2.7E-02	1.29	1.32	3.0
Gros Ventre WA	7.3E-03	8.3E-03	7.0E-03	8.3E-03	1.42	1.43	3.0
North Absaroka WA	1.4E-03	3.0E-03	1.5E-03	3.0E-03	1.29	1.29	3.0
Popo Agie WA	1.4E-02	1.6E-02	1.5E-02	1.6E-02	1.42	1.44	3.0
Teton WA	2.7E-03	3.2E-03	2.3E-03	3.2E-03	1.29	1.29	3.0
Washakie WA	2.4E-03	3.3E-03	2.2E-03	3.3E-03	1.29	1.29	3.0
Wind River RA	9.1E-03	1.1E-02	8.3E-03	1.1E-02	1.42	1.43	3.0
Yellowstone NP	1.7E-03	2.5E-03	1.8E-03	2.5E-03	1.29	1.29	3.0

[1] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.9.11
Maximum Modeled Nitrogen (N) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	4.2E-02	2.9E-02	3.6E-02	4.2E-02	1.42	1.46	3.0
Fitzpatrick WA	6.8E-03	7.1E-03	5.7E-03	7.1E-03	1.42	1.43	3.0
Grand Teton NP	2.2E-02	2.7E-02	2.6E-02	2.7E-02	1.29	1.32	3.0
Gros Ventre WA	8.6E-03	9.4E-03	8.1E-03	9.4E-03	1.42	1.43	3.0
North Absaroka WA	1.6E-03	3.4E-03	1.7E-03	3.4E-03	1.29	1.29	3.0
Popo Agie WA	1.7E-02	1.9E-02	1.8E-02	1.9E-02	1.42	1.44	3.0
Teton WA	3.1E-03	3.6E-03	2.8E-03	3.6E-03	1.29	1.29	3.0
Washakie WA	3.0E-03	3.9E-03	2.7E-03	3.9E-03	1.29	1.29	3.0
Wind River RA	1.1E-02	1.3E-02	1.0E-02	1.3E-02	1.42	1.43	3.0
Yellowstone NP	1.9E-03	2.8E-03	2.0E-03	2.8E-03	1.29	1.29	3.0

[1] Background value of 1.42 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 1.29 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.10.1
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	9.8E-03	6.9E-03	9.3E-03	9.8E-03	0.005	0.74	0.75	5.0
Fitzpatrick WA	1.5E-03	1.2E-03	1.3E-03	1.5E-03	0.005	0.74	0.74	5.0
Grand Teton NP	4.1E-04	6.1E-04	5.0E-04	6.1E-04	0.005	0.68	0.68	5.0
Gros Ventre WA	1.2E-03	1.3E-03	1.0E-03	1.3E-03	0.005	0.74	0.74	5.0
North Absaroka WA	2.6E-04	4.4E-04	2.6E-04	4.4E-04	0.005	0.68	0.68	5.0
Popo Agie WA	4.0E-03	4.2E-03	4.1E-03	4.2E-03	0.005	0.74	0.74	5.0
Teton WA	4.6E-04	5.0E-04	4.8E-04	5.0E-04	0.005	0.68	0.68	5.0
Washakie WA	5.7E-04	5.7E-04	4.8E-04	5.7E-04	0.005	0.68	0.68	5.0
Wind River RA	2.5E-03	2.6E-03	2.6E-03	2.6E-03	0.005	0.74	0.74	5.0
Yellowstone NP	2.6E-04	3.7E-04	2.6E-04	3.7E-04	0.005	0.68	0.68	5.0

[1] National Park Service (2001).
[2] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.10.2
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.0E-03	2.1E-03	2.7E-03	3.0E-03	0.005	0.74	0.74	5.0
Fitzpatrick WA	4.5E-04	3.8E-04	4.1E-04	4.5E-04	0.005	0.74	0.74	5.0
Grand Teton NP	1.2E-04	2.0E-04	1.6E-04	2.0E-04	0.005	0.68	0.68	5.0
Gros Ventre WA	3.5E-04	4.2E-04	3.2E-04	4.2E-04	0.005	0.74	0.74	5.0
North Absaroka WA	8.6E-05	1.4E-04	7.6E-05	1.4E-04	0.005	0.68	0.68	5.0
Popo Agie WA	1.3E-03	1.4E-03	1.3E-03	1.4E-03	0.005	0.74	0.74	5.0
Teton WA	1.4E-04	1.6E-04	1.4E-04	1.6E-04	0.005	0.68	0.68	5.0
Washakie WA	1.9E-04	1.8E-04	1.5E-04	1.9E-04	0.005	0.68	0.68	5.0
Wind River RA	8.1E-04	8.4E-04	8.0E-04	8.4E-04	0.005	0.74	0.74	5.0
Yellowstone NP	7.7E-05	1.2E-04	7.9E-05	1.2E-04	0.005	0.68	0.68	5.0

[1] National Park Service (2001).
[2] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.10.3
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.2E-03	2.3E-03	2.9E-03	3.2E-03	0.005	0.74	0.74	5.0
Fitzpatrick WA	5.0E-04	4.1E-04	4.3E-04	5.0E-04	0.005	0.74	0.74	5.0
Grand Teton NP	1.4E-04	2.1E-04	1.7E-04	2.1E-04	0.005	0.68	0.68	5.0
Gros Ventre WA	3.9E-04	4.3E-04	3.4E-04	4.3E-04	0.005	0.74	0.74	5.0
North Absaroka WA	8.9E-05	1.5E-04	8.8E-05	1.5E-04	0.005	0.68	0.68	5.0
Popo Agie WA	1.4E-03	1.4E-03	1.4E-03	1.4E-03	0.005	0.74	0.74	5.0
Teton WA	1.6E-04	1.7E-04	1.5E-04	1.7E-04	0.005	0.68	0.68	5.0
Washakie WA	2.0E-04	1.9E-04	1.6E-04	2.0E-04	0.005	0.68	0.68	5.0
Wind River RA	8.5E-04	8.8E-04	8.4E-04	8.8E-04	0.005	0.74	0.74	5.0
Yellowstone NP	8.6E-05	1.2E-04	8.6E-05	1.2E-04	0.005	0.68	0.68	5.0

[1] National Park Service (2001).
[2] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.10.4
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.2E-03	2.3E-03	2.9E-03	3.2E-03	0.005	0.74	0.74	5.0
Fitzpatrick WA	5.0E-04	4.1E-04	4.3E-04	5.0E-04	0.005	0.74	0.74	5.0
Grand Teton NP	1.4E-04	2.1E-04	1.7E-04	2.1E-04	0.005	0.68	0.68	5.0
Gros Ventre WA	3.9E-04	4.3E-04	3.4E-04	4.3E-04	0.005	0.74	0.74	5.0
North Absaroka WA	8.9E-05	1.5E-04	8.8E-05	1.5E-04	0.005	0.68	0.68	5.0
Popo Agie WA	1.4E-03	1.4E-03	1.4E-03	1.4E-03	0.005	0.74	0.74	5.0
Teton WA	1.6E-04	1.7E-04	1.5E-04	1.7E-04	0.005	0.68	0.68	5.0
Washakie WA	2.0E-04	1.9E-04	1.6E-04	2.0E-04	0.005	0.68	0.68	5.0
Wind River RA	8.5E-04	8.8E-04	8.4E-04	8.8E-04	0.005	0.74	0.74	5.0
Yellowstone NP	8.6E-05	1.2E-04	8.6E-05	1.2E-04	0.005	0.68	0.68	5.0

[1] National Park Service (2001).
[2] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.10.5
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Mitigation - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	2.2E-03	1.6E-03	2.1E-03	2.2E-03	0.005	0.74	0.74	5.0
Fitzpatrick WA	3.5E-04	2.8E-04	3.0E-04	3.5E-04	0.005	0.74	0.74	5.0
Grand Teton NP	9.5E-05	1.5E-04	1.2E-04	1.5E-04	0.005	0.68	0.68	5.0
Gros Ventre WA	2.8E-04	3.0E-04	2.4E-04	3.0E-04	0.005	0.74	0.74	5.0
North Absaroka WA	6.2E-05	1.0E-04	6.1E-05	1.0E-04	0.005	0.68	0.68	5.0
Popo Agie WA	9.5E-04	1.0E-03	9.6E-04	1.0E-03	0.005	0.74	0.74	5.0
Teton WA	1.1E-04	1.2E-04	1.1E-04	1.2E-04	0.005	0.68	0.68	5.0
Washakie WA	1.4E-04	1.3E-04	1.1E-04	1.4E-04	0.005	0.68	0.68	5.0
Wind River RA	5.9E-04	6.2E-04	5.8E-04	6.2E-04	0.005	0.74	0.74	5.0
Yellowstone NP	6.0E-05	8.7E-05	6.0E-05	8.7E-05	0.005	0.68	0.68	5.0

[1] National Park Service (2001).
[2] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.10.6
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Deposition Analysis Threshold (DAT)[1]	Background Deposition Value[2]	Total Impact	Level of Concern for Total[3]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	8.5E-05	6.3E-05	8.2E-05	8.5E-05	0.005	0.74	0.74	5.0
Fitzpatrick WA	1.5E-05	1.1E-05	1.1E-05	1.5E-05	0.005	0.74	0.74	5.0
Grand Teton NP	4.2E-06	4.5E-06	4.3E-06	4.5E-06	0.005	0.68	0.68	5.0
Gros Ventre WA	1.3E-05	1.1E-05	9.3E-06	1.3E-05	0.005	0.74	0.74	5.0
North Absaroka WA	2.1E-06	3.8E-06	2.8E-06	3.8E-06	0.005	0.68	0.68	5.0
Popo Agie WA	3.3E-05	3.5E-05	3.4E-05	3.5E-05	0.005	0.74	0.74	5.0
Teton WA	4.9E-06	4.0E-06	4.5E-06	4.9E-06	0.005	0.68	0.68	5.0
Washakie WA	5.0E-06	4.4E-06	4.2E-06	5.0E-06	0.005	0.68	0.68	5.0
Wind River RA	2.1E-05	2.0E-05	2.1E-05	2.1E-05	0.005	0.74	0.74	5.0
Yellowstone NP	2.6E-06	3.2E-06	2.7E-06	3.2E-06	0.005	0.68	0.68	5.0

[1] National Park Service (2001).
[2] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.
[3] Fox et al. (1989)

Table E.10.7
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.7E-03	2.8E-03	3.4E-03	3.7E-03	0.74	0.74	5.0
Fitzpatrick WA	7.1E-04	6.4E-04	6.9E-04	7.1E-04	0.74	0.74	5.0
Grand Teton NP	2.7E-04	4.4E-04	4.0E-04	4.4E-04	0.68	0.68	5.0
Gros Ventre WA	5.9E-04	7.8E-04	6.0E-04	7.8E-04	0.74	0.74	5.0
North Absaroka WA	2.3E-04	3.3E-04	2.1E-04	3.3E-04	0.68	0.68	5.0
Popo Agie WA	2.0E-03	2.1E-03	2.0E-03	2.1E-03	0.74	0.74	5.0
Teton WA	3.0E-04	3.7E-04	3.3E-04	3.7E-04	0.68	0.68	5.0
Washakie WA	3.9E-04	3.7E-04	4.0E-04	4.0E-04	0.68	0.68	5.0
Wind River RA	1.3E-03	1.3E-03	1.2E-03	1.3E-03	0.74	0.74	5.0
Yellowstone NP	2.0E-04	2.9E-04	2.2E-04	2.9E-04	0.68	0.68	5.0

[1] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.10.8
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.9E-03	2.9E-03	3.6E-03	3.9E-03	0.74	0.74	5.0
Fitzpatrick WA	7.5E-04	6.7E-04	7.1E-04	7.5E-04	0.74	0.74	5.0
Grand Teton NP	2.9E-04	4.5E-04	4.1E-04	4.5E-04	0.68	0.68	5.0
Gros Ventre WA	6.3E-04	7.9E-04	6.3E-04	7.9E-04	0.74	0.74	5.0
North Absaroka WA	2.3E-04	3.4E-04	2.2E-04	3.4E-04	0.68	0.68	5.0
Popo Agie WA	2.1E-03	2.2E-03	2.1E-03	2.2E-03	0.74	0.74	5.0
Teton WA	3.2E-04	3.8E-04	3.4E-04	3.8E-04	0.68	0.68	5.0
Washakie WA	4.0E-04	3.8E-04	4.1E-04	4.1E-04	0.68	0.68	5.0
Wind River RA	1.3E-03	1.3E-03	1.3E-03	1.3E-03	0.74	0.74	5.0
Yellowstone NP	2.1E-04	2.9E-04	2.2E-04	2.9E-04	0.68	0.68	5.0

[1] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table D.10.9
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	1.0E-02	7.4E-03	9.3E-03	1.0E-02	0.74	0.75	5.0
Fitzpatrick WA	1.7E-03	1.5E-03	1.5E-03	1.7E-03	0.74	0.74	5.0
Grand Teton NP	5.5E-04	8.4E-04	7.4E-04	8.4E-04	0.68	0.68	5.0
Gros Ventre WA	1.4E-03	1.6E-03	1.3E-03	1.6E-03	0.74	0.74	5.0
North Absaroka WA	4.1E-04	6.3E-04	4.0E-04	6.3E-04	0.68	0.68	5.0
Popo Agie WA	4.7E-03	5.0E-03	4.8E-03	5.0E-03	0.74	0.75	5.0
Teton WA	6.2E-04	7.0E-04	6.4E-04	7.0E-04	0.68	0.68	5.0
Washakie WA	7.8E-04	7.4E-04	7.1E-04	7.8E-04	0.68	0.68	5.0
Wind River RA	2.9E-03	3.0E-03	2.9E-03	3.0E-03	0.74	0.74	5.0
Yellowstone NP	3.8E-04	5.3E-04	3.9E-04	5.3E-04	0.68	0.68	5.0

[1] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.10.10
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	3.0E-03	2.3E-03	2.7E-03	3.0E-03	0.74	0.74	5.0
Fitzpatrick WA	6.0E-04	5.5E-04	5.8E-04	6.0E-04	0.74	0.74	5.0
Grand Teton NP	2.5E-04	3.8E-04	3.6E-04	3.8E-04	0.68	0.68	5.0
Gros Ventre WA	5.1E-04	6.6E-04	5.3E-04	6.6E-04	0.74	0.74	5.0
North Absaroka WA	2.1E-04	3.0E-04	1.9E-04	3.0E-04	0.68	0.68	5.0
Popo Agie WA	1.7E-03	1.8E-03	1.7E-03	1.8E-03	0.74	0.74	5.0
Teton WA	2.8E-04	3.3E-04	2.9E-04	3.3E-04	0.68	0.68	5.0
Washakie WA	3.4E-04	3.2E-04	3.6E-04	3.6E-04	0.68	0.68	5.0
Wind River RA	1.0E-03	1.1E-03	1.0E-03	1.1E-03	0.74	0.74	5.0
Yellowstone NP	1.8E-04	2.6E-04	2.0E-04	2.6E-04	0.68	0.68	5.0

[1] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.10.11
Maximum Modeled Sulfur (S) Deposition Impacts (kg/ha-yr) at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions-Using Meteorology Data for Years 2001 - 2003

Receptor Area	Direct Project Impact			Maximum Direct Project Impact	Background Deposition Value[1]	Total Impact	Level of Concern for Total[2]
	2001 (kg/ha-yr)	2002 (kg/ha-yr)	2003 (kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)	(kg/ha-yr)
Bridger WA	9.8E-04	9.0E-04	9.5E-04	9.8E-04	0.74	0.74	5.0
Fitzpatrick WA	2.8E-04	2.8E-04	2.9E-04	2.9E-04	0.74	0.74	5.0
Grand Teton NP	1.7E-04	2.4E-04	2.5E-04	2.5E-04	0.68	0.68	5.0
Gros Ventre WA	2.5E-04	3.7E-04	3.1E-04	3.7E-04	0.74	0.74	5.0
North Absaroka WA	1.5E-04	2.0E-04	1.4E-04	2.0E-04	0.68	0.68	5.0
Popo Agie WA	7.4E-04	8.1E-04	7.8E-04	8.1E-04	0.74	0.74	5.0
Teton WA	1.8E-04	2.2E-04	1.9E-04	2.2E-04	0.68	0.68	5.0
Washakie WA	2.1E-04	2.1E-04	2.6E-04	2.6E-04	0.68	0.68	5.0
Wind River RA	4.7E-04	4.8E-04	4.5E-04	4.8E-04	0.74	0.74	5.0
Yellowstone NP	1.3E-04	1.7E-04	1.5E-04	1.7E-04	0.68	0.68	5.0

[1] Background value of 0.74 collected at the CASTNET/NADP site near Pinedale for the year 2004.
Background value of 0.68 collected at the CASTNET/NADP site in Yellowstone National Park for the year 2005.

[2] Fox et al. (1989)

Table E.11.1
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.183	0.166	0.171	0.183	0.27%
Deep	Bridger	59.7	6.0	0.204	0.182	0.186	0.204	0.34%
Hobbs	Bridger	69.9	7.0	0.104	0.084	0.085	0.104	0.15%
Lazy Boy	Bridger	10.8	1.0	0.040	0.059	0.038	0.059	0.55%
Lower Saddlebag	Popo Agie	55.2	5.5	0.184	0.195	0.179	0.195	0.35%
Ross	Fitzpatrick	53.7	5.4	0.034	0.052	0.033	0.052	0.10%
Upper Frozen	Bridger	6.0	1.0	0.223	0.203	0.199	0.223	3.71%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 μeq/L
1 μeq/L for lakes with ANC values less than or equal to 25 μeq/L.

Table E.11.2
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change[2]			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.281	0.256	0.259	0.281	0.42%
Deep	Bridger	59.7	6.0	0.310	0.280	0.282	0.310	0.52%
Hobbs	Bridger	69.9	7.0	0.150	0.131	0.136	0.150	0.21%
Lazy Boy	Bridger	10.8	1.0	0.059	0.087	0.061	0.087	0.80%
Lower Saddlebag	Popo Agie	55.2	5.5	0.286	0.301	0.274	0.301	0.55%
Ross	Fitzpatrick	53.7	5.4	0.049	0.076	0.052	0.076	0.14%
Upper Frozen	Bridger	6.0	1.0	0.339	0.313	0.307	0.339	5.65%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.3
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.250	0.233	0.234	0.250	0.37%
Deep	Bridger	59.7	6.0	0.275	0.255	0.254	0.275	0.46%
Hobbs	Bridger	69.9	7.0	0.146	0.122	0.129	0.146	0.21%
Lazy Boy	Bridger	10.8	1.0	0.057	0.083	0.055	0.083	0.77%
Lower Saddlebag	Popo Agie	55.2	5.5	0.251	0.264	0.245	0.264	0.48%
Ross	Fitzpatrick	53.7	5.4	0.048	0.072	0.047	0.072	0.13%
Upper Frozen	Bridger	6.0	1.0	0.300	0.281	0.275	0.300	5.00%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.4
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.179	0.167	0.170	0.179	0.27%
Deep	Bridger	59.7	6.0	0.198	0.183	0.184	0.198	0.33%
Hobbs	Bridger	69.9	7.0	0.104	0.087	0.092	0.104	0.15%
Lazy Boy	Bridger	10.8	1.0	0.041	0.059	0.040	0.059	0.55%
Lower Saddlebag	Popo Agie	55.2	5.5	0.182	0.193	0.178	0.193	0.35%
Ross	Fitzpatrick	53.7	5.4	0.035	0.052	0.034	0.052	0.10%
Upper Frozen	Bridger	6.0	1.0	0.216	0.202	0.199	0.216	3.59%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.5
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Alternative C - 80% Emissions Reduction - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.065	0.059	0.061	0.065	0.10%
Deep	Bridger	59.7	6.0	0.072	0.065	0.067	0.072	0.12%
Hobbs	Bridger	69.9	7.0	0.037	0.031	0.032	0.037	0.05%
Lazy Boy	Bridger	10.8	1.0	0.015	0.022	0.014	0.022	0.20%
Lower Saddlebag	Popo Agie	55.2	5.5	0.068	0.071	0.065	0.071	0.13%
Ross	Fitzpatrick	53.7	5.4	0.013	0.019	0.012	0.019	0.03%
Upper Frozen	Bridger	6.0	1.0	0.079	0.072	0.073	0.079	1.32%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.6
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.082	0.074	0.079	0.082	0.12%
Deep	Bridger	59.7	6.0	0.092	0.081	0.086	0.092	0.15%
Hobbs	Bridger	69.9	7.0	0.048	0.038	0.036	0.048	0.07%
Lazy Boy	Bridger	10.8	1.0	0.020	0.029	0.017	0.029	0.27%
Lower Saddlebag	Popo Agie	55.2	5.5	0.086	0.091	0.081	0.091	0.17%
Ross	Fitzpatrick	53.7	5.4	0.018	0.026	0.015	0.026	0.05%
Upper Frozen	Bridger	6.0	1.0	0.104	0.091	0.094	0.104	1.73%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 μeq/L
1 μeq/L for lakes with ANC values less than or equal to 25 μeq/L.

Table E.11.7
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.335	0.312	0.311	0.335	0.50%
Deep	Bridger	59.7	6.0	0.369	0.340	0.339	0.369	0.62%
Hobbs	Bridger	69.9	7.0	0.177	0.166	0.164	0.177	0.25%
Lazy Boy	Bridger	10.8	1.0	0.074	0.115	0.081	0.115	1.06%
Lower Saddlebag	Popo Agie	55.2	5.5	0.345	0.370	0.341	0.370	0.67%
Ross	Fitzpatrick	53.7	5.4	0.063	0.101	0.070	0.101	0.19%
Upper Frozen	Bridger	6.0	1.0	0.404	0.379	0.370	0.404	6.74%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.8
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.304	0.289	0.286	0.304	0.45%
Deep	Bridger	59.7	6.0	0.334	0.314	0.310	0.334	0.56%
Hobbs	Bridger	69.9	7.0	0.173	0.157	0.157	0.173	0.25%
Lazy Boy	Bridger	10.8	1.0	0.073	0.111	0.076	0.111	1.03%
Lower Saddlebag	Popo Agie	55.2	5.5	0.310	0.333	0.311	0.333	0.60%
Ross	Fitzpatrick	53.7	5.4	0.062	0.097	0.065	0.097	0.18%
Upper Frozen	Bridger	6.0	1.0	0.365	0.347	0.338	0.365	6.09%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.9
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.233	0.224	0.286	0.286	0.43%
Deep	Bridger	59.7	6.0	0.256	0.243	0.310	0.310	0.52%
Hobbs	Bridger	69.9	7.0	0.132	0.123	0.157	0.157	0.22%
Lazy Boy	Bridger	10.8	1.0	0.056	0.087	0.076	0.087	0.80%
Lower Saddlebag	Popo Agie	55.2	5.5	0.241	0.262	0.311	0.311	0.56%
Ross	Fitzpatrick	53.7	5.4	0.048	0.077	0.065	0.077	0.14%
Upper Frozen	Bridger	6.0	1.0	0.281	0.268	0.338	0.338	5.63%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 μeq/L
1 μeq/L for lakes with ANC values less than or equal to 25 μeq/L.

Table E.11.10
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(µeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.119	0.116	0.113	0.119	0.18%
Deep	Bridger	59.7	6.0	0.131	0.125	0.123	0.131	0.22%
Hobbs	Bridger	69.9	7.0	0.064	0.067	0.060	0.067	0.10%
Lazy Boy	Bridger	10.8	1.0	0.030	0.050	0.035	0.050	0.46%
Lower Saddlebag	Popo Agie	55.2	5.5	0.126	0.140	0.132	0.140	0.25%
Ross	Fitzpatrick	53.7	5.4	0.026	0.044	0.030	0.044	0.08%
Upper Frozen	Bridger	6.0	1.0	0.144	0.138	0.136	0.144	2.41%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 µeq/L
1 µeq/L for lakes with ANC values less than or equal to 25 µeq/L.

Table E.11.11
Maximum Modeled Change in Acid Neutralizing Capacity (ANC) at Acid Sensitive Lakes from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions – Using Meteorology Data for Years 2001 - 2003

Lake	Wilderness Area	Background ANC	Level of Acceptable Change[1]	ANC Change			Maximum ANC Change	Maximum Percent ANC Change
				2001	2002	2003		
		(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(μeq/L)	(%)
Black Joe	Bridger	67.1	6.7	0.136	0.131	0.131	0.136	0.20%
Deep	Bridger	59.7	6.0	0.151	0.141	0.143	0.151	0.25%
Hobbs	Bridger	69.9	7.0	0.075	0.073	0.064	0.075	0.11%
Lazy Boy	Bridger	10.8	1.0	0.035	0.057	0.037	0.057	0.53%
Lower Saddlebag	Popo Agie	55.2	5.5	0.145	0.160	0.148	0.160	0.29%
Ross	Fitzpatrick	53.7	5.4	0.031	0.051	0.033	0.051	0.09%
Upper Frozen	Bridger	6.0	1.0	0.169	0.157	0.158	0.169	2.82%

[1] USFS Level of Acceptable Change; 10% change in ANC for lakes with ANC background values greater than 25 μeq/L
1 μeq/L for lakes with ANC values less than or equal to 25 μeq/L.

Table E.12.1
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	87	45	4.73	79	29	6.13	71	40	4.88	87	45	6.13
Fitzpatrick WA	15	5	2.14	15	3	3.91	15	5	1.63	15	5	3.91
Grand Teton NP	2	1	1.15	4	0	0.88	1	0	0.54	4	1	1.15
Gros Ventre WA	8	1	2.80	11	2	1.45	12	2	2.00	12	2	2.80
North Absaroka WA	0	0	0.32	0	0	0.49	0	0	0.29	0	0	0.49
Popo Agie WA	23	5	1.22	25	6	1.58	26	5	2.25	26	6	2.25
Teton WA	1	0	0.81	2	0	0.57	0	0	0.46	2	0	0.81
Washakie WA	2	0	0.89	1	0	0.52	1	0	0.53	2	0	0.89
Wind River RA	23	3	1.08	15	3	2.92	17	6	1.16	23	6	2.92
Yellowstone NP	0	0	0.44	1	0	0.52	0	0	0.38	1	0	0.52

Note: Δdv = change in deciview.

Table E.12.2
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	106	62	5.54	108	54	7.41	93	58	6.52	108	62	7.41
Fitzpatrick WA	22	6	2.68	18	8	4.80	19	7	2.67	22	8	4.80
Grand Teton NP	4	1	1.49	10	2	1.63	3	1	1.00	10	2	1.63
Gros Ventre WA	21	3	3.58	20	6	2.49	17	5	3.52	21	6	3.58
North Absaroka WA	0	0	0.41	3	0	0.86	0	0	0.36	3	0	0.86
Popo Agie WA	39	9	1.59	45	12	2.37	33	10	2.79	45	12	2.79
Teton WA	2	1	1.06	6	1	1.09	2	0	0.65	6	1	1.09
Washakie WA	3	2	1.15	7	0	0.95	2	0	0.76	7	2	1.15
Wind River RA	26	7	1.38	22	9	3.73	23	9	1.97	26	9	3.73
Yellowstone NP	1	0	0.58	4	0	0.83	1	0	0.72	4	0	0.83

Note: Δdv = change in deciview.

Table E.12.3
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	110	67	6.39	114	59	8.55	95	53	7.09	114	67	8.55
Fitzpatrick WA	31	10	3.10	22	8	5.59	20	9	2.34	31	10	5.59
Grand Teton NP	7	1	1.72	9	3	1.32	3	0	0.79	9	3	1.72
Gros Ventre WA	26	7	4.14	20	7	2.06	25	8	2.87	26	8	4.14
North Absaroka WA	0	0	0.49	3	0	0.75	0	0	0.43	3	0	0.75
Popo Agie WA	41	9	1.86	43	14	2.56	36	14	3.19	43	14	3.19
Teton WA	4	1	1.22	7	0	0.86	2	0	0.69	7	1	1.22
Washakie WA	3	2	1.33	7	0	0.75	3	0	0.80	7	2	1.33
Wind River RA	34	7	1.61	24	8	4.21	27	10	1.70	34	10	4.21
Yellowstone NP	1	0	0.70	6	0	0.79	1	0	0.56	6	0	0.79

Note: Δdv = change in deciview.

Table E.12.4
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	85	40	4.53	81	28	6.27	72	39	5.11	85	40	6.27
Fitzpatrick WA	17	4	2.14	15	3	3.95	14	5	1.57	17	5	3.95
Grand Teton NP	2	1	1.16	4	0	0.88	1	0	0.53	4	1	1.16
Gros Ventre WA	9	2	2.87	10	2	1.40	12	2	1.94	12	2	2.87
North Absaroka WA	0	0	0.33	1	0	0.50	0	0	0.28	1	0	0.50
Popo Agie WA	20	4	1.23	24	6	1.78	25	4	2.20	25	6	2.20
Teton WA	1	0	0.82	2	0	0.57	0	0	0.46	2	0	0.82
Washakie WA	3	0	0.90	1	0	0.50	1	0	0.53	3	0	0.90
Wind River RA	17	1	1.08	15	3	2.97	15	5	1.14	17	5	2.97
Yellowstone NP	0	0	0.46	1	0	0.55	0	0	0.38	1	0	0.55

Note: Δdv = change in deciview.

Table E.12.5
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	28	5	1.80	18	3	2.62	27	10	2.11	28	10	2.62
Fitzpatrick WA	1	0	0.85	3	1	1.52	2	0	0.57	3	1	1.52
Grand Teton NP	0	0	0.45	0	0	0.35	0	0	0.22	0	0	0.45
Gros Ventre WA	1	1	1.17	2	0	0.57	1	0	0.74	2	1	1.17
North Absaroka WA	0	0	0.13	0	0	0.20	0	0	0.10	0	0	0.20
Popo Agie WA	0	0	0.46	3	0	0.76	3	0	0.87	3	0	0.87
Teton WA	0	0	0.32	0	0	0.23	0	0	0.17	0	0	0.32
Washakie WA	0	0	0.34	0	0	0.20	0	0	0.20	0	0	0.34
Wind River RA	0	0	0.42	2	1	1.25	0	0	0.49	2	1	1.25
Yellowstone NP	0	0	0.18	0	0	0.23	0	0	0.16	0	0	0.23

Note: Δdv = change in deciview.

Table E.12.6
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	47	9	1.82	34	6	3.33	38	16	2.08	47	16	3.33
Fitzpatrick WA	4	1	1.29	3	3	2.08	3	0	0.95	4	3	2.08
Grand Teton NP	1	0	0.75	0	0	0.43	0	0	0.25	1	0	0.75
Gros Ventre WA	1	1	1.83	4	0	0.66	1	0	0.52	4	1	1.83
North Absaroka WA	0	0	0.20	0	0	0.32	0	0	0.17	0	0	0.32
Popo Agie WA	5	0	0.60	7	1	1.08	7	1	1.46	7	1	1.46
Teton WA	1	0	0.50	0	0	0.32	0	0	0.24	1	0	0.50
Washakie WA	1	0	0.55	0	0	0.31	0	0	0.30	1	0	0.55
Wind River RA	4	0	0.71	4	2	1.84	4	0	0.68	4	2	1.84
Yellowstone NP	0	0	0.28	0	0	0.31	0	0	0.21	0	0	0.31

Note: Δdv = change in deciview.

Table E.12.7
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	119	75	6.56	124	66	8.64	110	59	7.33	124	75	8.64
Fitzpatrick WA	34	11	3.60	29	10	5.98	24	13	2.95	34	13	5.98
Grand Teton NP	13	3	2.24	21	4	1.97	9	2	1.36	21	4	2.24
Gros Ventre WA	33	9	4.64	27	12	2.81	31	11	3.83	33	12	4.64
North Absaroka WA	1	0	0.64	7	1	1.05	1	0	0.54	7	1	1.05
Popo Agie WA	52	19	2.32	59	21	3.91	50	18	3.71	59	21	3.91
Teton WA	7	1	1.46	9	2	1.21	5	0	0.83	9	2	1.46
Washakie WA	6	2	1.66	11	2	1.14	5	0	0.94	11	2	1.66
Wind River RA	42	12	2.01	32	12	5.32	35	12	2.26	42	12	5.32
Yellowstone NP	2	0	0.88	8	1	1.16	2	0	0.99	8	1	1.16

Note: Δdv = change in deciview.

Table E.12.8
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	120	77	7.34	128	68	9.65	112	62	7.94	128	77	9.65
Fitzpatrick WA	41	15	3.99	28	12	6.65	26	14	2.60	41	15	6.65
Grand Teton NP	17	3	2.46	20	5	1.92	12	1	1.15	20	5	2.46
Gros Ventre WA	38	12	5.12	28	9	2.39	29	12	3.21	38	12	5.12
North Absaroka WA	1	0	0.73	6	1	1.03	1	0	0.60	6	1	1.03
Popo Agie WA	57	21	2.54	60	24	4.07	49	25	4.05	60	25	4.07
Teton WA	8	2	1.61	10	2	1.28	5	0	0.92	10	2	1.61
Washakie WA	6	3	1.84	13	2	1.02	7	1	1.04	13	3	1.84
Wind River RA	48	19	2.22	35	13	5.72	34	15	2.15	48	19	5.72
Yellowstone NP	3	0	0.98	8	1	1.25	2	0	0.84	8	1	1.25

Note: Δdv = change in deciview.

Table E.12.9
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	101	56	5.66	95	51	7.65	87	49	6.13	101	56	7.65
Fitzpatrick WA	29	7	3.11	22	6	5.19	20	7	1.85	29	7	5.19
Grand Teton NP	12	2	1.94	16	2	1.61	7	0	0.90	16	2	1.94
Gros Ventre WA	24	8	4.01	18	6	1.75	20	7	2.31	24	8	4.01
North Absaroka WA	1	0	0.57	4	0	0.79	0	0	0.46	4	0	0.79
Popo Agie WA	46	11	1.97	45	13	3.40	39	14	3.16	46	14	3.40
Teton WA	4	1	1.23	8	1	1.03	3	0	0.69	8	1	1.23
Washakie WA	4	2	1.42	7	0	0.81	2	0	0.78	7	2	1.42
Wind River RA	29	8	1.73	25	9	4.67	28	10	1.63	29	10	4.67
Yellowstone NP	1	0	0.76	4	1	1.01	1	0	0.65	4	1	1.01

Note: Δdv = change in deciview.

Table E.12.10
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	67	23	3.26	54	16	4.54	51	25	3.47	67	25	4.54
Fitzpatrick WA	12	2	1.95	7	4	3.12	9	0	0.92	12	4	3.12
Grand Teton NP	6	1	1.29	9	1	1.23	6	0	0.69	9	1	1.29
Gros Ventre WA	13	1	2.55	8	0	0.96	8	2	1.15	13	2	2.55
North Absaroka WA	0	0	0.36	1	0	0.51	0	0	0.29	1	0	0.51
Popo Agie WA	24	2	1.28	19	6	2.54	20	3	1.98	24	6	2.54
Teton WA	2	0	0.75	1	0	0.71	1	0	0.61	2	0	0.75
Washakie WA	3	0	0.90	2	0	0.54	0	0	0.48	3	0	0.90
Wind River RA	15	2	1.14	12	6	3.25	14	0	0.98	15	6	3.25
Yellowstone NP	0	0	0.49	1	0	0.71	0	0	0.44	1	0	0.71

Note: Δdv = change in deciview.

Table E.12.11
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026
Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=6

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	76	31	3.31	68	19	5.13	58	31	3.44	76	31	5.13
Fitzpatrick WA	14	2	2.34	10	4	3.60	11	2	1.26	14	4	3.60
Grand Teton NP	7	1	1.57	9	1	1.34	6	0	0.71	9	1	1.57
Gros Ventre WA	15	3	3.05	8	2	1.11	10	2	1.09	15	3	3.05
North Absaroka WA	0	0	0.43	2	0	0.62	0	0	0.35	2	0	0.62
Popo Agie WA	30	3	1.35	24	9	2.81	26	5	2.52	30	9	2.81
Teton WA	2	0	0.93	3	0	0.80	1	0	0.62	3	0	0.93
Washakie WA	3	1	1.09	5	0	0.63	1	0	0.60	5	1	1.09
Wind River RA	20	2	1.32	14	8	3.74	16	2	1.10	20	8	3.74
Yellowstone NP	1	0	0.58	3	0	0.79	0	0	0.49	3	0	0.79

Note: Δdv = change in deciview.

Table E.13.1
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	94	59	5.58	90	50	7.15	77	48	5.75	94	59	7.15
Fitzpatrick WA	22	6	2.55	18	5	4.65	15	7	1.95	22	7	4.65
Grand Teton NP	2	1	1.28	5	1	1.04	2	0	0.64	5	1	1.28
Gros Ventre WA	17	3	3.32	14	4	1.78	13	3	1.91	17	4	3.32
North Absaroka WA	0	0	0.38	3	0	0.59	0	0	0.34	3	0	0.59
Popo Agie WA	34	8	1.49	35	7	1.89	32	9	2.69	35	9	2.69
Teton WA	2	0	0.91	4	0	0.69	1	0	0.52	4	0	0.91
Washakie WA	3	1	1.06	6	0	0.65	1	0	0.63	6	1	1.06
Wind River RA	24	7	1.30	20	5	3.46	20	9	1.40	24	9	3.46
Yellowstone NP	0	0	0.49	3	0	0.62	0	0	0.46	3	0	0.62

Note: Δdv = change in deciview.

Table E.13.2
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	110	70	6.49	109	64	8.57	99	56	7.49	110	70	8.57
Fitzpatrick WA	31	11	3.19	23	11	5.66	21	9	2.55	31	11	5.66
Grand Teton NP	6	1	1.66	11	3	1.93	3	1	1.20	11	3	1.93
Gros Ventre WA	25	5	4.22	20	9	3.02	22	8	3.37	25	9	4.22
North Absaroka WA	0	0	0.49	5	1	1.07	0	0	0.43	5	1	1.07
Popo Agie WA	44	9	1.94	48	17	2.82	39	14	3.31	48	17	3.31
Teton WA	3	1	1.18	9	1	1.30	2	0	0.78	9	1	1.30
Washakie WA	3	2	1.35	9	2	1.17	3	0	0.81	9	2	1.35
Wind River RA	31	9	1.66	26	9	4.37	27	12	1.91	31	12	4.37
Yellowstone NP	1	0	0.65	7	0	0.99	1	0	0.87	7	0	0.99

Note: Δdv = change in deciview.

Table E.13.3
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	117	75	7.45	120	70	9.81	109	61	8.23	120	75	9.81
Fitzpatrick WA	35	13	3.68	24	11	6.55	25	13	2.79	35	13	6.55
Grand Teton NP	7	1	1.92	11	4	1.57	3	0	0.94	11	4	1.92
Gros Ventre WA	29	9	4.86	21	9	2.51	26	7	2.75	29	9	4.86
North Absaroka WA	1	0	0.59	5	0	0.88	1	0	0.51	5	0	0.88
Popo Agie WA	44	15	2.25	52	18	3.03	41	21	3.78	52	21	3.78
Teton WA	7	1	1.36	8	1	1.03	3	0	0.78	8	1	1.36
Washakie WA	7	2	1.57	10	0	0.93	3	0	0.95	10	2	1.57
Wind River RA	44	13	1.93	31	9	4.92	31	13	2.04	44	13	4.92
Yellowstone NP	2	0	0.78	6	0	0.94	1	0	0.67	6	0	0.94

Note: Δdv = change in deciview.

Table E.13.4
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	93	51	5.35	88	44	7.31	74	47	6.01	93	51	7.31
Fitzpatrick WA	21	6	2.55	19	5	4.69	17	7	1.88	21	7	4.69
Grand Teton NP	4	1	1.30	6	1	1.05	2	0	0.63	6	1	1.30
Gros Ventre WA	15	3	3.41	13	5	1.71	14	3	1.86	15	5	3.41
North Absaroka WA	0	0	0.40	2	0	0.59	0	0	0.34	2	0	0.59
Popo Agie WA	31	8	1.49	34	7	2.13	31	8	2.62	34	8	2.62
Teton WA	2	0	0.92	3	0	0.68	1	0	0.51	3	0	0.92
Washakie WA	3	1	1.06	4	0	0.63	1	0	0.62	4	1	1.06
Wind River RA	22	7	1.31	20	3	3.50	22	6	1.39	22	7	3.50
Yellowstone NP	1	0	0.52	3	0	0.65	0	0	0.45	3	0	0.65

Note: Δdv = change in deciview.

Table E.13.5
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	38	9	2.19	23	7	3.15	36	13	2.55	38	13	3.15
Fitzpatrick WA	3	1	1.03	3	1	1.85	3	0	0.69	3	1	1.85
Grand Teton NP	1	0	0.50	0	0	0.42	0	0	0.26	1	0	0.50
Gros Ventre WA	1	1	1.41	2	0	0.71	2	0	0.70	2	1	1.41
North Absaroka WA	0	0	0.15	0	0	0.24	0	0	0.12	0	0	0.24
Popo Agie WA	2	0	0.57	5	0	0.92	4	1	1.05	5	1	1.05
Teton WA	0	0	0.36	0	0	0.27	0	0	0.19	0	0	0.36
Washakie WA	0	0	0.41	0	0	0.25	0	0	0.24	0	0	0.41
Wind River RA	1	0	0.51	2	2	1.50	1	0	0.57	2	2	1.50
Yellowstone NP	0	0	0.20	0	0	0.27	0	0	0.19	0	0	0.27

Note: Δdv = change in deciview.

Table E.13.6
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	58	15	2.18	46	12	3.97	46	21	2.48	58	21	3.97
Fitzpatrick WA	7	1	1.56	6	3	2.51	3	1	1.15	7	3	2.51
Grand Teton NP	1	0	0.84	2	0	0.51	0	0	0.30	2	0	0.84
Gros Ventre WA	4	1	2.19	5	0	0.81	2	0	0.63	5	1	2.19
North Absaroka WA	0	0	0.24	0	0	0.38	0	0	0.20	0	0	0.38
Popo Agie WA	7	0	0.73	10	2	1.30	10	3	1.75	10	3	1.75
Teton WA	1	0	0.57	0	0	0.38	0	0	0.28	1	0	0.57
Washakie WA	2	0	0.65	0	0	0.36	0	0	0.36	2	0	0.65
Wind River RA	6	0	0.86	6	2	2.20	7	0	0.82	7	2	2.20
Yellowstone NP	0	0	0.32	0	0	0.37	0	0	0.25	0	0	0.37

Note: Δdv = change in deciview.

Table E.13.7
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	123	84	7.64	136	72	9.92	119	67	8.49	136	84	9.92
Fitzpatrick WA	44	16	4.25	33	14	6.98	29	17	2.82	44	17	6.98
Grand Teton NP	15	4	2.49	23	9	2.33	13	2	1.62	23	9	2.49
Gros Ventre WA	41	13	5.43	30	13	3.39	30	12	3.67	41	13	5.43
North Absaroka WA	1	0	0.76	7	3	1.29	1	0	0.64	7	3	1.29
Popo Agie WA	60	29	2.79	63	27	4.58	55	27	4.37	63	29	4.58
Teton WA	8	2	1.63	11	3	1.43	7	0	0.99	11	3	1.63
Washakie WA	6	3	1.95	11	5	1.40	8	1	1.11	11	5	1.95
Wind River RA	52	20	2.40	36	18	6.17	38	17	2.38	52	20	6.17
Yellowstone NP	3	0	0.98	8	2	1.37	2	1	1.18	8	2	1.37

Note: Δdv = change in deciview.

Table E.13.8
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	125	85	8.49	141	79	11.01	123	68	9.16	141	85	11.01
Fitzpatrick WA	48	21	4.69	33	17	7.73	32	16	3.09	48	21	7.73
Grand Teton NP	18	5	2.73	24	6	2.25	14	2	1.37	24	6	2.73
Gros Ventre WA	45	14	5.97	27	13	2.90	34	13	3.07	45	14	5.97
North Absaroka WA	1	0	0.86	7	3	1.22	1	0	0.72	7	3	1.22
Popo Agie WA	64	30	3.05	67	33	4.76	56	28	4.76	67	33	4.76
Teton WA	9	2	1.80	10	3	1.52	7	1	1.03	10	3	1.80
Washakie WA	7	3	2.15	13	5	1.25	7	1	1.23	13	5	2.15
Wind River RA	57	23	2.65	40	21	6.61	36	21	2.59	57	23	6.61
Yellowstone NP	4	1	1.10	8	2	1.47	3	0	0.99	8	2	1.47

Note: Δdv = change in deciview.

Table E.13.9
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	108	68	6.62	108	61	8.83	91	51	7.17	108	68	8.83
Fitzpatrick WA	36	11	3.68	25	8	6.10	25	10	2.22	36	11	6.10
Grand Teton NP	14	4	2.16	22	4	1.90	9	1	1.07	22	4	2.16
Gros Ventre WA	28	10	4.72	21	8	2.14	23	6	2.21	28	10	4.72
North Absaroka WA	1	0	0.67	6	0	0.94	1	0	0.55	6	0	0.94
Popo Agie WA	51	19	2.38	54	20	4.01	47	18	3.74	54	20	4.01
Teton WA	6	1	1.37	9	1	1.22	3	0	0.77	9	1	1.37
Washakie WA	5	3	1.68	10	0	0.99	5	0	0.92	10	3	1.68
Wind River RA	42	12	2.07	29	10	5.44	31	13	1.98	42	13	5.44
Yellowstone NP	2	0	0.85	7	1	1.20	2	0	0.78	7	1	1.20

Note: Δdv = change in deciview.

Table E.13.10
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	76	35	3.90	64	17	5.37	57	30	4.15	76	35	5.37
Fitzpatrick WA	15	2	2.33	11	4	3.73	12	3	1.13	15	4	3.73
Grand Teton NP	8	3	1.43	14	3	1.45	6	0	0.72	14	3	1.45
Gros Ventre WA	17	4	3.04	10	4	1.19	11	3	1.30	17	4	3.04
North Absaroka WA	0	0	0.43	2	0	0.60	0	0	0.34	2	0	0.60
Popo Agie WA	33	5	1.56	24	9	3.02	32	5	2.36	33	9	3.02
Teton WA	2	0	0.84	2	0	0.84	1	0	0.60	2	0	0.84
Washakie WA	3	1	1.07	5	0	0.67	1	0	0.57	5	1	1.07
Wind River RA	20	3	1.37	14	6	3.83	20	2	1.20	20	6	3.83
Yellowstone NP	1	0	0.55	1	0	0.84	1	0	0.53	1	0	0.84

Note: Δdv = change in deciview.

Table E.13.11
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026
Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and IMPROVE Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	81	43	3.91	74	26	6.03	66	37	4.06	81	43	6.03
Fitzpatrick WA	23	4	2.79	15	5	4.28	14	4	1.51	23	5	4.28
Grand Teton NP	9	3	1.75	15	3	1.58	7	0	0.77	15	3	1.75
Gros Ventre WA	19	5	3.61	11	5	1.34	13	3	1.34	19	5	3.61
North Absaroka WA	1	0	0.51	3	0	0.73	0	0	0.42	3	0	0.73
Popo Agie WA	39	8	1.64	38	10	3.33	37	9	3.00	39	10	3.33
Teton WA	2	1	1.04	6	0	0.95	2	0	0.61	6	1	1.04
Washakie WA	4	2	1.29	7	0	0.76	2	0	0.71	7	2	1.29
Wind River RA	26	7	1.59	21	8	4.39	25	5	1.33	26	8	4.39
Yellowstone NP	1	0	0.65	3	0	0.94	1	0	0.58	3	0	0.94

Note: Δdv = change in deciview.

Table E.14.1
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	97	61	8.71	92	49	10.24	94	63	13.49	97	63	13.49
Fitzpatrick WA	24	10	4.87	23	11	6.87	24	10	6.36	24	11	6.87
Grand Teton NP	7	3	1.57	9	3	1.45	1	0	0.56	9	3	1.57
Gros Ventre WA	21	6	2.82	16	8	2.14	16	4	2.24	21	8	2.82
North Absaroka WA	1	1	1.48	4	0	0.76	0	0	0.45	4	1	1.48
Popo Agie WA	28	11	4.04	35	15	3.27	33	13	4.28	35	15	4.28
Teton WA	5	2	1.27	6	1	1.23	2	0	0.72	6	2	1.27
Washakie WA	7	2	2.31	10	1	1.19	6	4	2.58	10	4	2.58
Wind River RA	28	11	4.12	27	10	5.56	26	15	4.38	28	15	5.56
Yellowstone NP	1	0	0.65	6	1	1.19	3	0	0.56	6	1	1.19

Note: Δdv = change in deciview.

Table E.14.2
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	112	76	9.82	103	64	13.80	107	75	19.05	112	76	19.05
Fitzpatrick WA	36	17	5.65	28	18	8.23	29	17	10.10	36	18	10.10
Grand Teton NP	13	3	1.85	12	7	2.23	4	1	1.05	13	7	2.23
Gros Ventre WA	34	11	3.62	22	13	3.62	24	9	3.91	34	13	3.91
North Absaroka WA	1	1	1.86	7	1	1.24	1	0	0.60	7	1	1.86
Popo Agie WA	41	15	4.74	43	20	4.64	50	22	5.61	50	22	5.61
Teton WA	10	2	1.62	10	5	1.57	5	0	0.92	10	5	1.62
Washakie WA	10	3	3.00	15	6	1.63	7	4	3.26	15	6	3.26
Wind River RA	37	12	4.99	34	16	6.87	32	20	7.09	37	20	7.09
Yellowstone NP	4	0	0.85	11	3	1.56	5	0	0.99	11	3	1.56

Note: Δdv = change in deciview.

Table E.14.3
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	115	75	11.49	109	66	13.48	114	82	17.64	115	82	17.64
Fitzpatrick WA	40	20	6.65	32	18	9.38	32	22	8.65	40	22	9.38
Grand Teton NP	16	3	2.32	15	6	2.15	7	0	0.82	16	6	2.32
Gros Ventre WA	38	16	4.19	25	13	3.04	26	10	3.21	38	16	4.19
North Absaroka WA	1	1	2.22	8	3	1.09	2	0	0.68	8	3	2.22
Popo Agie WA	41	21	5.53	45	25	5.00	50	24	6.26	50	25	6.26
Teton WA	13	4	1.94	12	3	1.80	7	1	1.08	13	4	1.94
Washakie WA	11	4	3.40	15	7	1.84	9	4	3.71	15	7	3.71
Wind River RA	43	18	5.75	35	18	7.71	37	22	6.15	43	22	7.71
Yellowstone NP	6	1	1.01	10	2	1.77	6	0	0.88	10	2	1.77

Note: Δdv = change in deciview.

Table E.14.4
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	92	59	8.62	88	47	10.40	94	63	14.03	94	63	14.03
Fitzpatrick WA	27	10	4.74	23	10	6.93	24	10	6.29	27	10	6.93
Grand Teton NP	7	3	1.53	8	3	1.49	1	0	0.55	8	3	1.53
Gros Ventre WA	22	6	2.91	15	7	2.07	16	4	2.18	22	7	2.91
North Absaroka WA	1	1	1.52	4	0	0.73	0	0	0.47	4	1	1.52
Popo Agie WA	30	10	3.92	35	14	3.59	34	13	4.50	35	14	4.50
Teton WA	6	2	1.30	6	1	1.25	2	0	0.72	6	2	1.30
Washakie WA	6	2	2.42	10	1	1.24	5	4	2.53	10	4	2.53
Wind River RA	28	11	4.06	28	11	5.67	26	13	4.40	28	13	5.67
Yellowstone NP	1	0	0.68	5	1	1.23	3	0	0.57	5	1	1.23

Note: Δdv = change in deciview.

Table E.14.5
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	46	29	3.54	34	18	4.84	55	26	7.39	55	29	7.39
Fitzpatrick WA	7	3	1.77	7	5	2.98	9	7	2.70	9	7	2.98
Grand Teton NP	1	0	0.55	1	0	0.62	0	0	0.23	1	0	0.62
Gros Ventre WA	5	1	1.19	4	0	0.86	2	0	0.82	5	1	1.19
North Absaroka WA	1	0	0.60	0	0	0.28	0	0	0.19	1	0	0.60
Popo Agie WA	7	1	1.47	11	5	1.61	10	4	1.97	11	5	1.97
Teton WA	1	0	0.51	1	0	0.51	0	0	0.27	1	0	0.51
Washakie WA	2	1	1.01	0	0	0.48	2	0	0.99	2	1	1.01
Wind River RA	7	2	1.64	9	5	2.54	11	2	1.92	11	5	2.54
Yellowstone NP	0	0	0.26	1	0	0.52	0	0	0.22	1	0	0.52

Note: Δdv = change in deciview.

Table E.14.6
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	60	36	4.74	55	25	6.05	63	38	6.27	63	38	6.27
Fitzpatrick WA	13	6	2.86	10	6	4.69	13	8	2.20	13	8	4.69
Grand Teton NP	3	0	0.80	4	0	0.88	0	0	0.26	4	0	0.88
Gros Ventre WA	11	1	1.86	5	2	1.15	3	0	0.81	11	2	1.86
North Absaroka WA	1	0	0.94	0	0	0.45	0	0	0.28	1	0	0.94
Popo Agie WA	12	4	1.68	15	7	2.28	17	7	2.60	17	7	2.60
Teton WA	2	0	0.81	2	0	0.72	0	0	0.43	2	0	0.81
Washakie WA	4	2	1.50	2	0	0.96	4	1	1.54	4	2	1.54
Wind River RA	14	5	2.74	12	6	3.65	16	5	1.93	16	6	3.65
Yellowstone NP	0	0	0.41	1	0	0.71	0	0	0.39	1	0	0.71

Note: Δdv = change in deciview.

Table E.14.7
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	124	85	10.31	112	76	14.20	124	87	19.69	124	87	19.69
Fitzpatrick WA	43	19	6.14	36	22	9.87	37	23	10.75	43	23	10.75
Grand Teton NP	22	6	2.42	25	9	3.12	12	2	1.42	25	9	3.12
Gros Ventre WA	44	19	4.64	33	17	4.08	34	13	4.23	44	19	4.64
North Absaroka WA	4	1	2.77	10	5	1.51	2	0	0.63	10	5	2.77
Popo Agie WA	64	26	5.24	56	31	7.04	59	33	6.92	64	33	7.04
Teton WA	13	3	2.38	15	5	2.48	10	2	1.39	15	5	2.48
Washakie WA	20	6	4.22	21	10	2.84	13	4	4.23	21	10	4.23
Wind River RA	56	27	5.72	46	24	9.19	46	28	7.85	56	28	9.19
Yellowstone NP	7	1	1.27	14	4	2.51	8	3	1.33	14	4	2.51

Note: Δdv = change in deciview.

Table E.14.8
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources
Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	125	88	11.91	121	79	14.89	127	87	18.70	127	88	18.70
Fitzpatrick WA	47	28	7.10	41	23	10.85	37	23	9.40	47	28	10.85
Grand Teton NP	26	10	2.86	24	8	3.36	14	3	1.20	26	10	3.36
Gros Ventre WA	49	20	5.16	34	16	3.52	30	16	3.55	49	20	5.16
North Absaroka WA	4	1	3.10	8	6	1.52	6	0	0.72	8	6	3.10
Popo Agie WA	66	33	6.00	62	33	7.33	67	34	7.49	67	34	7.49
Teton WA	15	6	2.67	15	6	2.69	11	3	1.54	15	6	2.69
Washakie WA	20	9	4.57	20	11	2.54	14	5	4.63	20	11	4.63
Wind River RA	55	32	6.18	49	25	9.81	49	29	7.42	55	32	9.81
Yellowstone NP	8	1	1.42	13	5	2.69	9	3	1.25	13	5	2.69

Note: Δdv = change in deciview.

Table E.14.9
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	107	71	9.17	99	61	12.27	105	74	15.59	107	74	15.59
Fitzpatrick WA	39	17	5.28	31	16	8.77	33	17	7.24	39	17	8.77
Grand Teton NP	19	5	2.11	23	4	2.79	12	0	0.95	23	5	2.79
Gros Ventre WA	36	16	4.00	26	11	2.61	26	10	2.55	36	16	4.00
North Absaroka WA	2	1	2.47	8	3	1.21	1	0	0.51	8	3	2.47
Popo Agie WA	50	22	4.46	46	26	6.22	49	26	5.95	50	26	6.22
Teton WA	13	3	2.08	12	2	2.18	6	1	1.20	13	3	2.18
Washakie WA	14	4	3.70	14	7	2.17	9	4	3.57	14	7	3.70
Wind River RA	44	17	4.69	38	17	8.22	40	23	5.89	44	23	8.22
Yellowstone NP	6	1	1.10	9	2	2.21	5	0	0.99	9	2	2.21

Note: Δdv = change in deciview.

Table E.14.10
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	84	47	4.43	69	30	7.95	71	53	10.20	84	53	10.20
Fitzpatrick WA	19	10	2.68	18	7	5.60	19	11	4.03	19	11	5.60
Grand Teton NP	11	3	1.37	12	3	2.05	7	0	0.82	12	3	2.05
Gros Ventre WA	21	10	2.48	16	6	1.75	12	4	1.40	21	10	2.48
North Absaroka WA	1	1	1.64	6	0	0.80	0	0	0.34	6	1	1.64
Popo Agie WA	34	11	2.17	30	13	4.74	34	17	3.80	34	17	4.74
Teton WA	4	1	1.35	4	1	1.51	4	0	0.77	4	1	1.51
Washakie WA	8	3	2.48	11	3	1.73	4	3	2.19	11	3	2.48
Wind River RA	30	11	2.73	25	11	5.95	30	12	3.79	30	12	5.95
Yellowstone NP	1	0	0.70	3	1	1.56	3	0	0.66	3	1	1.56

Note: Δdv = change in deciview.

Table E.14.11
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026
Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and FLAG Background Data - MVISBK=2

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum Δdv
Bridger WA	88	57	5.77	73	40	8.84	83	58	9.66	88	58	9.66
Fitzpatrick WA	24	13	3.72	26	7	6.39	19	12	3.98	26	13	6.39
Grand Teton NP	13	3	1.67	14	3	2.27	9	0	0.87	14	3	2.27
Gros Ventre WA	21	12	3.07	20	5	1.98	15	5	1.54	21	12	3.07
North Absaroka WA	1	1	1.94	6	0	0.91	0	0	0.35	6	1	1.94
Popo Agie WA	38	13	2.36	36	14	5.23	38	20	4.29	38	20	5.23
Teton WA	10	1	1.59	9	1	1.70	4	0	0.92	10	1	1.70
Washakie WA	9	4	2.90	12	5	1.80	5	3	2.68	12	5	2.90
Wind River RA	34	14	3.62	28	10	6.75	30	16	3.79	34	16	6.75
Yellowstone NP	2	0	0.85	6	1	1.74	4	0	0.79	6	1	1.74

Note: Δdv = change in deciview.

Table E.15.1
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	92	53	3.01	98	48	3.01	74	44	4.00	98	53	4.00
Fitzpatrick WA	20	0	0.99	13	0	0.97	10	1	1.01	20	1	1.01
Grand Teton NP	0	0	0.40	0	0	0.49	0	0	0.27	0	0	0.49
Gros Ventre WA	11	0	0.79	10	0	0.72	10	0	0.77	11	0	0.79
North Absaroka WA	0	0	0.12	0	0	0.27	0	0	0.13	0	0	0.27
Popo Agie WA	31	2	1.09	31	3	1.07	27	4	1.19	31	4	1.19
Teton WA	0	0	0.37	0	0	0.40	0	0	0.24	0	0	0.40
Washakie WA	0	0	0.34	0	0	0.46	0	0	0.27	0	0	0.46
Wind River RA	21	0	0.90	15	0	0.92	16	2	1.20	21	2	1.20
Yellowstone NP	0	0	0.20	0	0	0.29	0	0	0.15	0	0	0.29

Note: Δdv = change in deciview.

Table E.15.2
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	118	70	3.51	123	64	3.60	106	53	4.48	123	70	4.48
Fitzpatrick WA	26	4	1.24	20	5	1.28	16	5	1.22	26	5	1.28
Grand Teton NP	1	0	0.51	6	0	0.79	0	0	0.40	6	0	0.79
Gros Ventre WA	26	1	1.02	20	3	1.18	24	3	1.16	26	3	1.18
North Absaroka WA	0	0	0.17	0	0	0.32	0	0	0.24	0	0	0.32
Popo Agie WA	40	5	1.40	45	15	1.53	40	10	1.56	45	15	1.56
Teton WA	0	0	0.47	2	0	0.61	0	0	0.30	2	0	0.61
Washakie WA	0	0	0.39	2	0	0.59	0	0	0.38	2	0	0.59
Wind River RA	30	4	1.20	24	5	1.36	27	5	1.44	30	5	1.44
Yellowstone NP	0	0	0.28	1	0	0.52	0	0	0.23	1	0	0.52

Note: Δdv = change in deciview.

Table E.15.3
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	116	75	4.27	128	71	3.73	115	61	5.15	128	75	5.15
Fitzpatrick WA	33	9	1.46	23	7	1.35	19	7	1.46	33	9	1.46
Grand Teton NP	4	0	0.61	6	0	0.76	0	0	0.45	6	0	0.76
Gros Ventre WA	31	2	1.22	19	3	1.10	22	4	1.29	31	4	1.29
North Absaroka WA	0	0	0.20	0	0	0.39	0	0	0.21	0	0	0.39
Popo Agie WA	43	11	1.66	56	15	1.56	40	16	1.59	56	16	1.66
Teton WA	2	0	0.57	2	0	0.59	0	0	0.35	2	0	0.59
Washakie WA	0	0	0.49	3	0	0.65	0	0	0.37	3	0	0.65
Wind River RA	42	9	1.27	29	7	1.29	26	7	1.58	42	9	1.58
Yellowstone NP	0	0	0.33	0	0	0.43	0	0	0.25	0	0	0.43

Note: Δdv = change in deciview.

Table E.15.4
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	91	54	2.98	93	47	2.75	76	44	3.62	93	54	3.62
Fitzpatrick WA	21	0	0.98	14	0	0.90	13	0	0.96	21	0	0.98
Grand Teton NP	0	0	0.40	1	0	0.51	0	0	0.29	1	0	0.51
Gros Ventre WA	13	0	0.80	10	0	0.73	10	0	0.85	13	0	0.85
North Absaroka WA	0	0	0.13	0	0	0.26	0	0	0.14	0	0	0.26
Popo Agie WA	27	2	1.10	30	3	1.06	25	3	1.07	30	3	1.10
Teton WA	0	0	0.38	0	0	0.39	0	0	0.23	0	0	0.39
Washakie WA	0	0	0.32	0	0	0.44	0	0	0.26	0	0	0.44
Wind River RA	19	0	0.84	16	0	0.86	16	2	1.05	19	2	1.05
Yellowstone NP	0	0	0.21	0	0	0.29	0	0	0.17	0	0	0.29

Note: Δdv = change in deciview.

Table E.15.5
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	35	3	1.15	19	1	1.17	32	8	1.47	35	8	1.47
Fitzpatrick WA	0	0	0.37	0	0	0.33	0	0	0.36	0	0	0.37
Grand Teton NP	0	0	0.15	0	0	0.20	0	0	0.11	0	0	0.20
Gros Ventre WA	0	0	0.30	0	0	0.30	0	0	0.30	0	0	0.30
North Absaroka WA	0	0	0.05	0	0	0.10	0	0	0.06	0	0	0.10
Popo Agie WA	0	0	0.41	0	0	0.41	0	0	0.44	0	0	0.44
Teton WA	0	0	0.14	0	0	0.15	0	0	0.09	0	0	0.15
Washakie WA	0	0	0.12	0	0	0.17	0	0	0.10	0	0	0.17
Wind River RA	0	0	0.33	0	0	0.31	0	0	0.39	0	0	0.39
Yellowstone NP	0	0	0.08	0	0	0.12	0	0	0.06	0	0	0.12

Note: Δdv = change in deciview.

Table E.15.6
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	55	13	1.45	43	7	1.24	42	18	1.69	55	18	1.69
Fitzpatrick WA	5	0	0.52	0	0	0.45	0	0	0.40	5	0	0.52
Grand Teton NP	0	0	0.21	0	0	0.25	0	0	0.18	0	0	0.25
Gros Ventre WA	0	0	0.39	0	0	0.47	0	0	0.38	0	0	0.47
North Absaroka WA	0	0	0.08	0	0	0.12	0	0	0.07	0	0	0.12
Popo Agie WA	3	0	0.53	4	0	0.58	3	0	0.63	4	0	0.63
Teton WA	0	0	0.21	0	0	0.20	0	0	0.14	0	0	0.21
Washakie WA	0	0	0.19	0	0	0.26	0	0	0.15	0	0	0.26
Wind River RA	1	0	0.51	0	0	0.47	3	0	0.53	3	0	0.53
Yellowstone NP	0	0	0.12	0	0	0.14	0	0	0.11	0	0	0.14

Note: Δdv = change in deciview.

Table E.15.7
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	130	83	4.22	148	72	3.75	122	69	5.34	148	83	5.34
Fitzpatrick WA	42	11	1.52	32	8	1.55	26	10	1.47	42	11	1.55
Grand Teton NP	15	0	0.85	21	3	1.13	10	0	0.69	21	3	1.13
Gros Ventre WA	39	8	1.56	24	6	1.45	30	7	1.45	39	8	1.56
North Absaroka WA	0	0	0.26	0	0	0.45	0	0	0.36	0	0	0.45
Popo Agie WA	61	27	1.94	64	27	2.23	53	21	1.97	64	27	2.23
Teton WA	1	0	0.59	6	0	0.82	2	0	0.53	6	0	0.82
Washakie WA	0	0	0.45	7	0	0.72	1	0	0.60	7	0	0.72
Wind River RA	50	18	1.66	37	14	1.83	35	13	1.95	50	18	1.95
Yellowstone NP	0	0	0.35	2	0	0.65	0	0	0.34	2	0	0.65

Note: Δdv = change in deciview.

Table E.15.8
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	128	87	4.86	146	83	4.12	132	71	5.71	146	87	5.71
Fitzpatrick WA	43	17	1.79	34	11	1.43	30	12	1.69	43	17	1.79
Grand Teton NP	17	0	0.91	23	0	0.99	12	0	0.72	23	0	0.99
Gros Ventre WA	44	10	1.73	24	8	1.57	33	11	1.52	44	11	1.73
North Absaroka WA	0	0	0.28	1	0	0.51	0	0	0.30	1	0	0.51
Popo Agie WA	60	29	2.11	65	29	2.59	55	24	1.94	65	29	2.59
Teton WA	5	0	0.71	5	0	0.94	3	0	0.58	5	0	0.94
Washakie WA	1	0	0.53	6	0	0.86	3	0	0.61	6	0	0.86
Wind River RA	50	19	1.76	38	16	1.97	37	17	1.94	50	19	1.97
Yellowstone NP	0	0	0.41	2	0	0.67	0	0	0.33	2	0	0.67

Note: Δdv = change in deciview.

Table E.15.9
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	107	67	3.62	114	57	3.24	98	50	4.43	114	67	4.43
Fitzpatrick WA	31	8	1.28	20	3	1.09	21	4	1.22	31	8	1.28
Grand Teton NP	12	0	0.78	19	0	0.80	7	0	0.62	19	0	0.80
Gros Ventre WA	29	5	1.28	19	2	1.22	21	4	1.18	29	5	1.28
North Absaroka WA	0	0	0.22	0	0	0.39	0	0	0.24	0	0	0.39
Popo Agie WA	47	13	1.59	52	16	1.91	43	17	1.46	52	17	1.91
Teton WA	1	0	0.52	2	0	0.74	0	0	0.46	2	0	0.74
Washakie WA	0	0	0.41	5	0	0.62	0	0	0.49	5	0	0.62
Wind River RA	43	8	1.40	28	6	1.60	27	8	1.44	43	8	1.60
Yellowstone NP	0	0	0.33	1	0	0.53	0	0	0.27	1	0	0.53

Note: Δdv = change in deciview.

Table E.15.10
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	73	29	1.98	64	14	1.75	59	24	2.43	73	29	2.43
Fitzpatrick WA	11	0	0.72	6	0	0.62	7	0	0.66	11	0	0.72
Grand Teton NP	7	0	0.60	11	0	0.69	0	0	0.45	11	0	0.69
Gros Ventre WA	12	0	0.78	5	0	0.67	7	0	0.78	12	0	0.78
North Absaroka WA	0	0	0.14	0	0	0.24	0	0	0.16	0	0	0.24
Popo Agie WA	29	0	0.99	23	4	1.14	28	0	0.93	29	4	1.14
Teton WA	0	0	0.40	0	0	0.47	0	0	0.32	0	0	0.47
Washakie WA	0	0	0.28	0	0	0.45	0	0	0.30	0	0	0.45
Wind River RA	15	0	0.86	13	1	1.17	15	0	0.86	15	1	1.17
Yellowstone NP	0	0	0.22	0	0	0.31	0	0	0.19	0	0	0.31

Note: Δdv = change in deciview.

Table E.15.11
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Best Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	80	41	2.22	78	26	1.97	68	33	2.65	80	41	2.65
Fitzpatrick WA	18	0	0.86	11	0	0.69	9	0	0.75	18	0	0.86
Grand Teton NP	7	0	0.62	12	0	0.69	0	0	0.47	12	0	0.69
Gros Ventre WA	14	0	0.85	8	0	0.76	9	0	0.76	14	0	0.85
North Absaroka WA	0	0	0.17	0	0	0.28	0	0	0.18	0	0	0.28
Popo Agie WA	37	3	1.09	34	4	1.41	33	3	1.12	37	4	1.41
Teton WA	0	0	0.44	2	0	0.52	0	0	0.33	2	0	0.52
Washakie WA	0	0	0.28	1	0	0.51	0	0	0.33	1	0	0.51
Wind River RA	21	1	1.09	21	1	1.30	18	0	0.97	21	1	1.30
Yellowstone NP	0	0	0.24	0	0	0.35	0	0	0.22	0	0	0.35

Note: Δdv = change in deciview.

Table E.16.1
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	80	41	2.40	73	25	2.40	65	34	3.23	80	41	3.23
Fitzpatrick WA	8	0	0.78	8	0	0.76	8	0	0.79	8	0	0.79
Grand Teton NP	0	0	0.31	0	0	0.39	0	0	0.21	0	0	0.39
Gros Ventre WA	1	0	0.62	4	0	0.56	5	0	0.60	5	0	0.62
North Absaroka WA	0	0	0.09	0	0	0.21	0	0	0.10	0	0	0.21
Popo Agie WA	16	0	0.86	18	0	0.83	20	0	0.94	20	0	0.94
Teton WA	0	0	0.29	0	0	0.31	0	0	0.19	0	0	0.31
Washakie WA	0	0	0.26	0	0	0.36	0	0	0.21	0	0	0.36
Wind River RA	16	0	0.70	8	0	0.72	10	0	0.94	16	0	0.94
Yellowstone NP	0	0	0.16	0	0	0.23	0	0	0.12	0	0	0.23

Note: Δdv = change in deciview.

Table E.16.2
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	100	55	2.82	102	48	2.89	87	51	3.63	102	55	3.63
Fitzpatrick WA	15	0	0.98	11	1	1.01	12	0	0.96	15	1	1.01
Grand Teton NP	0	0	0.40	3	0	0.62	0	0	0.31	3	0	0.62
Gros Ventre WA	14	0	0.80	14	0	0.92	10	0	0.91	14	0	0.92
North Absaroka WA	0	0	0.13	0	0	0.25	0	0	0.19	0	0	0.25
Popo Agie WA	34	2	1.10	38	5	1.21	25	4	1.23	38	5	1.23
Teton WA	0	0	0.36	0	0	0.47	0	0	0.23	0	0	0.47
Washakie WA	0	0	0.30	0	0	0.46	0	0	0.30	0	0	0.46
Wind River RA	20	0	0.94	15	2	1.07	16	2	1.13	20	2	1.13
Yellowstone NP	0	0	0.22	0	0	0.41	0	0	0.18	0	0	0.41

Note: Δdv = change in deciview.

Table E.16.3
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	104	60	3.45	108	54	3.15	88	46	4.19	108	60	4.19
Fitzpatrick WA	24	4	1.15	15	1	1.06	13	2	1.15	24	4	1.15
Grand Teton NP	0	0	0.48	2	0	0.59	0	0	0.35	2	0	0.59
Gros Ventre WA	19	0	0.96	13	0	0.86	18	1	1.01	19	1	1.01
North Absaroka WA	0	0	0.15	0	0	0.30	0	0	0.16	0	0	0.30
Popo Agie WA	35	2	1.31	38	8	1.23	31	7	1.25	38	8	1.31
Teton WA	0	0	0.45	0	0	0.46	0	0	0.27	0	0	0.46
Washakie WA	0	0	0.38	1	0	0.50	0	0	0.29	1	0	0.50
Wind River RA	27	0	0.99	17	1	1.01	20	3	1.24	27	3	1.24
Yellowstone NP	0	0	0.26	0	0	0.34	0	0	0.20	0	0	0.34

Note: Δdv = change in deciview.

Table E.16.4
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	77	33	2.38	74	21	2.19	68	32	2.91	77	33	2.91
Fitzpatrick WA	10	0	0.76	8	0	0.70	7	0	0.75	10	0	0.76
Grand Teton NP	0	0	0.31	0	0	0.40	0	0	0.23	0	0	0.40
Gros Ventre WA	2	0	0.63	3	0	0.57	5	0	0.67	5	0	0.67
North Absaroka WA	0	0	0.10	0	0	0.21	0	0	0.11	0	0	0.21
Popo Agie WA	15	0	0.86	17	0	0.83	19	0	0.84	19	0	0.86
Teton WA	0	0	0.29	0	0	0.31	0	0	0.18	0	0	0.31
Washakie WA	0	0	0.25	0	0	0.34	0	0	0.20	0	0	0.34
Wind River RA	11	0	0.66	8	0	0.67	8	0	0.82	11	0	0.82
Yellowstone NP	0	0	0.17	0	0	0.22	0	0	0.13	0	0	0.22

Note: Δdv = change in deciview.

Table E.16.5
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	23	0	0.91	12	0	0.92	20	3	1.16	23	3	1.16
Fitzpatrick WA	0	0	0.29	0	0	0.26	0	0	0.28	0	0	0.29
Grand Teton NP	0	0	0.12	0	0	0.16	0	0	0.08	0	0	0.16
Gros Ventre WA	0	0	0.23	0	0	0.23	0	0	0.24	0	0	0.24
North Absaroka WA	0	0	0.04	0	0	0.08	0	0	0.05	0	0	0.08
Popo Agie WA	0	0	0.32	0	0	0.32	0	0	0.34	0	0	0.34
Teton WA	0	0	0.11	0	0	0.12	0	0	0.07	0	0	0.12
Washakie WA	0	0	0.09	0	0	0.13	0	0	0.08	0	0	0.13
Wind River RA	0	0	0.26	0	0	0.24	0	0	0.30	0	0	0.30
Yellowstone NP	0	0	0.06	0	0	0.10	0	0	0.05	0	0	0.10

Note: Δdv = change in deciview.

Table E.16.6
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	41	2	1.14	29	0	0.97	31	9	1.33	41	9	1.33
Fitzpatrick WA	0	0	0.40	0	0	0.35	0	0	0.31	0	0	0.40
Grand Teton NP	0	0	0.16	0	0	0.20	0	0	0.14	0	0	0.20
Gros Ventre WA	0	0	0.30	0	0	0.37	0	0	0.29	0	0	0.37
North Absaroka WA	0	0	0.06	0	0	0.09	0	0	0.06	0	0	0.09
Popo Agie WA	0	0	0.41	0	0	0.45	0	0	0.49	0	0	0.49
Teton WA	0	0	0.16	0	0	0.16	0	0	0.11	0	0	0.16
Washakie WA	0	0	0.14	0	0	0.20	0	0	0.12	0	0	0.20
Wind River RA	0	0	0.40	0	0	0.37	0	0	0.41	0	0	0.41
Yellowstone NP	0	0	0.10	0	0	0.11	0	0	0.09	0	0	0.11

Note: Δdv = change in deciview.

Table E.16.7
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	112	68	3.41	117	59	3.47	103	54	4.36	117	68	4.36
Fitzpatrick WA	27	4	1.20	22	3	1.22	17	6	1.16	27	6	1.22
Grand Teton NP	6	0	0.67	15	0	0.88	2	0	0.54	15	0	0.88
Gros Ventre WA	26	2	1.23	20	5	1.14	24	4	1.14	26	5	1.23
North Absaroka WA	0	0	0.20	0	0	0.35	0	0	0.28	0	0	0.35
Popo Agie WA	46	12	1.53	53	14	1.77	43	12	1.56	53	14	1.77
Teton WA	0	0	0.46	2	0	0.64	0	0	0.41	2	0	0.64
Washakie WA	0	0	0.35	4	0	0.56	0	0	0.47	4	0	0.56
Wind River RA	35	5	1.31	26	5	1.44	27	5	1.54	35	5	1.54
Yellowstone NP	0	0	0.27	1	0	0.51	0	0	0.27	1	0	0.51

Note: Δdv = change in deciview.

Table E.16.8
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	112	70	3.95	123	61	3.40	105	55	4.67	123	70	4.67
Fitzpatrick WA	34	8	1.42	21	5	1.12	21	7	1.34	34	8	1.42
Grand Teton NP	10	0	0.71	14	0	0.78	5	0	0.56	14	0	0.78
Gros Ventre WA	31	5	1.37	21	2	1.24	23	4	1.20	31	5	1.37
North Absaroka WA	0	0	0.22	0	0	0.40	0	0	0.24	0	0	0.40
Popo Agie WA	50	15	1.67	53	17	2.06	43	18	1.53	53	18	2.06
Teton WA	1	0	0.55	3	0	0.73	0	0	0.45	3	0	0.73
Washakie WA	0	0	0.41	6	0	0.67	0	0	0.47	6	0	0.67
Wind River RA	41	13	1.39	29	6	1.56	28	8	1.53	41	13	1.56
Yellowstone NP	0	0	0.32	1	0	0.53	0	0	0.26	1	0	0.53

Note: Δdv = change in deciview.

Table E.16.9
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	94	53	2.91	91	45	2.59	80	42	3.59	94	53	3.59
Fitzpatrick WA	23	1	1.01	16	0	0.86	13	0	0.96	23	1	1.01
Grand Teton NP	6	0	0.61	11	0	0.62	0	0	0.49	11	0	0.62
Gros Ventre WA	17	1	1.01	11	0	0.96	14	0	0.92	17	1	1.01
North Absaroka WA	0	0	0.17	0	0	0.30	0	0	0.18	0	0	0.30
Popo Agie WA	39	4	1.25	39	6	1.51	32	8	1.15	39	8	1.51
Teton WA	0	0	0.40	1	0	0.58	0	0	0.36	1	0	0.58
Washakie WA	0	0	0.32	0	0	0.48	0	0	0.38	0	0	0.48
Wind River RA	24	2	1.10	19	2	1.26	21	4	1.13	24	4	1.26
Yellowstone NP	0	0	0.25	0	0	0.41	0	0	0.21	0	0	0.41

Note: Δdv = change in deciview.

Table E.16.10
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	61	17	1.57	48	9	1.38	44	18	1.93	61	18	1.93
Fitzpatrick WA	6	0	0.56	0	0	0.48	3	0	0.51	6	0	0.56
Grand Teton NP	0	0	0.47	3	0	0.54	0	0	0.35	3	0	0.54
Gros Ventre WA	7	0	0.61	1	0	0.53	1	0	0.61	7	0	0.61
North Absaroka WA	0	0	0.11	0	0	0.19	0	0	0.12	0	0	0.19
Popo Agie WA	17	0	0.78	13	0	0.90	13	0	0.73	17	0	0.90
Teton WA	0	0	0.31	0	0	0.37	0	0	0.25	0	0	0.37
Washakie WA	0	0	0.22	0	0	0.35	0	0	0.23	0	0	0.35
Wind River RA	8	0	0.67	5	0	0.92	8	0	0.67	8	0	0.92
Yellowstone NP	0	0	0.17	0	0	0.24	0	0	0.15	0	0	0.24

Note: Δdv = change in deciview.

Table E.16.11
Maximum Modeled Visibility Impacts at PSD Class I and Sensitive PSD Class II Areas from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Regional Haze Rule - Average Days - Background Data

	2001			2002			2003			Maximum Modeled Impacts		
	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	8th Highest Δdv	# Days > 0.5 Δdv	# Days > 1.0 Δdv	Maximum 8th Highest Δdv
Bridger WA	69	24	1.76	63	12	1.56	51	24	2.11	69	24	2.11
Fitzpatrick WA	7	0	0.67	3	0	0.54	4	0	0.58	7	0	0.67
Grand Teton NP	0	0	0.48	3	0	0.54	0	0	0.37	3	0	0.54
Gros Ventre WA	8	0	0.66	1	0	0.59	3	0	0.59	8	0	0.66
North Absaroka WA	0	0	0.13	0	0	0.22	0	0	0.14	0	0	0.22
Popo Agie WA	23	0	0.85	17	2	1.11	21	0	0.88	23	2	1.11
Teton WA	0	0	0.34	0	0	0.40	0	0	0.26	0	0	0.40
Washakie WA	0	0	0.22	0	0	0.40	0	0	0.26	0	0	0.40
Wind River RA	13	0	0.85	8	1	1.02	10	0	0.76	13	1	1.02
Yellowstone NP	0	0	0.19	0	0	0.27	0	0	0.17	0	0	0.27

Note: Δdv = change in deciview.

Table E.17.1
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2005 Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	108	11.46	100	9.22	91	12.16	108	12.16
Cora	36	5.99	32	7.33	29	8.52	36	8.52
Pinedale	55	5.51	47	10.29	41	9.10	55	10.29

Note: Δdv = change in deciview.

Table E.17.2
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2007
No Action Case – Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	126	11.65	121	10.70	119	13.13	126	13.13
Cora	58	6.93	49	11.25	46	10.20	58	11.25
Pinedale	89	6.14	79	12.50	74	10.58	89	12.50

Note: Δdv = change in deciview.

Table E.17.3
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2009
Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	128	13.76	138	11.82	127	15.32	138	15.32
Cora	62	8.10	55	10.12	47	12.50	62	12.50
Pinedale	91	7.43	83	12.14	76	12.29	91	12.29

Note: Δdv = change in deciview.

Table E.17.4
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - .Alternative C - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	107	10.70	101	9.03	96	12.22	107	12.22
Cora	47	5.88	38	7.67	35	9.51	47	9.51
Pinedale	70	5.42	59	9.36	54	9.38	70	9.38

Note: Δdv = change in deciview.

Table E.17.5
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources – Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	45	5.14	35	4.14	39	6.60	45	6.60
Cora	11	2.29	12	3.63	10	4.03	12	4.03
Pinedale	25	2.44	15	4.42	17	4.08	25	4.42

Note: Δdv = change in deciview.

Table E.17.6
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project Sources - Year 2026
Proposed Action Maximum Field Production Emissions - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	54	5.29	45	3.39	42	6.76	54	6.76
Cora	12	1.97	10	3.29	10	2.78	12	3.29
Pinedale	23	2.94	18	5.25	19	3.47	23	5.25

Note: Δdv = change in deciview.

Table E.17.7
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Year 2007 No Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	133	12.34	141	11.23	128	13.69	141	13.69
Cora	65	7.26	54	11.55	48	10.86	65	11.55
Pinedale	94	6.95	84	12.77	80	11.45	94	12.77

Note: Δdv = change in deciview.

Table E.17.8
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Year 2009 Proposed Action Case - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	134	14.32	153	12.29	144	15.77	153	15.77
Cora	68	8.40	59	10.45	51	13.02	68	13.02
Pinedale	96	7.88	85	13.23	81	12.99	96	13.23

Note: Δdv = change in deciview.

Table E.17.9
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Alternative C - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	113	11.45	118	9.65	110	12.83	118	12.83
Cora	60	6.25	50	8.10	41	10.21	60	10.21
Pinedale	79	6.18	72	10.77	66	10.35	79	10.77

Note: Δdv = change in deciview.

Table E.17.10
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Alternative C - 80% Drill Rig Mitigation - Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	69	6.41	58	5.13	54	7.64	69	7.64
Cora	25	3.00	21	5.11	23	5.22	25	5.22
Pinedale	45	3.60	31	6.67	34	5.70	45	6.67

Note: Δdv = change in deciview.

Table E.17.11
Maximum Modeled Visibility Impacts at Wyoming Regional Community Locations from Pinedale Anticline Project and Regional Sources - Year 2026 Proposed Action Maximum Field Production Emissions – Using Meteorology Data for Years 2001 - 2003, and Boulder Background Data

	2001		2002		2003		Maximum Modeled Impacts	
	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv	# Days > 1.0 Δdv	Maximum Δdv
Boulder	74	6.55	59	4.48	54	7.79	74	7.79
Cora	25	3.28	27	5.59	22	4.12	27	5.59
Pinedale	43	4.05	34	7.30	33	4.70	43	7.30

Note: Δdv = change in deciview.

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Table F.1.1
Actual Emissions Inventory – Shell 2005 Actual Emissions Inventory

				Location		Production		Drill Rig Engines		Process Burners	Wellhead IC Engines
						Gas	Condensate	SO2	N0x	N0x	N0x
Well Name	API #	Field Name	Air Quality Permit #	Latitude	Longitude	MCF	BBL	TPY	TPY	TPY	TPY
Antelope 2-6	49-035-22635	Pinedale Anticline	**CT-3483**	42.51667	109.64278	312,385	2,557	0.00	19.32	0.000	0.0
Antelope 11-10D	49-035-22927	Pinedale Anticline	AP-1357 Waiver	42.49459	109.59229	0	0	0.00	19.32	0.000	0.0
Antelope 11-4	49-035-22133	Pinedale Anticline	**CT-2980**	45.50972	109.60917	430,040	3,574	0.00	19.32	0.000	0.0
Antelope 1-9	49-035-22173	Pinedale Anticline	**MD-836**	42.50166	109.59860	262,743	3,843	0.00	19.32	0.150	0.0
Antelope 2-9	49-035-22601	Pinedale Anticline	**MD-836**	42.50222	109.60278	142,349	1,352	0.00	15.07	0.000	0.0
Antelope 12-4D	49-035-23752	Pinedale Anticline	AP-3347	42.50610	109.60880	217,982	2,535	0.58	15.07	0.064	0.0
Antelope 13-4D	49-035-22718	Pinedale Anticline	AP-3347	42.50611	109.60883	515,710	8,120	0.58	15.07	0.178	0.0
Antelope 14-4	49-035-22717	Pinedale Anticline	**CT-3468**	42.50611	109.60889	267,889	2,020	0.00	15.07	0.180	0.0
Falcon 1-36	49-035-21742	Pinedale Anticline	AP-S50 Waiver / AP-0500 / MD-864	42.53056	109.65750	79,975	544	0.00	15.07	0.232	0.0
Falcon 2-36D	49-035-23797	Pinedale Anticline	Application Pending	42.5277	109.65828	496,889	4,629	0.58	15.07	0.313	0.0
Falcon 7-36D	49-035-23795	Pinedale Anticline	Application Pending	42.52769	109.65831	471,048	5,748	0.58	11.29	0.101	0.0
Falcon 8-36	49-035-22327	Pinedale Anticline	AP-0500 / **MD-864**	42.52778	109.65778	276,644	2,554	0.00	11.29	0.163	0.0
Jensen 6-11D	49-035-22875	Pinedale Anticline	**CT-3646**	42.67806	109.80249	537,395	3,771	0.00	11.29	0.168	0.0
Jensen 1	49-035-20606	Pinedale Anticline	AP-N21, AP-KV0 Waiver, PNA	42.67428	109.80739	0	0	0.00	10.45	0.000	0.0
Jensen 1A	49-035-22263	Pinedale Anticline	**CT-3123**	42.67527	109.80583	671,548	4,157	0.00	10.45	0.000	0.0
Jensen 9-10D	49-035-23707	Pinedale Anticline	AP-3353	42.67540	109.80629	1,688,943	9,010	0.00	9.17	0.000	0.0
Jensen 2	49-035-20748	Pinedale Anticline	AP-N31, AP-KU0 Waiver	42.66555	109.79194	0	0	0.00	9.17	0.062	0.0
Jensen 15-11D	49-035-23283	Pinedale Anticline	AP-3062	42.67010	109.79727	385,247	3,022	0.00	9.17	0.070	0.0
Jensen 16-11D	49-035-23284	Pinedale Anticline	AP-3062	42.66531	109.79186	609,225	3,889	0.00	9.17	0.141	0.0
Jensen 3	49-035-21666	Pinedale Anticline	AP-2830	42.66100	109.80266	0	0	0.00	9.17	0.143	0.0
Jensen 4	49-035-21902	Pinedale Anticline	AP-2830	42.66306	109.80333	132,888	736	0.00	9.17	0.273	0.0
Jensen 14-11D	49-035-23300	Pinedale Anticline	AP-2830	42.66299	109.80027	850,425	4,541	0.00	9.17	0.279	0.0
Jensen 3-14	49-035-23313	Pinedale Anticline	AP-2830	42.66304	109.81026	563,681	5,118	0.00	9.17	0.456	0.0
Jensen 7-11D	49-035-23282	Pinedale Anticline	AP-3624	42.67055	109.80414	1,317,826	7,144	0.76	9.17	0.459	0.0
Jensen 10-11D	49-035-22660	Pinedale Anticline	**CT-3196**	42.67055	109.80277	524,527	3,734	0.00	5.24	0.000	0.0
Jensen 11-11D	49-035-22701	Pinedale Anticline	AP-3624 / AP-2830	42.67055	109.80277	817,715	6,015	0.00	5.24	0.000	0.0
Jensen 12-11D	49-035-23285	Pinedale Anticline	AP-3624 / AP-2830	42.67055	109.80277	1,281,885	7,660	0.00	5.24	0.091	0.0
Jensen 13-11D	49-035-23566	Pinedale Anticline	AP-3624 / AP-2830	42.67055	109.80277	572,603	4,580	0.00	5.24	0.162	0.0
Mesa 6-28D	49-035-22603	Pinedale Anticline	AP-0036 / **CT-3134**	42.71583	109.84083	620,530	4,385	0.00	5.24	0.238	0.0
Mesa 11-28	49-035-22530	Pinedale Anticline	AP-0036 / **CT-3134**	42.71583	109.84083	410,530	2,843	0.00	5.24	0.331	0.0
Mesa 12-28	49-035-22564	Pinedale Anticline	AP-0847 / **MD-911**	42.71583	109.84083	518,727	3,606	0.00	5.24	0.374	0.0
Mesa 13-28D	49-035-22774	Pinedale Anticline	AP-1905 (4/20/04) **MD-1091**	42.71556	109.84083	566,498	4,578	0.00	5.24	0.441	0.0
Mesa 14-28D	49-035-22775	Pinedale Anticline	AP-0847 / **MD-911**	42.71556	109.84083	623,111	4,111	0.00	5.24	0.509	0.0
Mesa 9-29D	49-035-22565	Pinedale Anticline	AP-1905 (4/20/04) **MD-1091**	42.71583	109.84583	417,857	3,047	0.00	4.74	0.000	0.0
Mesa 3-28D	49-035-22698	Pinedale Anticline	**CT-3369**	42.72194	109.84917	544,990	3,653	0.00	4.74	0.000	0.0
Mesa 4-28D	49-035-22695	Pinedale Anticline	**CT-3369**	42.72194	109.84917	462,051	3,780	0.00	4.74	0.000	0.0
Mesa 5-28D	49-035-22697	Pinedale Anticline	**CT-3369**	42.72194	109.84917	475,580	3,943	0.00	4.74	0.076	0.0
Mesa 1-29D	49-035-22699	Pinedale Anticline	**CT-3369**	42.72194	109.84917	449,607	3,594	0.00	4.74	0.131	0.0
Mesa 5-33	49-035-23090	Pinedale Anticline	**CT-3785**	42.70571	109.84738	592,434	4,023	0.00	4.74	0.221	0.0
Mesa 6-33D	49-035-23089	Pinedale Anticline	**CT-3785**	42.70069	109.84650	478,370	4,066	0.00	4.74	0.294	0.0
Mesa 11-33D	49-035-23054	Pinedale Anticline	NOI SENT TO WDEQ	42.70151	109.84681	523,586	3,769	0.00	4.74	0.368	0.0
Mesa 12-33	49-035-23367	Pinedale Anticline	NOI SENT TO WDEQ	42.70130	109.84629	814,212	6,413	0.00	4.74	0.413	0.0
Mesa 13-33D	49-035-23051	Pinedale Anticline	NOI SENT TO WDEQ	42.70118	109.84603	750,250	5,338	0.00	4.74	0.448	0.0
Mesa 14-33D	49-035-23368	Pinedale Anticline	NOI SENT TO WDEQ	42.70140	109.84655	1,033,394	6,676	0.00	0.00	0.000	0.0
Mesa 9-32D	49-035-23053	Pinedale Anticline	NOI SENT TO WDEQ	42.70108	109.84578	543,079	4,222	0.00	0.00	0.000	0.0
Mesa 11-34D	49-035-23366	Pinedale Anticline	NOI SENT TO WDEQ	42.69913	109.82406	986,633	4,359	0.57	0.00	0.000	0.0
Mesa 12-34	49-035-22907	Pinedale Anticline	**CT-3649**	42.71056	109.80611	896,633	5,543	0.00	0.00	0.000	0.0
Mesa 13-34D	49-035-23365	Pinedale Anticline	NOI SENT TO WDEQ	42.69913	109.82403	808,545	5,165	0.57	0.00	0.000	0.0
Mesa 14-34D	49-035-22908	Pinedale Anticline	NOI SENT TO WDEQ	42.70053	109.82800	1,568,863	9,233	0.00	0.00	0.147	0.0
Mesa 11-35D	49-035-22947	Pinedale Anticline	NOI SENT TO WDEQ	42.69611	109.80781	416,204	2,848	0.50	0.00	0.307	0.0
Mesa 12-35D	49-035-22946	Pinedale Anticline	NOI SENT TO WDEQ	42.69633	109.80789	982,999	5,896	0.50	0.00	0.414	0.0
Mesa 13-35	49-035-22948	Pinedale Anticline	AP-2061	42.69601	109.80776	887,696	5,470	0.00	0.00	0.456	0.0
Mesa 14-35D	49-035-22945	Pinedale Anticline	NOI SENT TO WDEQ	42.6959	109.80772	407,562	2,611	0.50	0.00	0.457	0.0
Mesa 1-27	49-035-22900	Pinedale Anticline	**CT-3751**	42.72202	109.81196	195,882	2,272	0.00	0.00	0.496	0.0
Mesa 7-27	49-035-22422	Pinedale Anticline	**CT-3132**	42.71806	109.81722	421,168	3,179	0.00	0.00	0.542	0.0
Mesa 13-26	49-035-22611	Pinedale Anticline	**CT-3285**	42.71056	109.80611	573,234	4,249	0.00	0.00	0.542	0.0
New Fork 7-3	49-035-22473	Pinedale Anticline	**CT3141 Corrected**	42.68861	109.81667	792,000	4,453	0.00	0.00	0.542	0.0
New Fork 13-10	49-035-21646	Pinedale Anticline	AP-WM9 Waiver	42.57833	109.71165	15,659	113	0.00	0.00	0.542	0.0
New Fork 11-24	49-035-22359	Pinedale Anticline	**CT-3224**	42.64056	109.78250	366,193	2,078	0.00	0.00	0.542	0.0
New Fork 13-32S	49-035-22317	Pinedale Anticline	AP-1709 Waiver	42.60750	109.75083	23,288	210	0.00	0.00	0.542	0.0
North Mesa 4-7	49-035-22588	Pinedale Anticline	AP-1471 Waiver	42.76861	109.88750	26,756	368	0.00	0.00	0.542	0.0
Pinedale 13-19	49-035-21757	Pinedale Anticline	**CT-2013**	42.63631	109.76840	60,807	291	0.00	0.00	0.542	0.0
Steele 16-31	49-035-21725	Pinedale Anticline	AP-MS0 Waiver	42.86860	109.90250	0	0	0.00	0.00	0.542	0.0
Rainbow 7-31	49-035-22055	Pinedale Anticline	**CT3124**	42.52750	109.64306	165,187	1,318	0.00	0.00	0.542	0.0
Rainbow 11-32	49-035-22693	Pinedale Anticline	AP-4228	42.51972	109.62889	442,494	4,464	0.00	0.00	0.542	0.0
Rainbow 12-32	49-035-22680	Pinedale Anticline	AP-4228	42.52028	109.63333	362,981	4,255	0.00	0.00	0.542	0.0
Rainbow 13-32	49-035-22638	Pinedale Anticline	AP-4228	42.52028	109.63333	212,951	2,326	0.00	0.00	0.542	0.0
Rainbow 14-32	49-035-22641	Pinedale Anticline	AP-4228	42.51972	109.62888	162,697	2,102	0.76	0.00	0.542	0.0
Rainbow 11-31	49-035-22637	Pinedale Anticline	**CT3231**	42.52361	109.64750	212,306	1,956	0.00	0.00	0.542	0.0
Riverside 11-2D	49-035-22895	Pinedale Anticline	NOI SENT TO WDEQ	42.68500	109.80301	1,110,401	6,315	0.00	0.00	0.542	0.0
Riverside 12-2D	49-035-23549	Pinedale Anticline	NOI SENT TO WDEQ	42.68355	109.80343	1,408,823	6,879	0.00	0.00	0.542	0.0
Riverside 14-2D	49-035-23548	Pinedale Anticline	NOI SENT TO WDEQ	42.68311	109.80344	1,321,415	7,424	0.00	0.00	0.542	0.0
Pinedale 13-2A	49-035-21830	Pinedale Anticline	**CT-2011**	42.68249	109.80750	279,704	1,607	0.00	0.00	0.542	0.0
Riverside 1-3D	49-035-22898	Pinedale Anticline	AP-4223	42.69045	109.81260	1,595,846	8,437	0.00	0.00	0.542	0.0
Riverside 2-3D	49-035-22899	Pinedale Anticline	AP-4223	42.69044	109.81262	1,617,619	8,347	0.00	0.00	0.542	0.0
Riverside 8-3D	49-035-23162	Pinedale Anticline	AP-4223	42.68835	109.81127	1,332,653	6,450	0.00	0.00	0.542	0.0
Riverside 11-3D(ST)	49-035-23006	Pinedale Anticline	NOI SENT TO WDEQ	42.68260	109.82693	904,245	5,220	1.04	0.00	0.542	0.0
Riverside 12-3	49-035-23360	Pinedale Anticline	NOI SENT TO WDEQ	42.68599	109.8254	586,896	2,749	0.76	0.00	0.542	0.0
Riverside 13-3(ST)	49-035-23008	Pinedale Anticline	**CT-3649**	42.68266	109.82675	284,790	2,192	0.00	0.00	0.542	0.0
Riverside 14-3D	49-035-23359	Pinedale Anticline	NOI SENT TO WDEQ	42.68597	109.82538	678,098	4,330	0.76	0.00	0.542	0.0
Riverside 5-4D	49-035-23956	Pinedale Anticline	AP-4224	42.68469	109.8448	155,053	957	0.45	0.00	0.542	0.0
Riverside 6-4D	49-035-23904	Pinedale Anticline	AP-4224	42.68501	109.84521	398,372	2,900	0.45	0.00	0.542	0.0
Riverside 11-4D	49-035-23955	Pinedale Anticline	AP-4224	42.68485	109.84500	0	0	0.45	0.00	0.542	0.0

Table F.1.1
Actual Emissions Inventory – Shell 2005 Actual Emissions Inventory

				Location		Production		Drill Rig Engines		Process Burners	Wellhead IC Engines
						Gas	Condensate	SO2	N0x	N0x	N0x
Well Name	**API #**	**Field Name**	**Air Quality Permit #**	**Latitude**	**Longitude**	**MCF**	**BBL**	**TPY**	**TPY**	**TPY**	**TPY**
Riverside 14-4D	49-035-23960	Pinedale Anticline	AP-4224	42.68453	109.84459	57,750	651	0.45	0.00	0.542	0.0
Riverside 1-13D	49-035-23346	Pinedale Anticline	AP-4226	42.65919	109.77133	1,254,923	8,661	0.00	0.00	0.542	0.0
Riverside 2-13D	49-035-23342	Pinedale Anticline	AP-4226	42.65919	109.77133	1,053,221	6,334	0.00	0.00	0.542	0.0
Riverside 7-13	49-035-23348	Pinedale Anticline	AP-4226	42.65919	109.77133	926,134	7,305	0.00	0.00	0.542	0.0
Riverside 8-13D	49-035-23345	Pinedale Anticline	AP-4226	42.65919	109.77133	1,090,546	6,621	0.00	0.00	0.542	0.0
Riverside 11-13	49-035-23349	Pinedale Anticline	AP-4225	42.65545	109.78316	396,492	2,992	0.58	0.00	0.542	0.0
Riverside 12-13D	49-035-23343	Pinedale Anticline	AP-4225	42.65537	109.78421	349,623	2,769	0.58	0.00	0.542	0.0
Riverside 13-13D	49-035-23344	Pinedale Anticline	AP-4225	42.6553	109.78338	331,847	2,687	0.58	0.00	0.542	0.0
Riverside 14-13D	49-035-23347	Pinedale Anticline	AP-4225	42.65538	109.77594	425,663	2,385	0.58	0.00	0.542	0.0
Riverside 2-14	49-035-21901	Pinedale Anticline	**CT-3284**	42.66308	109.79836	571,431	3,699	0.00	0.00	0.542	0.0
Pinedale 1-14	49-035-21512	Pinedale Anticline	AP-WM9 Waiver	42.66044	109.79356	39,777	292	0.00	0.00	0.542	0.0
Riverside 8-23D	49-035-23272	Pinedale Anticline	Application Pending	42.64844	109.79201	239,212	1,940	0.76	0.00	0.542	0.0
Riverside 2-24	49-035-23005	Pinedale Anticline	**CT-3762**	42.64779	109.77945	514,300	3,980	0.00	0.00	0.542	0.0
Riverside 11-25	49-035-23352	Pinedale Anticline	Application Pending	42.62604	109.78300	265,866	1,819	0.57	0.00	0.542	0.0
Vible 1-11D	49-035-23097	Pinedale Anticline	AP-2945	42.67368	109.79338	943,504	5,931	0.00	0.00	0.542	0.0
Vible 8-11	49-035-23298	Pinedale Anticline	AP-2945	42.67389	109.79285	848,745	6,034	0.00	0.00	0.542	0.0
Vible 4-12D	49-035-23303	Pinedale Anticline	AP-2945	42.67402	109.79229	1,179,029	11,191	0.00	0.00	0.542	0.0
Jensen 2-11D	49-035-23302	Pinedale Anticline	AP-2945	42.67389	109.79285	1,040,694	6,002	0.00	0.00	0.542	0.0
Warbonnet 11-4D	49-035-23356	Pinedale Anticline	NOI SENT TO WDEQ	42.59759	109.7263	870,007	5,917	0.50	0.00	0.542	0.0
Warbonnet 12-4D	49-035-23309	Pinedale Anticline	NOI SENT TO WDEQ	42.59739	109.72619	1,049,338	8,615	0.50	0.00	0.542	0.0
Warbonnet 13-4D	49-035-23310	Pinedale Anticline	NOI SENT TO WDEQ	42.59699	109.72595	882,856	7,455	0.50	0.00	0.542	0.0
Warbonnet 14-4D	49-035-23311	Pinedale Anticline	NOI SENT TO WDEQ	42.59718	109.72608	972,988	7,315	0.50	0.00	0.542	0.0
Warbonnet 1-6D	49-035-23232	Pinedale Anticline	AP-3775	42.6009	109.75708	888,527	5,572	0.45	0.00	0.542	0.0
Warbonnet 8-6D	49-035-23233	Pinedale Anticline	AP-3775	42.60091	109.75678	694,468	5,538	0.45	0.00	0.542	0.0
Warbonnet 1-9D	49-035-23175	Pinedale Anticline	AP-3554	42.58773	109.71836	1,309,239	11,880	0.00	0.00	0.542	0.0
Warbonnet 2-9D	49-035-23785	Pinedale Anticline	AP-3554	42.58751	109.71831	1,104,821	8,618	0.45	0.00	0.542	0.0
Wabronnet 7-9D(X)	49-035-22933	Pinedale Anticline	AP-3554	42.58679	109.71893	991,187	7,785	0.45	0.00	0.542	0.0
Warbonnet 8-9D	49-035-22934	Pinedale Anticline	CT-3879	42.58721	109.71833	385,056	2,531	0.00	0.00	0.542	0.0
Warbonnet 11-10	49-035-22894	Pinedale Anticline	**CT-3422**	42.58206	109.70706	300,346	2,097	0.00	0.00	0.542	0.0
Warbonnet 11-14D	49-035-22930	Pinedale Anticline	**CT-3501**	42.56427	109.69240	363,630	2,525	0.00	0.00	0.542	0.0
Warbonnet 13-14	49-035-22926	Pinedale Anticline	AP-1321 / CT-3501	42.56427	109.69240	597,012	4,542	0.00	0.00	0.542	0.0
Mesa 1B-29D	49-035-24135	Pinedale Anticline	Application Pending	42.72045	109.85431	0	0	0.50	0.00	0.542	0.0
Mesa 7A-29D	49-035-24128	Pinedale Anticline	Application Pending	42.72050	109.85511	0	0	0.45	0.00	0.542	0.0
Mesa 7B-29D	49-035-24136	Pinedale Anticline	Application Pending	42.72050	109.85520	0	0	0.45	0.00	0.542	0.0
Mesa 8A-29D	49-035-24127	Pinedale Anticline	Application Pending	42.72045	109.85433	0	0	0.50	0.00	0.542	0.0
North Mesa 16-1D	49-035-23289	Pinedale Anticline	Application Pending	42.77265	109.89207	0	0	0.67	0.00	0.542	0.0
Vible 1A-11D	49-035-23798	Pinedale Anticline	Application Pending	42.52769	109.65831	0	0	1.04	0.00	0.542	0.0
Vible 1B-11D	49-035-24198	Pinedale Anticline	Application Pending	42.67407	109.79221	0	0	0.76	0.00	0.542	0.0
Vible 1D-11D	49-035-23799	Pinedale Anticline	Application Pending	42.67397	109.79227	0	0	1.04	0.00	0.542	0.0
Warbonnet 2-5D	49-035-23977	Pinedale Anticline	Application Pending	42.60043	109.74267	0	0	0.67	0.00	0.542	0.0
Warbonnet 12-10D	49-035-23533	Pinedale Anticline	Application Pending	42.57880	109.71211	0	0	1.04	0.00	0.542	0.0
Jensen 1-15D	49-035-23894	Pinedale Anticline	Application Pending	42.66285	109.80382	0	0	0.58	0.00	0.542	0.0
Totals						**67,853,254**	**473,150**	**26.04**	**399.55**	**48.27**	**0.00**
Total NOX TPY	**506.8**										
Total VOC TPY	**402.0**										

Table F.1.1
Actual Emissions Inventory – Shell 2005 Actual Emissions Inventory

	Flashing Emissions Tanks and Pressurized Vessels						Glycol Dehydration Units Still & Flash Tank Vents					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled
Well Name	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
Antelope 2-6	8.163	9.89E-02	1.54E-01	4.73E-03	5.45E-02	N	0.890	0.130	0.270	0.010	0.100	Y
Antelope 11-10D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N	0.000	0.000	0.000	0.000	0.000	N
Antelope 11-4	11.045	1.34E-01	2.08E-01	6.41E-03	7.38E-02	N	0.890	0.130	0.280	0.010	0.110	Y
Antelope 1-9	0.234	2.84E-03	4.41E-03	1.36E-04	1.57E-03	Y	0.940	0.140	0.290	0.010	0.110	Y
Antelope 2-9	0.067	8.13E-04	1.26E-03	3.89E-05	4.48E-04	Y	0.700	0.100	0.200	0.010	0.060	Y
Antelope 12-4D	0.182	2.21E-03	3.43E-03	1.06E-04	1.22E-03	Y	1.910	0.210	0.490	0.020	0.270	Y
Antelope 13-4D	0.571	6.91E-03	1.07E-02	3.31E-04	3.81E-03	Y	1.550	0.210	0.450	0.020	0.190	Y
Antelope 14-4	0.123	1.49E-03	2.31E-03	7.13E-05	8.22E-04	Y	0.690	0.100	0.220	0.010	0.090	Y
Falcon 1-36	0.031	3.81E-04	5.92E-04	1.82E-05	2.10E-04	Y	0.470	0.070	0.140	0.004	0.050	Y
Falcon 2-36D	0.335	4.05E-03	6.30E-03	1.94E-04	2.24E-03	Y	0.470	0.070	0.150	0.005	0.060	Y
Falcon 7-36D	0.470	5.70E-03	8.85E-03	2.73E-04	3.14E-03	Y	0.470	0.070	0.150	0.005	0.070	Y
Falcon 8-36	0.156	1.89E-03	2.94E-03	9.07E-05	1.04E-03	Y	0.630	0.090	0.200	0.010	0.080	Y
Jensen 6-11D	12.666	1.53E-01	2.38E-01	7.35E-03	8.46E-02	N	0.950	0.130	0.300	0.010	0.130	Y
Jensen 1	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	
Jensen 1A	0.277	3.35E-03	5.21E-03	1.61E-04	1.85E-03	Y	0.970	0.140	0.310	0.010	0.140	Y
Jensen 9-10D	0.615	7.45E-03	1.16E-02	3.57E-04	4.11E-03	Y	1.620	0.200	0.490	0.020	0.280	Y
Jensen 2	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	
Jensen 15-11D	0.199	2.41E-03	3.74E-03	1.15E-04	1.33E-03	Y	0.940	0.130	0.300	0.010	0.130	Y
Jensen 16-11D	0.258	3.13E-03	4.86E-03	1.50E-04	1.72E-03	Y	0.890	0.120	0.280	0.010	0.120	Y
Jensen 3	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	
Jensen 4	0.047	5.70E-04	8.86E-04	2.73E-05	3.15E-04	Y	0.680	0.090	0.200	0.010	0.080	Y
Jensen 14-11D	0.297	3.60E-03	5.59E-03	1.72E-04	1.98E-03	Y	0.940	0.130	0.300	0.010	0.130	Y
Jensen 3-14	0.336	4.07E-03	6.33E-03	1.95E-04	2.25E-03	Y	0.970	0.140	0.320	0.010	0.140	Y
Jensen 7-11D	0.557	6.74E-03	1.05E-02	3.23E-04	3.72E-03	Y	1.070	0.140	0.330	0.010	0.180	Y
Jensen 10-11D	0.242	2.93E-03	4.55E-03	1.40E-04	1.61E-03	Y	0.920	0.130	0.290	0.010	0.120	Y
Jensen 11-11D	0.395	4.78E-03	7.43E-03	2.29E-04	2.64E-03	Y	0.950	0.130	0.300	0.010	0.130	Y
Jensen 12-11D	0.530	6.42E-03	9.97E-03	3.07E-04	3.54E-03	Y	0.920	0.120	0.290	0.010	0.150	Y
Jensen 13-11D	0.299	3.62E-03	5.63E-03	1.73E-04	2.00E-03	Y	0.900	0.120	0.280	0.010	0.120	Y
Mesa 6-28D	0.362	4.39E-03	6.81E-03	2.10E-04	2.42E-03	Y	0.000	0.000	0.000	0.000	0.000	Y
Mesa 11-28	0.265	3.21E-03	4.99E-03	1.54E-04	1.77E-03	Y	2.150	0.300	0.690	0.020	0.310	Y
Mesa 12-28	0.338	4.09E-03	6.35E-03	1.96E-04	2.26E-03	Y	1.660	0.200	0.420	0.020	0.180	Y
Mesa 13-28D	0.434	5.26E-03	8.17E-03	2.52E-04	2.90E-03	Y	0.000	0.000	0.000	0.000	0.000	Y
Mesa 14-28D	0.338	4.09E-03	6.36E-03	1.96E-04	2.26E-03	Y	0.000	0.000	0.000	0.000	0.000	Y
Mesa 9-29D	0.265	3.21E-03	4.99E-03	1.54E-04	1.77E-03	Y	0.000	0.000	0.000	0.000	0.000	Y
Mesa 3-28D	0.236	2.86E-03	4.44E-03	1.37E-04	1.58E-03	Y	0.890	0.120	0.270	0.010	0.110	Y
Mesa 4-28D	0.244	2.95E-03	4.58E-03	1.41E-04	1.63E-03	Y	0.880	0.120	0.260	0.010	0.110	Y
Mesa 5-28D	0.254	3.08E-03	4.78E-03	1.47E-04	1.70E-03	Y	0.930	0.130	0.290	0.010	0.130	Y
Mesa 1-29D	0.232	2.81E-03	4.36E-03	1.34E-04	1.55E-03	Y	0.890	0.120	0.260	0.010	0.110	Y
Mesa 5-33	0.265	3.21E-03	4.99E-03	1.54E-04	1.77E-03	Y	0.930	0.130	0.290	0.010	0.120	Y
Mesa 6-33D	0.268	3.24E-03	5.04E-03	1.55E-04	1.79E-03	Y	0.930	0.130	0.290	0.010	0.120	Y
Mesa 11-33D	0.243	2.95E-03	4.57E-03	1.41E-04	1.62E-03	Y	0.910	0.130	0.280	0.010	0.120	Y
Mesa 12-33	0.417	5.04E-03	7.84E-03	2.42E-04	2.78E-03	Y	0.970	0.140	0.310	0.010	0.130	Y
Mesa 13-33D	0.346	4.19E-03	6.51E-03	2.01E-04	2.31E-03	Y	0.950	0.130	0.310	0.010	0.140	Y
Mesa 14-33D	0.433	5.24E-03	8.14E-03	2.51E-04	2.89E-03	Y	0.940	0.130	0.300	0.010	0.130	Y
Mesa 9-32D	0.274	3.32E-03	5.16E-03	1.59E-04	1.83E-03	Y	0.980	0.140	0.320	0.010	0.140	Y
Mesa 11-34D	0.603	7.30E-03	1.13E-02	3.50E-04	4.03E-03	Y	0.500	0.060	0.140	0.010	0.090	Y
Mesa 12-34	0.359	4.35E-03	6.76E-03	2.08E-04	2.40E-03	Y	0.920	0.130	0.290	0.010	0.130	Y
Mesa 13-34D	0.993	1.20E-02	1.87E-02	5.76E-04	6.63E-03	Y	0.560	0.070	0.170	0.010	0.100	Y
Mesa 14-34D	0.600	7.26E-03	1.13E-02	3.48E-04	4.00E-03	Y	1.640	0.210	0.480	0.020	0.250	Y
Mesa 11-35D	0.384	4.65E-03	7.22E-03	2.23E-04	2.56E-03	Y	0.640	0.090	0.200	0.010	0.100	Y
Mesa 12-35D	0.813	9.84E-03	1.53E-02	4.71E-04	5.43E-03	Y	0.940	0.120	0.290	0.010	0.150	Y
Mesa 13-35	0.358	4.34E-03	6.73E-03	2.08E-04	2.39E-03	Y	0.910	0.130	0.290	0.010	0.130	Y
Mesa 14-35D	0.988	1.20E-02	1.86E-02	5.73E-04	6.60E-03	Y	0.290	0.040	0.090	0.003	0.050	Y
Mesa 1-27	7.833	9.49E-02	1.47E-01	4.54E-03	5.23E-02	N	0.860	0.110	0.250	0.010	0.100	Y
Mesa 7-27	10.592	1.28E-01	1.99E-01	6.14E-03	7.08E-02	N	0.880	0.120	0.270	0.010	0.110	Y
Mesa 13-26	14.069	1.70E-01	2.65E-01	8.16E-03	9.40E-02	N	0.960	0.140	0.300	0.010	0.120	Y
New Fork 7-3	0.297	3.59E-03	5.58E-03	1.72E-04	1.98E-03	Y	0.950	0.130	0.310	0.010	0.140	Y
New Fork 13-10	0.011	1.34E-04	2.09E-04	6.43E-06	7.41E-05	Y	0.710	0.110	0.220	0.010	0.060	Y
New Fork 11-24	7.042	8.53E-02	1.32E-01	4.08E-03	4.70E-02	N	0.910	0.130	0.280	0.010	0.120	Y
New Fork 13-32S	0.944	1.14E-02	1.78E-02	5.47E-04	6.30E-03	N	6.800	0.750	1.790	0.080	0.980	N
North Mesa 4-7	1.527	1.85E-02	2.87E-02	8.86E-04	1.02E-02	N	4.400	0.500	1.270	0.060	0.770	N
Pinedale 13-19	1.209	1.46E-02	2.27E-02	7.01E-04	8.08E-03	N	0.280	0.040	0.090	0.003	0.030	Y
Steele 16-31	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	
Rainbow 7-31	4.396	5.32E-02	8.27E-02	2.55E-03	2.94E-02	N	0.810	0.110	0.230	0.010	0.090	Y
Rainbow 11-32	0.267	3.23E-03	5.02E-03	1.55E-04	1.78E-03	Y	0.930	0.140	0.300	0.010	0.110	Y
Rainbow 12-32	0.255	3.09E-03	4.80E-03	1.48E-04	1.70E-03	Y	1.200	0.140	0.350	0.020	0.210	Y
Rainbow 13-32	0.139	1.69E-03	2.62E-03	8.08E-05	9.31E-04	Y	0.800	0.110	0.220	0.010	0.080	Y
Rainbow 14-32	0.260	3.15E-03	4.89E-03	1.51E-04	1.74E-03	Y	0.440	0.060	0.140	0.004	0.060	Y
Rainbow 11-31	6.318	7.65E-02	1.19E-01	3.66E-03	4.22E-02	N	0.850	0.120	0.240	0.010	0.090	Y
Riverside 11-2D	0.409	4.95E-03	7.68E-03	2.37E-04	2.73E-03	Y	1.710	0.220	0.510	0.020	0.240	Y
Riverside 12-2D	0.447	5.42E-03	8.42E-03	2.59E-04	2.99E-03	Y	1.710	0.220	0.510	0.020	0.250	Y
Riverside 14-2D	0.484	5.86E-03	9.11E-03	2.81E-04	3.23E-03	Y	1.710	0.220	0.510	0.020	0.250	Y
Pinedale 13-2A	0.104	1.26E-03	1.96E-03	6.05E-05	6.96E-04	Y	0.950	0.130	0.300	0.010	0.120	Y
Riverside 1-3D	0.549	6.65E-03	1.03E-02	3.19E-04	3.67E-03	Y	1.690	0.220	0.500	0.020	0.250	Y
Riverside 2-3D	0.547	6.62E-03	1.03E-02	3.17E-04	3.65E-03	Y	1.700	0.220	0.500	0.020	0.260	Y
Riverside 8-3D	0.484	5.86E-03	9.11E-03	2.81E-04	3.23E-03	Y	0.930	0.120	0.290	0.010	0.170	Y
Riverside 11-3D(ST)	0.358	4.34E-03	6.74E-03	2.08E-04	2.39E-03	Y	0.590	0.070	0.170	0.010	0.100	Y
Riverside 12-3	0.512	6.20E-03	9.63E-03	2.97E-04	3.42E-03	Y	0.460	0.060	0.140	0.010	0.070	Y
Riverside 13-3(ST)	0.146	1.76E-03	2.74E-03	8.45E-05	9.73E-04	Y	0.830	0.120	0.270	0.010	0.110	Y
Riverside 14-3D	0.612	7.41E-03	1.15E-02	3.55E-04	4.09E-03	Y	0.600	0.080	0.180	0.010	0.100	Y
Riverside 5-4D	0.255	3.09E-03	4.80E-03	1.48E-04	1.70E-03	Y	0.000	0.000	0.000	0.000	0.000	Y
Riverside 6-4D	0.458	5.55E-03	8.62E-03	2.66E-04	3.06E-03	Y	0.920	0.120	0.290	0.010	0.150	Y
Riverside 11-4D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Y	0.000	0.000	0.000	0.000	0.000	Y

Table F.1.1
Actual Emissions Inventory – Shell 2005 Actual Emissions Inventory

	Flashing Emissions Tanks and Pressurized Vessels						Glycol Dehydration Units Still & Flash Tank Vents					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled
Well Name	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
Riverside 14-4D	0.254	3.08E-03	4.78E-03	1.47E-04	1.70E-03	Y	0.000	0.000	0.000	0.000	0.000	Y
Riverside 1-13D	0.568	6.88E-03	1.07E-02	3.29E-04	3.79E-03	Y	0.920	0.130	0.290	0.010	0.140	Y
Riverside 2-13D	0.415	5.03E-03	7.81E-03	2.41E-04	2.77E-03	Y	0.920	0.130	0.290	0.010	0.140	Y
Riverside 7-13	0.478	5.78E-03	8.98E-03	2.77E-04	3.19E-03	Y	0.960	0.140	0.310	0.010	0.140	Y
Riverside 8-13D	0.513	6.21E-03	9.65E-03	2.98E-04	3.43E-03	Y	0.570	0.070	0.170	0.010	0.110	Y
Riverside 11-13	0.771	9.33E-03	1.45E-02	4.47E-04	5.15E-03	Y	0.280	0.040	0.080	0.003	0.050	Y
Riverside 12-13D	0.697	8.44E-03	1.31E-02	4.04E-04	4.65E-03	Y	0.330	0.050	0.110	0.004	0.050	Y
Riverside 13-13D	0.359	4.35E-03	6.76E-03	2.08E-04	2.40E-03	Y	0.470	0.060	0.140	0.005	0.070	Y
Riverside 14-13D	0.576	6.98E-03	1.08E-02	3.34E-04	3.85E-03	Y	0.430	0.060	0.130	0.005	0.070	Y
Riverside 2-14	0.244	2.95E-03	4.59E-03	1.41E-04	1.63E-03	Y	0.950	0.140	0.300	0.010	0.120	Y
Pinedale 1-14	0.018	2.12E-04	3.30E-04	1.02E-05	1.17E-04	Y	0.230	0.040	0.070	0.002	0.030	Y
Riverside 8-23D	0.256	3.10E-03	4.81E-03	1.48E-04	1.71E-03	Y	0.250	0.040	0.080	0.003	0.030	Y
Riverside 2-24	16.193	1.96E-01	3.05E-01	9.39E-03	1.08E-01	N	1.030	0.130	0.320	0.010	0.160	Y
Riverside 11-25	0.463	5.61E-03	8.71E-03	2.69E-04	3.09E-03	Y	0.400	0.050	0.120	0.005	0.070	Y
Vible 1-11D	0.387	4.68E-03	7.28E-03	2.24E-04	2.58E-03	Y	0.960	0.140	0.310	0.010	0.130	Y
Vible 8-11	0.393	4.76E-03	7.40E-03	2.28E-04	2.63E-03	Y	0.950	0.130	0.300	0.010	0.130	Y
Vible 4-12D	0.761	9.22E-03	1.43E-02	4.41E-04	5.08E-03	Y	0.970	0.130	0.310	0.010	0.150	Y
Jensen 2-11D	0.394	4.77E-03	7.41E-03	2.29E-04	2.63E-03	Y	0.920	0.130	0.290	0.010	0.130	Y
Warbonnet 11-4D	0.454	5.50E-03	8.54E-03	2.63E-04	3.03E-03	Y	1.560	0.150	0.350	0.010	0.180	Y
Warbonnet 12-4D	0.733	8.88E-03	1.38E-02	4.25E-04	4.90E-03	Y	1.310	0.170	0.400	0.010	0.210	Y
Warbonnet 13-4D	0.573	6.94E-03	1.08E-02	3.32E-04	3.83E-03	Y	1.630	0.220	0.510	0.020	0.240	Y
Warbonnet 14-4D	0.464	5.62E-03	8.72E-03	2.69E-04	3.10E-03	Y	1.900	0.260	0.600	0.020	0.280	Y
Warbonnet 1-6D	0.616	7.46E-03	1.16E-02	3.58E-04	4.12E-03	Y	0.840	0.110	0.254	0.010	0.140	Y
Warbonnet 8-6D	0.431	5.22E-03	8.11E-03	2.50E-04	2.88E-03	Y	1.090	0.140	0.320	0.010	0.170	Y
Warbonnet 1-9D	0.763	9.24E-03	1.44E-02	4.43E-04	5.10E-03	Y	1.750	0.230	0.530	0.020	0.280	Y
Warbonnet 2-9D	0.604	7.31E-03	1.14E-02	3.50E-04	4.03E-03	Y	1.390	0.180	0.410	0.020	0.230	Y
Wabronnet 7-9D(X)	0.594	7.19E-03	1.12E-02	3.44E-04	3.97E-03	Y	1.290	0.160	0.390	0.010	0.210	Y
Warbonnet 8-9D	0.160	1.94E-03	3.02E-03	9.31E-05	1.07E-03	Y	0.970	0.140	0.310	0.010	0.120	Y
Warbonnet 11-10	0.141	1.70E-03	2.64E-03	8.15E-05	9.39E-04	Y	0.930	0.130	0.280	0.010	0.110	Y
Warbonnet 11-14D	0.161	1.95E-03	3.03E-03	9.33E-05	1.07E-03	Y	1.260	0.150	0.380	0.020	0.230	Y
Warbonnet 13-14	0.288	3.49E-03	5.42E-03	1.67E-04	1.92E-03	Y	0.900	0.130	0.290	0.010	0.130	Y
Mesa 1B-29D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Mesa 7A-29D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Mesa 7B-29D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Mesa 8A-29D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
North Mesa 16-1D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Vible 1A-11D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Vible 1B-11D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Vible 1D-11D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Warbonnet 2-5D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Warbonnet 12-10D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Jensen 1-15D	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.000	0.000	0.000	0.000	0.000	New Well
Totals	**138.65**	**1.68**	**2.61**	**0.08**	**0.93**	**0.00**	**106.68**	**14.10**	**32.14**	**1.23**	**15.28**	**0.00**

Table F.1.1
Actual Emissions Inventory – Shell 2005 Actual Emissions Inventory

	Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Antelope 2-6	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Antelope 11-10D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Antelope 11-4	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Antelope 1-9	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.960	2.37E-02	3.69E-02	1.14E-03	1.31E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Antelope 2-9	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.794	2.17E-02	3.37E-02	1.04E-03	1.20E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Antelope 12-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.064	1.29E-02	2.00E-02	6.17E-04	7.11E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Antelope 13-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.057	1.28E-02	1.99E-02	6.13E-04	7.06E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Antelope 14-4	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.057	1.28E-02	1.99E-02	6.13E-04	7.06E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Falcon 1-36	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.869	2.26E-02	3.52E-02	1.08E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Falcon 2-36D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.640	7.76E-03	1.20E-02	3.71E-04	4.28E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Falcon 7-36D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.627	7.59E-03	1.18E-02	3.64E-04	4.19E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Falcon 8-36	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.869	2.26E-02	3.52E-02	1.08E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 6-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 1A	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Jensen 9-10D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Jensen 2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 15-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 16-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 4	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.114	1.35E-02	2.10E-02	6.46E-04	7.44E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 14-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.320	1.60E-02	2.48E-02	7.66E-04	8.82E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 3-14	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.320	1.60E-02	2.48E-02	7.66E-04	8.82E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 7-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.474	5.74E-03	8.92E-03	2.75E-04	3.17E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Jensen 10-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.820	9.93E-03	1.54E-02	4.76E-04	5.48E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 11-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.820	9.93E-03	1.54E-02	4.76E-04	5.48E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 12-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.820	9.93E-03	1.54E-02	4.76E-04	5.48E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 13-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.820	9.93E-03	1.54E-02	4.76E-04	5.48E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 6-28D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.626	7.58E-03	1.18E-02	3.63E-04	4.18E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 11-28	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.626	7.58E-03	1.18E-02	3.63E-04	4.18E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 12-28	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.626	7.58E-03	1.18E-02	3.63E-04	4.18E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 13-28D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.626	7.58E-03	1.18E-02	3.63E-04	4.18E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 14-28D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.626	7.58E-03	1.18E-02	3.63E-04	4.18E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 9-29D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.626	7.58E-03	1.18E-02	3.63E-04	4.18E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 3-28D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 4-28D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 5-28D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 1-29D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 5-33	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 6-33D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 11-33D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.751	9.09E-03	1.41E-02	4.35E-04	5.02E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 12-33	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.751	9.09E-03	1.41E-02	4.35E-04	5.02E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 13-33D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.751	9.09E-03	1.41E-02	4.35E-04	5.02E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 14-33D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.751	9.09E-03	1.41E-02	4.35E-04	5.02E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 9-32D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.751	9.09E-03	1.41E-02	4.35E-04	5.02E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 11-34D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.433	5.25E-03	8.15E-03	2.51E-04	2.89E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 12-34	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.438	1.74E-02	2.70E-02	8.34E-04	9.61E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 13-34D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.445	5.39E-03	8.37E-03	2.58E-04	2.97E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 14-34D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.438	1.74E-02	2.70E-02	8.34E-04	9.61E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 11-35D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.589	7.13E-03	1.11E-02	3.42E-04	3.93E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 12-35D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.864	1.05E-02	1.63E-02	5.01E-04	5.77E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 13-35	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.972	2.39E-02	3.71E-02	1.14E-03	1.32E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 14-35D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.330	3.99E-03	6.20E-03	1.91E-04	2.20E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Mesa 1-27	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 7-27	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 13-26	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
New Fork 7-3	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
New Fork 13-10	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	2.129	2.58E-02	4.00E-02	1.23E-03	1.42E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
New Fork 11-24	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
New Fork 13-32S	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
North Mesa 4-7	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Pinedale 13-19	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	4.380	5.30E-02	8.24E-02	2.54E-03	2.93E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Steele 16-31	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Rainbow 7-31	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Rainbow 11-32	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.899	1.09E-02	1.69E-02	5.21E-04	6.01E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Rainbow 12-32	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.176	1.42E-02	2.21E-02	6.82E-04	7.86E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Rainbow 13-32	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.176	1.42E-02	2.21E-02	6.82E-04	7.86E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Rainbow 14-32	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.503	6.09E-03	9.46E-03	2.92E-04	3.36E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Rainbow 11-31	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 11-2D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 12-2D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 14-2D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Pinedale 13-2A	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.564	1.89E-02	2.94E-02	9.07E-04	1.04E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 1-3D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.251	1.52E-02	2.35E-02	7.26E-04	8.36E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 2-3D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.251	1.52E-02	2.35E-02	7.26E-04	8.36E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 8-3D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.251	1.52E-02	2.35E-02	7.26E-04	8.36E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 11-3D(ST)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.536	6.49E-03	1.01E-02	3.11E-04	3.58E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 12-3	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.643	7.78E-03	1.21E-02	3.73E-04	4.29E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 13-3(ST)	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.938	2.35E-02	3.65E-02	1.12E-03	1.29E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 14-3D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.637	7.72E-03	1.20E-02	3.70E-04	4.26E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 5-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.468	5.67E-03	8.81E-03	2.72E-04	3.13E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 6-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.793	9.60E-03	1.49E-02	4.60E-04	5.30E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 11-4D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000

Table F.1.1
Actual Emissions Inventory – Shell 2005 Actual Emissions Inventory

	Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Riverside 14-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.271	3.29E-03	5.10E-03	1.57E-04	1.81E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 1-13D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 2-13D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 7-13	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 8-13D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 11-13	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.166	2.01E-03	3.12E-03	9.61E-05	1.11E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 12-13D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.148	1.79E-03	2.79E-03	8.59E-05	9.89E-04	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 13-13D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.335	4.06E-03	6.30E-03	1.94E-04	2.24E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 14-13D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.339	4.10E-03	6.37E-03	1.96E-04	2.26E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 2-14	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	2.953	3.58E-02	5.56E-02	1.71E-03	1.97E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Pinedale 1-14	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.801	9.70E-03	1.51E-02	4.65E-04	5.35E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 8-23D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.442	5.36E-03	8.32E-03	2.57E-04	2.95E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Riverside 2-24	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Riverside 11-25	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.699	8.47E-03	1.32E-02	4.06E-04	4.67E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Vible 1-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Vible 8-11	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Vible 4-12D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 2-11D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.939	1.14E-02	1.77E-02	5.44E-04	6.27E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 11-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.706	8.54E-03	1.33E-02	4.09E-04	4.71E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 12-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.797	9.66E-03	1.50E-02	4.62E-04	5.33E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 13-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.940	1.14E-02	1.77E-02	5.45E-04	6.28E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 14-4D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.085	1.31E-02	2.04E-02	6.29E-04	7.25E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 1-6D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.132	1.37E-02	2.13E-02	6.57E-04	7.56E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 8-6D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.418	1.72E-02	2.67E-02	8.23E-04	9.48E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 1-9D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.046	1.27E-02	1.97E-02	6.07E-04	6.99E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 2-9D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.865	1.05E-02	1.63E-02	5.02E-04	5.78E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Wabronnet 7-9D(X)	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	0.797	9.65E-03	1.50E-02	4.62E-04	5.32E-03	0.034	3.57E-05	5.54E-05	1.71E-06	1.97E-05	1.637
Warbonnet 8-9D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.046	1.27E-02	1.97E-02	6.07E-04	6.99E-03	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 11-10	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	3.754	4.55E-02	7.06E-02	2.18E-03	2.51E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 11-14D	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 13-14	2.57E-02	4.57E-03	7.09E-03	2.19E-04	2.52E-03	1.877	2.27E-02	3.53E-02	1.09E-03	1.25E-02	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 1B-29D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 7A-29D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 7B-29D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Mesa 8A-29D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
North Mesa 16-1D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Vible 1A-11D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Vible 1B-11D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Vible 1D-11D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 2-5D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Warbonnet 12-10D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Jensen 1-15D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.000
Totals	**2.75**	**0.49**	**0.76**	**0.02**	**0.27**	**152.71**	**1.85**	**2.87**	**0.09**	**1.02**	**1.23**	**0.0013**	**0.0020**	**0.0001**	**0.0007**	**58.95**

Table F.1.2
2005 Actual Emissions Inventory – Ultra 2005 Actual Emissions Inventory

Well Name	Well Name	API #	Field Name	Air Quality Permit #	Location		Production		Drill Rig Engines	
					Latitude	Longitude	Gas MCF	Condensate BBL	SO2 TPY	N0x TPY
Boulder 12A-33	BR 12a-33	4903523709	Pinedale	AP-3125	42.6114	109.7307	666,548	6,648	0.00	25.17
Boulder 15-18	BR 15-18	4903523860	Pinedale		42.6508	109.7612	138,277	1,113	3.17	25.09
Boulder 5-19	BR 5-19	4903522569	Pinedale	CT-3175	42.6439	109.7686	521,417	3,273	0.00	24.90
Boulder 7-19	BR 7-19	4903522878	Pinedale	CT-3304	42.6434	109.7617	387,328	2,317	0.00	24.63
Boulder 6-32	BR 6-32	4903523738	Pinedale		42.6139	109.7470	0	0	3.17	24.58
Boulder 14-34	BR 14-34	4903523718	Pinedale		42.6065	109.7073	0	0	3.17	24.41
Boulder 15D-7D	BR 15d-7d	4903523940	Pinedale		42.6669	109.7574	0	0	3.17	24.28
	GN 12-16 Battery									
Gannett 12-16	GN 12-16	4903523335	Pinedale		42.8280	109.8785	157,097	1,460	0.00	24.20
Gannett 11-16	GN 11-16	4903523373	Pinedale		42.8284	109.8746	119,997	1,118	0.00	24.17
Gannett 14-16	GN 14-16	4903523374	Pinedale		42.8248	109.8745	441,108	4,100	0.00	24.04
Gannett 13-16	GN 13-16	4903522015	Pinedale		42.8244	109.8772	241,728	2,211	0.00	23.96
Lovatt Draw 15-8	LD 15-8	4903521723	Pinedale		42.6694	109.8564	1,942	10	0.00	23.71
Lizard Head 11-8	LH 11-8	4903521678	Pinedale		42.6689	109.7458	8,863	56	0.00	23.60
Lizard Head 13-28	LH 13-28	4903521657	Pinedale		42.6214	109.7314	1,186	40	0.00	23.55
	MS 10-33 Battery									
Mesa 10-33	MS 10-33	4903522983	Pinedale	CT-3609	42.7011	109.8357	836,169	6,139	0.00	23.41
Mesa 9-33	MS 9-33	4903522984	Pinedale		42.7008	109.8321	1,194,593	8,720	0.00	23.20
	MS 11-22 Battery									
Mesa 11-22	MS 11-22	4903523144	Pinedale		42.7291	109.8213	516,285	5,009	0.00	23.04
Mesa 10-22D	MS 10-22d	4903523143	Pinedale		42.7304	109.8211	526,067	5,122	0.00	22.93
	MS 12-22d Battery									
Mesa 12-22D	MS 12-22d	4903522793	Pinedale		42.7300	109.8281	708,765	5,331	0.00	22.87
Mesa 13-22D	MS 13-22d	4903522794	Pinedale		42.7300	109.8281	742,392	5,503	0.00	22.85
Mesa 1-33	MS 1-33	4903522938	Pinedale	AP-1531	42.7086	109.8320	908,189	4,958	0.00	22.72
Mesa 15A-28D	MS 15a-28d	4903524076	Pinedale		42.7113	109.8326	22,204	198	3.17	22.69
	MS 15-22d Battery									
Mesa 15-22D	MS 15-22d	4903523166	Pinedale		42.7239	109.8132	493,601	4,592	0.00	22.66
Mesa 16-22BD	MS 16-22bd	4903523556	Pinedale		42.7241	109.8127	439,786	4,282	0.00	22.66
Mesa 13-23BD	MS 13-23bd	4903523559	Pinedale		42.7241	109.8127	251,709	2,333	0.00	22.61
	MS 15-35 Battery									
Mesa 15-35	MS 15-35	4903522788	Pinedale		42.6956	109.7972	396,578	3,231	0.00	22.56
Mesa 16-35CD	MS 16-35cd	4903523496	Pinedale		42.6957	109.7976	463,478	3,774	0.00	22.44
Mesa 16-35D	MS 16-35d	4903523160	Pinedale		42.6952	109.7987	421,872	3,496	0.00	22.40
Mesa 15B-27D	MS 15b-27d	4903522998	Pinedale		42.7107	109.8168	483,886	3,271	3.17	22.39
	MS 16-21d Battery									
Mesa 16-21D	MS 16-21d	4903522467	Pinedale		42.7239	109.8314	462,580	3,205	0.00	22.34
Mesa 13-22CD	MS 13-22cd	4903523498	Pinedale		42.7225	109.8265	636,495	4,403	0.00	22.28
Mesa 14-22D	MS 14-22d	4903523133	Pinedale		42.7219	109.8217	824,342	5,716	0.00	21.96
Mesa 14C-22D	MS 14c-22d	4903523905	Pinedale		42.7218	109.8215	0	0	3.17	21.96
Mesa 15-21D	MS 15-21d	4903522466	Pinedale		42.7239	109.8311	595,265	4,127	0.00	21.82
Mesa 15-21AD	MS 15-21ad	4903523467	Pinedale		42.7238	109.8313	544,179	3,753	0.00	21.74
Mesa 16-21CD	MS 16-21cd	4903523468	Pinedale		42.7235	109.8337	375	3	0.00	21.69
	MS 16b-28d Battery									
Mesa 16B-28D	MS 16b-28d	4903523518	Pinedale		42.7115	109.8326	1,271,153	7,852	0.00	21.63
Mesa 16D-28D	MS 16d-28d	4903523517	Pinedale		42.7109	109.8329	1,254,886	7,778	0.00	21.49
	MS 2-28d Battery									
Mesa 2-28D	MS 2-28d	4903522363	Pinedale		42.7239	109.8311	613,109	4,120	0.00	21.42
Mesa 6-27D	MS 6-27d	4903522597	Pinedale		42.7181	109.8226	418,831	2,815	0.00	21.31
Mesa 3-27	MS 3-27	4903522790	Pinedale		42.7222	109.8200	784,293	5,261	0.00	21.31
Mesa 4-27	MS 4-27	4903522700	Pinedale		42.7226	109.8264	547,574	3,682	0.00	21.15
Mesa 4-27CD	MS 4-27cd	4903523497	Pinedale		42.7226	109.8266	951,287	6,363	0.00	19.69
Mesa 5-27D	MS 5-27d	4903522606	Pinedale		42.7181	109.8226	553,254	3,717	0.00	0.00
Mesa 1-28D	MS 1-28d	4903522390	Pinedale		42.7236	109.8311	672,568	4,520	0.00	0.00
Mesa 3-27CD	MS 3-27cd	4903523903	Pinedale		42.7218	109.8216	230,961	1,583	3.17	0.00
	MS 3-18d Battery									
Mesa 3-18D	MS 3-18d	4903523176	Pinedale		42.7502	109.8806	360,664	3,233	0.00	0.00
Mesa 6-18	MS 6-18	4903523159	Pinedale		42.7506	109.8803	327,778	2,980	0.00	0.00
	MS 3-35d Battery									
Mesa 3-35D	MS 3-35d	4903523111	Pinedale		42.7064	109.7981	399,994	3,466	0.00	0.00
Mesa 6-35D	MS 6-35d	4903523116	Pinedale		42.7064	109.7978	438,603	3,830	0.00	0.00
	MS 1a-35d Battery									
Mesa 1A-35D	MS 1a-35d	4903523831	Pinedale		42.7067	109.7974	38,408	258	3.17	0.00
Mesa 2-35AD	MS 2-35ad	4903523762	Pinedale		42.7066	109.7974	85,958	689	3.17	0.00
	MS 4-35 Battery									
Mesa 4-35	MS 4-35	4903522789	Pinedale		42.7061	109.8064	304,594	2,122	0.00	0.00
Mesa 5-35	MS 5-35	4903522791	Pinedale		42.7028	109.8061	577,804	4,031	0.00	0.00
Mesa 3-35CD	MS 3-35cd	4903523469	Pinedale		42.7059	109.8081	680,754	4,866	0.00	0.00
Mesa 4-35CD	MS 4-35cd	4903523519	Pinedale		42.7060	109.8081	757,838	5,299	0.00	0.00
	MS 7-28 Battery									
Mesa 7-28	MS 7-28	4903522651	Pinedale		42.7192	109.8364	444,863	2,995	0.00	0.00
Mesa 8-28	MS 8-28	4903522591	Pinedale		42.7189	109.8314	391,780	2,766	0.00	0.00
Mesa 7-34	MS 7-34	4903522867	Pinedale	CT-3615	42.7048	109.8158	625,204	3,980	0.00	0.00
	MS 9-21d Battery									
Mesa 9-21D	MS 9-21d	4903522537	Pinedale		42.7303	109.8325	359,262	2,556	0.00	0.00
Mesa 10-21D	MS 10-21d	4903522283	Pinedale		42.7303	109.8322	407,871	2,907	0.00	0.00
Mesa 9-21AD	MS 9-21ad	4903523901	Pinedale		42.7313	109.8310	209,620	1,346	0.00	0.00
Mesa 10A-21D	MS 10a-21d	4903523899	Pinedale		42.7313	109.8310	345,432	2,219	3.17	0.00
Mesa 9-22BD	MS 9-22bd	4903523553	Pinedale		42.7302	109.8136	401,095	3,738	0.00	0.00
Mesa 9-34	MS 9-34	4903522870	Pinedale	CT-3681	42.7000	109.8126	785,115	4,736	0.00	0.00
Mesa 7C-35D	MS 7c-35d	4903524103	Pinedale		42.6993	109.7968	0	0	3.17	0.00
Mesa 7D-34D	MS 7d-34d	4903524226	Pinedale		42.7043	109.8153	0	0	3.17	0.00
Mesa 8C-34D	MS 8c-34d	4903524163	Pinedale		42.7040	109.8135	0	0	3.17	0.00
Mesa 9C-35D	MS 9c-35d	4903524223	Pinedale		42.6986	109.7958	0	0	3.17	0.00
	PD 4a Battery									
Pinedale 4A	PD 4a	4903522256	Pinedale	AP-1720	42.7061	109.8242	430,570	2,470	0.00	0.00
Mesa 4-34D	MS 4-34d	4903523807	Pinedale		42.7072	109.8250	999,558	5,696	3.17	0.00
Rainbow 13-30	RB 13-30	4903523322	Pinedale	CT-3804	42.5351	109.6525	478,549	4,084	0.00	0.00
Riverside 10D-4D	RS 10d-4d	4903522953	Pinedale		42.6860	109.8323	324,827	2,121	3.17	0.00
Riverside 11-14	RS 11-14	4903523297	Pinedale	CT-3749	42.6561	109.8026	601,673	4,016	0.00	0.00
Riverside 12-12D	RS 12-12d	4903523308	Pinedale	AP-2728	42.6699	109.7877	1,664,560	9,638	0.00	0.00
	RS 1-4 Battery									
Riverside 1-4	RS 1-4	4903522590	Pinedale		42.6940	109.8322	500,369	3,231	0.00	0.00
Riverside 2D-4D	RS 2d-4d	4903523861	Pinedale		42.6939	109.8331	510,196	3,089	3.17	0.00
Riverside 15-12	RS 15-12	4903522679	Pinedale	CT-3752	42.6656	109.7783	938,967	7,069	0.00	0.00
	RS 16-3 Battery									
Riverside 16-3	RS 16-3	4903522871	Pinedale	CT-3784	42.6824	109.8116	987,493	6,192	0.00	0.00
Riverside 1-10D	RS 1-10d	4903523957	Pinedale		42.6822	109.8124	796,242	4,832	3.17	0.00
Riverside 16-4	RS 16-4	4903522962	Pinedale	AP-2932	42.6826	109.8311	696,108	4,290	0.00	0.00
Riverside 2-2	RS 2-2	4903522570	Pinedale		42.6923	109.7974	346,614	2,085	0.00	0.00
Riverside 4-10	RS 4-10	4903522704	Pinedale		42.6790	109.8263	324,793	1,716	0.00	0.00
Riverside 4D-1D	RS 4d-1d	4903523941	Pinedale		42.6866	109.7892	171,605	1,946	3.17	0.00
Riverside 4D-3D	RS 4d-3d	4903523516	Pinedale		42.6931	109.8225	1,324,554	7,890	0.00	0.00
	RS 6b-3d Battery									
Riverside 6B-3D	RS 6b-3d	4903522960	Pinedale		42.6936	109.8234	1,539,823	8,721	0.00	0.00
Riverside 3C-3D	RS 3c-3d	4903524065	Pinedale		42.6936	109.8233	451,416	2,555	3.17	0.00
	RS 8-4 Battery									
Riverside 8-4	RS 8-4	4903522716	Pinedale	AP-0475	42.6906	109.8319	438,525	2,714	0.00	0.00
Riverside 7D-4D	RS 7d-4d	4903523863	Pinedale		42.6905	109.8327	589,432	3,254	3.17	0.00

Table F.1.2
2005 Actual Emissions Inventory – Ultra 2005 Actual Emissions Inventory

Well Name	Well Name	API #	Field Name	Air Quality Permit #	Location		Production		Drill Rig Engines	
							Gas	Condensate	SO2	N0x
					Latitude	Longitude	MCF	BBL	TPY	TPY
Riverside 9-2	RS 9-2	4903522868	Pinedale	AP-0719	42.6847	109.7913	474,141	3,491	0.00	0.00
Riverside 4D-25D	RS 4d-25d	4903523746	Pinedale		42.6330	109.7907	0	0	3.17	0.00
HSR Sherlock 15-8	SF 15-8	4903521776	Pinedale		42.8392	109.8869	593	0	0.00	0.00
Warbonnet 10-9d	WB 10-9d	4903523381	Pinedale	AP-2701	42.5818	109.7207	645,634	4,641	0.00	0.00
Warbonnet 10D-4D	WB 10d-4d	4903523412	Pinedale		42.5970	109.7220	596,852	4,601	0.00	0.00
Warbonnet 1-21	WB 1-21	4903523767	Pinedale		42.5593	109.7181	97,423	779	3.17	0.00
	WB 1-26d Battery									
Warbonnet 1-26D	WB 1-26d	4903522536	Pinedale		42.5415	109.6779	272,429	1,616	0.00	0.00
Warbonnet 8-26	WB 8-26	4903522394	Pinedale	CT-3244	42.3230	109.4041	290,348	1,754	0.00	0.00
Warbonnet 12D-3D	WB 12d-3d	4903523751	Pinedale		42.5923	109.7132	599,073	6,810	3.17	0.00
	WB 13-11 Battery									
Warbonnet 13-11	WB 13-11	4903522939	Pinedale	CT-3520	42.3441	109.4135	447,259	4,398	0.00	0.00
Warbonnet 14-11D	WB 14-11d	4903523877	Pinedale		42.5780	109.6926	757,344	7,993	3.17	0.00
	WB 13-24 Battery									
Warbonnet 13-24	WB 13-24	4903522618	Pinedale	AP-2541	42.3200	109.4000	485,555	4,131	0.00	0.00
Warbonnet 14-24D	WB 14-24d	4903523558	Pinedale		42.5499	109.6729	1,063,118	9,003	0.00	0.00
Warbonnet 14B-3D	WB 14b-3d	4903523390	Pinedale		42.5936	109.7089	686,969	7,107	3.17	0.00
	WB 15-23 Battery									
Warbonnet 15-23	WB 15-23	4903522304	Pinedale	AP-0146	42.3300	109.4054	267,623	1,843	0.00	0.00
Warbonnet 2-26D	WB 2-26d	4903522494	Pinedale		42.5355	109.6817	207,588	1,436	0.00	0.00
	WB 16-5 Battery									
Warbonnet 16-5	WB 16-5	4903523339	Pinedale	AP-2304	42.3535	109.4412	505,124	4,502	0.00	0.00
Warbonnet 1-8D	WB 1-8d	4903523878	Pinedale		42.5929	109.7374	0	0	3.17	0.00
Warbonnet 9-5d	WB 9-5d	4903523386	Pinedale	AP-2601	42.5938	109.7390	709,259	6,355	0.00	0.00
Warbonnet 16B-10D	WB 16b-10d	4903523413	Pinedale		42.5778	109.6971	1,188,561	9,435	0.00	0.00
Warbonnet 16B-4D	WB 16b-4d	4903523408	Pinedale		42.5928	109.7181	605,508	5,147	0.00	0.00
	WB 16d-10d Battery									
Warbonnet 16D-10D	WB 16d-10d	4903523411	Pinedale		42.5778	109.6971	1,061,948	9,305	0.00	0.00
Warbonnet 9D-10D	WB 9d-10d	4903523465	Pinedale		42.5778	109.6972	1,296,355	11,417	0.00	0.00
Warbonnet 2-8	WB 2-8	4903523383	Pinedale		42.3522	109.4427	660,778	5,888	3.17	0.00
Warbonnet 2C-3D	WB 2c-3d	4903523754	Pinedale		42.5995	109.7033	586,660	7,286	3.17	0.00
Warbonnet 2D-4D	WB 2d-4d	4903523766	Pinedale		42.5987	109.7204	617,120	5,201	3.17	0.00
Warbonnet 3-10	WB 3-10	4903523388	Pinedale		42.5892	109.7073	642,062	5,763	3.17	0.00
Warbonnet 3-3	WB 3-3	4903523384	Pinedale		42.6027	109.7067	544,603	5,204	0.00	0.00
Warbonnet 3-4D	WB 3-4d	4903523379	Pinedale		42.5992	109.7268	721,895	6,446	0.00	0.00
Warbonnet 3-5D	WB 3-5d	4903523856	Pinedale		42.6001	109.7473	434,694	3,872	3.17	0.00
Warbonnet 4-10	WB 4-10	4903523320	Pinedale	AP-2548	42.5897	109.7112	542,978	4,627	0.00	0.00
Warbonnet 4-25	WB 4-25	4903522617	Pinedale	CT-3181	42.5452	109.6740	395,045	427	0.00	0.00
Warbonnet 4-26	WB 4-26	4903522605	Pinedale		42.5458	109.6922	104,906	427	0.00	0.00
Warbonnet 4-4D	WB 4-4d	4903523589	Pinedale	CT-4112	42.6001	109.7315	1,067,729	8,606	3.17	0.00
Warbonnet 5-10D	WB 5-10d	4903523410	Pinedale		42.5896	109.7112	589,982	5,465	0.00	0.00
Warbonnet 5-14	WB 5-14	4903523377	Pinedale	AP-2888	42.5707	109.6937	937,834	10,312	0.00	0.00
Warbonnet 5-23	WB 5-23	4903522438	Pinedale	MD-1090	42.5575	109.6924	292,901	2,304	0.00	0.00
Warbonnet 5-25	WB 5-25	4903523550	Pinedale		42.5420	109.6719	589,097	5,798	0.00	0.00
Warbonnet 5-4	WB 5-4	4903523385	Pinedale		42.6001	109.7308	762,597	5,745	3.17	0.00
Warbonnet 5-9	WB 5-9	4903523382	Pinedale	AP-2285	42.5862	109.7307	637,440	4,888	0.00	0.00
Warbonnet 6-10D	WB 6-10d	4903523871	Pinedale		42.5891	109.7073	567,516	5,500	3.17	0.00
Warbonnet 6-23	WB 6-23	4903522675	Pinedale	MD-1095	42.5569	109.6869	428,595	3,578	0.00	0.00
Warbonet 6-26	WB 6-26	4903522433	Pinedale	CT-3738	42.5422	109.6884	176,243	1,491	0.00	0.00
Warbonnet 6-4	WB 6-4	4903523321	Pinedale		42.5992	109.7269	857,444	6,841	0.00	0.00
Warbonnet 6-5	WB 6-5	4903523786	Pinedale		42.6002	109.7465	557,340	4,263	3.17	0.00
Warbonnet 7-15d	WB 7-15d	4903523337	Pinedale		42.5731	109.6987	1,068,270	7,368	0.00	0.00
Warbonnet 7-23	WB 7-23	4903522876	Pinedale	CT-3396	42.5571	109.6829	285,721	2,140	0.00	0.00
Warbonnet 7-4	WB 7-4	4903522739	Pinedale		42.5991	109.7222	293,589	2,785	0.00	0.00
Warbonnet 7B-3D	WB 7b-3d	4903523753	Pinedale		42.5995	109.7032	608,292	6,762	3.17	0.00
Warbonnet 8-22	WB 8-22	4903522736	Pinedale	AP-2451	42.5571	109.6958	471,200	3,987	0.00	0.00
Warbonnet 8-25	WB 8-25	4903523708	Pinedale		42.5420	109.6578	1,476,065	16,515	3.17	0.00
Warbonnet 8-8	WB 8-8	4903523387	Pinedale		42.5856	109.7369	391,482	2,540	3.17	0.00
Warbonnet 8B-4D	WB 8b-4d	4903523763	Pinedale		42.5987	109.7203	640,205	5,439	3.17	0.00
Warbonnet 9-15	WB 9-15	4903523338	Pinedale	AP-2784	42.5672	109.6980	599,666	4,869	0.00	0.00
Warbonnet 9-23	WB 9-23	4903521675	Pinedale		42.5522	109.6769	78,304	527	0.00	0.00
Warbonnet 9-26	WB 9-26	4903522737	Pinedale	AP-1393	42.5373	109.6774	361,689	3,344	0.00	0.00
Warbonnet 9B-4D	WB 9b-4d	4903523378	Pinedale		42.5969	109.7219	627,302	5,416	0.00	0.00
Warbonnet 9D-4D	WB 9d-4d	4903523409	Pinedale		42.5928	109.7181	709,164	6,680	0.00	0.00
Warbonnet 11D-15D	WB 11d-15d	4903523749	Pinedale		42.5702	109.7108	550,635	6,183	3.17	0.00
Warbonnet 9B-10D	WB 9b-10d	4903523414	Pinedale		42.5795	109.7010	0	0	3.17	0.00
TOTALS									136.28	983.51

Total NOX TPY	1,186.8
Total VOC TPY	900.2

Denotes new well being drilled and therefore no production yet.

Table F.1.2
2005 Actual Emissions Inventory – Ultra 2005 Actual Emissions Inventory

	Process Burners	Wellhead IC Engines	Flashing Emissions Tanks and Pressurized Vessels					Glycol Dehydration Units Still & Flash Tank Vents				
	N0x	N0x	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Boulder 12A-33	0.154	0.0	1.02	0.012	0.019	0.001	0.007	0.33	0.047	0.003	0.102	0.041
Boulder 15-18	0.092	0.0	0.85	0.010	0.016	0.000	0.006	0.03	0.004	0.000	0.009	0.004
Boulder 5-19	0.000	0.0	0.26	0.003	0.005	0.000	0.002	15.51	2.140	0.140	4.540	1.740
Boulder 7-19	0.061	0.0	9.86	0.119	0.185	0.006	0.066	14.96	2.010	0.130	4.210	1.610
Boulder 6-32	0.061	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Boulder 14-34	0.276	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Boulder 15D-7D	0.061	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Gannett 12-16	0.276	0.0	0.12	0.002	0.002	0.000	0.001	0.26	0.030	0.002	0.060	0.023
Gannett 11-16	0.185	0.0	0.10	0.001	0.002	0.000	0.001	0.24	0.026	0.002	0.052	0.020
Gannett 14-16	0.031	0.0	0.32	0.004	0.006	0.000	0.002	0.31	0.042	0.003	0.089	0.034
Gannett 13-16	0.061	0.0	0.19	0.002	0.004	0.000	0.001	0.34	0.035	0.003	0.079	0.040
Lovatt Draw 15-8	0.307	0.0	0.84	0.010	0.016	0.000	0.006	1.51	0.040	0.003	0.070	0.030
Lizard Head 11-8	0.123	0.0	1.31	0.016	0.025	0.001	0.009	4.85	0.210	0.010	0.390	0.150
Lizard Head 13-28	0.000	0.0	1.99	0.024	0.037	0.001	0.013	0.02	0.001	0.000	0.001	0.000
Mesa 10-33	0.000	0.0	0.50	0.006	0.009	0.000	0.003	0.32	0.046	0.003	0.099	0.039
Mesa 9-33	0.000	0.0	0.90	0.011	0.017	0.001	0.006	0.33	0.048	0.003	0.103	0.042
Mesa 11-22	0.246	0.0	20.85	0.252	0.392	0.012	0.139	0.31	0.044	0.003	0.094	0.036
Mesa 10-22D	0.000	0.0	21.70	0.263	0.408	0.013	0.145	0.32	0.044	0.003	0.094	0.036
Mesa 12-22D	0.092	0.0	21.32	0.258	0.401	0.012	0.142	0.32	0.046	0.003	0.097	0.038
Mesa 13-22D	0.185	0.0	22.25	0.269	0.419	0.013	0.149	0.32	0.046	0.003	0.098	0.038
Mesa 1-33	0.000	0.0	18.51	0.224	0.348	0.011	0.124	0.32	0.046	0.003	0.100	0.039
Mesa 15A-28D	0.246	0.0	7.92	0.096	0.149	0.005	0.053	0.02	0.003	0.000	0.006	0.002
Mesa 15-22D	0.000	0.0	18.82	0.228	0.354	0.011	0.126	0.31	0.044	0.003	0.093	0.036
Mesa 16-22BD	0.123	0.0	22.00	0.266	0.414	0.013	0.147	0.32	0.045	0.003	0.096	0.037
Mesa 13-23BD	0.000	0.0	12.14	0.147	0.228	0.007	0.081	0.30	0.040	0.003	0.083	0.032
Mesa 15-35	0.000	0.0	0.27	0.003	0.005	0.000	0.002	0.30	0.041	0.003	0.086	0.033
Mesa 16-35CD	0.123	0.0	0.35	0.004	0.007	0.000	0.002	0.31	0.044	0.003	0.093	0.036
Mesa 16-35D	0.000	0.0	0.37	0.004	0.007	0.000	0.002	0.31	0.043	0.003	0.092	0.035
Mesa 15B-27D	0.154	0.0	0.88	0.011	0.017	0.001	0.006	0.11	0.016	0.001	0.034	0.014
Mesa 16-21D	0.031	0.0	0.24	0.003	0.005	0.000	0.002	0.31	0.042	0.003	0.089	0.034
Mesa 13-22CD	0.061	0.0	0.41	0.005	0.008	0.000	0.003	0.32	0.046	0.003	0.099	0.038
Mesa 14-22D	0.215	0.0	0.46	0.006	0.009	0.000	0.003	0.32	0.046	0.003	0.100	0.039
Mesa 14C-22D	0.215	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Mesa 15-21D	0.276	0.0	0.32	0.004	0.006	0.000	0.002	0.31	0.044	0.003	0.093	0.036
Mesa 15-21AD	0.215	0.0	0.35	0.004	0.007	0.000	0.002	0.32	0.045	0.003	0.097	0.037
Mesa 16-21CD	0.061	0.0	0.00	0.000	0.000	0.000	0.000	0.01	0.000	0.000	0.000	0.000
Mesa 16B-28D	0.215	0.0	0.73	0.009	0.014	0.000	0.005	0.33	0.048	0.003	0.103	0.042
Mesa 16D-28D	0.154	0.0	0.72	0.009	0.014	0.000	0.005	0.33	0.048	0.003	0.103	0.042
Mesa 2-28D	0.215	0.0	0.29	0.003	0.005	0.000	0.002	0.32	0.044	0.003	0.095	0.036
Mesa 6-27D	0.185	0.0	0.20	0.002	0.004	0.000	0.001	0.30	0.040	0.003	0.085	0.032
Mesa 3-27	0.215	0.0	0.41	0.005	0.008	0.000	0.003	0.32	0.046	0.003	0.099	0.039
Mesa 4-27	0.215	0.0	0.26	0.003	0.005	0.000	0.002	0.31	0.043	0.003	0.052	0.035
Mesa 4-27CD	0.000	0.0	0.62	0.008	0.012	0.000	0.004	0.33	0.047	0.003	0.102	0.041
Mesa 5-27D	0.031	0.0	0.26	0.003	0.005	0.000	0.002	0.31	0.043	0.003	0.092	0.035
Mesa 1-28D	0.061	0.0	0.32	0.004	0.006	0.000	0.002	0.32	0.045	0.003	0.096	0.037
Mesa 3-27CD	0.061	0.0	0.70	0.008	0.013	0.000	0.005	0.06	0.008	0.001	0.017	0.007
Mesa 3-18D	0.061	0.0	0.25	0.003	0.005	0.000	0.002	0.30	0.039	0.003	0.082	0.031
Mesa 6-18	0.092	0.0	0.28	0.003	0.005	0.000	0.002	0.31	0.042	0.003	0.088	0.034
Mesa 3-35D	0.243	0.0	0.28	0.003	0.005	0.000	0.002	0.30	0.041	0.003	0.086	0.033
Mesa 6-35D	0.246	0.0	0.34	0.004	0.006	0.000	0.002	0.31	0.043	0.003	0.090	0.035
Mesa 1A-35D	0.274	0.0	0.20	0.002	0.004	0.000	0.001	0.05	0.006	0.000	0.013	0.005
Mesa 2-35AD	0.307	0.0	0.53	0.006	0.010	0.000	0.004	0.05	0.008	0.000	0.017	0.006
Mesa 4-35	0.307	0.0	0.25	0.003	0.005	0.000	0.002	0.37	0.040	0.004	0.094	0.051
Mesa 5-35	0.336	0.0	0.40	0.005	0.007	0.000	0.003	0.32	0.044	0.003	0.094	0.036
Mesa 3-35CD	0.367	0.0	0.59	0.007	0.011	0.000	0.004	0.33	0.047	0.003	0.101	0.040
Mesa 4-35CD	0.367	0.0	0.80	0.010	0.015	0.000	0.005	0.22	0.032	0.002	0.069	0.028
Mesa 7-28	0.367	0.0	0.24	0.003	0.005	0.000	0.002	0.31	0.042	0.003	0.088	0.034
Mesa 8-28	0.367	0.0	0.21	0.003	0.004	0.000	0.001	0.30	0.040	0.003	0.085	0.032
Mesa 7-34	0.367	0.0	0.30	0.004	0.006	0.000	0.002	0.32	0.044	0.003	0.095	0.037
Mesa 9-21D	0.367	0.0	0.23	0.003	0.004	0.000	0.002	0.30	0.039	0.003	0.082	0.031
Mesa 10-21D	0.367	0.0	0.27	0.003	0.005	0.000	0.002	0.30	0.041	0.003	0.086	0.033
Mesa 9-21AD	0.367	0.0	0.59	0.007	0.011	0.000	0.004	0.06	0.008	0.001	0.017	0.007
Mesa 10A-21D	0.367	0.0	0.94	0.011	0.018	0.001	0.006	0.06	0.008	0.001	0.017	0.007
Mesa 9-22BD	0.367	0.0	18.45	0.223	0.347	0.011	0.123	0.31	0.043	0.003	0.092	0.035
Mesa 9-34	0.367	0.0	0.35	0.004	0.007	0.000	0.002	0.32	0.046	0.003	0.098	0.038
Mesa 7C-35D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Mesa 7D-34D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Mesa 8C-34D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Mesa 9C-35D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Pinedale 4A	0.367	0.0	0.18	0.002	0.003	0.000	0.001	0.30	0.041	0.003	0.087	0.033
Mesa 4-34D	0.367	0.0	1.03	0.012	0.019	0.001	0.007	0.14	0.020	0.001	0.044	0.019
Rainbow 13-30	0.367	0.0	0.33	0.004	0.006	0.000	0.002	0.31	0.043	0.003	0.091	0.035
Riverside 10D-4D	0.367	0.0	0.56	0.007	0.011	0.000	0.004	0.14	0.020	0.001	0.043	0.017
Riverside 11-14	0.367	0.0	0.30	0.004	0.006	0.000	0.002	0.32	0.044	0.003	0.094	0.036
Riverside 12-12D	0.367	0.0	1.05	0.013	0.020	0.001	0.007	0.33	0.048	0.003	0.104	0.044
Riverside 1-4	0.367	0.0	0.24	0.003	0.005	0.000	0.002	0.31	0.043	0.003	0.090	0.035
Riverside 2D-4D	0.367	0.0	1.03	0.013	0.019	0.001	0.007	0.08	0.012	0.001	0.026	0.011
Riverside 15-12	0.367	0.0	0.55	0.007	0.010	0.000	0.004	0.33	0.047	0.003	0.100	0.040
Riverside 16-3	0.367	0.0	0.46	0.006	0.009	0.000	0.003	0.33	0.047	0.003	0.100	0.040
Riverside 1-10D	0.367	0.0	1.13	0.014	0.021	0.001	0.008	0.11	0.016	0.001	0.035	0.015
Riverside 16-4	0.367	0.0	0.64	0.008	0.012	0.000	0.004	0.33	0.048	0.003	0.103	0.042
Riverside 2-2	0.367	0.0	0.19	0.002	0.004	0.000	0.001	14.70	1.940	0.130	4.060	1.550
Riverside 4-10	0.367	0.0	0.16	0.002	0.003	0.000	0.001	0.37	0.040	0.004	0.095	0.052
Riverside 4D-1D	0.367	0.0	0.54	0.007	0.010	0.000	0.004	0.11	0.015	0.001	0.031	0.012
Riverside 4D-3D	0.367	0.0	0.78	0.009	0.015	0.000	0.005	0.33	0.048	0.003	0.103	0.043
Riverside 6B-3D	0.367	0.0	0.98	0.012	0.018	0.001	0.007	0.33	0.048	0.003	0.104	0.044
Riverside 3C-3D	0.367	0.0	1.01	0.012	0.019	0.001	0.007	0.06	0.008	0.001	0.017	0.007
Riverside 8-4	0.367	0.0	0.21	0.003	0.004	0.000	0.001	0.31	0.042	0.003	0.088	0.034
Riverside 7D-4D	0.367	0.0	1.19	0.014	0.022	0.001	0.008	0.08	0.012	0.001	0.026	0.011

Table F.1.2
2005 Actual Emissions Inventory – Ultra 2005 Actual Emissions Inventory

	Process Burners	Wellhead IC Engines	Flashing Emissions Tanks and Pressurized Vessels					Glycol Dehydration Units Still & Flash Tank Vents				
	N0x	N0x	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Riverside 9-2	0.367	0.0	15.18	0.184	0.286	0.009	0.101	15.38	2.110	0.140	4.460	1.700
Riverside 4D-25D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
HSR Sherlock 15-8	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.02	0.000	0.000	0.001	0.000
Warbonnet 10-9d	0.367	0.0	0.37	0.005	0.007	0.000	0.003	0.32	0.045	0.003	0.097	0.037
Warbonnet 10D-4D	0.367	0.0	0.42	0.005	0.008	0.000	0.003	0.32	0.045	0.003	0.097	0.037
Warbonnet 1-21	0.367	0.0	0.33	0.004	0.006	0.000	0.002	0.05	0.007	0.000	0.016	0.006
Warbonnet 1-26D	0.367	0.0	0.16	0.002	0.003	0.000	0.001	0.29	0.038	0.003	0.079	0.030
Warbonnet 8-26	0.367	0.0	0.17	0.002	0.003	0.000	0.001	0.29	0.039	0.003	0.080	0.031
Warbonnet 12D-3D	0.367	0.0	1.20	0.015	0.023	0.001	0.008	0.17	0.024	0.002	0.052	0.021
Warbonnet 13-11	0.367	0.0	0.32	0.004	0.006	0.000	0.002	0.31	0.043	0.003	0.090	0.035
Warbonnet 14-11D	0.367	0.0	1.10	0.013	0.021	0.001	0.007	0.19	0.028	0.002	0.060	0.024
Warbonnet 13-24	0.367	0.0	0.29	0.003	0.005	0.000	0.002	0.31	0.043	0.003	0.090	0.035
Warbonnet 14-24D	0.367	0.0	0.72	0.009	0.014	0.000	0.005	0.33	0.047	0.003	0.102	0.041
Warbonnet 14B-3D	0.367	0.0	1.67	0.020	0.032	0.001	0.011	0.17	0.024	0.002	0.052	0.022
Warbonnet 15-23	0.367	0.0	0.15	0.002	0.003	0.000	0.001	0.28	0.036	0.002	0.074	0.028
Warbonnet 2-26D	0.367	0.0	0.12	0.001	0.002	0.000	0.001	0.27	0.034	0.002	0.070	0.027
Warbonnet 16-5	0.367	0.0	0.33	0.004	0.006	0.000	0.002	0.31	0.043	0.003	0.092	0.035
Warbonnet 1-8D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
Warbonnet 9-5d	0.367	0.0	0.49	0.006	0.009	0.000	0.003	0.32	0.046	0.003	0.098	0.038
Warbonnet 16B-10D	0.367	0.0	1.16	0.014	0.022	0.001	0.008	0.33	0.048	0.003	0.103	0.043
Warbonnet 16B-4D	0.367	0.0	0.49	0.006	0.009	0.000	0.003	0.32	0.046	0.003	0.098	0.038
Warbonnet 16D-10D	0.367	0.0	1.02	0.012	0.019	0.001	0.007	0.33	0.048	0.003	0.103	0.042
Warbonnet 9D-10D	0.367	0.0	1.29	0.016	0.024	0.001	0.009	0.33	0.048	0.003	0.103	0.043
Warbonnet 2-8	0.367	0.0	1.11	0.013	0.021	0.001	0.007	0.22	0.032	0.002	0.069	0.028
Warbonnet 2C-3D	0.367	0.0	1.25	0.015	0.024	0.001	0.008	0.19	0.028	0.002	0.060	0.024
Warbonnet 2D-4D	0.367	0.0	0.85	0.010	0.016	0.000	0.006	0.19	0.028	0.002	0.060	0.024
Warbonnet 3-10	0.367	0.0	1.18	0.014	0.022	0.001	0.008	0.17	0.024	0.002	0.052	0.021
Warbonnet 3-3	0.367	0.0	0.43	0.005	0.008	0.000	0.003	0.32	0.044	0.003	0.094	0.036
Warbonnet 3-4D	0.367	0.0	0.55	0.007	0.010	0.000	0.004	0.32	0.046	0.003	0.099	0.039
Warbonnet 3-5D	0.367	0.0	0.69	0.008	0.013	0.000	0.005	0.19	0.028	0.002	0.059	0.024
Warbonnet 4-10	0.367	0.0	0.42	0.005	0.008	0.000	0.003	0.32	0.044	0.003	0.094	0.036
Warbonnet 4-25	0.367	0.0	0.26	0.003	0.005	0.000	0.002	0.30	0.040	0.003	0.085	0.032
Warbonnet 4-26	0.367	0.0	3.44	0.042	0.065	0.002	0.023	0.25	0.032	0.002	0.066	0.025
Warbonnet 4-4D	0.367	0.0	1.37	0.017	0.026	0.001	0.009	0.25	0.036	0.002	0.078	0.033
Warbonnet 5-10D	0.367	0.0	0.51	0.006	0.010	0.000	0.003	0.32	0.044	0.003	0.095	0.037
Warbonnet 5-14	0.367	0.0	0.87	0.011	0.016	0.001	0.006	0.33	0.047	0.003	0.101	0.040
Warbonnet 5-23	0.367	0.0	0.21	0.003	0.004	0.000	0.001	0.28	0.036	0.002	0.074	0.028
Warbonnet 5-25	0.367	0.0	0.82	0.010	0.016	0.000	0.006	0.27	0.039	0.003	0.084	0.033
Warbonnet 5-4	0.367	0.0	0.71	0.009	0.013	0.000	0.005	0.25	0.036	0.002	0.077	0.032
Warbonnet 5-9	0.367	0.0	0.36	0.004	0.007	0.000	0.002	0.32	0.045	0.003	0.095	0.037
Warbonnet 6-10D	0.367	0.0	1.51	0.018	0.028	0.001	0.010	0.14	0.020	0.001	0.043	0.018
Warbonnet 6-23	0.367	0.0	0.30	0.004	0.006	0.000	0.002	0.30	0.041	0.003	0.087	0.033
Warbonet 6-26	0.367	0.0	8.72	0.106	0.164	0.005	0.058	0.28	0.035	0.002	0.072	0.027
Warbonnet 6-4	0.367	0.0	0.61	0.007	0.012	0.000	0.004	0.33	0.047	0.003	0.101	0.040
Warbonnet 6-5	0.367	0.0	1.07	0.013	0.020	0.001	0.007	0.19	0.028	0.002	0.061	0.025
Warbonnet 7-15d	0.367	0.0	1.33	0.016	0.025	0.001	0.009	0.28	0.040	0.003	0.087	0.037
Warbonnet 7-23	0.367	0.0	8.86	0.107	0.167	0.005	0.059	14.65	1.930	0.130	4.030	1.540
Warbonnet 7-4	0.367	0.0	0.22	0.003	0.004	0.000	0.001	0.29	0.039	0.003	0.081	0.031
Warbonnet 7B-3D	0.367	0.0	1.33	0.016	0.025	0.001	0.009	0.19	0.028	0.002	0.060	0.025
Warbonnet 8-22	0.367	0.0	16.31	0.198	0.307	0.009	0.109	0.31	0.043	0.003	0.092	0.035
Warbonnet 8-25	0.367	0.0	2.15	0.026	0.040	0.001	0.014	0.28	0.040	0.003	0.087	0.037
Warbonnet 8-8	0.367	0.0	0.45	0.005	0.008	0.000	0.003	0.25	0.035	0.002	0.076	0.030
Warbonnet 8B-4D	0.367	0.0	0.97	0.012	0.018	0.001	0.006	0.19	0.028	0.002	0.060	0.024
Warbonnet 9-15	0.367	0.0	0.40	0.005	0.007	0.000	0.003	0.32	0.045	0.003	0.096	0.037
Warbonnet 9-23	0.367	0.0	7.52	0.091	0.142	0.004	0.050	0.20	0.024	0.002	0.048	0.018
Warbonnet 9-26	0.367	0.0	0.27	0.003	0.005	0.000	0.002	0.30	0.040	0.003	0.084	0.032
Warbonnet 9B-4D	0.367	0.0	0.48	0.006	0.009	0.000	0.003	0.32	0.046	0.003	0.098	0.038
Warbonnet 9D-4D	0.367	0.0	0.60	0.007	0.011	0.000	0.004	0.32	0.046	0.003	0.099	0.039
Warbonnet 11D-15D	0.367	0.0	1.02	0.012	0.019	0.001	0.007	0.22	0.032	0.002	0.068	0.027
Warbonnet 9B-10D	0.367	0.0	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000
TOTALS	42.00	0.00	326.16	3.95	6.14	0.19	2.18	115.73	15.11	0.99	31.81	12.32

Table F.1.2
2005 Actual Emissions Inventory – Ultra 2005 Actual Emissions Inventory

	Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Boulder 12A-33	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	1.4	1.7E-02	2.6E-02	8.1E-04	9.4E-03	2.79
Boulder 15-18	0.0	0.0	0.0	0.0	0.0	0.32	0.004	0.006	0.000	0.002	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Boulder 5-19	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Boulder 7-19	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Boulder 6-32	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Boulder 14-34	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Boulder 15D-7D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Gannett 12-16	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Gannett 11-16	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Gannett 14-16	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Gannett 13-16	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Lovatt Draw 15-8	0.0	0.0	0.0	0.0	0.0	0.95	0.011	0.018	0.001	0.006	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Lizard Head 11-8	0.0	0.0	0.0	0.0	0.0	2.49	0.030	0.047	0.001	0.017	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Lizard Head 13-28	0.0	0.0	0.0	0.0	0.0	0.63	0.008	0.012	0.000	0.004	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 10-33	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 9-33	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 11-22	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 10-22D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 12-22D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 13-22D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 1-33	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 15A-28D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 15-22D	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 16-22BD	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 13-23BD	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 15-35	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 16-35CD	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 16-35D	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 15B-27D	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	1.2	1.5E-02	2.3E-02	7.0E-04	8.0E-03	3.54
Mesa 16-21D	0.0	0.0	0.0	0.0	0.0	0.74	0.009	0.014	0.000	0.005	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 13-22CD	0.0	0.0	0.0	0.0	0.0	0.74	0.009	0.014	0.000	0.005	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 14-22D	0.0	0.0	0.0	0.0	0.0	0.74	0.009	0.014	0.000	0.005	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 14C-22D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 15-21D	0.0	0.0	0.0	0.0	0.0	0.74	0.009	0.014	0.000	0.005	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 15-21AD	0.0	0.0	0.0	0.0	0.0	0.74	0.009	0.014	0.000	0.005	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 16-21CD	0.0	0.0	0.0	0.0	0.0	0.06	0.001	0.001	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 16B-28D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 16D-28D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 2-28D	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 6-27D	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 3-27	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 4-27	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 4-27CD	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 5-27D	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 1-28D	0.0	0.0	0.0	0.0	0.0	0.52	0.006	0.010	0.000	0.003	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 3-27CD	0.0	0.0	0.0	0.0	0.0	0.09	0.001	0.002	0.000	0.001	10.8	1.3E-01	2.0E-01	6.3E-03	7.2E-02	5.04
Mesa 3-18D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 6-18	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 3-35D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 6-35D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 1A-35D	0.0	0.0	0.0	0.0	0.0	0.31	0.004	0.006	0.000	0.002	0.9	1.1E-02	1.7E-02	5.2E-04	6.0E-03	6.07
Mesa 2-35AD	0.0	0.0	0.0	0.0	0.0	0.31	0.004	0.006	0.000	0.002	6.2	7.5E-02	1.2E-01	3.6E-03	4.1E-02	7.42
Mesa 4-35	0.0	0.0	0.0	0.0	0.0	1.02	0.012	0.019	0.001	0.007	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 5-35	0.0	0.0	0.0	0.0	0.0	1.02	0.012	0.019	0.001	0.007	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 3-35CD	0.0	0.0	0.0	0.0	0.0	1.02	0.012	0.019	0.001	0.007	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 4-35CD	0.0	0.0	0.0	0.0	0.0	0.69	0.008	0.013	0.000	0.005	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 7-28	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 8-28	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 7-34	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 9-21D	0.0	0.0	0.0	0.0	0.0	1.61	0.019	0.030	0.001	0.011	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 10-21D	0.0	0.0	0.0	0.0	0.0	1.61	0.019	0.030	0.001	0.011	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 9-21AD	0.0	0.0	0.0	0.0	0.0	0.27	0.003	0.005	0.000	0.002	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.81
Mesa 10A-21D	0.0	0.0	0.0	0.0	0.0	0.27	0.003	0.005	0.000	0.002	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.06
Mesa 9-22BD	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 9-34	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 7C-35D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 7D-34D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.00
Mesa 8C-34D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.00
Mesa 9C-35D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.00
Pinedale 4A	0.0	0.0	0.0	0.0	0.0	2.65	0.032	0.050	0.002	0.018	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Mesa 4-34D	0.0	0.0	0.0	0.0	0.0	1.11	0.013	0.021	0.001	0.007	2.7	3.3E-02	5.1E-02	1.6E-03	1.8E-02	4.86
Rainbow 13-30	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 10D-4D	0.0	0.0	0.0	0.0	0.0	1.57	0.019	0.030	0.001	0.011	0.7	8.5E-03	1.3E-02	4.1E-04	4.7E-03	2.47
Riverside 11-14	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 12-12D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 1-4	0.0	0.0	0.0	0.0	0.0	3.00	0.036	0.056	0.002	0.020	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 2D-4D	0.0	0.0	0.0	0.0	0.0	0.76	0.009	0.014	0.000	0.005	17.9	2.2E-01	3.4E-01	1.0E-02	1.2E-01	6.86
Riverside 15-12	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 16-3	0.0	0.0	0.0	0.0	0.0	2.81	0.034	0.053	0.002	0.019	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 1-10D	0.0	0.0	0.0	0.0	0.0	0.94	0.011	0.018	0.001	0.006	1.0	1.2E-02	1.9E-02	5.8E-04	6.7E-03	3.17
Riverside 16-4	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 2-2	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 4-10	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 4D-1D	0.0	0.0	0.0	0.0	0.0	1.25	0.015	0.024	0.001	0.008	0.1	1.2E-03	1.9E-03	5.8E-05	6.7E-04	5.52
Riverside 4D-3D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 6B-3D	0.0	0.0	0.0	0.0	0.0	3.22	0.039	0.061	0.002	0.021	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 3C-3D	0.0	0.0	0.0	0.0	0.0	0.54	0.007	0.010	0.000	0.004	0.2	2.4E-03	3.8E-03	1.2E-04	1.3E-03	4.44
Riverside 8-4	0.0	0.0	0.0	0.0	0.0	3.00	0.036	0.056	0.002	0.020	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 7D-4D	0.0	0.0	0.0	0.0	0.0	0.76	0.009	0.014	0.000	0.005	0.3	3.6E-03	5.6E-03	1.7E-04	2.0E-03	4.94

Table F.1.2
2005 Actual Emissions Inventory – Ultra 2005 Actual Emissions Inventory

	Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Riverside 9-2	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Riverside 4D-25D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
HSR Sherlock 15-8	0.0	0.0	0.0	0.0	0.0	0.63	0.008	0.012	0.000	0.004	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 10-9d	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 10D-4D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 1-21	0.0	0.0	0.0	0.0	0.0	0.63	0.008	0.012	0.000	0.004	1.0	1.2E-02	1.9E-02	5.8E-04	6.7E-03	5.32
Warbonnet 1-26D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 8-26	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 12D-3D	0.0	0.0	0.0	0.0	0.0	1.89	0.023	0.036	0.001	0.013	4.7	5.7E-02	8.8E-02	2.7E-03	3.1E-02	3.41
Warbonnet 13-11	0.0	0.0	0.0	0.0	0.0	2.37	0.029	0.045	0.001	0.016	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 14-11D	0.0	0.0	0.0	0.0	0.0	1.39	0.017	0.026	0.001	0.009	8.1	9.8E-02	1.5E-01	4.7E-03	5.4E-02	4.51
Warbonnet 13-24	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 14-24D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 14B-3D	0.0	0.0	0.0	0.0	0.0	1.89	0.023	0.036	0.001	0.013	2.2	2.7E-02	4.1E-02	1.3E-03	1.5E-02	3.19
Warbonnet 15-23	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 2-26D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 16-5	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 1-8D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 9-5d	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 16B-10D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 16B-4D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 16D-10D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 9D-10D	0.0	0.0	0.0	0.0	0.0	1.88	0.023	0.035	0.001	0.013	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 2-8	0.0	0.0	0.0	0.0	0.0	2.52	0.031	0.047	0.001	0.017	8.3	1.0E-01	1.6E-01	4.8E-03	5.5E-02	3.86
Warbonnet 2C-3D	0.0	0.0	0.0	0.0	0.0	2.20	0.027	0.041	0.001	0.015	5.0	6.1E-02	9.4E-02	2.9E-03	3.3E-02	2.70
Warbonnet 2D-4D	0.0	0.0	0.0	0.0	0.0	2.20	0.027	0.041	0.001	0.015	6.1	7.4E-02	1.1E-01	3.5E-03	4.1E-02	4.70
Warbonnet 3-10	0.0	0.0	0.0	0.0	0.0	1.89	0.023	0.036	0.001	0.013	9.1	1.1E-01	1.7E-01	5.3E-03	6.1E-02	5.40
Warbonnet 3-3	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 3-4D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 3-5D	0.0	0.0	0.0	0.0	0.0	2.20	0.027	0.041	0.001	0.015	10.9	1.3E-01	2.1E-01	6.3E-03	7.3E-02	6.76
Warbonnet 4-10	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 4-25	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 4-26	0.0	0.0	0.0	0.0	0.0	3.44	0.042	0.065	0.002	0.023	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 4-4D	0.0	0.0	0.0	0.0	0.0	2.83	0.034	0.053	0.002	0.019	8.4	1.0E-01	1.6E-01	4.9E-03	5.6E-02	5.36
Warbonnet 5-10D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 5-14	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 5-23	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 5-25	0.0	0.0	0.0	0.0	0.0	3.15	0.038	0.059	0.002	0.021	11.9	1.4E-01	2.2E-01	6.9E-03	7.9E-02	3.36
Warbonnet 5-4	0.0	0.0	0.0	0.0	0.0	2.83	0.034	0.053	0.002	0.019	5.9	7.1E-02	1.1E-01	3.4E-03	3.9E-02	5.71
Warbonnet 5-9	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 6-10D	0.0	0.0	0.0	0.0	0.0	1.57	0.019	0.030	0.001	0.011	2.9	3.5E-02	5.5E-02	1.7E-03	1.9E-02	3.01
Warbonnet 6-23	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonet 6-26	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 6-4	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 6-5	0.0	0.0	0.0	0.0	0.0	2.20	0.027	0.041	0.001	0.015	2.4	2.9E-02	4.5E-02	1.4E-03	1.6E-02	6.98
Warbonnet 7-15d	0.0	0.0	0.0	0.0	0.0	3.15	0.038	0.059	0.002	0.021	2.4	2.9E-02	4.5E-02	1.4E-03	1.6E-02	2.76
Warbonnet 7-23	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 7-4	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 7B-3D	0.0	0.0	0.0	0.0	0.0	2.20	0.027	0.041	0.001	0.015	1.8	2.2E-02	3.4E-02	1.0E-03	1.2E-02	2.92
Warbonnet 8-22	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 8-25	0.0	0.0	0.0	0.0	0.0	3.15	0.038	0.059	0.002	0.021	3.0	3.6E-02	5.6E-02	1.7E-03	2.0E-02	4.06
Warbonnet 8-8	0.0	0.0	0.0	0.0	0.0	2.83	0.034	0.053	0.002	0.019	3.6	4.4E-02	6.8E-02	2.1E-03	2.4E-02	5.56
Warbonnet 8B-4D	0.0	0.0	0.0	0.0	0.0	2.20	0.027	0.041	0.001	0.015	9.7	1.2E-01	1.8E-01	5.6E-03	6.5E-02	5.63
Warbonnet 9-15	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 9-23	0.0	0.0	0.0	0.0	0.0	2.81	0.034	0.053	0.002	0.019	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 9-26	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 9B-4D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 9D-4D	0.0	0.0	0.0	0.0	0.0	3.75	0.045	0.071	0.002	0.025	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
Warbonnet 11D-15D	0.0	0.0	0.0	0.0	0.0	2.52	0.031	0.047	0.001	0.017	3.5	4.2E-02	6.6E-02	2.0E-03	2.3E-02	5.13
Warbonnet 9B-10D	0.0	0.0	0.0	0.0	0.0	0.00	0.000	0.000	0.000	0.000	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.00
TOTALS	0.00	0.00	0.00	0.00	0.00	304.05	3.68	5.72	0.18	2.03	154.30	1.87	2.90	0.09	1.03	161.32

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

					Location		Production		Drill Rig Engines	
							Gas	Condensate	SO2	N0x
Pad Name	Well Name	API #	Field Name	Air Quality Permit #	Latitude	Longitude	MMCF	BBL	TPY	TPY
	Pinedale Compressor Station	na	Pinedale	MD-1267	-	-	-	-	-	-
	Pinedale Stabilizer Site	na	Pinedale	CT-4070	-	-	-	-	-	-
	Mesa 15-6 CDP Site	na	Pinedale	CT-4064	42.77158	109.87258	-	-	-	-
	Mesa 14-16 CDP Site	na	Pinedale	CT-4069	42.74178	109.83982	-	-	-	-
	Stewart Point 16-18 CDP Site	na	Pinedale	CT-4062	42.82905	109.90654	-	-	-	-
Pad Wellsites										
Mesa 7-21	Mesa 2-21D	035-23770	Pinedale	MD-1330	42.73364	109.83739	645.9	4,180	1.5	30.7
Mesa 7-21	Mesa 6-21D	035-23565	Pinedale	MD-1330	42.73351	109.83797	1,051.8	6,513	0.6	12.7
Mesa 7-21	Mesa 6A-21D	035-23790	Pinedale	MD-1330	42.73357	109.83798	496.5	3,132	0.6	13.5
Mesa 7-21	Mesa 7-21	035-22721	Pinedale	MD-1330	42.73333	109.83611	399.7	2,819	-	-
Mesa 7-21	Mesa 7D-21D	035-23765	Pinedale	MD-1330	42.73286	109.83570	494.7	3,291	1.0	20.4
Mesa 7-21	Mesa 8-21D	035-23611	Pinedale	MD-1330	42.73391	109.83763	969.0	6,878	-	-
Mesa 7-21	Mesa 8D-21D	035-23789	Pinedale	MD-1330	42.73360	109.83793	740.8	4,717	1.0	20.3
Mesa 7-21	Mesa 11-21D	035-23371	Pinedale	MD-1330	42.73276	109.83565	1,107.8	7,221	1.0	22.0
Mesa 7-21	Mesa 11A-21D	035-23787	Pinedale	MD-1330	42.73279	109.83649	740.4	4,839	0.8	17.5
Mesa 7-21	Mesa 14A-21D	035-23788	Pinedale	MD-1330	42.73282	109.83644	1,173.0	7,673	1.0	22.1
							7,819.6	51,263		
Mesa 13A-16D	Mesa 13A-16D	035-23369	Pinedale	AP-3122	42.74139	109.84545	686.2	5,122	-	-
Mesa 13A-16D	Mesa 13AA-16D	035-23750	Pinedale	AP-3122	42.74183	109.84588	1,077.0	8,155	-	-
Mesa 13A-16D	Mesa 1-20D	035-23370	Pinedale	AP-3122	42.74194	109.84644	698.3	4,495	0.3	6.1
Mesa 13A-16D	Mesa 4-21D	035-23607	Pinedale	AP-3122	42.74195	109.74195	510.1	3,224	0.6	12.3
Mesa 13A-16D	Mesa 16-17D	035-23609	Pinedale	AP-3122	42.74191	109.84711	546.1	3,478	0.7	15.0
							3,517.7	24,474		
Mesa 11-20	Mesa 11-20	035-22432	Pinedale	AP-0453	42.74191	109.86027	254.8	1,893	-	-
Mesa 11-20	Mesa 13C-20D	035-23975	Pinedale	AP-0453	42.73084	109.86028	238.5	1,760	1.2	25.9
							493.3	3,653		
Mesa 1	Mesa Unit 1	035-20589	Pinedale	MD-1100	42.76659	109.87159	70.2	540	-	-
Mesa 1	Mesa Unit 1-7D	035-23574	Pinedale	MD-1100	42.76557	109.87225	601.6	4,731	-	-
Mesa 1	Mesa Unit 1A-7D	035-23573	Pinedale	MD-1100	42.76601	109.87295	757.8	5,976	-	-
Mesa 1	Mesa Unit 2-7D	035-23961	Pinedale	MD-1100	42.76612	109.87178	221.7	1,569	0.6	12.7
Mesa 1	Mesa Unit 2A-7D	035-23571	Pinedale	MD-1100	42.76605	109.87297	607.9	4,796	-	-
Mesa 1	Mesa Unit 8-7D	035-23171	Pinedale	MD-1100	42.76592	109.87135	506.9	3,978	-	-
							2,766.1	21,590		
Mesa 10-8D	Mesa 10-8D	035-22039	Pinedale	MD-1193	42.75750	109.85639	521.4	4,212	-	-
Mesa 10-8D	Mesa 11-8D	035-21823	Pinedale	MD-1193	42.75750	109.85639	626.2	5,064	-	-
Mesa 10-8D	Mesa 14A-8D	035-23943	Pinedale	MD-1193	42.75859	109.85839	612.4	4,287	0.7	14.4
Mesa 10-8D	Mesa 15-8	035-21680	Pinedale	MD-1193	42.75611	109.85500	338.4	2,669	-	-
Mesa 10-8D	Mesa 16-8D	035-22041	Pinedale	MD-1193	42.75750	109.85639	762.6	6,189	-	-
							2,861.0	22,421		
Mesa 11-16	Mesa 11-16	035-22303	Pinedale	MD-1306	42.74454	109.84054	344.0	2,513	-	-
Mesa 11-16	Mesa 11A-16D	035-23187	Pinedale	MD-1306	42.74526	109.84171	349.0	2,546	-	-
Mesa 11-16	Mesa 14B-16D	035-23896	Pinedale	MD-1306	42.74431	109.84017	505.2	3,721	0.6	13.0
Mesa 11-16	Mesa 7C-16D	035-23898	Pinedale	MD-1306	42.74425	109.84082	334.9	2,369	0.7	15.8
							1,533.1	11,149		
Mesa 12-16	Mesa 12-16	035-22491	Pinedale	AP-2740	42.74572	109.84627	296.6	2,116	-	-
Mesa 12-16	Mesa 12B-16D	035-23526	Pinedale	AP-2740	42.74640	109.84662	678.4	4,821	-	-
Mesa 12-16	Mesa 9-17D	035-22650	Pinedale	AP-2740	42.74658	109.86619	474.8	3,406	-	-
							1,449.8	10,343		
Mesa 12-17D	Mesa 10-17D	035-23608	Pinedale	CT-4186	42.74744	109.85712	1,080.2	8,459	-	-
Mesa 12-17D	Mesa 11C-17D	035-23944	Pinedale	CT-4186	42.74758	109.85769	336.4	2,286	0.7	15.7
Mesa 12-17D	Mesa 12-17D	035-23585	Pinedale	CT-4186	42.74802	109.85726	904.4	7,093	-	-
Mesa 12-17D	Mesa 5-17D	035-23688	Pinedale	CT-4186	42.74762	109.85844	502.1	3,465	-	-
Mesa 12-17D	Mesa 5A-17D	035-23945	Pinedale	CT-4186	42.74761	109.85835	678.8	4,699	0.7	14.2
Mesa 12-17D	Mesa 6-17D	035-23561	Pinedale	CT-4186	42.74735	109.85661	1,112.0	8,708	-	-
Mesa 12-17D	Mesa 7-17D	035-23570	Pinedale	CT-4186	42.74739	109.85654	988.3	7,740	-	-
							5,602.2	42,450		
Mesa 14-16	Mesa 14-16	035-22732	Pinedale	MD-1258	42.74178	109.83982	323.5	2,394	-	-
Mesa 14-16	Mesa 14A-16D	035-23529	Pinedale	MD-1258	42.74185	109.84003	527.5	3,928	-	-
							851.0	6,322		

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

					Location		Production		Drill Rig Engines	
							Gas	Condensate	SO2	N0x
Pad Name	Well Name	API #	Field Name	Air Quality Permit #	Latitude	Longitude	MMCF	BBL	TPY	TPY
Mesa 15-20	Mesa 14-20D	035-23563	Pinedale	MD-1307	42.72892	109.85478	487.3	3,383	-	-
Mesa 15-20	Mesa 15-20	035-22906	Pinedale	MD-1307	42.72873	109.85618	475.5	3,392	-	-
Mesa 15-20	Mesa 16-20D	035-23373	Pinedale	MD-1307	42.74526	109.84171	1,189.7	7,897	-	-
Mesa 15-20	Mesa 16C-20D	035-24022	Pinedale	MD-1307	42.72903	109.85514	351.2	2,387	0.7	15.6
							2,503.7	17,059		
Mesa 15-6	Mesa 14-6D	035-23066	Pinedale	MD-1054	42.77102	109.87253	538.3	4,154	-	-
Mesa 15-6	Mesa 15-6	035-22295	Pinedale	MD-1054	42.77158	109.87258	416.7	3,233	-	-
Mesa 15-6	Mesa 16-6D	035-23069	Pinedale	MD-1054	42.77102	109.87253	452.6	3,496	-	-
							1,407.6	10,883		
Mesa 16-16	Mesa 16-16	035-22729	Pinedale	MD-1306	42.74106	109.83058	334.9	2,385	-	-
Mesa 16-16	Mesa 16C-16D	035-23710	Pinedale	MD-1306	42.74056	109.83500	1,167.0	8,246	-	-
							1,501.9	10,631		
Stewart Point 16-29	Stewart Point 16-29	035-22284	Pinedale	CT-3321	42.79583	109.88277	822.1	6,278	-	-
Stewart Point 16-29	Stewart Point 9-29D	035-22598	Pinedale	CT-3321	42.79630	109.89547	1,251.4	9,805	-	-
							2,073.5	16,083		
Mesa 2	Mesa Unit 2	035-20620	Pinedale	CT-3382	42.74819	109.84056	37.9	255	-	-
Mesa 2	Mesa 2-16D	035-22450	Pinedale	CT-3382	42.74826	109.84124	160.4	1,120	-	-
Mesa 2	Mesa 3-16D	035-22305	Pinedale	CT-3382	42.75083	109.84166	247.9	1,733	-	-
Mesa 2	Mesa 4-16D	035-22449	Pinedale	CT-3382	42.74825	109.84131	237.5	1,636	-	-
Mesa 2	Mesa 7-16D	035-22447	Pinedale	CT-3382	42.74825	109.84138	248.4	1,711	-	-
							932.1	6,455		
Mesa 2-20	Mesa 14-17D	035-23139	Pinedale	MD-1097	42.73806	109.86166	579.7	4,460	-	-
Mesa 2-20	Mesa 15-17D	035-23268	Pinedale	MD-1097	42.73792	109.86245	752.0	5,369	1.0	20.5
Mesa 2-20	Mesa 2-20D	035-23201	Pinedale	MD-1097	42.73778	109.86222	657.3	5,025	-	-
Mesa 2-20	Mesa 3-20	035-22250	Pinedale	MD-1097	42.73611	109.86111	259.0	1,962	-	-
Mesa 2-20	Mesa 5CA-20D		Pinedale	MD-1097			-	-	0.3	6.4
Mesa 2-20	Mesa 4DD-20D		Pinedale	MD-1097			-	-	0.8	16.7
Mesa 2-20	Mesa 2BA-20D		Pinedale	MD-1097			-	-	0.2	3.3
Mesa 2-20	Mesa 5DB-20D		Pinedale	MD-1097			-	-	0.3	6.2
							2,248.0	16,816		
Mesa 3	Mesa 12A-16	035-23849	Pinedale	MD-1222	42.74636	109.84440	547.6	3,845	1.0	21.8
Mesa 3	Mesa Unit 3	035-22071	Pinedale	MD-1222	42.74778	109.84417	192.8	1,484	-	-
Mesa 3	Mesa 4D-16D	035-23859	Pinedale	MD-1222	42.74641	109.84441	366.5	2,558	1.0	20.4
Mesa 3	Mesa 5A-16D	035-23195	Pinedale	MD-1222	42.74694	109.84333	306.4	2,330	-	-
Mesa 3	Mesa 6A-16D	035-23528	Pinedale	MD-1222	42.74663	109.84415	590.3	4,435	-	-
Mesa 3	Mesa 8-17	035-22648	Pinedale	MD-1222	42.74889	109.85027	406.1	3,066	-	-
							2,409.7	17,718		
Mesa 3-21	Mesa 3-21	035-23177	Pinedale	CT-3805	42.73757	109.84065	631.7	4,813	-	-
Mesa 3-21	Mesa 3B-21D	035-23909	Pinedale	CT-3805	42.73720	109.84024	491.8	3,208	0.6	12.0
							1,123.5	8,021		
Mesa 3-8	Mesa 3-8	035-23207	Pinedale	CT-3772	42.76765	109.86011	456.0	3,653	-	-
Mesa 3-8	Mesa 6-8D	035-23186	Pinedale	CT-3772	42.76333	109.85444	416.8	3,336	-	-
							872.8	6,989		
Mesa 5-8	Mesa 5-8	035-22434	Pinedale	AP-0455	42.76333	109.86472	265.1	2,047	-	-
Mesa 5-8	Mesa 9-7	035-22640	Pinedale	AP-0466	42.76278	109.88755	323.5	2,503	-	-
							588.6	4,550		
Mesa 6-6	Mesa 6-6	035-23406	Pinedale	CT-4169	42.77811	109.88061	1,015.2	7,845	-	-
Mesa 6-6	Stewart Point 15-32D	035-23428	Pinedale	CT-4169	42.77731	109.88144	205.4	1,605	-	-
							1,220.6	9,450		
Mesa 7-7	Mesa 10-7D	035-23936	Pinedale	AP-4339	42.76536	109.87481	63.9	454	1.0	20.9
Mesa 7-7	Mesa 3-7	035-22435	Pinedale	AP-4339	42.76833	109.87972	308.7	2,593	-	-
Mesa 7-7	Mesa 6-7D	035-23947	Pinedale	AP-4339	42.76887	109.88101	156.6	1,069	0.7	15.4
Mesa 7-7	Mesa 7-7	035-22159	Pinedale	AP-4339	42.76500	109.87444	309.5	2,621	-	-
Mesa 7-7	Mesa 9B-7D	035-23937	Pinedale	AP-4339	42.76538	109.87476	73.4	521	1.0	21.8
							912.1	7,258		
Mesa 7-8	Mesa 1D-8D	035-23950	Pinedale	AP-4174	42.76376	109.85420	135.2	928	0.6	13.0
Mesa 7-8	Mesa 7-8	035-22251	Pinedale	AP-4174	42.76194	109.85500	365.0	2,782	-	-
Mesa 7-8	Mesa 7A-8D	035-23942	Pinedale	AP-4174	42.76373	109.85495	303.9	2,091	0.6	12.8

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

					Location		Production		Drill Rig Engines	
							Gas	Condensate	SO2	N0x
Pad Name	Well Name	API #	Field Name	Air Quality Permit #	Latitude	Longitude	MMCF	BBL	TPY	TPY
							804.1	5,801		
Mesa 9-8	Mesa 12-9D	035-22752	Pinedale	MD-1339	42.75928	109.85035	472.2	3,778	-	-
Mesa 9-8	Mesa 8-8D	035-23657	Pinedale	MD-1339	42.75971	109.85052	420.6	2,750	0.7	14.1
Mesa 9-8	Mesa 13-9D	035-22750	Pinedale	MD-1339	42.75944	109.85027	257.1	2,596	-	-
Mesa 9-8	Mesa 9-8	035-22751	Pinedale	MD-1339	42.75901	109.84956	856.1	6,857	-	-
							2,006.0	15,981		
Stewart Point 11-33	Stewart Point 11-33	035-22194	Pinedale	MD-1094	42.78430	109.87232	188.3	1,764	-	-
Stewart Point 11-33	Stewart Point 13-33D	035-23265	Pinedale	MD-1094	42.78490	109.87327	708.2	6,655	-	-
							896.5	8,419		
Stewart Point 2-20	Stewart Point 1-20D	035-23070	Pinedale	CT-3760	42.82056	109.88706	1,161.4	10,362	-	-
Stewart Point 2-20	Stewart Point 2-20	035-23068	Pinedale	CT-3760	42.82056	109.88804	806.5	7,193	-	-
Stewart Point 2-20	Stewart Point 3-20D	035-23067	Pinedale	CT-3760	42.82056	109.88811	766.6	6,835	-	-
							2,734.5	24,390		
Stewart Point 3-28	Stewart Point 2A-28D	035-24052	Pinedale	AP-4253	42.80783	109.86684	49.8	428	0.9	18.7
Stewart Point 3-28	Stewart Point 3-28	035-21682	Pinedale	AP-4253	42.80694	109.87333	278.9	2,737	-	-
							328.7	3,165		
Stewart Point 8-32D	Stewart Point 10-32D	035-23569	Pinedale	CT-4166	42.78732	109.88168	657.9	5,563	-	-
Stewart Point 8-32D	Stewart Point 12-33D	035-23442	Pinedale	CT-4166	42.78689	109.88027	1,624.5	13,686	-	-
Stewart Point 8-32D	Stewart Point 16-32D	035-23443	Pinedale	CT-4166	42.78687	109.88004	667.5	5,643	-	-
Stewart Point 8-32D	Stewart Point 5-33DR	035-23429	Pinedale	CT-4166	42.78689	109.88019	1,202.4	10,165	-	-
Stewart Point 8-32D	Stewart Point 7-32D	035-22121	Pinedale	CT-4166	42.78889	109.88667	525.9	4,527	0.7	13.8
Stewart Point 8-32D	Stewart Point 8-32D	035-22087	Pinedale	CT-4166	42.78806	109.88138	2,255.5	19,056	-	-
Stewart Point 8-32D	Stewart Point 9-32D	035-23444	Pinedale	CT-4166	42.78772	109.88080	450.2	3,855	0.7	13.9
							7,383.9	62,495		
Mesa 12-21 LEK	Mesa 12-21D	035-23042	Pinedale	AP-1945	42.73134	109.84339	936.4	6,275	-	-
Mesa 12-21 LEK	Mesa 12B-21D	035-23962	Pinedale	AP-1945	42.73117	109.84285	351.6	2,343	0.9	18.9
Mesa 12-21 LEK	Mesa 13-21D	035-23041	Pinedale	AP-1945	42.73127	109.84327	710.8	4,767	-	-
Mesa 12-21 LEK	Mesa 13D-21D	035-23963	Pinedale	AP-1945	42.73120	109.84281	369.0	2,505	0.9	18.1
Mesa 12-21 LEK	Mesa 14-21D	035-23040	Pinedale	AP-1945	42.73124	109.84321	792.8	5,317	-	-
							3,160.6	21,207		
Stewart Point 4-33	Stewart Point 13-28D	035-22664	Pinedale	CT-3321	42.79194	109.87555	822.1	7,294	-	-
Stewart Point 4-33	Stewart Point 14-28D	035-23119	Pinedale	CT-3321	42.79192	109.87660	414.1	3,672	-	-
Stewart Point 4-33	Stewart Point 1-32D	035-23252	Pinedale	CT-3321	42.79192	109.87660	1,573.2	13,939	-	-
Stewart Point 4-33	Stewart Point 3-33D	035-22666	Pinedale	CT-3321	42.79194	109.87555	447.8	3,968	-	-
Stewart Point 4-33	Stewart Point 4-33	035-22668	Pinedale	CT-3321	42.79194	109.87555	741.3	6,570	-	-
							3,998.5	35,443		
Stewart Point 15-20D	Stewart Point 14-20	035-22678	Pinedale	AP-0856	42.81011	109.89011	761.1	6,088	-	-
Stewart Point 15-20D	Stewart Point 15-20D	035-22896	Pinedale	AP-0856	42.81011	109.89011	763.9	6,111	-	-
							1,525.0	12,199		
					Pad Wells		**66,703.6**	**508,400**	**28.8**	**608.8**
Single Wellsites										
NA	Mesa 11-17	035-22430	Pinedale	CT-3330	42.74611	109.85861	498.8	3,631	-	-
NA	Mesa 11-9	035-23407	Pinedale	????	42.76030	109.84041	114.0	837	0.4	8.4
NA	Mesa 3-17	035-22723	Pinedale	MD-992	42.75278	109.86027	664.8	4,654	-	-
NA	Mesa 3-22D	035-21827	Pinedale	AP-171	42.73806	109.82333	51.4	375	-	-
NA	Mesa 5-21	035-22529	Pinedale	CT-3254	42.73500	109.84722	481.9	3,237	-	-
NA	Mesa 5-22	035-23140	Pinedale	CT-3748	42.73267	109.82677	526.1	4,064	-	-
NA	Mesa 10-16	035-22731	Pinedale	MD-1159	42.74469	109.83596	232.2	1,694	-	-
NA	Mesa 10A-16	035-23395	Pinedale	MD-1159	42.74545	109.83478	486.5	3,550	-	-
NA	Mesa 12-8	035-22891	Pinedale	CT-3539	42.76013	109.86626	415.4	3,216		
NA	Mesa 13-5	035-22193	Pinedale	CT-2726	42.77138	109.86500	228.7	1,783	-	-
NA	Mesa 15-16	035-22490	Pinedale	CT-3253	42.74097	109.83627	316.0	2,244	-	-
NA	Mesa 4-8	035-22728	Pinedale	????	42.76778	109.86500	418.3	3,169	-	-
NA	Mesa Unit 6	035-22091	Pinedale	AP-1635	42.74480	109.84480	191.2	1,238	-	-
NA	Mesa 6-16	035-22448	Pinedale	CT-3382	42.74827	109.84116	189.3	1,611	-	-
NA	Mesa 9-16	035-22730	Pinedale	CT-3220	42.74429	109.83108	222.1	1,752	-	-
NA	Pinedale Unit 8	035-06381	Pinedale	AP-3175	42.81406	109.89214	15.1	261	-	-
NA	Sidewinder 3-15D	035-24023	Pinedale	????	42.65937	109.82118	44.5	267	1.5	32.5

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

					Location		Production		Drill Rig Engines	
							Gas	Condensate	SO2	N0x
Pad Name	Well Name	API #	Field Name	Air Quality Permit #	Latitude	Longitude	MMCF	BBL	TPY	TPY
NA	Stewart Point 11-21	035-22560	Pinedale	Ct3295	42.81448	109.87247	302.0	2,224	-	-
NA	Stewart Point 15-17D	035-22852	Pinedale	????	42.82476	109.88758	887.3	8,696	-	-
NA	Stewart Point 15-33	035-22727	Pinedale	????	42.78111	109.86750	603.7	5,436	-	-
NA	Stewart Point 16-18D	035-22612	Pinedale	????	42.82905	109.90654	118.0	1,612	-	-
NA	Stewart Point 4-29D	035-23564	Pinedale	AP-3151	42.80745	109.90335	264.3	2,288	-	-
NA	Stewart Point 4-32	035-22391	Pinedale	AP-1634	42.79239	109.89680	87.0	705	-	-
NA	Stewart Point 5-17	035-23721	Pinedale	AP-4058	42.83170	109.89849	618.6	7,457	-	-
NA	Stewart Point 5-20	035-22262	Pinedale	MD-990	42.81916	109.89666	225.9	2,763	-	-
NA	Stewart Point 6-32	035-22258	Pinedale	AP-2H1	42.78925	109.88575	225.2	1,805	-	-
NA	Stewart Point 7-20	035-22561	Pinedale	CT-3673	42.81809	109.88687	654.4	5,448	-	-
NA	Stewart Point 9-33	035-22431	Pinedale	Ap-1637	42.78441	109.86263	60.6	668	-	-
NA	Stewart Point 11-34 (Shut in)		Pinedale	NA			-	-	-	-
					Individual Wells		**9,143.3**	**76,685**	**1.9**	**40.9**
					Total Wells		**75,846.9**	**585,085**	**30.8**	**649.6**
Drilled; but not completed	Mesa 10A-8D	035-24111	Pinedale	NA	-	-	-	-	0.6	12.7
Drilled; but not completed	Mesa 10A-20D	035-24045	Pinedale	NA	-	-	-	-	0.3	6.5
Drilled; but not completed	Mesa 1-17D	035-24143	Pinedale	NA	-	-	-	-	0.3	6.6
Drilled; but not completed	Mesa 11A-8D	035-24144	Pinedale	NA	-	-	-	-	0.9	19.1
Drilled; but not completed	Mesa 14-8D	035--23825	Pinedale	NA	-	-	-	-	0.3	6.8
Drilled; but not completed	Mesa 14D-20D	035-24051	Pinedale	NA	-	-	-	-	0.4	8.9
Drilled; but not completed	Mesa 1A-17D	035-23682	Pinedale	NA	-	-	-	-	0.3	7.1
Drilled; but not completed	Mesa 2-17D	035-24142	Pinedale	NA	-	-	-	-	0.9	18.3
Drilled; but not completed	Mesa 2A-17D	035-23769	Pinedale	NA	-	-	-	-	0.5	12.1
Drilled; but not completed	Mesa 3A-17D	035-23681	Pinedale	NA	-	-	-	-	0.3	5.9
Drilled; but not completed	Mesa 6BA-20D	035-24174	Pinedale	NA	-	-	-	-	0.2	4.4
Drilled; but not completed	Mesa 6C-20D	035-24062	Pinedale	NA	-	-	-	-	0.5	11.1
Drilled; but not completed	Mesa 6CA-20D	035-24180	Pinedale	NA	-	-	-	-	0.3	5.7
Drilled; but not completed	Mesa 6D-20D	035-24061	Pinedale	NA	-	-	-	-	0.5	10.7
Drilled; but not completed	Mesa 7B-20D	035-24049	Pinedale	NA	-	-	-	-	0.4	8.8
Drilled; but not completed	Mesa 7C-20D	035-24064	Pinedale	NA	-	-	-	-	1.4	29.2
Drilled; but not completed	Mesa 9-20D	035-24048	Pinedale	NA	-	-	-	-	0.8	17.6
Drilled; but not completed	Mesa 9D-20D	035-24047	Pinedale	NA	-	-	-	-	1.1	23.8
									10.2	**215.4**
									40.9	**865.0**

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

	Burners	Engines	Tanks and Pressurized Vessels						Still & Flash Tank Vents					
	N0x	N0x	VOC	Benzene	Toluene	benzene	Xylene	Controlled	VOC	Benzene	Toluene	benzene	Xylene	Controlled
Pad Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
	-	61.1	-	-	-	-	-	-	-	-	-	-	-	-
	3.9	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.3	1.2	-	-	-	-	-	-	-	-	-	-	-	-
	1.3	1.3	-	-	-	-	-	-	-	-	-	-	-	-
	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-
Pad Wellsites														
Mesa 7-21		-	1.1166	0.0086	0.0097	0.0006	0.0029	Yes						Yes
Mesa 7-21		-	1.7398	0.0134	0.0152	0.0009	0.0045	Yes						Yes
Mesa 7-21		-	0.8366	0.0064	0.0073	0.0004	0.0021	Yes						Yes
Mesa 7-21		-	0.7530	0.0058	0.0066	0.0004	0.0019	Yes						Yes
Mesa 7-21		-	0.8791	0.0068	0.0077	0.0005	0.0023	Yes						Yes
Mesa 7-21		-	1.8373	0.0141	0.0160	0.0009	0.0047	Yes						Yes
Mesa 7-21		-	1.2600	0.0097	0.0110	0.0006	0.0032	Yes						Yes
Mesa 7-21		-	1.9289	0.0148	0.0168	0.0010	0.0049	Yes						Yes
Mesa 7-21		-	1.2926	0.0099	0.0113	0.0007	0.0033	Yes						Yes
Mesa 7-21		-	2.0496	0.0158	0.0179	0.0011	0.0053	Yes						Yes
	0.79		13.6935	0.1053	0.1194	0.0070	0.0351		1.5651	0.1874	0.4851	0.0248	0.3514	
Mesa 13A-16D		-	1.3682	0.0105	0.0119	0.0007	0.0035	Yes						Yes
Mesa 13A-16D		-	2.1784	0.0168	0.0190	0.0011	0.0056	Yes	0.9896	0.1230	0.2892	0.0132	0.1636	Yes
Mesa 13A-16D		-	1.2007	0.0092	0.0105	0.0006	0.0031	Yes						Yes
Mesa 13A-16D		-	0.8612	0.0066	0.0075	0.0004	0.0022	Yes						Yes
Mesa 13A-16D		-	0.9291	0.0071	0.0081	0.0005	0.0024	Yes	0.9886	0.1229	0.2888	0.0132	0.1632	Yes
	0.44		6.5376	0.0503	0.0570	0.0034	0.0168		1.9782	0.2459	0.5780	0.0264	0.3268	
Mesa 11-20		-	0.5057	0.0039	0.0044	0.0003	0.0013	Yes						Yes
Mesa 11-20		-	0.4701	0.0036	0.0041	0.0002	0.0012	Yes						Yes
	0.33		0.9758	0.0075	0.0085	0.0005	0.0025		0.3296	0.0409	0.0934	0.0041	0.0500	
Mesa 1		-	0.1442	0.0011	0.0013	0.0001	0.0004	Yes						Yes
Mesa 1		-	1.2638	0.0097	0.0110	0.0006	0.0032	Yes						Yes
Mesa 1		-	1.5963	0.0123	0.0139	0.0008	0.0041	Yes						Yes
Mesa 1		-	0.4191	0.0032	0.0037	0.0002	0.0011	Yes						Yes
Mesa 1		-	1.2811	0.0099	0.0112	0.0007	0.0033	Yes						Yes
Mesa 1		-	1.0626	0.0082	0.0093	0.0005	0.0027	Yes						Yes
	0.68		5.7672	0.0444	0.0503	0.0030	0.0148		1.1037	0.1359	0.3345	0.0160	0.2090	
Mesa 10-8D		-	1.1251	0.0087	0.0098	0.0006	0.0029	Yes						Yes
Mesa 10-8D		-	1.3527	0.0104	0.0118	0.0007	0.0035	Yes						Yes
Mesa 10-8D		-	1.1452	0.0088	0.0100	0.0006	0.0029	Yes						Yes
Mesa 10-8D		-	0.7130	0.0055	0.0062	0.0004	0.0018	Yes						Yes
Mesa 10-8D		-	1.6532	0.0127	0.0144	0.0008	0.0042	Yes						Yes
	0.61		5.9892	0.0461	0.0522	0.0031	0.0154		0.9824	0.1201	0.3004	0.0147	0.1953	
Mesa 11-16		-	0.6713	0.0052	0.0059	0.0003	0.0017	Yes						Yes
Mesa 11-16		-	0.6801	0.0052	0.0059	0.0003	0.0017	Yes						Yes
Mesa 11-16		-	0.9940	0.0076	0.0087	0.0005	0.0025	Yes						Yes
Mesa 11-16		-	0.6328	0.0049	0.0055	0.0003	0.0016	Yes						Yes
	0.51		2.9782	0.0229	0.0260	0.0015	0.0076		0.4367	0.0530	0.1345	0.0067	0.0913	
Mesa 12-16		-	0.5652	0.0043	0.0049	0.0003	0.0014	Yes						Yes
Mesa 12-16		-	1.2878	0.0099	0.0112	0.0007	0.0033	Yes						Yes
Mesa 12-16		-	0.9098	0.0070	0.0079	0.0005	0.0023	Yes						Yes
	0.47		2.7629	0.0213	0.0241	0.0014	0.0071		0.4336	0.0527	0.1333	0.0066	0.0896	
Mesa 12-17D		-	2.2596	0.0174	0.0197	0.0012	0.0058	Yes						Yes
Mesa 12-17D		-	0.6106	0.0047	0.0053	0.0003	0.0016	Yes						Yes
Mesa 12-17D		-	1.8947	0.0146	0.0165	0.0010	0.0049	Yes						Yes
Mesa 12-17D		-	0.9256	0.0071	0.0081	0.0005	0.0024	Yes						Yes
Mesa 12-17D		-	1.2552	0.0097	0.0109	0.0006	0.0032	Yes						Yes
Mesa 12-17D		-	2.3261	0.0179	0.0203	0.0012	0.0060	Yes						Yes
Mesa 12-17D		-	2.0675	0.0159	0.0180	0.0011	0.0053	Yes						Yes
	0.67		11.3394	0.0872	0.0989	0.0058	0.0291		1.3653	0.1647	0.4221	0.0213	0.2954	
Mesa 14-16		-	0.6395	0.0049	0.0056	0.0003	0.0016	Yes						Yes
Mesa 14-16		-	1.0493	0.0081	0.0091	0.0005	0.0027	Yes						Yes
	0.33		1.6888	0.0130	0.0147	0.0009	0.0043		0.1817	0.0218	0.0563	0.0029	0.0403	

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Burners	Engines	Tanks and Pressurized Vessels						Still & Flash Tank Vents					
		N0x	N0x	VOC	Benzene	Toluene	benzene	Xylene	Controlled	VOC	Benzene	Toluene	benzene	Xylene	Controlled
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
	Pinedale Compressor Station	-	61.1	-	-	-	-	-	-	-	-	-	-	-	-
	Pinedale Stabilizer Site	3.9	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mesa 15-6 CDP Site	0.3	1.2	-	-	-	-	-	-	-	-	-	-	-	-
	Mesa 14-16 CDP Site	1.3	1.3	-	-	-	-	-	-	-	-	-	-	-	-
	Stewart Point 16-18 CDP Site	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-
Pad Wellsites															
Mesa 7-21	Mesa 2-21D		-	1.1166	0.0086	0.0097	0.0006	0.0029	Yes						Yes
Mesa 7-21	Mesa 6-21D		-	1.7398	0.0134	0.0152	0.0009	0.0045	Yes						Yes
Mesa 7-21	Mesa 6A-21D		-	0.8366	0.0064	0.0073	0.0004	0.0021	Yes						Yes
Mesa 7-21	Mesa 7-21		-	0.7530	0.0058	0.0066	0.0004	0.0019	Yes						Yes
Mesa 7-21	Mesa 7D-21D		-	0.8791	0.0068	0.0077	0.0005	0.0023	Yes						Yes
Mesa 7-21	Mesa 8-21D		-	1.8373	0.0141	0.0160	0.0009	0.0047	Yes						Yes
Mesa 7-21	Mesa 8D-21D		-	1.2600	0.0097	0.0110	0.0006	0.0032	Yes						Yes
Mesa 7-21	Mesa 11-21D		-	1.9289	0.0148	0.0168	0.0010	0.0049	Yes						Yes
Mesa 7-21	Mesa 11A-21D		-	1.2926	0.0099	0.0113	0.0007	0.0033	Yes						Yes
Mesa 7-21	Mesa 14A-21D		-	2.0496	0.0158	0.0179	0.0011	0.0053	Yes						Yes
		0.79		13.6935	0.1053	0.1194	0.0070	0.0351		1.5651	0.1874	0.4851	0.0248	0.3514	
Mesa 13A-16D	Mesa 13A-16D		-	1.3682	0.0105	0.0119	0.0007	0.0035	Yes						Yes
Mesa 13A-16D	Mesa 13AA-16D		-	2.1784	0.0168	0.0190	0.0011	0.0056	Yes	0.9896	0.1230	0.2892	0.0132	0.1636	Yes
Mesa 13A-16D	Mesa 1-20D		-	1.2007	0.0092	0.0105	0.0006	0.0031	Yes						Yes
Mesa 13A-16D	Mesa 4-21D		-	0.8612	0.0066	0.0075	0.0004	0.0022	Yes						Yes
Mesa 13A-16D	Mesa 16-17D		-	0.9291	0.0071	0.0081	0.0005	0.0024	Yes	0.9886	0.1229	0.2888	0.0132	0.1632	Yes
		0.44		6.5376	0.0503	0.0570	0.0034	0.0168		1.9782	0.2459	0.5780	0.0264	0.3268	
Mesa 11-20	Mesa 11-20		-	0.5057	0.0039	0.0044	0.0003	0.0013	Yes						Yes
Mesa 11-20	Mesa 13C-20D		-	0.4701	0.0036	0.0041	0.0002	0.0012	Yes						Yes
		0.33		0.9758	0.0075	0.0085	0.0005	0.0025		0.3296	0.0409	0.0934	0.0041	0.0500	
Mesa 1	Mesa Unit 1		-	0.1442	0.0011	0.0013	0.0001	0.0004	Yes						Yes
Mesa 1	Mesa Unit 1-7D		-	1.2638	0.0097	0.0110	0.0006	0.0032	Yes						Yes
Mesa 1	Mesa Unit 1A-7D		-	1.5963	0.0123	0.0139	0.0008	0.0041	Yes						Yes
Mesa 1	Mesa Unit 2-7D		-	0.4191	0.0032	0.0037	0.0002	0.0011	Yes						Yes
Mesa 1	Mesa Unit 2A-7D		-	1.2811	0.0099	0.0112	0.0007	0.0033	Yes						Yes
Mesa 1	Mesa Unit 8-7D		-	1.0626	0.0082	0.0093	0.0005	0.0027	Yes						Yes
		0.68		5.7672	0.0444	0.0503	0.0030	0.0148		1.1037	0.1359	0.3345	0.0160	0.2090	
Mesa 10-8D	Mesa 10-8D		-	1.1251	0.0087	0.0098	0.0006	0.0029	Yes						Yes
Mesa 10-8D	Mesa 11-8D		-	1.3527	0.0104	0.0118	0.0007	0.0035	Yes						Yes
Mesa 10-8D	Mesa 14A-8D		-	1.1452	0.0088	0.0100	0.0006	0.0029	Yes						Yes
Mesa 10-8D	Mesa 15-8		-	0.7130	0.0055	0.0062	0.0004	0.0018	Yes						Yes
Mesa 10-8D	Mesa 16-8D		-	1.6532	0.0127	0.0144	0.0008	0.0042	Yes						Yes
		0.61		5.9892	0.0461	0.0522	0.0031	0.0154		0.9824	0.1201	0.3004	0.0147	0.1953	
Mesa 11-16	Mesa 11-16		-	0.6713	0.0052	0.0059	0.0003	0.0017	Yes						Yes
Mesa 11-16	Mesa 11A-16D		-	0.6801	0.0052	0.0059	0.0003	0.0017	Yes						Yes
Mesa 11-16	Mesa 14B-16D		-	0.9940	0.0076	0.0087	0.0005	0.0025	Yes						Yes
Mesa 11-16	Mesa 7C-16D		-	0.6328	0.0049	0.0055	0.0003	0.0016	Yes						Yes
		0.51		2.9782	0.0229	0.0260	0.0015	0.0076		0.4367	0.0530	0.1345	0.0067	0.0913	
Mesa 12-16	Mesa 12-16		-	0.5652	0.0043	0.0049	0.0003	0.0014	Yes						Yes
Mesa 12-16	Mesa 12B-16D		-	1.2878	0.0099	0.0112	0.0007	0.0033	Yes						Yes
Mesa 12-16	Mesa 9-17D		-	0.9098	0.0070	0.0079	0.0005	0.0023	Yes						Yes
		0.47		2.7629	0.0213	0.0241	0.0014	0.0071		0.4336	0.0527	0.1333	0.0066	0.0896	
Mesa 12-17D	Mesa 10-17D		-	2.2596	0.0174	0.0197	0.0012	0.0058	Yes						Yes
Mesa 12-17D	Mesa 11C-17D		-	0.6106	0.0047	0.0053	0.0003	0.0016	Yes						Yes
Mesa 12-17D	Mesa 12-17D		-	1.8947	0.0146	0.0165	0.0010	0.0049	Yes						Yes
Mesa 12-17D	Mesa 5-17D		-	0.9256	0.0071	0.0081	0.0005	0.0024	Yes						Yes
Mesa 12-17D	Mesa 5A-17D		-	1.2552	0.0097	0.0109	0.0006	0.0032	Yes						Yes
Mesa 12-17D	Mesa 6-17D		-	2.3261	0.0179	0.0203	0.0012	0.0060	Yes						Yes
Mesa 12-17D	Mesa 7-17D		-	2.0675	0.0159	0.0180	0.0011	0.0053	Yes						Yes
		0.67		11.3394	0.0872	0.0989	0.0058	0.0291		1.3653	0.1647	0.4221	0.0213	0.2954	
Mesa 14-16	Mesa 14-16		-	0.6395	0.0049	0.0056	0.0003	0.0016	Yes						Yes
Mesa 14-16	Mesa 14A-16D		-	1.0493	0.0081	0.0091	0.0005	0.0027	Yes						Yes
		0.33		1.6888	0.0130	0.0147	0.0009	0.0043		0.1817	0.0218	0.0563	0.0029	0.0403	

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Burners	Engines	Tanks and Pressurized Vessels						Still & Flash Tank Vents					
		N0x	N0x	VOC	Benzene	Toluene	benzene	Xylene	Controlled	VOC	Benzene	Toluene	benzene	Xylene	Controlled
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
Mesa 15-20	Mesa 14-20D		-	0.9037	0.0070	0.0079	0.0005	0.0023	Yes						Yes
Mesa 15-20	Mesa 15-20		-	0.9061	0.0070	0.0079	0.0005	0.0023	Yes						Yes
Mesa 15-20	Mesa 16-20D		-	2.1095	0.0162	0.0184	0.0011	0.0054	Yes						Yes
Mesa 15-20	Mesa 16C-20D		-	0.6376	0.0049	0.0056	0.0003	0.0016	Yes						Yes
		0.50		4.5569	0.0351	0.0397	0.0023	0.0117		1.1622	0.1439	0.3477	0.0163	0.2082	
Mesa 15-6	Mesa 14-6D		-	1.1096	0.0085	0.0097	0.0006	0.0028	Yes						Yes
Mesa 15-6	Mesa 15-6		-	0.8636	0.0066	0.0075	0.0004	0.0022	Yes						Yes
Mesa 15-6	Mesa 16-6D		-	0.9339	0.0072	0.0081	0.0005	0.0024	Yes						Yes
		0.47		2.9071	0.0224	0.0253	0.0015	0.0075		0.1858	0.0220	0.0576	0.0030	0.0442	
Mesa 16-16	Mesa 16-16		-	0.6371	0.0049	0.0056	0.0003	0.0016	Yes						Yes
Mesa 16-16	Mesa 16C-16D		-	2.2027	0.0169	0.0192	0.0011	0.0056	Yes						Yes
		0.29		2.8398	0.0218	0.0248	0.0015	0.0073		0.2177	0.0258	0.0675	0.0035	0.0512	
Stewart Point 16-29	Stewart Point 16-29		-	1.6770	0.0129	0.0146	0.0009	0.0043	Yes						Yes
Stewart Point 16-29	Stewart Point 9-29D		-	2.6191	0.0201	0.0228	0.0013	0.0067	Yes						Yes
		0.33		4.2961	0.0330	0.0375	0.0022	0.0110		0.5207	0.0629	0.1610	0.0081	0.1120	
Mesa 2	Mesa Unit 2		-	0.0681	0.0005	0.0006	0.0000	0.0002	Yes						Yes
Mesa 2	Mesa 2-16D		-	0.2992	0.0023	0.0026	0.0002	0.0008	Yes						Yes
Mesa 2	Mesa 3-16D		-	0.4629	0.0036	0.0040	0.0002	0.0012	Yes						Yes
Mesa 2	Mesa 4-16D		-	0.4370	0.0034	0.0038	0.0002	0.0011	Yes						Yes
Mesa 2	Mesa 7-16D		-	0.4570	0.0035	0.0040	0.0002	0.0012	Yes						Yes
		0.79		1.7243	0.0133	0.0150	0.0009	0.0044		0.4205	0.0520	0.1261	0.0059	0.0761	
Mesa 2-20	Mesa 14-17D		-	1.1914	0.0092	0.0104	0.0006	0.0031	Yes						Yes
Mesa 2-20	Mesa 15-17D		-	1.4342	0.0110	0.0125	0.0007	0.0037	Yes						Yes
Mesa 2-20	Mesa 2-20D		-	1.3423	0.0103	0.0117	0.0007	0.0034	Yes						Yes
Mesa 2-20	Mesa 3-20		-	0.5241	0.0040	0.0046	0.0003	0.0013	Yes						Yes
Mesa 2-20	Mesa 5CA-20D		-	-	-	-	-	-							Yes
Mesa 2-20	Mesa 4DD-20D		-	-	-	-	-	-							Yes
Mesa 2-20	Mesa 2BA-20D		-	-	-	-	-	-							Yes
Mesa 2-20	Mesa 5DB-20D		-	-	-	-	-	-							Yes
		0.43		4.4919	0.0346	0.0392	0.0023	0.0115		0.7796	0.0954	0.2383	0.0116	0.1546	
Mesa 3	Mesa 12A-16		-	1.0271	0.0079	0.0090	0.0005	0.0026	Yes						Yes
Mesa 3	Mesa Unit 3		-	0.3964	0.0030	0.0035	0.0002	0.0010	Yes						Yes
Mesa 3	Mesa 4D-16D		-	0.6833	0.0053	0.0060	0.0004	0.0018	Yes						Yes
Mesa 3	Mesa 5A-16D		-	0.6224	0.0048	0.0054	0.0003	0.0016	Yes						Yes
Mesa 3	Mesa 6A-16D		-	1.1847	0.0091	0.0103	0.0006	0.0030	Yes						Yes
Mesa 3	Mesa 8-17		-	0.8190	0.0063	0.0071	0.0004	0.0021	Yes						Yes
		0.81		4.7329	0.0364	0.0413	0.0024	0.0121		0.6342	0.0767	0.1958	0.0098	0.1349	
Mesa 3-21	Mesa 3-21		-	1.2857	0.0099	0.0112	0.0007	0.0033	Yes						Yes
Mesa 3-21	Mesa 3B-21D		-	0.8569	0.0066	0.0075	0.0004	0.0022	Yes						Yes
		0.28		2.1426	0.0165	0.0187	0.0011	0.0055		0.5220	0.0646	0.1562	0.0073	0.0935	
Mesa 3-8	Mesa 3-8		-	0.9758	0.0075	0.0085	0.0005	0.0025	Yes						Yes
Mesa 3-8	Mesa 6-8D		-	0.8911	0.0069	0.0078	0.0005	0.0023	Yes						Yes
		0.29		1.8669	0.0144	0.0163	0.0010	0.0048		0.4150	0.0514	0.1239	0.0058	0.0736	
Mesa 5-8	Mesa 5-8		-	0.5468	0.0042	0.0048	0.0003	0.0014	Yes						Yes
Mesa 5-8	Mesa 9-7		-	0.6686	0.0051	0.0058	0.0003	0.0017	Yes						Yes
		0.43		1.2154	0.0093	0.0106	0.0006	0.0031		0.2010	0.0246	0.0615	0.0030	0.0400	
Mesa 6-6	Mesa 6-6		-	2.0956	0.0161	0.0183	0.0011	0.0054	Yes						Yes
Mesa 6-6	Stewart Point 15-32D		-	0.4287	0.0033	0.0037	0.0002	0.0011	Yes						Yes
		0.40		2.5243	0.0194	0.0220	0.0013	0.0065		0.9710	0.1193	0.2636	0.0113	0.1336	
Mesa 7-7	Mesa 10-7D		-	0.1213	0.0009	0.0011	0.0001	0.0003	Yes						Yes
Mesa 7-7	Mesa 3-7		-	0.6927	0.0053	0.0060	0.0004	0.0018	Yes						Yes
Mesa 7-7	Mesa 6-7D		-	0.2856	0.0022	0.0025	0.0001	0.0007	Yes						Yes
Mesa 7-7	Mesa 7-7		-	0.7001	0.0054	0.0061	0.0004	0.0018	Yes						Yes
Mesa 7-7	Mesa 9B-7D		-	0.1392	0.0011	0.0012	0.0001	0.0004	Yes						Yes
		0.34		1.9388	0.0149	0.0169	0.0010	0.0050		0.7556	0.0925	0.2028	0.0087	0.1015	
Mesa 7-8	Mesa 1D-8D		-	0.2479	0.0019	0.0022	0.0001	0.0006	Yes						Yes
Mesa 7-8	Mesa 7-8		-	0.7431	0.0057	0.0065	0.0004	0.0019	Yes						Yes
Mesa 7-8	Mesa 7A-8D		-	0.5586	0.0043	0.0049	0.0003	0.0014	Yes						Yes

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Burners	Engines	Tanks and Pressurized Vessels						Still & Flash Tank Vents					
		N0x	N0x	VOC	Benzene	Toluene	benzene	Xylene	Controlled	VOC	Benzene	Toluene	benzene	Xylene	Controlled
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
		0.33		1.5496	0.0119	0.0135	0.0008	0.0040		0.3698	0.0458	0.1107	0.0052	0.0665	
Mesa 9-8	Mesa 12-9D		-	1.0092	0.0078	0.0088	0.0005	0.0026	Yes						Yes
Mesa 9-8	Mesa 8-8D		-	0.7346	0.0057	0.0064	0.0004	0.0019	Yes						Yes
Mesa 9-8	Mesa 13-9D		-	0.6935	0.0053	0.0060	0.0004	0.0018	Yes						Yes
Mesa 9-8	Mesa 9-8		-	1.8317	0.0141	0.0160	0.0009	0.0047	Yes						Yes
		0.65		4.2689	0.0328	0.0372	0.0022	0.0109		0.4700	0.0566	0.1454	0.0074	0.1025	
Stewart Point 11-33	Stewart Point 11-33		-	0.4712	0.0036	0.0041	0.0002	0.0012	Yes						Yes
Stewart Point 11-33	Stewart Point 13-33D		-	1.7777	0.0137	0.0155	0.0009	0.0046	Yes						Yes
		0.34		2.2489	0.0173	0.0196	0.0012	0.0058		0.2532	0.0307	0.0780	0.0039	0.0531	
Stewart Point 2-20	Stewart Point 1-20D		-	2.7679	0.0213	0.0241	0.0014	0.0071	Yes						Yes
Stewart Point 2-20	Stewart Point 2-20		-	1.9214	0.0148	0.0168	0.0010	0.0049	Yes						Yes
Stewart Point 2-20	Stewart Point 3-20D		-	1.8258	0.0140	0.0159	0.0009	0.0047	Yes						Yes
		0.46		6.5151	0.0501	0.0568	0.0033	0.0167		0.6985	0.0844	0.2157	0.0108	0.1496	
Stewart Point 3-28	Stewart Point 2A-28D		-	0.1143	0.0009	0.0010	0.0001	0.0003	Yes						Yes
Stewart Point 3-28	Stewart Point 3-28		-	0.7311	0.0056	0.0064	0.0004	0.0019	Yes						Yes
		0.31		0.8454	0.0065	0.0074	0.0004	0.0022		0.2935	0.0356	0.0769	0.0032	0.0376	
Stewart Point 8-32D	Stewart Point 10-32D		-	1.4860	0.0114	0.0130	0.0008	0.0038	Yes						Yes
Stewart Point 8-32D	Stewart Point 12-33D		-	3.6558	0.0281	0.0319	0.0019	0.0094	Yes						Yes
Stewart Point 8-32D	Stewart Point 16-32D		-	1.5074	0.0116	0.0131	0.0008	0.0039	Yes						Yes
Stewart Point 8-32D	Stewart Point 5-33DR		-	2.7153	0.0209	0.0237	0.0014	0.0070	Yes						Yes
Stewart Point 8-32D	Stewart Point 7-32D		-	1.2093	0.0093	0.0105	0.0006	0.0031	Yes						Yes
Stewart Point 8-32D	Stewart Point 8-32D		-	5.0903	0.0392	0.0444	0.0026	0.0131	Yes						Yes
Stewart Point 8-32D	Stewart Point 9-32D		-	1.0298	0.0079	0.0090	0.0005	0.0026	Yes						Yes
		0.98		16.6939	0.1284	0.1455	0.0086	0.0428		1.5587	0.1870	0.4829	0.0246	0.3468	
Mesa 12-21 LEK	Mesa 12-21D		-	1.6762	0.0129	0.0146	0.0009	0.0043	Yes	0.2122	0.0255	0.0657	0.0033	0.0466	Yes
Mesa 12-21 LEK	Mesa 12B-21D		-	0.6259	0.0048	0.0055	0.0003	0.0016	Yes	0.1824	0.0226	0.0539	0.0025	0.0312	Yes
Mesa 12-21 LEK	Mesa 13-21D		-	1.2734	0.0098	0.0111	0.0007	0.0033	Yes	0.2063	0.0250	0.0635	0.0032	0.0429	Yes
Mesa 12-21 LEK	Mesa 13D-21D		-	0.6691	0.0051	0.0058	0.0003	0.0017	Yes	0.1843	0.0229	0.0547	0.0025	0.0321	Yes
Mesa 12-21 LEK	Mesa 14-21D		-	1.4203	0.0109	0.0124	0.0007	0.0036	Yes	0.2088	0.0253	0.0644	0.0032	0.0444	Yes
		0.42		5.6649	0.0436	0.0494	0.0029	0.0145		0.9940	0.1213	0.3022	0.0147	0.1972	
Stewart Point 4-33	Stewart Point 13-28D		-	1.9484	0.0150	0.0170	0.0010	0.0050	Yes	0.2096	0.0253	0.0648	0.0033	0.0449	Yes
Stewart Point 4-33	Stewart Point 14-28D		-	0.9809	0.0075	0.0086	0.0005	0.0025	Yes	0.1888	0.0234	0.0566	0.0027	0.0341	Yes
Stewart Point 4-33	Stewart Point 1-32D		-	3.7234	0.0286	0.0325	0.0019	0.0095	Yes	0.2179	0.0258	0.0676	0.0035	0.0515	Yes
Stewart Point 4-33	Stewart Point 3-33D		-	1.0599	0.0082	0.0092	0.0005	0.0027	Yes	0.1917	0.0237	0.0578	0.0027	0.0354	Yes
Stewart Point 4-33	Stewart Point 4-33		-	1.7550	0.0135	0.0153	0.0009	0.0045	Yes	0.2074	0.0251	0.0639	0.0032	0.0436	Yes
		0.78		9.4677	0.0728	0.0825	0.0049	0.0243		1.0154	0.1233	0.3107	0.0154	0.2095	
Stewart Point 15-20D	Stewart Point 14-20		-	1.6262	0.0125	0.0142	0.0008	0.0042	Yes	0.2497	0.0305	0.0765	0.0038	0.0503	Yes
Stewart Point 15-20D	Stewart Point 15-20D		-	1.6324	0.0126	0.0142	0.0008	0.0042	Yes	0.2497	0.0305	0.0765	0.0038	0.0503	Yes
		0.30		3.2586	0.0251	0.0284	0.0017	0.0084		0.4994	0.0610	0.1530	0.0076	0.1006	
		14.76		**137.5**	**1.1**	**1.2**	**0.1**	**0.4**		**21.3**	**2.6**	**6.4**	**0.3**	**4.1**	
Single Wellsites															
NA	Mesa 11-17	0.20	-	0.9699	0.0075	0.0085	0.0005	0.0025	Yes	8.5541	1.0462	2.6158	0.1277	1.7015	No
NA	Mesa 11-9	0.05	-	4.4716	0.0344	0.0390	0.0023	0.0115	No	5.9420	0.7031	1.4692	0.0603	0.6864	No
NA	Mesa 3-17	0.17	-	1.2432	0.0096	0.0108	0.0006	0.0032	Yes	8.8904	1.0755	2.7425	0.1373	1.8878	No
NA	Mesa 3-22D	0.05	-	0.1002	0.0008	0.0009	0.0001	0.0003	No	4.5652	0.4470	0.8427	0.0322	0.3487	No
NA	Mesa 5-21	0.20	-	0.8647	0.0067	0.0075	0.0004	0.0022	Yes	8.5152	1.0428	2.5999	0.1265	1.6784	No
NA	Mesa 5-22	0.17	-	1.0856	0.0084	0.0095	0.0006	0.0028	Yes	8.6226	1.0524	2.6422	0.1297	1.7376	No
NA	Mesa 10-16	0.20	-	0.4525	0.0035	0.0039	0.0002	0.0012	Yes	7.3064	0.9077	2.0945	0.0937	1.1432	No
NA	Mesa 10A-16	0.14	-	0.9483	0.0073	0.0083	0.0005	0.0024	Yes	9.7355	1.1991	2.9499	0.1413	1.8414	No
NA	Mesa 12-8	0.14		0.8591	0.0066	0.0075	0.0004	0.0022	Yes	8.2948	1.0215	2.5138	0.1204	1.5700	No
NA	Mesa 13-5	0.20	-	0.4763	0.0037	0.0042	0.0002	0.0012	Yes	5.2390	0.6484	1.5696	0.0738	0.9437	No
NA	Mesa 15-16	0.20	-	0.5994	0.0046	0.0052	0.0003	0.0015	Yes	7.8600	0.9750	2.3340	0.1085	1.3698	No
NA	Mesa 4-8	0.20	-	16.9303	0.1302	0.1476	0.0087	0.0434	No	8.3059	1.0227	2.5181	0.1207	1.5751	No
NA	Mesa Unit 6	0.29	-	6.6140	0.0509	0.0577	0.0034	0.0170	No	6.9389	0.8581	1.9299	0.0843	1.0070	No
NA	Mesa 6-16	0.20	-	0.4303	0.0033	0.0038	0.0002	0.0011	Yes	6.9221	0.8557	1.9219	0.0838	1.0060	No
NA	Mesa 9-16	0.20	-	9.3600	0.0720	0.0816	0.0048	0.0240	No	7.2241	0.8969	2.0575	0.0916	1.1112	No
NA	Pinedale Unit 8	0.10	-	1.3944	0.0107	0.0122	0.0007	0.0036	No	3.0734	0.1685	2.0930	0.0105	0.1105	No
NA	Sidewinder 3-15D	0.02	-	1.4264	0.0110	0.0124	0.0007	0.0037	No	4.3546	0.4046	0.7510	0.0284	0.3060	No

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Burners	Engines	Tanks and Pressurized Vessels						Still & Flash Tank Vents					
		N0x	N0x	VOC	Benzene	Toluene	benzene	Xylene	Controlled	VOC	Benzene	Toluene	benzene	Xylene	Controlled
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
NA	Stewart Point 11-21	0.20	-	11.8816	0.0914	0.1036	0.0061	0.0305	No	7.7859	0.9665	2.3018	0.1064	1.3362	No
NA	Stewart Point 15-17D	0.20	-	2.3229	0.0179	0.0203	0.0012	0.0060	Yes	10.5609	1.2727	3.2664	0.1650	2.2959	No
NA	Stewart Point 15-33	0.23	-	1.4521	0.0112	0.0127	0.0007	0.0037	Yes	8.7838	1.0665	2.7035	0.1343	1.8275	No
NA	Stewart Point 16-18D	0.23	-	8.6121	0.0662	0.0751	0.0044	0.0221	No	6.0031	0.7138	1.4991	0.0618	0.7053	No
NA	Stewart Point 4-29D	0.16	-	12.2236	0.0940	0.1066	0.0063	0.0313	No	7.5482	0.9382	2.1998	0.1000	1.2378	No
NA	Stewart Point 4-32	0.20	-	3.7664	0.0290	0.0328	0.0019	0.0097	No	5.4375	0.6143	1.2360	0.0493	0.5502	No
NA	Stewart Point 5-17	0.25	-	1.9919	0.0153	0.0174	0.0010	0.0051	Yes	0.2025	0.0247	0.0621	0.0030	0.0408	Yes
NA	Stewart Point 5-20	0.20	-	14.7612	0.1135	0.1287	0.0076	0.0378	No	8.1617	1.0095	2.2723	0.0993	1.1874	No
NA	Stewart Point 6-32	0.18	-	9.6432	0.0742	0.0841	0.0049	0.0247	No	8.1617	1.0095	2.2723	0.0993	1.1874	No
NA	Stewart Point 7-20	0.20	-	1.4553	0.0112	0.0127	0.0007	0.0037	Yes	10.2088	1.2433	3.1345	0.1546	2.0857	No
NA	Stewart Point 9-33	0.20	-	3.5688	0.0275	0.0311	0.0018	0.0092	No	5.3660	0.5259	0.9916	0.0379	0.4105	No
NA	Stewart Point 11-34 (Shut in)		-	-	-	-	-	-	No	-	-	-	-	-	NA
		4.98		**119.9**	**0.9**	**1.0**	**0.1**	**0.3**		**198.6**	**23.7**	**55.8**	**2.6**	**32.9**	
		19.74		**257.4**	**2.0**	**2.2**	**0.1**	**0.7**		**219.9**	**26.3**	**62.2**	**2.9**	**37.0**	
Drilled; but not completed	Mesa 10A-8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 10A-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 1-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 11A-8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 14-8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 14D-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 1A-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 2-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 2A-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 3A-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6BA-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6C-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6CA-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6D-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 7B-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 7C-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 9-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 9D-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
		VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
	Pinedale Compressor Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pinedale Stabilizer Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mesa 15-6 CDP Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mesa 14-16 CDP Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stewart Point 16-18 CDP Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pad Wellsites																	
Mesa 7-21	Mesa 2-21D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 6-21D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 6A-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 7-21	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 7-21	Mesa 7D-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 8-21D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mesa 7-21	Mesa 8D-21D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 11-21D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 11A-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 7-21	Mesa 14A-21D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
		-	-	-	-	-	0.5200	0.0003	0.0005	0.0000	0.0002	2.568					17.70
Mesa 13A-16D	Mesa 13A-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 13A-16D	Mesa 13AA-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 13A-16D	Mesa 1-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321					2.213
Mesa 13A-16D	Mesa 4-21D	-	-	-	-	-	-	-	-	-	-	0.321					2.213
Mesa 13A-16D	Mesa 16-17D	-	-	-	-	-	-	-	-	-	-	0.321					2.213
							0.3900	0.0002	0.0003	0.0000	0.0001	1.284					8.85
Mesa 11-20	Mesa 11-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mesa 11-20	Mesa 13C-20D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
							-	-	-	-	-	0.321					2.21
Mesa 1	Mesa Unit 1	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 1	Mesa Unit 1-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 1	Mesa Unit 1A-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 1	Mesa Unit 2-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 1	Mesa Unit 2A-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 1	Mesa Unit 8-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.7800	0.0004	0.0007	0.0000	0.0003	0.321					2.21
Mesa 10-8D	Mesa 10-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 10-8D	Mesa 11-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 10-8D	Mesa 14A-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 10-8D	Mesa 15-8	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 10-8D	Mesa 16-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.6500	0.0003	0.0006	0.0000	0.0002	0.321					2.21
Mesa 11-16	Mesa 11-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mesa 11-16	Mesa 11A-16D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mesa 11-16	Mesa 14B-16D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 11-16	Mesa 7C-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
							0.1300	0.0001	0.0001	0.0000	0.0000	0.642					4.43
Mesa 12-16	Mesa 12-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 12-16	Mesa 12B-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 12-16	Mesa 9-17D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.3900	0.0002	0.0003	0.0000	0.0001	-					-
Mesa 12-17D	Mesa 10-17D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 12-17D	Mesa 11C-17D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 12-17D	Mesa 12-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mesa 12-17D	Mesa 5-17D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 12-17D	Mesa 5A-17D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 12-17D	Mesa 6-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mesa 12-17D	Mesa 7-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	0.963					6.64
Mesa 14-16	Mesa 14-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 14-16	Mesa 14A-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000		-					-

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
		VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Mesa 15-20	Mesa 14-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 15-20	Mesa 15-20	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 15-20	Mesa 16-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 15-20	Mesa 16C-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
							0.5200	0.0003	0.0005	0.0000	0.0002	0.321					2.21
Mesa 15-6	Mesa 14-6D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 15-6	Mesa 15-6	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 15-6	Mesa 16-6D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.3900	0.0002	0.0003	0.0000	0.0001	-					-
Mesa 16-16	Mesa 16-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 16-16	Mesa 16C-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
							0.2600	0.0001	0.0002	0.0000	0.0001	0.321					2.21
Stewart Point 16-29	Stewart Point 16-29	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 16-29	Stewart Point 9-29D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	-					-
Mesa 2	Mesa Unit 2	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2	Mesa 2-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2	Mesa 3-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2	Mesa 4-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2	Mesa 7-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.6500	0.0003	0.0006	0.0000	0.0002	-					-
Mesa 2-20	Mesa 14-17D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2-20	Mesa 15-17D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 2-20	Mesa 2-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2-20	Mesa 3-20	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 2-20	Mesa 5CA-20D	-	-	-	-	-	na	na	na	na	na	-	-	-	-	-	0
Mesa 2-20	Mesa 4DD-20D	-	-	-	-	-	na	na	na	na	na	-	-	-	-	-	0
Mesa 2-20	Mesa 2BA-20D	-	-	-	-	-	na	na	na	na	na	-	-	-	-	-	0
Mesa 2-20	Mesa 5DB-20D	-	-	-	-	-	na	na	na	na	na	-	-	-	-	-	0
							0.5200	0.0003	0.0005	0.0000	0.0002	0.32					2.21
Mesa 3	Mesa 12A-16	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 3	Mesa Unit 3	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 3	Mesa 4D-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 3	Mesa 5A-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 3	Mesa 6A-16D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 3	Mesa 8-17	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.6500	0.0003	0.0006	0.0000	0.0002	0.642					4.43
Mesa 3-21	Mesa 3-21	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 3-21	Mesa 3B-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
							0.2600	0.0001	0.0002	0.0000	0.0001	0.321					2.21
Mesa 3-8	Mesa 3-8	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 3-8	Mesa 6-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	-					-
Mesa 5-8	Mesa 5-8	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 5-8	Mesa 9-7	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	-					-
Mesa 6-6	Mesa 6-6	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 6-6	Stewart Point 15-32D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	-					-
Mesa 7-7	Mesa 10-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 7-7	Mesa 3-7	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 7-7	Mesa 6-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 7-7	Mesa 7-7	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 7-7	Mesa 9B-7D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
							0.6500	0.0003	0.0006	0.0000	0.0002	0.963					6.64
Mesa 7-8	Mesa 1D-8D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Mesa 7-8	Mesa 7-8	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 7-8	Mesa 7A-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
		VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
							0.2600	0.0001	0.0002	0.0000	0.0001	0.642					4.43
Mesa 9-8	Mesa 12-9D	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Mesa 9-8	Mesa 8-8D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 9-8	Mesa 13-9D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 9-8	Mesa 9-8	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	
							0.3900	0.0002	0.0003	0.0000	0.0001	0.321					2.21
Stewart Point 11-33	Stewart Point 11-33	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 11-33	Stewart Point 13-33D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	-					-
Stewart Point 2-20	Stewart Point 1-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 2-20	Stewart Point 2-20	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 2-20	Stewart Point 3-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-					-
							0.3900	0.0002	0.0003	0.0000	0.0001						
Stewart Point 3-28	Stewart Point 2A-28D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
Stewart Point 3-28	Stewart Point 3-28	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.1300	0.0001	0.0001	0.0000	0.0000	0.321					2.21
Stewart Point 8-32D	Stewart Point 10-32D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Stewart Point 8-32D	Stewart Point 12-33D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Stewart Point 8-32D	Stewart Point 16-32D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Stewart Point 8-32D	Stewart Point 5-33DR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Stewart Point 8-32D	Stewart Point 7-32D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Stewart Point 8-32D	Stewart Point 8-32D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Stewart Point 8-32D	Stewart Point 9-32D	-	-	-	-	-	-	-	-	-	-	0.321	-	-	-	-	2.213
							0.1300	0.0001	0.0001	0.0000	0.0000	0.642					4.43
Mesa 12-21 LEK	Mesa 12-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 12-21 LEK	Mesa 12B-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 12-21 LEK	Mesa 13-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Mesa 12-21 LEK	Mesa 13D-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
Mesa 12-21 LEK	Mesa 14-21D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.6500	0.0003	0.0006	0.0000	0.0002	0.642					4.43
Stewart Point 4-33	Stewart Point 13-28D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Stewart Point 4-33	Stewart Point 14-28D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 4-33	Stewart Point 1-32D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 4-33	Stewart Point 3-33D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 4-33	Stewart Point 4-33	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.5200	0.0003	0.0005	0.0000	0.0002	-					-
Stewart Point 15-20D	Stewart Point 14-20	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
Stewart Point 15-20D	Stewart Point 15-20D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
							0.2600	0.0001	0.0002	0.0000	0.0001	-					-
							11.18	**0.01**	**0.01**	**0.00**	**0.00**	**11.877**	**-**	**-**	**-**	**-**	**81.881**
Single Wellsites																	
NA	Mesa 11-17	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 11-9	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
NA	Mesa 3-17	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 3-22D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 5-21	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 5-22	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 10-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 10A-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 12-8						0.1300	0.0001	0.0001	0.0000	0.0000						
NA	Mesa 13-5	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 15-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 4-8	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa Unit 6	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 6-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Mesa 9-16	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Pinedale Unit 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
NA	Sidewinder 3-15D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213

Table F.1.3
2005 Actual Emissions Inventory – Questar 2005 Actual Emissions Inventory

		Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
		VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	benzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Pad Name	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
NA	Stewart Point 11-21	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 15-17D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 15-33	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 16-18D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 4-29D	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 4-32	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 5-17	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	0.321	-	-	-	-	2.213
NA	Stewart Point 5-20	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 6-32	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 7-20	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 9-33	-	-	-	-	-	0.1300	0.0001	0.0001	0.0000	0.0000	-	-	-	-	-	0
NA	Stewart Point 11-34 (Shut in)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
							3.51	**0.00**	**0.00**	**0.00**	**0.00**	0.963	-	-	-	-	6.639
							14.7	**0.0**	**0.0**	**0.0**	**0.0**	**12.840**	**-**	**-**	**-**	**-**	**88.520**
Drilled; but not completed	Mesa 10A-8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 10A-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 1-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 11A-8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 14-8D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 14D-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 1A-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 2-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 2A-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 3A-17D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6BA-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6C-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6CA-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 6D-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 7B-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 7C-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 9-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drilled; but not completed	Mesa 9D-20D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table F.1.4
2005 Actual Emissions Inventory – BP/Stone 2005 Actual Emissions Inventory

Well Name	API #	Field Name	Air Quality Permit #	Location Latitude	Location Longitude	Production Gas MMCF	Production Condensate BBL	ill Rig Engin SO2 TPY	ill Rig Engin N0x TPY	Process Burners N0x TPY	Wellhead IC Engines N0x TPY
ANTELOPE 03-05	490352305500	Pinedale Anticline	CT-3914	42.516638	109.628779	569.2	9,848			0.251	0
ANTELOPE 03-09	490352241200	Pinedale Anticline	MD-1278	42.502778	109.609167	114.3	996			0.084	0
ANTELOPE 03-14 (Inactive)	490352187700	Pinedale Anticline		42.486944	109.569444	1.1	0			0.076	0
ANTELOPE 04-05	490352306500	Pinedale Anticline	CT-3868	42.516668	109.633108	236.9	1,246			0.241	0
ANTELOPE 05-04	490352242900	Pinedale Anticline	MD-1279	42.516668	109.633108	429.6	2,276			0.255	0
ANTELOPE 05-05	490352306400	Pinedale Anticline		42.510000	109.610000	890.6	9,520			0.180	0
ANTELOPE 06-04	490352308400	Pinedale Anticline		42.513060	109.633100	126.1	1,619			0.250	0
Antelope 09-05	490352308600	Pinedale Anticline		42.512569	109.608581	14.0	0			0.114	
ANTELOPE 10-05D	490352330500	Pinedale Anticline		42.508970	109.618360	13.9	0			0.114	
ANTELOPE 15-04	490352173900	Pinedale Anticline	CT-1679	42.506110	109.603810	790.4	6,132			0.151	0
ANTELOPE 15-23	490352174000	Pinedale Anticline	AP-1093	42.506111	109.603889	10.0	202			0.115	0
RAINBOW 03-31	490352255600	Pinedale Anticline	CT-3496	42.456389	109.673056	299.7	2,509			0.240	0
Rainbow 03-31PAD		Pinedale Anticline		42.473610	109.648330	0.0	0			0.000	
RAINBOW 04-31D	490352330700	Pinedale Anticline	3-31 pad ct-3496	42.530000	109.650000	541.6	5,472			0.299	0
RAINBOW 04-32D	490352383600	Pinedale Anticline		42.528230	109.629070			0.75	9.29		
RAINBOW 05-31	490352255900	Pinedale Anticline	CT-3866	42.530860	109.648340	258.3	2,067			0.125	0
RAINBOW 05-32	490352329600	Pinedale Anticline	CT-3982	42.530860	109.648340	772.3	18,507			0.261	0
RAINBOW 06-31D	490352344100	Pinedale Anticline		42.508040	109.652090			0.28	3.44		
RAINBOW 06-32	490352329500	Pinedale Anticline	CT-3925	42.528090	109.652060	129.5	1,489			0.237	0
RAINBOW 09-31	490352255800	Pinedale Anticline	CT-3430	42.527390	109.633220	486.8	4,418			0.137	0
Rainbow 10-31D	490352342400	Pinedale Anticline	Produces to 10-32	42.528310	109.629070	156.7	495	0.5	6.22	0.008	
RAINBOW 10-32	490352305600	Pinedale Anticline	CT-3683	42.520125	109.642973	437.4	3,480			0.253	0
RAINBOW 15-29 (Inactive)	490352189700	Pinedale Anticline		42.520125	109.642973	0.0	0			0.000	0
Rainbow 15-30	490352341800	Pinedale Anticline		42.524180	109.623000	456.3	4,862	0.43	5.29	0.251	
Rainbow 15-30 PAD		Pinedale Anticline		42.534722	109.624167	0.0	0			0.000	
RAINBOW 15-31	490352255700	Pinedale Anticline	CT-3915	42.534750	109.643150	360.3	3,268			0.243	0
Rainbow 15-31 PAD		Pinedale Anticline		42.534750	109.643150	0.0	0			0.000	
RAINBOW 15-32	490352305800	Pinedale Anticline	CT-3669	42.520080	109.643020	499.8	4,164			0.107	0
RAINBOW 16-30	490352329400	Pinedale Anticline		42.520080	109.643020	1,721.0	39,098			0.190	0
RAINBOW 16-31	490352306300	Pinedale Anticline	CT-3827	42.520270	109.622690	513.5	4,836			0.158	0
RAINBOW 10-30D	490352330600	Pinedale Anticline		42.53476	109.643086	Comp. Only		0.39	4.83		
							2005 Totals:	**2.35**	**29.07**	**4.34**	**0.00**

Note: All emissions taken from BPs 2005 inventory with the exception of drilling emissions taken from Stones 2005 inventory.

Table F.1.4
2005 Actual Emissions Inventory – BP/Stone 2005 Actual Emissions Inventory

	Flashing Emissions Tanks and Pressurized Vessels						Glycol Dehydration Units Still & Flash Tank Vents					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled
Well Name	TPY	TPY	TPY	TPY	TPY	(yes/no)	TPY	TPY	TPY	TPY	TPY	(yes/no)
ANTELOPE 03-05	2.86	0.02	0.01	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
ANTELOPE 03-09	0.30	0.00	0.00	0.00	0.00	yes	6.89	0.692	2.176	0.106	1.371	
ANTELOPE 03-14 (Inactive)	0.00	0.00	0.00	0.00	0.00	no	0.00	0.00	0.00	0.00	0.00	
ANTELOPE 04-05	0.36	0.00	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
ANTELOPE 05-04	0.67	0.00	0.00	0.00	0.00	yes	14.16	0.748	2.126	0.098	1.735	
ANTELOPE 05-05	2.81	0.02	0.01	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
ANTELOPE 06-04	0.48	0.00	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
Antelope 09-05	0.00	0.00	0.00	0.00	0.00		0.67	0.06	0.20	0.01	0.14	
ANTELOPE 10-05D	0.00	0.00	0.00	0.00	0.00		0.66	0.06	0.20	0.01	0.14	
ANTELOPE 15-04	1.81	0.01	0.01	0.00	0.00	yes	0.13	0.020	0.029	0.000	0.005	yes
ANTELOPE 15-23	3.08	0.02	0.01	0.00	0.00	no	0.00	0.00	0.00	0.00	0.00	
RAINBOW 03-31	0.73	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
Rainbow 03-31PAD	0.00	0.00	0.00	0.00	0.00	no	0.00	0.00	0.00	0.00	0.00	
RAINBOW 04-31D	1.59	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 04-32D												
RAINBOW 05-31	0.61	0.00	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 05-32	5.39	0.04	0.02	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 06-31D												
RAINBOW 06-32	0.44	0.00	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 09-31	1.29	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
Rainbow 10-31D	6.83	0.05	0.02	0.00	0.00	no	7.44	0.71	2.29	0.11	1.56	
RAINBOW 10-32	1.03	0.01	0.00	0.00	0.00	yes	8.36	0.870	2.342	0.114	2.014	
RAINBOW 15-29 (Inactive)	0.00	0.00	0.00	0.00	0.00	no	0.00	0.00	0.00	0.00	0.00	
Rainbow 15-30	1.40	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
Rainbow 15-30 PAD	0.00	0.00	0.00	0.00	0.00	no	0.00	0.00	0.00	0.00	0.00	
RAINBOW 15-31	0.96	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
Rainbow 15-31 PAD	0.00	0.00	0.00	0.00	0.00	no	0.00	0.00	0.00	0.00	0.00	
RAINBOW 15-32	1.21	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 16-30	11.41	0.08	0.03	0.00	0.01	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 16-31	1.42	0.01	0.00	0.00	0.00	yes	0.00	0.00	0.00	0.00	0.00	
RAINBOW 10-30D												
	46.68	**0.33**	**0.14**	**0.01**	**0.03**		**38.30**	**3.17**	**9.37**	**0.45**	**6.96**	

Table F.1.4
2005 Actual Emissions Inventory – BP/Stone 2005 Actual Emissions Inventory

	Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
ANTELOPE 03-05	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001						
ANTELOPE 03-09	0.110	0.001	0.002	0.000	0.001	0.024	0.000	0.000	0.000	0.000						
ANTELOPE 03-14 (Inactive)	0.110	0.001	0.002	0.000	0.001	1.198	0.009	0.020	0.001	0.011						
ANTELOPE 04-05	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001						
ANTELOPE 05-04	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001						
ANTELOPE 05-05	0.110	0.001	0.002	0.000	0.001	0.043	0.000	0.001	0.000	0.000	1.34	0.01	0.02	0.00	0.01	1.25
ANTELOPE 06-04	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001	0.88	0.01	0.01	0.00	0.01	0.82
Antelope 09-05	0.110	0.001	0.002	0.000	0.001	0.036	0.000	0.001	0.000	0.000	0.09	0.00	0.00	0.00	0.00	0.08
ANTELOPE 10-05D	0.110	0.001	0.002	0.000	0.001	0.036	0.000	0.001	0.000	0.000	0.06	0.00	0.00	0.00	0.00	0.05
ANTELOPE 15-04	0.110	0.001	0.002	0.000	0.001	0.036	0.000	0.001	0.000	0.000						
ANTELOPE 15-23	0.110	0.001	0.002	0.000	0.001	1.797	0.013	0.030	0.001	0.017						
RAINBOW 03-31	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001						
Rainbow 03-31PAD						0.000	0.000	0.000	0.000	0.000						
RAINBOW 04-31D	0.110	0.001	0.002	0.000	0.001	0.086	0.001	0.001	0.000	0.001						
RAINBOW 04-32D																
RAINBOW 05-31	0.110	0.001	0.002	0.000	0.001	0.036	0.000	0.001	0.000	0.000						
RAINBOW 05-32	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001	1.73	0.01	0.03	0.00	0.02	1.62
RAINBOW 06-31D																
RAINBOW 06-32	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001	0.11	0.00	0.00	0.00	0.00	0.11
RAINBOW 09-31	0.110	0.001	0.002	0.000	0.001	0.036	0.000	0.001	0.000	0.000						
Rainbow 10-31D	0.110	0.001	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.51	0.00	0.01	0.00	0.00	0.48
RAINBOW 10-32	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001						
RAINBOW 15-29 (Inactive)	0.110	0.001	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.000						
Rainbow 15-30	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001	1.05	0.01	0.02	0.00	0.01	0.98
Rainbow 15-30 PAD						0.000	0.000	0.000	0.000	0.000						
RAINBOW 15-31	0.110	0.001	0.002	0.000	0.001	0.072	0.001	0.001	0.000	0.001						
Rainbow 15-31 PAD						0.000	0.000	0.000	0.000	0.000						
RAINBOW 15-32	0.110	0.001	0.002	0.000	0.001	0.024	0.000	0.000	0.000	0.000						
RAINBOW 16-30	0.110	0.001	0.002	0.000	0.001	0.036	0.000	0.001	0.000	0.000	0.20	0.00	0.00	0.00	0.00	0.19
RAINBOW 16-31	0.110	0.001	0.002	0.000	0.001	0.043	0.000	0.001	0.000	0.000						
RAINBOW 10-30D											0.03	0.00	0.00	0.00	0.00	0.03
	2.76	**0.02**	**0.05**	**0.00**	**0.03**	**4.15**	**0.03**	**0.07**	**0.00**	**0.04**	**6.00**	**0.05**	**0.10**	**0.00**	**0.06**	**5.61**

Table F.1.5
2005 Actual Emissions Inventory – Yates 2005 Actual Emissions Inventory

							Production		rill Rig Engin		Process Burners	Wellhead IC Engines
					Location		Gas	Condensate	SO2	N0x	N0x	N0x
Operator	**Well Name**	**API #**	**Field Name**	**Air Quality Permit #**	**Latitude**	**Longitude**	**MMCF**	**BBL**	**TPY**	**TPY**	**TPY**	**TPY**
Yates	Highway Federal #4Y	35-22426	Pinedale	CT-3061	42.49833	109.60416	363.931	4480	-	-	0.813	0.775
Yates	Blue Rim State #1	35-21777	Pinedale	MD-1022	42.57444	109.71666	257.342	2097	-	-	0.783	-
Yates	Blue Rim State #8	35-23039	Pinedale	See Note	42.57138	109.71694	393.422	3190	-	-	-	-
Yates	Southeast Pinedale Unit #1	35-23644	Pinedale	See Note	42.53906	109.58823	20.312	1915	-	-	0.124	-
						Totals:	**1035.007**	**11682**	**0**	**0**	**1.72**	**0.775**
	NOTES:											
	Blue Rim State #8 is commingled through the Blue Rim State #1 production equipment, waiver letter dated November 18, 2003											
	Southeast Pinedale Unit #1 NOI was filed January 11, 2006											

Table F.1.5
2005 Actual Emissions Inventory – Yates 2005 Actual Emissions Inventory

		Flashing Emissions Tanks and Pressurized Vessels						Glycol Dehydration Units Still & Flash Tank Vents					
		VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled	VOC	Benzene	Toluene	Ethylbenzene	Xylene	Controlled
Operator	**Well Name**	**TPY**	**TPY**	**TPY**	**TPY**	**TPY**	**(yes/no)**	**TPY**	**TPY**	**TPY**	**TPY**	**TPY**	**(yes/no)**
Yates	Highway Federal #4Y	-	-	-	-	-	Yes	0.139	0.016	0.014	0.001	0.004	Yes
Yates	Blue Rim State #1	-	-	-	-	-	Yes	-	-	-	-	-	No Dehy
Yates	Blue Rim State #8	-	-	-	-	-	-	-	-	-	-	-	-
Yates	Southeast Pinedale Unit #1	-	-	-	-	-	Yes	4.440	0.230	0.437	0.017	0.205	No
		0	**0**	**0**	**0**	**0**	**0**	**4.579**	**0.246**	**0.451**	**0.018**	**0.209**	**0**

Table F.1.5
2005 Actual Emissions Inventory – Yates 2005 Actual Emissions Inventory

		Well Head and Flow Line Blow Down Episodes					Pneumatic Pump Operation					Well completions/recompletions/testing					
		VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Operator	Well Name	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
Yates	Highway Federal #4Y	-	-	-	-	-	1.290	0.117	0.179	0.006	0.070	-	-	-	-	-	-
Yates	Blue Rim State #1	-	-	-	-	-	1.290	0.117	0.179	0.006	0.070	-	-	-	-	-	-
Yates	Blue Rim State #8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yates	Southeast Pinedale Unit #1	-	-	-	-	-	0.711	0.065	0.099	0.003	0.039	1.000	0.001	0.001	0.001	0.001	14.460
		0	**0**	**0**	**0**	**0**	**3.291**	**0.299**	**0.457**	**0.015**	**0.179**	**1**	**0.001**	**0.001**	**0.001**	**0.001**	**14.46**
	NOTES:																
	Blue Rim State #8 is commingled through the Blue Rim State #1 production equipment, waiver letter dated November 18, 2003																
	Southeast Pinedale																

Table F.1.6
2005 Actual Emissions Inventory - 2005 Pad, Road and Pipeline Disturbances

Year	Pads (acres)	New Pads (number)	Local Roads (miles)	Local Roads (acres)	Resource Roads (Miles)	Resource Roads (acres)	Pipelines (miles)	Pipelines (acres)	Annual Total (acres)	Cumulative Total (acres)
2005	408.14	52	10.40	46.90	11.96	55.85	26.00	156.00	666.90	666.90

Table F.1.7
2005 Actual Emissions Inventory - Well Pad Construction/Expansion - All Operators - Per Acre

Project: Pinedale Anticline SEIS
Scenario: All Scenerios
Activity: Well Pad Construction
Emissions: Fugitive Particulate Emissions from Well Pad Construction
Date: 11/30/2006

Well Pad Area (Expansion)	Construction Activity TSP Emission Factor[1]	Construction Activity Duration[2]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(acre)	(tons/acre-month)	(days/acre)	(hours/day)	(%)	(lb/acre)	(lb/acre)
1	1.2	2.1	12	50	15.12	3.99

[1] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations"; TSP = total suspended particulates.
[2] Construction Activity Duration taken from an average of durations provided by Shell, Ultra and Questar.
[3] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.1.8
2005 Actual Emissions Inventory - Local Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Local Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]	$PM_{2.5}$ Emissions (controlled)[5]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.51	1.2	3.3	12	50	214.32	56.56

[1] Construction Area taken from average of current field activity of 4.51 acres/mile for Local Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.1.9
2005 Actual Emissions Inventory - Resource Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Resource Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.67	1.2	3.3	12	50	221.92	58.56

[1] Construction Area taken from average of current field activity of 4.67 acres/mile for Resource Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.1.10
2005 Actual Emissions Inventory - Pipeline Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: 2005
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Pipeline Construction
Date: 11/30/2006

Pipeline Length (mi)	Pipeline Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration (days/mi)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[3] (lb/mi)	$PM_{2.5}$ Emissions (controlled)[4] (lb/mi)
1	6.00	1.2	3.3	12	50	285.12	75.24

[1] Construction Area taken from average of current field activity of 6.00 acres/mile for pipelines.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.1.11
2005 Actual Emissions Inventory - Ancillary Facilities Construction

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Misc. Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Construction Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration[3] (days)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[4] (lbs)	PM_{10} Emissions (controlled)[4] (tpy)	$PM_{2.5}$ Emissions (controlled)[5] (lbs)	$PM_{2.5}$ Emissions (controlled)[5] (tpy)
Stabilizer Facility	5.67	1.2	11.9	12	50	971.61	0.49	256.40	0.13
Paradise Compressor Station	10.00	1.2	21	12	50	3024.00	1.51	798.00	0.40
Questar Gathering System	275.48	1.2	120	12	50	476029.44	238.01	125618.88	62.81
Total Other Construction:	291.15	1.2	152.9	12	50	480025.05	240.01	126673.28	63.34

[1] Construction area provided by operators.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to pad construction and pipeline construction for stabilizer faclity/compressor station and gathering system, respectively.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.1.12
2005 Actual Emissions Inventory - Construction Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Well Pad, Resource Road, Pipeline Construction
Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor :	0.3733	lb/hr/100m^2	Based on AP-42 Chapter 13.2.5 (EPA 2004a), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.
Control Efficiency:	50	%	
Disturbed Area:			
Well Pad Construction/Exp.:	1	acres	4,047.00 m^2
Access Road Construction:	1	acres	4,047.00 m^2
Pipeline Construction	1	acres	4,047.00 m^2

PM_{10} Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	# of Construction Hours Per Acre (hr)	PM_{10} Emissions (lb/hr)	$PM_{2.5}$ Emissions (lb/hr)	PM_{10} Emissions (tons/acre)	$PM_{2.5}$ Emissions (tons/acre)
Well Pad Construction:	0.3733	0.1493	40.47	50	25.2	7.55	3.02	0.10	0.04
Road Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01
Pipeline Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01

Table F.1.13
2005 Actual Emissions Inventory - Well Pad Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	Round Trips (RTs) (RT/pad)	RT Distance (miles)	Vehicle Miles Traveled (VMT)[3] (VMT/pad)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/pad)	$PM_{2.5}$ Emissions[5] (controlled) (lb/pad)
Heavy Trucks	Local	Chemical	35,000	35	5.1	2.4	240	10	2400	85	1.54	0.24	552.85	84.77
	Resource	Water	35,000	20	5.1	2.4	240	1	240	50	1.54	0.24	184.28	28.26
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	160	10	1600	85	0.60	0.09	144.80	21.65
	Resource	Water	7,000	20	5.1	2.4	160	1	160	50	0.46	0.07	36.48	5.45
									Total Unpaved Road Traffic Emissions (lb/pad)				918.40	140.13

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
5 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.1.14
2005 Actual Emissions Inventory - Road Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Resource Road Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	Round Trips (RTs) (RT/pad)	RT Distance (miles)	Vehicle Miles Traveled (VMT)[3] (VMT/pad)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/pad)	$PM_{2.5}$ Emissions[5] (controlled) (lb/pad)
Gravel/Haul Trucks	Local	Chemical	35,000	35	5.1	2.4	88	10	880	85	1.54	0.24	202.71	31.08
	Resource	Water	35,000	20	5.1	2.4	88	1	88	50	1.54	0.24	67.57	10.36
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	58	10	580	85	0.60	0.09	52.49	7.85
	Resource	Water	7,000	20	5.1	2.4	58	1	58	50	0.46	0.07	13.22	1.98
									Total Unpaved Road Traffic Emissions (lb/pad)				335.99	51.27

[1] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[2] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[3] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
[5] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.1.15
2005 Actual Emissions Inventory - Pipeline Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Unpaved Road Traffic
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per pad	RT Distance (miles)	VMT[4] (VMT/pad)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/pad)	$PM_{2.5}$ Emissions[6] (controlled) (lb/pad)
Semis/transport, boom, equipment, water removal, sand, and gravel trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light truck/pick-ups	Local	Chemical	7,000	35	5.1	2.4	200	10	2000	85	0.23	0.03	69.00	10.26
	Resource	Water	7,000	20	5.1	2.4	200	1	200	50	0.23	0.03	23.00	3.42
												Total Unpaved Road Traffic Emissions (lb/pad)	1,113.36	170.29

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.1.16
2005 Actual Emissions Inventory - Well Pad Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/acre)	(hours/day)	(lb/acre)				
				CO	NO_x	SO_2	VOC	PM_{10}	equipment type)		CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	25.19	20.44	0.39	2.96	1.19
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	11	51.94	42.17	0.79	6.11	2.44
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	2.1	11	207.78	168.67	3.18	24.44	9.78
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	56.67	46.00	0.87	6.67	2.67
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	12.59	10.22	0.19	1.48	0.59
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	10	31.48	25.56	0.48	3.70	1.48
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	39.67	32.20	0.61	4.67	1.87
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	2.1	6	31.17	25.30	0.48	3.67	1.47
									Total Heavy Equipment Tailpipe Emissions		456.48	370.56	6.98	53.70	21.48

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.1.17
2005 Actual Emissions Inventory - Road Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Road Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	11	81.63	66.26	1.25	9.60	3.84
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	3.3	11	326.51	265.05	4.99	38.41	15.37
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	89.05	72.29	1.36	10.48	4.19
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	19.79	16.06	0.30	2.33	0.93
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	10	49.47	40.16	0.76	5.82	2.33
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	62.33	50.60	0.95	7.33	2.93
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	3.3	6	48.98	39.76	0.75	5.76	2.30
Total Heavy Equipment Tailpipe Emissions											717.33	582.30	10.97	84.39	33.76

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.1.18
2005 Actual Emissions Inventory - Pipeline Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Grader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Excavator	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Trencher	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Tractor (side-boom)	150	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	29.68	24.10	0.45	3.49	1.40
Total Emissions from Heavy Equipment Tailpipes											187.99	152.60	2.88	22.12	8.85

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.1.19
2005 Actual Emissions Inventory - Drilling Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT [4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis-tractor/ trailer/mud/water/fuel / cement trucks[1]	Local Road	Chemical	44,000	35	5.1	2.4	360	10	3,600	85	1.70	0.26	919.22	140.95
	Resource Road	Water	44,000	20	5.1	2.4	360	1	360	50	1.70	0.26	306.41	46.98
Vendors/ marketers/ various / workers	Local Road	Chemical	7,000	35	5.1	2.4	540	10	5,400	85	0.60	0.090	488.69	73.07
	Resource Road	Water	7,000	20	5.1	2.4	540	1	540	50	0.46	0.068	123.11	18.39
												Total Unpaved Road Traffic Emissions (lb/well)	1,837.43	279.39

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.

[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."

[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."

[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.

[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.1.20
2005 Actual Emissions Inventory - Rig Move Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT [4] (VMT/move)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Rig Haul Trucks	Local Road	Chemical	44,000	35	5.1	2.4	26.3	10	263	85	1.70	0.26	67.15	10.30
	Resource Road	Water	44,000	20	5.1	2.4	26.3	1	26	50	1.70	0.26	22.38	3.43
Light Trucks	Local Road	Chemical	7,000	35	5.1	2.4	8.8	10	88	85	0.74	0.11	9.83	1.51
	Resource Road	Water	7,000	20	5.1	2.4	8.8	1	9	50	0.74	0.11	3.28	0.50
											Total Unpaved Road Traffic Emissions (lb/well)		102.64	15.74

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
[6] Calculated as lb/VMT x VMT/well x control efficiency.

Table F.1.21
2005 Actual Emissions Inventory - Drilling Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	360	11	3960	45	24	128.68
NO_x	11.44	360	11	3960	45	24	99.87
SO_2[2]	0.13	360	11	3960	45	24	1.13
VOC	5.69	360	11	3960	45	24	49.67

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.
[3] Based on a life of project average of 45 days per well.

Table F.1.22
2005 Actual Emissions Inventory - Rig Move Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration (days/move)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	26.3	11	289.3	3	24	9.40
NO_x	11.44	26.3	11	289.3	3	24	7.30
SO_2[2]	0.13	26.3	11	289.3	3	24	0.08
VOC	5.69	26.3	11	289.3	3	24	3.63

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.

[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.

Table F.1.23
2005 Actual Emissions Inventory - Completion/Testing Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT[4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emissions[5] (lb/VMT)	$PM_{2.5}$ Emissions[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis/ transport/ water/ sand/ frac trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3,000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light Trucks/ Pickups	Local	Chemical	7,000	35	5.1	2.4	450	10	4,500	85	0.74	0.11	502.42	77.04
	Resource	Water	7,000	20	5.1	2.4	450	1	450	50	0.74	0.11	167.47	25.68
									Total Unpaved Road Traffic Emissions (lb/well)				1,691.26	259.33

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
6 Calculated as lb/VMT x VMT/well x control efficiency.

Table F.1.24
2005 Actual Emissions Inventory - Completion/Testing Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration[3] (hours/day)	Emissions (lb/well)
CO	14.74	300	11	3300	10	18	107.24
NO_x	11.44	300	11	3300	10	18	83.23
SO_2[2]	0.16	300	11	3300	10	18	1.16
VOC	5.69	300	11	3300	10	18	41.40

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, aged with 50,000 miles, 1997+ model.

[2] The SO_2 emission factor is based on a S balance and 350 ppm diesel fuel.

[3] Haul Activity Duration for completion activities based on an average of 10 days per well and an average of 24 hr/day for 5 days and 12 hr/day for 5 days.

Table F.1.25
2005 Actual Emissions Inventory - Production Traffic - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	RTs (RT)	RT Distance (miles)	VMT[3] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[5] (controlled) (lb/RT)
Light Truck	Local	Chemical	7,000	35	5.1	2.4	1	10	10	85	0.74	0.11	1.12	0.17
	Resource	Water	7,000	20	5.1	2.4	1	1	1	50	0.74	0.11	0.37	0.06
												Total Access and Unimproved Road Emissions (lb/RT)	1.49	0.23

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
5 Calculated as lb/VMT x VMT/RT x control efficiency.

Table F.1.26
2005 Actual Emissions Inventory - Liquids Gathering Traffic - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	RT (RT)	RT Distance (miles)	VMT[3] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[5] (controlled) (lb/RT)
Haul Truck	Local	Chemical	54,000	35	5.1	2.4	1	10	10	85	1.87	0.29	2.80	0.43
	Resource	Water	54,000	20	5.1	2.4	1	1	1	50	1.87	0.29	0.93	0.14
												Total Access and Unimproved Road Emissions (lb/RT)	3.73	0.57

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
5 Calculated as lb/VMT x VMT/RT x control efficiency.

Table F.1.27
2005 Actual Emissions Inventory - Tanker Traffic Tailpipe - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mi)	RT (RT)	Single Well Round Trip Distance (mi/RT)	Single Well Daily VMT (mi/RT)	Daily Emissions Single Well (lb/RT)
CO	14.74	1	11	11.00	0.36
NO_x	11.44	1	11	11.00	0.28
SO_2[2]	0.16	1	11	11.00	0.00
VOC	5.69	1	11	11.00	0.14

[1] AP-42 (EPA 1985), Table 2.7.1 "Volume II Mobile Sources." Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a S balance and 350 ppm diesel fuel.

Table F.1.28
2005 Actual Emissions Inventory - 2005 Compression Totals

Compression:	2005 (Baseline Year)	
	(lb/hr)	(tpy)
NOx:	96.3	421.9
CO:	36.0	157.7
VOC:	73.2	320.5
PM10:	0.0	0.0
PM2.5:	0.0	0.0
SO2:	0.0	0.0
Formaldehyde:	9.5	41.7

Paradise 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1187.

Falcon 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1186.

Pinedale 2005 based on (2) 1,860 hp and (2) 3,720 hp compressors as provided by Questar and emissions from MD-1267.

Table F.1.29
2005 Actual Emissions Inventory - Granger Gas Plant 2005 Actual Emissions

Pollutant	(lb/hr)	(tpy)[1]
NOx:	38.52	168.7
CO:	57.58	252.2
VOCs:	22.35	97.9
SO2:	0.00	0.0
PM10:	0.00	0.0
Benzene:	0.02	0.1
Toluene:	0.00	0.0
Ethylbenzene	0.00	0.0
Xylene:	0.00	0.0
n-Hexane	0.00	0.0
ormaldehyde:	4.61	20.2
Total HAPs:	4.63	20.3

[1] Emissions taken from 2005 actual emissions inventory as submitted to WDEQ-AQD.

Table F.1.30
2005 Actual Emissions Inventory - Opal Gas Plant 2005 Actual Emissions

Pollutant	(lb/hr)	(tpy)[1]
NOx:	70.27	307.8
CO:	40.39	176.9
VOCs:	33.08	144.9
SO2:	0.00	0.0
PM10:	0.00	0.0
Benzene:	1.85	8.1
Toluene:	0.53	2.3
Ethylbenzene:	0.18	0.8
Xylene:	0.25	1.1
n-Hexane:	1.39	6.1
Formaldehyde:	0.00	0.0
Total HAPs:	4.20	18.4

[1] Emissions taken from 2005 actual emissions inventory as submitted to WDEQ-AQD.

Table F.1.31
2005 Actual Emissions Inventory - WDEQ Submitted Operator Actual Emissions Inventory Summaries

			Process	Wellhead	Flashing Emissions				
	Drill Rig Engines		Burners	IC Engines	Tanks and Pressurized Vessels				
	SO2	N0x	N0x	N0x	VOC	Benzene	Toluene	Ethylbenzene	Xylene
Shell Totals:	26.04	399.55	48.27	0.00	138.65	1.68	2.61	0.08	0.93
Ultra Totals:	136.28	983.51	42.00	0.00	326.16	3.95	6.14	0.19	2.18
Questar Totals:	40.92	865.02	19.74	0.00	257.39	1.98	2.24	0.13	0.66
BP/Stone Totals:	2.35	29.07	4.34	0.00	46.68	0.33	0.14	0.01	0.03
Yates Totals:	0.00	0.00	1.72	0.78	0.00	0.00	0.00	0.00	0.00
TOTALS:	**205.60**	**2277.15**	**116.07**	**0.78**	**768.88**	**7.94**	**11.12**	**0.41**	**3.80**

	Glycol Dehydration Units									
	Still & Flash Tank Vents					Well Head and Flow Line Blow Down Episodes				
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene
Shell Totals:	106.68	14.10	32.14	1.23	15.28	2.75	0.49	0.76	0.02	0.27
Ultra Totals:	115.73	15.11	0.99	31.81	12.32	0.00	0.00	0.00	0.00	0.00
Questar Totals:	219.88	26.31	62.20	2.89	37.02	0.00	0.00	0.00	0.00	0.00
BP/Stone Totals:	38.30	3.17	9.37	0.45	6.96	2.76	0.02	0.05	0.00	0.03
Yates Totals:	4.58	0.25	0.45	0.02	0.21	0.00	0.00	0.00	0.00	0.00
TOTALS:	**485.17**	**58.93**	**105.15**	**36.41**	**71.80**	**5.51**	**0.51**	**0.80**	**0.03**	**0.30**

	Pneumatic Pump Operation					Well completions/recompletions/testing					
	VOC	Benzene	Toluene	Ethylbenzene	Xylene	VOC	Benzene	Toluene	Ethylbenzene	Xylene	N0x
Shell Totals:	152.71	1.85	2.87	0.09	1.02	1.23	0.00	0.00	0.00	0.00	58.95
Ultra Totals:	304.05	3.68	5.72	0.18	2.03	154.30	1.87	2.90	0.09	1.03	161.32
Questar Totals:	14.69	0.01	0.01	0.00	0.00	12.84	0.00	0.00	0.00	0.00	88.52
BP/Stone Totals:	4.15	0.03	0.07	0.00	0.04	6.00	0.05	0.10	0.00	0.06	5.61
Yates Totals:	3.29	0.30	0.46	0.02	0.18	1.00	0.00	0.00	0.00	0.00	14.46
TOTALS:	**478.88**	**5.87**	**9.13**	**0.28**	**3.27**	**175.37**	**1.92**	**3.00**	**0.10**	**1.09**	**328.86**

Table F.1.32
2005 Actual Emissions Inventory - Total Construction Disturbance Emissions

		2005	
		(lb/hr)[1]	(tpy)[2]
Pad Construction/Expansion:	PM_{10}	2.82	3.09
	$PM_{2.5}$	0.74	0.81
Local Road Construction:	PM_{10}	1.02	1.11
	$PM_{2.5}$	0.27	0.29
Resource Road Construction:	PM_{10}	1.21	1.33
	$PM_{2.5}$	0.32	0.35
Pipeline Construction:	PM_{10}	3.38	3.71
	$PM_{2.5}$	0.89	0.98
Wind Erosion[3]:	PM_{10}	21.44	46.95
	$PM_{2.5}$	8.58	18.78
Ancillary Facilities Construction:	PM_{10}	219.19	240.01
	$PM_{2.5}$	57.84	63.34
Total Construction Surface Disturbace Emissions:	PM_{10}	249.06	296.20
	$PM_{2.5}$	68.64	84.55

Note: Construction Surface Disturbance Emissions occur during summer months (May-Oct.) and daylight hours (12 hrs/day) only.
[1] lb/hr number based on 6 months of construction at 12 hrs/day.
[2] tpy numbers based on total construction occuring over a 6 month period between May and October of each year.
[3] Wind erosion numbers based on 6 months of construction and 24 hr/day.

Table F.1.33
2005 Actual Emissions Inventory - Total Construction Traffic and Heavy Equipment Tailpipe Emissions

		2005 (lb/hr)	2005 (tpy)
Pad Construction Traffic:	PM_{10}	30.19	33.06
	$PM_{2.5}$	4.61	5.04
Road Construction Traffic:	PM_{10}	7.98	8.74
	$PM_{2.5}$	1.22	1.33
Pipeline Construction Traffic:	PM_{10}	26.44	28.95
	$PM_{2.5}$	4.04	4.43
Ancillary Facilities Construction Traffic:	PM_{10}	31.65	34.65
	$PM_{2.5}$	4.84	5.30
Well Pad Construction Heavy Equipment Tailpipe:	CO	85.07	93.15
	NO_x	69.06	75.62
	SO_2	1.30	1.42
	VOC	10.01	10.96
	$PM_{10/2.5}$	4.00	4.38
Road Construction Heavy Equipment Tailpipe:	CO	7.32	8.02
	NO_x	5.95	6.51
	SO_2	0.11	0.12
	VOC	0.86	0.94
	$PM_{10/2.5}$	0.34	0.38
Pipeline Construction Heavy Equipment Tailpipe:	CO	2.23	2.44
	NO_x	1.81	1.98
	SO_2	0.03	0.04
	VOC	0.26	0.29
	$PM_{10/2.5}$	0.11	0.12
Ancillary Facilities Construction Heavy Equipment Tailpipe:	CO	5.87	6.42
	NO_x	4.76	5.22
	SO_2	0.09	0.10
	VOC	0.69	0.76
	$PM_{10/2.5}$	0.28	0.30
Drilling Traffic:	PM_{10}	36.08	158.02
	$PM_{2.5}$	5.49	24.03
Rig Move Traffic:	PM_{10}	2.02	8.83
	$PM_{2.5}$	0.31	1.35
Drilling Haul Truck Tailpipe:	CO	2.53	11.07
	NO_x	1.96	8.59
	SO_2	0.02	0.10
	VOC	0.98	4.27
Rig Move Haul Truck Tailpipe:	CO	0.18	0.81
	NO_x	0.14	0.63
	SO_2	0.00	0.01
	VOC	0.07	0.31
Total Construction Surface Disturbace Emissions:	**CO**	103.21	121.92
	NO_x	83.68	98.55
	SO_2	1.56	1.79
	VOC	12.87	17.53
	PM_{10}	139.08	277.42
	$PM_{2.5}$	25.23	46.66

Note: All tpy numbers except drilling related based on total emissions during the six month construction season (May-October). All lb/hr numbers except drilling related based on this total and assumed to happen evenly over the daylight hours of the construction season (2190 hrs/yr). All drilling emissions based on year-round drilling.

Table F.1.34
2005 Actual Emissions Inventory - Total Frac/Completion Emissions

		2005	
		(lb/hr)[1]	(tpy)[2]
Completion Traffic:	PM_{10}	33.21	145.45
	$PM_{2.5}$	5.09	22.30
Completion/Testing Haul Truck Tailpipe:	CO	2.11	9.22
	NO_x	1.63	7.16
	SO_2	0.02	0.10
	VOC	0.81	3.56
Total Completion/Testing Traffic Emissions:	CO	2.11	9.22
	NO_x	1.63	7.16
	SO_2	0.02	0.10
	VOCs	0.81	3.56
	PM_{10}	33.21	145.45
	$PM_{2.5}$	5.09	22.30

[1] lb/hr number based on tpy and year-round activity.
[2] tpy numbers based on number of wells drilled per year.

Table F.1.35
2005 Actual Emissions Inventory - Total Construction Emissions

		(lb/hr) Summer	2005 (lb/hr) Winter	(tpy) Total
Total 2005 Construction Disturbance Emissions:	PM_{10}	249.06	0.00	296.20
	$PM_{2.5}$	68.64	0.00	84.55
2005 Construction Traffic and Heavy Equipment Tailpipe Emissions:	CO	103.21	0.00	121.92
	NO_x	83.68	0.00	98.55
	SO_2	1.56	0.00	1.79
	VOC	12.87	0.00	17.53
	PM_{10}	139.08	0.00	277.42
	$PM_{2.5}$	25.23	0.00	46.66
2005 Drill Rig Engine Emissions[1]:	CO	486.08	488.81	2031.60
	NOx	594.54	607.51	2590.88
	SO2	50.85	50.92	221.00
	VOC	58.33	59.04	244.47
	PM10/2.5	31.83	32.82	133.46
2005 Completion Emissions[2]:	CO	41.87	41.87	183.37
	NO_x	75.08	75.08	328.86
	SO_2	2.01	2.01	8.81
	VOCs	40.04	40.04	175.37
	PM_{10}	35.50	35.50	155.50
	$PM_{2.5}$	7.39	7.39	32.35
2005 TOTAL CONSTRUCTION EMISSIONS:	**CO**	631.16	530.68	2336.89
	NO_x	753.30	682.59	3018.28
	SO_2	54.42	52.93	231.60
	VOCs	111.24	99.08	437.37
	PM_{10}	455.47	68.32	862.58
	$PM_{2.5}$	133.09	40.21	297.03

[1] Drill rig engine emissions based on actual emissions for NOx and SO2 and PTEs from the 2005 potential emissions inventory for other pollutants as these pollutants were not reported in the State's 2005 inventory. Totals include emissions from the rig boilers also. As no emissions inventory was available for Petrogulf, Anschutz or Yates, drilling emissions were added from the 2005 potential inventory
[2] Completion emissions based on actual emissions for NOx and SO2 and PTEs from the 2005 potential emissions inventory for other

Table F.1.36
2005 Actual Emissions Inventory - Total Production Traffic Emissions

		2005	
		(lb/hr)[1]	(tpy)[2]
Production Traffic:	PM_{10}	15.08	66.05
	$PM_{2.5}$	2.31	10.13
Liquids Gathering Haul Truck Traffic:	PM_{10}	13.86	60.69
	$PM_{2.5}$	2.12	9.31
Production Haul Truck Tailpipe:	CO	1.33	5.81
	NO_x	1.03	4.51
	SO_2	0.01	0.06
	VOC	0.51	2.24
Total Production Traffic Emissions:	CO	1.33	5.81
	NO_x	1.03	4.51
	SO_2	0.01	0.06
	VOCs	0.51	2.24
	PM_{10}	28.93	126.73
	$PM_{2.5}$	4.44	19.43

[1] lb/hr number based on tpy and year-round activity.
[2] tpy numbers based on number of wells drilled per year.

Table F.1.37
2005 Actual Emissions Inventory - Total Production Emissions

		2005 (Baseline) (lb/hr) Summer	(lb/hr) Winter	(tpy) Total
# of Wells Drilled:			172	
# of Wells in Production:			286	
Production Traffic[1]:	PM_{10}	15.08	15.08	66.05
	$PM_{2.5}$	2.31	2.31	10.13
Liquids Gathering Haul Truck Traffic:	PM_{10}	13.86	13.86	60.69
	$PM_{2.5}$	2.12	2.12	9.31
Production Haul Truck Tailpipe[1]:	CO	1.33	1.33	5.81
	NO_x	1.03	1.03	4.51
	SO_2	0.01	0.01	0.06
	VOC	0.51	0.51	2.24
Production Wind Erosion:	PM_{10}	47.46	47.46	207.86
	$PM_{2.5}$	18.98	18.98	83.14
Separator/Indirect Line Heaters[1,3]:	$PM_{10/2.5}$	0.16	0.57	1.61
	SO_2	0.01	0.05	0.13
	NO_x	2.15	7.51	21.14
	CO	0.45	1.58	4.44
	VOC	0.12	0.41	1.16
Dehy Reboiler Heaters[1]:	$PM_{10/2.5}$	0.02	0.06	0.18
	SO_2	0.00	0.01	0.01
	NO_x	0.24	0.85	2.40
	CO	0.05	0.18	0.50
	VOC	0.01	0.05	0.13
Dehy Flashing Emissions[2,4]:	VOC	110.77	110.77	485.17
	Total HAPs	63.18	63.18	276.75
	Benzene	13.45	13.45	58.93
	Toluene	24.01	24.01	105.15
	Ethylbenzene	8.31	8.31	36.41
	Xylene	16.39	16.39	71.80
	n-Hexane	1.02	1.02	4.46
Fugitive HAPs and VOCs[2,4]:	VOC	109.33	109.33	478.88
	Total HAPs	4.37	4.37	19.12
	Benzene	1.34	1.34	5.87
	Toluene	2.08	2.08	9.13
	Ethylbenzene	0.06	0.06	0.28
	Xylene	0.75	0.75	3.27
	n-Hexane	0.13	0.13	0.56

Table F.1.37
2005 Actual Emissions Inventory - Total Production Emissions

		2005 (Baseline) (lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Condensate Storage Pre Gathering System[2,4]:	VOC	175.54	175.54	768.88
	Total HAPs	12.96	12.96	56.76
	Benzene	1.81	1.81	7.94
	Toluene	2.54	2.54	11.12
	Ethylbenzene	0.09	0.09	0.41
	Xylene	0.87	0.87	3.80
	n-Hexane	7.65	7.65	33.49
	NOx	10.09	10.09	44.17
	CO	54.88	54.88	240.36
2005 Compression:	NOx	96.32	96.32	421.90
	CO	36.00	36.00	157.70
	VOC	73.17	73.17	320.50
	PM10	0.00	0.00	0.00
	PM2.5	0.00	0.00	0.00
	SO2	0.00	0.00	0.00
	Formaldehyde	9.52	9.52	41.70
2005 Granger and Opal Actual Emissions:	NOx:	108.79	108.79	476.50
	CO:	97.97	97.97	429.10
	VOCs:	55.43	55.43	242.80
	SO2:	0.00	0.00	0.00
	PM10:	0.00	0.00	0.00
	Benzene:	1.87	1.87	8.20
	Toluene:	0.53	0.53	2.30
	Ethylbenzene:	0.18	0.18	0.80
	Xylene:	0.25	0.25	1.10
	n-Hexane:	1.39	1.39	6.10
	Formaldehyde:	4.61	4.61	20.20
	Total HAPs:	8.84	8.84	38.70
TOTAL PRODUCTION EMISSIONS:	**NOx**	218.62	224.59	970.62
	CO	190.68	191.94	837.91
	VOC	524.90	525.23	2299.77
	PM10	76.57	77.02	336.38
	PM2.5	23.60	24.05	104.37
	SO2	0.02	0.07	0.20
	Formaldehyde	14.13	14.13	61.90
	Benzene	18.48	18.48	80.94
	Toluene	29.16	29.16	127.71
	Ethylbenzene	8.65	8.65	37.90
	Xylene	18.26	18.26	79.97
	n-Hexane	10.19	10.19	44.62
	Total HAPs	98.86	98.86	433.03

[1] No actual emissions available, emissions based on 2005 potential to emit inventory.
[2] No actual emissions available for n-hexane, NOx or CO from these sources, emissions for these pollutants based on 2005 potential to emit inventory.
[3] Sepatator and indirect line heater emissions are based on 2005 potential to emit calculations, as operator's 2005 inventories were mostly based on PTE without taking into account intermittent, seasonal usage. Therefore, the "actual" emissions reported are higher than the PTEs calculated.
[4] Reported "actual" emissions from these sources are greater than calculated "potential" emissions due to the fact that the "actual" emissions in many cases are based on permitted levels that do not take into account well production declines and other operating parameters.

Table F.1.38
2005 Actual Emissions Inventory - Total Emissions

		(lb/hr) Summer	2005 (lb/hr) Winter	(tpy) Total
TOTAL 2005 ACTUAL CONSTRUCTION EMISSIONS:	CO	631.16	530.68	2336.89
	NO_x	753.30	682.59	3018.28
	SO_2	54.42	52.93	231.60
	VOCs	111.24	99.08	437.37
	PM_{10}	455.47	68.32	862.58
	$PM_{2.5}$	133.09	40.21	297.03
TOTAL 2005 ACTUAL PRODUCTION EMISSIONS:	NOx	218.62	224.59	970.62
	CO	190.68	191.94	837.91
	VOC	524.90	525.23	2299.77
	PM10	76.57	77.02	336.38
	PM2.5	23.60	24.05	104.37
	SO2	0.02	0.07	0.20
	Formaldehyde	14.13	14.13	61.90
	Benzene	18.48	18.48	80.94
	Toluene	29.16	29.16	127.71
	Ethylbenzene	8.65	8.65	37.90
	Xylene	18.26	18.26	79.97
	n-Hexane	10.19	10.19	44.62
	Total HAPs	98.86	98.86	433.03
TOTAL 2005 ACTUAL EMISSIONS:	**NOx**	971.93	907.18	3988.90
	CO	821.83	722.62	3174.80
	VOC	636.13	624.31	2737.14
	PM10	532.04	145.34	1198.97
	PM2.5	156.69	64.26	401.39
	SO2	54.44	53.00	231.80
	Formaldehyde	14.13	14.13	61.90
	Benzene	18.48	18.48	80.94
	Toluene	29.16	29.16	127.71
	Ethylbenzene	8.65	8.65	37.90
	Xylene	18.26	18.26	79.97
	n-Hexane	10.19	10.19	44.62
	Total HAPs	98.86	98.86	433.03

Table F.2.1
2005 Potential Emissions Inventory - Pad, Road and Pipeline Disturbances

Year	Pads (acres)	New Pads (number)	Local Roads (miles)	Local Roads (acres)	Resource Roads (Miles)	Resource Roads (acres)	Pipelines (miles)	Pipelines (acres)	Annual Total (acres)
Pre-ROD	**332.05**	**56**	**--**	**--**	**108.3**	**652.3**	**12.14**	**60.15**	**1044.5**
Rod to 2005	**1399.88**	**214**	**--**	**--**	**164.56**	**857.13**	**108.18**	**648.81**	**2858.91**
2005	408.14	52	10.40	46.90	11.96	55.85	26.00	156.00	666.90

Table F.2.2
2005 Potential Emissions Inventory - Well Pad Construction/Expansion - All Operators - Per Acre

Project: Pinedale Anticline SEIS
Scenario: All Scenerios
Activity: Well Pad Construction
Emissions: Fugitive Particulate Emissions from Well Pad Construction
Date: 11/30/2006

Well Pad Area (Expansion)	Construction Activity TSP Emission Factor[1]	Construction Activity Duration[2]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(acre)	(tons/acre-month)	(days/acre)	(hours/day)	(%)	(lb/acre)	(lb/acre)
1	1.2	2.1	12	50	15.12	3.99

[1] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations"; TSP = total suspended particulates.
[2] Construction Activity Duration taken from an average of durations provided by Shell, Ultra and Questar.
[3] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.2.3
2005 Potential Emissions Inventory - Local Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Local Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]	$PM_{2.5}$ Emissions (controlled)[5]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.51	1.2	3.3	12	50	214.32	56.56

[1] Construction Area taken from average of current field activity of 4.51 acres/mile for Local Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.2.4
2005 Potential Emissions Inventory - Resource Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Resource Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.67	1.2	3.3	12	50	221.92	58.56

[1] Construction Area taken from average of current field activity of 4.67 acres/mile for Resource Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.2.5
2005 Potential Emissions Inventory - Pipeline Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: 2005
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Pipeline Construction
Date: 11/30/2006

Pipeline Length (mi)	Pipeline Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration[3] (days/mi)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[4] (lb/mi)	$PM_{2.5}$ Emissions (controlled)[5] (lb/mi)
1	6.00	1.2	3.3	12	50	285.12	75.24

[1] Construction Area taken from average of current field activity of 6.00 acres/mile for pipelines.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.2.6
2005 Potential Emissions Inventory - Ancillary Facilities Construction

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Misc. Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Construction Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]		$PM_{2.5}$ Emissions (controlled)[5]	
	(acres)	(tons/acre-month)	(days)	(hours/day)	(%)	(lbs)	(tpy)	(lbs)	(tpy)
Stabilizer Facility	5.67	1.2	11.9	12	50	971.61	0.49	256.40	0.13
Paradise Compressor Station	10.00	1.2	21	12	50	3024.00	1.51	798.00	0.40
Questar Gathering System	275.48	1.2	120	12	50	476029.44	238.01	125618.88	62.81
Total Other Construction:	291.15	1.2	152.9	12	50	480025.05	240.01	126673.28	63.34

1 Construction area provided by operators.
2 AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
3 Construction Activity Duration assumed to be similar to pad construction and pipeline construction for stabilizer faclity/compressor station and gathering system, respectively.
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.2.7
2005 Potential Emissions Inventory - Construction Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Well Pad, Resource Road, Pipeline Construction
Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor :	0.3733	lb/hr/100m^2	Based on AP-42 Chapter 13.2.5 (EPA 2004a), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.
Control Efficiency:	50	%	
Disturbed Area:			
Well Pad Construction/Exp.:	1	acres	4,047.00 m^2
Access Road Construction:	1	acres	4,047.00 m^2
Pipeline Construction	1	acres	4,047.00 m^2

PM_{10} Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	# of Construction Hours Per Acre (hr)	PM_{10} Emissions (lb/hr)	$PM_{2.5}$ Emissions (lb/hr)	PM_{10} Emissions (tons/acre)	$PM_{2.5}$ Emissions (tons/acre)
Well Pad Construction:	0.3733	0.1493	40.47	50	25.2	7.55	3.02	0.10	0.04
Road Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01
Pipeline Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01

Table F.2.8
2005 Potential Emissions Inventory - Well Pad Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight	Average Vehicle Speed	Silt Content[1]	Moisture Content[2]	Round Trips (RTs)	RT Distance	Vehicle Miles Traveled (VMT)[3]	Emission Control Efficiency	PM_{10} Emission Factor[4]	$PM_{2.5}$ Emission Factor[4]	PM_{10} Emissions[5] (controlled)	$PM_{2.5}$ Emissions[5] (controlled)
			(lb)	(mph)	(%)	(%)	(RT/pad)	(miles)	(VMT/pad)	(%)	(lb/VMT)	(lb/VMT)	(lb/pad)	(lb/pad)
Heavy Trucks	Local	Chemical	35,000	35	5.1	2.4	240	10	2400	85	1.54	0.24	552.85	84.77
	Resource	Water	35,000	20	5.1	2.4	240	1	240	50	1.54	0.24	184.28	28.26
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	160	10	1600	85	0.60	0.09	144.80	21.65
	Resource	Water	7,000	20	5.1	2.4	160	1	160	50	0.46	0.07	36.48	5.45
									Total Unpaved Road Traffic Emissions (lb/pad)				918.40	140.13

[1] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[2] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[3] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
[5] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.2.9
2005 Potential Emissions Inventory - Road Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Resource Road Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight	Average Vehicle Speed	Silt Content[1]	Moisture Content[2]	Round Trips (RTs)	RT Distance	Vehicle Miles Traveled (VMT)[3]	Emission Control Efficiency	PM_{10} Emission Factor[4]	$PM_{2.5}$ Emission Factor[4]	PM_{10} Emissions[5] (controlled)	$PM_{2.5}$ Emissions[5] (controlled)
			(lb)	(mph)	(%)	(%)	(RT/pad)	(miles)	(VMT/pad)	(%)	(lb/VMT)	(lb/VMT)	(lb/pad)	(lb/pad)
Gravel/Haul Trucks	Local	Chemical	35,000	35	5.1	2.4	88	10	880	85	1.54	0.24	202.71	31.08
	Resource	Water	35,000	20	5.1	2.4	88	1	88	50	1.54	0.24	67.57	10.36
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	58	10	580	85	0.60	0.09	52.49	7.85
	Resource	Water	7,000	20	5.1	2.4	58	1	58	50	0.46	0.07	13.22	1.98
									Total Unpaved Road Traffic Emissions (lb/pad)				335.99	51.27

[1] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[2] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[3] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
[5] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.2.10
2005 Potential Emissions Inventory - Pipeline Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Unpaved Road Traffic
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight[1] (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per pad	RT Distance (miles)	VMT[4] (VMT/pad)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/pad)	$PM_{2.5}$ Emissions[6] (controlled) (lb/pad)
Semis/transport, boom, equipment, water removal, sand, and gravel trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light truck/pick-ups	Local	Chemical	7,000	35	5.1	2.4	200	10	2000	85	0.23	0.03	69.00	10.26
	Resource	Water	7,000	20	5.1	2.4	200	1	200	50	0.23	0.03	23.00	3.42
												Total Unpaved Road Traffic Emissions (lb/pad)	1,113.36	170.29

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
6 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.2.11
2005 Potential Emissions Inventory - Well Pad Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/acre)	(hours/day)	(lb/acre)				
				CO	NO_x	SO_2	VOC	PM_{10}	equipment type)		CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	25.19	20.44	0.39	2.96	1.19
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	11	51.94	42.17	0.79	6.11	2.44
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	2.1	11	207.78	168.67	3.18	24.44	9.78
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	56.67	46.00	0.87	6.67	2.67
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	12.59	10.22	0.19	1.48	0.59
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	10	31.48	25.56	0.48	3.70	1.48
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	39.67	32.20	0.61	4.67	1.87
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	2.1	6	31.17	25.30	0.48	3.67	1.47
									Total Heavy Equipment Tailpipe Emissions		456.48	370.56	6.98	53.70	21.48

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.2.12
2005 Potential Emissions Inventory - Road Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Road Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	11	81.63	66.26	1.25	9.60	3.84
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	3.3	11	326.51	265.05	4.99	38.41	15.37
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	89.05	72.29	1.36	10.48	4.19
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	19.79	16.06	0.30	2.33	0.93
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	10	49.47	40.16	0.76	5.82	2.33
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	62.33	50.60	0.95	7.33	2.93
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	3.3	6	48.98	39.76	0.75	5.76	2.30
Total Heavy Equipment Tailpipe Emissions											717.33	582.30	10.97	84.39	33.76

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.2.13
2005 Potential Emissions Inventory - Pipeline Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Grader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Excavator	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Trencher	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Tractor (side-boom)	150	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	29.68	24.10	0.45	3.49	1.40
Total Emissions from Heavy Equipment Tailpipes											187.99	152.60	2.88	22.12	8.85

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, Tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.2.14
2005 Potential Emissions Inventory - Drilling Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT [4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis-tractor/ trailer/mud/water/fuel / cement trucks[1]	Local Road	Chemical	44,000	35	5.1	2.4	360	10	3,600	85	1.70	0.26	919.22	140.95
	Resource Road	Water	44,000	20	5.1	2.4	360	1	360	50	1.70	0.26	306.41	46.98
Vendors/ marketers/ various / workers	Local Road	Chemical	7,000	35	5.1	2.4	540	10	5,400	85	0.60	0.090	488.69	73.07
	Resource Road	Water	7,000	20	5.1	2.4	540	1	540	50	0.46	0.068	123.11	18.39
												Total Unpaved Road Traffic Emissions (lb/well)	1,837.43	279.39

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.

[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."

[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."

[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.

[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.2.15
2005 Potential Emissions Inventory - Rig Move Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT [4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Rig Haul Trucks	Local Road	Chemical	44,000	35	5.1	2.4	26.3	10	263	85	1.70	0.26	67.15	10.30
	Resource Road	Water	44,000	20	5.1	2.4	26.3	1	26	50	1.70	0.26	22.38	3.43
Light Trucks	Local Road	Chemical	7,000	35	5.1	2.4	8.8	10	88	85	0.74	0.11	9.83	1.51
	Resource Road	Water	7,000	20	5.1	2.4	8.8	1	9	50	0.74	0.11	3.28	0.50
											Total Unpaved Road Traffic Emissions (lb/well)		102.64	15.74

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
[6] Calculated as lb/VMT x VMT/well x control efficiency.

Table F.2.16
2005 Potential Emissions Inventory - Drilling Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	360	11	3960	45	24	128.68
NO_x	11.44	360	11	3960	45	24	99.87
SO_2[2]	0.13	360	11	3960	45	24	1.13
VOC	5.69	360	11	3960	45	24	49.67

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.
[3] Based on a life of project average of 45 days per well.

Table F.2.17
2005 Potential Emissions Inventory - Rig Move Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Diesel Combustion Emissions from Haul Truck Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration (days/move)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	26.3	11	289.3	3	24	9.40
NO_x	11.44	26.3	11	289.3	3	24	7.30
SO_2[2]	0.13	26.3	11	289.3	3	24	0.08
VOC	5.69	26.3	11	289.3	3	24	3.63

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.

[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.

Table F.2.18
2005 Potential Emissions Inventory - Ultra Tier 0 Rig

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 0
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration		Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,640	0.42	62	24	12,487.90	8.39	6.24
NOx	Tier 0	10.89	3,640	0.42	62	24	54,615.76	36.70	27.31
SO_2	Tier 0	0.44	3,640	0.42	62	24	2,206.70	1.48	1.10
VOC	Tier 0	0.32	3,640	0.42	62	24	1,604.87	1.08	0.80
PM_{10}[4]	Tier 0	0.32	3,640	0.42	62	24	1,604.87	1.08	0.80

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.2.19
2005 Potential Emissions Inventory - Ultra Tier 1 Rig

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 1
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,640	0.42	62	24	42,629.38	28.65	21.31
NOx	Tier 1	6.90	3,640	0.42	62	24	34,605.03	23.26	17.30
SO_2	Tier 1	0.44	3,640	0.42	62	24	2,206.70	1.48	1.10
VOC	Tier 1	1.00	3,640	0.42	62	24	5,015.22	3.37	2.51
PM_{10}[4]	Tier 1	0.40	3,640	0.42	62	24	2,006.09	1.35	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.2.20
2005 Potential Emissions Inventory - Shell Tier 0 Rig

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 0
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	4,040	0.42	45	24	10,059.82	9.31	5.03
NOx	Tier 0	10.89	4,040	0.42	45	24	43,996.57	40.74	22.00
SO_2	Tier 0	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 0	0.32	4,040	0.42	45	24	1,292.83	1.20	0.65
PM_{10}[4]	Tier 0	0.32	4,040	0.42	45	24	1,292.83	1.20	0.65

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

F.2.21
2005 Potential Emissions Inventory - Shell Tier 1 Rig

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 1
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	4,040	0.42	45	24	34,340.76	31.80	17.17
NOx	Tier 1	6.90	4,040	0.42	45	24	27,876.61	25.81	13.94
SO_2	Tier 1	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 1	1.00	4,040	0.42	45	24	4,040.09	3.74	2.02
PM_{10}[4]	Tier 1	0.40	4,040	0.42	45	24	1,616.04	1.50	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.2.22
2005 Potential Emissions Inventory - Questar Tier 0 Rig

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 0
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,940	0.42	45	24	9,810.82	9.08	4.91
NOx	Tier 0	10.89	3,940	0.42	45	24	42,907.55	39.73	21.45
SO_2	Tier 0	0.44	3,940	0.42	45	24	1,733.64	1.61	0.87
VOC	Tier 0	0.32	3,940	0.42	45	24	1,260.83	1.17	0.63
PM_{10}[4]	Tier 0	0.32	3,940	0.42	45	24	1,260.83	1.17	0.63

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.2.23
2005 Potential Emissions Inventory - Questar Tier 1 Rig

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 1
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,940	0.42	45	24	33,490.74	31.01	16.75
NOx	Tier 1	6.90	3,940	0.42	45	24	27,186.60	25.17	13.59
SO_2	Tier 1	0.44	3,940	0.42	45	24	1,733.64	1.61	0.87
VOC	Tier 1	1.00	3,940	0.42	45	24	3,940.09	3.65	1.97
PM_{10}[4]	Tier 1	0.40	3,940	0.42	45	24	1,576.03	1.46	0.79

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.2.24
2005 Potential Emissions Inventory - Questar Tier 2 Rig

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 2
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,940	0.42	45	24	10,244.23	9.49	5.12
NOx	Tier 2	4.50	3,940	0.42	45	24	17,730.39	16.42	8.87
SO_2	Tier 2	0.44	3,940	0.42	45	24	1,733.64	1.61	0.87
VOC	Tier 2	0.30	3,940	0.42	45	24	1,182.03	1.09	0.59
PM_{10}[4]	Tier 2	0.15	3,940	0.42	45	24	591.01	0.55	0.30

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1250 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.2.25
2005 Potential Emissions Inventory - Yates Tier 1 Rig

Project: Pinedale Anticline SEIS
Scenario: Yates - Tier 1
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	58	24	42,453.71	30.50	21.23
NOx	Tier 1	6.90	3,875	0.42	58	24	34,462.43	24.76	17.23
SO_2	Tier 1	0.44	3,875	0.42	58	24	2,197.60	1.58	1.10
VOC	Tier 1	1.00	3,875	0.42	58	24	4,994.55	3.59	2.50
PM_{10}[4]	Tier 1	0.40	3,875	0.42	58	24	1,997.82	1.44	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.2.26
2005 Potential Emissions Inventory - Anschutz Tier 0 Rig

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	58	24	12,436.44	8.93	6.22
NOx	Tier 0	10.89	3,875	0.42	58	24	54,390.70	39.07	27.20
SO_2	Tier 0	0.44	3,875	0.42	58	24	2,197.60	1.58	1.10
VOC	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80
PM_{10}[4]	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.2.27
2005 Potential Emissions Inventory - BP/Stone Tier 2 Rig

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 2
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,6]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,875	0.42	58	24	12,985.84	9.33	6.49
NOx	Tier 2	4.50	3,875	0.42	58	24	22,475.50	16.15	11.24
SO_2	Tier 2	0.13	3,875	0.42	58	24	649.29	0.47	0.32
VOC	Tier 2	0.30	3,875	0.42	58	24	1,498.37	1.08	0.75
PM_{10}[4]	Tier 2	0.15	3,875	0.42	58	24	749.18	0.54	0.37

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.
[6] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.2.28
2005 Potential Emissions Inventory - Petrogulf Tier 0 Rig

Project: Pinedale Anticline SEIS
Scenario: Petrogulf - Tier 0
Effective Dates: 2005
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	58	24	12,436.44	8.93	6.22
NOx	Tier 0	10.89	3,875	0.42	58	24	54,390.70	39.07	27.20
SO_2	Tier 0	0.44	3,875	0.42	58	24	2,197.60	1.58	1.10
VOC	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80
PM_{10}[4]	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 1200 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.2.29
2005 Potential Emissions Inventory - Drill Rig Boiler Emissions

Project:	**Pinedale Anticline SEIS**
Scenario:	**All**
Activity:	**Drilling**
Emissions:	**Rig Boilers**
Date:	**11/30/2006**

Fuel Combustion Source:

Unit Description	Rig Boilers	
Design Firing Rate (MMBTU/hr) :	5	

Operating Parameters:

Annual Operating hours	4380	
Operation %	Winter (Nov. - Apr.)	100

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combusted	21.90	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr)
Total PM	7.6000	0.03800
SO_2	0.6	0.00300
NO_x	100.0000	0.50000
CO	21.0000	0.10500
VOC	5.50000	0.02750

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.2.30
2005 Potential Emissions Inventory - Frac/Other Completion Engine Emissions

Project: Pinedale Anticline SEIS
Scenario: All
Effective Dates: All
Emissions: Diesel Combustion Emissions from Frac/Other Completion Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5] (g/hp-hr)	Horsepower[2] (hp)	Overall Load Factor[3]	Drilling Activity Duration (days/well)	Drilling Activity Duration (hours/day)	Emissions per Well (lb/well)	Emissions per Hour (lb/hr)	Emissions per Well (tons)
CO	Tier 2	2.60	9,200	0.40	4	24	2,025.02	21.09	1.01
NOx	Tier 2	4.50	9,200	0.40	4	24	3,504.84	36.51	1.75
SO_2	Tier 2	0.13	9,200	0.40	4	24	101.25	1.05	0.05
VOC	Tier 2	0.30	9,200	0.40	4	24	233.66	2.43	0.12
PM_{10}[4]	Tier 2	0.15	9,200	0.40	4	24	116.83	1.22	0.06

Note: Frac engines are EPA Tier 2 from data provided by operators and Frac contractor Halliburton.
[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of operators current data. Frac pump engines constitute the majority of the hp used.
[3] Load factor based on weighted average of full load and idle conditions during frac operations.
[4] PM2.5 assumed equivalent to PM10 for frac engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.2.31
2005 Potential Emissions Inventory - Completion/Testing Traffic

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT[4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emissions[5] (lb/VMT)	$PM_{2.5}$ Emissions[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis/ transport/ water/ sand/ frac trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3,000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light Trucks/ Pickups	Local	Chemical	7,000	35	5.1	2.4	450	10	4,500	85	0.74	0.11	502.42	77.04
	Resource	Water	7,000	20	5.1	2.4	450	1	450	50	0.74	0.11	167.47	25.68
									Total Unpaved Road Traffic Emissions (lb/well)				1,691.26	259.33

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
6 Calculated as lb/VMT x VMT/well x control efficiency.

Table F.2.32
2005 Potential Emissions Inventory - Completion/Testing Haul Truck Tailpipe

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration[3] (hours/day)	Emissions (lb/well)
CO	14.74	300	11	3300	10	18	107.24
NO_x	11.44	300	11	3300	10	18	83.23
SO_2[2]	0.16	300	11	3300	10	18	1.16
VOC	5.69	300	11	3300	10	18	41.40

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a S balance and 350 ppm diesel fuel.
[3] Haul Activity Duration for completion activities based on an average of 10 days per well and an average of 24 hr/day for 5 days and 12 hr/day for 5 days.

Table F.2.33
2005 Potential Emissions Inventory - Production Traffic – Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	RTs (RTs)	RT Distance (miles)	VMT[3] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[5] (controlled) (lb/RT)
Light Truck	Local	Chemical	7,000	35	5.1	2.4	1	10	10	85	0.74	0.11	1.12	0.17
	Resource	Water	7,000	20	5.1	2.4	1	1	1	50	0.74	0.11	0.37	0.06
												Total Access and Unimproved Road Emissions (lb/RT)	1.49	0.23

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
5 Calculated as lb/VMT x VMT/RT x control efficiency.

Table F.2.34
2005 Potential Emissions Inventory - Liquids Gathering Traffic - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	RT (RT)	RT Distance (miles)	VMT[3] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[5] (controlled) (lb/RT)
Haul Truck	Local	Chemical	54,000	35	5.1	2.4	1	10	10	85	1.87	0.29	2.80	0.43
	Resource	Water	54,000	20	5.1	2.4	1	1	1	50	1.87	0.29	0.93	0.14
												Total Access and Unimproved Road Emissions (lb/RT)	3.73	0.57

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
5 Calculated as lb/VMT x VMT/RT x control efficiency.

Table F.2.35
2005 Potential Emissions Inventory - Tanker Traffic Tailpipe - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mi)	RT (RT)	Single Well Round Trip Distance (mi/RT)	Single Well Daily VMT (mi/RT)	Daily Emissions Single Well (lb/RT)
CO	14.74	1	11	11.00	0.36
NO_x	11.44	1	11	11.00	0.28
SO_2[2]	0.16	1	11	11.00	0.00
VOC	5.69	1	11	11.00	0.14

[1] AP-42 (EPA 1985), Table 2.7.1 "Volume II Mobile Sources." Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is base don a S balance and 350 ppm diesel fuel.

Table F.2.36
2005 Potential Emissions Inventory - Production Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Production Wind Erosion
Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor : 0.3733 lb/hr/100m^2 Based on AP-42 Chapter 13.2.5 (EPA 2004), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.

Control Efficiency: 50 %

Disturbed Area: 1 acres 4,047.00 m^2

PM Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	PM_{10} Emissions (lb/hr/acre)	$PM_{2.5}$ Emissions (lb/hr/acre)	PM_{10} Emissions[1] (tons/acre/yr)	$PM_{2.5}$ Emissions[1] (tons/acre/yr)
Production:	0.3733	0.1493	40.47	50	7.55	3.02	0.18	0.07

[1] TPY numbers based on lb/hr/acre and 47 hours per year that the wind speed in the Jonah Field met data overcome the threshold friction velocity.

Table F.2.37
2005 Potential Emissions Inventory - Separator/Indirect Line Heaters

Project: Pinedlae Anticline SEIS
Scenario: Average per Well
Activity: Production
Emissions: Separator/Line Heaters
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Separator/Line Heaters	
Design Firing Rate (MMBTU/hr)	0.75	

Operating Parameters:

Annual Operating hours	1971	
Operation %	Winter (Nov. - Apr.)	35
	Summer (May - Oct.)	10

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combustec	1.48	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr) Winter	(lb/hr) Summer	(tpy) Total
Total PM	7.6000	0.00200	0.00057	0.0056
SO_2	0.6	0.00016	0.00005	0.0004
NO_x	100.0000	0.02625	0.00750	0.0739
CO	21.0000	0.00551	0.00158	0.0155
VOC	5.50000	0.00144	0.00041	0.0041

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.2.38
2005 Potential Emissions Inventory - Dehy Reboiler Heater

Project: Pinedlae Anticline SEIS
Scenario: Average per Well
Activity: Production
Emissions: Dehy Reboiler Heater
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Separator/Line Heaters	
Design Firing Rate (MMBTU/hr)	0.085	

Operating Parameters:

Annual Operating hours	1971	
Operation %	Winter (Nov. - Apr.)	35
	Summer (May - Oct.)	10

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combustec	0.17	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr) Winter	(lb/hr) Summer	(tpy) Total
Total PM	7.6000	0.00023	0.00006	0.0006
SO_2	0.6	0.00002	0.00001	0.0001
NO_x	100.0000	0.00298	0.00085	0.0084
CO	21.0000	0.00062	0.00018	0.0018
VOC	5.50000	0.00016	0.00005	0.0005

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.2.39
2005 Potential Emissions Inventory - Dehydrator Flashing

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Production
Emissions: TEG Dehydrator Flashing
Date: 11/30/2006

	Uncontrolled		Controlled[1]	
Pollutant	(tpy)	(lb/hr)	(tpy)	(lb/hr)
VOC	12.55	2.87	0.63	0.14
HAP	8.52	1.95	0.43	0.10
Benzene	1.42	0.32	0.07	0.02
Toluene	3.83	0.88	0.19	0.04
Ethylbenzene	0.18	0.04	0.01	2.10E-03
Xylene	2.97	0.68	0.15	0.03
n-Hexane	0.11	0.02	0.01	1.20E-03

[1] Data based on GRI-GLYCalc V. 4.0, 4 MMSCFD, 0.32 gpm glycol flow rate, average representative gas analysis and 95% destruction efficiency for controlled.

Table F.2.40
2005 Potential Emissions Inventory - Fugitive HAPs and VOCs - Per Pad

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Production
Emissions: Fugitive VOC/HAP Emissions
Date: 11/30/2006

Gas Analysis Weight Fraction

VOC	0.13930
Benzene	0.00052
Toluene	0.00091
Ethlybenzene	0.00003
Xylene	0.00036
n-hexane	0.00131

Source	Quantity	Emission Factor[1] (lb/hr/component)	Non-methane Hydrocarbons[2] (lb/hr)	Non-methane Hydrocarbons (tpy)	Benzene[2] (lb/hr)	Benzene (tpy)	Toluene[2] (lb/hr)	Toluene (tpy)	Ethlybenzene[2] (lb/hr)	Ethlybenzene (tpy)	Xylene[2] (lb/hr)	Xylene (tpy)	n-Hexane[2] (lb/hr)	n-Hexane (tpy)
Valves	20	0.00992	0.0276	0.121	0.00010	0.00045	0.00018	0.00079	0.000006	0.000028	0.00007	0.00031	0.00026	0.0011
Flanges	30	0.00086	0.0036	0.016	0.00001	0.00006	0.00002	0.00010	0.000001	0.000004	0.00001	0.00004	0.00003	0.0001
Connections	275	0.00044	0.0169	0.074	0.00006	0.00028	0.00011	0.00048	0.000004	0.000017	0.00004	0.00019	0.00016	0.0007
Pump seals	2	0.00529	0.0015	0.006	0.00001	0.00002	0.00001	0.00004	0.000000	0.000002	0.00000	0.00002	0.00001	0.0001
Open ended lines	3	0.00441	0.0018	0.008	0.00001	0.00003	0.00001	0.00005	0.000000	0.000002	0.00000	0.00002	0.00002	0.0001
		Total Emissions/Well	0.0514	0.225	0.00019	0.00084	0.00034	0.00147	0.000012	0.000052	0.00013	0.00058	0.00048	0.0021

[1] Taken from the WDEQ (2001) "Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance".
[2] Calculated as weight fraction * emissions factor * quantity of source.

Table F.2.41
2005 Potential Emissions Inventory - Condensate Storage Emissions - Per Well

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Production
Emissions: Condensate Storage Tanks
Date: 11/30/2006

Average Controlled Condensate Storage Emissions[1]

VOC and HAP Emissions		
VOC	1.1856	tpy/well
HAP	0.0594	tpy/well
Benzene	0.0029	tpy/well
Toluene	0.0001	tpy/well
Ethylbenzene	0.0017	tpy/well
Xylene	0.0022	tpy/well
n-Hexane	0.0526	tpy/well

NO_x and CO Emissions from Smokeless Flare Combustion		
NO_x Emission Factor	0.068	lb/MMBTU
CO Emission Factor	0.37	lb/MMBTU
Heat Content	1,000	Btu/scf
Condensate Production	13.00	bbl/day
Gas to Oil Ratio	957.37	scf/bbl
Gas Production	12,445.81	SCFD
Combustion Emissions from Storage Tanks		
NO_x	0.15	tpy/tank
CO	0.84	tpy/tank

Average Uncontrolled Storage Tank Emissions[1]

VOC	16.1000	tpy/well
HAP	0.7880	tpy/well
Benzene	0.0372	tpy/well
Toluene	0.0021	tpy/well
Ethylbenzene	0.0223	tpy/well
Xylene	0.0283	tpy/well
n-Hexane	0.6981	tpy/well

Table F.2.42
2005 Potential Emissions Inventory - Compression Emissions

Compression:	2005	
	(lb/hr)	(tpy)
NOx:	96.3	421.9
CO:	36.0	157.7
VOC:	73.2	320.5
PM10:	0.0	0.0
PM2.5:	0.0	0.0
SO2:	0.0	0.0
Formaldehyde:	9.5	41.7

Paradise 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1187
Falcon 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1186.
Pinedale 2005 based on (2) 1,860 hp and (2) 3,720 hp compressors as provided by Questar and emissions from MD-1267.

Table F.2.43
2005 Potential Emissions Inventory - Granger Gas Plant 2005 Potential Emissions

Pollutant	(lb/hr)	(tpy)[1]
NOx:	68.88	301.7
CO:	73.70	322.8
VOCs:	32.01	140.2
SO2:	0.00	0.0
PM10:	0.00	0.0
Benzene:	0.07	0.3
Toluene:	0.02	0.1
Ethylbenzene:	0.00	0.0
Xylene:	0.02	0.1
n-Hexane:	0.07	0.3
Formaldehyde:	7.65	33.5
Total HAPs:	7.83	34.3

[1] Emissions taken from WDEQ-AQD permit # MD-644A. BTEX and n-Hexane estimated from Total HAPs.

Table F.2.44
2005 Potential Emissions Inventory - Opal Gas Plant 2005 Potential Emissions

Pollutant	(lb/hr)	(tpy)[1]
NOx:	127.76	559.6
CO:	117.33	513.9
VOCs:	54.98	240.8
SO2:	0.00	0.0
PM10:	0.00	0.0
Benzene:	2.58	11.3
Toluene:	0.75	3.3
Ethylbenzene:	0.23	1.0
Xylene:	0.37	1.6
n-Hexane:	1.94	8.5
Formaldehyde:	0.00	0.0
Total HAPs:	5.87	25.7

[1] Emissions taken from WDEQ-AQD permit # MD-1188. HAPs estimated from total HAPs in MD-1188 and speciated based on the ratios in Opal's 2005 actual emissions inventory.

Table F.2.45
2005 Potential Emissions Inventory - Drill Rig Schedule

	Questar			Ultra			Shell			Yates			Anschutz			BP/Stone			Petrogulf			Total		
Year	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves
2005	60	7.4	8	46	8.9	18	46	5.7	12	7	1.2	2	1	0.3	1.0	6	1.4	3.0	6.0	1.0	6.0	172.0	25.9	50.0

Note: Number of Rigs operating are averaged over the year to remain consistent with the proposed action inventory.

Table F.2.46
2005 Potential Emissions Inventory - Rig Counts and Tier Levels by Operator

		2005
Questar:	Tier 0:	3
	Tier 1:	4
	Tier 2:	0.4
	Total:	7.4
Ultra:	Tier 0:	6
	Tier 1:	2.9
	Tier 2:	0
	Total:	8.9
Shell:	Tier 0:	2
	Tier 1:	3.7
	Tier 2:	0
	Total:	5.7
Yates:	Tier 0:	0
	Tier 1:	1.2
	Tier 2:	0
	Total:	1.2
Anschutz:	Tier 0:	0.3
	Tier 1:	0
	Tier 2:	0
	Total:	0.3
BP/Stone:	Tier 0:	0
	Tier 1:	0
	Tier 2:	1.4
	Total:	1.4
Petrogulf:	Tier 0:	1
	Tier 1:	0
	Tier 2:	0
	Total:	1

Note: Totals based on averages taken from Rig Data.

Table F.2.47
2005 Potential Emissions Inventory - Total Drilling Rig Engine Emissions

		2005	
		(lb/hr)[1]	(tpy)[2]
Questar:	CO	155.09	685.69
	NO_x	226.45	990.07
	SO_2	11.88	52.01
	VOC	18.53	81.91
	PM_{10}	9.56	42.02
Ultra:	CO	133.44	513.28
	NO_x	287.67	1106.08
	SO_2	13.20	50.75
	VOC	16.25	62.49
	PM_{10}	10.38	39.92
Shell:	CO	136.28	595.59
	NO_x	176.98	770.12
	SO_2	2.77	12.08
	VOC	16.24	70.94
	PM_{10}	7.93	34.58
Yates:	CO	36.60	148.59
	NO_x	29.71	120.62
	SO_2	1.89	7.69
	VOC	4.31	17.48
	PM_{10}	1.72	6.99
Anschutz:	CO	2.68	6.22
	NO_x	11.72	27.20
	SO_2	0.47	1.10
	VOC	0.34	0.80
	PM_{10}	0.34	0.80
BP/Stone:	CO	13.06	38.96
	NO_x	22.60	67.43
	SO_2	0.65	1.95
	VOC	1.51	4.50
	PM_{10}	0.75	2.25
Petrogulf:	CO	8.93	37.31
	NO_x	39.07	163.17
	SO_2	1.58	6.59
	VOC	1.15	4.79
	PM_{10}	1.15	4.79
Total:	**CO**	486.07	2025.64
	NO_x	794.20	3244.68
	SO_2	32.45	132.17
	VOC	58.32	242.92
	PM_{10}	31.84	131.36

[1] lb/hr based on worst case # of drill rigs operating at once.
[2] tpy numbers based on makeup of drill fleet and # of wells proposed to be drilled in given year.

Table F.2.48
2005 Potential Emissions Inventory - Total Drilling Rig Boiler Emission

		2005 (lb/hr)[1]	2005 (tpy)[2]				
Questar:	CO	0.78	1.70	**Anschutz:**	CO	0.03	0.07
	NO_x	3.70	8.10		NO_x	0.15	0.33
	SO_2	0.02	0.05		SO_2	0.00	0.00
	VOC	0.20	0.45		VOC	0.01	0.02
	PM_{10}	0.28	0.62		PM_{10}	0.01	0.02
Ultra:	CO	0.93	2.05	**BP/Stone:**	CO	0.15	0.32
	NO_x	4.45	9.75		NO_x	0.70	1.53
	SO_2	0.03	0.06		SO_2	0.00	0.01
	VOC	0.24	0.54		VOC	0.04	0.08
	PM_{10}	0.34	0.74		PM_{10}	0.05	0.12
Shell:	CO	0.60	1.31	**Petrogulf:**	CO	0.11	0.23
	NO_x	2.85	6.24		NO_x	0.50	1.10
	SO_2	0.02	0.04		SO_2	0.00	0.01
	VOC	0.16	0.34		VOC	0.03	0.06
	PM_{10}	0.22	0.47		PM_{10}	0.04	0.08
Yates:	CO	0.13	0.28				
	NO_x	0.60	1.31				
	SO_2	0.00	0.01				
	VOC	0.03	0.07				
	PM_{10}	0.05	0.10				
Total:	**CO**	2.72	5.96				
	NO_x	12.95	28.36				
	SO_2	0.08	0.17				
	VOC	0.71	1.56				
	PM_{10}	0.98	2.16				

[1] lb/hr based on worst case # of drill rigs operating at once.
[2] tpy numbers based on boilers running throughout the winter season (Nov.-April).

Table F.2.49
2005 Potential Emissions Inventory - Total Construction Disturbance Emissions

		2005	
		(lb/hr)[1]	(tpy)[2]
Pad Construction/Expansion:	PM_{10}	2.82	3.09
	$PM_{2.5}$	0.74	0.81
Local Road Construction:	PM_{10}	1.02	1.11
	$PM_{2.5}$	0.27	0.29
Resource Road Construction:	PM_{10}	1.21	1.33
	$PM_{2.5}$	0.32	0.35
Pipeline Construction:	PM_{10}	3.38	3.71
	$PM_{2.5}$	0.89	0.98
Wind Erosion[3]:	PM_{10}	21.44	46.95
	$PM_{2.5}$	8.58	18.78
Other Construction Activities:	PM_{10}	219.19	240.01
	$PM_{2.5}$	57.84	63.34
Total Construction Surface Disturbace Emissions:	PM_{10}	249.06	296.20
	$PM_{2.5}$	68.64	84.55

Note: Construction Surface Disturbance Emissions occur during summer months (May-Oct.) and daylight hours (12 hrs/day) only.

[1] lb/hr number based on 6 months of construction at 12 hrs/day.
[2] tpy numbers based on total construction occuring over a 6 month period between May and October of each year.
[3] Wind erosion lb/hr totals assume that construction is evenly distributed over the summer construction season.

Table F.2.50
2005 Potential Emissions Inventory - Total Construction Traffic and Heavy Equipment Tailpipe Emissions

		2005 (lb/hr)	2005 (tpy)
Pad Construction Traffic[1]:	PM_{10}	30.19	33.06
	$PM_{2.5}$	4.61	5.04
Road Construction Traffic:	PM_{10}	7.98	8.74
	$PM_{2.5}$	1.22	1.33
Pipeline Construction Traffic:	PM_{10}	26.44	28.95
	$PM_{2.5}$	4.04	4.43
Other Construction Activities Traffic[2]:	PM_{10}	31.65	34.65
	$PM_{2.5}$	4.84	5.30
Well Pad Construction Heavy Equipment Tailpipe:	CO	85.07	93.15
	NO_x	69.06	75.62
	SO_2	1.30	1.42
	VOC	10.01	10.96
	$PM_{10/2.5}$	4.00	4.38
Road Construction Heavy Equipment Tailpipe:	CO	7.32	8.02
	NO_x	5.95	6.51
	SO_2	0.11	0.12
	VOC	0.86	0.94
	$PM_{10/2.5}$	0.34	0.38
Pipeline Construction Heavy Equipment Tailpipe:	CO	2.23	2.44
	NO_x	1.81	1.98
	SO_2	0.03	0.04
	VOC	0.26	0.29
	$PM_{10/2.5}$	0.11	0.12
er Construction Activities Heavy Equipment Tailpipe:	CO	5.87	6.42
	NO_x	4.76	5.22
	SO_2	0.09	0.10
	VOC	0.69	0.76
	$PM_{10/2.5}$	0.28	0.30

		2005 (lb/hr)	2005 (tpy)
Drilling Traffic:	PM_{10}	36.08	158.02
	$PM_{2.5}$	5.49	24.03
Rig Move Traffic:	PM_{10}	2.02	8.83
	$PM_{2.5}$	0.31	1.35
Drilling Haul Truck Tailpipe:	CO	2.53	11.07
	NO_x	1.96	8.59
	SO_2	0.02	0.10
	VOC	0.98	4.27
Rig Move Haul Truck Tailpipe:	CO	0.18	0.81
	NO_x	0.14	0.63
	SO_2	0.00	0.01
	VOC	0.07	0.31
Total Construction Surface Disturbace Emissions:	**CO**	103.21	121.92
	NO_x	83.68	98.55
	SO_2	1.56	1.79
	VOC	12.87	17.53
	PM_{10}	139.08	277.42
	$PM_{2.5}$	25.23	46.66

Note: All tpy numbers except drilling related based on total emissions during the six month construction season (May-October). All lb/hr numbers except drilling related based on this total and assumed to happen evenly over the daylight hours of the construction season (2190 hrs/yr). All drilling emissions based on year-round drilling.

[1] Based on new pads and 20 expanded pads

[2] For estimates of traffic and HE tailpipe emissions for other construction activities, the stabilizer facility and Paradise Compressor Station were conservatively assumed to be pads and Questar's gathering system was treated as other pipelines.

Table F.2.51
2005 Potential Emissions Inventory - Total Frac/Completion Emissions

		2005	
		(lb/hr)[1]	(tpy)[2]
Frac and Other Completion Engine Emissions:	CO	39.76	174.15
	NO_x	68.82	301.42
	SO_2	1.99	8.71
	VOCs	4.59	20.09
	$PM_{10/2.5}$	2.29	10.05
Completion Traffic:	PM_{10}	33.21	145.45
	$PM_{2.5}$	5.09	22.30
Completion/Testing Haul Truck Tailpipe:	CO	2.11	9.22
	NO_x	1.63	7.16
	SO_2	0.02	0.10
	VOC	0.81	3.56
Total Frac/Completion Emissions:	CO	41.87	183.37
	NO_x	70.45	308.57
	SO_2	2.01	8.81
	VOCs	5.40	23.65
	PM_{10}	35.50	155.50
	$PM_{2.5}$	7.39	32.35

[1] lb/hr number based on tpy and year-round activity.
[2] tpy numbers based on number of wells drilled per year.

Table F.2.52
2005 Potential Emissions Inventory - Total Construction Emissions

		(lb/hr) Summer	2005 (lb/hr) Winter	(tpy) Total
Total 2005 Potential Construction Disturbance Emissions:	PM_{10}	249.06	0.00	296.20
	$PM_{2.5}$	68.64	0.00	84.55
2005 Potential Construction Traffic and Heavy Equipment Tailpipe Emissions:	CO	103.21	0.00	121.92
	NO_x	83.68	0.00	98.55
	SO_2	1.56	0.00	1.79
	VOC	12.87	0.00	17.53
	PM_{10}	139.08	0.00	277.42
	$PM_{2.5}$	25.23	0.00	46.66
2005 Potential Drill Rig Engine Emissions:	CO	486.07	486.07	2025.64
	NOx	794.20	794.20	3244.68
	SO2	32.45	32.45	132.17
	VOC	58.32	58.32	242.92
	PM10	31.84	31.84	131.36
2005 Potential Drill Rig Boiler Emissions:	CO	0.00	2.72	5.96
	NOx	0.00	12.95	28.36
	SO2	0.00	0.08	0.17
	VOC	0.00	0.71	1.56
	PM10	0.00	0.98	2.16
2005 Potential Completion Emissions[1]:	CO	41.87	41.87	183.37
	NO_x	70.45	70.45	308.57
	SO_2	2.01	2.01	8.81
	VOCs	5.40	5.40	23.65
	PM_{10}	35.50	35.50	155.50
	$PM_{2.5}$	7.39	7.39	32.35
POTENTIAL CONSTRUCTION EMISSIONS:	**CO**	631.15	530.66	2336.89
	NO_x	948.33	877.60	3680.16
	SO_2	36.02	34.54	142.94
	VOCs	76.59	64.43	285.66
	PM_{10}	455.48	68.32	862.63
	$PM_{2.5}$	133.10	40.21	297.08

[1] 2005 potential completion emissions are slightly less than reported in the operators 2005 actual inventories, as some of the operators used average, overly conservative numbers per well in their actual inventories.

Table F.2.53
2005 Potential Emissions Inventory - Total Production Emissions

		(lb/hr) Summer	2005 (lb/hr) Winter	(tpy) Total
	# of Wells Drilled:		172	
	# of Wells in Production:		286	
Production Traffic:	PM_{10}	15.08	15.08	66.05
	$PM_{2.5}$	2.31	2.31	10.13
Liquids Gathering Haul Truck Traffic:	PM_{10}	13.86	13.86	60.69
	$PM_{2.5}$	2.12	2.12	9.31
Production Haul Truck Tailpipe:	CO	1.33	1.33	5.81
	NO_x	1.03	1.03	4.51
	SO_2	0.01	0.01	0.06
	VOC	0.51	0.51	2.24
Production Wind Erosion:	PM_{10}	47.46	47.46	207.86
	$PM_{2.5}$	18.98	18.98	83.14
Separator/Indirect Line Heaters:	$PM_{10/2.5}$	0.16	0.57	1.61
	SO_2	0.01	0.05	0.13
	NO_x	2.15	7.51	21.14
	CO	0.45	1.58	4.44
	VOC	0.12	0.41	1.16
Dehy Reboiler Heaters:	$PM_{10/2.5}$	0.02	0.06	0.18
	SO_2	0.00	0.01	0.01
	NO_x	0.24	0.85	2.40
	CO	0.05	0.18	0.50
	VOC	0.01	0.05	0.13
Dehy Flashing Emissions:	VOC	118.86	118.86	520.59
	Total HAPs	80.69	80.69	353.43
	Benzene	13.41	13.41	58.72
	Toluene	36.28	36.28	158.92
	Ethylbenzene	1.72	1.72	7.53
	Xylene	28.14	28.14	123.27
	n-Hexane	1.02	1.02	4.46
Fugitive HAPs and VOCs:	VOC	13.67	13.67	59.89
	Total HAPs	0.31	0.31	1.35
	Benzene	0.05	0.05	0.22
	Toluene	0.09	0.09	0.39
	Ethylbenzene	0.00	0.00	0.01
	Xylene	0.03	0.03	0.15
	n-Hexane	0.13	0.13	0.56
Condensate Storage Pre Gathering System[1]:	VOC	174.80	174.80	765.63
	Total HAPs	8.64	8.64	37.83
	Benzene	0.41	0.41	1.81
	Toluene	0.02	0.02	0.09
	Ethylbenzene	0.24	0.24	1.07
	Xylene	0.31	0.31	1.37
	n-Hexane	7.65	7.65	33.49
	NOx	10.09	10.09	44.17
	CO	54.88	54.88	240.36
2005 Compression:	NOx	96.32	96.32	421.90
	CO	36.00	36.00	157.70
	VOC	73.17	73.17	320.50
	PM10	0.00	0.00	0.00
	PM2.5	0.00	0.00	0.00
	SO2	0.00	0.00	0.00
	Formaldehyde	9.52	9.52	41.70
2005 Granger and Opal Potential Emissions:	NOx:	196.64	196.64	861.30
	CO:	191.03	191.03	836.70
	VOCs:	86.99	86.99	381.00
	SO2:	0.00	0.00	0.00
	PM10:	0.00	0.00	0.00
	Benzene:	2.65	2.65	11.61
	Toluene:	0.78	0.78	3.40
	Ethylbenzene:	0.23	0.23	1.00
	Xylene:	0.39	0.39	1.70
	n-Hexane:	2.01	2.01	8.80
	Formaldehyde:	7.65	7.65	33.50
	Total HAPs:	13.70	13.70	60.00
TOTAL PRODUCTION EMISSIONS:	**NOx**	306.47	312.44	1355.42
	CO	283.74	284.99	1245.51
	VOC	468.14	468.46	2051.15
	PM10	76.57	77.03	336.38
	PM2.5	23.60	24.05	104.36
	SO2	0.03	0.06	0.20
	Formaldehyde	17.17	17.17	75.20
	Benzene	16.52	16.52	72.36
	Toluene	37.17	37.17	162.81
	Ethylbenzene	2.19	2.19	9.61
	Xylene	28.88	28.88	126.49
	n-Hexane	10.80	10.80	47.32
	Total HAPs	112.74	112.74	493.80

[1] Assumes that 90% of the condensate storage is controlled to 98%.

Table F.2.54
2005 Potential Emissions Inventory - Total Emissions

		(lb/hr) Summer	2005 (lb/hr) Winter	(tpy) Total
TOTAL 2005 POTENTIAL CONSTRUCTION EMISSIONS:	CO	631.15	530.66	2336.89
	NO_x	948.33	877.60	3680.16
	SO_2	36.02	34.54	142.94
	VOCs	76.59	64.43	285.66
	PM_{10}	455.48	68.32	862.63
	$PM_{2.5}$	133.10	40.21	297.08
TOTAL 2005 POTENTIAL PRODUCTION EMISSIONS:	NOx	306.47	312.44	1355.42
	CO	283.74	284.99	1245.51
	VOC	468.14	468.46	2051.15
	PM10	76.57	77.03	336.38
	PM2.5	23.60	24.05	104.36
	SO2	0.03	0.06	0.20
	Formaldehyde	17.17	17.17	75.20
	Benzene	16.52	16.52	72.36
	Toluene	37.17	37.17	162.81
	Ethylbenzene	2.19	2.19	9.61
	Xylene	28.88	28.88	126.49
	n-Hexane	10.80	10.80	47.32
	Total HAPs	112.74	112.74	493.80
TOTAL 2005 POTENTIAL EMISSIONS:	**NOx**	1254.81	1190.04	5035.58
	CO	914.88	815.65	3582.39
	VOC	544.72	532.90	2336.82
	PM10	532.05	145.35	1199.01
	PM2.5	156.70	64.26	401.45
	SO2	36.05	34.60	143.14
	Formaldehyde	17.17	17.17	75.20
	Benzene	16.52	16.52	72.36
	Toluene	37.17	37.17	162.81
	Ethylbenzene	2.19	2.19	9.61
	Xylene	28.88	28.88	126.49
	n-Hexane	10.80	10.80	47.32
	Total HAPs	112.74	112.74	493.80

Table F.3.1
Proposed Action Emissions Inventory - Pad, Road and Pipeline Disturbances by Year

Year	Pads (acres)	New Pads (number)	Expanded Pads (number)	Local Roads (miles)	Local Roads (acres)	Resource Roads (Miles)	Resource roads (acres)	Pipelines (miles)	Pipelines (acres)	Total (acres)
Pre-ROD	332.05	56	--	--	--	108.3	652.3	12.14	60.15	1044.5
ROD through 2005	1808.02	266	--	--	--	176.52	912.98	134.18	804.81	3525.81
2006 [1]	295.50	26	43	5.20	23.45	5.98	27.93	13.00	78.00	424.88
2007	822.50	44	37	8.80	39.69	10.12	47.26	22.00	132.00	1041.45
2008	680.50	36	31	7.20	32.47	8.28	38.67	18.00	108.00	859.64
2009	712.00	37	19	7.40	33.37	8.51	39.74	18.50	111.00	896.12
2010	623.00	29	18	5.80	26.16	6.67	31.15	14.50	87.00	767.31
2011	589.00	33	11	6.60	29.77	7.59	35.45	16.50	99.00	753.21
2012	556.00	13	13	2.60	11.73	2.99	13.96	6.50	39.00	620.69
2013	485.00	15	10	3.00	13.53	3.45	16.11	7.50	45.00	559.64
2014	567.00	11	20	2.20	9.92	2.53	11.82	5.50	33.00	621.74
2015	537.00	12	18	2.40	10.82	2.76	12.89	6.00	36.00	596.71
2016	557.00	12	19	2.40	10.82	2.76	12.89	6.00	36.00	616.71
2017	508.00	8	20	1.60	7.22	1.84	8.59	4.00	24.00	547.81
2018	399.00	0	25	0.00	0.00	0.00	0.00	0.00	0.00	399.00
2019	342.00	0	18	0.00	0.00	0.00	0.00	0.00	0.00	342.00
2020	230.00	0	11	0.00	0.00	0.00	0.00	0.00	0.00	230.00
2021	210.00	0	10	0.00	0.00	0.00	0.00	0.00	0.00	210.00
2022	210.00	0	10	0.00	0.00	0.00	0.00	0.00	0.00	210.00
2023	84.00	0	4	0.00	0.00	0.00	0.00	0.00	0.00	84.00
Total 2007-2023	**8112.00**	**250**	**294**	**50.00**	**225.50**	**57.50**	**268.53**	**125.00**	**750.00**	**9356.03**

[1] The year 2006 is neither part of the No Action nor the Proposed Action

Table F.3.2
Proposed Action Emissions Inventory - Well Pad Construction/Expansion - All Operators - Per Acre

Project: Pinedale Anticline SEIS
Scenario: All Scenerios
Activity: Well Pad Construction
Emissions: Fugitive Particulate Emissions from Well Pad Construction
Date: 11/30/2006

Well Pad Area (Expansion)	Construction Activity TSP Emission Factor[1]	Construction Activity Duration[2]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(acre)	(tons/acre-month)	(days/acre)	(hours/day)	(%)	(lb/acre)	(lb/acre)
1	1.2	2.1	12	50	15.12	3.99

[1] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations"; TSP = total suspended particulates.
[2] Construction Activity Duration taken from an average of durations provided by Shell, Ultra and Questar.
[3] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.3
Proposed Action Emissions Inventory - Local Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Local Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]	$PM_{2.5}$ Emissions (controlled)[5]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.51	1.2	3.3	12	50	214.32	56.56

[1] Construction Area taken from average of current field activity of 4.51 acres/mile for Local Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.4
Proposed Action Emissions Inventory - Resource Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Resource Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]	$PM_{2.5}$ Emissions (controlled)[5]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.67	1.2	3.3	12	50	221.92	58.56

[1] Construction Area taken from average of current field activity of 4.67 acres/mile for Resource Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.5
Proposed Action Emissions Inventory - Pipeline Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Pipeline Construction
Date: 11/30/2006

Pipeline Length (mi)	Pipeline Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration[3] (days/mi)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[4] (lb/mi)	$PM_{2.5}$ Emissions (controlled)[5] (lb/mi)
1	6.00	1.2	3.3	12	50	285.12	75.24

[1] Construction Area taken from average of current field activity of 6.00 acres/mile for pipelines.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.6
Proposed Action Emissions Inventory - Ultra/Shell Gathering System Construction - 2008

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Misc. Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Construction Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]		$PM_{2.5}$ Emissions (controlled)[5]	
	(acres)	(tons/acre-month)	(days)	(hours/day)	(%)	(lbs)	(tpy)	(lbs)	(tpy)
Ultra/Shell Gathering System	351.52	1.2	150	12	50	759283.20	379.64	200366.40	100.18

[1] Acres of construction provided by operators.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.7
Proposed Action Emissions Inventory - Sales Pipeline Construction

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Sales Pipeline Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Year of Proposed Construction	Construction Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration[3] (days)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[4] (lbs)	(tpy)	$PM_{2.5}$ Emissions (controlled)[5] (lbs)	(tpy)
QGM (2) Mesa Loop inside PAPA	2007	145.45	1.2	39.6	12	50	82,941	41.47	21,887	10.94
QGM Water Gathering System	2007	109.09	1.2	59.4	12	50	93,311	46.66	24,624	12.31
TEPPCO Mesa to Falcon inside PAPA	2011	155.15	1.2	52.8	12	50	117,964	58.98	31,129	15.56
						Total 2007:	176,253	88.13	46,511	23.26
						Total 2011:	117,964	58.98	31,129	15.56

[1] Acres of construction provided by operators.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.8
Proposed Action Emissions Inventory - Ancillary Facilities Construction

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Ancillary Facilities Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Year of Proposed Construction	Construction Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration[3] (days)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[4] (lbs)	PM_{10} Emissions (controlled)[4] (tpy)	$PM_{2.5}$ Emissions (controlled)[5] (lbs)	$PM_{2.5}$ Emissions (controlled)[5] (tpy)
Compressor Sites Expansion	2011	90.00	1.2	189	12	50	244,944	122.47	64,638	32.32
Central Gathering Facilities - TEPPCO	2011	90.00	1.2	189	12	50	244,944	122.47	64,638	32.32
Central Gathering Facilities - QGM	2007	12.00	1.2	25.2	12	50	4,355	2.18	1,149	0.57
Falcon Stbilizer Facility - TEPPCO	2011	20.00	1.2	42	12	50	12,096	6.05	3,192	1.60
Water Trucking Facility - TEPPCO	2011	20.00	1.2	42	12	50	12,096	6.05	3,192	1.60
Water Trucking Facility - QGM	2007	7.00	1.2	14.7	12	50	1,482	0.74	391	0.20
Falcon Truck Unloading - QGM	2007	15.00	1.2	31.5	12	50	6,804	3.40	1,796	0.90
Expand Stbilizer Site - QGM	2007	5.00	1.2	10.5	12	50	756	0.38	200	0.10
						Total 2007:	13,396	6.70	3,535	1.77
						Total 2011:	514,080	257.04	135,660	67.83

1 Acres of construction provided by operators.
2 AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
3 Construction Activity Duration assumed to be similar to pads and or pipelines, respectively.
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.3.9
Proposed Action Emissions Inventory - Construction Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Well Pad, Resource Road, Pipeline Construction
Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor :	0.3733	lb/hr/100m^2	Based on AP-42 Chapter 13.2.5 (EPA 2004), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.
Control Efficiency:	50	%	
Disturbed Area:			
Well Pad Construction/Exp.:	1	acres	4,047.00 m^2
Access Road Construction:	1	acres	4,047.00 m^2
Pipeline Construction	1	acres	4,047.00 m^2

PM_{10} Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	# of Construction Hours Per Acre (hr)	PM_{10} Emissions (lb/hr)	$PM_{2.5}$ Emissions (lb/hr)	PM_{10} Emissions (tons/acre)	$PM_{2.5}$ Emissions (tons/acre)
Well Pad Construction:	0.3733	0.1493	40.47	50	25.2	7.55	3.02	0.10	0.04
Road Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01
Pipeline Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01

Table F.3.10
Proposed Action Emissions Inventory - Well Pad Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight	Average Vehicle Speed	Silt Content[1]	Moisture Content[2]	Round Trips (RTs)	RT Distance	Vehicle Miles Traveled (VMT)[3]	Emission Control Efficiency	PM_{10} Emission Factor[4]	$PM_{2.5}$ Emission Factor[4]	PM_{10} Emissions[5] (controlled)	$PM_{2.5}$ Emissions[5] (controlled)
			(lb)	(mph)	(%)	(%)	(RT/pad)	(miles)	(VMT/pad)	(%)	(lb/VMT)	(lb/VMT)	(lb/pad)	(lb/pad)
Heavy Trucks	Local	Chemical	35,000	35	5.1	2.4	240	10	2400	85	1.54	0.24	552.85	84.77
	Resource	Water	35,000	20	5.1	2.4	240	1	240	50	1.54	0.24	184.28	28.26
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	160	10	1600	85	0.60	0.09	144.80	21.65
	Resource	Water	7,000	20	5.1	2.4	160	1	160	50	0.46	0.07	36.48	5.45
									Total Unpaved Road Traffic Emissions (lb/pad)				918.40	140.13

[1] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[2] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[3] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
[5] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.3.11
Proposed Action Emissions Inventory - Road Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Resource Road Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight	Average Vehicle Speed	Silt Content[1]	Moisture Content[2]	Round Trips (RTs)	RT Distance	Vehicle Miles Traveled (VMT)[3]	Emission Control Efficiency	PM_{10} Emission Factor[4]	$PM_{2.5}$ Emission Factor[4]	PM_{10} Emissions[5] (controlled)	$PM_{2.5}$ Emissions[5] (controlled)
			(lb)	(mph)	(%)	(%)	(RT/pad)	(miles)	(VMT/pad)	(%)	(lb/VMT)	(lb/VMT)	(lb/pad)	(lb/pad)
Heavy Trucks	Local	Chemical	35,000	35	5.1	2.4	88	10	880	85	1.54	0.24	202.71	31.08
	Resource	Water	35,000	20	5.1	2.4	88	1	88	50	1.54	0.24	67.57	10.36
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	58	10	580	85	0.60	0.09	52.49	7.85
	Resource	Water	7,000	20	5.1	2.4	58	1	58	50	0.46	0.07	13.22	1.98
									Total Unpaved Road Traffic Emissions (lb/pad)				335.99	51.27

[1] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[2] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[3] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
[5] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.3.12
Proposed Action Emissions Inventory - Pipeline Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Pipeline Construction Traffic
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per pad	RT Distance (miles)	VMT[4] (VMT/pad)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/pad)	$PM_{2.5}$ Emissions[6] (controlled) (lb/pad)
Semis/transport, boom, equipment, water removal, sand, and gravel trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light truck/pick-ups	Local	Chemical	7,000	35	5.1	2.4	200	10	2000	85	0.23	0.03	69.00	10.26
	Resource	Water	7,000	20	5.1	2.4	200	1	200	50	0.23	0.03	23.00	3.42
												Total Unpaved Road Traffic Emissions (lb/pad)	1,113.36	170.29

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
6 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.3.13
Proposed Action Emissions Inventory - Well Pad Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/acre/ equipment type)	(hours/day)	(lb/acre)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	25.19	20.44	0.39	2.96	1.19
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	11	51.94	42.17	0.79	6.11	2.44
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	2.1	11	207.78	168.67	3.18	24.44	9.78
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	56.67	46.00	0.87	6.67	2.67
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	12.59	10.22	0.19	1.48	0.59
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	10	31.48	25.56	0.48	3.70	1.48
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	39.67	32.20	0.61	4.67	1.87
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	2.1	6	31.17	25.30	0.48	3.67	1.47
									Total Heavy Equipment Tailpipe Emissions		456.48	370.56	6.98	53.70	21.48

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.3.14
Proposed Action Emissions Inventory - Road Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Road Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	11	81.63	66.26	1.25	9.60	3.84
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	3.3	11	326.51	265.05	4.99	38.41	15.37
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	89.05	72.29	1.36	10.48	4.19
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	19.79	16.06	0.30	2.33	0.93
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	10	49.47	40.16	0.76	5.82	2.33
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	62.33	50.60	0.95	7.33	2.93
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	3.3	6	48.98	39.76	0.75	5.76	2.30
Total Heavy Equipment Tailpipe Emissions											717.33	582.30	10.97	84.39	33.76

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.3.15
Proposed Action Emissions Inventory - Pipeline Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Grader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Excavator	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Trencher	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Tractor (side-boom)	150	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	29.68	24.10	0.45	3.49	1.40
Total Emissions from Heavy Equipment Tailpipes											187.99	152.60	2.88	22.12	8.85

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.3.16
Proposed Action Emissions Inventory - Drilling Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight[1] (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT[4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis-tractor/ trailer/mud/water/ fuel/ cement trucks[1]	Local Road	Chemical	44,000	35	5.1	2.4	300	10	3,000	85	1.70	0.26	766.02	117.46
	Resource Road	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Vendors/ marketers/ various/ workers	Local Road	Chemical	7,000	35	5.1	2.4	300	10	3,000	85	0.60	0.090	271.49	40.59
	Resource Road	Water	7,000	20	5.1	2.4	300	1	300	50	0.46	0.068	68.39	10.22
											Total Unpaved Road Traffic Emissions (lb/well)		1,361.25	207.42

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.3.17
Proposed Action Emissions Inventory - Rig Move Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight[1] (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well Drilled	RT Distance (miles)	VMT [4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Rig Haul Trucks	Local Road	Chemical	44,000	35	5.1	2.4	6.6	10	66	85	1.70	0.26	16.85	2.58
	Resource Road	Water	44,000	20	5.1	2.4	6.6	1	7	50	1.70	0.26	5.62	0.86
Light Trucks/Pickups	Local Road	Chemical	7,000	35	5.1	2.4	2.2	10	22	85	0.74	0.11	2.46	0.38
	Resource Road	Water	7,000	25	5.1	2.4	2.2	1	2	50	0.74	0.11	0.82	0.13
											Total Unpaved Road Traffic Emissions (lb/well)		25.74	3.95

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.

[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."

[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."

[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.

[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.3.18
Proposed Action Emissions Inventory - Drilling Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Diesel Combustion Emissions from Haul Truck Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	300	11	3300	45	24	107.24
NO_x	11.44	300	11	3300	45	24	83.23
SO_2[2]	0.13	300	11	3300	45	24	0.95
VOC	5.69	300	11	3300	45	24	41.40

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.
[3] Based on a life of project average of 45 days per well.

Table F.3.19
Proposed Action Emissions Inventory - Rig Move Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Emissions (lb/well)
CO	14.74	6.6	11	72.6	2.36
NO_x	11.44	6.6	11	72.6	1.83
SO_2[2]	0.13	6.6	11	72.6	0.02
VOC	5.69	6.6	11	72.6	0.91

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.

[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.

Table F.3.20
Proposed Action Emissions Inventory - Ultra Tier 0 Rig – 2006

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 0
Effective Dates: 2006
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,640	0.42	62	24	12,487.90	8.39	6.24
NOx	Tier 0	10.89	3,640	0.42	62	24	54,615.76	36.70	27.31
SO_2	Tier 0	0.13	3,640	0.42	62	24	651.98	0.44	0.33
VOC	Tier 0	0.32	3,640	0.42	62	24	1,604.87	1.08	0.80
PM_{10}[4]	Tier 0	0.32	3,640	0.42	62	24	1,604.87	1.08	0.80

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.21
Proposed Action Emissions Inventory - Ultra Tier 1 Rig – 2006

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 1
Effective Dates: 2006
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,640	0.42	62	24	42,629.38	28.65	21.31
NOx	Tier 1	6.90	3,640	0.42	62	24	34,605.03	23.26	17.30
SO_2	Tier 1	0.13	3,640	0.42	62	24	651.98	0.44	0.33
VOC	Tier 1	1.00	3,640	0.42	62	24	5,015.22	3.37	2.51
PM_{10}[4]	Tier 1	0.40	3,640	0.42	62	24	2,006.09	1.35	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.22
Proposed Action Emissions Inventory - Ultra Tier 0 Rig – 2007

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 0
Effective Dates: 2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,640	0.42	55	24	11,077.98	8.39	5.54
NOx	Tier 0	10.89	3,640	0.42	55	24	48,449.47	36.70	24.22
SO_2	Tier 0	0.13	3,640	0.42	55	24	578.37	0.44	0.29
VOC	Tier 0	0.32	3,640	0.42	55	24	1,423.68	1.08	0.71
PM_{10}[4]	Tier 0	0.32	3,640	0.42	55	24	1,423.68	1.08	0.71

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.23
Proposed Action Emissions Inventory - Ultra Tier 1 Rig - 2007-2009

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 1
Effective Dates: 2007-2009
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,640	0.42	55	24	37,816.39	28.65	18.91
NOx	Tier 1	6.90	3,640	0.42	55	24	30,698.01	23.26	15.35
SO_2	Tier 1	0.13	3,640	0.42	55	24	578.37	0.44	0.29
VOC	Tier 1	1.00	3,640	0.42	55	24	4,448.99	3.37	2.22
PM_{10}[4]	Tier 1	0.40	3,640	0.42	55	24	1,779.59	1.35	0.89

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.24
Proposed Action Emissions Inventory - Ultra Tier 2 Rig - 2007-2010

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 2
Effective Dates: 2007-June 1, 2010
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,640	0.42	55	24	11,567.37	8.76	5.78
NOx	Tier 2	4.50	3,640	0.42	55	24	20,020.44	15.17	10.01
SO_2	Tier 2	0.13	3,640	0.42	55	24	578.37	0.44	0.29
VOC	Tier 2	0.30	3,640	0.42	55	24	1,334.70	1.01	0.67
PM_{10}[4]	Tier 2	0.15	3,640	0.42	55	24	667.35	0.51	0.33

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.25
Proposed Action Emissions Inventory - Ultra Tier 2 Rig - 2010-2015

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 2
Effective Dates: June 1, 2010 - 2015
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5] (g/hp-hr)	Horsepower[2] (hp)	Overall Load Factor[3]	Drilling Activity Duration (days/well)	Drilling Activity Duration (hours/day)	Emissions per Well (lb/well)	Emissions per Hour (lb/hr)	Emissions per Well (tons)
CO	Tier 2	2.60	3,640	0.42	55	24	11,567.37	8.76	5.78
NOx	Tier 2	4.50	3,640	0.42	55	24	20,020.44	15.17	10.01
SO_2	Tier 2	0.006	3,640	0.42	55	24	26.69	0.02	0.01
VOC	Tier 2	0.30	3,640	0.42	55	24	1,334.70	1.01	0.67
PM_{10}[4]	Tier 2	0.15	3,640	0.42	55	24	667.35	0.51	0.33

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.26
Proposed Action Emissions Inventory - Ultra Tier 2 Rig - 2015+

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 2
Effective Dates: 2015+
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,640	0.42	45	24	9,464.21	8.76	4.73
NOx	Tier 2	4.50	3,640	0.42	45	24	16,380.36	15.17	8.19
SO_2	Tier 2	0.006	3,640	0.42	45	24	21.84	0.02	0.01
VOC	Tier 2	0.30	3,640	0.42	45	24	1,092.02	1.01	0.55
PM_{10}[4]	Tier 2	0.15	3,640	0.42	45	24	546.01	0.51	0.27

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.27
Proposed Action Emissions Inventory - Shell Tier 0 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 0
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	4,040	0.42	45	24	10,059.82	9.31	5.03
NOx	Tier 0	10.89	4,040	0.42	45	24	43,996.57	40.74	22.00
SO_2	Tier 0	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 0	0.32	4,040	0.42	45	24	1,292.83	1.20	0.65
PM_{10}[4]	Tier 0	0.32	4,040	0.42	45	24	1,292.83	1.20	0.65

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.28
Proposed Action Emissions Inventory - Shell Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	4,040	0.42	45	24	34,340.76	31.80	17.17
NOx	Tier 1	6.90	4,040	0.42	45	24	27,876.61	25.81	13.94
SO_2	Tier 1	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 1	1.00	4,040	0.42	45	24	4,040.09	3.74	2.02
PM_{10}[4]	Tier 1	0.40	4,040	0.42	45	24	1,616.04	1.50	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.29
Proposed Action Emissions Inventory - Shell Tier 2 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 2
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	4,040	0.42	45	24	10,504.23	9.73	5.25
NOx	Tier 2	4.50	4,040	0.42	45	24	18,180.40	16.83	9.09
SO_2	Tier 2	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 2	0.30	4,040	0.42	45	24	1,212.03	1.12	0.61
PM_{10}[4]	Tier 2	0.15	4,040	0.42	45	24	606.01	0.56	0.30

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.30
Proposed Action Emissions Inventory - Shell Tier 1 Rig - 2008-2009

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 1
Effective Dates: 2008 - 2009
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	4,040	0.42	40	24	30,525.12	31.80	15.26
NOx	Tier 1	6.90	4,040	0.42	40	24	24,779.21	25.81	12.39
SO_2	Tier 1	0.13	4,040	0.42	40	24	466.85	0.49	0.23
VOC	Tier 1	1.00	4,040	0.42	40	24	3,591.19	3.74	1.80
PM_{10}[4]	Tier 1	0.40	4,040	0.42	40	24	1,436.48	1.50	0.72

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.31
Proposed Action Emissions Inventory - Shell Tier 2 Rig - 2008-2010

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 2
Effective Dates: 2008 - June 1, 2010
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	4,040	0.42	40	24	9,337.09	9.73	4.67
NOx	Tier 2	4.50	4,040	0.42	40	24	16,160.36	16.83	8.08
SO_2	Tier 2	0.13	4,040	0.42	40	24	466.85	0.49	0.23
VOC	Tier 2	0.30	4,040	0.42	40	24	1,077.36	1.12	0.54
PM_{10}[4]	Tier 2	0.15	4,040	0.42	40	24	538.68	0.56	0.27

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.32
Proposed Action Emissions Inventory - Shell Tier 2 Rig - 2010-2015

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 2
Effective Dates: June 1, 2010 - 2015
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	4,040	0.42	40	24	9,337.09	9.73	4.67
NOx	Tier 2	4.50	4,040	0.42	40	24	16,160.36	16.83	8.08
SO_2	Tier 2	0.006	4,040	0.42	40	24	21.55	0.02	0.01
VOC	Tier 2	0.30	4,040	0.42	40	24	1,077.36	1.12	0.54
PM_{10}[4]	Tier 2	0.15	4,040	0.42	40	24	538.68	0.56	0.27

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.33
Proposed Action Emissions Inventory - Shell Tier 2 Rig - 2015+

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 2
Effective Dates: 2015+
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	4,040	0.42	30	24	7,002.82	9.73	3.50
NOx	Tier 2	4.50	4,040	0.42	30	24	12,120.27	16.83	6.06
SO_2	Tier 2	0.006	4,040	0.42	30	24	16.16	0.02	0.01
VOC	Tier 2	0.30	4,040	0.42	30	24	808.02	1.12	0.40
PM_{10}[4]	Tier 2	0.15	4,040	0.42	30	24	404.01	0.56	0.20

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.34
Proposed Action Emissions Inventory - Questar Tier 0 Rig – 2006

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 0
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,940	0.42	45	24	9,810.82	9.08	4.91
NOx	Tier 0	10.89	3,940	0.42	45	24	42,907.55	39.73	21.45
SO_2	Tier 0	0.006	3,940	0.42	45	24	23.64	0.02	0.01
VOC	Tier 0	0.32	3,940	0.42	45	24	1,260.83	1.17	0.63
PM_{10}[4]	Tier 0	0.32	3,940	0.42	45	24	1,260.83	1.17	0.63

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.35
Proposed Action Emissions Inventory - Questar Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,940	0.42	45	24	33,490.74	31.01	16.75
NOx	Tier 1	6.90	3,940	0.42	45	24	27,186.60	25.17	13.59
SO_2	Tier 1	0.006	3,940	0.42	45	24	23.64	0.02	0.01
VOC	Tier 1	1.00	3,940	0.42	45	24	3,940.09	3.65	1.97
PM_{10}[4]	Tier 1	0.40	3,940	0.42	45	24	1,576.03	1.46	0.79

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.36
Proposed Action Emissions Inventory - Questar Tier 2 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 2
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,940	0.42	45	24	10,244.23	9.49	5.12
NOx	Tier 2	4.50	3,940	0.42	45	24	17,730.39	16.42	8.87
SO_2	Tier 2	0.006	3,940	0.42	45	24	23.64	0.02	0.01
VOC	Tier 2	0.30	3,940	0.42	45	24	1,182.03	1.09	0.59
PM_{10}[4]	Tier 2	0.15	3,940	0.42	45	24	591.01	0.55	0.30

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.37
Proposed Action Emissions Inventory - Questar Tier 1 Rig - 2008-2009

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 1
Effective Dates: 2008-2009
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,940	0.42	40	24	29,769.55	31.01	14.88
NOx	Tier 1	6.90	3,940	0.42	40	24	24,165.87	25.17	12.08
SO_2	Tier 1	0.006	3,940	0.42	40	24	21.01	0.02	0.01
VOC	Tier 1	1.00	3,940	0.42	40	24	3,502.30	3.65	1.75
PM_{10}[4]	Tier 1	0.40	3,940	0.42	40	24	1,400.92	1.46	0.70

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.3.38
Proposed Action Emissions Inventory - Questar Tier 2 Rig - 2008-2015

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 2
Effective Dates: 2008-2015
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,940	0.42	40	24	9,105.98	9.49	4.55
NOx	Tier 2	4.50	3,940	0.42	40	24	15,760.35	16.42	7.88
SO_2	Tier 2	0.006	3,940	0.42	40	24	21.01	0.02	0.01
VOC	Tier 2	0.30	3,940	0.42	40	24	1,050.69	1.09	0.53
PM_{10}[4]	Tier 2	0.15	3,940	0.42	40	24	525.34	0.55	0.26

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.39
Proposed Action Emissions Inventory - Questar Tier 2 Rig - 2015+

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 2
Effective Dates: 2015+
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5] (g/hp-hr)	Horsepower[2] (hp)	Overall Load Factor[3]	Drilling Activity Duration (days/well)	Drilling Activity Duration (hours/day)	Emissions per Well (lb/well)	Emissions per Hour (lb/hr)	Emissions per Well (tons)
CO	Tier 2	2.60	3,940	0.42	35	24	7,967.73	9.49	3.98
NOx	Tier 2	4.50	3,940	0.42	35	24	13,790.30	16.42	6.90
SO_2	Tier 2	0.006	3,940	0.42	35	24	18.39	0.02	0.01
VOC	Tier 2	0.30	3,940	0.42	35	24	919.35	1.09	0.46
PM_{10}[4]	Tier 2	0.15	3,940	0.42	35	24	459.68	0.55	0.23

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.40
Proposed Action Emissions Inventory - Yates Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Yates - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	58	24	42,453.71	30.50	21.23
NOx	Tier 1	6.90	3,875	0.42	58	24	34,462.43	24.76	17.23
SO_2	Tier 1	0.13	3,875	0.42	58	24	649.29	0.47	0.32
VOC	Tier 1	1.00	3,875	0.42	58	24	4,994.55	3.59	2.50
PM_{10}[4]	Tier 1	0.40	3,875	0.42	58	24	1,997.82	1.44	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.41
Proposed Action Emissions Inventory - Yates Tier 1 Rig - 2008-2009

Project: Pinedale Anticline SEIS
Scenario: Yates - Tier 1
Effective Dates: 2008 - 2009
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	47	24	34,402.15	30.50	17.20
NOx	Tier 1	6.90	3,875	0.42	47	24	27,926.45	24.76	13.96
SO_2	Tier 1	0.13	3,875	0.42	47	24	526.15	0.47	0.26
VOC	Tier 1	1.00	3,875	0.42	47	24	4,047.31	3.59	2.02
PM_{10}[4]	Tier 1	0.40	3,875	0.42	47	24	1,618.92	1.44	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.42
Proposed Action Emissions Inventory - Anschutz Tier 0 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	58	24	12,436.44	8.93	6.22
NOx	Tier 0	10.89	3,875	0.42	58	24	54,390.70	39.07	27.20
SO_2	Tier 0	0.13	3,875	0.42	58	24	649.29	0.47	0.32
VOC	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80
PM_{10}[4]	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.43
Proposed Action Emissions Inventory - Anschutz Tier 0 Rig - 2008-2010

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: 2008-June 1, 2010
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	47	24	10,077.81	8.93	5.04
NOx	Tier 0	10.89	3,875	0.42	47	24	44,075.22	39.07	22.04
SO_2	Tier 0	0.13	3,875	0.42	47	24	526.15	0.47	0.26
VOC	Tier 0	0.32	3,875	0.42	47	24	1,295.14	1.15	0.65
PM_{10}[4]	Tier 0	0.32	3,875	0.42	47	24	1,295.14	1.15	0.65

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.44
Proposed Action Emissions Inventory - Anschutz Tier 0 Rig - 2010-2015

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: June 1, 2010 - 2015
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	47	24	10,077.81	8.93	5.04
NOx	Tier 0	10.89	3,875	0.42	47	24	44,075.22	39.07	22.04
SO_2	Tier 0	0.006	3,875	0.42	47	24	24.28	0.02	0.01
VOC	Tier 0	0.32	3,875	0.42	47	24	1,295.14	1.15	0.65
PM_{10}[4]	Tier 0	0.32	3,875	0.42	47	24	1,295.14	1.15	0.65

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.45
Proposed Action Emissions Inventory - Anschutz Tier 0 Rig - 2015+

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: 2015+
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	37	24	7,933.59	8.93	3.97
NOx	Tier 0	10.89	3,875	0.42	37	24	34,697.51	39.07	17.35
SO_2	Tier 0	0.006	3,875	0.42	37	24	19.12	0.02	0.01
VOC	Tier 0	0.32	3,875	0.42	37	24	1,019.58	1.15	0.51
PM_{10}[4]	Tier 0	0.32	3,875	0.42	37	24	1,019.58	1.15	0.51

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.46
Proposed Action Emissions Inventory - BP/Stone Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	58	24	42,453.71	30.50	21.23
NOx	Tier 1	6.90	3,875	0.42	58	24	34,462.43	24.76	17.23
SO_2	Tier 1	0.006	3,875	0.42	58	24	29.97	0.02	0.01
VOC	Tier 1	1.00	3,875	0.42	58	24	4,994.55	3.59	2.50
PM_{10}[4]	Tier 1	0.40	3,875	0.42	58	24	1,997.82	1.44	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.47
Proposed Action Emissions Inventory - BP/Stone Tier 1 Rig - 2008-2009

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 1
Effective Dates: 2008-2009
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	47	24	34,402.15	30.50	17.20
NOx	Tier 1	6.90	3,875	0.42	47	24	27,926.45	24.76	13.96
SO_2	Tier 1	0.006	3,875	0.42	47	24	24.28	0.02	0.01
VOC	Tier 1	1.00	3,875	0.42	47	24	4,047.31	3.59	2.02
PM_{10}[4]	Tier 1	0.40	3,875	0.42	47	24	1,618.92	1.44	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.3.48
Proposed Action Emissions Inventory - BP/Stone Tier 2 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 2
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,6]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,875	0.42	58	24	12,985.84	9.33	6.49
NOx	Tier 2	4.50	3,875	0.42	58	24	22,475.50	16.15	11.24
SO_2	Tier 2	0.006	3,875	0.42	58	24	29.97	0.02	0.01
VOC	Tier 2	0.30	3,875	0.42	58	24	1,498.37	1.08	0.75
PM_{10}[4]	Tier 2	0.15	3,875	0.42	58	24	749.18	0.54	0.37

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.
[6] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.49
Proposed Action Emissions Inventory - BP/Stone Tier 2 Rig - 2008-2009

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 2
Effective Dates: 2008-2009
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,6]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,875	0.42	47	24	10,523.01	9.33	5.26
NOx	Tier 2	4.50	3,875	0.42	47	24	18,212.90	16.15	9.11
SO_2	Tier 2	0.006	3,875	0.42	47	24	24.28	0.02	0.01
VOC	Tier 2	0.30	3,875	0.42	47	24	1,214.19	1.08	0.61
PM_{10}[4]	Tier 2	0.15	3,875	0.42	47	24	607.10	0.54	0.30

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.
[6] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.50
Proposed Action Emissions Inventory - Drill Rig Boiler Emissions

Project:	**Pinedale Anticline SEIS**
Scenario:	**All**
Activity:	**Drilling**
Emissions:	**Rig Boilers**
Date:	**11/30/2006**

Fuel Combustion Source:

Unit Description	Rig Boilers	
Design Firing Rate (MMBTU/hr) :	5	

Operating Parameters:

Annual Operating hours	4380	
Operation %	Winter (Nov. - Apr.)	100

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combusted	21.90	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr)
Total PM	7.6000	0.03800
SO_2	0.6	0.00300
NO_x	100.0000	0.50000
CO	21.0000	0.10500
VOC	5.50000	0.02750

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.3.51
Proposed Action Emissions Inventory - Frac/Other Completion Engine Emissions

Project: Pinedale Anticline SEIS
Scenario: All
Effective Dates: All
Emissions: Diesel Combustion Emissions from Frac/Other Completion Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5] (g/hp-hr)	Horsepower[2] (hp)	Overall Load Factor[3]	Drilling Activity Duration (days/well)	Drilling Activity Duration (hours/day)	Emissions per Well (lb/well)	Emissions per Hour (lb/hr)	Emissions per Well (tons)
CO	Tier 2	2.60	9,200	0.40	3	24	1,518.76	21.09	0.76
NOx	Tier 2	4.50	9,200	0.40	3	24	2,628.63	36.51	1.31
SO_2	Tier 2	0.13	9,200	0.40	3	24	75.94	1.05	0.04
VOC	Tier 2	0.30	9,200	0.40	3	24	175.24	2.43	0.09
PM_{10}[4]	Tier 2	0.15	9,200	0.40	3	24	87.62	1.22	0.04

Note: Frac engines are EPA Tier 2 from data provided by operators and Frac contractor Halliburton.
[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of operators current data. Frac pump engines constitute the majority of the hp used.
[3] Load factor based on weighted average of full load and idle conditions during frac operations.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for frac engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.3.52
Proposed Action Emissions Inventory - Completion/Testing Traffic

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT[4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emissions[5] (lb/VMT)	$PM_{2.5}$ Emissions[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis/ transport/ water/ sand/ frac trucks[1]	Local	Chemical	44,000	35	5.1	2.4	180	10	1,800	85	1.70	0.26	459.61	70.47
	Resource	Water	44,000	20	5.1	2.4	180	1	180	50	1.70	0.26	153.20	23.49
Light Trucks/ Pickups	Local	Chemical	7,000	35	5.1	2.4	120	10	1,200	85	0.74	0.11	133.98	20.54
	Resource	Water	7,000	20	5.1	2.4	120	1	120	50	0.74	0.11	44.66	6.85
									Total Unpaved Road Traffic Emissions (lb/well)				791.46	121.36

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
6 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.3.53
Proposed Action Emissions Inventory - Completion/Testing Haul Truck Tailpipe

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration[3] (hours/day)	Emissions (lb/well)
CO	14.74	180	11	1980	10	18	64.34
NO_x	11.44	180	11	1980	10	18	49.94
SO_2[2]	0.16	180	11	1980	10	18	0.70
VOC	5.69	180	11	1980	10	18	24.84

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a S balance and 350 ppm diesel fuel.
[3] Haul Activity Duration for completion activities based on an average of 10 days per well and an average of 24 hr/day for 5 days and 12 hr/day for 5 days.

Table F.3.54
Proposed Action Emissions Inventory - Production Traffic - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight[1] (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs (RT)	RT Distance (miles)	VMT[4] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[6] (controlled) (lb/RT)
Light Truck	Local	Chemical	7,000	35	5.1	2.4	1	10	10	85	0.74	0.11	1.12	0.17
	Resource	Water	7,000	20	5.1	2.4	1	1	1	50	0.74	0.11	0.37	0.06
												Total Access and Unimproved Road Emissions (lb/RT)	1.49	0.23

1 Avg. light truck wt.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance
6 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
7 Calculated as lb/VMT x VMT/RT x control efficiency.

Table F.3.55
Proposed Action Emissions Inventory - Liquids Gathering Traffic - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight[1] (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs (RT)	RT Distance (miles)	VMT[4] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[6] (controlled) (lb/RT)
Tanker	Local	Chemical	54,000	35	5.1	2.4	1	10	10	85	1.87	0.29	2.80	0.43
	Resource	Water	54,000	20	5.1	2.4	1	1	1	50	1.87	0.29	0.93	0.14
												Total Access and Unimproved Road Emissions (lb/RT)	3.73	0.57

1 Haul trucks weight range is 28,000-80,000 lbs. Average weight of 54,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance
6 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
7 Calculated as lb/VMT x VMT/RT x control efficiency.

Table F.3.56
Proposed Action Emissions Inventory - Tanker Traffic Tailpipe - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mi)	RTs (RTs/well/day)	Round Trip Distance (mi/RT)	Single Well Daily VMT (mi/RT/day)	Daily Emissions Single Well (lb/RT)
CO	14.74	1	11	11.00	0.36
NO_x	11.44	1	11	11.00	0.28
SO_2[2]	0.16	1	11	11.00	0.00
VOC	5.69	1	11	11.00	0.14

[1] AP-42 (EPA 1985), Table 2.7.1 "Volume II Mobile Sources." Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a S balance and 350 ppm diesel fuel.

Table F.3.57
Proposed Action Emissions Inventory - Production Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Production Wind Erosion

Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor : 0.3733 lb/hr/100m^2 Based on AP-42 Chapter 13.2.5 (EPA 2004), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.

Control Efficiency: 50 %

Disturbed Area: 1 acres 4,047.00 m^2

PM Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	PM_{10} Emissions (lb/hr/acre)	$PM_{2.5}$ Emissions (lb/hr/acre)	PM_{10} Emissions[1] (tons/acre/yr)	$PM_{2.5}$ Emissions[1] (tons/acre/yr)
Production:	0.3733	0.1493	40.47	50	7.55	3.02	0.18	0.07

[1] TPY numbers based on lb/hr/acre and 47 hours per year that the wind speed in the Jonah Field met data overcome the threshold friction velocity.

Table F.3.58
Proposed Action Emissions Inventory - Separator/Indirect Line Heaters

Project: Pinedlae Anticline SEIS
Scenario: Average per Well
Activity: Production
Emissions: Separator/Line Heaters
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Separator/Line Heaters	
Design Firing Rate (MMBTU/hr)	0.75	

Operating Parameters:

Annual Operating hours	1971	
Operation %	Winter (Nov. - Apr.)	35
	Summer (May - Oct.)	10

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combustec	1.48	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr) Winter	(lb/hr) Summer	(tpy) Total
Total PM	7.6000	0.00200	0.00057	0.0056
SO_2	0.6	0.00016	0.00005	0.0004
NO_x	100.0000	0.02625	0.00750	0.0739
CO	21.0000	0.00551	0.00158	0.0155
VOC	5.50000	0.00144	0.00041	0.0041

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.3.59
Proposed Action Emissions Inventory - Dehy Reboiler Heaters

Project: Pinedlae Anticline SEIS
Scenario: Average per Well
Activity: Production
Emissions: Dehy Reboiler Heater
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Separator/Line Heaters	
Design Firing Rate (MMBTU/hr)	0.085	

Operating Parameters:

Annual Operating hours	1971	
Operation %	Winter (Nov. - Apr.)	35
	Summer (May - Oct.)	10

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combustec	0.17	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr) Winter	(lb/hr) Summer	(tpy) Total
Total PM	7.6000	0.00023	0.00006	0.0006
SO_2	0.6	0.00002	0.00001	0.0001
NO_x	100.0000	0.00298	0.00085	0.0084
CO	21.0000	0.00062	0.00018	0.0018
VOC	5.50000	0.00016	0.00005	0.0005

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.3.60
Proposed Action Emissions Inventory - Dehydrator Flashing

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Production
Emissions: TEG Dehydrator Flashing
Date: 11/30/2006

	Uncontrolled		Controlled[1]	
Pollutant	(tpy)	(lb/hr)	(tpy)	(lb/hr)
VOC	12.55	2.87	0.63	0.14
HAP	8.52	1.95	0.43	0.10
Benzene	1.42	0.32	0.07	0.02
Toluene	3.83	0.88	0.19	0.04
Ethylbenzene	0.18	0.04	0.01	2.10E-03
Xylene	2.97	0.68	0.15	0.03
n-Hexane	0.11	0.02	0.01	1.20E-03

[1] Data based on GRI-GLYCalc V. 4.0, 4 MMSCFD, 0.32 gpm glycol flow rate, average representative gas analysis and 95% destruction efficiency for controlled.

Table F.3.61
Proposed Action Emissions Inventory - Average Well Production Decline Factors

Year	Factor
0	1
1	0.33426
2	0.23752
3	0.18898
4	0.15838
5	0.13689
6	0.12165
7	0.10828
8	0.09692
9	0.08708
10	0.07884
11	0.07083
12	0.06407
13	0.05803
14	0.05261
15	0.04772
16	0.04331
17	0.03932
18	0.03571
19	0.03243
20	0.02946
21	0.02675
22	0.02428
23	0.02376
24	0.01998
25	0.01811

Note: Decline factors averaged from data provided by all Shell, Ultra and Questar.

Table F.3.62
Proposed Action Emissions Inventory - Fugitive HAPs and VOCs - Per Pad

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Production
Emissions: Fugitive VOC/HAP Emissions
Date: 11/30/2006

Gas Analysis Weight Fraction

VOC	0.13930
Benzene	0.00052
Toluene	0.00091
Ethlybenzene	0.00003
Xylene	0.00036
n-hexane	0.00131

Source	Quantity	Emission Factor[1] (lb/hr/component)	Non-methane Hydrocarbons[2] (lb/hr)	Non-methane Hydrocarbons (tpy)	Benzene[2] (lb/hr)	Benzene (tpy)	Toluene[2] (lb/hr)	Toluene (tpy)	Ethlybenzene[2] (lb/hr)	Ethlybenzene (tpy)	Xylene[2] (lb/hr)	Xylene (tpy)	n-Hexane[2] (lb/hr)	n-Hexane (tpy)
Valves	20	0.00992	0.0276	0.121	0.00010	0.00045	0.00018	0.00079	0.000006	0.000028	0.00007	0.00031	0.00026	0.0011
Flanges	30	0.00086	0.0036	0.016	0.00001	0.00006	0.00002	0.00010	0.000001	0.000004	0.00001	0.00004	0.00003	0.0001
Connections	275	0.00044	0.0169	0.074	0.00006	0.00028	0.00011	0.00048	0.000004	0.000017	0.00004	0.00019	0.00016	0.0007
Pump seals	2	0.00529	0.0015	0.006	0.00001	0.00002	0.00001	0.00004	0.000000	0.000002	0.00000	0.00002	0.00001	0.0001
Open ended lines	3	0.00441	0.0018	0.008	0.00001	0.00003	0.00001	0.00005	0.000000	0.000002	0.00000	0.00002	0.00002	0.0001
		Total Emissions/Pad	0.0514	0.225	0.00019	0.00084	0.00034	0.00147	0.000012	0.000052	0.00013	0.00058	0.00048	0.0021

[1] Taken from the WDEQ (2001) "Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance".
[2] Calculated as weight fraction * emissions factor * quantity of source.

Table F.3.63
Proposed Action Emissions Inventory - Condensate Storage Emissions - Per Well

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Production
Emissions: Condensate Storage Tanks
Date: 11/30/2006

Average Controlled Condensate Storage Emissions

VOC and HAP Emissions		
VOC	1.1856	tpy/well
HAP	0.0594	tpy/well
Benzene	0.0029	tpy/well
Toluene	0.0001	tpy/well
Ethylbenzene	0.0017	tpy/well
Xylene	0.0022	tpy/well
n-Hexane	0.0526	tpy/well
Based on 30 bbl per day		

NO_x and CO Emissions from Smokeless Flare Combustion		
NO_x Emission Factor	0.068	lb/MMBTU
CO Emission Factor	0.37	lb/MMBTU
Heat Content	1,000	Btu/scf
Condensate Production	13.00	bbl/day
Gas to Oil Ratio	957.37	scf/bbl
Gas Production	12,445.81	SCFD
Combustion Emissions from Storage Tanks		
NO_x	0.15	tpy/facility
CO	0.84	tpy/facility

Average Uncontrolled Storage Tank Emissions

VOC	16.1000	tpy/well
HAP	0.7880	tpy/well
Benzene	0.0372	tpy/well
Toluene	0.0021	tpy/well
Ethylbenzene	0.0223	tpy/well
Xylene	0.0283	tpy/well
n-Hexane	0.6981	tpy/well
Based on 8 bbl per day		

Table F.3.64
Proposed Action Emissions Inventory - Pinedale Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: Questar - Pinedale C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Pinedale Compressor Station					
2006 Projected Increase (hp)	7,440	(I.C. Engines/Recip.)				
2009 Projected Increase (hp)	31,000	(Turbines/Centrifugal)				
2015 Projected Increase (hp)	15,500	(Turbines/Centrifugal)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	2006-2008 Increase from Baseline		2009-2014 Increase from Baseline		2015 + Increase from Baseline		Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Method of Determination (Turbines)	Emission Factor (Turbines)	Units
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy					
PM_{10}	0.0	0.0	0.0	0.0	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
$PM_{2.5}$	0.0	0.0	0.0	0.0	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
SO_2	0.0	0.0	0.0	0.0	0.0	0.0	Fuel Analysis	0.00	Fuel Analysis	0.00	lb/MMscf
NO_x	11.5	50.3	25.2	110.2	32.0	140.1	BACT	0.7	Provided by Questar	0.2	g/hp-hr
CO	4.1	18.0	17.8	77.8	24.6	107.8	Permitted Emissions[2]	0.250	Provided by Questar	0.200	g/hp-hr
VOC	7.5	33.0	8.4	36.6	8.8	38.4	Permitted Emissions[2]	0.460	Provided by Questar	0.012	g/hp-hr
Formaldehyde	0.7	3.2	1.7	7.4	2.2	9.5	Permitted Emissions[2]	0.045	Provided by Questar	0.014	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Pindale C.S. WDEQ Permit # MD-1267.
[3] Based on AP-42, Chapter 3, Table 3.1-2a for a natural gas fired turbine.

Table F.3.65
Proposed Action Emissions Inventory - Paradise Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: JGG/Teppco Paradise C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Paradise Compressor Station					
2011 Projected Increase (hp)	59,000	(I.C. Engines/Recip.)				
2011 Projected Increase (hp)	125,000	(Turbines/Centrifugal)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2011+ Increase from Baseline** lb/hr	tpy	Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Method of Determination (Turbines)	Emission Factor (Turbines)	Units
PM_{10}	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
$PM_{2.5}$	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
SO_2	0.0	0.0	Fuel Analysis	0.00	Fuel Analysis	0.00	lb/MMscf
NO_x	201.3	881.6	BACT	0.7	Permitted Emissions[2]	0.4	g/hp-hr
CO	176.8	774.4	Permitted Emissions[2]	0.300	Permitted Emissions[2]	0.500	g/hp-hr
VOC	172.5	755.6	Permitted Emissions[2]	0.500	Permitted Emissions[2]	0.390	g/hp-hr
Formaldehyde	10.7	46.8	Permitted Emissions[2]	0.080	Permitted Emissions[2]	0.001	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Bird Canyon Permit MD-1013, issued June 23, 2004.
[3] Based on AP-42, Chapter 3, Table 3.1-2a for a natural gas fired turbine.

Table F.3.66
Proposed Action Emissions Inventory - Falcon Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: JGG/Teppco Falcon C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Falcon Compressor Station					
2011 Projected Increase (hp)	7,366	(I.C. Engines/Recip.)				
2011 Projected Increase (hp)	30,000	(Turbines/Centrifugal)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2011+ Increase from Baseline** lb/hr	tpy	Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Method of Determination (Turbines)	Emission Factor (Turbines)	Units
PM_{10}	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
$PM_{2.5}$	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
SO_2	0.0	0.0	Fuel Analysis	0.00	Fuel Analysis	0.00	lb/MMscf
NO_x	37.8	165.7	BACT	0.7	Permitted Emissions[2]	0.4	g/hp-hr
CO	37.9	166.2	Permitted Emissions[2]	0.300	Permitted Emissions[2]	0.500	g/hp-hr
VOC	33.9	148.5	Permitted Emissions[2]	0.500	Permitted Emissions[2]	0.390	g/hp-hr
Formaldehyde	1.4	6.0	Permitted Emissions[2]	0.080	Permitted Emissions[2]	0.001	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Bird Canyon Permit MD-1013, issued June 23, 2004.
[3] Based on AP-42, Chapter 3, Table 3.1-2a for a natural gas fired turbine.

Table F.3.67
Proposed Action Emissions Inventory - Bird Canyon Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: JGG/Teppco Bird Canyon C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Bird Canyon Compressor Station					
2011 Projected Increase (hp)	14,672	(I.C. Engines/Recip.)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2011+ Increase from Baseline** lb/hr	tpy	Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Units
PM_{10}	0.0	0.0	AP-42[1]	0.00008	lb/MMscf
$PM_{2.5}$	0.0	0.0	AP-42[1]	0.00008	lb/MMscf
SO_2	0.0	0.0	Fuel Analysis	0.00	lb/MMscf
NO_x	22.6	99.2	BACT	0.7	g/hp-hr
CO	9.7	42.5	Permitted Emissions[2]	0.300	g/hp-hr
VOC	16.2	70.8	Permitted Emissions[2]	0.500	g/hp-hr
Formaldehyde	2.6	11.3	Permitted Emissions[2]	0.080	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Bird Canyon Permit MD-1013, issued June 23, 2004.

Table F.3.68
Proposed Action Emissions Inventory - Compression Emissions by Year

	2005 (Baseline Year)		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015+	
Compression:	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
NOx	96.3	421.9	107.8	472.2	107.8	472.2	107.8	472.2	121.5	532.1	121.5	532.1	383.2	1678.5	383.2	1678.5	383.2	1678.5	383.2	1678.5	390.1	1708.5
CO	36.0	157.7	40.1	175.7	40.1	175.7	40.1	175.7	53.8	235.5	53.8	235.5	278.2	1218.7	278.2	1218.7	278.2	1218.7	278.2	1218.7	285.1	1248.6
VOC	73.2	320.5	80.7	353.5	80.7	353.5	80.7	353.5	81.5	357.1	81.5	357.1	304.1	1332.1	304.1	1332.1	304.1	1332.1	304.1	1332.1	304.5	1333.9
PM10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SO2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Formaldehyde	9.5	41.7	10.3	44.9	10.3	44.9	10.3	44.9	11.2	49.1	11.2	49.1	25.8	113.2	25.8	113.2	25.8	113.2	25.8	113.2	26.3	115.3

Paradise 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1187.
Falcon 2005 based on (6) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1186.
Pinedale 2005 based on (2) 1,860 hp and (2) 3,720 hp compressors as provided by Questar and emissions from MD-1267.

Table F.3.69
Proposed Action Emissions Inventory - Granger Gas Plant Expansion

	2005 Potential Emissions		2007 Projected Expansion		2007+ Projected Totals	
Pollutant:	**(lb/hr)**	**(tpy)[1]**	**(lb/hr)**	**(tpy)[2]**	**(lb/hr)**	**(tpy)**
NOx:	68.88	301.7	68.88	301.7	137.8	603.4
CO:	73.70	322.8	73.70	322.8	147.4	645.6
VOCs:	32.01	140.2	32.01	140.2	64.0	280.4
SO2:	0.00	0.0	0.00	0.0	0.0	0.0
PM10:	0.00	0.0	0.00	0.0	0.0	0.0
Benzene:	0.07	0.3	0.07	0.3	0.1	0.6
Toluene:	0.02	0.1	0.02	0.1	0.0	0.2
Ethylbenzene:	0.00	0.0	0.00	0.0	0.0	0.0
Xylene:	0.02	0.1	0.02	0.1	0.0	0.2
n-Hexane:	0.07	0.3	0.07	0.3	0.1	0.6
Formaldehyde:	7.65	33.5	7.65	33.5	15.3	67.0
Total HAPs:	7.83	34.3	7.83	34.3	15.7	68.6

[1] Emissions taken from WDEQ-AQD permit # MD-644A
[2] Plant size to double in 2007, therefore emissions assumed to double over 2005 potentials.

Table F.3.70
Proposed Action Emissions Inventory - Opal Gas Plant Expansion

	2005 Potential Emissions		2011 Projected Expansion		2011+ Projected Totals	
Pollutant:	**(lb/hr)**	**(tpy)[1]**	**(lb/hr)**	**(tpy)[2]**	**(lb/hr)**	**(tpy)**
NOx:	127.76	559.6	8.56	37.50	136.32	597.1
CO:	117.33	513.9	14.27	62.50	131.60	576.4
VOCs:	54.98	240.8	26.78	117.30	81.76	358.1
SO2:	0.00	0.0	0.00	0.00	0.00	0.0
PM10:	0.00	0.0	0.00	0.00	0.00	0.0
Benzene:	2.58	11.3	1.23	5.40	3.82	16.7
Toluene:	0.75	3.3	1.28	5.60	2.03	8.9
Ethylbenzene:	0.23	1.0	0.00	0.00	0.23	1.0
Xylene:	0.37	1.6	0.53	2.30	0.89	3.9
n-Hexane:	1.94	8.5	0.59	2.60	2.53	11.1
Formaldehyde:	0.00	0.0	0.11	0.50	0.11	0.5
Total HAPs:	5.87	25.7	3.74	16.40	9.61	42.1

[1] Emissions taken from WDEQ-AQD permit # MD-644A
[2] Emissions based on Pioneer Gas Plant Expansion WDEQ-AQD permit # CT-4302.

Table F.3.71
Proposed Action Emissions Inventory - 2006 Drill Rig Schedule

	Questar			Ultra			Shell			Yates			Anschutz			BP/Stone			Total		
Year	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs[1]**	**Rig Moves**	**Wells**	**Rigs[2]**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**
2006	50	7.5	8	61	10.4	20	60	8	14	8	1	2	17	4/3	4	9	1/2	2	205	31.9	50

[1]Anschutz will have 4 rigs (May through November) and 3 rigs (November through May).

[2]BP/Stone will have 1 rig (for quarters 1 through 3) and 2 rigs for the fourth quarter.

Table F.3.72
Proposed Action Emissions Inventory - 2007-2025 Drill Rig Schedule

	Questar			Ultra			Shell			Yates			Anschutz			BP/Stone			Total		
Year	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs[1]**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**	**Wells**	**Rigs**	**Rig Moves**
2007	90	8.08	11	69	10.4	20	72	9	14	8	1	2	17	4/3	4	12	2	2	268	34.48	53
2008	90	14	15	95	14.3	21	80	10	16	8	1	2	16	4/3	4	10	2	2	299	45.3	60
2009	90	15	15	106	16	21	80	10	16	4	1	2	15	4/3	4	10	2	2	305	48	60
2010	90	15	15	107	16	21	80	10	16				14	4/3	4				291	45	56
2011	90	15	15	107	16	21	80	10	12				13	4/3	4				290	45	52
2012	90	15	15	107	16	8	80	10	12				12	4/3	4				289	45	39
2013	90	15	15	107	16	8	80	10	12				11	4/3	4				288	45	39
2014	90	15	15	107	16	8	80	10	12				10	4/3	4				287	45	39
2015	90	15	15	107	16	8	80	10	12				10	4/3	4				287	45	39
2016	90	15	15	107	16	8	80	10	12				9	4/3	4				286	45	39
2017	87	14	14	107	16	8	80	10	12				8	4/3	4				282	44	38
2018	84	13	13	107	16	8	80	10	12				8	4/3	4				279	43	37
2019	84	13	13	107	16	8	15	2	2				7	4/3	4				213	35	27
2020	80	12	12	107	16	8													187	28	20
2021	70	10	10	107	16	8													177	26	18
2022	36	5	5	107	16	8													143	21	13
2023	5	3	3	107	16	8													112	19	11
2024				107	16	8													107	16	8
2025				9	3	2													9	3	2
Total	**1,346**			**1,884**			**967**			**20**			**150**			**32**			**4,399**		

[1]Anschutz will have 4 rigs (May through November) and 3 rigs (November through May).

Table F.3.73
Proposed Action Emissions Inventory - Rig Counts and Tier Levels by Operator and Year

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Questar:	Tier 0:	2.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
	Tier 1:	3.92	0.75	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
	Tier 2:	1.25	7.33	10	10	15	15	15	15	15	15	15	14	13	13	12	10	5	3	N/A	N/A
	Total:	7.5	8.08	14	15	15	15	15	15	15	15	15	14	13	13	12	10	5	3	N/A	N/A
Ultra:	Tier 0:	6.4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tier 1:	4	3.8	4.8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tier 2:	0	4.6	9.5	11	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	3
	Total:	10.4	10.4	14.3	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	3
Shell:	Tier 0:	2.5	1	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 1:	3.5	4	3	3	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 2:	2	4	7	7	10	10	10	10	10	10	10	10	10	2	N/A	N/A	N/A	N/A	N/A	N/A
	Total:	8	9	10	10	10	10	10	10	10	10	10	10	10	2	N/A	N/A	N/A	N/A	N/A	N/A
Yates:	Tier 0:	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 1:	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 2:	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total:	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Anschutz:	Tier 0:	4	4	4	4	4	4	4	4	4	4	4	4	4	4	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 1:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 2:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
	Total:	4	4	4	4	4	4	4	4	4	4	4	4	4	4	N/A	N/A	N/A	N/A	N/A	N/A
BP/Stone:	Tier 0:	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 1:	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tier 2:	0	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total:	1	2	2	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Totals based on rig schedules submitted by operators.

Table F.3.74
Proposed Action Emissions Inventory - Total Drilling Rig Emissions by Year

		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Questar:	CO	154.58	554.84	92.79	553.98	218.89	678.40	249.90	719.72	142.28	409.77	142.28	409.77	142.28	409.77	142.28	409.77	142.28	409.77	142.28	358.55
	NO_x	211.77	767.61	139.22	835.69	264.86	818.49	290.03	835.30	246.26	709.22	246.26	709.22	246.26	709.22	246.26	709.22	246.26	709.22	246.26	620.56
	SO_2	0.16	0.59	0.18	1.06	0.31	0.95	0.33	0.95	0.33	0.95	0.33	0.95	0.33	0.95	0.33	0.95	0.33	0.95	0.33	0.83
	VOC	18.39	66.04	10.76	64.22	25.54	79.15	29.19	84.06	16.42	47.28	16.42	47.28	16.42	47.28	16.42	47.28	16.42	47.28	16.42	41.37
	PM_{10}	9.12	32.94	5.11	30.54	11.31	35.02	12.77	36.77	8.21	23.64	8.21	23.64	8.21	23.64	8.21	23.64	8.21	23.64	8.21	20.69
Ultra:	CO	168.31	591.87	165.96	724.01	220.76	982.56	239.64	691.82	140.21	618.85	140.21	618.85	140.21	618.85	140.21	618.85	140.21	618.85	140.21	506.34
	NO_x	327.93	1525.71	231.55	1008.96	255.72	1127.15	283.12	1093.12	242.67	1071.09	242.67	1071.09	242.67	1071.09	242.67	1071.09	242.67	1071.09	242.67	876.35
	SO_2	4.56	19.89	4.56	19.95	6.27	27.47	7.01	30.65	7.01	13.84	0.32	1.43	0.32	1.43	0.32	1.43	0.32	1.43	0.32	1.17
	VOC	20.38	72.82	19.62	85.55	25.78	114.78	27.97	80.08	16.18	71.41	16.18	71.41	16.18	71.41	16.18	71.41	16.18	71.41	16.18	58.42
	PM_{10}	12.30	51.76	9.61	41.84	11.27	50.05	12.30	38.71	8.09	35.70	8.09	35.70	8.09	35.70	8.09	35.70	8.09	35.70	8.09	29.21
Shell:	CO	154.03	620.78	175.41	757.76	163.47	627.74	163.47	627.74	97.26	373.48	97.26	373.48	97.26	373.48	97.26	373.48	97.26	373.48	97.26	280.11
	NO_x	225.85	916.72	211.32	912.90	195.27	749.84	195.27	749.84	168.34	646.41	168.34	646.41	168.34	646.41	168.34	646.41	168.34	646.41	168.34	484.81
	SO_2	3.89	15.76	4.38	18.91	4.86	18.67	4.86	18.67	4.86	8.21	0.22	0.86	0.22	0.86	0.22	0.86	0.22	0.86	0.22	0.65
	VOC	18.33	73.89	20.65	89.21	19.08	73.26	19.08	73.26	11.22	43.09	11.22	43.09	11.22	43.09	11.22	43.09	11.22	43.09	11.22	32.32
	PM_{10}	9.35	37.84	9.43	40.72	8.42	32.32	8.42	32.32	5.61	21.55	5.61	21.55	5.61	21.55	5.61	21.55	5.61	21.55	5.61	16.16
Yates:	CO	30.50	169.81	30.50	169.81	30.50	137.61	30.50	68.80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	24.76	137.85	24.76	137.85	24.76	111.71	24.76	55.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.47	2.60	0.47	2.60	0.47	2.10	0.47	1.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	3.59	19.98	3.59	19.98	3.59	16.19	3.59	8.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	1.44	7.99	1.44	7.99	1.44	6.48	1.44	3.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Anschutz:	CO	35.74	105.71	35.74	105.71	35.74	80.62	35.74	75.58	35.74	70.54	35.74	65.51	35.74	60.47	35.74	55.43	35.74	50.39	35.74	39.67
	NO_x	156.30	462.32	156.30	462.32	156.30	352.60	156.30	330.56	156.30	308.53	156.30	286.49	156.30	264.45	156.30	242.41	156.30	220.38	156.30	173.49
	SO_2	1.87	5.52	1.87	5.52	1.87	4.21	1.87	3.95	0.09	0.17	0.09	0.16	0.09	0.15	0.09	0.13	0.09	0.12	0.09	0.10
	VOC	4.59	13.59	4.59	13.59	4.59	10.36	4.59	9.71	4.59	9.07	4.59	8.42	4.59	7.77	4.59	7.12	4.59	6.48	4.59	5.10
	PM_{10}	4.59	13.59	4.59	13.59	4.59	10.36	4.59	9.71	4.59	9.07	4.59	8.42	4.59	7.77	4.59	7.12	4.59	6.48	4.59	5.10
BP/Stone:	CO	30.50	191.04	39.83	166.32	39.83	112.31	39.83	112.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	24.76	155.08	40.90	170.81	40.90	115.35	40.90	115.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.02	0.13	0.04	0.18	0.04	0.12	0.04	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	3.59	22.48	4.66	19.48	4.66	13.15	4.66	13.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	1.44	8.99	1.97	8.24	1.97	5.57	1.97	5.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total:	**CO**	573.65	2234.06	540.22	2477.58	709.19	2619.24	759.08	2295.98	415.49	1472.65	415.49	1467.61	415.49	1462.57	415.49	1457.53	415.49	1452.50	415.49	1184.66
	NO_x	971.36	3965.28	804.04	3528.54	937.80	3275.13	990.38	3180.02	813.56	2735.25	813.56	2713.21	813.56	2691.17	813.56	2669.14	813.56	2647.10	813.56	2155.21
	SO_2	10.97	44.48	11.49	48.22	13.81	53.53	14.58	55.39	12.29	23.17	0.96	3.39	0.96	3.38	0.96	3.37	0.96	3.36	0.96	2.74
	VOC	68.87	268.79	63.87	292.02	83.24	306.90	89.08	268.36	48.41	170.85	48.41	170.20	48.41	169.55	48.41	168.90	48.41	168.26	48.41	137.21
	PM_{10}	38.24	153.10	32.14	142.92	39.00	139.80	41.49	126.32	26.50	89.96	26.50	89.31	26.50	88.66	26.50	88.01	26.50	87.37	26.50	71.16

[1] lb/hr based on worst case # of drill rigs operating at once from Tables B.X.X and B.X.X.

[2] tpy numbers based on makeup of drill fleet and # of wells proposed to be drilled in given year.

Table F.3.74
Proposed Action Emissions Inventory - Total Drilling Rig Emissions by Year

		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Questar:	CO	142.28	358.55	132.80	346.60	123.31	334.64	123.31	334.64	113.82	318.71	94.85	278.87	47.43	143.42	28.46	19.92	N/A	N/A	N/A	N/A
	NO_x	246.26	620.56	229.84	599.88	213.42	579.19	213.42	579.19	197.00	551.61	164.17	482.66	82.09	248.23	49.25	34.48	N/A	N/A	N/A	N/A
	SO_2	0.33	0.83	0.31	0.80	0.28	0.77	0.28	0.77	0.26	0.74	0.22	0.64	0.11	0.33	0.07	0.05	N/A	N/A	N/A	N/A
	VOC	16.42	41.37	15.32	39.99	14.23	38.61	14.23	38.61	13.13	36.77	10.94	32.18	5.47	16.55	3.28	2.30	N/A	N/A	N/A	N/A
	PM_{10}	8.21	20.69	7.66	20.00	7.11	19.31	7.11	19.31	6.57	18.39	5.47	16.09	2.74	8.27	1.64	1.15	N/A	N/A	N/A	N/A
Ultra:	CO	140.21	506.34	140.21	506.34	140.21	506.34	140.21	506.34	140.21	506.34	140.21	506.34	140.21	506.34	140.21	506.34	140.21	496.87	26.29	42.59
	NO_x	242.67	876.35	242.67	876.35	242.67	876.35	242.67	876.35	242.67	876.35	242.67	876.35	242.67	876.35	242.67	876.35	242.67	859.97	45.50	73.71
	SO_2	0.32	1.17	0.32	1.17	0.32	1.17	0.32	1.17	0.32	1.17	0.32	1.17	0.32	1.17	0.32	1.17	0.32	1.15	0.06	0.10
	VOC	16.18	58.42	16.18	58.42	16.18	58.42	16.18	58.42	16.18	58.42	16.18	58.42	16.18	58.42	16.18	58.42	16.18	57.33	3.03	4.91
	PM_{10}	8.09	29.21	8.09	29.21	8.09	29.21	8.09	29.21	8.09	29.21	8.09	29.21	8.09	29.21	8.09	29.21	8.09	28.67	1.52	2.46
Shell:	CO	97.26	280.11	97.26	280.11	97.26	280.11	19.45	52.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	168.34	484.81	168.34	484.81	168.34	484.81	33.67	90.90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.22	0.65	0.22	0.65	0.22	0.65	0.04	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	11.22	32.32	11.22	32.32	11.22	32.32	2.24	6.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	5.61	16.16	5.61	16.16	5.61	16.16	1.12	3.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yates:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Anschutz:	CO	35.74	35.70	35.74	31.73	35.74	31.73	35.74	27.77	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	156.30	156.14	156.30	138.79	156.30	138.79	156.30	121.44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.09	0.09	0.09	0.08	0.09	0.08	0.09	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	4.59	4.59	4.59	4.08	4.59	4.08	4.59	3.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	4.59	4.59	4.59	4.08	4.59	4.08	4.59	3.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BP/Stone:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total:	**CO**	415.49	1180.70	406.00	1164.78	396.52	1152.83	318.71	921.27	254.04	825.04	235.06	785.21	187.64	649.75	168.67	526.25	140.21	496.87	26.29	42.59
	NO_x	813.56	2137.86	797.14	2099.83	780.73	2079.14	646.06	1667.89	439.68	1427.96	406.84	1359.01	324.76	1124.57	291.92	910.83	242.67	859.97	45.50	73.71
	SO_2	0.96	2.73	0.94	2.69	0.92	2.66	0.74	2.13	0.59	1.90	0.54	1.81	0.43	1.50	0.39	1.21	0.32	1.15	0.06	0.10
	VOC	48.41	136.70	47.32	134.81	46.22	133.44	37.24	106.66	29.31	95.20	27.12	90.60	21.65	74.97	19.46	60.72	16.18	57.33	3.03	4.91
	PM_{10}	26.50	70.65	25.95	69.45	25.41	68.76	20.92	55.12	14.66	47.60	13.56	45.30	10.83	37.49	9.73	30.36	8.09	28.67	1.52	2.46

Table F.3.75
Proposed Action Emissions Inventory - Total Drilling Rig Boiler Emissions by Year

		2006		2007		2008		2009		2010		2011		2012		2013		2014	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Questar:	CO	0.79	1.72	0.85	1.86	1.47	3.22	1.58	3.45	1.58	3.45	1.58	3.45	1.58	3.45	1.58	3.45	1.58	3.45
	NO_x	3.75	8.21	4.04	8.85	7.00	15.33	7.50	16.43	7.50	16.43	7.50	16.43	7.50	16.43	7.50	16.43	7.50	16.43
	SO_2	0.02	0.05	0.02	0.05	0.04	0.09	0.05	0.10	0.05	0.10	0.05	0.10	0.05	0.10	0.05	0.10	0.05	0.10
	VOC	0.21	0.45	0.22	0.49	0.39	0.84	0.41	0.90	0.41	0.90	0.41	0.90	0.41	0.90	0.41	0.90	0.41	0.90
	PM_{10}	0.29	0.62	0.31	0.67	0.53	1.17	0.57	1.25	0.57	1.25	0.57	1.25	0.57	1.25	0.57	1.25	0.57	1.25
Ultra:	CO	1.09	2.39	1.09	2.39	1.50	3.29	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68
	NO_x	5.20	11.39	5.20	11.39	7.15	15.66	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52
	SO_2	0.03	0.07	0.03	0.07	0.04	0.09	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11
	VOC	0.29	0.63	0.29	0.63	0.39	0.86	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96
	PM_{10}	0.40	0.87	0.40	0.87	0.54	1.19	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33
Shell:	CO	0.84	1.84	0.95	2.07	1.05	2.30	1.05	2.30	1.05	2.30	1.05	2.30	1.05	2.30	1.05	2.30	1.05	2.30
	NO_x	4.00	8.76	4.50	9.86	5.00	10.95	5.00	10.95	5.00	10.95	5.00	10.95	5.00	10.95	5.00	10.95	5.00	10.95
	SO_2	0.02	0.05	0.03	0.06	0.03	0.07	0.03	0.07	0.03	0.07	0.03	0.07	0.03	0.07	0.03	0.07	0.03	0.07
	VOC	0.22	0.48	0.25	0.54	0.28	0.60	0.28	0.60	0.28	0.60	0.28	0.60	0.28	0.60	0.28	0.60	0.28	0.60
	PM_{10}	0.30	0.67	0.34	0.75	0.38	0.83	0.38	0.83	0.38	0.83	0.38	0.83	0.38	0.83	0.38	0.83	0.38	0.83
Yates:	CO	0.11	0.23	0.11	0.23	0.11	0.23	0.11	0.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	0.50	1.10	0.50	1.10	0.50	1.10	0.50	1.10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.03	0.06	0.03	0.06	0.03	0.06	0.03	0.06	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	0.04	0.08	0.04	0.08	0.04	0.08	0.04	0.08	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Anschutz:	CO	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92
	NO_x	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38
	SO_2	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03
	VOC	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24
	PM_{10}	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33
BP/Stone:	CO	0.11	0.23	0.21	0.46	0.21	0.46	0.21	0.46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	0.50	1.10	1.00	2.19	1.00	2.19	1.00	2.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.03	0.06	0.06	0.12	0.06	0.12	0.06	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	0.04	0.08	0.08	0.17	0.08	0.17	0.08	0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total:	**CO**	3.35	7.34	3.62	7.93	4.76	10.42	5.04	11.04	4.73	10.35	4.73	10.35	4.73	10.35	4.73	10.35	4.73	10.35
	NO_x	15.95	34.93	17.24	37.76	22.65	49.60	24.00	52.56	22.50	49.28	22.50	49.28	22.50	49.28	22.50	49.28	22.50	49.28
	SO_2	0.10	0.21	0.10	0.23	0.14	0.30	0.14	0.32	0.14	0.30	0.14	0.30	0.14	0.30	0.14	0.30	0.14	0.30
	VOC	0.88	1.92	0.95	2.08	1.25	2.73	1.32	2.89	1.24	2.71	1.24	2.71	1.24	2.71	1.24	2.71	1.24	2.71
	PM_{10}	1.21	2.65	1.31	2.87	1.72	3.77	1.82	3.99	1.71	3.74	1.71	3.74	1.71	3.74	1.71	3.74	1.71	3.74

[1] lb/hr based on worst case # of drill rigs operating at once from Tables B.X.X and B.X.X.
[2] tpy numbers based on boilers running throughout the winter season (Nov.-April).

Table F.3.75
Proposed Action Emissions Inventory - Total Drilling Rig Boiler Emissions by Year

		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025	
	(lb/l	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Questar:	CO	1.58	3.45	1.47	3.22	1.37	2.99	1.37	2.99	1.26	2.76	1.05	2.30	0.53	1.15	0.32	0.69	N/A	N/A	N/A	N/A
	NO_x	7.50	16.43	7.00	15.33	6.50	14.24	6.50	14.24	6.00	13.14	5.00	10.95	2.50	5.48	1.50	3.29	N/A	N/A	N/A	N/A
	SO_2	0.05	0.10	0.04	0.09	0.04	0.09	0.04	0.09	0.04	0.08	0.03	0.07	0.02	0.03	0.01	0.02	N/A	N/A	N/A	N/A
	VOC	0.41	0.90	0.39	0.84	0.36	0.78	0.36	0.78	0.33	0.72	0.28	0.60	0.14	0.30	0.08	0.18	N/A	N/A	N/A	N/A
	PM_{10}	0.57	1.25	0.53	1.17	0.49	1.08	0.49	1.08	0.46	1.00	0.38	0.83	0.19	0.42	0.11	0.25	N/A	N/A	N/A	N/A
Ultra:	CO	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	1.68	3.68	0.32	0.69
	NO_x	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	8.00	17.52	1.50	3.29
	SO_2	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.05	0.11	0.01	0.02
	VOC	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.44	0.96	0.08	0.18
	PM_{10}	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.61	1.33	0.11	0.25
Shell:	CO	1.05	2.30	1.05	2.30	1.05	2.30	0.21	0.46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	5.00	10.95	5.00	10.95	5.00	10.95	1.00	2.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.03	0.07	0.03	0.07	0.03	0.07	0.01	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.28	0.60	0.28	0.60	0.28	0.60	0.06	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	0.38	0.83	0.38	0.83	0.38	0.83	0.08	0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yates:	CO /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2 /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10} /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Anschutz:	CO	0.42	0.92	0.42	0.92	0.42	0.92	0.42	0.92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	2.00	4.38	2.00	4.38	2.00	4.38	2.00	4.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.11	0.24	0.11	0.24	0.11	0.24	0.11	0.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	0.15	0.33	0.15	0.33	0.15	0.33	0.15	0.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BP/Stone:	CO /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2 /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10} /	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total:	**CO**	4.73	10.35	4.62	10.12	4.52	9.89	3.68	8.05	2.94	6.44	2.73	5.98	2.21	4.83	2.00	4.37	1.68	3.68	0.32	0.69
	NO_x	22.50	49.28	22.00	48.18	21.50	47.09	17.50	38.33	14.00	30.66	13.00	28.47	10.50	23.00	9.50	20.81	8.00	17.52	1.50	3.29
	SO_2	0.14	0.30	0.13	0.29	0.13	0.28	0.11	0.23	0.08	0.18	0.08	0.17	0.06	0.14	0.06	0.12	0.05	0.11	0.01	0.02
	VOC	1.24	2.71	1.21	2.65	1.18	2.59	0.96	2.11	0.77	1.69	0.72	1.57	0.58	1.26	0.52	1.14	0.44	0.96	0.08	0.18
	PM_{10}	1.71	3.74	1.67	3.66	1.63	3.58	1.33	2.91	1.06	2.33	0.99	2.16	0.80	1.75	0.72	1.58	0.61	1.33	0.11	0.25

Table F.3.76
Proposed Action Emissions Inventory - Total Construction Disturbance Emissions by Year

		2006		2007		2008		2009		2010		2011		2012		2013	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Pad Construction/Expansion:	PM_{10}	2.04	2.23	5.68	6.22	4.70	5.14	4.92	5.38	4.30	4.71	4.07	4.45	3.84	4.20	3.35	3.67
	$PM_{2.5}$	0.54	0.59	1.50	1.64	1.24	1.36	1.30	1.42	1.14	1.24	1.07	1.18	1.01	1.11	0.88	0.97
Local Road Construction:	PM_{10}	0.51	0.56	0.86	0.94	0.70	0.77	0.72	0.79	0.57	0.62	0.65	0.71	0.25	0.28	0.29	0.32
	$PM_{2.5}$	0.13	0.15	0.23	0.25	0.19	0.20	0.19	0.21	0.15	0.16	0.17	0.19	0.07	0.07	0.08	0.08
Resource Road Construction:	PM_{10}	0.61	0.66	1.03	1.12	0.84	0.92	0.86	0.94	0.68	0.74	0.77	0.84	0.30	0.33	0.35	0.38
	$PM_{2.5}$	0.16	0.18	0.27	0.30	0.22	0.24	0.23	0.25	0.18	0.20	0.20	0.22	0.08	0.09	0.09	0.10
Pipeline Construction:	PM_{10}	1.69	1.85	2.86	3.14	2.34	2.57	2.41	2.64	1.89	2.07	2.15	2.35	0.85	0.93	0.98	1.07
	$PM_{2.5}$	0.45	0.49	0.76	0.83	0.62	0.68	0.64	0.70	0.50	0.55	0.57	0.62	0.22	0.24	0.26	0.28
Wind Erosion[3]:	PM_{10}	14.69	32.18	38.88	85.14	32.14	70.38	33.58	73.53	29.14	63.81	27.95	61.20	25.09	54.94	22.15	48.50
	$PM_{2.5}$	5.88	12.87	15.55	34.06	12.85	28.15	13.43	29.41	11.66	25.53	11.18	24.48	10.04	21.98	8.86	19.40
Ultra/Shell Gathering System Construction:	PM_{10}	N/A	N/A	N/A	N/A	346.70	379.64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	91.49	100.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline Construction:	PM_{10}	N/A	N/A	80.48	88.13	N/A	N/A	N/A	N/A	N/A	N/A	53.86	58.98	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	21.24	23.26	N/A	N/A	N/A	N/A	N/A	N/A	14.21	15.56	N/A	N/A	N/A	N/A
Ancillary Facility Construction:	PM_{10}	N/A	N/A	6.12	6.70	N/A	N/A	N/A	N/A	N/A	N/A	234.74	257.04	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	1.61	1.77	N/A	N/A	N/A	N/A	N/A	N/A	61.95	67.83	N/A	N/A	N/A	N/A
Total Construction Surface Disturbace Emissions:	PM_{10}	19.54	37.49	135.90	191.39	387.43	459.42	42.49	83.29	36.57	71.95	324.18	385.58	30.33	60.68	27.11	53.94
	$PM_{2.5}$	7.16	14.27	41.16	62.09	106.61	130.82	15.78	31.99	13.62	27.67	89.35	110.08	11.42	23.49	10.17	20.83

Note: Construction Surface Disturbance Emissions occur during summer months (May-Oct.) and daylight hours (12 hrs/day) only.

[1] lb/hr number based on 6 months of construction at 12 hrs/day.

[2] tpy numbers based on total construction occuring over a 6 month period between May and October of each year.

[3] Wind erosion lb/hr totals assume that construction is evenly distributed over the summer construction season.

Table F.3.76
Proposed Action Emissions Inventory - Total Construction Disturbance Emissions by Year

		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Pad Construction/Expansion:	PM_{10}	3.91	4.29	3.71	4.06	3.85	4.21	3.51	3.84	2.75	3.02	2.36	2.59	1.59	1.74	1.45	1.59	1.45	1.59	0.58	0.64
	$PM_{2.5}$	1.03	1.13	0.98	1.07	1.01	1.11	0.93	1.01	0.73	0.80	0.62	0.68	0.42	0.46	0.38	0.42	0.38	0.42	0.15	0.17
Local Road Construction:	PM_{10}	0.22	0.24	0.23	0.26	0.23	0.26	0.16	0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.06	0.06	0.06	0.07	0.06	0.07	0.04	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resource Road Construction:	PM_{10}	0.26	0.28	0.28	0.31	0.28	0.31	0.19	0.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.07	0.07	0.07	0.08	0.07	0.08	0.05	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction:	PM_{10}	0.72	0.78	0.78	0.86	0.78	0.86	0.52	0.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.19	0.21	0.21	0.23	0.21	0.23	0.14	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wind Erosion[3]:	PM_{10}	25.42	55.68	24.19	52.98	25.06	54.88	22.65	49.59	17.34	37.97	14.86	32.55	10.00	21.89	9.13	19.99	9.13	19.99	3.65	7.99
	$PM_{2.5}$	10.17	22.27	9.68	21.19	10.02	21.95	9.06	19.84	6.94	15.19	5.94	13.02	4.00	8.76	3.65	7.99	3.65	7.99	1.46	3.20
Ultra/Shell Gathering System Construction:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline Construction:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Construction:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Construction Surface Disturbace Emissions:	PM_{10}	30.53	61.26	29.19	58.46	30.20	60.51	27.02	54.38	20.09	40.99	17.22	35.13	11.58	23.63	10.58	21.57	10.58	21.57	4.23	8.63
	$PM_{2.5}$	11.52	23.75	11.00	22.64	11.38	23.44	10.21	21.10	7.66	15.99	6.57	13.70	4.42	9.21	4.03	8.41	4.03	8.41	1.61	3.37

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2006			2007			2008			2009		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Pad Construction Traffic[1]:	PM_{10}	28.94	0.00	31.68	33.97	0.00	37.20	28.10	0.00	30.77	23.48	0.00	25.72
	$PM_{2.5}$	4.41	0.00	4.83	5.18	0.00	5.68	4.29	0.00	4.69	3.58	0.00	3.92
Road Construction Traffic:	PM_{10}	3.99	0.00	4.37	6.75	0.00	7.39	5.52	0.00	6.05	5.68	0.00	6.22
	$PM_{2.5}$	0.61	0.00	0.67	1.03	0.00	1.13	0.84	0.00	0.92	0.87	0.00	0.95
Pipeline Construction Traffic:	PM_{10}	13.22	0.00	14.47	22.37	0.00	24.49	18.30	0.00	20.04	18.81	0.00	20.60
	$PM_{2.5}$	2.02	0.00	2.21	3.42	0.00	3.75	2.80	0.00	3.07	2.88	0.00	3.15
Ultra/Shell Gathering System Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	58.97	0.00	64.58	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	9.02	0.00	9.88	N/A	N/A	N/A
Sales Pipeline ConstructionTraffic:	PM_{10}	N/A	N/A	N/A	30.50	0.00	33.40	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	4.67	0.00	5.11	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Construction Traffic:	PM_{10}	N/A	N/A	N/A	2.31	0.00	2.53	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	0.35	0.00	0.39	N/A	N/A	N/A	N/A	N/A	N/A
Well Pad Construction Heavy Equipment Tailpipe:	CO	61.59	0.00	67.45	171.44	0.00	187.73	141.84	0.00	155.32	148.41	0.00	162.51
	NO_x	50.00	0.00	54.75	139.17	0.00	152.39	115.14	0.00	126.08	120.47	0.00	131.92
	SO_2	0.94	0.00	1.03	2.62	0.00	2.87	2.17	0.00	2.38	2.27	0.00	2.49
	VOC	7.25	0.00	7.93	20.17	0.00	22.09	16.69	0.00	18.27	17.46	0.00	19.12
	$PM_{10/2.5}$	2.90	0.00	3.17	8.07	0.00	8.83	6.67	0.00	7.31	6.98	0.00	7.65
Road Construction Heavy Equipment Tailpipe:	CO	3.66	0.00	4.01	6.20	0.00	6.79	5.07	0.00	5.55	5.21	0.00	5.71
	NO_x	2.97	0.00	3.26	5.03	0.00	5.51	4.12	0.00	4.51	4.23	0.00	4.63
	SO_2	0.06	0.00	0.06	0.09	0.00	0.10	0.08	0.00	0.08	0.08	0.00	0.09
	VOC	0.43	0.00	0.47	0.73	0.00	0.80	0.60	0.00	0.65	0.61	0.00	0.67
	$PM_{10/2.5}$	0.17	0.00	0.19	0.29	0.00	0.32	0.24	0.00	0.26	0.25	0.00	0.27
Pipeline Construction Heavy Equipment Tailpipe:	CO	1.12	0.00	1.22	1.89	0.00	2.07	1.55	0.00	1.69	1.59	0.00	1.74
	NO_x	0.91	0.00	0.99	1.53	0.00	1.68	1.25	0.00	1.37	1.29	0.00	1.41
	SO_2	0.02	0.00	0.02	0.03	0.00	0.03	0.02	0.00	0.03	0.02	0.00	0.03
	VOC	0.13	0.00	0.14	0.22	0.00	0.24	0.18	0.00	0.20	0.19	0.00	0.20
	$PM_{10/2.5}$	0.05	0.00	0.06	0.09	0.00	0.10	0.07	0.00	0.08	0.07	0.00	0.08
Ultra/Shell GS Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	4.98	0.00	5.45	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	4.04	0.00	4.43	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	0.08	0.00	0.08	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	0.59	0.00	0.64	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	0.23	0.00	0.26	N/A	N/A	N/A

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2006 (lb/hr) Summer	2006 (lb/hr) Winter	2006 (tpy) Total	2007 (lb/hr) Summer	2007 (lb/hr) Winter	2007 (tpy) Total	2008 (lb/hr) Summer	2008 (lb/hr) Winter	2008 (tpy) Total	2009 (lb/hr) Summer	2009 (lb/hr) Winter	2009 (tpy) Total
Sales Pipeline Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	2.58	0.00	2.82	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	2.09	0.00	2.29	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	0.04	0.00	0.04	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	0.30	0.00	0.33	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	0.12	0.00	0.13	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	17.07	0.00	18.69	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	13.86	0.00	15.17	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	0.26	0.00	0.29	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	2.01	0.00	2.20	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	0.80	0.00	0.88	N/A	N/A	N/A	N/A	N/A	N/A
Drilling Traffic:	PM_{10}	31.86	31.86	139.53	41.65	41.65	182.41	46.46	46.46	203.51	47.39	47.39	207.59
	$PM_{2.5}$	4.85	4.85	21.26	6.35	6.35	27.79	7.08	7.08	31.01	7.22	7.22	31.63
Rig Move Traffic:	PM_{10}	0.60	0.60	2.64	0.79	0.79	3.45	0.88	0.88	3.85	0.90	0.90	3.93
	$PM_{2.5}$	0.09	0.09	0.40	0.12	0.12	0.53	0.13	0.13	0.59	0.14	0.14	0.60
Drilling Haul Truck Tailpipe:	CO	2.51	2.51	10.99	3.28	3.28	14.37	3.66	3.66	16.03	3.73	3.73	16.35
	NO_x	1.95	1.95	8.53	2.55	2.55	11.15	2.84	2.84	12.44	2.90	2.90	12.69
	SO_2	0.02	0.02	0.10	0.03	0.03	0.13	0.03	0.03	0.14	0.03	0.03	0.14
	VOC	0.97	0.97	4.24	1.27	1.27	5.55	1.41	1.41	6.19	1.44	1.44	6.31
Rig Move Haul Truck Tailpipe:	CO	0.06	0.06	0.24	0.07	0.07	0.32	0.08	0.08	0.35	0.08	0.08	0.36
	NO_x	0.04	0.04	0.19	0.06	0.06	0.25	0.06	0.06	0.27	0.06	0.06	0.28
	SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VOC	0.02	0.02	0.09	0.03	0.03	0.12	0.03	0.03	0.14	0.03	0.03	0.14
Total Construction Surface Disturbace Emissions:	**CO**	68.94	2.56	83.91	202.53	3.35	232.78	157.18	3.74	184.40	159.02	3.82	186.67
	NO_x	55.87	1.99	67.72	164.28	2.60	188.44	127.46	2.90	149.10	128.95	2.96	150.93
	SO_2	1.04	0.02	1.21	3.08	0.03	3.47	2.38	0.03	2.71	2.41	0.03	2.75
	VOC	8.80	0.99	12.89	24.73	1.29	31.33	19.50	1.44	26.09	19.73	1.47	26.45
	PM_{10}	81.72	32.46	196.11	147.70	42.43	301.13	165.46	47.34	336.69	103.57	48.29	272.04
	$PM_{2.5}$	15.11	4.95	32.80	30.49	6.47	54.63	31.38	7.21	58.06	21.99	7.36	48.25

Note: All tpy numbers except drilling related based on total emissions during the six month construction season (May-October).

All lb/hr numbers except drilling related based on this total and assumed to happen evenly over the daylight hours of the construction season (2190 hrs/yr).

All drilling numbers based on year-round drilling.

[1] For the purpose of estimating the number of pads constructed/expanded for the year and average of 15 acres per expansion/construction of a pad was used.

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2010			2011			2012			2013		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Pad Construction Traffic[1]:	PM_{10}	19.71	0.00	21.58	18.45	0.00	20.20	10.90	0.00	11.94	10.48	0.00	11.48
	$PM_{2.5}$	3.01	0.00	3.29	2.82	0.00	3.08	1.66	0.00	1.82	1.60	0.00	1.75
Road Construction Traffic:	PM_{10}	4.45	0.00	4.87	5.06	0.00	5.54	1.99	0.00	2.18	2.30	0.00	2.52
	$PM_{2.5}$	0.68	0.00	0.74	0.77	0.00	0.85	0.30	0.00	0.33	0.35	0.00	0.38
Pipeline Construction Traffic:	PM_{10}	14.74	0.00	16.14	16.78	0.00	18.37	6.61	0.00	7.24	7.63	0.00	8.35
	$PM_{2.5}$	2.26	0.00	2.47	2.57	0.00	2.81	1.01	0.00	1.11	1.17	0.00	1.28
Ultra/Shell Gathering System Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline ConstructionTraffic:	PM_{10}	N/A	N/A	N/A	16.27	0.00	17.81	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	2.49	0.00	2.72	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Construction Traffic:	PM_{10}	N/A	N/A	N/A	12.92	0.00	14.14	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	1.97	0.00	2.16	N/A	N/A	N/A	N/A	N/A	N/A
Well Pad Construction Heavy Equipment Tailpipe:	CO	129.86	0.00	142.19	122.77	0.00	134.43	115.89	0.00	126.90	101.09	0.00	110.70
	NO_x	105.41	0.00	115.43	99.66	0.00	109.13	94.08	0.00	103.01	82.06	0.00	89.86
	SO_2	1.99	0.00	2.17	1.88	0.00	2.06	1.77	0.00	1.94	1.55	0.00	1.69
	VOC	15.28	0.00	16.73	14.44	0.00	15.82	13.63	0.00	14.93	11.89	0.00	13.02
	$PM_{10/2.5}$	6.11	0.00	6.69	5.78	0.00	6.33	5.45	0.00	5.97	4.76	0.00	5.21
Road Construction Heavy Equipment Tailpipe:	CO	4.08	0.00	4.47	4.65	0.00	5.09	1.83	0.00	2.00	2.11	0.00	2.31
	NO_x	3.32	0.00	3.63	3.77	0.00	4.13	1.49	0.00	1.63	1.71	0.00	1.88
	SO_2	0.06	0.00	0.07	0.07	0.00	0.08	0.03	0.00	0.03	0.03	0.00	0.04
	VOC	0.48	0.00	0.53	0.55	0.00	0.60	0.22	0.00	0.24	0.25	0.00	0.27
	$PM_{10/2.5}$	0.19	0.00	0.21	0.22	0.00	0.24	0.09	0.00	0.09	0.10	0.00	0.11
Pipeline Construction Heavy Equipment Tailpipe:	CO	1.24	0.00	1.36	1.42	0.00	1.55	0.56	0.00	0.61	0.64	0.00	0.70
	NO_x	1.01	0.00	1.11	1.15	0.00	1.26	0.45	0.00	0.50	0.52	0.00	0.57
	SO_2	0.02	0.00	0.02	0.02	0.00	0.02	0.01	0.00	0.01	0.01	0.00	0.01
	VOC	0.15	0.00	0.16	0.17	0.00	0.18	0.07	0.00	0.07	0.08	0.00	0.08
	$PM_{10/2.5}$	0.06	0.00	0.06	0.07	0.00	0.07	0.03	0.00	0.03	0.03	0.00	0.03
Ultra/Shell GS Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2010 (lb/hr) Summer	2010 (lb/hr) Winter	2010 (tpy) Total	2011 (lb/hr) Summer	2011 (lb/hr) Winter	2011 (tpy) Total	2012 (lb/hr) Summer	2012 (lb/hr) Winter	2012 (tpy) Total	2013 (lb/hr) Summer	2013 (lb/hr) Winter	2013 (tpy) Total
Sales Pipeline Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	1.37	0.00	1.50	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	1.11	0.00	1.22	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	0.02	0.00	0.02	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	0.16	0.00	0.18	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	0.06	0.00	0.07	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	96.30	0.00	105.45	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	78.17	0.00	85.60	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	1.47	0.00	1.61	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	11.33	0.00	12.41	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	4.53	0.00	4.96	N/A	N/A	N/A	N/A	N/A	N/A
Drilling Traffic:	PM_{10}	45.22	45.22	198.06	45.06	45.06	197.38	44.91	44.91	196.70	44.75	44.75	196.02
	$PM_{2.5}$	6.89	6.89	30.18	6.87	6.87	30.08	6.84	6.84	29.97	6.82	6.82	29.87
Rig Move Traffic:	PM_{10}	0.86	0.86	3.75	0.85	0.85	3.73	0.85	0.85	3.72	0.85	0.85	3.71
	$PM_{2.5}$	0.13	0.13	0.57	0.13	0.13	0.57	0.13	0.13	0.57	0.13	0.13	0.57
Drilling Haul Truck Tailpipe:	CO	3.56	3.56	15.60	3.55	3.55	15.55	3.54	3.54	15.50	3.53	3.53	15.44
	NO_x	2.76	2.76	12.11	2.76	2.76	12.07	2.75	2.75	12.03	2.74	2.74	11.98
	SO_2	0.03	0.03	0.14	0.03	0.03	0.14	0.03	0.03	0.14	0.03	0.03	0.14
	VOC	1.38	1.38	6.02	1.37	1.37	6.00	1.37	1.37	5.98	1.36	1.36	5.96
Rig Move Haul Truck Tailpipe:	CO	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34
	NO_x	0.06	0.06	0.27	0.06	0.06	0.27	0.06	0.06	0.26	0.06	0.06	0.26
	SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VOC	0.03	0.03	0.13	0.03	0.03	0.13	0.03	0.03	0.13	0.03	0.03	0.13
Total Construction Surface Disturbace Emissions:	**CO**	138.83	3.64	163.98	230.14	3.63	263.92	121.90	3.62	145.35	107.45	3.60	129.50
	NO_x	112.57	2.83	132.54	186.69	2.82	213.67	98.82	2.81	117.43	87.10	2.80	104.56
	SO_2	2.10	0.03	2.40	3.50	0.03	3.93	1.84	0.03	2.12	1.62	0.03	1.88
	VOC	17.31	1.41	23.57	28.05	1.40	35.31	15.31	1.40	21.35	13.61	1.39	19.47
	PM_{10}	91.34	46.07	251.37	126.05	45.92	288.86	70.83	45.76	227.88	70.90	45.60	227.43
	$PM_{2.5}$	19.32	7.02	44.23	28.27	7.00	53.94	15.52	6.97	39.90	14.95	6.95	39.20

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2014			2015			2016			2017		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Pad Construction Traffic[1]:	PM_{10}	13.00	0.00	14.24	12.58	0.00	13.78	13.00	0.00	14.24	11.74	0.00	12.86
	$PM_{2.5}$	1.98	0.00	2.17	1.92	0.00	2.10	1.98	0.00	2.17	1.79	0.00	1.96
Road Construction Traffic:	PM_{10}	1.69	0.00	1.85	1.84	0.00	2.02	1.84	0.00	2.02	1.23	0.00	1.34
	$PM_{2.5}$	0.26	0.00	0.28	0.28	0.00	0.31	0.28	0.00	0.31	0.19	0.00	0.21
Pipeline Construction Traffic:	PM_{10}	5.59	0.00	6.12	6.10	0.00	6.68	6.10	0.00	6.68	4.07	0.00	4.45
	$PM_{2.5}$	0.86	0.00	0.94	0.93	0.00	1.02	0.93	0.00	1.02	0.62	0.00	0.68
Ultra/Shell Gathering System Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline ConstructionTraffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well Pad Construction Heavy Equipment Tailpipe:	CO	118.18	0.00	129.41	111.93	0.00	122.57	116.10	0.00	127.13	105.89	0.00	115.95
	NO_x	95.94	0.00	105.05	90.86	0.00	99.49	94.25	0.00	103.20	85.96	0.00	94.12
	SO_2	1.81	0.00	1.98	1.71	0.00	1.87	1.78	0.00	1.94	1.62	0.00	1.77
	VOC	13.90	0.00	15.23	13.17	0.00	14.42	13.66	0.00	14.96	12.46	0.00	13.64
	$PM_{10/2.5}$	5.56	0.00	6.09	5.27	0.00	5.77	5.46	0.00	5.98	4.98	0.00	5.46
Road Construction Heavy Equipment Tailpipe:	CO	1.55	0.00	1.70	1.69	0.00	1.85	1.69	0.00	1.85	1.13	0.00	1.23
	NO_x	1.26	0.00	1.38	1.37	0.00	1.50	1.37	0.00	1.50	0.91	0.00	1.00
	SO_2	0.02	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.02	0.00	0.02
	VOC	0.18	0.00	0.20	0.20	0.00	0.22	0.20	0.00	0.22	0.13	0.00	0.15
	$PM_{10/2.5}$	0.07	0.00	0.08	0.08	0.00	0.09	0.08	0.00	0.09	0.05	0.00	0.06
Pipeline Construction Heavy Equipment Tailpipe:	CO	0.47	0.00	0.52	0.52	0.00	0.56	0.52	0.00	0.56	0.34	0.00	0.38
	NO_x	0.38	0.00	0.42	0.42	0.00	0.46	0.42	0.00	0.46	0.28	0.00	0.31
	SO_2	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01
	VOC	0.06	0.00	0.06	0.06	0.00	0.07	0.06	0.00	0.07	0.04	0.00	0.04
	$PM_{10/2.5}$	0.02	0.00	0.02	0.02	0.00	0.03	0.02	0.00	0.03	0.02	0.00	0.02
Ultra/Shell GS Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2014 (lb/hr) Summer	2014 (lb/hr) Winter	2014 (tpy) Total	2015 (lb/hr) Summer	2015 (lb/hr) Winter	2015 (tpy) Total	2016 (lb/hr) Summer	2016 (lb/hr) Winter	2016 (tpy) Total	2017 (lb/hr) Summer	2017 (lb/hr) Winter	2017 (tpy) Total
Sales Pipeline Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drilling Traffic:	PM_{10}	44.60	44.60	195.34	44.60	44.60	195.34	44.44	44.44	194.66	43.82	43.82	191.94
	$PM_{2.5}$	6.80	6.80	29.76	6.80	6.80	29.76	6.77	6.77	29.66	6.68	6.68	29.25
Rig Move Traffic:	PM_{10}	0.84	0.84	3.69	0.84	0.84	3.69	0.84	0.84	3.68	0.83	0.83	3.63
	$PM_{2.5}$	0.13	0.13	0.57	0.13	0.13	0.57	0.13	0.13	0.56	0.13	0.13	0.56
Drilling Haul Truck Tailpipe:	CO	3.51	3.51	15.39	3.51	3.51	15.39	3.50	3.50	15.33	3.45	3.45	15.12
	NO_x	2.73	2.73	11.94	2.73	2.73	11.94	2.72	2.72	11.90	2.68	2.68	11.74
	SO_2	0.03	0.03	0.14	0.03	0.03	0.14	0.03	0.03	0.14	0.03	0.03	0.13
	VOC	1.36	1.36	5.94	1.36	1.36	5.94	1.35	1.35	5.92	1.33	1.33	5.84
Rig Move Haul Truck Tailpipe:	CO	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.33
	NO_x	0.06	0.06	0.26	0.06	0.06	0.26	0.06	0.06	0.26	0.06	0.06	0.26
	SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VOC	0.03	0.03	0.13	0.03	0.03	0.13	0.03	0.03	0.13	0.03	0.03	0.13
Total Construction Surface Disturbace Emissions:	**CO**	123.80	3.59	147.35	117.73	3.59	140.71	121.88	3.58	145.22	110.89	3.53	133.01
	NO_x	100.37	2.79	119.06	95.44	2.79	113.66	98.81	2.78	117.32	89.89	2.74	107.42
	SO_2	1.87	0.03	2.15	1.78	0.03	2.05	1.84	0.03	2.12	1.67	0.03	1.93
	VOC	15.53	1.39	21.56	14.81	1.39	20.77	15.30	1.38	21.29	13.99	1.36	19.80
	PM_{10}	71.38	45.44	227.43	71.34	45.44	227.39	71.79	45.28	227.37	66.74	44.65	219.75
	$PM_{2.5}$	15.68	6.92	39.92	15.43	6.92	39.64	15.67	6.90	39.82	14.46	6.80	38.18

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2018			2019			2020			2021		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Pad Construction Traffic[1]:	PM_{10}	10.48	0.00	11.48	7.55	0.00	8.27	4.61	0.00	5.05	4.19	0.00	4.59
	$PM_{2.5}$	1.60	0.00	1.75	1.15	0.00	1.26	0.70	0.00	0.77	0.64	0.00	0.70
Road Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ultra/Shell Gathering System Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline ConstructionTraffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well Pad Construction Heavy Equipment Tailpipe:	CO	83.17	0.00	91.07	71.29	0.00	78.06	47.94	0.00	52.50	43.77	0.00	47.93
	NO_x	67.51	0.00	73.93	57.87	0.00	63.37	38.92	0.00	42.61	35.53	0.00	38.91
	SO_2	1.27	0.00	1.39	1.09	0.00	1.19	0.73	0.00	0.80	0.67	0.00	0.73
	VOC	9.78	0.00	10.71	8.39	0.00	9.18	5.64	0.00	6.18	5.15	0.00	5.64
	$PM_{10/2.5}$	3.91	0.00	4.29	3.35	0.00	3.67	2.26	0.00	2.47	2.06	0.00	2.26
Road Construction Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ultra/Shell GS Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2018 (lb/hr) Summer	2018 (lb/hr) Winter	2018 (tpy) Total	2019 (lb/hr) Summer	2019 (lb/hr) Winter	2019 (tpy) Total	2020 (lb/hr) Summer	2020 (lb/hr) Winter	2020 (tpy) Total	2021 (lb/hr) Summer	2021 (lb/hr) Winter	2021 (tpy) Total
Sales Pipeline Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drilling Traffic:	PM_{10}	43.35	43.35	189.89	33.10	33.10	144.97	29.06	29.06	127.28	27.50	27.50	120.47
	$PM_{2.5}$	6.61	6.61	28.93	5.04	5.04	22.09	4.43	4.43	19.39	4.19	4.19	18.36
Rig Move Traffic:	PM_{10}	0.82	0.82	3.59	0.63	0.63	2.74	0.55	0.55	2.41	0.52	0.52	2.28
	$PM_{2.5}$	0.13	0.13	0.55	0.10	0.10	0.42	0.08	0.08	0.37	0.08	0.08	0.35
Drilling Haul Truck Tailpipe:	CO	3.42	3.42	14.96	2.61	2.61	11.42	2.29	2.29	10.03	2.17	2.17	9.49
	NO_x	2.65	2.65	11.61	2.02	2.02	8.86	1.78	1.78	7.78	1.68	1.68	7.37
	SO_2	0.03	0.03	0.13	0.02	0.02	0.10	0.02	0.02	0.09	0.02	0.02	0.08
	VOC	1.32	1.32	5.77	1.01	1.01	4.41	0.88	0.88	3.87	0.84	0.84	3.66
Rig Move Haul Truck Tailpipe:	CO	0.08	0.08	0.33	0.06	0.06	0.25	0.05	0.05	0.22	0.05	0.05	0.21
	NO_x	0.06	0.06	0.26	0.04	0.04	0.20	0.04	0.04	0.17	0.04	0.04	0.16
	SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VOC	0.03	0.03	0.13	0.02	0.02	0.10	0.02	0.02	0.09	0.02	0.02	0.08
Total Construction Surface Disturbace Emissions:	**CO**	86.66	3.49	106.36	73.95	2.66	89.73	50.28	2.34	62.74	45.99	2.21	57.63
	NO_x	70.22	2.71	85.79	59.94	2.07	72.42	40.73	1.82	50.57	37.25	1.72	46.44
	SO_2	1.30	0.03	1.53	1.11	0.02	1.30	0.75	0.02	0.89	0.69	0.02	0.82
	VOC	11.13	1.35	16.62	9.42	1.03	13.69	6.54	0.90	10.13	6.00	0.85	9.38
	PM_{10}	58.57	44.17	209.25	44.63	33.72	159.65	36.48	29.61	137.21	34.28	28.02	129.60
	$PM_{2.5}$	12.25	6.73	35.52	9.65	5.14	27.44	7.47	4.51	23.00	6.97	4.27	21.66

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2022			2023			2024			2025		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Pad Construction Traffic[1]:	PM_{10}	4.19	0.00	4.59	1.68	0.00	1.84	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.64	0.00	0.70	0.26	0.00	0.28	N/A	N/A	N/A	N/A	N/A	N/A
Road Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ultra/Shell Gathering System Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline ConstructionTraffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Construction Traffic:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Well Pad Construction Heavy Equipment Tailpipe:	CO	43.77	0.00	47.93	17.51	0.00	19.17	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	35.53	0.00	38.91	14.21	0.00	15.56	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.67	0.00	0.73	0.27	0.00	0.29	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	5.15	0.00	5.64	2.06	0.00	2.26	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	2.06	0.00	2.26	0.82	0.00	0.90	N/A	N/A	N/A	N/A	N/A	N/A
Road Construction Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ultra/Shell GS Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table F.3.77
Proposed Action Emissions Inventory - Toptal Construction Traffic and Heavy Equipment Emissions by Year

		2022			2023			2024			2025		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Sales Pipeline Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ancillary Facility Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drilling Traffic:	PM_{10}	22.22	22.22	97.33	17.40	17.40	76.23	16.63	16.63	72.83	1.40	1.40	6.13
	$PM_{2.5}$	3.39	3.39	14.83	2.65	2.65	11.62	2.53	2.53	11.10	0.21	0.21	0.93
Rig Move Traffic:	PM_{10}	0.42	0.42	1.84	0.33	0.33	1.44	0.31	0.31	1.38	0.03	0.03	0.12
	$PM_{2.5}$	0.06	0.06	0.28	0.05	0.05	0.22	0.05	0.05	0.21	0.00	0.00	0.02
Drilling Haul Truck Tailpipe:	CO	1.75	1.75	7.67	1.37	1.37	6.01	1.31	1.31	5.74	0.11	0.11	0.48
	NO_x	1.36	1.36	5.95	1.06	1.06	4.66	1.02	1.02	4.45	0.09	0.09	0.37
	SO_2	0.02	0.02	0.07	0.01	0.01	0.05	0.01	0.01	0.05	0.00	0.00	0.00
	VOC	0.68	0.68	2.96	0.53	0.53	2.32	0.51	0.51	2.21	0.04	0.04	0.19
Rig Move Haul Truck Tailpipe:	CO	0.04	0.04	0.17	0.03	0.03	0.13	0.03	0.03	0.13	0.00	0.00	0.01
	NO_x	0.03	0.03	0.13	0.02	0.02	0.10	0.02	0.02	0.10	0.00	0.00	0.01
	SO_2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VOC	0.01	0.01	0.07	0.01	0.01	0.05	0.01	0.01	0.05	0.00	0.00	0.00
Total Construction Surface Disturbace Emissions:	**CO**	45.56	1.79	55.77	18.91	1.40	25.31	1.34	1.34	5.86	0.11	0.11	0.49
	NO_x	36.92	1.39	44.99	15.30	1.09	20.33	1.04	1.04	4.55	0.09	0.09	0.38
	SO_2	0.69	0.02	0.80	0.28	0.01	0.35	0.01	0.01	0.05	0.00	0.00	0.00
	VOC	5.84	0.69	8.66	2.60	0.54	4.62	0.52	0.52	2.26	0.04	0.04	0.19
	PM_{10}	28.90	22.64	106.02	20.23	17.73	80.41	16.94	16.94	74.20	1.42	1.42	6.24
	$PM_{2.5}$	6.15	3.45	18.07	3.78	2.70	13.02	2.58	2.58	11.31	0.22	0.22	0.95

Table F.3.78
Proposed Action Emissions Inventory - Total Frac/Completion Emissions by Year

		2006		2007		2008		2009		2010		2011		2012		2013		2014	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Frac and Other Completion Engine Emissions:	CO	35.54	155.67	46.46	203.51	51.84	227.06	52.88	231.61	50.45	220.98	50.28	220.22	50.11	219.46	49.93	218.70	49.76	217.94
	NO_x	61.51	269.43	80.42	352.24	89.72	392.98	91.52	400.87	87.32	382.47	87.02	381.15	86.72	379.84	86.42	378.52	86.12	377.21
	SO_2	1.78	7.78	2.32	10.18	2.59	11.35	2.64	11.58	2.52	11.05	2.51	11.01	2.51	10.97	2.50	10.94	2.49	10.90
	VOCs	4.10	17.96	5.36	23.48	5.98	26.20	6.10	26.72	5.82	25.50	5.80	25.41	5.78	25.32	5.76	25.23	5.74	25.15
	$PM_{10/2.5}$	2.05	8.98	2.68	11.74	2.99	13.10	3.05	13.36	2.91	12.75	2.90	12.71	2.89	12.66	2.88	12.62	2.87	12.57
Completion Traffic:	PM_{10}	18.52	81.12	24.21	106.05	27.01	118.32	27.56	120.70	26.29	115.16	26.20	114.76	26.11	114.37	26.02	113.97	25.93	113.57
	$PM_{2.5}$	2.84	12.44	3.71	16.26	4.14	18.14	4.23	18.51	4.03	17.66	4.02	17.60	4.00	17.54	3.99	17.48	3.98	17.41
Completion/Testing Haul Truck Tailpipe:	CO	1.51	6.59	1.97	8.62	2.20	9.62	2.24	9.81	2.14	9.36	2.13	9.33	2.12	9.30	2.12	9.27	2.11	9.23
	NO_x	1.17	5.12	1.53	6.69	1.70	7.47	1.74	7.62	1.66	7.27	1.65	7.24	1.65	7.22	1.64	7.19	1.64	7.17
	SO_2	0.02	0.07	0.02	0.09	0.02	0.10	0.02	0.11	0.02	0.10	0.02	0.10	0.02	0.10	0.02	0.10	0.02	0.10
	VOC	0.58	2.55	0.76	3.33	0.85	3.71	0.86	3.79	0.83	3.61	0.82	3.60	0.82	3.59	0.82	3.58	0.81	3.56
Total Frac/Completion Emissions:	CO	37.05	162.27	48.43	212.14	54.04	236.67	55.12	241.42	52.59	230.34	52.41	229.55	52.23	228.76	52.05	227.97	51.87	227.18
	NO_x	62.68	274.55	81.95	358.93	91.43	400.45	93.26	408.48	88.98	389.73	88.67	388.39	88.37	387.05	88.06	385.71	87.76	384.37
	SO_2	1.79	7.86	2.34	10.27	2.62	11.46	2.67	11.69	2.55	11.15	2.54	11.11	2.53	11.07	2.52	11.04	2.51	11.00
	VOCs	4.68	20.51	6.12	26.81	6.83	29.91	6.97	30.51	6.65	29.11	6.62	29.01	6.60	28.91	6.58	28.81	6.56	28.71
	PM_{10}	20.57	90.11	26.89	117.80	30.00	131.42	30.61	134.06	29.20	127.91	29.10	127.47	29.00	127.03	28.90	126.59	28.80	126.15
	$PM_{2.5}$	4.89	21.42	6.39	28.00	7.13	31.24	7.28	31.87	6.94	30.41	6.92	30.30	6.89	30.20	6.87	30.09	6.85	29.99

[1] lb/hr number based on tpy and year-round activity.
[2] tpy numbers based on number of wells drilled per year.

Table F.3.78
Proposed Action Emissions Inventory - Total Frac/Completion Emissions by Year

		2017		2018		2019		2020		2021		2022		2023		2024		2025	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Frac and Other Completion Engine Emissions:	CO	48.89	214.15	48.37	211.87	36.93	161.75	32.42	142.00	30.69	134.41	24.79	108.59	19.42	85.05	18.55	81.25	1.56	6.83
	NO_x	84.62	370.64	83.72	366.69	63.92	279.95	56.11	245.78	53.11	232.63	42.91	187.95	33.61	147.20	32.11	140.63	2.70	11.83
	SO_2	2.44	10.71	2.42	10.59	1.85	8.09	1.62	7.10	1.53	6.72	1.24	5.43	0.97	4.25	0.93	4.06	0.08	0.34
	VOCs	5.64	24.71	5.58	24.45	4.26	18.66	3.74	16.39	3.54	15.51	2.86	12.53	2.24	9.81	2.14	9.38	0.18	0.79
	$PM_{10/2.5}$	2.82	12.35	2.79	12.22	2.13	9.33	1.87	8.19	1.77	7.75	1.43	6.26	1.12	4.91	1.07	4.69	0.09	0.39
Completion Traffic:	PM_{10}	25.48	111.60	25.21	110.41	19.24	84.29	16.90	74.00	15.99	70.04	12.92	56.59	10.12	44.32	9.67	42.34	0.81	3.56
	$PM_{2.5}$	3.91	17.11	3.87	16.93	2.95	12.92	2.59	11.35	2.45	10.74	1.98	8.68	1.55	6.80	1.48	6.49	0.12	0.55
Completion/Testing Haul Truck Tailpipe:	CO	2.07	9.07	2.05	8.98	1.56	6.85	1.37	6.02	1.30	5.69	1.05	4.60	0.82	3.60	0.79	3.44	0.07	0.29
	NO_x	1.61	7.04	1.59	6.97	1.21	5.32	1.07	4.67	1.01	4.42	0.82	3.57	0.64	2.80	0.61	2.67	0.05	0.22
	SO_2	0.02	0.10	0.02	0.10	0.02	0.07	0.01	0.07	0.01	0.06	0.01	0.05	0.01	0.04	0.01	0.04	0.00	0.00
	VOC	0.80	3.50	0.79	3.46	0.60	2.65	0.53	2.32	0.50	2.20	0.41	1.78	0.32	1.39	0.30	1.33	0.03	0.11
Total Frac/Completion Emissions:	CO	50.96	223.22	50.42	220.84	38.49	168.60	33.79	148.02	31.99	140.10	25.84	113.19	20.24	88.65	19.34	84.70	1.63	7.12
	NO_x	86.23	377.68	85.31	373.66	65.13	285.27	57.18	250.45	54.12	237.05	43.73	191.52	34.25	150.00	32.72	143.30	2.75	12.05
	SO_2	2.47	10.81	2.44	10.69	1.86	8.16	1.64	7.17	1.55	6.78	1.25	5.48	0.98	4.29	0.94	4.10	0.08	0.34
	VOCs	6.44	28.21	6.37	27.91	4.86	21.31	4.27	18.71	4.04	17.71	3.27	14.31	2.56	11.20	2.44	10.70	0.21	0.90
	PM_{10}	28.30	123.95	28.00	122.63	21.37	93.62	18.77	82.19	17.76	77.80	14.35	62.85	11.24	49.23	10.74	47.03	0.90	3.96
	$PM_{2.5}$	6.73	29.47	6.66	29.15	5.08	22.26	4.46	19.54	4.22	18.49	3.41	14.94	2.67	11.70	2.55	11.18	0.21	0.94

Table F.3.79
Proposed Action Emissions Inventory - Total Construction Emissions by Year

		2006 (lb/hr) Summer	2006 (lb/hr) Winter	2006 (tpy) Total	2007 (lb/hr) Summer	2007 (lb/hr) Winter	2007 (tpy) Total	2008 (lb/hr) Summer	2008 (lb/hr) Winter	2008 (tpy) Total	2009 (lb/hr) Summer	2009 (lb/hr) Winter	2009 (tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	19.54	0.00	37.49	135.90	0.00	191.39	387.43	0.00	459.42	42.49	0.00	83.29
	$PM_{2.5}$	7.16	0.00	14.27	41.16	0.00	62.09	106.61	0.00	130.82	15.78	0.00	31.99
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	68.94	2.56	83.91	202.53	3.35	232.78	157.18	3.74	184.40	159.02	3.82	186.67
	NO_x	55.87	1.99	67.72	164.28	2.60	188.44	127.46	2.90	149.10	128.95	2.96	150.93
	SO_2	1.04	0.02	1.21	3.08	0.03	3.47	2.38	0.03	2.71	2.41	0.03	2.75
	VOC	8.80	0.99	12.89	24.73	1.29	31.33	19.50	1.44	26.09	19.73	1.47	26.45
	PM_{10}	81.72	32.46	196.11	147.70	42.43	301.13	165.46	47.34	336.69	103.57	48.29	272.04
	$PM_{2.5}$	15.11	4.95	32.80	30.49	6.47	54.63	31.38	7.21	58.06	21.99	7.36	48.25
Drill Rig Engine Emissions by Year:	CO	573.65	573.65	2234.06	540.22	540.22	2477.58	709.19	709.19	2619.24	759.08	759.08	2295.98
	NOx	971.36	971.36	3965.28	804.04	804.04	3528.54	937.80	937.80	3275.13	990.38	990.38	3180.02
	SO2	10.97	10.97	44.48	11.49	11.49	48.22	13.81	13.81	53.53	14.58	14.58	55.39
	VOC	68.87	68.87	268.79	63.87	63.87	292.02	83.24	83.24	306.90	89.08	89.08	268.36
	PM10	38.24	38.24	153.10	32.14	32.14	142.92	39.00	39.00	139.80	41.49	41.49	126.32
Drill Rig Boiler Emissions by Year:	CO	0.00	3.35	7.34	0.00	3.62	7.93	0.00	4.76	10.42	0.00	5.04	11.04
	NOx	0.00	15.95	34.93	0.00	17.24	37.76	0.00	22.65	49.60	0.00	24.00	52.56
	SO2	0.00	0.10	0.21	0.00	0.10	0.23	0.00	0.14	0.30	0.00	0.14	0.32
	VOC	0.00	0.88	1.92	0.00	0.95	2.08	0.00	1.25	2.73	0.00	1.32	2.89
	PM10	0.00	1.21	2.65	0.00	1.31	2.87	0.00	1.72	3.77	0.00	1.82	3.99
Completion Emissions by Year:	CO	37.05	37.05	162.27	48.43	48.43	212.14	54.04	54.04	236.67	55.12	55.12	241.42
	NO_x	62.68	62.68	274.55	81.95	81.95	358.93	91.43	91.43	400.45	93.26	93.26	408.48
	SO_2	1.79	1.79	7.86	2.34	2.34	10.27	2.62	2.62	11.46	2.67	2.67	11.69
	VOCs	4.68	4.68	20.51	6.12	6.12	26.81	6.83	6.83	29.91	6.97	6.97	30.51
	PM_{10}	20.57	20.57	90.11	26.89	26.89	117.80	30.00	30.00	131.42	30.61	30.61	134.06
	$PM_{2.5}$	4.89	4.89	21.42	6.39	6.39	28.00	7.13	7.13	31.24	7.28	7.28	31.87
TOTAL CONSTRUCTION EMISSIONS BY YEAR:	**CO**	679.63	616.61	2487.57	791.17	595.62	2930.43	920.41	771.73	3050.73	973.22	823.05	2735.11
	NO_x	1089.91	1051.98	4342.48	1050.27	905.83	4113.66	1156.69	1054.78	3874.29	1212.59	1110.60	3791.99
	SO_2	13.80	12.88	53.76	16.91	13.96	62.18	18.81	16.60	68.00	19.65	17.42	70.14
	VOCs	82.35	75.42	304.10	94.72	72.23	352.24	109.57	92.76	365.63	115.78	98.84	328.21
	PM_{10}	160.07	92.48	479.46	342.64	102.78	756.10	621.89	118.07	1071.10	218.15	122.21	619.70
	$PM_{2.5}$	65.40	49.28	224.24	110.18	46.31	290.52	184.13	55.07	363.69	86.54	57.95	242.42

Table F.3.79
Proposed Action Emissions Inventory - Total Construction Emissions by Year

		2010			2011			2012			2013		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	36.57	0.00	71.95	324.18	0.00	385.58	30.33	0.00	60.68	27.11	0.00	53.94
	$PM_{2.5}$	13.62	0.00	27.67	89.35	0.00	110.08	11.42	0.00	23.49	10.17	0.00	20.83
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	138.83	3.64	163.98	230.14	3.63	263.92	121.90	3.62	145.35	107.45	3.60	129.50
	NO_x	112.57	2.83	132.54	186.69	2.82	213.67	98.82	2.81	117.43	87.10	2.80	104.56
	SO_2	2.10	0.03	2.40	3.50	0.03	3.93	1.84	0.03	2.12	1.62	0.03	1.88
	VOC	17.31	1.41	23.57	28.05	1.40	35.31	15.31	1.40	21.35	13.61	1.39	19.47
	PM_{10}	91.34	46.07	251.37	126.05	45.92	288.86	70.83	45.76	227.88	70.90	45.60	227.43
	$PM_{2.5}$	19.32	7.02	44.23	28.27	7.00	53.94	15.52	6.97	39.90	14.95	6.95	39.20
Drill Rig Engine Emissions by Year:	CO	415.49	415.49	1472.65	415.49	415.49	1467.61	415.49	415.49	1462.57	415.49	415.49	1457.53
	NOx	813.56	813.56	2735.25	813.56	813.56	2713.21	813.56	813.56	2691.17	813.56	813.56	2669.14
	SO2	12.29	12.29	23.17	0.96	0.96	3.39	0.96	0.96	3.38	0.96	0.96	3.37
	VOC	48.41	48.41	170.85	48.41	48.41	170.20	48.41	48.41	169.55	48.41	48.41	168.90
	PM10	26.50	26.50	89.96	26.50	26.50	89.31	26.50	26.50	88.66	26.50	26.50	88.01
Drill Rig Boiler Emissions by Year:	CO	0.00	4.73	10.35	0.00	4.73	10.35	0.00	4.73	10.35	0.00	4.73	10.35
	NOx	0.00	22.50	49.28	0.00	22.50	49.28	0.00	22.50	49.28	0.00	22.50	49.28
	SO2	0.00	0.14	0.30	0.00	0.14	0.30	0.00	0.14	0.30	0.00	0.14	0.30
	VOC	0.00	1.24	2.71	0.00	1.24	2.71	0.00	1.24	2.71	0.00	1.24	2.71
	PM10	0.00	1.71	3.74	0.00	1.71	3.74	0.00	1.71	3.74	0.00	1.71	3.74
Completion Emissions by Year:	CO	52.59	52.59	230.34	52.41	52.41	229.55	52.23	52.23	228.76	52.05	52.05	227.97
	NO_x	88.98	88.98	389.73	88.67	88.67	388.39	88.37	88.37	387.05	88.06	88.06	385.71
	SO_2	2.55	2.55	11.15	2.54	2.54	11.11	2.53	2.53	11.07	2.52	2.52	11.04
	VOCs	6.65	6.65	29.11	6.62	6.62	29.01	6.60	6.60	28.91	6.58	6.58	28.81
	PM_{10}	29.20	29.20	127.91	29.10	29.10	127.47	29.00	29.00	127.03	28.90	28.90	126.59
	$PM_{2.5}$	6.94	6.94	30.41	6.92	6.92	30.30	6.89	6.89	30.20	6.87	6.87	30.09
TOTAL CONSTRUCTION EMISSIONS BY YEAR:	**CO**	606.91	476.44	1877.32	698.03	476.25	1971.43	589.61	476.06	1847.03	574.99	475.87	1825.35
	NO_x	1015.10	927.86	3306.80	1088.92	927.55	3364.55	1000.75	927.23	3244.93	988.72	926.92	3208.68
	SO_2	16.93	15.00	37.02	7.00	3.67	18.73	5.33	3.66	16.87	5.10	3.65	16.58
	VOCs	72.37	57.70	226.24	83.08	57.67	237.24	70.32	57.64	222.52	68.60	57.62	219.90
	PM_{10}	183.61	103.49	544.93	505.84	103.23	894.96	156.66	102.97	507.99	153.41	102.71	499.71
	$PM_{2.5}$	66.38	42.17	196.01	151.04	42.13	287.38	60.33	42.08	185.99	58.49	42.03	181.89

Table F.3.79
Proposed Action Emissions Inventory - Total Construction Emissions by Year

		2014 (lb/hr) Summer	2014 (lb/hr) Winter	2014 (tpy) Total	2015 (lb/hr) Summer	2015 (lb/hr) Winter	2015 (tpy) Total	2016 (lb/hr) Summer	2016 (lb/hr) Winter	2016 (tpy) Total	2017 (lb/hr) Summer	2017 (lb/hr) Winter	2017 (tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	30.53	0.00	61.26	29.19	0.00	58.46	30.20	0.00	60.51	27.02	0.00	54.38
	$PM_{2.5}$	11.52	0.00	23.75	11.00	0.00	22.64	11.38	0.00	23.44	10.21	0.00	21.10
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	123.80	3.59	147.35	117.73	3.59	140.71	121.88	3.58	145.22	110.89	3.53	133.01
	NO_x	100.37	2.79	119.06	95.44	2.79	113.66	98.81	2.78	117.32	89.89	2.74	107.42
	SO_2	1.87	0.03	2.15	1.78	0.03	2.05	1.84	0.03	2.12	1.67	0.03	1.93
	VOC	15.53	1.39	21.56	14.81	1.39	20.77	15.30	1.38	21.29	13.99	1.36	19.80
	PM_{10}	71.38	45.44	227.43	71.34	45.44	227.39	71.79	45.28	227.37	66.74	44.65	219.75
	$PM_{2.5}$	15.68	6.92	39.92	15.43	6.92	39.64	15.67	6.90	39.82	14.46	6.80	38.18
Drill Rig Engine Emissions by Year:	CO	415.49	415.49	1452.50	415.49	415.49	1184.66	415.49	415.49	1180.70	406.00	406.00	1164.78
	NOx	813.56	813.56	2647.10	813.56	813.56	2155.21	813.56	813.56	2137.86	797.14	797.14	2099.83
	SO2	0.96	0.96	3.36	0.96	0.96	2.74	0.96	0.96	2.73	0.94	0.94	2.69
	VOC	48.41	48.41	168.26	48.41	48.41	137.21	48.41	48.41	136.70	47.32	47.32	134.81
	PM10	26.50	26.50	87.37	26.50	26.50	71.16	26.50	26.50	70.65	25.95	25.95	69.45
Drill Rig Boiler Emissions by Year:	CO	0.00	4.73	10.35	0.00	4.73	10.35	0.00	4.73	10.35	0.00	4.62	10.12
	NOx	0.00	22.50	49.28	0.00	22.50	49.28	0.00	22.50	49.28	0.00	22.00	48.18
	SO2	0.00	0.14	0.30	0.00	0.14	0.30	0.00	0.14	0.30	0.00	0.13	0.29
	VOC	0.00	1.24	2.71	0.00	1.24	2.71	0.00	1.24	2.71	0.00	1.21	2.65
	PM10	0.00	1.71	3.74	0.00	1.71	3.74	0.00	1.71	3.74	0.00	1.67	3.66
Completion Emissions by Year:	CO	51.87	51.87	227.18	51.87	51.87	227.18	51.69	51.69	226.38	50.96	50.96	223.22
	NO_x	87.76	87.76	384.37	87.76	87.76	384.37	87.45	87.45	383.03	86.23	86.23	377.68
	SO_2	2.51	2.51	11.00	2.51	2.51	11.00	2.50	2.50	10.96	2.47	2.47	10.81
	VOCs	6.56	6.56	28.71	6.56	6.56	28.71	6.53	6.53	28.61	6.44	6.44	28.21
	PM_{10}	28.80	28.80	126.15	28.80	28.80	126.15	28.70	28.70	125.71	28.30	28.30	123.95
	$PM_{2.5}$	6.85	6.85	29.99	6.85	6.85	29.99	6.82	6.82	29.88	6.73	6.73	29.47
TOTAL CONSTRUCTION EMISSIONS BY YEAR:	**CO**	591.15	475.67	1837.37	585.08	475.67	1562.89	589.06	475.48	1562.65	567.85	465.12	1531.12
	NO_x	1001.68	926.60	3199.80	996.76	926.60	2702.52	999.82	926.29	2687.50	973.26	908.11	2633.11
	SO_2	5.34	3.64	16.80	5.25	3.64	16.08	5.31	3.63	16.10	5.08	3.57	15.72
	VOCs	70.49	57.59	221.24	69.78	57.59	189.41	70.24	57.56	189.31	67.75	56.33	185.47
	PM_{10}	157.21	102.45	505.96	155.83	102.45	486.89	157.20	102.19	487.98	148.01	100.58	471.19
	$PM_{2.5}$	60.54	41.98	184.76	59.77	41.98	167.17	60.37	41.94	167.54	57.35	41.16	161.86

Table F.3.79
Proposed Action Emissions Inventory - Total Construction Emissions by Year

		2018 (lb/hr) Summer	2018 (lb/hr) Winter	2018 (tpy) Total	2019 (lb/hr) Summer	2019 (lb/hr) Winter	2019 (tpy) Total	2020 (lb/hr) Summer	2020 (lb/hr) Winter	2020 (tpy) Total	2021 (lb/hr) Summer	2021 (lb/hr) Winter	2021 (tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	20.09	0.00	40.99	17.22	0.00	35.13	11.58	0.00	23.63	10.58	0.00	21.57
	$PM_{2.5}$	7.66	0.00	15.99	6.57	0.00	13.70	4.42	0.00	9.21	4.03	0.00	8.41
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	86.66	3.49	106.36	73.95	2.66	89.73	50.28	2.34	62.74	45.99	2.21	57.63
	NO_x	70.22	2.71	85.79	59.94	2.07	72.42	40.73	1.82	50.57	37.25	1.72	46.44
	SO_2	1.30	0.03	1.53	1.11	0.02	1.30	0.75	0.02	0.89	0.69	0.02	0.82
	VOC	11.13	1.35	16.62	9.42	1.03	13.69	6.54	0.90	10.13	6.00	0.85	9.38
	PM_{10}	58.57	44.17	209.25	44.63	33.72	159.65	36.48	29.61	137.21	34.28	28.02	129.60
	$PM_{2.5}$	12.25	6.73	35.52	9.65	5.14	27.44	7.47	4.51	23.00	6.97	4.27	21.66
Drill Rig Engine Emissions by Year:	CO	396.52	396.52	1152.83	318.71	318.71	921.27	254.04	254.04	825.04	235.06	235.06	785.21
	NOx	780.73	780.73	2079.14	646.06	646.06	1667.89	439.68	439.68	1427.96	406.84	406.84	1359.01
	SO2	0.92	0.92	2.66	0.74	0.74	2.13	0.59	0.59	1.90	0.54	0.54	1.81
	VOC	46.22	46.22	133.44	37.24	37.24	106.66	29.31	29.31	95.20	27.12	27.12	90.60
	PM10	25.41	25.41	68.76	20.92	20.92	55.12	14.66	14.66	47.60	13.56	13.56	45.30
Drill Rig Boiler Emissions by Year:	CO	0.00	4.52	9.89	0.00	3.68	8.05	0.00	2.94	6.44	0.00	2.73	5.98
	NOx	0.00	21.50	47.09	0.00	17.50	38.33	0.00	14.00	30.66	0.00	13.00	28.47
	SO2	0.00	0.13	0.28	0.00	0.11	0.23	0.00	0.08	0.18	0.00	0.08	0.17
	VOC	0.00	1.18	2.59	0.00	0.96	2.11	0.00	0.77	1.69	0.00	0.72	1.57
	PM10	0.00	1.63	3.58	0.00	1.33	2.91	0.00	1.06	2.33	0.00	0.99	2.16
Completion Emissions by Year:	CO	50.42	50.42	220.84	38.49	38.49	168.60	33.79	33.79	148.02	31.99	31.99	140.10
	NO_x	85.31	85.31	373.66	65.13	65.13	285.27	57.18	57.18	250.45	54.12	54.12	237.05
	SO_2	2.44	2.44	10.69	1.86	1.86	8.16	1.64	1.64	7.17	1.55	1.55	6.78
	VOCs	6.37	6.37	27.91	4.86	4.86	21.31	4.27	4.27	18.71	4.04	4.04	17.71
	PM_{10}	28.00	28.00	122.63	21.37	21.37	93.62	18.77	18.77	82.19	17.76	17.76	77.80
	$PM_{2.5}$	6.66	6.66	29.15	5.08	5.08	22.26	4.46	4.46	19.54	4.22	4.22	18.49
TOTAL CONSTRUCTION EMISSIONS BY YEAR:	**CO**	533.60	454.95	1489.91	431.15	363.54	1187.65	338.11	293.11	1042.25	313.04	272.00	988.92
	NO_x	936.26	890.25	2585.68	771.12	730.75	2063.90	537.59	512.67	1759.63	498.22	475.68	1670.97
	SO_2	4.66	3.52	15.16	3.72	2.73	11.82	2.98	2.33	10.15	2.78	2.19	9.58
	VOCs	63.73	55.12	180.55	51.52	44.10	143.77	40.13	35.26	125.72	37.17	32.74	119.26
	PM_{10}	132.07	99.21	445.21	104.14	77.35	346.44	81.48	64.09	292.96	76.18	60.34	276.43
	$PM_{2.5}$	51.97	40.43	153.00	42.21	32.47	121.43	31.01	24.69	101.69	28.79	23.04	96.03

Table F.3.79
Proposed Action Emissions Inventory - Total Construction Emissions by Year

		2022 (lb/hr) Summer	2022 (lb/hr) Winter	2022 (tpy) Total	2023 (lb/hr) Summer	2023 (lb/hr) Winter	2023 (tpy) Total	2024 (lb/hr) Summer	2024 (lb/hr) Winter	2024 (tpy) Total	2025 (lb/hr) Summer	2025 (lb/hr) Winter	2025 (tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	10.58	0.00	21.57	4.23	0.00	8.63	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	4.03	0.00	8.41	1.61	0.00	3.37	N/A	N/A	N/A	N/A	N/A	N/A
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	45.56	1.79	55.77	18.91	1.40	25.31	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	36.92	1.39	44.99	15.30	1.09	20.33	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.69	0.02	0.80	0.28	0.01	0.35	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	5.84	0.69	8.66	2.60	0.54	4.62	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	28.90	22.64	106.02	20.23	17.73	80.41	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	6.15	3.45	18.07	3.78	2.70	13.02	N/A	N/A	N/A	N/A	N/A	N/A
Drill Rig Engine Emissions by Year:	CO	187.64	187.64	649.75	168.67	168.67	526.25	140.21	140.21	496.87	26.29	26.29	42.59
	NOx	324.76	324.76	1124.57	291.92	291.92	910.83	242.67	242.67	859.97	45.50	45.50	73.71
	SO2	0.43	0.43	1.50	0.39	0.39	1.21	0.32	0.32	1.15	0.06	0.06	0.10
	VOC	21.65	21.65	74.97	19.46	19.46	60.72	16.18	16.18	57.33	3.03	3.03	4.91
	PM10	10.83	10.83	37.49	9.73	9.73	30.36	8.09	8.09	28.67	1.52	1.52	2.46
Drill Rig Boiler Emissions by Year:	CO	0.00	2.21	4.83	0.00	2.00	4.37	0.00	1.68	3.68	0.00	0.32	0.69
	NOx	0.00	10.50	23.00	0.00	9.50	20.81	0.00	8.00	17.52	0.00	1.50	3.29
	SO2	0.00	0.06	0.14	0.00	0.06	0.12	0.00	0.05	0.11	0.00	0.01	0.02
	VOC	0.00	0.58	1.26	0.00	0.52	1.14	0.00	0.44	0.96	0.00	0.08	0.18
	PM10	0.00	0.80	1.75	0.00	0.72	1.58	0.00	0.61	1.33	0.00	0.11	0.25
Completion Emissions by Year:	CO	25.84	25.84	113.19	20.24	20.24	88.65	19.34	19.34	84.70	1.63	1.63	7.12
	NO_x	43.73	43.73	191.52	34.25	34.25	150.00	32.72	32.72	143.30	2.75	2.75	12.05
	SO_2	1.25	1.25	5.48	0.98	0.98	4.29	0.94	0.94	4.10	0.08	0.08	0.34
	VOCs	3.27	3.27	14.31	2.56	2.56	11.20	2.44	2.44	10.70	0.21	0.21	0.90
	PM_{10}	14.35	14.35	62.85	11.24	11.24	49.23	10.74	10.74	47.03	0.90	0.90	3.96
	$PM_{2.5}$	3.41	3.41	14.94	2.67	2.67	11.70	2.55	2.55	11.18	0.21	0.21	0.94
TOTAL CONSTRUCTION EMISSIONS BY YEAR:	**CO**	259.04	217.47	823.54	207.82	192.30	644.59	159.55	161.23	585.25	27.92	28.23	50.40
	NO_x	405.40	380.37	1384.08	341.47	336.76	1101.96	275.39	283.39	1020.79	48.25	49.75	89.05
	SO_2	2.37	1.76	7.92	1.65	1.44	5.98	1.26	1.31	5.35	0.14	0.15	0.46
	VOCs	30.76	26.18	99.21	24.62	23.08	77.70	18.62	19.06	69.00	3.24	3.32	6.00
	PM_{10}	64.65	48.61	229.68	45.44	39.43	170.21	18.83	19.43	77.03	2.42	2.53	6.66
	$PM_{2.5}$	24.42	18.48	80.66	17.80	15.83	60.03	10.64	11.25	41.18	1.73	1.85	3.65

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2005 (Baseline/PTE)[1]			2006			2007			2008			2009			2010		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
# of Wells Drilled:			172			205			268			299			305			291	
of Wells in Production:			286			458			663			931			1230			1535	
Production Traffic:	PM_{10}				3.55	3.55	15.55	5.14	5.14	22.52	7.22	7.22	31.62	9.54	9.54	41.77	11.90	11.90	52.13
	$PM_{2.5}$				0.54	0.54	2.38	0.79	0.79	3.45	1.11	1.11	4.85	1.46	1.46	6.40	1.82	1.82	7.99
Gathering System Maintenance Traffic:	PM_{10}				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.54	9.54	41.77	11.90	11.90	52.13
	$PM_{2.5}$				N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.46	1.46	6.40	1.82	1.82	7.99
Liquids Haul Truck Gathering Traffic:	PM_{10}				20.60	20.60	90.22	35.27	35.27	154.48	47.53	47.53	208.20	5.52	5.52	24.19	6.02	6.02	26.37
	$PM_{2.5}$				3.16	3.16	13.83	5.41	5.41	23.69	7.29	7.29	31.92	0.85	0.85	3.71	0.92	0.92	4.04
Production Haul Truck Tailpipe:	CO				1.97	1.97	8.64	3.38	3.38	14.79	4.55	4.55	19.94	0.53	0.53	2.32	0.58	0.58	2.53
	NO_x				1.53	1.53	6.70	2.62	2.62	11.48	3.53	3.53	15.47	0.41	0.41	1.80	0.45	0.45	1.96
	SO_2				0.02	0.02	0.09	0.04	0.04	0.16	0.05	0.05	0.22	0.01	0.01	0.03	0.01	0.01	0.03
	VOC				0.76	0.76	3.33	1.30	1.30	5.71	1.76	1.76	7.70	0.20	0.20	0.89	0.22	0.22	0.97
Production Wind Erosion:	PM_{10}				55.56	55.56	243.37	60.73	60.73	266.00	73.39	73.39	321.45	83.84	83.84	367.23	94.74	94.74	414.95
	$PM_{2.5}$				22.23	22.23	97.35	24.29	24.29	106.40	29.36	29.36	128.58	33.54	33.54	146.89	37.89	37.89	165.98
Separator/Indirect Line Heaters:	$PM_{10/2.5}$				0.26	0.91	2.57	0.38	1.32	3.72	0.53	1.86	5.23	0.70	2.45	6.91	0.87	3.06	8.62
	SO_2				0.02	0.07	0.20	0.03	0.10	0.29	0.04	0.15	0.41	0.06	0.19	0.55	0.07	0.24	0.68
	NO_x				3.44	12.02	33.85	4.97	17.40	49.00	6.98	24.44	68.81	9.23	32.29	90.91	11.51	40.29	113.46
	CO				0.72	2.52	7.11	1.04	3.65	10.29	1.47	5.13	14.45	1.94	6.78	19.09	2.42	8.46	23.83
	VOC	See 2005 Emissions Inventory			0.19	0.66	1.86	0.27	0.96	2.70	0.38	1.34	3.78	0.51	1.78	5.00	0.63	2.22	6.24
Dehy Reboiler Heaters:	$PM_{10/2.5}$				0.03	0.10	0.29	0.04	0.15	0.42	0.06	0.21	0.59	0.08	0.28	0.78	0.10	0.35	0.98
	SO_2				0.00	0.01	0.02	0.00	0.01	0.03	0.00	0.02	0.05	0.01	0.02	0.06	0.01	0.03	0.08
	NO_x				0.39	1.36	3.84	0.56	1.97	5.55	0.79	2.77	7.80	1.05	3.66	10.30	1.30	4.57	12.86
	CO				0.08	0.29	0.81	0.12	0.41	1.17	0.17	0.58	1.64	0.22	0.77	2.16	0.27	0.96	2.70
	VOC				0.02	0.07	0.21	0.03	0.11	0.31	0.04	0.15	0.43	0.06	0.20	0.57	0.07	0.25	0.71
Dehy Flashing Emissions:	VOC				111.21	111.21	487.09	137.32	137.32	601.45	179.29	179.29	785.30	214.05	214.05	937.56	238.43	238.43	1044.33
	Total HAPs				75.51	75.51	330.71	93.23	93.23	408.36	121.73	121.73	533.18	145.33	145.33	636.56	161.88	161.88	709.05
	Benzene				12.55	12.55	54.98	15.50	15.50	67.89	20.24	20.24	88.64	24.16	24.16	105.83	26.91	26.91	117.88
	Toluene				33.94	33.94	148.66	41.91	41.91	183.56	54.72	54.72	239.66	65.33	65.33	286.13	72.77	72.77	318.72
	Ethylbenzene				1.61	1.61	7.07	1.99	1.99	8.73	2.60	2.60	11.39	3.11	3.11	13.60	3.46	3.46	15.15
	Xylene				26.33	26.33	115.32	32.51	32.51	142.40	42.45	42.45	185.92	50.68	50.68	221.97	56.45	56.45	247.25
	n-Hexane				0.94	0.94	4.14	1.17	1.17	5.11	1.52	1.52	6.67	1.82	1.82	7.96	2.03	2.03	8.87
Fugitive HAPs and VOCs:	VOC				16.55	16.55	72.50	17.89	17.89	78.35	20.15	20.15	88.26	22.00	22.00	96.36	23.90	23.90	104.69
	Total HAPs				0.37	0.37	1.63	0.40	0.40	1.76	0.45	0.45	1.98	0.49	0.49	2.17	0.54	0.54	2.35
	Benzene				0.06	0.06	0.27	0.07	0.07	0.29	0.08	0.08	0.33	0.08	0.08	0.36	0.09	0.09	0.39
	Toluene				0.11	0.11	0.47	0.12	0.12	0.51	0.13	0.13	0.58	0.14	0.14	0.63	0.16	0.16	0.68
	Ethylbenzene				0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.01	0.01	0.02	0.01	0.01	0.02
	Xylene				0.04	0.04	0.19	0.05	0.05	0.20	0.05	0.05	0.23	0.06	0.06	0.25	0.06	0.06	0.27
	n-Hexane				0.16	0.16	0.68	0.17	0.17	0.74	0.19	0.19	0.83	0.21	0.21	0.91	0.22	0.22	0.99

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2005 (Baseline/PTE)[1]			2006			2007			2008			2009			2010		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
	VOC				130.84	130.84	573.10	161.56	161.56	707.65	210.95	210.95	923.95	25.18	25.18	110.31	28.05	28.05	122.87
	Total HAPs				6.47	6.47	28.32	7.98	7.98	34.97	10.42	10.42	45.65	1.24	1.24	5.45	1.39	1.39	6.07
	Benzene				0.31	0.31	1.36	0.38	0.38	1.67	0.50	0.50	2.18	0.06	0.06	0.26	0.07	0.07	0.29
	Toluene				0.02	0.02	0.07	0.02	0.02	0.08	0.03	0.03	0.11	0.00	0.00	0.01	0.00	0.00	0.01
Condensate Storage[1]:	Ethylbenzene				0.18	0.18	0.80	0.23	0.23	0.99	0.29	0.29	1.29	0.04	0.04	0.15	0.04	0.04	0.17
	Xylene				0.23	0.23	1.02	0.29	0.29	1.26	0.38	0.38	1.65	0.04	0.04	0.20	0.05	0.05	0.22
	n-Hexane				5.72	5.72	25.07	7.07	7.07	30.96	9.23	9.23	40.42	1.10	1.10	4.83	1.23	1.23	5.38
	NOx				9.08	9.08	39.79	9.82	9.82	43.00	11.06	11.06	48.44	1.31	1.31	5.75	1.39	1.39	6.10
	CO				49.43	49.43	216.49	53.42	53.42	233.97	60.17	60.17	263.55	7.14	7.14	31.26	7.58	7.58	33.21
	NOx				107.81	107.81	472.19	107.81	107.81	472.19	107.81	107.81	472.19	121.47	121.47	532.06	121.47	121.47	532.06
	CO				40.11	40.11	175.66	40.11	40.11	175.66	40.11	40.11	175.66	53.77	53.77	235.53	53.77	53.77	235.53
Proposed Compression:	VOC				80.72	80.72	353.55	80.72	80.72	353.55	80.72	80.72	353.55	81.54	81.54	357.14	81.54	81.54	357.14
	PM10				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
	PM2.5				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
	SO2				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Formaldehyde				10.26	10.26	44.93	10.26	10.26	44.93	10.26	10.26	44.93	11.22	11.22	49.12	11.22	11.22	49.12
	NOx:				196.64	196.64	861.30	265.53	265.53	1163.00	265.53	265.53	1163.00	265.53	265.53	1163.00	265.53	265.53	1163.00
	CO:				191.03	191.03	836.70	264.73	264.73	1159.50	264.73	264.73	1159.50	264.73	264.73	1159.50	264.73	264.73	1159.50
	VOCs:				86.99	86.99	381.00	119.00	119.00	521.20	119.00	119.00	521.20	119.00	119.00	521.20	119.00	119.00	521.20
	SO2:				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM10:	See 2005 Emissions Inventory			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opal and Granger	Benzene:				2.65	2.65	11.61	2.72	2.72	11.91	2.72	2.72	11.91	2.72	2.72	11.91	2.72	2.72	11.91
Production Emissions:	Toluene:				0.78	0.78	3.40	0.80	0.80	3.50	0.80	0.80	3.50	0.80	0.80	3.50	0.80	0.80	3.50
	Ethylbenzene:				0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00
	Xylene:				0.39	0.39	1.70	0.41	0.41	1.80	0.41	0.41	1.80	0.41	0.41	1.80	0.41	0.41	1.80
	n-Hexane:				2.01	2.01	8.80	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10
	Formaldehyde:				7.65	7.65	33.50	15.30	15.30	67.00	15.30	15.30	67.00	15.30	15.30	67.00	15.30	15.30	67.00
	Total HAPs:				13.70	13.70	60.00	21.53	21.53	94.30	21.53	21.53	94.30	21.53	21.53	94.30	21.53	21.53	94.30
	NOx				318.89	328.45	1417.67	391.31	405.15	1744.23	395.70	415.13	1775.71	398.99	424.67	1803.82	401.66	433.70	1829.44
	CO				283.33	285.34	1245.40	362.79	365.69	1595.38	371.19	375.27	1634.74	328.32	333.72	1449.86	329.35	336.08	1457.29
	VOC				427.28	427.81	1872.64	518.09	518.85	2270.90	612.29	613.36	2684.16	462.54	463.96	2029.03	491.85	493.61	2158.16
	PM10				80.00	80.73	352.01	101.56	102.61	447.14	128.73	130.21	567.09	99.68	101.64	440.89	113.64	116.07	503.06
	PM2.5				26.22	26.95	116.43	30.91	31.96	137.68	38.34	39.82	171.18	36.63	38.58	164.70	41.62	44.05	187.62
TOTAL PRODUCTION	**SO2**				0.04	0.10	0.32	0.07	0.15	0.49	0.10	0.21	0.68	0.07	0.22	0.63	0.08	0.28	0.79
EMISSIONS:	**Formaldehyde**				17.91	17.91	78.43	25.56	25.56	111.93	25.56	25.56	111.93	26.51	26.51	116.12	26.51	26.51	116.12
	Benzene				15.58	15.58	68.22	18.67	18.67	81.77	23.53	23.53	103.07	27.02	27.02	118.36	29.79	29.79	130.47
	Toluene				34.84	34.84	152.60	42.84	42.84	187.65	55.67	55.67	243.85	66.27	66.27	290.28	73.73	73.73	322.92
	Ethylbenzene				2.03	2.03	8.89	2.45	2.45	10.73	3.13	3.13	13.71	3.37	3.37	14.78	3.73	3.73	16.35
	Xylene				26.99	26.99	118.23	33.26	33.26	145.66	43.29	43.29	189.60	51.19	51.19	224.21	56.97	56.97	249.54
	n-Hexane				8.83	8.83	38.69	10.48	10.48	45.90	13.02	13.02	57.02	5.20	5.20	22.80	5.56	5.56	24.33
	Total HAPs				106.18	106.18	465.05	133.25	133.25	583.65	164.20	164.20	719.17	179.58	179.58	786.55	196.29	196.29	859.73

[1] 90% of pads assumed to be connected to gathering system after 2009. 90% of unconnected pads assumed to be controlled to 98%. Centralized gathering facilities to be equipped with VRUs.

One combustion unit assumed per pad with tanks, as worst case.

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2011 (lb/hr) Summer	2011 (lb/hr) Winter	2011 (tpy) Total	2012 (lb/hr) Summer	2012 (lb/hr) Winter	2012 (tpy) Total	2013 (lb/hr) Summer	2013 (lb/hr) Winter	2013 (tpy) Total	2014 (lb/hr) Summer	2014 (lb/hr) Winter	2014 (tpy) Total	2015 (lb/hr) Summer	2015 (lb/hr) Winter	2015 (tpy) Total	2016 (lb/hr) Summer	2016 (lb/hr) Winter	2016 (tpy) Total
# of Wells Drilled:			290			289			288			287			287			286	
of Wells in Production:			1826			2116			2405			2693			2980			3267	
Production Traffic:	PM_{10}	14.16	14.16	62.01	16.41	16.41	71.86	18.65	18.65	81.67	20.88	20.88	91.45	23.11	23.11	101.20	25.33	25.33	110.95
	$PM_{2.5}$	2.17	2.17	9.51	2.52	2.52	11.02	2.86	2.86	12.52	3.20	3.20	14.02	3.54	3.54	15.52	3.88	3.88	17.01
Gathering System Maintenance Traffic:	PM_{10}	14.16	14.16	62.01	16.41	16.41	71.86	18.65	18.65	81.67	20.88	20.88	91.45	23.11	23.11	101.20	25.33	25.33	110.95
	$PM_{2.5}$	2.17	2.17	9.51	2.52	2.52	11.02	2.86	2.86	12.52	3.20	3.20	14.02	3.54	3.54	15.52	3.88	3.88	17.01
Liquids Haul Truck Gathering Traffic:	PM_{10}	6.50	6.50	28.47	6.65	6.65	29.12	6.47	6.47	28.35	6.16	6.16	26.98	5.88	5.88	25.76	5.66	5.66	24.80
	$PM_{2.5}$	1.00	1.00	4.37	1.02	1.02	4.46	0.99	0.99	4.35	0.94	0.94	4.14	0.90	0.90	3.95	0.87	0.87	3.80
Production Haul Truck Tailpipe:	CO	0.62	0.62	2.73	0.64	0.64	2.79	0.62	0.62	2.71	0.59	0.59	2.58	0.56	0.56	2.47	0.54	0.54	2.37
	NO_x	0.48	0.48	2.12	0.49	0.49	2.16	0.48	0.48	2.11	0.46	0.46	2.00	0.44	0.44	1.91	0.42	0.42	1.84
	SO_2	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03
	VOC	0.24	0.24	1.05	0.25	0.25	1.08	0.24	0.24	1.05	0.23	0.23	1.00	0.22	0.22	0.95	0.21	0.21	0.92
Production Wind Erosion:	PM_{10}	104.07	104.07	455.81	113.22	113.22	495.92	120.77	120.77	528.97	127.57	127.57	558.77	135.13	135.13	591.88	142.39	142.39	623.65
	$PM_{2.5}$	41.63	41.63	182.32	45.29	45.29	198.37	48.31	48.31	211.59	51.03	51.03	223.51	54.05	54.05	236.75	56.95	56.95	249.46
Separator/Indirect Line Heaters:	$PM_{10/2.5}$	1.04	3.64	10.26	1.21	4.22	11.89	1.37	4.80	13.51	1.54	5.37	15.13	1.70	5.95	16.74	1.86	6.52	18.35
	SO_2	0.08	0.29	0.81	0.10	0.33	0.94	0.11	0.38	1.07	0.12	0.42	1.19	0.13	0.47	1.32	0.15	0.51	1.45
	NO_x	13.70	47.93	134.96	15.87	55.55	156.40	18.04	63.13	177.76	20.20	70.69	199.05	22.35	78.23	220.26	24.50	85.76	241.47
	CO	2.88	10.07	28.34	3.33	11.66	32.84	3.79	13.26	37.33	4.24	14.85	41.80	4.69	16.43	46.25	5.15	18.01	50.71
	VOC	0.75	2.64	7.42	0.87	3.05	8.60	0.99	3.47	9.78	1.11	3.89	10.95	1.23	4.30	12.11	1.35	4.72	13.28
Dehy Reboiler Heaters:	$PM_{10/2.5}$	0.12	0.41	1.16	0.14	0.48	1.35	0.16	0.54	1.53	0.17	0.61	1.71	0.19	0.67	1.90	0.21	0.74	2.08
	SO_2	0.01	0.03	0.09	0.01	0.04	0.11	0.01	0.04	0.12	0.01	0.05	0.14	0.02	0.05	0.15	0.02	0.06	0.16
	NO_x	1.55	5.43	15.30	1.80	6.30	17.73	2.04	7.15	20.15	2.29	8.01	22.56	2.53	8.87	24.96	2.78	9.72	27.37
	CO	0.33	1.14	3.21	0.38	1.32	3.72	0.43	1.50	4.23	0.48	1.68	4.74	0.53	1.86	5.24	0.58	2.04	5.75
	VOC	0.09	0.30	0.84	0.10	0.35	0.97	0.11	0.39	1.11	0.13	0.44	1.24	0.14	0.49	1.37	0.15	0.53	1.51
Dehy Flashing Emissions:	VOC	251.60	251.60	1102.01	265.40	265.40	1162.44	277.61	277.61	1215.95	288.45	288.45	1263.40	298.11	298.11	1305.73	307.05	307.05	1344.87
	Total HAPs	170.83	170.83	748.21	180.19	180.19	789.24	188.49	188.49	825.58	195.84	195.84	857.79	202.41	202.41	886.53	208.47	208.47	913.11
	Benzene	28.40	28.40	124.39	29.96	29.96	131.21	31.34	31.34	137.25	32.56	32.56	142.61	33.65	33.65	147.39	34.66	34.66	151.81
	Toluene	76.79	76.79	336.32	81.00	81.00	354.76	84.72	84.72	371.09	88.03	88.03	385.58	90.98	90.98	398.49	93.71	93.71	410.44
	Ethylbenzene	3.65	3.65	15.99	3.85	3.85	16.87	4.03	4.03	17.64	4.19	4.19	18.33	4.33	4.33	18.95	4.46	4.46	19.51
	Xylene	59.57	59.57	260.90	62.83	62.83	275.21	65.73	65.73	287.88	68.29	68.29	299.12	70.58	70.58	309.14	72.69	72.69	318.40
	n-Hexane	2.14	2.14	9.36	2.25	2.25	9.87	2.36	2.36	10.33	2.45	2.45	10.73	2.53	2.53	11.09	2.61	2.61	11.42
Fugitive HAPs and VOCs:	VOC	25.39	25.39	111.22	27.09	27.09	118.65	27.76	27.76	121.58	28.53	28.53	124.96	29.09	29.09	127.43	29.71	29.71	130.13
	Total HAPs	0.57	0.57	2.50	0.61	0.61	2.67	0.62	0.62	2.73	0.64	0.64	2.81	0.65	0.65	2.86	0.67	0.67	2.93
	Benzene	0.09	0.09	0.42	0.10	0.10	0.44	0.10	0.10	0.45	0.11	0.11	0.47	0.11	0.11	0.48	0.11	0.11	0.49
	Toluene	0.17	0.17	0.73	0.18	0.18	0.78	0.18	0.18	0.80	0.19	0.19	0.82	0.19	0.19	0.83	0.19	0.19	0.85
	Ethylbenzene	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03
	Xylene	0.06	0.06	0.28	0.07	0.07	0.30	0.07	0.07	0.31	0.07	0.07	0.32	0.07	0.07	0.33	0.08	0.08	0.33
	n-Hexane	0.24	0.24	1.05	0.25	0.25	1.12	0.26	0.26	1.14	0.27	0.27	1.18	0.27	0.27	1.20	0.28	0.28	1.22

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2011			2012			2013			2014			2015			2016		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Condensate Storage[1]:	VOC	29.60	29.60	129.66	31.23	31.23	136.77	32.66	32.66	143.06	33.94	33.94	148.65	35.07	35.07	153.63	36.13	36.13	158.23
	Total HAPs	1.46	1.46	6.41	1.54	1.54	6.76	1.61	1.61	7.07	1.68	1.68	7.34	1.73	1.73	7.59	1.79	1.79	7.82
	Benzene	0.07	0.07	0.31	0.07	0.07	0.32	0.08	0.08	0.34	0.08	0.08	0.35	0.08	0.08	0.36	0.09	0.09	0.37
	Toluene	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02
	Ethylbenzene	0.04	0.04	0.18	0.04	0.04	0.19	0.05	0.05	0.20	0.05	0.05	0.21	0.05	0.05	0.21	0.05	0.05	0.22
	Xylene	0.05	0.05	0.23	0.06	0.06	0.24	0.06	0.06	0.26	0.06	0.06	0.27	0.06	0.06	0.27	0.06	0.06	0.28
	n-Hexane	1.30	1.30	5.67	1.37	1.37	5.98	1.43	1.43	6.26	1.48	1.48	6.50	1.53	1.53	6.72	1.58	1.58	6.92
	NOx	1.49	1.49	6.51	1.52	1.52	6.67	1.57	1.57	6.86	1.60	1.60	6.99	1.63	1.63	7.14	1.66	1.66	7.29
	CO	8.09	8.09	35.43	8.29	8.29	36.31	8.52	8.52	37.31	8.69	8.69	38.05	8.87	8.87	38.86	9.06	9.06	39.67
Proposed Compression:	NOx	383.22	383.22	1678.52	383.22	383.22	1678.52	383.22	383.22	1678.52	383.22	383.22	1678.52	390.06	390.06	1708.45	390.06	390.06	1708.45
	CO	278.23	278.23	1218.65	278.23	278.23	1218.65	278.23	278.23	1218.65	278.23	278.23	1218.65	285.07	285.07	1248.59	285.07	285.07	1248.59
	VOC	304.14	304.14	1332.13	304.14	304.14	1332.13	304.14	304.14	1332.13	304.14	304.14	1332.13	304.55	304.55	1333.92	304.55	304.55	1333.92
	PM10	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04
	PM2.5	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.04	0.01	0.01	0.04
	SO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Formaldehyde	25.85	25.85	113.22	25.85	25.85	113.22	25.85	25.85	113.22	25.85	25.85	113.22	26.33	26.33	115.32	26.33	26.33	115.32
Opal and Granger Production Emissions:	NOx:	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50
	CO:	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00
	VOCs:	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50
	SO2:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM10:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Benzene:	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31
	Toluene:	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10
	Ethylbenzene:	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00
	Xylene:	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10
	n-Hexane:	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70
	Formaldehyde:	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50
	Total HAPs:	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70
TOTAL PRODUCTION EMISSIONS:	**NOx**	674.53	712.64	3037.91	677.00	721.17	3061.98	679.44	729.64	3085.89	681.85	738.07	3109.62	691.10	753.30	3163.23	693.51	761.71	3186.92
	CO	569.14	577.14	2510.36	569.86	579.14	2516.31	570.58	581.13	2522.24	571.23	583.03	2527.82	578.72	591.78	2563.41	579.39	593.71	2569.08
	VOC	757.59	759.69	3322.83	774.84	777.27	3399.14	789.29	792.05	3463.15	802.29	805.39	3520.82	814.19	817.61	3573.66	824.92	828.67	3621.36
	PM10	125.89	128.79	557.75	137.63	140.98	610.16	147.42	151.24	654.07	156.33	160.60	694.08	166.02	170.75	737.51	175.46	180.64	779.87
	PM2.5	45.96	48.86	207.65	50.17	53.53	227.11	53.69	57.51	243.53	56.89	61.16	258.54	60.40	65.13	274.89	63.79	68.97	290.75
	SO2	0.10	0.33	0.93	0.11	0.38	1.08	0.13	0.43	1.22	0.14	0.48	1.36	0.16	0.53	1.50	0.17	0.58	1.64
	Formaldehyde	41.26	41.26	180.72	41.26	41.26	180.72	41.26	41.26	180.72	41.26	41.26	180.72	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	32.52	32.52	142.43	34.08	34.08	149.29	35.47	35.47	155.36	36.70	36.70	160.74	37.79	37.79	165.54	38.81	38.81	169.98
	Toluene	79.03	79.03	346.16	83.25	83.25	364.65	86.99	86.99	381.01	90.30	90.30	395.51	93.25	93.25	408.45	95.98	95.98	420.41
	Ethylbenzene	3.93	3.93	17.20	4.13	4.13	18.09	4.31	4.31	18.87	4.47	4.47	19.57	4.61	4.61	20.19	4.74	4.74	20.77
	Xylene	60.62	60.62	265.52	63.89	63.89	279.86	66.79	66.79	292.55	69.36	69.36	303.80	71.65	71.65	313.84	73.77	73.77	323.12
	n-Hexane	6.34	6.34	27.78	6.55	6.55	28.67	6.72	6.72	29.43	6.87	6.87	30.11	7.01	7.01	30.71	7.14	7.14	31.27
	Total HAPs	223.70	223.70	979.81	233.17	233.17	1021.29	241.54	241.54	1057.93	248.96	248.96	1090.45	256.06	256.06	1121.54	262.18	262.18	1148.36

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2017 (lb/hr) Summer	2017 (lb/hr) Winter	2017 (tpy) Total	2018 (lb/hr) Summer	2018 (lb/hr) Winter	2018 (tpy) Total	2019 (lb/hr) Summer	2019 (lb/hr) Winter	2019 (tpy) Total	2020 (lb/hr) Summer	2020 (lb/hr) Winter	2020 (tpy) Total	2021 (lb/hr) Summer	2021 (lb/hr) Winter	2021 (tpy) Total	2022 (lb/hr) Summer	2022 (lb/hr) Winter	2022 (tpy) Total
# of Wells Drilled:			282			279			213			187			177			143	
of Wells in Production:			3553			3835			4114			4327			4514			4691	
Production Traffic:	PM_{10}	27.55	27.55	120.66	29.73	29.73	130.24	31.90	31.90	139.71	33.55	33.55	146.95	35.00	35.00	153.30	36.37	36.37	159.31
	$PM_{2.5}$	4.22	4.22	18.50	4.56	4.56	19.97	4.89	4.89	21.42	5.14	5.14	22.53	5.37	5.37	23.51	5.58	5.58	24.43
Gathering System Maintenance Traffic:	PM_{10}	27.55	27.55	120.66	29.73	29.73	130.24	31.90	31.90	139.71	33.55	33.55	146.95	35.00	35.00	153.30	36.37	36.37	159.31
	$PM_{2.5}$	4.22	4.22	18.50	4.56	4.56	19.97	4.89	4.89	21.42	5.14	5.14	22.53	5.37	5.37	23.51	5.58	5.58	24.43
Liquids Haul Truck Gathering Traffic:	PM_{10}	5.64	5.64	24.71	5.54	5.54	24.26	4.85	4.85	21.26	4.18	4.18	18.29	3.74	3.74	16.37	3.35	3.35	14.67
	$PM_{2.5}$	0.86	0.86	3.79	0.85	0.85	3.72	0.74	0.74	3.26	0.64	0.64	2.80	0.57	0.57	2.51	0.51	0.51	2.25
Production Haul Truck Tailpipe:	CO	0.54	0.54	2.37	0.53	0.53	2.32	0.46	0.46	2.04	0.40	0.40	1.75	0.36	0.36	1.57	0.32	0.32	1.40
	NO_x	0.42	0.42	1.84	0.41	0.41	1.80	0.36	0.36	1.58	0.31	0.31	1.36	0.28	0.28	1.22	0.25	0.25	1.09
	SO_2	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02
	VOC	0.21	0.21	0.91	0.20	0.20	0.90	0.18	0.18	0.79	0.15	0.15	0.68	0.14	0.14	0.61	0.12	0.12	0.54
Production Wind Erosion:	PM_{10}	149.88	149.88	656.49	156.54	156.54	685.66	161.40	161.40	706.91	165.55	165.55	725.12	168.35	168.35	737.37	170.90	170.90	748.55
	$PM_{2.5}$	59.95	59.95	262.60	62.62	62.62	274.27	64.56	64.56	282.76	66.22	66.22	290.05	67.34	67.34	294.95	68.36	68.36	299.42
Separator/Indirect Line Heaters:	$PM_{10/2.5}$	2.03	7.09	19.96	2.19	7.65	21.54	2.34	8.21	23.11	2.47	8.63	24.31	2.57	9.01	25.36	2.67	9.36	26.35
	SO_2	0.16	0.56	1.58	0.17	0.60	1.70	0.19	0.65	1.82	0.19	0.68	1.92	0.20	0.71	2.00	0.21	0.74	2.08
	NO_x	26.65	93.27	262.61	28.76	100.67	283.45	30.86	107.99	304.08	32.45	113.58	319.82	33.86	118.49	333.64	35.18	123.14	346.72
	CO	5.60	19.59	55.15	6.04	21.14	59.53	6.48	22.68	63.86	6.82	23.85	67.16	7.11	24.88	70.06	7.39	25.86	72.81
	VOC	1.47	5.13	14.44	1.58	5.54	15.59	1.70	5.94	16.72	1.78	6.25	17.59	1.86	6.52	18.35	1.94	6.77	19.07
Dehy Reboiler Heaters:	$PM_{10/2.5}$	0.23	0.80	2.26	0.25	0.87	2.44	0.27	0.93	2.62	0.28	0.98	2.75	0.29	1.02	2.87	0.30	1.06	2.99
	SO_2	0.02	0.06	0.18	0.02	0.07	0.19	0.02	0.07	0.21	0.02	0.08	0.22	0.02	0.08	0.23	0.02	0.08	0.24
	NO_x	3.02	10.57	29.76	3.26	11.41	32.12	3.50	12.24	34.46	3.68	12.87	36.25	3.84	13.43	37.81	3.99	13.96	39.30
	CO	0.63	2.22	6.25	0.68	2.40	6.75	0.73	2.57	7.24	0.77	2.70	7.61	0.81	2.82	7.94	0.84	2.93	8.25
	VOC	0.17	0.58	1.64	0.18	0.63	1.77	0.19	0.67	1.90	0.20	0.71	1.99	0.21	0.74	2.08	0.22	0.77	2.16
Dehy Flashing Emissions:	VOC	314.76	314.76	1378.66	320.34	320.34	1403.10	325.13	325.13	1424.06	302.87	302.87	1326.58	287.72	287.72	1260.22	277.88	277.88	1217.11
	Total HAPs	213.71	213.71	936.05	217.50	217.50	952.64	220.75	220.75	966.87	205.64	205.64	900.69	195.35	195.35	855.63	188.67	188.67	826.36
	Benzene	35.53	35.53	155.62	36.16	36.16	158.38	36.70	36.70	160.75	34.19	34.19	149.74	32.48	32.48	142.25	31.37	31.37	137.38
	Toluene	96.06	96.06	420.75	97.76	97.76	428.21	99.23	99.23	434.61	92.43	92.43	404.86	87.81	87.81	384.60	84.80	84.80	371.45
	Ethylbenzene	4.57	4.57	20.00	4.65	4.65	20.36	4.72	4.72	20.66	4.39	4.39	19.25	4.17	4.17	18.29	4.03	4.03	17.66
	Xylene	74.52	74.52	326.40	75.84	75.84	332.19	76.98	76.98	337.15	71.71	71.71	314.07	68.12	68.12	298.36	65.79	65.79	288.15
	n-Hexane	2.67	2.67	11.71	2.72	2.72	11.92	2.76	2.76	12.10	2.57	2.57	11.27	2.44	2.44	10.70	2.36	2.36	10.34
Fugitive HAPs and VOCs:	VOC	30.33	30.33	132.84	30.33	30.33	132.84	30.33	30.33	132.84	30.33	30.33	132.84	30.33	30.33	132.84	30.33	30.33	132.84
	Total HAPs	0.68	0.68	2.99	0.68	0.68	2.99	0.68	0.68	2.99	0.68	0.68	2.99	0.68	0.68	2.99	0.68	0.68	2.99
	Benzene	0.11	0.11	0.50	0.11	0.11	0.50	0.11	0.11	0.50	0.11	0.11	0.50	0.11	0.11	0.50	0.11	0.11	0.50
	Toluene	0.20	0.20	0.87	0.20	0.20	0.87	0.20	0.20	0.87	0.20	0.20	0.87	0.20	0.20	0.87	0.20	0.20	0.87
	Ethylbenzene	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03
	Xylene	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34
	n-Hexane	0.29	0.29	1.25	0.29	0.29	1.25	0.29	0.29	1.25	0.29	0.29	1.25	0.29	0.29	1.25	0.29	0.29	1.25

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2017			2018			2019			2020			2021			2022		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Condensate Storage[1]:	VOC	37.03	37.03	162.21	37.69	37.69	165.08	38.25	38.25	167.55	35.63	35.63	156.08	33.85	33.85	148.27	32.69	32.69	143.20
	Total HAPs	1.83	1.83	8.02	1.86	1.86	8.16	1.89	1.89	8.28	1.76	1.76	7.71	1.67	1.67	7.33	1.62	1.62	7.08
	Benzene	0.09	0.09	0.38	0.09	0.09	0.39	0.09	0.09	0.40	0.08	0.08	0.37	0.08	0.08	0.35	0.08	0.08	0.34
	Toluene	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.02
	Ethylbenzene	0.05	0.05	0.23	0.05	0.05	0.23	0.05	0.05	0.23	0.05	0.05	0.22	0.05	0.05	0.21	0.05	0.05	0.20
	Xylene	0.07	0.07	0.29	0.07	0.07	0.29	0.07	0.07	0.30	0.06	0.06	0.28	0.06	0.06	0.26	0.06	0.06	0.26
	n-Hexane	1.62	1.62	7.10	1.65	1.65	7.22	1.67	1.67	7.33	1.56	1.56	6.83	1.48	1.48	6.49	1.43	1.43	6.26
	NOx	1.69	1.69	7.39	1.69	1.69	7.39	1.69	1.69	7.39	1.69	1.69	7.39	1.69	1.69	7.39	1.69	1.69	7.39
	CO	9.18	9.18	40.20	9.18	9.18	40.20	9.18	9.18	40.20	9.18	9.18	40.20	9.18	9.18	40.20	9.18	9.18	40.20
Proposed Compression:	NOx	390.06	390.06	1708.45	390.06	390.06	1708.45	390.06	390.06	1708.45	390.06	390.06	1708.45	390.06	390.06	1708.45	390.06	390.06	1708.45
	CO	285.07	285.07	1248.59	285.07	285.07	1248.59	285.07	285.07	1248.59	285.07	285.07	1248.59	285.07	285.07	1248.59	285.07	285.07	1248.59
	VOC	304.55	304.55	1333.92	304.55	304.55	1333.92	304.55	304.55	1333.92	304.55	304.55	1333.92	304.55	304.55	1333.92	304.55	304.55	1333.92
	PM10	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04
	PM2.5	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04
	SO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Formaldehyde	26.33	26.33	115.32	26.33	26.33	115.32	26.33	26.33	115.32	26.33	26.33	115.32	26.33	26.33	115.32	26.33	26.33	115.32
Opal and Granger Production Emissions:	NOx:	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50
	CO:	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00
	VOCs:	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50
	SO2:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM10:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Benzene:	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31
	Toluene:	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10
	Ethylbenzene:	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00
	Xylene:	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10
	n-Hexane:	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70
	Formaldehyde:	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50
	Total HAPs:	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70
TOTAL PRODUCTION EMISSIONS:	**NOx**	695.92	770.09	3210.55	698.27	778.32	3233.72	700.54	786.42	3256.46	702.27	792.60	3273.77	703.80	798.03	3289.01	705.25	803.17	3303.45
	CO	580.01	595.59	2574.55	580.49	597.31	2579.38	580.92	598.95	2583.92	581.23	600.20	2587.32	581.51	601.30	2590.36	581.79	602.35	2593.26
	VOC	834.29	838.37	3663.13	840.65	845.05	3691.69	846.10	850.83	3716.27	821.30	826.27	3608.18	804.44	809.62	3534.79	793.50	798.89	3487.34
	PM10	185.34	190.97	824.12	194.26	200.34	864.18	200.77	207.29	893.65	206.03	212.90	917.46	209.96	217.12	935.31	213.61	221.05	951.90
	PM2.5	67.31	72.94	307.15	70.47	76.55	321.98	72.81	79.34	333.21	74.76	81.63	342.49	76.15	83.31	349.23	77.44	84.88	355.47
	SO2	0.18	0.63	1.78	0.20	0.68	1.92	0.21	0.73	2.05	0.22	0.76	2.16	0.23	0.80	2.25	0.24	0.83	2.33
	Formaldehyde	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	39.68	39.68	173.81	40.31	40.31	176.58	40.86	40.86	178.95	38.34	38.34	167.92	36.62	36.62	160.41	35.51	35.51	155.53
	Toluene	98.34	98.34	430.74	100.04	100.04	438.20	101.51	101.51	444.59	94.71	94.71	414.84	90.09	90.09	394.59	87.08	87.08	381.43
	Ethylbenzene	4.85	4.85	21.26	4.94	4.94	21.62	5.01	5.01	21.93	4.68	4.68	20.50	4.46	4.46	19.52	4.31	4.31	18.89
	Xylene	75.60	75.60	331.13	76.92	76.92	336.92	78.06	78.06	341.89	72.78	72.78	318.79	69.19	69.19	303.07	66.86	66.86	292.85
	n-Hexane	7.25	7.25	31.76	7.33	7.33	32.09	7.39	7.39	32.38	7.09	7.09	31.05	6.88	6.88	30.14	6.75	6.75	29.55
	Total HAPs	267.47	267.47	1171.52	271.28	271.28	1188.22	274.56	274.56	1202.56	259.34	259.34	1135.91	248.98	248.98	1090.55	242.25	242.25	1061.07

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2023 (lb/hr) Summer	2023 (lb/hr) Winter	2023 (tpy) Total	2024 (lb/hr) Summer	2024 (lb/hr) Winter	2024 (tpy) Total	2025 (lb/hr) Summer	2025 (lb/hr) Winter	2025 (tpy) Total	2026 (lb/hr) Summer	2026 (lb/hr) Winter	2026 (tpy) Total
# of Wells Drilled:			112			107			9			0	
of Wells in Production:			4834			4946			5053			5062	
Production Traffic:	PM_{10}	37.48	37.48	164.16	38.35	38.35	167.97	39.18	39.18	171.60	39.25	39.25	171.91
	$PM_{2.5}$	5.75	5.75	25.17	5.88	5.88	25.75	6.01	6.01	26.31	6.02	6.02	26.36
Gathering System Maintenance Traffic:	PM_{10}	37.48	37.48	164.16	38.35	38.35	167.97	39.18	39.18	171.60	39.25	39.25	171.91
	$PM_{2.5}$	5.75	5.75	25.17	5.88	5.88	25.75	6.01	6.01	26.31	6.02	6.02	26.36
Liquids Haul Truck Gathering Traffic:	PM_{10}	3.00	3.00	13.15	2.70	2.70	11.81	2.42	2.42	10.62	2.18	2.18	9.55
	$PM_{2.5}$	0.46	0.46	2.02	0.41	0.41	1.81	0.37	0.37	1.63	0.33	0.33	1.46
Production Haul Truck Tailpipe:	CO	0.29	0.29	1.26	0.26	0.26	1.13	0.23	0.23	1.02	0.21	0.21	0.91
	NO_x	0.22	0.22	0.98	0.20	0.20	0.88	0.18	0.18	0.79	0.16	0.16	0.71
	SO_2	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01
	VOC	0.11	0.11	0.49	0.10	0.10	0.44	0.09	0.09	0.39	0.08	0.08	0.35
Production Wind Erosion:	PM_{10}	173.46	173.46	759.74	174.48	174.48	764.21	174.48	174.48	764.21	174.48	174.48	764.21
	$PM_{2.5}$	69.38	69.38	303.89	69.79	69.79	305.68	69.79	69.79	305.68	69.79	69.79	305.68
Separator/Indirect Line Heaters:	$PM_{10/2.5}$	2.76	9.64	27.15	2.82	9.87	27.78	2.88	10.08	28.38	2.89	10.10	28.44
	SO_2	0.22	0.76	2.14	0.22	0.78	2.19	0.23	0.80	2.24	0.23	0.80	2.24
	NO_x	36.26	126.89	357.29	37.10	129.83	365.57	37.90	132.64	373.48	37.97	132.88	374.15
	CO	7.61	26.65	75.03	7.79	27.26	76.77	7.96	27.85	78.43	7.97	27.90	78.57
	VOC	1.99	6.98	19.65	2.04	7.14	20.11	2.08	7.30	20.54	2.09	7.31	20.58
Dehy Reboiler Heaters:	$PM_{10/2.5}$	0.31	1.09	3.08	0.32	1.12	3.15	0.33	1.14	3.22	0.33	1.14	3.22
	SO_2	0.02	0.09	0.24	0.03	0.09	0.25	0.03	0.09	0.25	0.03	0.09	0.25
	NO_x	4.11	14.38	40.49	4.20	14.71	41.43	4.30	15.03	42.33	4.30	15.06	42.40
	CO	0.86	3.02	8.50	0.88	3.09	8.70	0.90	3.16	8.89	0.90	3.16	8.90
	VOC	0.23	0.79	2.23	0.23	0.81	2.28	0.24	0.83	2.33	0.24	0.83	2.33
Dehy Flashing Emissions:	VOC	258.67	258.67	1132.97	237.39	237.39	1039.78	224.77	224.77	984.49	175.21	175.21	767.42
	Total HAPs	175.62	175.62	769.24	161.18	161.18	705.96	152.61	152.61	668.43	118.96	118.96	521.05
	Benzene	29.20	29.20	127.89	26.80	26.80	117.37	25.37	25.37	111.13	19.78	19.78	86.63
	Toluene	78.94	78.94	345.77	72.45	72.45	317.33	68.60	68.60	300.46	53.47	53.47	234.21
	Ethylbenzene	3.75	3.75	16.44	3.44	3.44	15.09	3.26	3.26	14.28	2.54	2.54	11.14
	Xylene	61.24	61.24	268.24	56.20	56.20	246.17	53.22	53.22	233.08	41.48	41.48	181.69
	n-Hexane	2.20	2.20	9.62	2.02	2.02	8.83	1.91	1.91	8.36	1.49	1.49	6.52
Fugitive HAPs and VOCs:	VOC	30.33	30.33	132.84	30.33	30.33	132.84	30.33	30.33	132.84	30.33	30.33	132.84
	Total HAPs	0.68	0.68	2.99	0.68	0.68	2.99	0.68	0.68	2.99	0.68	0.68	2.99
	Benzene	0.11	0.11	0.50	0.11	0.11	0.50	0.11	0.11	0.50	0.11	0.11	0.50
	Toluene	0.20	0.20	0.87	0.20	0.20	0.87	0.20	0.20	0.87	0.20	0.20	0.87
	Ethylbenzene	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03	0.01	0.01	0.03
	Xylene	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34	0.08	0.08	0.34
	n-Hexane	0.29	0.29	1.25	0.29	0.29	1.25	0.29	0.29	1.25	0.29	0.29	1.25

Table F.3.80
Proposed Action Emissions Inventory - Total Production Emissions by Year

		2023			2024			2025			2026		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Condensate Storage[1]:	VOC	30.43	30.43	133.30	27.93	27.93	122.34	26.45	26.45	115.83	20.61	20.61	90.29
	Total HAPs	1.50	1.50	6.59	1.38	1.38	6.04	1.31	1.31	5.72	1.02	1.02	4.46
	Benzene	0.07	0.07	0.32	0.07	0.07	0.29	0.06	0.06	0.27	0.05	0.05	0.21
	Toluene	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01
	Ethylbenzene	0.04	0.04	0.19	0.04	0.04	0.17	0.04	0.04	0.16	0.03	0.03	0.13
	Xylene	0.05	0.05	0.24	0.05	0.05	0.22	0.05	0.05	0.21	0.04	0.04	0.16
	n-Hexane	1.33	1.33	5.83	1.22	1.22	5.35	1.16	1.16	5.07	0.90	0.90	3.95
	NOx	1.69	1.69	7.39	1.69	1.69	7.39	1.69	1.69	7.39	1.69	1.69	7.39
	CO	9.18	9.18	40.20	9.18	9.18	40.20	9.18	9.18	40.20	9.18	9.18	40.20
Proposed Compression:	NOx	390.06	390.06	1708.45	390.06	390.06	1708.45	390.06	390.06	1708.45	390.06	390.06	1708.45
	CO	285.07	285.07	1248.59	285.07	285.07	1248.59	285.07	285.07	1248.59	285.07	285.07	1248.59
	VOC	304.55	304.55	1333.92	304.55	304.55	1333.92	304.55	304.55	1333.92	304.55	304.55	1333.92
	PM10	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04
	PM2.5	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04	0.01	0.01	0.04
	SO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Formaldehyde	26.33	26.33	115.32	26.33	26.33	115.32	26.33	26.33	115.32	26.33	26.33	115.32
Opal and Granger Production Emissions:	NOx:	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50	274.09	274.09	1200.50
	CO:	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00	279.00	279.00	1222.00
	VOCs:	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50	145.78	145.78	638.50
	SO2:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM10:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Benzene:	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31	3.95	3.95	17.31
	Toluene:	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10	2.08	2.08	9.10
	Ethylbenzene:	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00
	Xylene:	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10	0.94	0.94	4.10
	n-Hexane:	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70	2.67	2.67	11.70
	Formaldehyde:	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50	15.41	15.41	67.50
	Total HAPs:	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70	25.27	25.27	110.70
TOTAL PRODUCTION EMISSIONS:	**NOx**	706.42	807.33	3315.11	707.33	810.58	3324.22	708.20	813.69	3332.94	708.26	813.93	3333.60
	CO	582.00	603.19	2595.58	582.17	603.85	2597.39	582.33	604.48	2599.13	582.32	604.52	2599.18
	VOC	772.09	777.64	3393.90	748.35	754.02	3290.19	734.28	740.08	3228.85	678.88	684.70	2986.24
	PM10	217.02	224.68	967.32	218.67	226.52	974.96	219.29	227.31	978.06	219.13	227.16	977.36
	PM2.5	78.67	86.34	361.35	79.23	87.08	364.22	79.39	87.40	365.26	79.36	87.40	365.20
	SO2	0.25	0.85	2.40	0.25	0.87	2.45	0.26	0.89	2.51	0.26	0.89	2.51
	Formaldehyde	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	33.34	33.34	146.01	30.93	30.93	135.46	29.50	29.50	129.21	23.89	23.89	104.65
	Toluene	81.22	81.22	355.75	74.73	74.73	327.31	70.88	70.88	310.44	55.75	55.75	244.19
	Ethylbenzene	4.03	4.03	17.66	3.72	3.72	16.29	3.53	3.53	15.48	2.81	2.81	12.29
	Xylene	62.31	62.31	272.91	57.27	57.27	250.83	54.28	54.28	237.73	42.53	42.53	186.29
	n-Hexane	6.49	6.49	28.41	6.20	6.20	27.13	6.02	6.02	26.38	5.35	5.35	23.42
	Total HAPs	229.12	229.12	1003.56	214.58	214.58	939.84	205.95	205.95	902.05	172.07	172.07	753.65

Table F.3.81
Proposed Action Emissions Inventory - Total Emissions by Year

		2006			2007			2008			2009			2010		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
TOTAL CONSTRUCTION EMISSIONS:	CO	679.63	616.61	2487.57	791.17	595.62	2930.43	920.41	771.73	3050.73	973.22	823.05	2735.11	606.91	476.44	1877.32
	NO_x	1089.91	1051.98	4342.48	1050.27	905.83	4113.66	1156.69	1054.78	3874.29	1212.59	1110.60	3791.99	1015.10	927.86	3306.80
	SO_2	13.80	12.88	53.76	16.91	13.96	62.18	18.81	16.60	68.00	19.65	17.42	70.14	16.93	15.00	37.02
	VOCs	82.35	75.42	304.10	94.72	72.23	352.24	109.57	92.76	365.63	115.78	98.84	328.21	72.37	57.70	226.24
	PM_{10}	160.07	92.48	479.46	342.64	102.78	756.10	621.89	118.07	1071.10	218.15	122.21	619.70	183.61	103.49	544.93
	$PM_{2.5}$	65.40	49.28	224.24	110.18	46.31	290.52	184.13	55.07	363.69	86.54	57.95	242.42	66.38	42.17	196.01
TOTAL PRODUCTION EMISSIONS:	NOx	318.89	328.45	1417.67	391.31	405.15	1744.23	395.70	415.13	1775.71	398.99	424.67	1803.82	401.66	433.70	1829.44
	CO	283.33	285.34	1245.40	362.79	365.69	1595.38	371.19	375.27	1634.74	328.32	333.72	1449.86	329.35	336.08	1457.29
	VOC	427.28	427.81	1872.64	518.09	518.85	2270.90	612.29	613.36	2684.16	462.54	463.96	2029.03	491.85	493.61	2158.16
	PM10	80.00	80.73	352.01	101.56	102.61	447.14	128.73	130.21	567.09	99.68	101.64	440.89	113.64	116.07	503.06
	PM2.5	26.22	26.95	116.43	30.91	31.96	137.68	38.34	39.82	171.18	36.63	38.58	164.70	41.62	44.05	187.62
	SO2	0.04	0.10	0.32	0.07	0.15	0.49	0.10	0.21	0.68	0.07	0.22	0.63	0.08	0.28	0.79
	Formaldehyde	17.91	17.91	78.43	25.56	25.56	111.93	25.56	25.56	111.93	26.51	26.51	116.12	26.51	26.51	116.12
	Benzene	15.58	15.58	68.22	18.67	18.67	81.77	23.53	23.53	103.07	27.02	27.02	118.36	29.79	29.79	130.47
	Toluene	34.84	34.84	152.60	42.84	42.84	187.65	55.67	55.67	243.85	66.27	66.27	290.28	73.73	73.73	322.92
	Ethylbenzene	2.03	2.03	8.89	2.45	2.45	10.73	3.13	3.13	13.71	3.37	3.37	14.78	3.73	3.73	16.35
	Xylene	26.99	26.99	118.23	33.26	33.26	145.66	43.29	43.29	189.60	51.19	51.19	224.21	56.97	56.97	249.54
	n-Hexane	8.83	8.83	38.69	10.48	10.48	45.90	13.02	13.02	57.02	5.20	5.20	22.80	5.56	5.56	24.33
	Total HAPs	106.18	106.18	465.05	133.25	133.25	583.65	164.20	164.20	719.17	179.58	179.58	786.55	196.29	196.29	859.73
TOTAL PROPOSED ACTION EMISSIONS:	**NOx**	1408.80	1380.43	5760.15	1441.58	1310.98	5857.89	1552.38	1469.91	5650.00	1611.59	1535.27	5595.81	1416.76	1361.57	5136.23
	CO	962.97	901.95	3732.98	1153.96	961.32	4525.81	1291.59	1146.99	4685.46	1301.55	1156.77	4184.97	936.26	812.52	3334.61
	VOC	509.63	503.23	2176.75	612.81	591.08	2623.14	721.86	706.12	3049.80	578.33	562.80	2357.24	564.22	551.31	2384.40
	PM10	240.08	173.21	831.47	444.20	205.39	1203.24	750.63	248.28	1638.20	317.83	223.85	1060.59	297.25	219.56	1047.99
	PM2.5	91.62	76.23	340.68	141.09	78.27	428.20	222.47	94.89	534.87	123.16	96.53	407.13	108.00	86.23	383.63
	SO2	13.84	12.98	54.08	16.98	14.12	62.67	18.90	16.81	68.67	19.72	17.64	70.77	17.02	15.28	37.80
	Formaldehyde	17.91	17.91	78.43	25.56	25.56	111.93	25.56	25.56	111.93	26.51	26.51	116.12	26.51	26.51	116.12
	Benzene	15.58	15.58	68.22	18.67	18.67	81.77	23.53	23.53	103.07	27.02	27.02	118.36	29.79	29.79	130.47
	Toluene	34.84	34.84	152.60	42.84	42.84	187.65	55.67	55.67	243.85	66.27	66.27	290.28	73.73	73.73	322.92
	Ethylbenzene	2.03	2.03	8.89	2.45	2.45	10.73	3.13	3.13	13.71	3.37	3.37	14.78	3.73	3.73	16.35
	Xylene	26.99	26.99	118.23	33.26	33.26	145.66	43.29	43.29	189.60	51.19	51.19	224.21	56.97	56.97	249.54
	n-Hexane	8.83	8.83	38.69	10.48	10.48	45.90	13.02	13.02	57.02	5.20	5.20	22.80	5.56	5.56	24.33
	Total HAPs	106.18	106.18	465.05	133.25	133.25	583.65	164.20	164.20	719.17	179.58	179.58	786.55	196.29	196.29	859.73

Table F.3.81
Proposed Action Emissions Inventory - Total Emissions by Year

		2011 (tpy) Total	(lb/hr) Summer	2012 (lb/hr) Winter	(tpy) Total	(lb/hr) Summer	2013 (lb/hr) Winter	(tpy) Total	(lb/hr) Summer	2014 (lb/hr) Winter	(tpy) Total	(lb/hr) Summer	2015 (lb/hr) Winter	(tpy) Total
TOTAL CONSTRUCTION EMISSIONS:	CO	1971.43	589.61	476.06	1847.03	574.99	475.87	1825.35	591.15	475.67	1837.37	585.08	475.67	1562.89
	NO_x	3364.55	1000.75	927.23	3244.93	988.72	926.92	3208.68	1001.68	926.60	3199.80	996.76	926.60	2702.52
	SO_2	18.73	5.33	3.66	16.87	5.10	3.65	16.58	5.34	3.64	16.80	5.25	3.64	16.08
	VOCs	237.24	70.32	57.64	222.52	68.60	57.62	219.90	70.49	57.59	221.24	69.78	57.59	189.41
	PM_{10}	894.96	156.66	102.97	507.99	153.41	102.71	499.71	157.21	102.45	505.96	155.83	102.45	486.89
	$PM_{2.5}$	287.38	60.33	42.08	185.99	58.49	42.03	181.89	60.54	41.98	184.76	59.77	41.98	167.17
TOTAL PRODUCTION EMISSIONS:	NOx	3037.91	677.00	721.17	3061.98	679.44	729.64	3085.89	681.85	738.07	3109.62	691.10	753.30	3163.23
	CO	2510.36	569.86	579.14	2516.31	570.58	581.13	2522.24	571.23	583.03	2527.82	578.72	591.78	2563.41
	VOC	3322.83	774.84	777.27	3399.14	789.29	792.05	3463.15	802.29	805.39	3520.82	814.19	817.61	3573.66
	PM10	557.75	137.63	140.98	610.16	147.42	151.24	654.07	156.33	160.60	694.08	166.02	170.75	737.51
	PM2.5	207.65	50.17	53.53	227.11	53.69	57.51	243.53	56.89	61.16	258.54	60.40	65.13	274.89
	SO2	0.93	0.11	0.38	1.08	0.13	0.43	1.22	0.14	0.48	1.36	0.16	0.53	1.50
	Formaldehyde	180.72	41.26	41.26	180.72	41.26	41.26	180.72	41.26	41.26	180.72	41.74	41.74	182.82
	Benzene	142.43	34.08	34.08	149.29	35.47	35.47	155.36	36.70	36.70	160.74	37.79	37.79	165.54
	Toluene	346.16	83.25	83.25	364.65	86.99	86.99	381.01	90.30	90.30	395.51	93.25	93.25	408.45
	Ethylbenzene	17.20	4.13	4.13	18.09	4.31	4.31	18.87	4.47	4.47	19.57	4.61	4.61	20.19
	Xylene	265.52	63.89	63.89	279.86	66.79	66.79	292.55	69.36	69.36	303.80	71.65	71.65	313.84
	n-Hexane	27.78	6.55	6.55	28.67	6.72	6.72	29.43	6.87	6.87	30.11	7.01	7.01	30.71
	Total HAPs	979.81	233.17	233.17	1021.29	241.54	241.54	1057.93	248.96	248.96	1090.45	256.06	256.06	1121.54
TOTAL PROPOSED ACTION EMISSIONS:	**NOx**	6402.46	1677.75	1648.40	6306.91	1668.16	1656.56	6294.57	1683.53	1664.67	6309.43	1687.85	1679.91	5865.75
	CO	4481.79	1159.48	1055.20	4363.34	1145.57	1056.99	4347.59	1162.38	1058.70	4365.20	1163.81	1067.46	4126.30
	VOC	3560.07	845.17	834.92	3621.66	857.89	849.67	3683.05	872.79	862.97	3742.05	883.97	875.20	3763.07
	PM10	1452.71	294.29	243.96	1118.15	300.84	253.95	1153.78	313.54	263.06	1200.04	321.85	273.20	1224.41
	PM2.5	495.02	110.51	95.61	413.11	112.19	99.54	425.42	117.43	103.15	443.30	120.17	107.11	442.06
	SO2	19.67	5.44	4.04	17.95	5.23	4.08	17.80	5.48	4.12	18.16	5.41	4.17	17.58
	Formaldehyde	180.72	41.26	41.26	180.72	41.26	41.26	180.72	41.26	41.26	180.72	41.74	41.74	182.82
	Benzene	142.43	34.08	34.08	149.29	35.47	35.47	155.36	36.70	36.70	160.74	37.79	37.79	165.54
	Toluene	346.16	83.25	83.25	364.65	86.99	86.99	381.01	90.30	90.30	395.51	93.25	93.25	408.45
	Ethylbenzene	17.20	4.13	4.13	18.09	4.31	4.31	18.87	4.47	4.47	19.57	4.61	4.61	20.19
	Xylene	265.52	63.89	63.89	279.86	66.79	66.79	292.55	69.36	69.36	303.80	71.65	71.65	313.84
	n-Hexane	27.78	6.55	6.55	28.67	6.72	6.72	29.43	6.87	6.87	30.11	7.01	7.01	30.71
	Total HAPs	979.81	233.17	233.17	1021.29	241.54	241.54	1057.93	248.96	248.96	1090.45	256.06	256.06	1121.54

Table F.3.81
Proposed Action Emissions Inventory - Total Emissions by Year

		2016			2017			2018			2019			2021		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
TOTAL CONSTRUCTION EMISSIONS:	CO	589.06	475.48	1562.65	567.85	465.12	1531.12	533.60	454.95	1489.91	431.15	363.54	1187.65	313.04	272.00	988.92
	NO_x	999.82	926.29	2687.50	973.26	908.11	2633.11	936.26	890.25	2585.68	771.12	730.75	2063.90	498.22	475.68	1670.97
	SO_2	5.31	3.63	16.10	5.08	3.57	15.72	4.66	3.52	15.16	3.72	2.73	11.82	2.78	2.19	9.58
	VOCs	70.24	57.56	189.31	67.75	56.33	185.47	63.73	55.12	180.55	51.52	44.10	143.77	37.17	32.74	119.26
	PM_{10}	157.20	102.19	487.98	148.01	100.58	471.19	132.07	99.21	445.21	104.14	77.35	346.44	76.18	60.34	276.43
	$PM_{2.5}$	60.37	41.94	167.54	57.35	41.16	161.86	51.97	40.43	153.00	42.21	32.47	121.43	28.79	23.04	96.03
TOTAL PRODUCTION EMISSIONS:	NOx	693.51	761.71	3186.92	695.92	770.09	3210.55	698.27	778.32	3233.72	700.54	786.42	3256.46	703.80	798.03	3289.01
	CO	579.39	593.71	2569.08	580.01	595.59	2574.55	580.49	597.31	2579.38	580.92	598.95	2583.92	581.51	601.30	2590.36
	VOC	824.92	828.67	3621.36	834.29	838.37	3663.13	840.65	845.05	3691.69	846.10	850.83	3716.27	804.44	809.62	3534.79
	PM10	175.46	180.64	779.87	185.34	190.97	824.12	194.26	200.34	864.18	200.77	207.29	893.65	209.96	217.12	935.31
	PM2.5	63.79	68.97	290.75	67.31	72.94	307.15	70.47	76.55	321.98	72.81	79.34	333.21	76.15	83.31	349.23
	SO2	0.17	0.58	1.64	0.18	0.63	1.78	0.20	0.68	1.92	0.21	0.73	2.05	0.23	0.80	2.25
	Formaldehyde	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	38.81	38.81	169.98	39.68	39.68	173.81	40.31	40.31	176.58	40.86	40.86	178.95	36.62	36.62	160.41
	Toluene	95.98	95.98	420.41	98.34	98.34	430.74	100.04	100.04	438.20	101.51	101.51	444.59	90.09	90.09	394.59
	Ethylbenzene	4.74	4.74	20.77	4.85	4.85	21.26	4.94	4.94	21.62	5.01	5.01	21.93	4.46	4.46	19.52
	Xylene	73.77	73.77	323.12	75.60	75.60	331.13	76.92	76.92	336.92	78.06	78.06	341.89	69.19	69.19	303.07
	n-Hexane	7.14	7.14	31.27	7.25	7.25	31.76	7.33	7.33	32.09	7.39	7.39	32.38	6.88	6.88	30.14
	Total HAPs	262.18	262.18	1148.36	267.47	267.47	1171.52	271.28	271.28	1188.22	274.56	274.56	1202.56	248.98	248.98	1090.55
TOTAL PROPOSED ACTION EMISSIONS:	**NOx**	1693.33	1688.00	5874.42	1669.18	1678.20	5843.66	1634.52	1668.57	5819.40	1471.67	1517.18	5320.36	1202.02	1273.71	4959.98
	CO	1168.45	1069.19	4131.73	1147.86	1060.70	4105.68	1114.09	1052.25	4069.30	1012.07	962.50	3771.57	894.55	873.30	3579.28
	VOC	895.16	886.23	3810.68	902.04	894.70	3848.60	904.38	900.18	3872.24	897.63	894.93	3860.04	841.61	842.36	3654.04
	PM10	332.66	282.84	1267.84	333.35	291.55	1295.31	326.33	299.56	1309.39	304.91	284.64	1240.09	286.14	277.46	1211.74
	PM2.5	124.16	110.91	458.28	124.66	114.10	469.00	122.44	116.98	474.97	115.03	111.81	454.65	104.94	106.36	445.27
	SO2	5.48	4.21	17.74	5.26	4.20	17.50	4.86	4.20	17.08	3.93	3.46	13.87	3.01	2.98	11.83
	Formaldehyde	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	38.81	38.81	169.98	39.68	39.68	173.81	40.31	40.31	176.58	40.86	40.86	178.95	36.62	36.62	160.41
	Toluene	95.98	95.98	420.41	98.34	98.34	430.74	100.04	100.04	438.20	101.51	101.51	444.59	90.09	90.09	394.59
	Ethylbenzene	4.74	4.74	20.77	4.85	4.85	21.26	4.94	4.94	21.62	5.01	5.01	21.93	4.46	4.46	19.52
	Xylene	73.77	73.77	323.12	75.60	75.60	331.13	76.92	76.92	336.92	78.06	78.06	341.89	69.19	69.19	303.07
	n-Hexane	7.14	7.14	31.27	7.25	7.25	31.76	7.33	7.33	32.09	7.39	7.39	32.38	6.88	6.88	30.14
	Total HAPs	262.18	262.18	1148.36	267.47	267.47	1171.52	271.28	271.28	1188.22	274.56	274.56	1202.56	248.98	248.98	1090.55

Table F.3.81
Proposed Action Emissions Inventory - Total Emissions by Year

		2022			2023			2024			2025			2026		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
TOTAL CONSTRUCTION EMISSIONS:	CO	259.04	217.47	823.54	207.82	192.30	644.59	159.55	161.23	585.25	27.92	28.23	50.40	0.00	0.00	0.00
	NO_x	405.40	380.37	1384.08	341.47	336.76	1101.96	275.39	283.39	1020.79	48.25	49.75	89.05	0.00	0.00	0.00
	SO_2	2.37	1.76	7.92	1.65	1.44	5.98	1.26	1.31	5.35	0.14	0.15	0.46	0.00	0.00	0.00
	VOCs	30.76	26.18	99.21	24.62	23.08	77.70	18.62	19.06	69.00	3.24	3.32	6.00	0.00	0.00	0.00
	PM_{10}	64.65	48.61	229.68	45.44	39.43	170.21	18.83	19.43	77.03	2.42	2.53	6.66	0.00	0.00	0.00
	$PM_{2.5}$	24.42	18.48	80.66	17.80	15.83	60.03	10.64	11.25	41.18	1.73	1.85	3.65	0.00	0.00	0.00
TOTAL PRODUCTION EMISSIONS:	NOx	705.25	803.17	3303.45	706.42	807.33	3315.11	707.33	810.58	3324.22	708.20	813.69	3332.94	708.26	813.93	3333.60
	CO	581.79	602.35	2593.26	582.00	603.19	2595.58	582.17	603.85	2597.39	582.33	604.48	2599.13	582.32	604.52	2599.18
	VOC	793.50	798.89	3487.34	772.09	777.64	3393.90	748.35	754.02	3290.19	734.28	740.08	3228.85	678.88	684.70	2986.24
	PM10	213.61	221.05	951.90	217.02	224.68	967.32	218.67	226.52	974.96	219.29	227.31	978.06	219.13	227.16	977.36
	PM2.5	77.44	84.88	355.47	78.67	86.34	361.35	79.23	87.08	364.22	79.39	87.40	365.26	79.36	87.40	365.20
	SO2	0.24	0.83	2.33	0.25	0.85	2.40	0.25	0.87	2.45	0.26	0.89	2.51	0.26	0.89	2.51
	Formaldehyde	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	35.51	35.51	155.53	33.34	33.34	146.01	30.93	30.93	135.46	29.50	29.50	129.21	23.89	23.89	104.65
	Toluene	87.08	87.08	381.43	81.22	81.22	355.75	74.73	74.73	327.31	70.88	70.88	310.44	55.75	55.75	244.19
	Ethylbenzene	4.31	4.31	18.89	4.03	4.03	17.66	3.72	3.72	16.29	3.53	3.53	15.48	2.81	2.81	12.29
	Xylene	66.86	66.86	292.85	62.31	62.31	272.91	57.27	57.27	250.83	54.28	54.28	237.73	42.53	42.53	186.29
	n-Hexane	6.75	6.75	29.55	6.49	6.49	28.41	6.20	6.20	27.13	6.02	6.02	26.38	5.35	5.35	23.42
	Total HAPs	242.25	242.25	1061.07	229.12	229.12	1003.56	214.58	214.58	939.84	205.95	205.95	902.05	172.07	172.07	753.65
TOTAL PROPOSED ACTION EMISSIONS:	**NOx**	1110.65	1183.55	4687.53	1047.89	1144.09	4417.06	982.72	1093.97	4345.01	756.46	863.44	3421.99	708.26	813.93	3333.60
	CO	840.83	819.82	3416.80	789.82	795.50	3240.17	741.72	765.08	3182.64	610.25	632.71	2649.53	582.32	604.52	2599.18
	VOC	824.26	825.07	3586.54	796.71	800.72	3471.59	766.97	773.09	3359.19	737.52	743.40	3234.84	678.88	684.70	2986.24
	PM10	278.25	269.67	1181.58	262.45	264.11	1137.53	237.50	245.95	1051.98	221.71	229.84	984.73	219.13	227.16	977.36
	PM2.5	101.86	103.36	436.13	96.46	102.16	421.38	89.87	98.33	405.40	81.12	89.25	368.91	79.36	87.40	365.20
	SO2	2.61	2.59	10.25	1.89	2.29	8.38	1.51	2.18	7.81	0.40	1.04	2.97	0.26	0.89	2.51
	Formaldehyde	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82	41.74	41.74	182.82
	Benzene	35.51	35.51	155.53	33.34	33.34	146.01	30.93	30.93	135.46	29.50	29.50	129.21	23.89	23.89	104.65
	Toluene	87.08	87.08	381.43	81.22	81.22	355.75	74.73	74.73	327.31	70.88	70.88	310.44	55.75	55.75	244.19
	Ethylbenzene	4.31	4.31	18.89	4.03	4.03	17.66	3.72	3.72	16.29	3.53	3.53	15.48	2.81	2.81	12.29
	Xylene	66.86	66.86	292.85	62.31	62.31	272.91	57.27	57.27	250.83	54.28	54.28	237.73	42.53	42.53	186.29
	n-Hexane	6.75	6.75	29.55	6.49	6.49	28.41	6.20	6.20	27.13	6.02	6.02	26.38	5.35	5.35	23.42
	Total HAPs	242.25	242.25	1061.07	229.12	229.12	1003.56	214.58	214.58	939.84	205.95	205.95	902.05	172.07	172.07	753.65

Table F.4.1
No Action Emissions Inventory - Pad, Road and Pipeline Disturbances by Year

Year	Pads (acres)	New Pads (number)	Expanded Pads (number)	Local Roads (miles)	Local Roads (acres)	Resource Roads (Miles)	Resource roads (acres)	Pipelines (miles)	Pipelines (acres)	Annual Total (acres)
Pre-ROD	332.05	56	--	--	--	108.3	652.3	12.14	60.15	1044.5
ROD through 2005	1808.02	266	--	--	--	176.52	912.98	134.18	804.81	3525.81
2006 [1]	295.50	26	43	5.20	23.45	5.98	27.93	13.00	78.00	424.88
2007	807.50	92	24	18.40	82.98	21.16	98.82	46.00	276.00	1265.30
2008	12.60	1	1	0.20	0.90	0.23	1.07	0.50	3.00	17.58
Total 2007-2008	**820.10**	**93**	**25**	**18.60**	**83.89**	**21.39**	**99.89**	**46.50**	**279.00**	**1282.88**

Table F.4.2
No Action Emissions Inventory - Well Pad Construction/Expansion - All Operators - Per Acre

Project: Pinedale Anticline SEIS
Scenario: All Scenerios
Activity: Well Pad Construction
Emissions: Fugitive Particulate Emissions from Well Pad Construction
Date: 11/30/2006

Well Pad Area (Expansion)	Construction Activity TSP Emission Factor[1]	Construction Activity Duration[2]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(acre)	(tons/acre-month)	(days/acre)	(hours/day)	(%)	(lb/acre)	(lb/acre)
1	1.2	2.1	12	50	15.12	3.99

[1] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations"; TSP = total suspended particulates.
[2] Construction Activity Duration taken from an average of durations provided by Shell, Ultra and Questar.
[3] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.4.3
No Action Emissions Inventory - Local Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Local Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration[3]	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[4]	$PM_{2.5}$ Emissions (controlled)[5]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.51	1.2	3.3	12	50	214.32	56.56

[1] Construction Area taken from average of current field activity of 4.51 acres/mile for Local Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.4.4
No Action Emissions Inventory - Resource Road Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: Resource Road Construction
Activity: Access Road Construction
Emissions: Fugitive Particulate Emissions from Access Road Construction
Date: 11/30/2006

Road Length	Resource Road Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]	$PM_{2.5}$ Emissions (controlled)[4]
(mi)	(acres)	(tons/acre-month)	(days/mi)	(hours/day)	(%)	(lb/mi)	(lb/mi)
1	4.67	1.2	3.3	12	50	221.92	58.56

[1] Construction Area taken from average of current field activity of 4.67 acres/mile for Resource Roads.

[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".

[3] Construction Activity Duration taken from the average of data provided by Shell, Ultra and Questar.

[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.4.5
No Action Emissions Inventory - Pipeline Construction - All Operators - Per Mile

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Pipeline Construction
Date: 11/30/2006

Pipeline Length (mi)	Pipeline Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration[3] (days/mi)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[4] (lb/mi)	$PM_{2.5}$ Emissions (controlled)[5] (lb/mi)
1	6.00	1.2	3.3	12	50	285.12	75.24

[1] Construction Area taken from average of current field activity of 6.00 acres/mile for pipelines.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.4.6
No Action Emissions Inventory - Sales Pipeline Construction

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Sales Pipeline Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Year of Proposed Construction	Construction Area[1] (acres)	Construction Activity TSP Emission Factor[2] (tons/acre-month)	Construction Activity Duration (days)	Construction Activity Duration (hours/day)	Emission Control Efficiency (%)	PM_{10} Emissions (controlled)[3] (lbs)	(tpy)	$PM_{2.5}$ Emissions (controlled)[4] (lbs)	(tpy)
QGM (2) Mesa Loop inside PAPA	2007	145.45	1.2	39.6	12	50	82,941	41.47	21,887	10.94
QGM Water Gathering System	2007	109.09	1.2	59.4	12	50	93,311	46.66	24,624	12.31
TEPPCO Mesa to Falcon inside PAPA	2011	155.15	1.2	52.8	12	50	117,964	58.98	31,129	15.56
						Total 2007:	176,253	88.13	46,511	23.26
						Total 2011:	117,964	58.98	31,129	15.56

[1] Acres of construction provided by operators.
[2] AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
[3] Construction Activity Duration assumed to be similar to road construction.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.4.7
No Action Emissions Inventory - Ancillary Facilities Construction

Project: Pinedale Anticline SEIS
Scenario: Other Construction Activities
Activity: Ancillary Facilities Construction
Emissions: Fugitive Particulate Emissions from Const. Activities
Date: 11/30/2006

Construction Activity	Year of Proposed Construction	Construction Area[1]	Construction Activity TSP Emission Factor[2]	Construction Activity Duration	Construction Activity Duration	Emission Control Efficiency	PM_{10} Emissions (controlled)[3]		$PM_{2.5}$ Emissions (controlled)[4]	
		(acres)	(tons/acre-month)	(days)	(hours/day)	(%)	(lbs)	(tpy)	(lbs)	(tpy)
Compressor Sites Expansion	2011	90.00	1.2	189	12	50	244,944	122.47	64,638	32.32
Central Gathering Facilities - QGM	2007	12.00	1.2	25.2	12	50	4,355	2.18	1,149	0.57
Water Trucking Facility - QGM	2007	7.00	1.2	14.7	12	50	1,482	0.74	391	0.20
Falcon Truck Unloading - QGM	2007	15.00	1.2	31.5	12	50	6,804	3.40	1,796	0.90
Expand Stbilizer Site - QGM	2007	5.00	1.2	10.5	12	50	756	0.38	200	0.10
						Total 2007:	13,396	6.70	3,535	1.77
						Total 2011:	244,944	122.47	64,638	32.32

1 Acres of construction provided by operators.
2 AP-42 (EPA 2004a), Section 13.2.3, "Heavy Construction Operations".
3 Construction Activity Duration assumed to be similar to road construction.
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 36% of the TSP is in the PM_{10} size range, monthly emissions converted to daily and hourly emissions based on 30-day month.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", Background Document. Assuming that 9.5% of the TSP is in the $PM_{2.5}$ size range, monthly emissions converted to daily and hourly emissions based on 30-day month.

Table F.4.8
No Action Emissions Inventory - Construction Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Well Pad, Resource Road, Pipeline Construction
Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor :	0.3733	lb/hr/100m^2	Based on AP-42 Chapter 13.2.5 (EPA 2004a), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.
Control Efficiency:	50	%	

Disturbed Area:

Well Pad Construction/Exp.:	1	acres	4,047.00	m^2
Access Road Construction:	1	acres	4,047.00	m^2
Pipeline Construction	1	acres	4,047.00	m^2

PM_{10} Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	# of Construction Hours Per Acre (hr)	PM_{10} Emissions (lb/hr)	$PM_{2.5}$ Emissions (lb/hr)	PM_{10} Emissions (tons/acre)	$PM_{2.5}$ Emissions (tons/acre)
Well Pad Construction:	0.3733	0.1493	40.47	50	25.2	7.55	3.02	0.10	0.04
Road Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01
Pipeline Construction	0.3733	0.1493	40.47	50	8.3	7.55	3.02	0.03	0.01

Table F.4.9
No Action Emissions Inventory - Well Pad Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight	Average Vehicle Speed	Silt Content[1]	Moisture Content[2]	Round Trips (RTs)	RT Distance	Vehicle Miles Traveled (VMT)[3]	Emission Control Efficiency	PM_{10} Emission Factor[4]	$PM_{2.5}$ Emission Factor[4]	PM_{10} Emissions[5] (controlled)	$PM_{2.5}$ Emissions[5] (controlled)
			(lb)	(mph)	(%)	(%)	(RT/pad)	(miles)	(VMT/pad)	(%)	(lb/VMT)	(lb/VMT)	(lb/pad)	(lb/pad)
Heavy Trucks	Local	Chemical	35,000	35	5.1	2.4	240	10	2400	85	1.54	0.24	552.85	84.77
	Resource	Water	35,000	20	5.1	2.4	240	1	240	50	1.54	0.24	184.28	28.26
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	160	10	1600	85	0.60	0.09	144.80	21.65
	Resource	Water	7,000	20	5.1	2.4	160	1	160	50	0.46	0.07	36.48	5.45
									Total Unpaved Road Traffic Emissions (lb/pad)				918.40	140.13

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
5 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.4.10
No Action Emissions Inventory - Road Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Resource Road Const. Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight	Average Vehicle Speed	Silt Content[1]	Moisture Content[2]	Round Trips (RTs)	RT Distance	Vehicle Miles Traveled (VMT)[3]	Emission Control Efficiency	PM_{10} Emission Factor[4]	$PM_{2.5}$ Emission Factor[4]	PM_{10} Emissions[5] (controlled)	$PM_{2.5}$ Emissions[5] (controlled)
			(lb)	(mph)	(%)	(%)	(RT/pad)	(miles)	(VMT/pad)	(%)	(lb/VMT)	(lb/VMT)	(lb/pad)	(lb/pad)
Gravel/Haul Trucks	Local	Chemical	35,000	35	5.1	2.4	88	10	880	85	1.54	0.24	202.71	31.08
	Resource	Water	35,000	20	5.1	2.4	88	1	88	50	1.54	0.24	67.57	10.36
Light Trucks/Pickups	Local	Chemical	7,000	35	5.1	2.4	58	10	580	85	0.60	0.09	52.49	7.85
	Resource	Water	7,000	20	5.1	2.4	58	1	58	50	0.46	0.07	13.22	1.98
									Total Unpaved Road Traffic Emissions (lb/pad)				335.99	51.27

[1] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[2] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[3] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[4] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
[5] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.4.11
No Action Emissions Inventory - Pipeline Construction Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Fugitive Particulate Emissions from Pipeline Construction Traffic
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per pad	RT Distance (miles)	VMT[4] (VMT/pad)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/pad)	$PM_{2.5}$ Emissions[6] (controlled) (lb/pad)
Semis/transport, boom, equipment, water removal, sand, and gravel trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light truck/pick-ups	Local	Chemical	7,000	35	5.1	2.4	200	10	2000	85	0.23	0.03	69.00	10.26
	Resource	Water	7,000	20	5.1	2.4	200	1	200	50	0.23	0.03	23.00	3.42
												Total Unpaved Road Traffic Emissions (lb/pad)	1,113.36	170.29

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
6 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.4.12
No Action Emissions Inventory - Well Pad Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Pad Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/acre)	(hours/day)	(lb/acre)				
				CO	NO_x	SO_2	VOC	PM_{10}	equipment type)		CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	25.19	20.44	0.39	2.96	1.19
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	11	51.94	42.17	0.79	6.11	2.44
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	2.1	11	207.78	168.67	3.18	24.44	9.78
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	56.67	46.00	0.87	6.67	2.67
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	2.1	8	12.59	10.22	0.19	1.48	0.59
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	2.1	10	31.48	25.56	0.48	3.70	1.48
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	2.1	12	39.67	32.20	0.61	4.67	1.87
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	2.1	6	31.17	25.30	0.48	3.67	1.47
									Total Heavy Equipment Tailpipe Emissions		456.48	370.56	6.98	53.70	21.48

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.4.13
No Action Emissions Inventory - Road Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Road Construction Heavy Equip.
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Loader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Dozer	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	11	81.63	66.26	1.25	9.60	3.84
Scraper	600	2	0.4	8.5	6.9	0.13	1	0.4	3.3	11	326.51	265.05	4.99	38.41	15.37
Grader	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	89.05	72.29	1.36	10.48	4.19
Backhoe	100	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	19.79	16.06	0.30	2.33	0.93
Roller	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	10	49.47	40.16	0.76	5.82	2.33
Water Truck	210	1	0.4	8.5	6.9	0.13	1	0.4	3.3	12	62.33	50.60	0.95	7.33	2.93
Dump Truck	330	1	0.4	8.5	6.9	0.13	1	0.4	3.3	6	48.98	39.76	0.75	5.76	2.30
Total Heavy Equipment Tailpipe Emissions											717.33	582.30	10.97	84.39	33.76

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.4.14
No Action Emissions Inventory - Pipeline Construction - Heavy Equipment Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Pipeline Construction
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Heavy Equipment	Engine Horsepower	Number Required	Operating Load Factor[1]	Pollutant Emission Factor[2]					Construction Activity Duration	Construction Activity Duration	Pollutant Emissions				
	(hp)			(g/hp-hr)					(days/mile)	(hours/day)	(lb/mile)				
				CO	NO_x	SO_2	VOC	PM_{10}			CO	NO_x	SO_2	VOC	PM_{10}[3]
Grader	200	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	39.58	32.13	0.61	4.66	1.86
Excavator	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Trencher	300	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	59.37	48.19	0.91	6.98	2.79
Tractor (side-boom)	150	1	0.4	8.5	6.9	0.13	1	0.4	3.3	8	29.68	24.10	0.45	3.49	1.40
Total Emissions from Heavy Equipment Tailpipes											187.99	152.60	2.88	22.12	8.85

[1] Taken from "Surface Mining" (Pfleider 1972) for average service duty.

[2] Emission factors based on the fact that there is a mix of Tier 0, 1 and 2 equipment operating in the field. Therefore, tier 1 emission factors are conservatively assumed for the life of project.

SO_2 emissions based on a sulfur balance and 350 ppm diesel fuel.

[3] $PM_{2.5}$ assumed equivalent to PM_{10} for combustion sources.

Table F.4.15
No Action Emissions Inventory - Drilling Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT[4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis-tractor/ trailer/mud/water/ fuel/ cement trucks[1]	Local Road	Chemical	44,000	35	5.1	2.4	360	10	3,600	85	1.70	0.26	919.22	140.95
	Resource Road	Water	44,000	20	5.1	2.4	360	1	360	50	1.70	0.26	306.41	46.98
Vendors/ marketers/ various/ workers	Local Road	Chemical	7,000	35	5.1	2.4	540	10	5,400	85	0.60	0.090	488.69	73.07
	Resource Road	Water	7,000	20	5.1	2.4	540	1	540	50	0.46	0.068	123.11	18.39
												Total Unpaved Road Traffic Emissions (lb/well)	1,837.43	279.39

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.4.16
No Action Emissions Inventory - Rig Move Traffic - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT [4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Rig Haul Trucks	Local Road	Chemical	44,000	35	5.1	2.4	26.3	10	263	85	1.70	0.26	67.15	10.30
	Resource Road	Water	44,000	20	5.1	2.4	26.3	1	26	50	1.70	0.26	22.38	3.43
Light Trucks	Local Road	Chemical	7,000	35	5.1	2.4	8.8	10	88	85	0.74	0.11	9.83	1.51
	Resource Road	Water	7,000	20	5.1	2.4	8.8	1	9	50	0.74	0.11	3.28	0.50
											Total Unpaved Road Traffic Emissions (lb/well)		102.64	15.74

[1] Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
[2] AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
[3] AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
[4] Calculated as Round Trips per Vehicle Type x Round Trip Distance.
[5] AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1b.
[6] Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.4.17
No Action Emissions Inventory - Drilling Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Drilling
Emissions: Diesel Combustion Emissions from Haul Truck Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	360	11	3960	45	24	128.68
NO_x	11.44	360	11	3960	45	24	99.87
SO_2[2]	0.13	360	11	3960	45	24	1.13
VOC	5.69	360	11	3960	45	24	49.67

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.
[3] Based on a life of project average of 45 days per well.

Table F.4.18
No Action Emissions Inventory - Rig Move Haul Truck Tailpipe - All Operators

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Rig Move
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well\)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration (days/move)	Haul Activity Duration (hours/day)	Emissions (lb/well)
CO	14.74	26.3	11	289.3	3	24	9.40
NO_x	11.44	26.3	11	289.3	3	24	7.30
SO_2[2]	0.13	26.3	11	289.3	3	24	0.08
VOC	5.69	26.3	11	289.3	3	24	3.63

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.

[2] The SO_2 emission factor is based on a sulfur balance and 350 ppm diesel fuel.

Table F.4.19
No Action Emissions Inventory - Ultra Tier 0 Rig – 2006

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 0
Effective Dates: 2006
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,640	0.42	62	24	12,487.90	8.39	6.24
NOx	Tier 0	10.89	3,640	0.42	62	24	54,615.76	36.70	27.31
SO_2	Tier 0	0.13	3,640	0.42	62	24	651.98	0.44	0.33
VOC	Tier 0	0.32	3,640	0.42	62	24	1,604.87	1.08	0.80
PM_{10}[4]	Tier 0	0.32	3,640	0.42	62	24	1,604.87	1.08	0.80

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.20
No Action Emissions Inventory - Ultra Tier 1 Rig – 2006

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 1
Effective Dates: 2006
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,640	0.42	62	24	42,629.38	28.65	21.31
NOx	Tier 1	6.90	3,640	0.42	62	24	34,605.03	23.26	17.30
SO_2	Tier 1	0.13	3,640	0.42	62	24	651.98	0.44	0.33
VOC	Tier 1	1.00	3,640	0.42	62	24	5,015.22	3.37	2.51
PM_{10}[4]	Tier 1	0.40	3,640	0.42	62	24	2,006.09	1.35	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.21
No Action Emissions Inventory - Ultra Tier 0 Rig - 2007-2008

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 0
Effective Dates: 2007- 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,640	0.42	55	24	11,077.98	8.39	5.54
NOx	Tier 0	10.89	3,640	0.42	55	24	48,449.47	36.70	24.22
SO_2	Tier 0	0.13	3,640	0.42	55	24	578.37	0.44	0.29
VOC	Tier 0	0.32	3,640	0.42	55	24	1,423.68	1.08	0.71
PM_{10}[4]	Tier 0	0.32	3,640	0.42	55	24	1,423.68	1.08	0.71

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.22
No Action Emissions Inventory - Ultra Tier 1 Rig - 2007-2008

Project: Pinedale Anticline SEIS
Scenario: Ultra - Tier 1
Effective Dates: 2007-2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,640	0.42	55	24	37,816.39	28.65	18.91
NOx	Tier 1	6.90	3,640	0.42	55	24	30,698.01	23.26	15.35
SO_2	Tier 1	0.13	3,640	0.42	55	24	578.37	0.44	0.29
VOC	Tier 1	1.00	3,640	0.42	55	24	4,448.99	3.37	2.22
PM_{10}[4]	Tier 1	0.40	3,640	0.42	55	24	1,779.59	1.35	0.89

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Ultra.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.23
No Action Emissions Inventory - Shell Tier 0 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 0
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	4,040	0.42	45	24	10,059.82	9.31	5.03
NOx	Tier 0	10.89	4,040	0.42	45	24	43,996.57	40.74	22.00
SO_2	Tier 0	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 0	0.32	4,040	0.42	45	24	1,292.83	1.20	0.65
PM_{10}[4]	Tier 0	0.32	4,040	0.42	45	24	1,292.83	1.20	0.65

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.24
No Action Emissions Inventory - Shell Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	4,040	0.42	45	24	34,340.76	31.80	17.17
NOx	Tier 1	6.90	4,040	0.42	45	24	27,876.61	25.81	13.94
SO_2	Tier 1	0.13	4,040	0.42	45	24	525.21	0.49	0.26
VOC	Tier 1	1.00	4,040	0.42	45	24	4,040.09	3.74	2.02
PM_{10}[4]	Tier 1	0.40	4,040	0.42	45	24	1,616.04	1.50	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.25
No Action Emissions Inventory - Shell Tier 0 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 0
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	4,040	0.42	40	24	8,942.06	9.31	4.47
NOx	Tier 0	10.89	4,040	0.42	40	24	39,108.06	40.74	19.55
SO_2	Tier 0	0.13	4,040	0.42	40	24	466.85	0.49	0.23
VOC	Tier 0	0.32	4,040	0.42	40	24	1,149.18	1.20	0.57
PM_{10}[4]	Tier 0	0.32	4,040	0.42	40	24	1,149.18	1.20	0.57

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.26
No Action Emissions Inventory - Shell Tier 1 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: Shell - Tier 1
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	4,040	0.42	40	24	30,525.12	31.80	15.26
NOx	Tier 1	6.90	4,040	0.42	40	24	24,779.21	25.81	12.39
SO_2	Tier 1	0.13	4,040	0.42	40	24	466.85	0.49	0.23
VOC	Tier 1	1.00	4,040	0.42	40	24	3,591.19	3.74	1.80
PM_{10}[4]	Tier 1	0.40	4,040	0.42	40	24	1,436.48	1.50	0.72

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Shell.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.27
No Action Emissions Inventory - Questar Tier 0 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 0
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,940	0.42	45	24	9,810.82	9.08	4.91
NOx	Tier 0	10.89	3,940	0.42	45	24	42,907.55	39.73	21.45
SO_2	Tier 0	0.006	3,940	0.42	45	24	23.64	0.02	0.01
VOC	Tier 0	0.32	3,940	0.42	45	24	1,260.83	1.17	0.63
PM_{10}[4]	Tier 0	0.32	3,940	0.42	45	24	1,260.83	1.17	0.63

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.28
No Action Emissions Inventory - Questar Tier 2 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 2
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,940	0.42	45	24	10,244.23	9.49	5.12
NOx	Tier 2	4.50	3,940	0.42	45	24	17,730.39	16.42	8.87
SO_2	Tier 2	0.006	3,940	0.42	45	24	23.64	0.02	0.01
VOC	Tier 2	0.30	3,940	0.42	45	24	1,182.03	1.09	0.59
PM_{10}[4]	Tier 2	0.15	3,940	0.42	45	24	591.01	0.55	0.30

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.4.29
No Action Emissions Inventory - Questar Tier 0 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 0
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,940	0.42	40	24	8,720.73	9.08	4.36
NOx	Tier 0	10.89	3,940	0.42	40	24	38,140.04	39.73	19.07
SO_2	Tier 0	0.006	3,940	0.42	40	24	21.01	0.02	0.01
VOC	Tier 0	0.32	3,940	0.42	40	24	1,120.74	1.17	0.56
PM_{10}[4]	Tier 0	0.32	3,940	0.42	40	24	1,120.74	1.17	0.56

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.

Table F.4.30
No Action Emissions Inventory - Questar Tier 2 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: Questar - Tier 2
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,940	0.42	40	24	9,105.98	9.49	4.55
NOx	Tier 2	4.50	3,940	0.42	40	24	15,760.35	16.42	7.88
SO_2	Tier 2	0.006	3,940	0.42	40	24	21.01	0.02	0.01
VOC	Tier 2	0.30	3,940	0.42	40	24	1,050.69	1.09	0.53
PM_{10}[4]	Tier 2	0.15	3,940	0.42	40	24	525.34	0.55	0.26

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of current fleet. - Current fleet data provided by Questar.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.4.31
No Action Emissions Inventory - Yates Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Yates - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	58	24	42,453.71	30.50	21.23
NOx	Tier 1	6.90	3,875	0.42	58	24	34,462.43	24.76	17.23
SO_2	Tier 1	0.13	3,875	0.42	58	24	649.29	0.47	0.32
VOC	Tier 1	1.00	3,875	0.42	58	24	4,994.55	3.59	2.50
PM_{10}[4]	Tier 1	0.40	3,875	0.42	58	24	1,997.82	1.44	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.4.32
No Action Emissions Inventory - Yates Tier 1 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: Yates - Tier 1
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	47	24	34,402.15	30.50	17.20
NOx	Tier 1	6.90	3,875	0.42	47	24	27,926.45	24.76	13.96
SO_2	Tier 1	0.13	3,875	0.42	47	24	526.15	0.47	0.26
VOC	Tier 1	1.00	3,875	0.42	47	24	4,047.31	3.59	2.02
PM_{10}[4]	Tier 1	0.40	3,875	0.42	47	24	1,618.92	1.44	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.4.33
No Action Emissions Inventory - Anschutz Tier 0 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	58	24	12,436.44	8.93	6.22
NOx	Tier 0	10.89	3,875	0.42	58	24	54,390.70	39.07	27.20
SO_2	Tier 0	0.13	3,875	0.42	58	24	649.29	0.47	0.32
VOC	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80
PM_{10}[4]	Tier 0	0.32	3,875	0.42	58	24	1,598.26	1.15	0.80

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.4.34
No Action Emissions Inventory - Anschutz Tier 0 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: Anschutz - Tier 0
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration [5]	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 0	2.49	3,875	0.42	47	24	10,077.81	8.93	5.04
NOx	Tier 0	10.89	3,875	0.42	47	24	44,075.22	39.07	22.04
SO_2	Tier 0	0.13	3,875	0.42	47	24	526.15	0.47	0.26
VOC	Tier 0	0.32	3,875	0.42	47	24	1,295.14	1.15	0.65
PM_{10}[4]	Tier 0	0.32	3,875	0.42	47	24	1,295.14	1.15	0.65

[1] Based on AP-42 (EPA, 1996), Section 3.4, Large Stationary Diesel and Dual Fuel Engines for engines >600hp.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.4.35
No Action Emissions Inventory - BP/Stone Tier 1 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 1
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	58	24	42,453.71	30.50	21.23
NOx	Tier 1	6.90	3,875	0.42	58	24	34,462.43	24.76	17.23
SO_2	Tier 1	0.006	3,875	0.42	58	24	29.97	0.02	0.01
VOC	Tier 1	1.00	3,875	0.42	58	24	4,994.55	3.59	2.50
PM_{10}[4]	Tier 1	0.40	3,875	0.42	58	24	1,997.82	1.44	1.00

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.4.36
No Action Emissions Inventory - BP/Stone Tier 1 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 1
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 1	8.50	3,875	0.42	47	24	34,402.15	30.50	17.20
NOx	Tier 1	6.90	3,875	0.42	47	24	27,926.45	24.76	13.96
SO_2	Tier 1	0.006	3,875	0.42	47	24	24.28	0.02	0.01
VOC	Tier 1	1.00	3,875	0.42	47	24	4,047.31	3.59	2.02
PM_{10}[4]	Tier 1	0.40	3,875	0.42	47	24	1,618.92	1.44	0.81

[1] Based on EPA Tier 1 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.

Table F.4.37
No Action Emissions Inventory - BP/Stone Tier 2 Rig - 2006-2007

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 2
Effective Dates: 2006-2007
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,6]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,875	0.42	58	24	12,985.84	9.33	6.49
NOx	Tier 2	4.50	3,875	0.42	58	24	22,475.50	16.15	11.24
SO_2	Tier 2	0.006	3,875	0.42	58	24	29.97	0.02	0.01
VOC	Tier 2	0.30	3,875	0.42	58	24	1,498.37	1.08	0.75
PM_{10}[4]	Tier 2	0.15	3,875	0.42	58	24	749.18	0.54	0.37

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.
[6] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.4.38
No Action Emissions Inventory - BP/Stone Tier 2 Rig – 2008

Project: Pinedale Anticline SEIS
Scenario: BP/Stone - Tier 2
Effective Dates: 2008
Emissions: Diesel Combustion Emissions from Drilling Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,6]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	3,875	0.42	47	24	10,523.01	9.33	5.26
NOx	Tier 2	4.50	3,875	0.42	47	24	18,212.90	16.15	9.11
SO_2	Tier 2	0.006	3,875	0.42	47	24	24.28	0.02	0.01
VOC	Tier 2	0.30	3,875	0.42	47	24	1,214.19	1.08	0.61
PM_{10}[4]	Tier 2	0.15	3,875	0.42	47	24	607.10	0.54	0.30

[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 15 ppm diesel fuel.
[2] Horsepower determined by average of other operators current fleets.
[3] Load factor based on 65% usage factor and average 65% engine load for a total load factor of 42% or 0.42.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for drilling engines.
[5] Drilling duration derived from an average of other operators.
[6] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.4.39
No Action Emissions Inventory - Drill Rig Boiler Emissions

Project:	**Pinedale Anticline SEIS**
Scenario:	**All**
Activity:	**Drilling**
Emissions:	**Rig Boilers**
Date:	**11/30/2006**

Fuel Combustion Source:

Unit Description	Rig Boilers	
Design Firing Rate (MMBTU/hr) :	5	

Operating Parameters:

Annual Operating hours	4380	
Operation %	Winter (Nov. - Apr.)	100

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combusted	21.90	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr)
Total PM	7.6000	0.03800
SO_2	0.6	0.00300
NO_x	100.0000	0.50000
CO	21.0000	0.10500
VOC	5.50000	0.02750

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.4.40
No Action Emissions Inventory - Frac/Other Completion Engine Emissions

Project: Pinedale Anticline SEIS
Scenario: All
Effective Dates: All
Emissions: Diesel Combustion Emissions from Frac/Other Completion Engines
Date: 11/30/2006

Pollutant	EPA Tier Certification	Pollutant Emission Factor[1,5]	Horsepower[2]	Overall Load Factor[3]	Drilling Activity Duration	Drilling Activity Duration	Emissions per Well	Emissions per Hour	Emissions per Well
		(g/hp-hr)	(hp)		(days/well)	(hours/day)	(lb/well)	(lb/hr)	(tons)
CO	Tier 2	2.60	9,200	0.40	4	24	2,025.02	21.09	1.01
NOx	Tier 2	4.50	9,200	0.40	4	24	3,504.84	36.51	1.75
SO_2	Tier 2	0.13	9,200	0.40	4	24	101.25	1.05	0.05
VOC	Tier 2	0.30	9,200	0.40	4	24	233.66	2.43	0.12
PM_{10}[4]	Tier 2	0.15	9,200	0.40	4	24	116.83	1.22	0.06

Note: Frac engines are EPA Tier 2 from data provided by operators and Frac contractor Halliburton.
[1] Based on EPA Tier 2 Nonroad Diesel Standards.
All SO_2 emissions based on S-balance equation in Section 3.4 and 350 ppm diesel fuel.
[2] Horsepower determined by average of operators current data. Frac pump engines constitute the majority of the hp used.
[3] Load factor based on weighted average of full load and idle conditions during frac operations.
[4] $PM_{2.5}$ assumed equivalent to PM_{10} for frac engines.
[5] NO_x+VOCs standard of 4.8. Split based on EPA-NRC-009 (EPA 2004b).

Table F.4.41
No Action Emissions Inventory - Completion/Testing Traffic

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs per Well	RT Distance (miles)	VMT[4] (VMT/well)	Emission Control Efficiency (%)	PM_{10} Emissions[5] (lb/VMT)	$PM_{2.5}$ Emissions[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/well)	$PM_{2.5}$ Emissions[6] (controlled) (lb/well)
Semis/ transport/ water/ sand/ frac trucks[1]	Local	Chemical	44,000	35	5.1	2.4	300	10	3,000	85	1.70	0.26	766.02	117.46
	Resource	Water	44,000	20	5.1	2.4	300	1	300	50	1.70	0.26	255.34	39.15
Light Trucks/ Pickups	Local	Chemical	7,000	35	5.1	2.4	450	10	4,500	85	0.74	0.11	502.42	77.04
	Resource	Water	7,000	20	5.1	2.4	450	1	450	50	0.74	0.11	167.47	25.68
									Total Unpaved Road Traffic Emissions (lb/well)				1,691.26	259.33

1 Semi vehicle weight range is 28,000-60,000 lbs; average weight of 44,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance.
5 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
6 Calculated as lb/VMT x VMT/pad x control efficiency.

Table F.4.42
No Action Emissions Inventory - Completion/Testing Haul Truck Tailpipe

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Completion/Testing
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mile)	Total Haul Truck RTs (RTs/well)	RT Distance (miles/RT)	Total Haul Truck Miles Traveled (miles/well)	Haul Activity Duration[3] (days/well)	Haul Activity Duration[3] (hours/day)	Emissions (lb/well)
CO	14.74	300	11	3300	10	18	107.24
NO_x	11.44	300	11	3300	10	18	83.23
SO_2[2]	0.16	300	11	3300	10	18	1.16
VOC	5.69	300	11	3300	10	18	41.40

[1] AP-42 (EPA 1985), Volume II Mobile Sources. Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is based on a S balance and 350 ppm diesel fuel.
[3] Haul Activity Duration for completion activities based on an average of 10 days per well and an average of 24 hr/day for 5 days and 12 hr/day for 5 days.

Table F.4.43
No Action Emissions Inventory - Production Traffic – Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight[1] (lb)	Average Vehicle Speed (mph)	Silt Content[2] (%)	Moisture Content[3] (%)	RTs[4] (RTs)	RT Distance (miles)	VMT[4] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[5] (lb/VMT)	$PM_{2.5}$ Emission Factor[5] (lb/VMT)	PM_{10} Emissions[6] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[6] (controlled) (lb/RT)
Light Truck	Local	Chemical	7,000	35	5.1	2.4	1	10	10	85	0.74	0.11	1.12	0.17
	Resource	Water	7,000	20	5.1	2.4	1	1	1	50	0.74	0.11	0.37	0.06
												Total Access and Unimproved Road Emissions (lb/RT)	1.49	0.23

1 Haul trucks weight range is 28,000-80,000 lbs. Average weight of 54,000 lbs used for calculations.
2 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
3 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
4 Calculated as Round Trips per Vehicle Type x Round Trip Distance
6 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
7 Calculated as lb/VMT x VMT/well x control efficiency.

Table F.4.44
No Action Emissions Inventory - Liquids Gathering Traffic - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Fugitive Particulate Emissions from Traffic on Unpaved Roads
Date: 11/30/2006

Vehicle Type	Road Type	Dust Control Method	Average Vehicle Weight (lb)	Average Vehicle Speed (mph)	Silt Content[1] (%)	Moisture Content[2] (%)	RT (RT)	RT Distance (miles)	VMT[3] (VMT/RT)	Emission Control Efficiency (%)	PM_{10} Emission Factor[4] (lb/VMT)	$PM_{2.5}$ Emission Factor[4] (lb/VMT)	PM_{10} Emissions[5] (controlled) (lb/RT)	$PM_{2.5}$ Emissions[5] (controlled) (lb/RT)
Haul Truck	Local	Chemical	54,000	35	5.1	2.4	1	10	10	85	1.87	0.29	2.80	0.43
	Resource	Water	54,000	20	5.1	2.4	1	1	1	50	1.87	0.29	0.93	0.14
												Total Access and Unimproved Road Emissions (lb/RT)	3.73	0.57

1 AP-42 (EPA 2004a), Table 13.2.2-1, "Typical Silt Content Values of Surface Material on Industrial and Rural Unpaved Roads."
2 AP-42 (EPA 2004a), Table 11.9-3, "Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations."
3 Calculated as Round Trips per Vehicle Type x Round Trip Distance
4 AP-42 (EPA 2004a), Section 13.2.2 "Unpaved Roads", equations 1a and 1F.
5 Calculated as lb/VMT x VMT/well x control efficiency.

Table F.4.45
No Action Emissions Inventory - Tanker Traffic Tailpipe - Per Round Trip

Project: Pinedale Anticline SEIS
Scenario: All Operators
Activity: Production Traffic
Emissions: Diesel Combustion Emissions from Heavy Equipment Tailpipes
Date: 11/30/2006

Pollutant	Pollutant Emission Factor[1] (g/mi)	RT (RT)	Single Well Round Trip Distance (mi/RT)	Single Well Daily VMT (mi/pad/day)	Daily Emissions Single Well (lb/pad/day)
CO	14.74	1	11	11.00	0.36
NO_x	11.44	1	11	11.00	0.28
SO_2[2]	0.16	1	11	11.00	0.00
VOC	5.69	1	11	11.00	0.14

[1] AP-42 (EPA 1985), Table 2.7.1 "Volume II Mobile Sources." Heavy duty diesel engine powered trucks, high altitude, 20 mph, "aged" with 50,000 miles, 1997+ model.
[2] The SO_2 emission factor is base don a S balance and 350 ppm diesel fuel.

Table F.4.46
No Action Emissions Inventory - Production Wind Erosion - All Operators - Per Acre of Disturbance

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Production Wind Erosion
Emissions: Wind Erosion
Date: 11/30/2006

Emission Factor : 0.3733 lb/hr/100m^2 Based on AP-42 Chapter 13.2.5 (EPA 2004), Industrial Wind Erosion using Jonah Field, Wyoming meteorological data.

Control Efficiency: 50 %

Disturbed Area: 1 acres 4,047.00 m^2

PM Emissions Calculations:

	PM_{10} Emission Factor (lb/hr/100 m^2)	$PM_{2.5}$ Emission Factor (lb/hr/100 m^2)	Area (100 m^2)	Control Efficiency (%)	PM_{10} Emissions (lb/hr/acre)	$PM_{2.5}$ Emissions (lb/hr/acre)	PM_{10} Emissions[1] (tons/acre/yr)	$PM_{2.5}$ Emissions[1] (tons/acre/yr)
Production:	0.3733	0.1493	40.47	50	7.55	3.02	0.18	0.07

[1] TPY numbers based on lb/hr/acre and 47 hours per year that the wind speed in the Jonah Field met data overcome the threshold friction velocity.

Table F.4.47
No Action Emissions Inventory - Separator/Indirect Line Heaters

Project: Pinedlae Anticline SEIS
Scenario: Average per Well
Activity: Production
Emissions: Separator/Line Heaters
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Separator/Line Heaters	
Design Firing Rate (MMBTU/hr)	0.75	

Operating Parameters:

Annual Operating hours	1971	
Operation %	Winter (Nov. - Apr.)	35
	Summer (May - Oct.)	10

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combustec	1.48	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr) Winter	(lb/hr) Summer	(tpy) Total
Total PM	7.6000	0.00200	0.00057	0.0056
SO_2	0.6	0.00016	0.00005	0.0004
NO_x	100.0000	0.02625	0.00750	0.0739
CO	21.0000	0.00551	0.00158	0.0155
VOC	5.50000	0.00144	0.00041	0.0041

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.4.48
No Action Emissions Inventory - Dehy Reboiler Heaters

Project: Pinedlae Anticline SEIS
Scenario: Average per Well
Activity: Production
Emissions: Dehy Reboiler Heater
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Separator/Line Heaters	
Design Firing Rate (MMBTU/hr)	0.085	

Operating Parameters:

Annual Operating hours	1971	
Operation %	Winter (Nov. - Apr.)	35
	Summer (May - Oct.)	10

Actual Fuel Combustion for the Year for Unit:

Volume of Natural Gas Combustec	0.17	MMSCF
Heat Content	1,000	Btu/scf

Potential Emission Data:

	Emission Factor[1] (lb/MMscf)	(lb/hr) Winter	(lb/hr) Summer	(tpy) Total
Total PM	7.6000	0.00023	0.00006	0.0006
SO_2	0.6	0.00002	0.00001	0.0001
NO_x	100.0000	0.00298	0.00085	0.0084
CO	21.0000	0.00062	0.00018	0.0018
VOC	5.50000	0.00016	0.00005	0.0005

[1] Emission factors taken from WDEQ "Oil and Gas Production Facilities - Chapter 6, Section 2 Permitting Guidance" and AP-42, Table 1.4-2.

Table F.4.49
No Action Emissions Inventory - Dehydrator Flashing

Project: **Pinedale Anticline SEIS**
Scenario: **All Scenarios**
Activity: **Production**
Emissions: **TEG Dehydrator Flashing**
Date: **11/30/2006**

	Uncontrolled		Controlled[1]	
Pollutant	(tpy)	(lb/hr)	(tpy)	(lb/hr)
VOC	12.55	2.87	0.63	0.14
HAP	8.52	1.95	0.43	0.10
Benzene	1.42	0.32	0.07	0.02
Toluene	3.83	0.88	0.19	0.04
Ethylbenzene	0.18	0.04	0.01	2.10E-03
Xylene	2.97	0.68	0.15	0.03
n-Hexane	0.11	0.02	0.01	1.20E-03

[1] Data based on GRI-GLYCalc V. 4.0, 4 MMSCFD, 0.32 gpm glycol flow rate, average representative gas analysis and 95% destruction efficiency for controlled.

Table F.4.50
No Action Emissions Inventory - Average Well Production Decline Factors

Year	Factor
0	1
1	0.33426
2	0.23752
3	0.18898
4	0.15838
5	0.13689
6	0.12165
7	0.10828
8	0.09692
9	0.08708
10	0.07884
11	0.07083
12	0.06407
13	0.05803
14	0.05261
15	0.04772
16	0.04331
17	0.03932
18	0.03571
19	0.03243
20	0.02946
21	0.02675
22	0.02428
23	0.02376
24	0.01998
25	0.01811
26	0.01
27	0.01
28	0.01
29	0.01

Note: Decline factors averaged from data provided by all Shell, Ultra and Questar.

Table F.4.51
No Action Emissions Inventory - Fugitive HAPs and VOCs - Per Pad

Project: Pinedale Anticline SEIS
Scenario: All
Activity: Production
Emissions: Fugitive VOC/HAP Emissions
Date: 11/30/2006

Gas Analysis Weight Fraction

VOC	0.13930
Benzene	0.00052
Toluene	0.00091
Ethlybenzene	0.00003
Xylene	0.00036
n-hexane	0.00131

Source	Quantity	Emission Factor[1] (lb/hr/component)	Non-methane Hydrocarbons[2] (lb/hr)	Non-methane Hydrocarbons (tpy)	Benzene[2] (lb/hr)	Benzene (tpy)	Toluene[2] (lb/hr)	Toluene (tpy)	Ethlybenzene[2] (lb/hr)	Ethlybenzene (tpy)	Xylene[2] (lb/hr)	Xylene (tpy)	n-Hexane[2] (lb/hr)	n-Hexane (tpy)
Valves	20	0.00992	0.0276	0.121	0.00010	0.00045	0.00018	0.00079	0.000006	0.000028	0.00007	0.00031	0.00026	0.0011
Flanges	30	0.00086	0.0036	0.016	0.00001	0.00006	0.00002	0.00010	0.000001	0.000004	0.00001	0.00004	0.00003	0.0001
Connections	275	0.00044	0.0169	0.074	0.00006	0.00028	0.00011	0.00048	0.000004	0.000017	0.00004	0.00019	0.00016	0.0007
Pump seals	2	0.00529	0.0015	0.006	0.00001	0.00002	0.00001	0.00004	0.000000	0.000002	0.00000	0.00002	0.00001	0.0001
Open ended lines	3	0.00441	0.0018	0.008	0.00001	0.00003	0.00001	0.00005	0.000000	0.000002	0.00000	0.00002	0.00002	0.0001
		Total Emissions/Well	0.0514	0.225	0.00019	0.00084	0.00034	0.00147	0.000012	0.000052	0.00013	0.00058	0.00048	0.0021

[1] Taken from the WDEQ (2001) "Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance".
[2] Calculated as weight fraction * emissions factor * quantity of source.

Table F.4.52
No Action Emissions Inventory - Condensate Storage Emissions - Per Well

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Production
Emissions: Condensate Storage Tanks
Date: 11/30/2006

Average Controlled Condensate Storage Emissions[1]

VOC and HAP Emissions		
VOC	1.1856	tpy/well
HAP	0.0594	tpy/well
Benzene	0.0029	tpy/well
Toluene	0.0001	tpy/well
Ethylbenzene	0.0017	tpy/well
Xylene	0.0022	tpy/well
n-Hexane	0.0526	tpy/well

NO_x and CO Emissions from Smokeless Flare Combustion		
NO_x Emission Factor	0.068	lb/MMBTU
CO Emission Factor	0.37	lb/MMBTU
Heat Content	1,000	Btu/scf
Condensate Production	13.00	bbl/day
Gas to Oil Ratio	957.37	scf/bbl
Gas Production	12,445.81	SCFD
Combustion Emissions from Storage Tanks		
NO_x	0.15	tpy/facility
CO	0.84	tpy/facility

Average Uncontrolled Storage Tank Emissions[1]

VOC	16.1000	tpy/well
HAP	0.7880	tpy/well
Benzene	0.0372	tpy/well
Toluene	0.0021	tpy/well
Ethylbenzene	0.0223	tpy/well
Xylene	0.0283	tpy/well
n-Hexane	0.6981	tpy/well

Table F.4.53
No Action Emissions Inventory - Pinedale Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: Questar - Pinedale C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Pinedale Compressor Station					
2006 Projected Increase (hp)	7,440	(I.C. Engines/Recip.)				
2009 Projected Increase (hp)	31,000	(Turbines/Centrifugal)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2006-2008 Increase from Baseline**		**2009-2014 Increase from Baseline**		Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Method of Determination (Turbines)	Emission Factor (Turbines)	Units
	lb/hr	tpy	lb/hr	tpy					
PM_{10}	0.0	0.0	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
$PM_{2.5}$	0.0	0.0	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
SO_2	0.0	0.0	0.0	0.0	Fuel Analysis	0.00	Fuel Analysis	0.00	lb/MMscf
NO_x	11.5	50.3	25.2	110.2	BACT	0.7	Provided by Questar	0.2	g/hp-hr
CO	4.1	18.0	17.8	77.8	Permitted Emissions[2]	0.250	Provided by Questar	0.200	g/hp-hr
VOC	7.5	33.0	8.4	36.6	Permitted Emissions[2]	0.460	Provided by Questar	0.012	g/hp-hr
Formaldehyde	0.7	3.2	1.7	7.4	Permitted Emissions[2]	0.045	Provided by Questar	0.014	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Pindale C.S. WDEQ Permit # MD-1267.
[3] Based on AP-42, Chapter 3, Table 3.1-2a for a natural gas fired turbine.

Table F.4.54
No Action Emissions Inventory - Paradise Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: JGG/Teppco Paradise C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Paradise Compressor Station					
2011 Projected Increase (hp)	59,000	(I.C. Engines/Recip.)				
2011 Projected Increase (hp)	125,000	(Turbines/Centrifugal)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2011+ Increase from Baseline** lb/hr	tpy	Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Method of Determination (Turbines)	Emission Factor (Turbines)	Units
PM_{10}	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
$PM_{2.5}$	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
SO_2	0.0	0.0	Fuel Analysis	0.00	Fuel Analysis	0.00	lb/MMscf
NO_x	201.3	881.6	BACT	0.7	Permitted Emissions[2]	0.4	g/hp-hr
CO	176.8	774.4	Permitted Emissions[2]	0.300	Permitted Emissions[2]	0.500	g/hp-hr
VOC	172.5	755.6	Permitted Emissions[2]	0.500	Permitted Emissions[2]	0.390	g/hp-hr
Formaldehyde	10.7	46.8	Permitted Emissions[2]	0.080	Permitted Emissions[2]	0.001	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Bird Canyon Permit MD-1013, issued June 23, 2004.
[3] Based on AP-42, Chapter 3, Table 3.1-2a for a natural gas fired turbine.

Table F.4.55
No Action Emissions Inventory - Falcon Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: JGG/Teppco Falcon C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Falcon Compressor Station	
2011 Projected Increase (hp)	7,366	(I.C. Engines/Recip.)
2011 Projected Increase (hp)	30,000	(Turbines/Centrifugal)

Operating Parameters:

Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2011+ Increase from Baseline** lb/hr	tpy	Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Method of Determination (Turbines)	Emission Factor (Turbines)	Units
PM_{10}	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
$PM_{2.5}$	0.0	0.0	AP-42[1]	0.00008	AP-42[3]	0.00660	lb/MMscf
SO_2	0.0	0.0	Fuel Analysis	0.00	Fuel Analysis	0.00	lb/MMscf
NO_x	37.8	165.7	BACT	0.7	Permitted Emissions[2]	0.4	g/hp-hr
CO	37.9	166.2	Permitted Emissions[2]	0.300	Permitted Emissions[2]	0.500	g/hp-hr
VOC	33.9	148.5	Permitted Emissions[2]	0.500	Permitted Emissions[2]	0.390	g/hp-hr
Formaldehyde	1.4	6.0	Permitted Emissions[2]	0.080	Permitted Emissions[2]	0.001	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Bird Canyon Permit MD-1013, issued June 23, 2004.
[3] Based on AP-42, Chapter 3, Table 3.1-2a for a natural gas fired turbine.

Table F.4.56
No Action Emissions Inventory - Bird Canyon Compressor Station Expansion

Project: Pinedale Anticline SEIS
Scenario: All Scenarios
Activity: Projected PAPA Compression
Emissions: JGG/Teppco Bird Canyon C.S.
Date: 11/30/2006

Fuel Combustion Source:

Unit Description	Bird Canyon Compressor Station					
2011 Projected Increase (hp)	14,672	(I.C. Engines/Recip.)				
Operating Parameters:						
Operated	24	hr/day,	7	days/wk,	365	days/yr
Operating hours	8,760					
Capacity (%)	100	(while operating)				
Annual Load (%)	Winter	25	Spring	25		
	Summer	25	Fall	25		

Potential Fuel Combustion for the Units:

Assumes gas consumed at rate of	6601	Btu/hp-hr
Heat Content	1000	Btu/scf

Emission Data:	**2011+ Increase from Baseline** lb/hr	tpy	Method of Determination (I.C. Engines)	Emission Factor (I.C. Engines)	Units
PM_{10}	0.0	0.0	AP-42[1]	0.00008	lb/MMscf
$PM_{2.5}$	0.0	0.0	AP-42[1]	0.00008	lb/MMscf
SO_2	0.0	0.0	Fuel Analysis	0.00	lb/MMscf
NO_x	22.6	99.2	BACT	0.7	g/hp-hr
CO	9.7	42.5	Permitted Emissions[2]	0.300	g/hp-hr
VOC	16.2	70.8	Permitted Emissions[2]	0.500	g/hp-hr
Formaldehyde	2.6	11.3	Permitted Emissions[2]	0.080	g/hp-hr

[1] Based on a 4-stroke lean burn engine, taken from AP-42 Table 3.2-2.
[2] Emission rates taken from Bird Canyon Permit MD-1013, issued June 23, 2004.

Table F.4.57
No Action Emissions Inventory - Compression Emissions by Year

Compression:	2005 (Baseline Year)		2006		2007		2008		2009		2010		2011	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
NOx	96.3	421.9	107.8	472.2	107.8	472.2	107.8	472.2	121.5	532.1	121.5	532.1	383.2	1678.5
CO	36.0	157.7	40.1	175.7	40.1	175.7	40.1	175.7	53.8	235.5	53.8	235.5	278.2	1218.7
VOC	73.2	320.5	80.7	353.5	80.7	353.5	80.7	353.5	81.5	357.1	81.5	357.1	304.1	1332.1
PM10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SO2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Formaldehyde	9.5	41.7	10.3	44.9	10.3	44.9	10.3	44.9	11.2	49.1	11.2	49.1	25.8	113.2

Paradise 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1187.
Falcon 2005 based on (5) 3,668 hp compressors, (2) 1,800 hp generators, and (1) 245 hp VRU as provided by TEPPCO and emissions from MD-1186.
Pinedale 2005 based on (2) 1,860 hp and (2) 3,720 hp compressors as provided by Questar and emissions from MD-1267.

Table F.4.58
No Action Emissions Inventory - Granger Gas Plant Expansion

	2005 Potential Emissions		2007 Projected Expansion		2007 Projected Totals	
Pollutant	**(lb/hr)**	**(tpy)[1]**	**(lb/hr)**	**(tpy)[2]**	**(lb/hr)**	**(tpy)**
NOx:	68.88	301.7	68.88	301.7	137.8	603.4
CO:	73.70	322.8	73.70	322.8	147.4	645.6
VOCs:	32.01	140.2	32.01	140.2	64.0	280.4
SO2:	0.00	0.0	0.00	0.0	0.0	0.0
PM10:	0.00	0.0	0.00	0.0	0.0	0.0
Benzene:	0.07	0.3	0.07	0.3	0.1	0.6
Toluene:	0.02	0.1	0.02	0.1	0.0	0.2
Ethylbenzene:	0.00	0.0	0.00	0.0	0.0	0.0
Xylene:	0.02	0.1	0.02	0.1	0.0	0.2
n-Hexane:	0.07	0.3	0.07	0.3	0.1	0.6
Formaldehyde:	7.65	33.5	7.65	33.5	15.3	67.0
Total HAPs:	7.83	34.3	7.83	34.3	15.7	68.6

[1] Emissions taken from WDEQ-AQD permit # MD-644A
[2] Plant size to double in 2007, therefore emissions assumed to double over 2005 potentials.

Table F.4.59
No Action Emissions Inventory - Opal Gas Plant Expansion

	2005 Potential Emissions		2011 Projected Expansion		2011+ Projected Totals	
Pollutant	**(lb/hr)**	**(tpy)[1]**	**(lb/hr)**	**(tpy)[2]**	**(lb/hr)**	**(tpy)**
NOx:	127.76	559.6	8.56	37.50	136.32	597.1
CO:	117.33	513.9	14.27	62.50	131.60	576.4
VOCs:	54.98	240.8	26.78	117.30	81.76	358.1
SO2:	0.00	0.0	0.00	0.00	0.00	0.0
PM10:	0.00	0.0	0.00	0.00	0.00	0.0
Benzene:	2.58	11.3	1.23	5.40	3.82	16.7
Toluene:	0.75	3.3	1.28	5.60	2.03	8.9
Ethylbenzene:	0.23	1.0	0.00	0.00	0.23	1.0
Xylene:	0.37	1.6	0.53	2.30	0.89	3.9
n-Hexane:	1.94	8.5	0.59	2.60	2.53	11.1
Formaldehyde:	0.00	0.0	0.11	0.50	0.11	0.5
Total HAPs:	5.87	25.7	3.74	16.40	9.61	42.1

[1] Emissions taken from WDEQ-AQD permit # MD-644A
[2] Emissions based on Pioneer Gas Plant Expansion WDEQ-AQD permit # CT-4302.

Table F.4.60
No Action Emissions Inventory - 2006 Drill Rig Schedule

	Questar			Ultra			Shell			Yates			Anschutz			BP/Stone			Total		
Year	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs	Rig Moves	Wells	Rigs[1]	Rig Moves	Wells	Rigs[2]	Rig Moves	Wells	Rigs	Rig Moves
2006	50	7.6	8	61	10.4	20	60	8	14	8	1	2	17	4/3	4	9	1/2	2	205	32	50

[1]Anschutz will have 4 rigs (May through November) and 3 rigs (November through May).
[2]BP/Stone will have 1 rig (for quarters 1 through 3) and 2 rigs for the fourth quarter.

Table F.4.61
No Action Emissions Inventory - 2007-2008 Drill Rig Schedule

	Questar				Ultra				Shell				Yates			
		Rigs				Rigs				Rigs				Rigs		
Year	Wells	S	W	Rig Moves	Wells	S	W	Rig Moves	Wells	S	W	Rig Moves	Wells	S	W	Rig Moves
2007	50	10	6	8	69	16	8	20	75	10	10	15	8	1	1	2
2008	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1
Total	**51**				**70**				**76**				**9**			

Anschutz				BP/Stone				Total						Completion %	
	Rigs				Rigs				Rigs		S/W %				
Wells	S	W	Rig Moves	Wells	S	W	Rig Moves	Wells	S	W	S	W	Rig Moves	Summer	Winter
17	4	3	4	12	2	2	2	231	43	30	0.589041096	0.410958904	51	0.66	0.34
1	0	1	1	1	0	1	1	6	0	6	0	1	6	0.13	0.87
18				**13**				**237**							

Table F.4.62
No Action Emissions Inventory - Rig Counts and Tier Levels by Operator and Year

		2006	2007		2008	
		Year-Round	Summer	Winter	Summer	Winter
Questar:	Tier 0:	2.5	4	1	0	0
	Tier 1:	4.2	0	0	0	0
	Tier 2:	0.9	6	5	0	1
	Total:	7.6	10	6	0	1
Ultra:	Tier 0:	6.4	10	5	0	0
	Tier 1:	4	6	3	0	1
	Tier 2:	0	0	0	0	0
	Total:	10.4	16	8	0	1
Shell:	Tier 0:	3	3	3	0	0
	Tier 1:	5	7	7	0	1
	Tier 2:	0	0	0	0	0
	Total:	8	10	10	0	1
Yates:	Tier 0:	0	0	0	0	0
	Tier 1:	1	1	1	0	1
	Tier 2:	0	0	0	0	0
	Total:	1	1	1	0	1
Anschutz:	Tier 0:	4	4	3	0	1
	Tier 1:	0	0	0	0	0
	Tier 2:	0	0	0	0	0
	Total:	4	4	3	0	1
BP/Stone:	Tier 0:	0	0	0	0	0
	Tier 1:	1	1	1	0	0
	Tier 2:	0	1	1	0	1
	Total:	1	2	2	0	1

Note: Totals based on rig schedules submitted by operators.

Table F.4.63
No Action Emissions Inventory - Total Drilling Rig Engine Emissions by Year

		2006			2007			2008		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Questar:	CO	161.49	161.49	577.66	93.25	56.51	252.86	0.00	9.49	4.55
	NO_x	219.82	219.82	802.24	257.42	121.81	632.09	0.00	16.42	7.88
	SO_2	0.17	0.17	0.59	0.22	0.13	0.59	0.00	0.02	0.01
	VOC	19.23	19.23	68.87	11.24	6.64	30.14	0.00	1.09	0.53
	PM_{10}	9.54	9.54	34.59	7.95	3.90	19.80	0.00	0.55	0.26
Ultra:	CO	168.31	168.31	591.87	255.82	127.91	729.79	0.00	28.65	18.91
	NO_x	327.93	327.93	1525.71	506.58	253.29	1440.74	0.00	23.26	15.35
	SO_2	4.56	4.56	19.89	7.01	3.51	19.95	0.00	0.44	0.29
	VOC	20.38	20.38	72.82	31.01	15.50	88.45	0.00	3.37	2.22
	PM_{10}	12.30	12.30	51.76	18.87	9.44	53.74	0.00	1.35	0.89
Shell:	CO	198.64	198.64	811.69	250.52	250.52	1020.69	0.00	31.80	15.26
	NO_x	248.09	248.09	1002.79	302.89	302.89	1222.69	0.00	25.81	12.39
	SO_2	3.94	3.94	15.98	4.86	4.86	19.70	0.00	0.49	0.23
	VOC	23.63	23.63	96.54	29.78	29.78	121.28	0.00	3.74	1.80
	PM_{10}	11.33	11.33	46.06	14.07	14.07	57.05	0.00	1.50	0.72
Yates:	CO	30.50	30.50	169.81	30.50	30.50	169.81	0.00	30.50	17.20
	NO_x	24.76	24.76	137.85	24.76	24.76	137.85	0.00	24.76	13.96
	SO_2	0.47	0.47	2.60	0.47	0.47	2.60	0.00	0.47	0.26
	VOC	3.59	3.59	19.98	3.59	3.59	19.98	0.00	3.59	2.02
	PM_{10}	1.44	1.44	7.99	1.44	1.44	7.99	0.00	1.44	0.81
Anschutz:	CO	35.74	35.74	105.71	35.74	26.80	105.71	0.00	8.93	5.04
	NO_x	156.30	156.30	462.32	156.30	117.22	462.32	0.00	39.07	22.04
	SO_2	1.87	1.87	5.52	1.87	1.40	5.52	0.00	0.47	0.26
	VOC	4.59	4.59	13.59	4.59	3.44	13.59	0.00	1.15	0.65
	PM_{10}	4.59	4.59	13.59	4.59	3.44	13.59	0.00	1.15	0.65
BP/Stone:	CO	30.50	30.50	191.04	39.83	39.83	166.32	0.00	9.33	5.26
	NO_x	24.76	24.76	155.08	40.90	40.90	170.81	0.00	16.15	9.11
	SO_2	0.02	0.02	0.13	0.04	0.04	0.18	0.00	0.02	0.01
	VOC	3.59	3.59	22.48	4.66	4.66	19.48	0.00	1.08	0.61
	PM_{10}	1.44	1.44	8.99	1.97	1.97	8.24	0.00	0.54	0.30
Total:	**CO**	625.16	625.16	2447.78	705.65	532.07	2445.18	0.00	118.69	66.23
	NO_x	1001.65	1001.65	4085.99	1288.85	860.88	4066.50	0.00	145.46	80.73
	SO_2	11.01	11.01	44.71	14.47	10.41	48.54	0.00	1.90	1.07
	VOC	75.01	75.01	294.27	84.87	63.62	292.91	0.00	14.02	7.82
	PM_{10}	40.63	40.63	162.98	48.89	34.26	160.41	0.00	6.51	3.63

[1] lb/hr based on worst case # of drill rigs operating at once.
[2] tpy numbers based on makeup of drill fleet and # of wells proposed to be drilled in given year.

Table F.4.64
No Action Emissions Inventory - Total Drilling Rig Boiler Emissions by Year

		2006		2007		2008	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Questar:	CO	0.80	1.75	0.63	1.38	0.11	0.23
	NO_x	3.80	8.32	3.00	6.57	0.50	1.10
	SO_2	0.02	0.05	0.02	0.04	0.00	0.01
	VOC	0.21	0.46	0.17	0.36	0.03	0.06
	PM_{10}	0.29	0.63	0.23	0.50	0.04	0.08
Ultra:	CO	1.09	2.39	0.84	1.84	0.11	0.23
	NO_x	5.20	11.39	4.00	8.76	0.50	1.10
	SO_2	0.03	0.07	0.02	0.05	0.00	0.01
	VOC	0.29	0.63	0.22	0.48	0.03	0.06
	PM_{10}	0.40	0.87	0.30	0.67	0.04	0.08
Shell:	CO	0.84	1.84	1.05	2.30	0.11	0.23
	NO_x	4.00	8.76	5.00	10.95	0.50	1.10
	SO_2	0.02	0.05	0.03	0.07	0.00	0.01
	VOC	0.22	0.48	0.28	0.60	0.03	0.06
	PM_{10}	0.30	0.67	0.38	0.83	0.04	0.08
Yates:	CO	0.11	0.23	0.11	0.23	0.11	0.23
	NO_x	0.50	1.10	0.50	1.10	0.50	1.10
	SO_2	0.00	0.01	0.00	0.01	0.00	0.01
	VOC	0.03	0.06	0.03	0.06	0.03	0.06
	PM_{10}	0.04	0.08	0.04	0.08	0.04	0.08
Anschutz:	CO	0.32	0.69	0.32	0.69	0.11	0.23
	NO_x	1.50	3.29	1.50	3.29	0.50	1.10
	SO_2	0.01	0.02	0.01	0.02	0.00	0.01
	VOC	0.08	0.18	0.08	0.18	0.03	0.06
	PM_{10}	0.11	0.25	0.11	0.25	0.04	0.08
BP/Stone:	CO	0.11	0.23	0.21	0.46	0.11	0.23
	NO_x	0.50	1.10	1.00	2.19	0.50	1.10
	SO_2	0.00	0.01	0.01	0.01	0.00	0.01
	VOC	0.03	0.06	0.06	0.12	0.03	0.06
	PM_{10}	0.04	0.08	0.08	0.17	0.04	0.08
Total:	**CO**	3.26	7.13	3.15	6.90	0.63	1.38
	NO_x	15.50	33.95	15.00	32.85	3.00	6.57
	SO_2	0.09	0.20	0.09	0.20	0.02	0.04
	VOC	0.85	1.87	0.83	1.81	0.17	0.36
	PM_{10}	1.18	2.58	1.14	2.50	0.23	0.50

[1] lb/hr based on worst case # of drill rigs operating at once.
[2] tpy numbers based on boilers running throughout the winter season (Nov.-April)

Table F.4.65
No Action Emissions Inventory - Total Construction Disturbance Emissions by Year

		2006		2007		2008		2009		2010		2011	
		(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]	(lb/hr)[1]	(tpy)[2]
Pad Construction/Expansion:	PM_{10}	2.04	2.23	5.58	6.10	0.09	0.10	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.54	0.59	1.47	1.61	0.02	0.03	N/A	N/A	N/A	N/A	N/A	N/A
Local Road Construction:	PM_{10}	0.51	0.56	1.80	1.97	0.02	0.02	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.13	0.15	0.48	0.52	0.01	0.01	N/A	N/A	N/A	N/A	N/A	N/A
Resource Road Construction:	PM_{10}	0.61	0.66	2.14	2.35	0.02	0.03	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.16	0.18	0.57	0.62	0.01	0.01	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction:	PM_{10}	1.69	1.85	5.99	6.56	0.07	0.07	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.45	0.49	1.58	1.73	0.02	0.02	N/A	N/A	N/A	N/A	N/A	N/A
Wind Erosion[3]:	PM_{10}	14.69	32.18	41.64	91.20	0.62	1.36	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	5.88	12.87	16.66	36.48	0.25	0.54	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline Construction:	PM_{10}	N/A	N/A	80.48	88.13	N/A	N/A	N/A	N/A	N/A	N/A	53.86	58.98
	$PM_{2.5}$	N/A	N/A	21.24	23.26	N/A	N/A	N/A	N/A	N/A	N/A	14.21	15.56
Ancillary Facility Construction:	PM_{10}	N/A	N/A	6.12	6.70	N/A	N/A	N/A	N/A	N/A	N/A	111.85	122.47
	$PM_{2.5}$	N/A	N/A	1.61	1.77	N/A	N/A	N/A	N/A	N/A	N/A	29.52	32.32
Total Construction Surface Disturbace Emissions:	PM_{10}	19.54	37.49	143.75	203.01	0.81	1.57	N/A	N/A	N/A	N/A	165.71	181.45
	$PM_{2.5}$	7.16	14.27	43.60	65.98	0.30	0.60	N/A	N/A	N/A	N/A	43.73	47.88

Note: Construction Surface Disturbance Emissions occur during summer months (May-Oct.) and daylight hours (12 hrs/day) only.
[1] lb/hr number based on 6 months of construction at 12 hrs/day.
[2] tpy numbers based on total construction occuring over a 6 month period between May and October of each year.
[3] Wind erosion lb/hr totals assume that construction is evenly distributed over the summer construction season.

Table F.4.66
No Action Emissions Inventory - Total Construction Traffic and Heavy Equipment Tailpipe Emissions by Year

		2006			2007			2008			2009			2010			2011		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Pad Construction Traffic[1]:	PM_{10}	28.94	0.00	31.68	48.65	0.00	53.27	0.84	0.00	0.92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	4.41	0.00	4.83	7.42	0.00	8.13	0.13	0.00	0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Road Construction Traffic:	PM_{10}	3.99	0.00	4.37	14.11	0.00	15.46	0.15	0.00	0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.61	0.00	0.67	2.15	0.00	2.36	0.02	0.00	0.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction Traffic:	PM_{10}	13.22	0.00	14.47	46.77	0.00	51.21	0.51	0.00	0.56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	2.02	0.00	2.21	7.15	0.00	7.83	0.08	0.00	0.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline ConstructionTraffic:	PM_{10}	N/A	N/A	N/A	30.50	0.00	33.40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16.27	0.00	17.81
	$PM_{2.5}$	N/A	N/A	N/A	4.67	0.00	5.11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49	0.00	2.72
Ancillary Facility Construction Traffic:	PM_{10}	N/A	N/A	N/A	1.32	0.00	1.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.52	0.00	2.76
	$PM_{2.5}$	N/A	N/A	N/A	0.20	0.00	0.22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.38	0.00	0.42
Well Pad Construction Heavy Equipment Tailpipe:	CO	61.59	0.00	67.45	168.31	0.00	184.30	2.63	0.00	2.88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	50.00	0.00	54.75	136.63	0.00	149.61	2.13	0.00	2.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.94	0.00	1.03	2.57	0.00	2.82	0.04	0.00	0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	7.25	0.00	7.93	19.80	0.00	21.68	0.31	0.00	0.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	2.90	0.00	3.17	7.92	0.00	8.67	0.12	0.00	0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Road Construction Heavy Equipment Tailpipe:	CO	3.66	0.00	4.01	12.96	0.00	14.19	0.14	0.00	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	2.97	0.00	3.26	10.52	0.00	11.52	0.11	0.00	0.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.06	0.00	0.06	0.20	0.00	0.22	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.43	0.00	0.47	1.52	0.00	1.67	0.02	0.00	0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	0.17	0.00	0.19	0.61	0.00	0.67	0.01	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pipeline Construction Heavy Equipment Tailpipe:	CO	1.12	0.00	1.22	3.95	0.00	4.32	0.04	0.00	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	0.91	0.00	0.99	3.21	0.00	3.51	0.03	0.00	0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.02	0.00	0.02	0.06	0.00	0.07	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.13	0.00	0.14	0.46	0.00	0.51	0.01	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{10/2.5}$	0.05	0.00	0.06	0.19	0.00	0.20	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sales Pipeline Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	2.58	0.00	2.82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.37	0.00	1.50
	NO_x	N/A	N/A	N/A	2.09	0.00	2.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.11	0.00	1.22
	SO_2	N/A	N/A	N/A	0.04	0.00	0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.02	0.00	0.02
	VOC	N/A	N/A	N/A	0.30	0.00	0.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.16	0.00	0.18
	$PM_{10/2.5}$	N/A	N/A	N/A	0.12	0.00	0.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.06	0.00	0.07

Table F.4.66
No Action Emissions Inventory - Total Construction Traffic and Heavy Equipment Tailpipe Emissions by Year

		2006			2007			2008			2009			2010			2011		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Ancillary Facility Heavy Equipment Tailpipe:	CO	N/A	N/A	N/A	17.07	0.00	18.69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96.30	0.00	105.45
	NO_x	N/A	N/A	N/A	13.86	0.00	15.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	78.17	0.00	85.60
	SO_2	N/A	N/A	N/A	0.26	0.00	0.29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.47	0.00	1.61
	VOC	N/A	N/A	N/A	2.01	0.00	2.20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.33	0.00	12.41
	$PM_{10/2.5}$	N/A	N/A	N/A	0.80	0.00	0.88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.53	0.00	4.96
Drilling Traffic:	PM_{10}	43.00	43.00	188.34	57.08	39.82	212.22	0.00	2.52	5.51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	6.54	6.54	28.64	8.68	6.06	32.27	0.00	0.38	0.84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rig Move Traffic:	PM_{10}	2.40	2.40	10.52	3.19	2.22	11.85	0.00	0.14	0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	0.37	0.37	1.61	0.49	0.34	1.82	0.00	0.02	0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drilling Haul Truck Tailpipe:	CO	6.02	6.02	13.19	4.00	2.79	14.86	0.00	0.18	0.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	4.67	4.67	10.24	3.10	2.16	11.54	0.00	0.14	0.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.05	0.05	0.12	0.04	0.02	0.13	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	2.32	2.32	5.09	1.54	1.08	5.74	0.00	0.07	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rig Move Haul Truck Tailpipe:	CO	0.22	0.22	0.96	0.29	0.20	1.09	0.00	0.01	0.03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	0.17	0.17	0.75	0.23	0.16	0.84	0.00	0.01	0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	0.08	0.08	0.37	0.11	0.08	0.42	0.00	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Construction Surface Disturbance Emissions:	**CO**	72.61	6.24	86.83	209.16	2.99	240.28	2.81	0.19	3.49	N/A	N/A	N/A	N/A	N/A	N/A	97.67	0.00	106.95
	NO_x	58.72	4.85	69.98	169.63	2.32	194.48	2.28	0.15	2.82	N/A	N/A	N/A	N/A	N/A	N/A	79.29	0.00	86.82
	SO_2	1.07	0.06	1.24	3.17	0.03	3.57	0.04	0.00	0.05	N/A	N/A	N/A	N/A	N/A	N/A	1.49	0.00	1.64
	VOC	10.22	2.41	14.01	25.76	1.16	32.55	0.33	0.07	0.52	N/A	N/A	N/A	N/A	N/A	N/A	11.49	0.00	12.58
	PM_{10}	94.67	45.40	252.80	211.27	42.05	389.42	1.63	2.66	7.61	N/A	N/A	N/A	N/A	N/A	N/A	23.38	0.00	25.60
	$PM_{2.5}$	17.08	6.91	41.38	40.41	6.40	68.29	0.36	0.40	1.28	N/A	N/A	N/A	N/A	N/A	N/A	7.47	0.00	8.18

Note: All tpy numbers except drilling related based on total emissions during the six month construction season (May-October).
All lb/hr numbers except drilling related based on this total and assumed to happen evenly over the daylight hours of the construction season (2190 hrs/yr).
All drilling numbers based on year-round drilling.
[1] For the purpose of estimating the number of pads constructed/expanded for the year and average of 15 acres per expansion/construction of a pad was used.
[2] Drilling traffic lb/hr based on average rigs in summer and winter.

Table F.4.67
No Action Emissions Inventory - Total Completion Emissions by Year

		2006 (lb/hr) Summer	2006 (lb/hr) Winter	2006 (tpy) Total	2007 (lb/hr) Summer	2007 (lb/hr) Winter	2007 (tpy) Total	2008 (lb/hr) Summer	2008 (lb/hr) Winter	2008 (tpy) Total
Frac and Other Completion Engine Emissions:	CO	47.39	47.39	207.56	70.51	36.29	233.89	0.37	2.40	6.08
	NO_x	82.02	82.02	359.25	122.03	62.81	404.81	0.64	4.16	10.51
	SO_2	2.37	2.37	10.38	3.53	1.81	11.69	0.02	0.12	0.30
	VOCs	5.47	5.47	23.95	8.14	4.19	26.99	0.04	0.28	0.70
	$PM_{10/2.5}$	2.73	2.73	11.97	4.07	2.09	13.49	0.02	0.14	0.35
Completion Traffic:	PM_{10}	39.58	39.58	173.35	58.89	30.31	195.34	0.31	2.01	5.07
	$PM_{2.5}$	6.07	6.07	26.58	9.03	4.65	29.95	0.05	0.31	0.78
Completion/Testing Haul Truck Tailpipe:	CO	2.51	2.51	10.99	3.73	1.92	12.39	0.02	0.13	0.32
	NO_x	1.95	1.95	8.53	2.90	1.49	9.61	0.02	0.10	0.25
	SO_2	0.03	0.03	0.12	0.04	0.02	0.13	0.00	0.00	0.00
	VOC	0.97	0.97	4.24	1.44	0.74	4.78	0.01	0.05	0.12
Total Frac/Completion Emissions:	CO	49.90	49.90	218.56	74.24	38.21	246.28	0.39	2.53	6.40
	NO_x	83.97	83.97	367.78	124.93	64.30	414.42	0.66	4.26	10.76
	SO_2	2.40	2.40	10.50	3.57	1.84	11.83	0.02	0.12	0.31
	VOCs	6.44	6.44	28.19	9.58	4.93	31.77	0.05	0.33	0.83
	PM_{10}	42.31	42.31	185.33	62.96	32.40	208.83	0.33	2.15	5.42
	$PM_{2.5}$	8.80	8.80	38.56	13.10	6.74	43.45	0.07	0.45	1.13

[1] lb/hr number based on tpy and Summer/Winter average emissions.
[2] tpy numbers based on number of wells drilled per year.

Table F.4.68
No Action Inventory - Total Construction Emissions by Year

		2006 (lb/hr) Summer	2006 (lb/hr) Winter	2006 (tpy) Total	2007 (lb/hr) Summer	2007 (lb/hr) Winter	2007 (tpy) Total	2008 (lb/hr) Summer	2008 (lb/hr) Winter	2008 (tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	19.54	0.00	37.49	143.75	0.00	203.01	0.81	0.00	1.57
	$PM_{2.5}$	7.16	0.00	14.27	43.60	0.00	65.98	0.30	0.00	0.60
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	72.61	6.24	86.83	209.16	2.99	240.28	2.81	0.19	3.49
	NO_x	58.72	4.85	69.98	169.63	2.32	194.48	2.28	0.15	2.82
	SO_2	1.07	0.06	1.24	3.17	0.03	3.57	0.04	0.00	0.05
	VOC	10.22	2.41	14.01	25.76	1.16	32.55	0.33	0.07	0.52
	PM_{10}	94.67	45.40	252.80	211.27	42.05	389.42	1.63	2.66	7.61
	$PM_{2.5}$	17.08	6.91	41.38	40.41	6.40	68.29	0.36	0.40	1.28
Drill Rig Engine Emissions by Year:	CO	625.16	625.16	2447.78	705.65	532.07	2445.18	0.00	118.69	66.23
	NOx	1001.65	1001.65	4085.99	1288.85	860.88	4066.50	0.00	145.46	80.73
	SO2	11.01	11.01	44.71	14.47	10.41	48.54	0.00	1.90	1.07
	VOC	75.01	75.01	294.27	84.87	63.62	292.91	0.00	14.02	7.82
	PM10/2.5	40.63	40.63	162.98	48.89	34.26	160.41	0.00	6.51	3.63
Drill Rig Boiler Emissions by Year:	CO	0.00	3.26	7.13	0.00	3.15	6.90	0.00	0.63	1.38
	NOx	0.00	15.50	33.95	0.00	15.00	32.85	0.00	3.00	6.57
	SO2	0.00	0.09	0.20	0.00	0.09	0.20	0.00	0.02	0.04
	VOC	0.00	0.85	1.87	0.00	0.83	1.81	0.00	0.17	0.36
	PM10/2.5	0.00	1.18	2.58	0.00	1.14	2.50	0.00	0.23	0.50
Completion Emissions by Year:	CO	49.90	49.90	218.56	74.24	38.21	246.28	0.39	2.53	6.40
	NO_x	83.97	83.97	367.78	124.93	64.30	414.42	0.66	4.26	10.76
	SO_2	2.40	2.40	10.50	3.57	1.84	11.83	0.02	0.12	0.31
	VOCs	6.44	6.44	28.19	9.58	4.93	31.77	0.05	0.33	0.83
	PM_{10}	42.31	42.31	185.33	62.96	32.40	208.83	0.33	2.15	5.42
	$PM_{2.5}$	8.80	8.80	38.56	13.10	6.74	43.45	0.07	0.45	1.13
TOTAL CONSTRUCTION EMISSIONS BT YEAR:	**CO**	747.68	684.56	2760.30	989.05	576.43	2938.63	3.20	122.04	77.49
	NO_x	1144.34	1105.96	4557.69	1583.41	942.50	4708.26	2.94	152.87	100.88
	SO_2	14.48	13.56	56.64	21.20	12.36	64.13	0.06	2.04	1.47
	VOCs	91.67	84.71	338.35	120.20	70.53	359.04	0.38	14.58	9.53
	PM_{10}	197.15	129.52	641.18	466.87	109.85	964.16	2.78	11.55	18.73
	$PM_{2.5}$	73.67	57.52	259.77	146.00	48.54	340.63	0.73	7.59	7.14

Table F.4.68
No Action Inventory - Total Construction Emissions by Year

		2009			2010			2011		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Total Construction Disturbance Emissions by Year:	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	165.71	0.00	181.45
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	43.73	0.00	47.88
Construction Traffic and Heavy Equipment Tailpipe Emissions by Year:	CO	N/A	N/A	N/A	N/A	N/A	N/A	97.67	0.00	106.95
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	79.29	0.00	86.82
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	1.49	0.00	1.64
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	11.49	0.00	12.58
	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	23.38	0.00	25.60
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	7.47	0.00	8.18
Drill Rig Engine Emissions by Year:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NOx	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM10/2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drill Rig Boiler Emissions by Year:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NOx	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM10/2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Completion Emissions by Year:	CO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	VOCs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL CONSTRUCTION EMISSIONS BT YEAR:	**CO**	N/A	N/A	N/A	N/A	N/A	N/A	97.67	0.00	106.95
	NO_x	N/A	N/A	N/A	N/A	N/A	N/A	79.29	0.00	86.82
	SO_2	N/A	N/A	N/A	N/A	N/A	N/A	1.49	0.00	1.64
	VOCs	N/A	N/A	N/A	N/A	N/A	N/A	11.49	0.00	12.58
	PM_{10}	N/A	N/A	N/A	N/A	N/A	N/A	189.09	0.00	207.06
	$PM_{2.5}$	N/A	N/A	N/A	N/A	N/A	N/A	51.20	0.00	56.06

Table F.4.69
No Action Emissions Inventory - Total Production Emissions by Year

		2005	2006 (lb/hr) Summer	2006 (lb/hr) Winter	2006 (tpy) Total	2007 (lb/hr) Summer	2007 (lb/hr) Winter	2007 (tpy) Total	2008 (lb/hr) Summer	2008 (lb/hr) Winter	2008 (tpy) Total
# of Wells Drilled:		172		205			231			6	
# of Wells in Production:		286		458			663			894	
Production Traffic:	PM_{10}	See 2005 Inventory	24.15	24.15	105.77	34.96	34.96	153.11	47.13	47.13	206.45
	$PM_{2.5}$		3.70	3.70	16.22	5.36	5.36	23.48	7.23	7.23	31.66
Liquids Gathering Haul Truck Traffic:	PM_{10}		20.60	20.60	90.22	35.27	35.27	154.48	47.53	47.53	208.20
	$PM_{2.5}$		3.16	3.16	13.83	5.41	5.41	23.69	7.29	7.29	31.92
Production Haul Truck Tailpipe:	CO		1.97	1.97	8.64	3.38	3.38	14.79	4.55	4.55	19.94
	NO_x		1.53	1.53	6.70	2.62	2.62	11.48	3.53	3.53	15.47
	SO_2		0.02	0.02	0.09	0.04	0.04	0.16	0.05	0.05	0.22
	VOC		0.76	0.76	3.33	1.30	1.30	5.71	1.76	1.76	7.70
Production Wind Erosion:	PM_{10}		55.56	55.56	243.37	60.73	60.73	266.00	76.11	76.11	333.37
	$PM_{2.5}$		22.23	22.23	97.35	24.29	24.29	106.40	30.45	30.45	133.35
Separator/Indirect Line Heaters:	$PM_{10/2.5}$		0.26	0.91	2.57	0.38	1.32	3.72	0.51	1.78	5.02
	SO_2		0.02	0.07	0.20	0.03	0.10	0.29	0.04	0.14	0.40
	NO_x		3.44	12.02	33.85	4.97	17.40	49.00	6.71	23.47	66.08
	CO		0.72	2.52	7.11	1.04	3.65	10.29	1.41	4.93	13.88
	VOC		0.19	0.66	1.86	0.27	0.96	2.70	0.37	1.29	3.63
Dehy Reboiler Heaters:	$PM_{10/2.5}$		0.03	0.10	0.29	0.04	0.15	0.42	0.06	0.20	0.57
	SO_2		0.00	0.01	0.02	0.00	0.01	0.03	0.00	0.02	0.04
	NO_x		0.39	1.36	3.84	0.56	1.97	5.55	0.76	2.66	7.49
	CO		0.08	0.29	0.81	0.12	0.41	1.17	0.16	0.56	1.57
	VOC		0.02	0.07	0.21	0.03	0.11	0.31	0.04	0.15	0.41
Dehy Flashing Emissions[1]:	VOC		111.21	111.21	487.09	137.32	137.32	601.45	163.92	163.92	717.95
	Total HAPs		75.51	75.51	330.71	93.23	93.23	408.36	111.29	111.29	487.45
	Benzene		12.55	12.55	54.98	15.50	15.50	67.89	18.50	18.50	81.04
	Toluene		33.94	33.94	148.66	41.91	41.91	183.56	50.02	50.02	219.11
	Ethylbenzene		1.61	1.61	7.07	1.99	1.99	8.73	2.38	2.38	10.42
	Xylene		26.33	26.33	115.32	32.51	32.51	142.40	38.81	38.81	169.98
	n-Hexane		0.94	0.94	4.14	1.17	1.17	5.11	1.39	1.39	6.10
Fugitive HAPs and VOCs:	VOC		16.55	16.55	72.50	17.89	17.89	78.35	22.62	22.62	99.06
	Total HAPs		0.37	0.37	1.63	0.40	0.40	1.76	0.51	0.51	2.23
	Benzene		0.06	0.06	0.27	0.07	0.07	0.29	0.08	0.08	0.37
	Toluene		0.11	0.11	0.47	0.12	0.12	0.51	0.15	0.15	0.65
	Ethylbenzene		0.00	0.00	0.02	0.00	0.00	0.02	0.01	0.01	0.02
	Xylene		0.04	0.04	0.19	0.05	0.05	0.20	0.06	0.06	0.25
	n-Hexane		0.16	0.16	0.68	0.17	0.17	0.74	0.21	0.21	0.93

Table F.4.69
No Action Emissions Inventory - Total Production Emissions by Year

		2005	2006 (lb/hr) Summer	2006 (lb/hr) Winter	2006 (tpy) Total	2007 (lb/hr) Summer	2007 (lb/hr) Winter	2007 (tpy) Total	2008 (lb/hr) Summer	2008 (lb/hr) Winter	2008 (tpy) Total
	VOC		130.84	130.84	573.10	161.56	161.56	707.65	192.86	192.86	844.71
	Total HAPs		6.47	6.47	28.32	7.98	7.98	34.97	9.53	9.53	41.74
	Benzene		0.31	0.31	1.36	0.38	0.38	1.67	0.46	0.46	2.00
	Toluene		0.02	0.02	0.07	0.02	0.02	0.08	0.02	0.02	0.10
Condensate Storage[1]:	Ethylbenzene		0.18	0.18	0.80	0.23	0.23	0.99	0.27	0.27	1.18
	Xylene		0.23	0.23	1.02	0.29	0.29	1.26	0.34	0.34	1.51
	n-Hexane		5.72	5.72	25.07	7.07	7.07	30.96	8.44	8.44	36.95
	NOx		11.35	11.35	49.73	12.27	12.27	53.75	15.52	15.52	67.96
	CO		61.78	61.78	270.61	66.77	66.77	292.46	84.42	84.42	369.78
	NOx		107.81	107.81	472.19	107.81	107.81	472.19	107.81	107.81	472.19
	CO		40.11	40.11	175.66	40.11	40.11	175.66	40.11	40.11	175.66
	VOC		80.72	80.72	353.55	80.72	80.72	353.55	80.72	80.72	353.55
Proposed Compression:	PM10		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM2.5		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SO2		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Formaldehyde		10.26	10.26	44.93	10.26	10.26	44.93	10.26	10.26	44.93
	NOx:		196.64	196.64	861.30	265.53	265.53	1163.00	265.53	265.53	1163.00
	CO:		191.03	191.03	836.70	264.73	264.73	1159.50	264.73	264.73	1159.50
	VOCs:		86.99	86.99	381.00	119.00	119.00	521.20	119.00	119.00	521.20
	SO2:	**See 2005**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM10:	**Inventory**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opal and Granger Production	Benzene:		2.65	2.65	11.61	2.72	2.72	11.91	2.72	2.72	11.91
Emissions:	Toluene:		0.78	0.78	3.40	0.80	0.80	3.50	0.80	0.80	3.50
	Ethylbenzene:		0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00
	Xylene:		0.39	0.39	1.70	0.41	0.41	1.80	0.41	0.41	1.80
	n-Hexane:		2.01	2.01	8.80	2.08	2.08	9.10	2.08	2.08	9.10
	Formaldehyde:		7.65	7.65	33.50	15.30	15.30	67.00	15.30	15.30	67.00
	Total HAPs:		13.70	13.70	60.00	21.53	21.53	94.30	21.53	21.53	94.30
	NOx		321.16	330.72	1427.62	393.76	407.60	1754.98	399.84	418.51	1792.19
	CO		295.69	297.70	1299.52	376.14	379.05	1653.87	395.37	399.29	1740.32
	VOC		427.28	427.81	1872.64	518.09	518.85	2270.90	581.27	582.30	2548.22
	PM10		100.60	101.33	442.22	131.38	132.43	577.73	171.35	172.77	753.62
	PM2.5		29.38	30.10	130.26	35.48	36.53	157.71	45.53	46.95	202.52
TOTAL PRODUCTION	**SO2**		0.04	0.10	0.32	0.07	0.15	0.49	0.09	0.21	0.66
EMISSIONS:	**Formaldehyde**		17.91	17.91	78.43	25.56	25.56	111.93	25.56	25.56	111.93
	Benzene		15.58	15.58	68.22	18.67	18.67	81.77	21.76	21.76	95.32
	Toluene		34.84	34.84	152.60	42.84	42.84	187.65	50.99	50.99	223.36
	Ethylbenzene		2.03	2.03	8.89	2.45	2.45	10.73	2.88	2.88	12.62
	Xylene		26.99	26.99	118.23	33.26	33.26	145.66	39.62	39.62	173.54
	n-Hexane		8.83	8.83	38.69	10.48	10.48	45.90	12.12	12.12	53.08
	Total HAPs		106.30	106.30	465.59	133.41	133.41	584.32	153.12	153.12	670.65

[1] 90% Controlled - 10% Uncontrolled.

Table F.4.69
No Action Emissions Inventory - Total Production Emissions by Year

		2009 (lb/hr) Summer	2009 (lb/hr) Winter	2009 (tpy) Total	2010 (lb/hr) Summer	2010 (lb/hr) Winter	2010 (tpy) Total	2011 (lb/hr) Summer	2011 (lb/hr) Winter	2011 (tpy) Total
# of Wells Drilled:			0			0			0	
# of Wells in Production:			900			900			900	
Production Traffic:	PM_{10}	47.45	47.45	207.84	47.45	47.45	207.84	47.45	47.45	207.84
	$PM_{2.5}$	7.28	7.28	31.87	7.28	7.28	31.87	7.28	7.28	31.87
Liquids Gathering Haul Truck Traffic:	PM_{10}	55.23	55.23	241.89	60.22	60.22	263.75	65.00	65.00	284.72
	$PM_{2.5}$	8.47	8.47	37.09	9.23	9.23	40.44	9.97	9.97	43.66
Production Haul Truck Tailpipe:	CO	5.29	5.29	23.16	5.77	5.77	25.25	6.22	6.22	27.26
	NO_x	4.10	4.10	17.98	4.47	4.47	19.60	4.83	4.83	21.16
	SO_2	0.06	0.06	0.25	0.06	0.06	0.27	0.07	0.07	0.30
	VOC	2.04	2.04	8.94	2.23	2.23	9.75	2.40	2.40	10.52
Production Wind Erosion:	PM_{10}	76.33	76.33	334.31	76.33	76.33	334.31	76.33	76.33	334.31
	$PM_{2.5}$	30.53	30.53	133.72	30.53	30.53	133.72	30.53	30.53	133.72
Separator/Indirect Line Heaters:	$PM_{10/2.5}$	0.51	1.80	5.06	0.51	1.80	5.06	0.51	1.80	5.06
	SO_2	0.04	0.14	0.40	0.04	0.14	0.40	0.04	0.14	0.40
	NO_x	6.75	23.63	66.52	6.75	23.63	66.52	6.75	23.63	66.52
	CO	1.42	4.96	13.97	1.42	4.96	13.97	1.42	4.96	13.97
	VOC	0.37	1.30	3.66	0.37	1.30	3.66	0.37	1.30	3.66
Dehy Reboiler Heaters:	$PM_{10/2.5}$	0.06	0.20	0.57	0.06	0.20	0.57	0.06	0.20	0.57
	SO_2	0.00	0.02	0.05	0.00	0.02	0.05	0.00	0.02	0.05
	NO_x	0.77	2.68	7.54	0.77	2.68	7.54	0.77	2.68	7.54
	CO	0.16	0.56	1.58	0.16	0.56	1.58	0.16	0.56	1.58
	VOC	0.04	0.15	0.41	0.04	0.15	0.41	0.04	0.15	0.41
Dehy Flashing Emissions[1]:	VOC	87.15	87.15	381.72	67.33	67.33	294.89	56.47	56.47	247.34
	Total HAPs	59.17	59.17	259.17	45.71	45.71	200.22	38.34	38.34	167.93
	Benzene	9.84	9.84	43.09	7.60	7.60	33.29	6.37	6.37	27.92
	Toluene	26.60	26.60	116.50	20.55	20.55	90.00	17.23	17.23	75.49
	Ethylbenzene	1.26	1.26	5.54	0.98	0.98	4.28	0.82	0.82	3.59
	Xylene	20.63	20.63	90.37	15.94	15.94	69.82	13.37	13.37	58.56
	n-Hexane	0.74	0.74	3.24	0.57	0.57	2.50	0.48	0.48	2.10
Fugitive HAPs and VOCs:	VOC	22.67	22.67	99.29	22.67	22.67	99.29	22.67	22.67	99.29
	Total HAPs	0.51	0.51	2.23	0.51	0.51	2.23	0.51	0.51	2.23
	Benzene	0.08	0.08	0.37	0.08	0.08	0.37	0.08	0.08	0.37
	Toluene	0.15	0.15	0.65	0.15	0.15	0.65	0.15	0.15	0.65
	Ethylbenzene	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02
	Xylene	0.06	0.06	0.25	0.06	0.06	0.25	0.06	0.06	0.25
	n-Hexane	0.21	0.21	0.93	0.21	0.21	0.93	0.21	0.21	0.93

Table F.4.69
No Action Emissions Inventory - Total Production Emissions by Year

		2009			2010			2011		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
Condensate Storage[1]:	VOC	102.54	102.54	449.12	79.21	79.21	346.96	66.44	66.44	291.01
	Total HAPs	5.07	5.07	22.19	3.91	3.91	17.14	3.28	3.28	14.38
	Benzene	0.24	0.24	1.06	0.19	0.19	0.82	0.16	0.16	0.69
	Toluene	0.01	0.01	0.05	0.01	0.01	0.04	0.01	0.01	0.03
	Ethylbenzene	0.14	0.14	0.63	0.11	0.11	0.48	0.09	0.09	0.41
	Xylene	0.18	0.18	0.80	0.14	0.14	0.62	0.12	0.12	0.52
	n-Hexane	4.49	4.49	19.65	3.47	3.47	15.18	2.91	2.91	12.73
	NOx	15.55	15.55	68.11	15.55	15.55	68.11	15.55	15.55	68.11
	CO	84.62	84.62	370.62	84.62	84.62	370.62	84.62	84.62	370.62
Proposed Compression:	NOx	121.47	121.47	532.06	121.47	121.47	532.06	383.22	383.22	1678.52
	CO	53.77	53.77	235.53	53.77	53.77	235.53	278.23	278.23	1218.65
	VOC	81.54	81.54	357.14	81.54	81.54	357.14	304.14	304.14	1332.13
	PM10	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.04
	PM2.5	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.03
	SO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Formaldehyde	11.22	11.22	49.12	11.22	11.22	49.12	25.85	25.85	113.22
Opal and Granger Production Emissions:	NOx:	265.53	265.53	1163.00	265.53	265.53	1163.00	274.09	274.09	1200.50
	CO:	264.73	264.73	1159.50	264.73	264.73	1159.50	279.00	279.00	1222.00
	VOCs:	119.00	119.00	521.20	119.00	119.00	521.20	145.78	145.78	638.50
	SO2:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PM10:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Benzene:	2.72	2.72	11.91	2.72	2.72	11.91	3.95	3.95	17.31
	Toluene:	0.80	0.80	3.50	0.80	0.80	3.50	2.08	2.08	9.10
	Ethylbenzene:	0.23	0.23	1.00	0.23	0.23	1.00	0.23	0.23	1.00
	Xylene:	0.41	0.41	1.80	0.41	0.41	1.80	0.94	0.94	4.10
	n-Hexane:	2.08	2.08	9.10	2.08	2.08	9.10	2.67	2.67	11.70
	Formaldehyde:	15.30	15.30	67.00	15.30	15.30	67.00	15.41	15.41	67.50
	Total HAPs:	21.53	21.53	94.30	21.53	21.53	94.30	25.27	25.27	110.70
TOTAL PRODUCTION EMISSIONS:	**NOx**	414.17	432.96	1855.21	414.54	433.33	1856.83	685.21	703.99	3042.35
	CO	409.98	413.93	1804.36	410.46	414.41	1806.45	649.64	653.59	2854.08
	VOC	415.35	416.38	1821.48	372.38	373.42	1633.30	598.31	599.35	2622.87
	PM10	179.58	181.00	789.67	184.57	185.99	811.53	189.36	190.79	832.53
	PM2.5	46.85	48.27	208.32	47.61	49.04	211.67	48.35	49.78	214.91
	SO2	0.10	0.22	0.70	0.11	0.22	0.72	0.11	0.23	0.74
	Formaldehyde	26.51	26.51	116.12	26.51	26.51	116.12	41.26	41.26	180.72
	Benzene	12.88	12.88	56.43	10.59	10.59	46.39	10.57	10.57	46.29
	Toluene	27.56	27.56	120.70	21.50	21.50	94.19	19.47	19.47	85.27
	Ethylbenzene	1.64	1.64	7.19	1.32	1.32	5.79	1.15	1.15	5.02
	Xylene	21.28	21.28	93.23	16.55	16.55	72.49	14.48	14.48	63.43
	n-Hexane	7.52	7.52	32.92	6.33	6.33	27.72	6.27	6.27	27.47
	Total HAPs	97.49	97.49	427.02	82.88	82.88	363.02	93.26	93.26	408.47

Table F.4.70
No Action Emissions Inventory - Total Emissions by Year

		2006			2007			2008			2009			2010			2011		
		(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total	(lb/hr) Summer	(lb/hr) Winter	(tpy) Total
TOTAL CONSTRUCTION EMISSIONS:	CO	747.68	684.56	2760.30	989.05	576.43	2938.63	3.20	122.04	77.49	N/A	N/A	N/A	N/A	N/A	N/A	97.67	0.00	106.95
	NO_x	1144.34	1105.96	4557.69	1583.41	942.50	4708.26	2.94	152.87	100.88	N/A	N/A	N/A	N/A	N/A	N/A	79.29	0.00	86.82
	SO_2	14.48	13.56	56.64	21.20	12.36	64.13	0.06	2.04	1.47	N/A	N/A	N/A	N/A	N/A	N/A	1.49	0.00	1.64
	VOCs	91.67	84.71	338.35	120.20	70.53	359.04	0.38	14.58	9.53	N/A	N/A	N/A	N/A	N/A	N/A	11.49	0.00	12.58
	PM_{10}	197.15	129.52	641.18	466.87	109.85	964.16	2.78	11.55	18.73	N/A	N/A	N/A	N/A	N/A	N/A	189.09	0.00	207.06
	$PM_{2.5}$	73.67	57.52	259.77	146.00	48.54	340.63	0.73	7.59	7.14	N/A	N/A	N/A	N/A	N/A	N/A	51.20	0.00	56.06
TOTAL PRODUCTION EMISSIONS:	NOx	321.16	330.72	1427.62	393.76	407.60	1754.98	399.84	418.51	1792.19	414.17	432.96	1855.21	414.54	433.33	1856.83	685.21	703.99	3042.35
	CO	295.69	297.70	1299.52	376.14	379.05	1653.87	395.37	399.29	1740.32	409.98	413.93	1804.36	410.46	414.41	1806.45	649.64	653.59	2854.08
	VOC	427.28	427.81	1872.64	518.09	518.85	2270.90	581.27	582.30	2548.22	415.35	416.38	1821.48	372.38	373.42	1633.30	598.31	599.35	2622.87
	PM10	100.60	101.33	442.22	131.38	132.43	577.73	171.35	172.77	753.62	179.58	181.00	789.67	184.57	185.99	811.53	189.36	190.79	832.53
	PM2.5	29.38	30.10	130.26	35.48	36.53	157.71	45.53	46.95	202.52	46.85	48.27	208.32	47.61	49.04	211.67	48.35	49.78	214.91
	SO2	0.04	0.10	0.32	0.07	0.15	0.49	0.09	0.21	0.66	0.10	0.22	0.70	0.11	0.22	0.72	0.11	0.23	0.74
	Formaldehyde	17.91	17.91	78.43	25.56	25.56	111.93	25.56	25.56	111.93	26.51	26.51	116.12	26.51	26.51	116.12	41.26	41.26	180.72
	Benzene	15.58	15.58	68.22	18.67	18.67	81.77	21.76	21.76	95.32	12.88	12.88	56.43	10.59	10.59	46.39	10.57	10.57	46.29
	Toluene	34.84	34.84	152.60	42.84	42.84	187.65	50.99	50.99	223.36	27.56	27.56	120.70	21.50	21.50	94.19	19.47	19.47	85.27
	Ethylbenzene	2.03	2.03	8.89	2.45	2.45	10.73	2.88	2.88	12.62	1.64	1.64	7.19	1.32	1.32	5.79	1.15	1.15	5.02
	Xylene	26.99	26.99	118.23	33.26	33.26	145.66	39.62	39.62	173.54	21.28	21.28	93.23	16.55	16.55	72.49	14.48	14.48	63.43
	n-Hexane	8.83	8.83	38.69	10.48	10.48	45.90	12.12	12.12	53.08	7.52	7.52	32.92	6.33	6.33	27.72	6.27	6.27	27.47
	Total HAPs	106.30	106.30	465.59	133.41	133.41	584.32	153.12	153.12	670.65	97.49	97.49	427.02	82.88	82.88	363.02	93.26	93.26	408.47
TOTAL NO ACTION EMISSIONS:	**NOx**	1465.50	1436.68	5985.31	1977.17	1350.10	6463.23	402.78	571.38	1893.07	414.17	432.96	1855.21	414.54	433.33	1856.83	764.49	703.99	3129.17
	CO	1043.37	982.26	4059.82	1365.19	955.47	4592.50	398.57	521.34	1817.82	409.98	413.93	1804.36	410.46	414.41	1806.45	747.32	653.59	2961.03
	VOC	518.95	512.52	2210.99	638.29	589.38	2629.94	581.65	596.88	2557.75	415.35	416.38	1821.48	372.38	373.42	1633.30	609.80	599.35	2635.45
	PM10	297.75	230.85	1083.40	598.25	242.28	1541.90	174.13	184.31	772.35	179.58	181.00	789.67	184.57	185.99	811.53	378.45	190.79	1039.58
	PM2.5	103.04	87.62	390.04	181.48	85.07	498.33	46.26	54.54	209.66	46.85	48.27	208.32	47.61	49.04	211.67	99.55	49.78	270.97
	SO2	14.53	13.66	56.96	21.27	12.51	64.62	0.16	2.25	2.13	0.10	0.22	0.70	0.11	0.22	0.72	1.61	0.23	2.38
	Formaldehyde	17.91	17.91	78.43	25.56	25.56	111.93	25.56	25.56	111.93	26.51	26.51	116.12	26.51	26.51	116.12	41.26	41.26	180.72
	Benzene	15.58	15.58	68.22	18.67	18.67	81.77	21.76	21.76	95.32	12.88	12.88	56.43	10.59	10.59	46.39	10.57	10.57	46.29
	Toluene	34.84	34.84	152.60	42.84	42.84	187.65	50.99	50.99	223.36	27.56	27.56	120.70	21.50	21.50	94.19	19.47	19.47	85.27
	Ethylbenzene	2.03	2.03	8.89	2.45	2.45	10.73	2.88	2.88	12.62	1.64	1.64	7.19	1.32	1.32	5.79	1.15	1.15	5.02
	Xylene	26.99	26.99	118.23	33.26	33.26	145.66	39.62	39.62	173.54	21.28	21.28	93.23	16.55	16.55	72.49	14.48	14.48	63.43
	n-Hexane	8.83	8.83	38.69	10.48	10.48	45.90	12.12	12.12	53.08	7.52	7.52	32.92	6.33	6.33	27.72	6.27	6.27	27.47
	Total HAPs	106.30	106.30	465.59	133.41	133.41	584.32	153.12	153.12	670.65	97.49	97.49	427.02	82.88	82.88	363.02	93.26	93.26	408.47

Appendix G

Cumulative Emissions Inventory

G.1 STATE AGENCY-PERMITTED INDUSTRIAL SOURCE INVENTORY

G.1.1 State Air-Quality Regulatory Authority

The determination of sources to inventory was based on the date a source was permitted and its operation start-up date. The following criteria were the basis on which sources were included or excluded:

- Include sources permitted and operating January 1, 2005 – February 1, 2006.
- Include if permitted July 1, 2003 – December 31, 2004 but not yet operating.
- Exclude sources permitted and operating prior to January 1, 2005; sources listed but with permits cancelled or rescinded; and sources with no NO_x, SO_2, or PM_{10} emissions.

A list of permitted sources within the inventory boundary was provided by the WDEQ-AQD or other state's air quality agency. The inventory boundary extended 200 km from the Pinedale Anticline Project Area, and was defined by the following extents:

Northern Extent: Lat 44.75 degrees N
Eastern Extent: Long 106.86 degrees W
Southern Extent: Lat 40.50 degrees N
Western Extent: Long 112.85 degrees W

The inclusion/exclusion determination was made either at the initial list stage, depending upon the detail of information provided, or when the physical file was examined. Throughout the process, excluded facilities and reason for exclusion were documented.

For all included sources, the following information was collected if available:

- County
- Facility name
- Unique facility ID number
- Permit number
- Permit issuance date
- Operation start-up date
- Unique source ID numbers and SIC codes if available
- Source description
- Site location (lat/long, UTM and zone, and/or section township range)
- Site elevation
- Permitted change in NO_x, SO_2, PM_{10}, and $PM_{2.5}$ emission rate by source during inventory period
- Stack exit parameters: height, temp, velocity, diameter, and flow rate

The change in permitted emission limits occurring during the inventory period was obtained for included sources, either through a physical file search or from the state agency. $PM_{2.5}$ data was not available for sources in any state. $PM_{2.5}$ emissions were calculated based on the ratio of $PM_{2.5}$ to PM_{10} using assumptions for natural gas combustion, coal combustion, or fugitive particulates, consistent with the $PM_{2.5}$ calculation approach used in the Vernal, Utah RMP Inventory.

For any modification to an included permitted source:

- The permitted increase or decrease in emissions was determined between the period pre-January 1, 2005 and the inventory period (January 1, 2005 –February 1, 2006).
- The permitted increase or decrease was obtained from permit documents by locating a description of change or by recording both new and old permit limits.
- Emissions decreases were tracked for major sources only (>250 tpy).
- Emissions increases of less than 1 tpy were not tracked.

For each site, multiple stacks were combined into a single representative emission point for the cumulative modeling. The following methodology was used in combining the stacks.

- Combine total change in emissions by site and pollutant
- Select stack parameters using the following hierarchy:
  - Select stack with greatest "M" value using SCREEN method outlined in "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised", EPA-454/R-92-019.
  - Review "M" values and, if they are not representative of the overall facility, use stack parameters from the single point exhibiting the highest emission rate.
  - Select worst-case parameters based on the source with greatest potential for maximum long-range impacts (i.e., high temperature, stack height, exit velocity).
  - If no stack parameters are available, determine the SIC code for the facility and substitute the stack parameters given for that SIC code in the EPA SIC code parameter guidance. If a single stack parameter value is missing and the SIC code is known, the single value is substituted from SIC code stack parameter guidance when reasonable.
  - If the SIC code is not known, or if no representative SIC code values are found, use generic stack parameters of 15-m height, 422° Kelvin temperature, 0.31-m exit diameter, and 10.0-m per second (m/sec) exit velocity. If a single parameter is missing from any source for which no SIC code is known or available, the single generic parameter is substituted.

G.1.2 State-Specific Methodologies

The inventory area includes a portion of Wyoming, Colorado, Utah, and Idaho. Due to the differences in data provided by each state, some minor differences in inventory procedures were necessary. The following are state-specific procedures used in the inventory.

Colorado

A list of permitted sources meeting the requested criteria was provided in electronic format by CDPHE. Permit documents were provided in .PDF format for these facilities; specifically, the most recent permit and all previous permits for the facility were requested to allow determination of change in emissions. These permits were reviewed to determine change in emissions for each new source or modification. If a facility had both an Initial and a Final permit and there were differences between the Initial and Final permit limits, the differences were documented as a permitted emissions change. Permits with ".CN" suffixes are cancelled, ".XP" indicates permit exempt, ".XA" indicates both APEN and permit exempt, ".GF" indicates grandfathered and all permits with theses extensions were excluded from inventory. "F" indicates fugitive source. Because no start-up dates were found in the files reviewed, and because of Colorado's procedures for Initial and Final permit issuance, all permits issued through February 1, 2006 were conservatively assumed to be operational as of February 1, 2006. Colorado included state-permitted sources are shown in Table C.1 and Colorado excluded state-permitted sources are shown in Table C.2.

Idaho

IDEQ generated a list of permitted facilities within the inventory area and provided those permits in electronic format. All permitted facilities were assumed operational and stack exit parameters were obtained from files when available. Idaho included state-permitted sources are shown in Table C.3 and Idaho excluded state-permitted sources are shown in Table C.4.

Utah

UDAQ supplied electronic versions of Approval Order documents and a list of stack parameters in electronic format. Approval Orders were examined for change in emissions. If no emissions change was listed in the Approval Order, change in emissions was calculated based on the difference between the current facility total emissions as reported by UDAQ and facility total emissions from the most recent permit as reported by UDAQ. Because UDAQ does not track start-up dates electronically, and no physical file search at UDAQ offices was required for any other reason, all permitted sources were assumed operational. Utah included state-permitted sources are shown in Table C.5 and Utah excluded state-permitted sources are shown in Table C.6.

Wyoming

WDEQ-AQD provided a list of permitted facilities within the state. Permit files for all facilities listed were reviewed on-site at WDEQ-AQD offices in Cheyenne to obtain necessary data. For any WY facilities classified as production sites with emissions increases greater than 3 tpy, the files were reviewed for any combustion equipment and the facility was included if any single piece of combustion equipment emitted more than 2 tpy. All other production sites were

assumed to be included in WOGCC production estimates. Start-up dates were provided by WDEQ-AQD to determine the operating status of a facility. Due to the variation in start-up data, all facilities permitted within the inventory timeframe were assumed to be operational. Stack exit parameters were obtained from permit files when available. Wyoming included state-permitted sources are shown in Table C.7 and Wyoming excluded state-permitted sources are shown in Table C.8.

G.1.3 Natural Gas and Oil Well Agency-Permitted Sources

Natural gas and oil well data were gathered by obtaining permitted well listings from state oil and gas permitting agencies including the Wyoming Oil and Gas Conservation Commission (WOGCC), the Colorado Oil and Gas Conservation Commission (COGCC), the Utah Department of Natural Resources-Division of Oil, Gas, and Mining (UDNR-DOGM), and the Idaho Oil and Gas Conservation Commission (IOGCC). Wells with permits issued between January 1, 2005 and February 1, 2006 were inventoried. An average emission rate per unit natural gas well of 0.12 tpy NO_x was used based on a weighted average well emission rate, calculated from the wells proposed within the modeling domain. An average emission rate of 0.3 tpy NO_x was obtained from WDEQ-AQD for oil wells. These representative emission rates were applied to calculate total NO_x emissions per county. PM_{10}, $PM_{2.5}$, and SO_2 emissions were assumed to be negligible from oil and gas wells.

All oil and gas agency-permitted well data are included in Table C.9. There were no wells located in Idaho in the modeling domain for the January 1, 2005 through February 1, 2006 inventory period.

G.2 RFD INVENTORY

In accordance with definitions agreed upon by BLM, EPA, WDEQ-AQD, and USDA Forest Service for use in EIS projects, RFD was defined as 1) the NEPA-authorized but not yet developed portions of NEPA projects and 2) not yet authorized NEPA projects for which air quality analyses were in progress and for which emissions had been quantified. RFD within the inventory area was compiled, including portions of Wyoming, Colorado, Idaho, and Utah. BLM field offices located within the inventory area were contacted to determine potential RFD sources. NEPA projects were only quantified for the Wyoming portion of the inventory domain. There were no oil and gas NEPA projects located in the Colorado, Idaho, and Utah portions of the inventory domain.

A list of BLM and other agency NEPA projects was developed from current BLM NEPA Hot Sheet listings, from conversations with field office staff, and from recent RFD inventory projects conducted by TRC. A draft NEPA list was provided to the PAP Project Manager in the PFO for submittal to each Wyoming BLM Field Office, along with a request for feedback regarding the inclusion of listed projects. The following information was requested:

- Number of natural gas, CBM, or oil wells developed within a NEPA project area which could be counted toward well totals authorized in a specific NEPA document. Alternatively, wells remaining to be developed within project area.
- Compression or other combustion equipment developed with a NEPA project area which could be counted toward authorized totals.
- Any EIS or EA located within the Wyoming portion of the cumulative study area that had been scoped but was not on the list provided. A map showing the cumulative study area was attached. Some projects known to be fully developed were shown as excluded.
- Information on any future projects not yet scoped. A qualitative discussion of such projects could be necessary in air quality impacts summarization.

No information on specific development status within each field was available from BLM. Therefore, data was obtained from the WOGCC and WDEQ-AQD to determine permitted wells and permitted compressor engines, respectively. Well development by project area was determined by geographically plotting well locations, counting the wells located within each project area that were permitted after the project authorization date, and using those well counts to determine remaining authorized wells for that project area. No compressor development data was available for any BLM field office. As a result, compressors historically permitted through WDEQ-AQD were geographically plotted, and those located in or associated with a specific project area that were permitted after the project authorization date were subtracted from total authorized compression for that project area.

Emissions from RFD were summarized by project for all pollutants for which data was available. Any excluded projects and the exclusion reason were documented. A summary of RFD is included in Table C.10.

G.3 QA/QC PROCEDURES

The QA/QC procedure followed throughout the inventory process is a follows:

- Procedures for data collection and processing were documented (see above).
- Files were obtained digitally directly from agency when possible to eliminate transcription errors.
- When physical file searches were required, relevant documents were photocopied when possible so input could be completed in an orderly manner, transcription errors could be minimized, and documents could be reviewed without return to agency premises if questions arise.
- All input values were checked once following initial input for numerical errors, and again following completion of input group for reasonableness.
- Exclusions and questionable data were documented. Such methods used to single out incorrect data include: examine UTM zone by county, plotting geographic locations, and spot-checking data points to determine reasonableness.
- Issuing agency was contacted with permit questions rather than making assumptions.

- All data were entered into databases with consistent format to eliminate inconsistency between states.
- Database query results were spot-checked manually to ensure accuracy.
- Inventory was peer reviewed at several stages during development and upon completion.

G.4 LIST OF TABLES INCLUDED IN APPENDIX G

Table G.1 State-Permitted Source Inventory – CDPHE APCD Permitted Sources – Table of Included Sources
Table G.2 State-Permitted Source Inventory – CDPHE APCD Permitted Sources – Table of Excluded Sources
Table G.3 State-Permitted Source Inventory – IDEQ Permitted Sources – Table of Included Sources
Table G.4 State-Permitted Source Inventory – IDEQ Permitted Sources – Table of Excluded Sources
Table G.5 State-Permitted Source Inventory – UDAQ Permitted Sources – Table of Included Sources
Table G.6 State-Permitted Source Inventory – UDAQ Permitted Sources – Table of Excluded Sources
Table G.7 State-Permitted Source Inventory – WDEQ-AQD Permitted Sources – Table of Included Sources
Table G.8 State-Permitted Source Inventory – WDEQ-AQD Permitted Sources – Table of Excluded Sources
Table G.9 State-Permitted Source Inventory – WOGCC, COGCC, and UDNR-DOGM – Table of Well NO_x Emission by State, for Wells Permitted after January 1, 2005
Table G.10 RFD - Table of Sources – Includes NEPA Projects Through May 2006

Table G.1 – State-Permitted Source Inventory - CDPHE APCD Permitted Sources - Table of Included Sources

State	County	Facility Name	Facility ID	Permit Number	Stack Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)
Colorado	Moffat	J-W Operating Company	148	99MF0797	6.10	699.67	45.73	0.305	27.70	0.007	0.110
Colorado	Moffat	Koch Exploration Company LLC	169	03MF0434	3.05	808.00	12.50	0.101	21.45	1.420	1.520
Colorado	Moffat	Cedar Ridge LLC	248	04MF0467	4.27	294.11	12.50	0.253	28.40	0.003	0.048
Colorado	Moffat	Cedar Ridge LLC	248	04MF0468	4.27	294.11	12.50	0.253	12.20	0.013	0.211
Colorado	Moffat	Western Gas Resources	268	05MF0004	3.35	835.78	97.56	0.091	2.00	0.004	0.070
								Total	**91.7**	**1.4**	**2.0**

Table G.2 - State-Permitted Source Inventory - CDPHE APCD Permitted Sources – Table of Excluded Sources

State	County	Facility	Facility ID	Permit Number	Reason for Exclusion
Colorado	Moffat	Questar	49	950PMF031	current APEN expired
Colorado	Moffat	Questar	49	950PMF031	current APEN expired
Colorado	Moffat	Questar	49	950PMF031	current APEN expired
Colorado	Moffat	Questar	49	950PMF031	current APEN expired
Colorado	Moffat	Questar	49	90MF242	no change, APEN update only
Colorado	Moffat	Questar	49	950PMF031	current APEN expired
Colorado	Moffat	Questar	49	950PMF031	current APEN expired
Colorado	Moffat	Wexpro	55	88MF142-1	source began 2004
Colorado	Moffat	Wexpro	55	88MF142-3	source began 2004
Colorado	Moffat	Wexpro	55	95MF632	transfer of ownership
Colorado	Moffat	Moffatt Road Dept.	63	91MF103F	transfer of ownership
Colorado	Moffat	Questar	67	91MF625	current APEN expired
Colorado	Moffat	Questar	67	01MF0039	source began 2004
Colorado	Moffat	Questar	75	95MF955-1	current APEN expired
Colorado	Moffat	Questar	76	96MF715-1 (G	Grandfathered
Colorado	Moffat	Questar	76	96MF715-2 (X	Permit Exempt
Colorado	Moffat	Questar	76	96MF715-3 (G	Grandfathered
Colorado	Moffat	Questar	76	96MF715-4 (G	Grandfathered
Colorado	Moffat	Questar	76	96MF715-5 (G	Grandfathered
Colorado	Moffat	Questar	76	04MF0936	no change, APEN update only
Colorado	Moffat	Wexpro	79	93MF1132	source began 2004
Colorado	Moffat		81	97MF0469F	current APEN expired
Colorado	Moffat	Questar	97	95MF1016	no change, APEN update only
Colorado	Moffat	Questar	98	95MF1017	no change, APEN update only
Colorado	Moffat	Questar	100	94MF422	source began 2004
Colorado	Moffat	Jetta Operation	105	94MF789	source began 2004
Colorado	Moffat	Big West Oil and Gas	108	95MF004-2	current APEN expired
Colorado	Moffat	Ocean Energy	112	95MF025	source began 2004
Colorado	Moffat	Ensign	112	02MF0134	no change, APEN update only
Colorado	Moffat	Umetco	122	95MF035	source began 2003
Colorado	Moffat	Questar	132	97MF0336	current APEN expired
Colorado	Moffat		133	02MF0001	no change, APEN update only
Colorado	Moffat	Argali	143	01MF0993	current APEN expired
Colorado	Moffat	Journey Operation	152	97MF0493	source began 2004
Colorado	Moffat	Western Gas	153	97MF0649	change in emissions,throughput or equipment 04/2004
Colorado	Moffat	Grant Mortuary	154	98MF0573	current APEN expired
Colorado	Moffat	True Oil	156	00MF0111	current APEN expired
Colorado	Moffat	True Oil	157	00MF0474	no change, APEN update only
Colorado	Moffat	Questar	161	01MF0787	transfer of ownership
Colorado	Moffat	Questar	161	03MF0662	source began 2004
Colorado	Moffat	Tipperary Corp.	168	02MF0371	current APEN expired
Colorado	Moffat	Koch Exploration	168	03MF0808	transfer of ownership
Colorado	Moffat	Koch Exploration	169	02MF0686	change in emissions,throughput or equipment 07/2004
Colorado	Moffat	Koch Exploration	177	03MF0809	current APEN expired
Colorado	Moffat	Koch Exploration	178	03MF0810	current APEN expired
Colorado	Moffat	Koch Exploration	223	03MF0811	change in emissions,throughput or equipment 07/2004
Colorado	Moffat	Koch Exploration	224	03MF0812	change in emissions,throughput or equipment 07/2004

Table G.2 - State-Permitted Source Inventory - CDPHE APCD Permitted Sources – Table of Excluded Sources

State	County	Facility	Facility ID	Permit Number	Reason for Exclusion
Colorado	Moffat	Koch Exploration	228	03MF0943	current APEN expired
Colorado	Moffat	Encana Oil and Gas	229	03MF1025	transfer of ownership
Colorado	Moffat	Cedar Ridge	244	04MF0463	source began June 2004
Colorado	Moffat	Cedar Ridge	245	04MF0464	source began June 2004
Colorado	Moffat	Cedar Ridge	246	04MF0465	source began June 2004
Colorado	Moffat	Cedar Ridge	247	04MF0466	source began June 2004
Colorado	Moffat	Cedar Ridge	250	04MF0470	source began June 2004
Colorado	Moffat	Cedar Ridge	251	04MF0471	source began June 2004
Colorado	Moffat	Cedar Ridge	251	04MF0472	source began June 2004
Colorado	Moffat	Cedar Ridge	252	04MF0473	source began June 2004
Colorado	Moffat	Cedar Ridge	253	04MF0474	source began June 2004
Colorado	Moffat	Cedar Ridge	254	04MF0475	source began June 2004
Colorado	Moffat	Western Gas	261	04MF1033	source began December 2004
Colorado	Moffat	Western Gas	261	04MF1050	source began December 2004
Colorado	Moffat	Koch Exploration	269	03MF1070	source began December 2004
Colorado	Moffat	Koch Exploration	272	04MF1135	source began Sept 2004
Colorado	Routt	Duckels Construction	32	99RO0624F	transfer of ownership
Colorado	Routt	Duckels Construction	36	91RO409F	current APEN expired
Colorado	Routt	Duckels Construction	75	99RO0342F	transfer of ownership
Colorado	Routt	Duckels Construction	75	99RO0342F	transfer of ownership
Colorado	Routt	Ed Hockin	80	01RO0299	current APEN expired
Colorado	Moffat	Questar	49	GRAND.000007	Grandfathered
Colorado	Moffat	Questar	67	GRAND.000007	Grandfathered
Colorado	Moffat	Grynberg Petroleum Company	72	92MF1363F.XP	Permit Exempt
Colorado	Moffat	Questar	75	95MF955-2.XP	Permit Exempt
Colorado	Moffat	Questar	75	95MF955-3.CN	Cancelled
Colorado	Moffat	Questar	85	93MF1655-1XP	Permit Exempt
Colorado	Moffat	Three Sons Corp.	96	94MF157F.XP	Permit Exempt
Colorado	Moffat	Thomas Operation	111	02MF0073.XP	Permit Exempt
Colorado	Moffat	Argali Exploration	133	00MF0693.XP	Permit Exempt
Colorado	Moffat	Koch Exploration	178	03MF0133.CN	Cancelled
Colorado	Moffat	Koch Exploration	221	03MF0316.XP	Permit Exempt
Colorado	Moffat	Encana Oil and Gas	225	04MF1325 XP	Permit Exempt
Colorado	Moffat	Encana Oil and Gas	227	04MF1324 XP	Permit Exempt
Colorado	Routt	Duckels Construction	48	93RO926F.XP	Permit Exempt

Table G.3 - State-Permitted Source Inventory - IDEQ Permitted Sources - Table of Included Sources

State	County	Facility Name	Facility ID	Permit Number	Stack Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)
Idaho	Bonneville	Busch Agricultural Resources, Inc	019-00025	P-040520	31.10	422.0	10.00	1.10	0.00	0.00	2.95
Idaho	Jefferson	Idaho Pacific Corporation	051-00013	P-040521	15.00	422.0	10.00	0.31	0.00	0.00	6.57
Idaho	Oneida	Hess Pumice Products, Inc.	071-00003	P-050307	15.00	422.0	10.00	0.31	18.92	4.01	24.27
Idaho	Jefferson	Busch Agricultural Resources, Inc	051-00015	P-040523	15.00	422.0	10.00	0.31	0.00	0.00	12.14
								Total	**18.9**	**4.0**	**45.9**

Table G.4 - State-Permitted Source Inventory - IDEQ Permitted Sources - Table of Excluded Sources

State	County_Name	Company	Facility ID	Permit Number	Reason For Exclusion
Idaho	Caribou	Nu-West Industries, Inc	029-00003	P-050312	Permit for new stack no applicable emissions
Idaho	Bonneville	GModelo Agriculture, Inc.	019-00050	P-040526	Permit to clarify NSPS for units
Idaho	Franklin	Bear River Zeolite Co.	041-00010	P-040310	Permit for equipment that was constructed without a permit
Idaho	Madison	Norsun Food Group, Inc	065-00013	P-040511	Facility was constructed without first obtaining a PTC from DEQ. PTC contains conditions to limit the facility's potential to emit to protect ambient air quality standards.
Idaho	Bingham	Blackfoot Facility of Basic American Foods (BAF)	011-00012	P-050301	Permit to construct to add more fuel flexibility, facility operations already exist
Idaho	Madison	Norsun Food Group, Inc.	065-00013	P-050501	Permit for equipment that was constructed without a permit
Idaho	Bonneville	Busch Agricultural Resources, Inc	019-00028	P-050504	Permit to address applicability of Standards of Performance.
Idaho	Caribou	Nu-West Industries, Inc.,	029-00027	T2-040323	No Change
Idaho	Power	ConAgra Foods Packaged Foods Company, Inc	077-00017	T2-040324	facility name change

Table G.5 - State-Permitted Source Inventory - UDAQ Permitted Sources - Table of Included Sources

State	County	Facility Name	Facility ID	Permit Number	Stack Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Utah	Asphalt Materials Incorporated	10343	AN0343008-05	724	12.20	351.9	0.48	0.91	-0.770	-0.240	-0.280
Utah	ATK Thiokol Propulsion	10009	AN0009106-05	14008	1.83	299.7	0.27	0.30	0.000	0.000	0.000
Utah	Boeing Company (The)	10425	AN0425006-05	169320	9.15	414.1	1.81	0.30	0.000	0.000	0.000
Utah	Cabinetry by Karman	10558	AN0558005-05	7739	14.12	350.0	10.03	0.91	0.000	0.000	0.000
Utah	Carriage Industries LLC	10052	AN0052004-05	174447	7.93	294.1	0.41	0.91	0.000	0.000	0.000
Utah	Central Valley Water Reclamation Fac.	10414	AN0414008-05	3955	11.89	505.2	0.73	0.30	4.720	0.650	0.310
Utah	Chevron Products Co - SL Refinery	10119	AN0119063-05	4334	50.30	908.0	0.06	0.61	0.000	0.000	0.000
Utah	Construction Products Company	10407	AN0407007-05	16679	14.12	350.0	10.03	0.91	0.000	0.000	0.000
Utah	Easton Technical Products	10365	AN0365009-05	10524	10.06	298.6	0.11	1.52	0.000	0.000	0.000
Utah	Flying J Incorporated	10122	AN0122034-05	1299	73.17	616.3	0.24	0.91	0.000	0.000	0.000
Utah	Fresenius Medical Care	10951	AN0951013-05	12214	10.67	449.7	0.33	0.30	0.000	0.000	0.000
Utah	Geneva Rock Products	10021	AN0021005-05	17152	11.68	326.2	15.37	0.73	0.000	0.000	0.000
Utah	Granite Construction Company	12272	AN2272007-05	170616	14.12	350.0	10.03	0.91	2.130	0.200	0.850
Utah	Hexcel Corporation	11386	AN1386013-05	8779	13.72	421.9	0.10	0.30	17.260	7.050	0.000
Utah	Holcim (US) Inc.	10007	AN0007019-05	172684	0.91	366.3	0.41	0.30	0.000	0.000	0.000
Utah	Holly Refining & Marketing Company	10123	AN0123020-05	5505	10.67	727.4	0.24	0.30	-4.310	0.080	-0.150
Utah	KC Asphalt LLC	12469	AN2469004-05	173427	14.12	350.0	10.03	0.91	0.000	0.000	0.220
Utah	Kennecott Utah Copper Corporation	10571	AN0571017-05	987	11.68	326.2	15.37	0.73	-6.950	-86.300	-1.190
Utah	Kennecott Utah Copper Corporation	10572	AN0572017-05	4041	41.16	418.6	0.09	3.05	0.000	0.000	-6.940
Utah	Lakeview Rock Products	10439	AN0439006-05	20805	11.68	326.2	15.37	0.73	0.000	0.000	0.840
Utah	LDS Church	10578	AN0578004-05	168211	6.40	421.9	0.17	1.22	7.030	1.490	0.510
Utah	Nucor Steel	10008	AN0008019-05	15515	9.15	321.9	0.81	0.61	-35.800	0.000	0.000
Utah	Owens Corning	10033	AN0033009-06	13517	10.37	324.7	0.13	0.30	0.000	0.000	0.000
Utah	PacifiCorp	10355	AN0355012-05	13691	15.00	422.0	10.00	0.31	4.530	0.570	0.030
Utah	Salt Lake City Department of Airports	10450	AN0450014-05	13749	22.87	441.3	0.01	0.30	8.380	0.520	2.010
Utah	Silver Eagle Refining - Woods Cross Inc.	10124	AN0124015-05	5666	7.62	366.3	10.00	0.31	1.070	0.230	0.160
Utah	Staker & Parson Companies	10928	AN0928005-05	12950	15.00	422.0	10.00	0.31	0.000	0.000	0.000
Utah	Staker & Parson Companies	10972	AN0972003-05	13028	14.12	350.0	10.03	0.91	0.000	0.000	0.000
Utah	Swift & Co. - Miller's Blue Ribbon Beef	10051	AN0051007-05	171712	11.89	477.4	10.03	0.61	38.840	36.220	11.700
Utah	Tesoro West Coast	10335	AN0335026-05	14661	53.35	350.0	0.04	0.61	0.000	0.000	0.000
Utah	Tooele Army Depot	11594	AN1594031-05	2614	1.52	435.8	1.15	0.30	0.620	0.050	0.050
Utah	Vulcraft	10028	AN0028009-05	9990	7.62	338.6	0.79	0.30	-37.670	-1.950	1.670
Utah	Watson Laboratories Incorporated	10517	AN0517007-05	8317	0.91	533.0	0.03	0.30	5.020	1.050	0.160
Utah	Westinghouse Electric Company LLC	10922	AN0922012-05	1751	6.10	588.6	0.01	0.91	0.000	0.000	0.000
								Total	4.1	-40.4	10.0

Table G.6 - State-Permitted Source Inventory - UDAQ Permitted Sources - Table of Excluded Sources

State	Company	Facility (Site ID)	Stack ID	Permit Number	Reason For Exclusion
Utah	Desert Power LP	12519	171812	AN2519007-05	Out of Modeling domain

Table G.7 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources -Table of Included Sources

State	County Name	Company	Facility	Permit Number	Stack ID	Stack Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)
WY	Big Horn	American Colloid Company	Lovell Plant	wv-3983	DC-13	12.23	342.7	15.49	0.95	0.00	0.00	2.46
WY	Big Horn	American Colloid Company	Lovell Plant	wv-3984	BV-16	12.23	342.7	15.49	0.95	85.40	70.70	156.60
WY	Carbon	Anadarko E&P Company, LP	Brown Cow Injection Facility	CT-4005	ANKBCE1	9.14	762.0	38.60	0.25	22.20	0.00	0.00
WY	Carbon	Anadarko E&P Company, LP	Federal 1691 8I Injection Well	MD-1110	G2	10.10	762.0	38.60	0.25	22.20	0.00	0.00
WY	Sweetwater	Anadarko E&P Company, LP	Higgins Dehydration Facility	CT-4008	F-002	15.00	422.0	10.00	0.31	0.90	74.40	0.00
WY	Sweetwater	Anadarko E&P Company, LP	Rock Springs Area Compression	wv-4261	RBE	11.77	450.5	9.51	0.82	10.20	0.00	0.00
WY	Sweetwater	Anadarko E&P Company, LP	Table Rock Gas Plant	MD-1214	TGI	15.00	422.0	10.00	0.31	-54.40	0.20	0.00
WY	Carbon	Anadarko Gathering Company	Doty Mountain Compressor Station	CT-3349A	CAT	11.00	762.0	38.60	0.25	-5.80	0.00	0.00
WY	Carbon	Anadarko Gathering Company	Red Rim Compressor Station	CT-3393A	CAT	11.00	762.0	38.60	0.25	-12.00	0.00	0.00
WY	Carbon	Anadarko Gathering Company	Sun Dog CBM Unit Pod 6	MD-1092	CAT	7.23	730.4	71.57	0.25	16.70	0.00	0.00
WY	Sweetwater	Anadarko Petroleum Company	Greasewood Wash 11-35	CT-4095	Flare	11.77	450.5	9.51	0.82	69.30	0.00	0.00
WY	Sweetwater	Anadarko Petroleum Company	Greasewood Wash CBM Pilot	wv-3762	ANA-3762-01	15.00	422.0	10.00	0.31	4.20	0.00	0.00
WY	Sweetwater	Anadarko Petroleum Company	UPRC SWD 4-1	wv-3758	E1b	15.00	422.0	10.00	0.31	18.20	0.00	0.00
WY	Sublette	Anticline Disposal Company	Anticline Disposal Facility	wv-2873	Cat3408TA	15.00	422.0	10.00	0.31	-29.05	-3.84	0.00
WY	Fremont	B T Inc.	Bonneville Soda Ash Transfer Site	MD-1286	DC-5	15.00	422.0	10.00	0.31	0.00	0.00	6.50
WY	Park	Big Horn Basin Development, Inc.	Polecat LPC 1	wv-4014	E1	7.09	422.0	30.05	0.10	3.90	0.00	0.00
WY	Natrona	Bill Barrett Corporation	Cave Gulch 5-30	MD-1313	E1	7.33	730.4	49.69	0.31	38.80	0.00	0.00
WY	Natrona	Bill Barrett Corporation	Cave Gulch Gas Conditioning Plant	MD-994A	E1	38.00	810.9	38.40	1.00	-6.50	0.00	0.00
WY	Natrona	Bill Barrett Corporation	Hitchcock Draw	CT-4076	BBHDE2	11.43	730.4	19.69	0.31	38.80	0.00	0.00
WY	Fremont	Bill Barrett Corporation	Poison Creek Compressor Station	CT-3788	BBPCE1	9.14	730.4	50.16	0.30	38.80	0.00	0.00
WY	Fremont	Bill Barrett Corporation	Squaw Butte 33-32	wv-3322	E1	9.05	509.8	12.50	0.76	4.10	0.00	0.00
WY	Natrona	Bill Barrett Corporation	Stone Cabin 11-27	wv-3321	E1	9.05	509.8	12.50	0.76	4.10	0.00	0.00
WY	Carbon	BP America Production Company	Champlin 444 A1	wv-2661(CORRECTED)	E1	6.50	563.0	5.56	0.34	3.50	0.00	0.00
WY	Sublette	BP America Production Company	Pinedale Area Reserve Pit Fluids Evaporation	wv-3860	H1	15.00	422.0	10.00	0.31	7.50	0.00	0.00
WY	Big Horn	BPM Minerals, LLC	Lovell Plant	MD-1233	D1	12.23	342.7	15.49	0.95	20.10	0.00	0.00
WY	Fremont	Burlington Resources Oil and Gas Co	MBE Compressor	MD-1292	CET	2.38	388.0	10.00	0.30	8.30	0.00	0.00
WY	Carbon	C&B Sand and Gravel	C&B Sand and Gravel Quarry	CT-3881	HR	9.05	509.8	12.50	0.76	0.00	0.00	8.00
WY	Carbon	Cedar Ridge, LLC	State 34-13-89 #1	wv-3556	VORTEC	11.77	450.5	9.51	0.82	3.60	0.00	0.00
WY	Sublette	Chevron USA, Inc.	Birch Creek Compressor Station @ Battery A	MD-1317	E7	7.62	894.3	11.47	0.36	4.60	0.00	0.00
WY	Sweetwater	Chevron USA, Inc.	Table Rock Compressor Station	MD-1191	E1	11.00	762.0	38.60	0.25	-1.80	0.00	0.00
WY	Fremont	Delta Exploration Company, Inc.	Copper Mountain Unit #35-13	wv-4071	A1	6.60	507.4	13.90	0.33	6.00	0.00	0.00
WY	Fremont	Delta Exploration Company, Inc.	Diamond State #36-13	wv-3997	Ajax	6.60	507.4	13.90	0.33	6.00	0.00	0.00
WY	Fremont	Delta Exploration Company, Inc.	Diamond State #36-31	wv-4007	E1	6.60	507.4	13.90	0.33	6.00	0.00	0.00
WY	Fremont	Delta Exploration Company, Inc.	Gates Butte Unit #10-17	wv-4072	E1	6.60	507.4	13.90	0.33	6.00	0.00	0.00
WY	Carbon	Devon Energy Production Company, L.P.	Baggs Mainline/ Blue Gap Compressor Station	MD-1163	E4	2.59	835.9	26.84	0.10	19.20	0.00	0.00
WY	Carbon	Double Eagle Petroleum Company	Cow Creek Central Production Facility	MD-1047A	W1	5.40	722.0	26.00	0.25	-10.90	0.00	0.00
WY	Washakie	Dowell Schlumberger	Worland	wv-3687	Cement	11.68	326.2	15.37	0.73	0.00	0.00	4.80
WY	Lincoln	Duke Energy Field Services, LP	Muddy Creek Compressor Station	CT-3384	MC1	9.75	895.3	29.40	0.36	16.20	0.00	0.00
WY	Sweetwater	Duke Energy Field Services, LP	Yates Bicycle Federal Compressor #18	CT-3477	E1	1.38	693.0	12.69	0.40	6.30	0.00	0.00
WY	Sweetwater	Duke Energy Field Services, LP	Yates Bicycle Federal Compressor #6	CT-3507	E1	1.38	693.0	12.69	0.40	6.30	0.00	0.00
WY	Sweetwater	Duke Energy Field Services, LP	Yates Huffy State Compressor #16	CT-3508	E1	1.38	693.0	12.69	0.40	6.30	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	Five Mile Creek Booster Station	CT-3921	E1	9.05	509.8	12.50	0.76	18.30	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	Frenchie Draw/Graham Unit #5	CT-3467	E1	7.93	903.6	32.90	0.38	36.00	0.00	0.00
WY	Natrona	Encana Oil and Gas (USA), Inc.	GBU #7 Central Tank Battery	CT-4019	Ajax	6.60	516.0	13.77	0.36	4.40	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	GBU Monita 1 Central Facility	CT-3949	E1	11.77	450.5	9.51	0.82	19.40	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	Indian Butte 23-44	wv-4156	E1	11.77	450.5	9.51	0.82	3.20	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	Midway Compressor Station	CT-3920	E1	7.09	422.0	30.05	0.10	36.90	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	Moneta Compressor Station	CT-3950	E1	9.05	509.8	12.50	0.76	38.90	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	Pavillion Compressor Station	wv-3053	E1	7.70	525.0	14.40	0.44	-183.30	0.00	0.00
WY	Fremont	Encana Oil and Gas (USA), Inc.	South Pavillion Booster Station	MD-1213	COMP1	7.32	748.7	46.43	0.30	18.30	0.00	0.00
WY	Sublette	EOG Resources	BPMV B Tank Battery	wv-2825	AJAX	4.83	500.0	5.45	0.31	3.70	0.00	0.00
WY	Sweetwater	ESS	BP Man Camp	wv-4276	GEN	11.77	450.5	9.51	0.82	20.90	0.00	0.00
WY	Lincoln	Excalibar Minerals, Inc.	Kemmerer Plant	CT-4139	RM	10.70	450.0	37.80	0.36	0.70	0.00	3.00
WY	Sublette	Fairbanks Jones, LLC	Applequist Pit	CT-4028	CRUSH	11.68	326.2	15.37	0.73	0.00	0.00	2.90
WY	Sublette	Fremont Sand & Gravel	Hagenstien Pit	CT-3878	TL/SP	9.05	509.8	12.50	0.76	0.00	0.00	3.10
WY	Teton	Hillwood Bar BC, LLC	Bar BC Gravel Pit	CT-3978	HA	11.68	326.2	15.37	0.73	0.00	0.00	16.80
WY	Uinta	H-K Contractors	Marvin Danielson Pit	CT-4144	SP	11.68	326.2	15.37	0.73	3.40	0.00	28.30

Table G.7 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources -Table of Included Sources

State	County Name	Company	Facility	Permit Number	Stack ID	Stack Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)
WY	Sweetwater	Hyland Enterprises, Inc.	Red Rock Pit/Hyland	CT-3946	TL/SP	7.09	422.0	30.05	0.10	0.00	0.00	4.50
WY	Sweetwater	Hyland Enterprises, Inc.	White Rock Pit South	CT-4057	HR	11.68	326.2	15.37	0.73	0.00	0.00	227.90
WY	Sweetwater	Infinity Oil & Gas of Wyoming	Black Bear 1	wv-3120	ACP	11.77	450.5	9.51	0.82	3.90	0.00	0.00
WY	Sublette	Infinity Oil & Gas of Wyoming	Riley Ridge Federal 11-4	wv-3520	LPE	11.77	450.5	9.51	0.82	3.80	0.00	0.00
WY	Sublette	Infinity Oil & Gas of Wyoming	Riley Ridge Federal 14-33	wv-3518	LPE	11.77	450.5	9.51	0.82	3.80	0.00	0.00
WY	Teton	Jackson Hole Ski Corporation	Ski Resort	wv-3890	CE	15.00	422.0	10.00	0.31	6.30	0.00	0.00
WY	Sublette	Joe's Concrete & Lumber Incorporated	Fear Pit	CT-3972	C&S	11.68	326.2	15.37	0.73	5.60	0.60	3.80
WY	Sublette	Jonah Gas Gathering Company	Bird Canyon/County Line Compressor Station	MD-1013	E3	12.80	642.0	47.56	0.20	115.40	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Bird Canyon/County Line Compressor Station	MD-1122	E1_2	14.80	738.7	37.18	0.50	3.00	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Bird Canyon/County Line Compressor Station	MD-1131	E3	12.80	751.0	36.33	0.20	49.30	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Falcon Compressor Station	MD-1104	Cat2	7.62	808.0	21.97	0.50	42.20	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Falcon Compressor Station	MD-1186	E2	6.10	737.0	19.06	0.20	5.00	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Luman Compressor Station	MD-1000	G4	10.00	642.0	47.56	0.20	31.50	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Luman Compressor Station	MD-1192	E1_2	13.70	726.5	28.65	0.71	49.60	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Paradise Compressor Station	MD-1139	E1	10.00	642.0	47.56	0.20	16.40	0.00	0.00
WY	Sublette	Jonah Gas Gathering Company	Paradise Compressor Station	MD-1187	E6_7_8	14.80	726.5	28.65	0.71	74.40	0.00	0.00
WY	Lincoln	Jonah Gas Gathering Company	Pioneer Dew Point Depression Plant	MD-999A	Flare	15.00	422.0	10.00	0.31	-0.10	0.00	0.00
WY	Sweetwater	J-W Operating Company	Battle Compressor Site	wv-4096	W1	1.73	509.8	12.50	0.76	4.10	0.00	0.00
WY	Carbon	Marathon Oil Company	Echo Springs 21-2	MD-1290	E1	11.77	450.5	9.51	0.82	6.40	0.00	0.00
WY	Park	Marathon Oil Company	Oregon Basin Gas Plant	wv-4266	BOILER	15.00	422.0	10.00	0.31	-6.70	0.00	-0.10
WY	Carbon	Marathon Oil Company	Standard Draw 5-10	MD-1243	E1	7.09	422.0	30.05	0.10	5.30	0.00	0.00
WY	Sweetwater	Marathon Oil Company	Wamsutter A-7	MD-1248	CAT	11.77	450.5	9.51	0.82	5.30	0.00	0.00
WY	Sublette	McMurry Oil Company	Jonah Federal 5-7 PAD	MD-1204	E1	11.77	450.5	9.51	0.82	3.60	0.00	0.00
WY	Sublette	McMurry Oil Company	Stud Horse Butte 11-35 PAD	MD-1206	B1	11.77	450.5	9.51	0.82	5.40	0.00	0.00
WY	Sublette	McMurry Oil Company	Stud Horse Butte 16-33 PAD	MD-1230	C/C	11.77	450.5	9.51	0.82	5.00	0.00	0.00
WY	Sublette	McMurry Oil Company	Stud Horse Butte 2-27 PAD	MD-1280	Flare1	11.77	450.5	9.51	0.82	5.40	0.00	0.00
WY	Sublette	McMurry Oil Company	Stud Horse Butte 71-32 PAD	CT-4115	Flare1	11.77	450.5	9.51	0.82	5.60	0.00	0.00
WY	Sublette	McMurry Oil Company	Stud Horse Butte 9-32 Central Facility	MD-1281	B-TEX	11.77	450.5	9.51	0.82	8.80	0.00	0.00
WY	Carbon	Merit Energy Company	Jons/Ruth Sweezy Compressor Station	MD-941	Cat	1.90	726.0	23.69	0.30	7.80	0.00	0.00
WY	Carbon	Merit Energy Company	South Baggs Compressor Station	CT-3542	e1	6.35	730.2	47.71	0.31	16.20	0.00	0.00
WY	Carbon	Merit Energy Company	South Baggs Compressor Station	MD-1270	E1	5.49	730.4	49.71	0.30	6.70	0.00	0.00
WY	Sweetwater	Mountain Gas Resources	Granger Gas Plant	MD-963	W1	7.93	903.6	32.90	0.38	16.60	0.00	0.00
WY	Sweetwater	Mountain Gas Resources	Hay Reservoir Central Compressor Station	MD-975	E2	13.11	880.4	20.00	0.46	16.70	0.00	0.00
WY	Sublette	Mountain Gas Resources	Jonah Compressor Station	CT-2280A	E	9.05	509.8	12.50	0.76	-1.50	0.00	0.00
WY	Sweetwater	Mountain Gas Resources	Red Desert Gas Plant	MD-1143	C4	6.63	903.7	22.70	0.46	61.60	0.00	0.00
WY	Sublette	Mountain Gas Resources	Wild Horse	CT-4050	SUP	9.14	950.0	32.30	0.25	5.80	0.00	0.00
WY	Sweetwater	OCI Wyoming L.P.	Big Island Soda Ash Plant	MD-1261	DC62	6.00	288.7	19.00	0.40	381.80	0.00	-207.10
WY	Sweetwater	Pacificorp	Jim Bridger Plant	MD-1138	U2	152.40	333.2	22.30	7.30	-4946.00	0.00	0.00
WY	Uinta	Questar Exploration & Production Company	Eakin Ranch 4	wv-4184	A1	11.77	450.5	9.51	0.82	3.60	0.00	0.00
WY	Uinta	Questar Exploration & Production Company	Eakin Ranch Unit Well 1	wv-4183	AJAX	11.77	450.5	9.51	0.82	3.70	0.00	0.00
WY	Sweetwater	Questar Gas Management Company	Blacks Fork Gas Plant	MD-1106	H2	15.00	422.0	10.00	0.31	1.10	0.00	0.00
WY	Sweetwater	Questar Gas Management Company	Blacks Fork Gas Plant	MD-1140	E1	2.38	895.2	21.65	0.46	6.20	0.00	0.00
WY	Uinta	Questar Gas Management Company	Lateral 1127	CT-3841	E1	1.86	735.0	19.70	0.15	15.30	0.00	0.00
WY	Sublette	Questar Gas Management Company	Mesa Well 14-16 CDP	CT-4069	CAT1	15.00	422.0	10.00	0.31	10.30	0.50	0.00
WY	Sublette	Questar Gas Management Company	Mesa Well 15-6 CDP	CT-4064	CAT1	15.00	422.0	10.00	0.31	10.60	0.40	0.00
WY	Sublette	Questar Gas Management Company	Pinedale Compressor Station	MD-1267	cat	15.24	713.7	72.54	0.46	50.20	0.00	0.00
WY	Sublette	Questar Gas Management Company	Pinedale Liquids Facility	CT-4070	GEN	15.00	422.0	10.00	0.31	13.80	1.10	0.00
WY	Sublette	Questar Gas Management Company	Stewart Point Well 16-18 CDP	CT-4062	CAT	15.00	422.0	10.00	0.31	2.30	0.50	0.00
WY	Sweetwater	Questar Gas Management Company	Vermillion Creek Deep Unit #1	wv-4185	E1	11.77	450.5	9.51	0.82	2.90	0.00	0.00
WY	Uinta	Questar Pipeline Company	Leroy Storage Compressor Station	MD-1049	E2	9.05	509.8	12.50	0.76	3.50	0.00	0.00
WY	Sweetwater	Red Desert Gravel	Bitter Creek Pit	CT-3976	HA	11.68	326.2	15.37	0.73	0.00	0.00	2.40
WY	Sweetwater	Red Desert Gravel	Red Rock Pit	CT-3975	HA	7.09	422.0	30.05	0.10	0.00	0.00	2.80
WY	Sublette	Reed Construction Company, Inc.	Reeds State Pit #2	CT-3942	HA	11.68	326.2	15.37	0.73	0.00	0.00	3.80
WY	Park	Reiter Construction, LLC	Cooley Pit	CT-3860	TL/SP	11.68	326.2	15.37	0.73	0.00	0.00	2.00
WY	Fremont	Rice Kilroy Construction	Atlantic City Mine	CT-3863	HR	11.68	326.2	15.37	0.73	0.00	0.00	1.40
WY	Carbon	Sinclair Wyoming Refining Company	Sinclair Refinery	MD-1129A	2HDS	15.00	422.0	10.00	0.31	-0.10	-0.20	-0.10
WY	Sweetwater	Solvay Minerals Incorporated	Green River Soda Ash Plant	MD-995	10	4.10	293.0	5.50	0.60	376.70	0.00	85.20

Table G.7 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources -Table of Included Sources

State	County Name	Company	Facility	Permit Number	Stack ID	Stack Height (m)	Temperature (K)	Velocity (m/s)	Diameter (m)	NO_x (tpy)	SO_2 (tpy)	PM_{10} (tpy)
WY	Sweetwater	Solvay Minerals Incorporated	Green River Soda Ash Plant	MD-1078	AQD_102	36.57	293.0	17.98	0.53	2.40	0.00	10.50
WY	Fremont	Stone Energy Corporation	Owl Creek Federal #1-18	wv-3809	AJAX	3.50	545.0	446.00	0.34	3.20	0.00	0.00
WY	Sublette	Sublette Company Road & Bridge	Cottonwood Pit	CT-4087	E1	7.09	422.0	30.05	0.10	9.90	1.30	0.40
WY	Carbon	Tri-State Truck & Equipment Incorporated	Impactor Plant	CT-4068	JD	11.68	326.2	15.37	0.73	8.50	0.00	0.80
WY	Sublette	Ultra Resources Incorporated	Warbonnet 14b-3d	CT-4179	BTEX	11.77	450.5	9.51	0.82	3.20	0.00	0.00
WY	Sublette	Ultra Resources Incorporated	Warbonnet 16-10 PAD	CT-4055	H	11.77	450.5	9.51	0.82	3.80	0.00	0.00
WY	Sublette	Ultra Resources Incorporated	Warbonnet 3-10	CT-4178	BTEX	11.77	450.5	9.51	0.82	3.20	0.00	0.00
WY	Sublette	Ultra Resources Incorporated	Warbonnet 5-4/4-4D Facility	CT-4112	Flare	11.77	450.5	9.51	0.82	3.40	0.00	0.00
WY	Park	Voyager Exploration Incorporated	Silvertip Field Production Facility	MD-1126	E5	9.14	2000.0	46.94	0.15	41.40	0.00	0.00
WY	Sweetwater	Western Gas Resources, Inc.	Church Butte	MD-1221	G11b	15.00	422.0	10.00	0.31	0.40	0.00	0.00
WY	Fremont	Western Gas Resources, Inc.	Lysite Interconnect	MD-1141	Cat	4.58	738.2	49.73	0.30	21.20	0.00	0.00
WY	Sweetwater	Western Gas Resources, Inc.	Wild Rose Compressor Station	CT-3412	G2	5.50	810.9	18.60	0.05	120.60	0.00	0.00
WY	Uinta	Wexpro Company	Butcherknife Spring Unit 8	wv-4182	AJAX	11.77	450.5	9.51	0.82	4.30	0.00	0.00
WY	Carbon	Williams Field Services Company	Echo Springs Gas Plant	MD-1227	T40	13.72	712.0	33.49	1.22	38.50	0.00	0.00
WY	Sweetwater	Williams Field Services Company	Frewan Lake Compressor Station	MD-1242	TURB	13.72	777.0	34.68	0.31	15.90	0.00	0.00
WY	Sweetwater	Williams Field Services Company	Monument Lake Compressor Station	MD-1237	TURB	13.72	712.0	33.49	1.22	21.80	0.00	0.00
WY	Sweetwater	Williams Field Services Company	Monument Lake Compressor Station	MD-1237A	E1	2.69	775.0	45.50	0.20	2.20	0.00	0.00
WY	Fremont	Wind River Mushrooms, LLC	Shoshoni Growing Facility	wv-2794	B1	15.00	422.0	10.00	0.31	10.10	0.00	0.00
WY	Park	Windsor Energy Group, LLC	Bennett Creek Central Station	CT-3854	E1	7.33	880.4	21.00	0.25	16.80	0.00	0.00
WY	Uinta	Wyoming Department of Transportation	Beacon #2 Extension	CT-4088	EA	11.68	326.2	15.37	0.73	0.00	0.00	4.80
WY	Teton	Wyoming Department of Transportation	Black Rock mine	CT-4058	STOKPLE	14.12	350.0	10.03	0.91	0.00	0.00	1.20
WY	Park	Wyoming Department of Transportation	Chapman Bench Pit	CT-3873	TL/SP	11.68	326.2	15.37	0.73	0.00	0.00	4.20
WY	Fremont	Wyoming Department of Transportation	Dunoir #1 Pit	CT-3849	EA	11.68	326.2	15.37	0.73	0.00	0.00	1.60
WY	Sweetwater	Wyoming Department of Transportation	LaBarge Pit	CT-3974	TL/SP	11.68	326.2	15.37	0.73	0.00	0.00	11.40
WY	Sweetwater	Wyoming Department of Transportation	Massacre Hill East	CT-3835	HR	11.68	326.2	15.37	0.73	0.00	0.00	5.40
WY	Sublette	Wyoming Department of Transportation	Murdock Pit	CT-3852	EA	11.68	326.2	15.37	0.73	0.00	0.00	1.60
WY	Park	Wyoming Department of Transportation	New 4 Mile	CT-3864	EA	11.68	326.2	15.37	0.73	0.00	0.00	3.20
WY	Fremont	Wyoming Department of Transportation	Richardson Pit	CT-4002	TL/SP	11.68	326.2	15.37	0.73	0.00	0.00	2.30
WY	Sweetwater	Wyoming Department of Transportation	Seedskadee	CT-3874	EA	11.68	326.2	15.37	0.73	0.00	0.00	1.80
WY	Sublette	Wyoming Department of Transportation	Speedway Pit	CT-3853	EA	11.68	326.2	15.37	0.73	0.00	0.00	1.50
WY	Fremont	Wyoming Department of Transportation	US Steel Pit #2	CT-3834	EA	11.68	326.2	15.37	0.73	0.00	0.00	3.20
WY	Fremont	Wyoming Department of Transportation	Wind River Pit	CT-3857	HR	11.68	326.2	15.37	0.73	0.00	0.00	5.70
WY	Sublette	Yates Petroleum Corporation	Highway SWD 11 Injection Facility	wv-3089	GEN	11.77	450.5	9.51	0.82	3.60	0.00	0.00
WY	Sweetwater	Mountain Gas Resources	Lincoln Road Compressor Station	wv-3917	ONAN	9.05	509.8	12.50	0.76	3.00	0.00	0.00
WY	Sweetwater	Mountain Gas Resources	Lincoln Road Compressor Station	MD-829A	E1	9.05	509.8	12.50	0.76	-20.20	0.00	0.00
WY	Uinta	Questar Gas Management Company	Blacks Fork Gas Plant	MD-1402	E1	15.24	713.7	0.46	72.54	26.60	0.00	0.00
									Total	747.9	142.8	292.1

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Carbon	Anadarko E&P Company, LP	Hanna Draw	CT-4009	Out of Domain
WY	Carbon	Arch of Wyoming	Carbon Basin Mines (CBM)	CT-4136	Out of Domain
WY	Natrona	Bill Barrett Corporation	Cave Gulch 1-29	MD-1312	Out of Domain
WY	Sublette	Bitter Creek Pipelines LLC	Box Elder Compressor Station	CT-4066	Out of Domain
WY	Natrona	Black Hills Bentonite	Mills Complex	MD-1180	Out of Domain
WY	Laramie	CHAMP, LLC	Feedmill	wv-3586	Out of Domain
WY	Goshen	Heartland BioComposites, LLC	Heartland BioComposites	CT-4170	Out of Domain
WY	Natrona	Howell Petroleum Corporation	Salt Creek Gas Plant	MD-1314	Out of Domain
WY	Natrona	Howell Petroleum Corporation	Salt Creek LACT 4	MD-1157	Out of Domain
WY	Natrona	Howell Petroleum Corporation	Salt Creek LACT 5 Tank Battery	MD-1156	Out of Domain
WY	Natrona	Howell Petroleum Corporation	Salt Creek South	MD-1168	Out of Domain
WY	Natrona	Kinder Morgan, Inc.	Casper Extraction Plant	MD-1150	Out of Domain
WY	Natrona	Sinclair Casper Refining Company	Casper Refinery	MD-1165	Out of Domain
WY	Fremont	2M Construction, Inc.	2M Pit Crushing & Screening Equipment	CT-3845	<1.0 tpy
WY	Niobrara	Abraxas Petroleum Corporation	Prairie Falcon 1-12-38-67	CT-3840	Out of Domain
WY	Lincoln	AKA Energy Group LLC	Waterfall Compressor Station	CT-3862	<1.0 tpy
WY	Lincoln	AKA Energy Group LLC	Waterfall Well 1-35	wv-3773	Waiver < 3.0 tpy
WY	Sheridan	All B Excavating Company	Crushing & Screening Equipment	CT-4103	Out of Domain
WY	Campbell	Amble Pipeline & Gathering LLC	Crump Compressor Station	CT-3817	Out of Domain
WY	Campbell	Amble Pipeline & Gathering LLC	Crump Compressor Station	MD-1198	Out of Domain
WY	Crook	American Colloid Company	Colony East	wv-3678	Out of Domain
WY	Big Horn	American Colloid Company	Lovell Plant	wv-3285	No Credit for Decrease at non-major source
WY	Big Horn	American Colloid Company	Lovell Plant	wv-3986	Waiver < 3.0 tpy
WY	Big Horn	American Colloid Company	Lovell Plant	wv-4221	Waiver < 3.0 tpy
WY	Carbon	Anadarko E&P Company, LP	Baumgartner Federal 3-6	wv-3671	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Cathedral Federal 3-22	wv-2288	Waiver < 3.0 tpy
WY	Carbon	Anadarko E&P Company, LP	Celsius Federal 1-14E	wv-3487	Waiver < 3.0 tpy
WY	Uinta	Anadarko E&P Company, LP	Church Buttes Buffer 5-27	wv-2690	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Churchill Federal Unit 12	wv-2354	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Dayton 19-6	CT-4148	< 1.0 tpy
WY	Carbon	Anadarko E&P Company, LP	Echo Springs Federal 5-12	CT-4150	< 1.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Higgins Unit 15-43A Well and Production Battery	wv-3130	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Higgins Unit 15-43A Well and Production Battery	wv-3707	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Higgins Unit 17	wv-2666	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Higgins Unit 18	wv-3672	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Higgins Unit 19	wv-2364	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Monell Production Battery A	MD-1301	<1.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Piqua 21-6	wv-3846	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Piqua 5-21	wv-2968	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Red Desert 20-2	wv-3045	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Red Desert 20-4	wv-3771	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Red Desert 29-3	CT-4149	< 1.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Rock Island 4-H	wv-3270	Out of Domain
WY	Sweetwater	Anadarko E&P Company, LP	State E-3	wv-3670	Waiver < 3.0 tpy
WY	Johnson	Anadarko E&P Company, LP	Sussex B-2 Tensleep and C Production Battery	MD-1247	Out of Domain
WY	Sweetwater	Anadarko E&P Company, LP	Table Rock Gas Plant	wv-4054	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	Tiffen 29-5	wv-2937	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	UPRR 2-19 Wellsite & Production Facility	wv-3931	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko E&P Company, LP	UPRR 2-3	wv-2991	Waiver < 3.0 tpy
WY	Carbon	Anadarko E&P Company, LP	Wamsutter Federal 4-18 & 18-5	wv-2673	Waiver < 3.0 tpy
WY	Carbon	Anadarko E&P Company, LP	Wamsutter Federal 6-5	wv-2604	Waiver < 3.0 tpy
WY	Carbon	Anadarko E&P Company, LP	Wamsutter Federal 8-5	wv-2482	Waiver < 3.0 tpy
WY	Johnson	Anadarko Gathering Company	Cole Central Compressor Station	CT-4119	Out of Domain
WY	Carbon	Anadarko Gathering Company	Muddy Mountain Compressor Station	MD-1295	<1.0 tpy
WY	Campbell	Anadarko Petroleum Company	Double Tank Compressor Station	CT-4159	Out of Domain
WY	Sweetwater	Anadarko Petroleum Company	Greasewood Wash 10-35	wv-3761	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko Petroleum Company	Greasewood Wash 14-35	wv-3770	Waiver < 3.0 tpy
WY	Sweetwater	Anadarko Petroleum Company	Greasewood Wash 16-35	wv-3903	Waiver < 3.0 tpy
WY	Johnson	Anadarko Petroleum Company	Jeff Pod Compressor Station	MD-1302	Out of Domain
WY	Johnson	Anadarko Petroleum Company	Mark Pod	CT-3800	Out of Domain
WY	Johnson	Anadarko Petroleum Company	Neil Pod Compressor Station	MD-1246	Out of Domain
WY	Converse	Antelope Coal Company	Antelope Mine	wv-3031	Out of Domain
WY	Converse	Antelope Coal Company	Antelope Mine	wv-3402	Out of Domain
WY	Converse	Antelope Coal Company	Antelope Mine	MD-1304	Out of Domain
WY	Fremont	B T Inc.	Rail Car Repair Facility	wv-3712	Waiver < 3.0 tpy
WY	Sweetwater	Badger Mining Corporation	Wamsutter Facility	wv-3503	Waiver < 3.0 tpy
WY	Campbell	Bear Paw Energy Incorporated	House Creek Main Station	MD-1236	Out of Domain
WY	Johnson	Bear Paw Energy, L.L.C.	Big Cat Main Compressor Station	MD-1118	Out of Domain
WY	Johnson	Bear Paw Energy, L.L.C.	Big Cat Mid	MD-1120	Out of Domain
WY	Johnson	Bear Paw Energy, L.L.C.	Big Cat North	MD-1119	Out of Domain
WY	Johnson	Bear Paw Energy, L.L.C.	Big Cat West	CT-3824	Out of Domain
WY	Campbell	Bear Paw Energy, L.L.C.	Double Tank Compressor Station	CT-4127	Out of Domain
WY	Campbell	Bear Paw Energy, L.L.C.	House Creek #24	CT-4060	Out of Domain
WY	Campbell	Bear Paw Energy, L.L.C.	House Creek #29 Compressor Station	CT-4078	Out of Domain
WY	Sheridan	Bear Paw Energy, L.L.C.	Little Badger	MD-1284	Out of Domain

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Campbell	Bear Paw Energy, L.L.C.	Pinnette Draw Compressor Station	CT-4163	Out of Domain
WY	Sheridan	Bear Paw Energy, L.L.C.	Prairie Dog Booster (Station 9)	MD-1155	Out of Domain
WY	Campbell	Bear Paw Energy, L.L.C.	Stones Throw Pod 1 Station	CT-4012	Out of Domain
WY	Campbell	Big Basin Petroleum, LLC	Cosner Project	CT-4071	Out of Domain
WY	Natrona	Bill Barrett Corporation	Bull Frog 5-12	wv-2416	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 1, 15, and 33 (Multiple Wells)	wv-2638	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 2-29 and East Cave Gulch 14-29	wv-3188	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 30 and 46 (Multiple Wells)	wv-2640	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 31 and 44 (Multiple Wells)	wv-2639	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 34	wv-2635	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 35 and 39 (Multiple Wells)	wv-2637	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 37 and 48	wv-3804	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 41	wv-2595	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 42	wv-2716	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 6 and 45 (Multiple Wells)	wv-2634	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cave Gulch 9 and 43 (Multiple Wells)	wv-2720	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 112	wv-3871	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 41 and 69	wv-3995	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 42 and 51(Multiple Wells)	wv-3035	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 4-27	wv-2719	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 46 and Cooper Reservoir 88	wv-3376	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 48 & Cooper Reservoir 74	wv-2979	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 49 and 90	wv-3867	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 50 and Cooper Reservoir 97	wv-2832	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 5-27	wv-3383	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 5-27	wv-3383	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 53 Wellsite	wv-2721	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 56	wv-2872	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 63 and Cooper Reservoir 72	wv-3377	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 65	wv-2833	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 68 and Cooper Reservoir 105	wv-3384	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 70	wv-4133	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 92	wv-3868	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Cooper Reservoir 95	wv-3187	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	East Cave Gulch 22-29	wv-4029	Waiver < 3.0 tpy
WY	Campbell	Bill Barrett Corporation	Geer 42-8P	wv-2231	Out of Domain
WY	Natrona	Bill Barrett Corporation	North Cave Gulch 13-30	wv-2871	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	North Cave Gulch 14-30	wv-2878	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	North Cave Gulch 16-30	wv-4030	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	North Cave Gulch 19-30	wv-2718	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	North Cave Gulch 8-30X	wv-3870	Waiver < 3.0 tpy
WY	Fremont	Bill Barrett Corporation	Squaw Butte 33-36	wv-2949	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Stone Cabin 11-27	wv-3862	Waiver < 3.0 tpy
WY	Natrona	Bill Barrett Corporation	Stone Cabin 1-15	wv-3869	Waiver < 3.0 tpy
WY	Fremont	Bill Barrett Corporation	Talon 1	wv-3385	Waiver < 3.0 tpy
WY	Fremont	Bill Barrett Corporation	Talon 23-35	wv-3994	Waiver < 3.0 tpy
WY	Fremont	Bill Barrett Corporation	Talon 31-31	wv-3663	Waiver < 3.0 tpy
WY	Fremont	Bill Barrett Corporation	Talon 41-32	CT-4152	<1.0 tpy
WY	Sheridan	Bitter Creek Pipelines LLC	Beatty Gulch Central Compressor Station	wv-3914	Out of Domain
WY	Sheridan	Bitter Creek Pipelines LLC	Gladewater Central Station	wv-3604	Out of Domain
WY	Campbell	Bitter Creek Pipelines LLC	Landeck Central Station	wv-3514	Out of Domain
WY	Campbell	Bitter Creek Pipelines LLC	North Landeck Compressor Station	MD-631A	Out of Domain
WY	Sheridan	Bitter Creek Pipelines LLC	Seven Brothers 1 Battery	MD-1293	Out of Domain
WY	Sheridan	Bitter Creek Pipelines LLC	St. Romaine #25 Battery	CT-3859	Out of Domain
WY	Converse	Black Hills Bentonite	Glenrock	MD-1128	Out of Domain
WY	Natrona	Black Hills Bentonite	Mills Complex	wv-2981	Waiver < 3.0 tpy
WY	Campbell	Black Hills Corporation	Neil Simpson Two	wv-3431	Out of Domain
WY	Sweetwater	Blackjack Oil Company	Treasure Unit 1	wv-3836	Waiver < 3.0 tpy
WY	Hot Springs	Bonanza Creek Oil Company, LLC	Red Springs Field	wv-2962A	Waiver < 3.0 tpy
WY	Sheridan	Bowers Oil and Gas, Inc.	CMB #1 Compressor	wv-3840	Out of Domain
WY	Sublette	BP America Production Company	Antelope 15-23	wv-3940	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Battle Springs 23-1	wv-3471	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Battle springs 25-01	wv-3389	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Battle Springs 27-1	wv-3530	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Battle Springs 33-01	wv-3390	Waiver < 3.0 tpy
WY	Uinta	BP America Production Company	Blacks Fork 1	wv-2768	Waiver < 3.0 tpy
WY	Uinta	BP America Production Company	Blacks Fork 2	wv-3088	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Buck Draw 17-1	wv-3637	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Champlin 149 K1	wv-2787	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Champlin 221 C2	wv-3360	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Champlin 222 Amoco D	wv-3102	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Champlin 222 D-12	wv-4152	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Carbon	BP America Production Company	Champlin 226 Amoco B	wv-3103	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Champlin 261 Amoco L1	wv-3425	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Champlin 261 G3	wv-3424	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Champlin 270 A2	wv-2737	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Champlin 278 D1A	CT-4157	< 1.0 tpy
WY	Carbon	BP America Production Company	Champlin 444 C3	wv-2938	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Cherokee Federal 32-2	CT-4156	< 1.0 tpy
WY	Carbon	BP America Production Company	Coal Bank 11-01	wv-3362	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Coal Bank 35-01	wv-3363	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Creston 03-02	wv-2738	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Delaney Rim 23-1	wv-2438	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Delaney Rim 29-1	wv-2513	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Delaney Rim 31-1	wv-2341	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Desert Flats 9-1	wv-2337	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Eight Mile Lake 25-4	wv-3470	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Emigrant Trail 17-1	wv-2339	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Fillmore Creek 09-01	wv-3004	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Fillmore Creek 15-01	wv-3003	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Fillmore Creek 27-02	wv-3036	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Fillmore Creek 31-02	wv-2896	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Five Mile 13-1	wv-2220	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Five Mile 23-1	CT-4158	< 1.0 tpy
WY	Sweetwater	BP America Production Company	Five Mile 25-1	wv-3644	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	High Point 11-1	CT-4153	<1.0 tpy
WY	Carbon	BP America Production Company	High Point 23-1	wv-2437	Waiver < 3.0 tpy
WY	Weston	BP America Production Company	Horseshoe Bend 3-1	CT-3952	Out of Domain
WY	Sweetwater	BP America Production Company	Horseshoe Bend 5-1	wv-3896	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Horseshoe Bend 9-1	wv-3734	Waiver < 3.0 tpy
WY	Sublette	BP America Production Company	Jonah Water Disposal Site #1	wv-4008	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Laney Wash 21-2	wv-3527	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Laney Wash 27-1R	wv-4150	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Latham Draw 09-01	wv-3204	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Luman 29-2	wv-3255	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Luman 29-2	wv-3437	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Luman 31-02	wv-3037	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Luman 35-1	wv-2458	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Mexican Flats 09-02	wv-2566	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Monument 07-01	wv-2897	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Monument 35-01	wv-2895	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Monument Lake 11-1	wv-2340	Waiver < 3.0 tpy
WY	Carbon	BP America Production Company	Muddy Creek 15-1	wv-3567	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	North Barrel Springs 01-01	wv-3008	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	North Barrel Springs 11-2	wv-2441	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	North Barrel Springs 15-1	wv-2442	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	North Barrel Springs 23-01	wv-2512	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	North Barrel Springs 25-01	wv-2510	Waiver < 3.0 tpy
WY	Sublette	BP America Production Company	Rainbow 3-31 PAD	MD-1318	< 1.0 tpy
WY	Sweetwater	BP America Production Company	Rasmussen 3-1	wv-2338	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Red Lake Fed 4-2	wv-3039	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Red Wash 11-2	wv-3531	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Red Wash 25-01	wv-3340	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Red Wash 35-01	wv-2894	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Rudy Knolls 25-1	wv-3361	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Seven Mile Gulch 5-21	wv-4130	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Seven Mile Gulch 6-23	wv-4057	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Shute Creek 13-4	wv-3723	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Sourdough Gulch 5-1	wv-2336	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	South Two Rim 21-1	wv-3641	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	South Two Rim 3-1	wv-2565	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	South Two Rim 3-1	MD-1299	<1.0 tpy
WY	Sweetwater	BP America Production Company	South Two Rim 35-1	wv-3642	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Wamsutter Rim 15-12	wv-4138	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Wamsutter Rim 9-8	wv-3897	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 002	wv-2788	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 200	wv-2483	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 201	wv-2424	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 202	wv-2478	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 203	wv-2460	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 204	wv-2423	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 205	wv-2593	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 206	wv-2796	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 207	wv-2514	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 208	wv-2763	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 210	wv-4131	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 212	wv-3725	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 213	wv-3726	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 216	wv-3727	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 218	wv-3729	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 227	wv-3820	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 228	wv-4129	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 229	wv-3854	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Lincoln	BP America Production Company	Whiskey Buttes 235	wv-3844	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 236	wv-3944	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 237	wv-3730	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 240	wv-4205	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 241	wv-3881	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 242	wv-3928	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 245	wv-3941	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 246	wv-3927	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 249	wv-3882	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 257	wv-4034	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 258	wv-3906	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 265	wv-3943	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 266	wv-3853	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 5-25	wv-3724	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Whiskey Buttes 5-26	WV-4206	Waiver < 3.0 tpy
WY	Sweetwater	BP America Production Company	Willow Creek 1-1	wv-3643	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Wilson Ranch 04-19	wv-2890	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Wilson Ranch 4-17	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Wilson Ranch 5	wv-2651	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Wilson Ranch 5-17	wv-3728	Waiver < 3.0 tpy
WY	Lincoln	BP America Production Company	Wilson Ranch 5-7	wv-3942	Waiver < 3.0 tpy
WY	Crook	BPM Minerals, LLC	Colony Plant	MD-1310	Out of Domain
WY	Fremont	Burlington Resources Oil and Gas Co	Madden Field Portable Compressor	wv-2791	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	Madden Field Portable Compressor	wv-3966	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 100	wv-2750	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 10-27	wv-4220	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 103	wv-2752	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 10-32	wv-3800	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 104	wv-2983	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 109	wv-2525	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 110	wv-2410	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 111	wv-2467	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 11-28	wv-4088	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 113	wv-2411	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 11-32	wv-4219	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 115	wv-2656	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 116	wv-2744	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 117	wv-2984	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 118	wv-2745	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 119	wv-3065	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 120	wv-3009	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 121	wv-2743	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 122	wv-3801	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 1-25C	wv-3796	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 126	wv-3164	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 127	wv-3797	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 1-28	wv-3067	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 130	wv-3878	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 132	wv-3745	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 136	wv-4255	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 137	wv-4017	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 139	wv-4016	Waiver < 3.0 tpy
WY	Natrona	Burlington Resources Oil and Gas Co	MDU 1-3E	wv-2466	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 14-27	wv-3877	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 143	wv-3794	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 144	wv-3964	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 145	wv-3915	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 15-27	wv-4018	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 2-31E	wv-4019	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 2-32E	wv-2526	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 3-26C	wv-3166	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 3-27	wv-3650	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 3-31E	wv-4015	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 3-9	wv-3799	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 4-27	wv-3167	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 4-28	wv-3066	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 4-31C	wv-3798	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 5-25C	wv-4218	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 5-31C	wv-4252	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 5-36C	wv-3163	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 6-31C	wv-4300	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 6-34	wv-3245	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 7-27	wv-2742	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 7-28	wv-2607	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 7-31C	wv-4301	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 7-33	wv-2696	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 7-34	wv-4256	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 7-9	wv-2468	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 80	wv-3802	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 8-12	wv-3010	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 8-28	wv-3795	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 83	wv-3165	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 8-32	wv-2751	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 8-33	wv-3746	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 8-36C	wv-3747	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 88	wv-2469	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 9-12	wv-4302	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 9-32	wv-2697	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 9-33	wv-3907	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	MDU 97	wv-3317	Waiver < 3.0 tpy
WY	Fremont	Burlington Resources Oil and Gas Co	Unit #4419 Portable Compressor	wv-3334	Waiver < 3.0 tpy
WY	Campbell	C&H Oil & Gas, Inc.	East Springen	wv-3264	Out of Domain
WY	Campbell	C&H Oil & Gas, Inc.	West Springen	wv-3271	Out of Domain
WY	Campbell	Caballo Coal Company	Caballo Mine/Rocky Butte Mine	MD-1125	Out of Domain
WY	Campbell	Caballo Coal Company	Caballo Mine/Rocky Butte Mine	MD-1215	Out of Domain
WY	Campbell	Caballo Coal Company	Caballo Mine/Rocky Butte Mine	MD-1303	Out of Domain
WY	Carbon	Cabot Oil & Gas Corporation	Balcron Federal #31-4	wv-3020	Waiver < 3.0 tpy
WY	Carbon	Cabot Oil & Gas Corporation	Big Ridge Unit 32-20L	wv-3971	Waiver < 3.0 tpy
WY	Washakie	Cabot Oil & Gas Corporation	Corral Creek State 30-16	wv-2812	Waiver < 3.0 tpy
WY	Lincoln	Cabot Oil & Gas Corporation	Cow Hollow 10-24	wv-2842	Waiver < 3.0 tpy
WY	Lincoln	Cabot Oil & Gas Corporation	Cow Hollow 20-24	wv-3772	Waiver < 3.0 tpy
WY	Carbon	Cabot Oil & Gas Corporation	Falcone Federal 90-22	wv-4257	Waiver < 3.0 tpy
WY	Lincoln	Cabot Oil & Gas Corporation	Helwig 10-8R	wv-2944	Waiver < 3.0 tpy
WY	Sweetwater	Cabot Oil & Gas Corporation	Lincoln Road #10-10	wv-2929	Waiver < 3.0 tpy
WY	Carbon	Cabot Oil & Gas Corporation	Lookout Wash 20-5V	wv-3600	Waiver < 3.0 tpy
WY	Carbon	Cabot Oil & Gas Corporation	Lookout Wash Unit 10-32L	wv-2542	Waiver < 3.0 tpy
WY	Sweetwater	Cabot Oil & Gas Corporation	Quealy 50-25	wv-3058	Waiver < 3.0 tpy
WY	Sheridan	Cantera Natural Gas, Inc.	AC Ranch East Compressor Station	MD-1308	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	AC Ranch North	CT-3712A	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	AC Ranch South	CT-3791	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Brinkerhoff Pod 19 Compressor Station	MD-1245	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Brinkerhoff Pod 6	CT-3918	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Burgess 13	CT-4015	Out of Domain
WY	Johnson	Cantera Natural Gas, Inc.	Crazy Woman Creek Prospect Compressor Station	CT-3518A	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Dow #2 Compressor Station	CT-4092	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Farmland 26	CT-3919	Out of Domain
WY	Campbell	Cantera Natural Gas, Inc.	Felix Central Station	MD-1252	Out of Domain
WY	Campbell	Cantera Natural Gas, Inc.	Felix Central Station	MD-1252A	Out of Domain
WY	Campbell	Cantera Natural Gas, Inc.	Fitch Central Compressor Station	MD-602A2	Out of Domain
WY	Campbell	Cantera Natural Gas, Inc.	Fitch-Sorenson Compressor Station	CT-1733A2	Out of Domain
WY	Campbell	Cantera Natural Gas, Inc.	Floyd Compressor Station	CT-1634A	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Hape 14	MD-1260	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Hardesty 10	CT-3808	Out of Domain
WY	Campbell	Cantera Natural Gas, Inc.	Kline Draw Compressor Station	MD-1254	Out of Domain
WY	Johnson	Cantera Natural Gas, Inc.	Knudsen 9 Pod	CT-4047	Out of Domain
WY	Johnson	Cantera Natural Gas, Inc.	Kuhn 27 Compressor Station	CT-2189A2	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Perry 24	CT-3796	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Peterson 29 Compressor Station	CT-4016	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Rucki 15	CT-3816	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Rucki 15	MD-1257	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Sales 14 Compressor Station	CT-4090	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Sampson 31 Comprssor Station	CT-4171	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Wild Horse Central Station	MD-1255	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Wildhorse Compressor Station	MD-1146	Out of Domain
WY	Sheridan	Cantera Natural Gas, Inc.	Wildhorse Compressor Station	MD-503 & MD-827 Expired	Out of Domain
WY	Campbell	Champion Concrete Incorporated	CT-4021	CT-4021	Out of Domain
WY	Uinta	Chevron USA, Inc.	ACG-6	wv-3284	Out of Domain
WY	Sublette	Chevron USA, Inc.	Birch Creek Unit 193	wv-3409	Waiver < 3.0 tpy
WY	Sublette	Chevron USA, Inc.	Birch Creek Unit 197	wv-3408	Waiver < 3.0 tpy
WY	Sublette	Chevron USA, Inc.	Birch Creek Unit 198	wv-3252	Waiver < 3.0 tpy
WY	Sublette	Chevron USA, Inc.	Birch Creek Unit E Battery	wv-3477	Waiver < 3.0 tpy
WY	Sublette	Chevron USA, Inc.	Labarge 38	wv-3404	Waiver < 3.0 tpy
WY	Sublette	Chevron USA, Inc.	Minton A-9	wv-3553	Waiver < 3.0 tpy
WY	Natrona	Chevron USA, Inc.	Waltman 16	wv-3379	Waiver < 3.0 tpy
WY	Natrona	Chevron USA, Inc.	Waltman 37,42,20,37A	wv-3379	Waiver < 3.0 tpy
WY	Natrona	Chevron USA, Inc.	Waltman 44 Compression Facility	wv-3379	Waiver < 3.0 tpy
WY	Natrona	Chevron USA, Inc.	Waltman 73	wv-3410	Waiver < 3.0 tpy
WY	Natrona	Chevron USA, Inc.	Waltman 75	wv-3048	Waiver < 3.0 tpy
WY	Natrona	Chevron USA, Inc.	Waltman 84	wv-3539	Waiver < 3.0 tpy
WY	Sweetwater	Chevron USA, Inc.	Wyoming NCT 1-5	wv-3700	Waiver < 3.0 tpy
WY	Sweetwater	Chevron USA, Inc.	Wyoming NCT 2-5	wv-3596	Waiver < 3.0 tpy
WY	Sweetwater	Chevron USA, Inc.	Wyoming NCT 2-6	wv-3594	Waiver < 3.0 tpy
WY	Natrona	ChevronTexaco	Waltman 85	wv-3538	Waiver < 3.0 tpy
WY	Campbell	Cheyenne Light Fuel and Power Company	WYGEN 2	CT-3030A	Out of Domain
WY	Sweetwater	Chicken Creek, LLC	Rhode Island Red Federal 4-27	wv-3232	Waiver < 3.0 tpy
WY	Sweetwater	Chicken Creek, LLC	Rhode Island Red Federal 4-27	wv-3504	Waiver < 3.0 tpy
WY	Sweetwater	Church & Dwight Incorporated	Green River Sodium Products Plant	wv-3032 **HOLD**	Waiver < 3.0 tpy
WY	Sweetwater	Church & Dwight Incorporated	Green River Sodium Products Plant	wv-3054	Waiver < 3.0 tpy
WY	Johnson	City of Buffalo	Hot Mix Asphalt Plant	CT-4011	Out of Domain
WY	Campbell	Clear Creek Energy Services, LLC	Bow and Arrow	CT-3871	Out of Domain

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Johnson	Cole Lumber & Construction Company	Cole Bull Wacker #1	CT-4010	Out of Domain
WY	Sweetwater	Coleman Oil & Gas, Inc.	Barrel Springs Federal 12-1	wv-3933	Waiver < 3.0 tpy
WY	Park	Colorado Interstate Gas	Elk Basin Compressor Station	wv-3072	Waiver < 3.0 tpy
WY	Sweetwater	Colorado Interstate Gas	Entrega Bitter	wv-4074	Waiver < 3.0 tpy
WY	Sweetwater	Colorado Interstate Gas	Frewen Lake Meter Station	wv-4051	Waiver < 3.0 tpy
WY	Carbon	Colorado Interstate Gas	Rawlins Plant	wv-2798	Waiver < 3.0 tpy
WY	Johnson	Continental Industries LLC	Box Elder Quinn CPF #2	CT-3102A	Out of Domain
WY	Converse	Converse County Road & Bridge	Glenrock Gravel Pit	CT-4084	Out of Domain
WY	Converse	Converse County Road & Bridge	Lightning Creek	CT-4147	Out of Domain
WY	Campbell	Croel Ready Mix	Concrete Batch Plant	CT-4083	Out of Domain
WY	Park	Dakota Coal Company	Wyoming Lime Producers	wv-3948	Waiver < 3.0 tpy
WY	Sweetwater	Davis Petroleum Corporation	Vermillion Federal 27-6	wv-2493	Waiver < 3.0 tpy
WY	Fremont	Delta Exploration Company, Inc.	RCU 1-35 Production Facility	wv-3774	Waiver < 3.0 tpy
WY	Fremont	Delta Exploration Company, Inc.	West Madden Federal 6-27	wv-3116	Waiver < 3.0 tpy
WY	Fremont	Delta Exploration Company, Inc.	West Madden Federal 6-27	wv-3608	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Corp.	Five Mile Ditch 13-20-21-93	wv-3855	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Baggs Mainline/ Blue Gap Compressor Station	MD-1163A	<1.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Baldy Butte 8-8-17-92	wv-3697	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Barrel Springs Unit 7-10-16-93	wv-2611	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Blue Gap II Unit 16-18-15-92	wv-3444	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Blue Gap II Unit 3-18-15-92	wv-3622	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 10A-11-16-93	wv-3434	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 11-1-16-93	wv-3266	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 11-12-16-93	wv-3393	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 13-11-16-93	wv-2433	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 14-33-16-93	wv-3330	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 2-6-16-93	wv-3920	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 3-24-16-93	wv-3251	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	BSU 7-15-16-93	wv-3806	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 10-32-17-93	wv-3432	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 11-20-17-93	wv-3919	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 11-28-17-93	wv-3329	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 4-32-17-93	wv-4121	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 6-30-17-93	wv-4078	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 8-30-17-93	wv-2611	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Coal Gulch 9-30-17-93	wv-4077	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	East Echo Springs 11-33-19-92	wv-3260	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	East Echo Springs 1-2-19-92	wv-2383	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	East Echo Springs 16-34-19-92	wv-3703	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	East Echo Springs 6-34-19-92	wv-3623	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Flat Top 13-23-14-93	wv-3250	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Flat Top 9-11-15-93	wv-3013	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Latham 6-14-20-93	wv-3235	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Mexican Flats 12-32-15-92	wv-3475	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Red Desert 16-18-20-95	wv-2652	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Robbers Gulch 10-34-14-92	wv-2327	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Robbers Gulch 12-35-14-92	wv-2357	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Robbers Gulch 13-33-14-92	wv-2432	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Robbers Gulch 14-29-14-92	wv-3805	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Robbers Gulch 4-13-14-92	wv-3523	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Siberia Ridge 12-14-22-94	wv-2885	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Sourdough Gulch 11-16-22-93	wv-3852	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Sourdough Gulch 1-22-22-93	wv-3555	Waiver < 3.0 tpy
WY	Campbell	Devon Energy Production Company, L.P.	Spotted Horse Field	wv-4124	Out of Domain
WY	Carbon	Devon Energy Production Company, L.P.	Standard Draw 11-28-18-93	wv-3433	Waiver < 3.0 tpy
WY	Carbon	Devon Energy Production Company, L.P.	Standard Draw 1-8-18-93	wv-3705	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	West Wamsutter 9X-34-21-95	wv-4116	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Wild Rose 1-20-17-94	wv-2380	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Wild Rose 16-30-17-94	wv-2470	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Wild Rose 4-24-17-94	wv-2806	Waiver < 3.0 tpy
WY	Sweetwater	Devon Energy Production Company, L.P.	Wild Rose 4-8-17-94	wv-2281	Waiver < 3.0 tpy
WY	Sheridan	Dewey, Carlton	Dewey 21 Gravel Quarry	CT-3844	Out of Domain
WY	Laramie	Domson Incorporated	Harriman Road Quarry	CT-4046	Out of Domain
WY	Laramie	Domson Incorporated	Nimmo Ranch	CT-4027	Out of Domain
WY	Carbon	Double Eagle Petroleum Company	Cow Creek Central Production Facility	wv-3977	Waiver < 3.0 tpy
WY	Carbon	Double Eagle Petroleum Company	Cow Creek Unit 34-12	wv-3684	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Champlin 336 Amoco D-1	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Chorney Federal 4-1	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Federal 1-18	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Federal 1-32	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Federal 1-8	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	MDU 6	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Red Lakes 9-36	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Standard Draw 16-18-18-93	wv-2269	Waiver < 3.0 tpy
WY	Carbon	El Paso Field Services	Tierney 15-32-19-94	wv-2269	Waiver < 3.0 tpy
WY	Fremont	El Paso Production Company	Voodoo Hills Federal 1-2	wv-2300	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Castle Gardens Federal 13-31X	wv-3100	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Desert Springs 10-14L	wv-3111	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Desert Springs 10-14L	wv-3655	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Fremont	Encana Oil and Gas (USA), Inc.	Frenchie Draw Satellite/Graham West Station	wv-3093	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Frenchie Draw Satellite/Graham West Station	wv-4039	No Credit for non major source reductions
WY	Fremont	Encana Oil and Gas (USA), Inc.	Frenchie Draw/Graham Unit #5	wv-3092	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Frenchie Draw/Graham Unit Compressor Station	wv-3210	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Frenchie Draw/Graham Unit Compressor Station	wv-3954	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Fuller Compressor Station	wv-2946	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Fuller Compressor Station	wv-3490	Waiver < 3.0 tpy
WY	Carbon	Encana Oil and Gas (USA), Inc.	Gamblers Reservior Federal 43-32	wv-3015	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Graham Unit 10	wv-3262	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Gun Barrel Unit 18-44	wv-3462	Waiver < 3.0 tpy
WY	Natrona	Encana Oil and Gas (USA), Inc.	Gun Barrel Unit 24-33	wv-3462	Waiver < 3.0 tpy
WY	Natrona	Encana Oil and Gas (USA), Inc.	Gun Barrel Unit 25-21	wv--3462	Waiver < 3.0 tpy
WY	Natrona	Encana Oil and Gas (USA), Inc.	Gun Barrel Unit 26-22	wv-3462	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Hay Reservoir 44	wv-3559	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Hay Reservoir 71	wv-3708	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Hay Reservoir Unit 83	wv-3172	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Hay Reservoir Unit 84	wv-3173	Waiver < 3.0 tpy
WY	Sweetwater	Encana Oil and Gas (USA), Inc.	Hay Reservoir Unit 86	wv-2343	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Lamar 7-22	wv-3448	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Midway Compressor Station	wv-3956	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Montecristo 1 19-22	wv-2312	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Montecristo 14 24-42	wv-2679	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Montecristo 26 13-44	wv-2678	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Montecristo 3 19-41	wv-2615	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Ocla Draw 8-32	wv-3294	Waiver < 3.0 tpy
WY	Sublette	Encana Oil and Gas (USA), Inc.	SOL Unit 12-25	wv-3683	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	Travis Federal	wv-4091	Waiver < 3.0 tpy
WY	Fremont	Encana Oil and Gas (USA), Inc.	West Pavillion Compressor Station	wv-3095	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	B 5A Water Disposal Facility	wv-3202	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	BB 14-75	wv-3311	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	BNG 22-5	wv-4033	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	BNG 3 Tank Battery	wv-3202	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	BPMV 1-106-23	wv-3261	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	BPMV 2-38	wv-3263	Waiver < 3.0 tpy
WY	Sweetwater	EOG Resources	Buffalo Hump 13-4	wv-2546	Waiver < 3.0 tpy
WY	Carbon	EOG Resources	BX 101-17	wv-3491	Waiver < 3.0 tpy
WY	Converse	EOG Resources	Copperhead 1-7	wv-4106	Out of Domain
WY	Lincoln	EOG Resources	Cow Creek 1-20	wv-2284	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	ELBU T76-32	wv-3026	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Emigrant Hollow 35-20E	wv-3152	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Emigrant Springs 34-23	wv-3315	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Farson Springs 1-14	wv-2725	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	GRB 232-35	wv-2947	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRB 233-11	wv-2998	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRB 237-11D	wv-2999	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRB 238-2	wv-2964	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRB 239-02	wv-3091	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	GRB 240-35	wv-3124	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRB 4-13	wv-3295	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRBU 224-02	wv-2802	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRBU 235-13	wv-2625	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	GRBU 241-36	wv-2323	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	GRBU 242-36	wv-2614	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRBU 247-1	wv-2695	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRBU 248-24	wv-2443	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	GRBU 250-12	wv-2672	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Green River Bend 1 Tank Battery	wv-3202	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Green River Bend 2-12	wv-4034	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Green River Bend 225-2	wv-2795	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Jackson Creek 22-11	wv-3144	Waiver < 3.0 tpy
WY	Fremont	EOG Resources	Pappy Draw 101-33E	wv-3621	Waiver < 3.0 tpy
WY	Fremont	EOG Resources	Pappy Draw 101-33E	wv-3668	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressor Engine	wv-3961	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-1142A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-1313A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-1326A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-1690A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-1839A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-2034A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-2123A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-2178A	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-3025	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	Portable Compressors	wv-3026	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 21-28	wv-2826	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 72-28	wv-3138	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 74-34	wv-2876	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 74-34	wv-3381	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Sublette	EOG Resources	S 77-34	wv-3313	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 82-21	wv-3314	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 83-33	wv-3316	Waiver < 3.0 tpy
WY	Sublette	EOG Resources	S 84-7D	wv-3320	Waiver < 3.0 tpy
WY	Sweetwater	EOG Resources	South Moxa Gravel Pit	wv-3689	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Stead Canyon 13-15	wv-3996	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Stead Canyon 16-10	wv-4003	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Stead Canyon 6-10	wv-4002	Waiver < 3.0 tpy
WY	Lincoln	EOG Resources	Stead Canyon Unit 1-15 & Stead Canyon 18-15	wv-2955	Waiver < 3.0 tpy
WY	Fremont	EOG Resources	Webb Ranch 2-19	wv-2605	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Corporation	Hogsback Unit T23X-25G	wv-3403	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Corporation	Hogsback Unit T31X-25G	wv-3403	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Corporation	Hogsback Unit T52X-8G	wv-3403	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Corporation	Hogsback Unit T87X-29G	wv-3403	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Corporation	Tip Top T41X-14P1 & T41X-14P2	wv-2228	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Hogsback T15X-8GN	wv-3168	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Hogsback T25X-30G2	wv-3168	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Hogsback T44X-17G	wv-3168	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Hogsback T78X-36S	wv-3168	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T23X-31GS	wv-3291	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T26X-29G2	wv-2950	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T36X-30G1	wv-2950	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T36X-30G2	wv-2950	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T38X-6G	wv-3291	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T45X-31G	wv-3291	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T52X-32G1	wv-3291	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T72X-16S	wv-2950	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T75X-17G	wv-3291	Waiver < 3.0 tpy
WY	Sublette	Exxon Mobil Production Company	Tip Top T76X-1G1	wv-3291	Waiver < 3.0 tpy
WY	Crook	First Energy Services Company, Inc.	Cole Pit	CT-3897	Out of Domain
WY	Crook	First Energy Services Company, Inc.	Cole Pit	MD-1210	Out of Domain
WY	Campbell	First Energy Services Company, Inc.	Durham Ranch Pit	CT-3958	Out of Domain
WY	Campbell	First Energy Services Company, Inc.	Durham Ranch Pit	CT-4022	Out of Domain
WY	Crook	Fisher Sand and Gravel	StateLine Quarry	CT-3839	Out of Domain
WY	Sweetwater	FMC Wyoming Corporation	Soda Ash Facility - Granger	wv-3297	Waiver < 3.0 tpy
WY	Sweetwater	Forest Oil Corporation	Forest 9-32-18-94	wv-4059	Waiver < 3.0 tpy
WY	Sublette	Forest Oil Corporation	Wild Rose 1-26	wv-4060	Waiver < 3.0 tpy
WY	Sweetwater	Forest Oil Corporation	Wild Rose Federal 2-32	wv-2293	Waiver < 3.0 tpy
WY	Campbell	Foundation Coal West, Inc.	Belle Ayre Mine	MD-1271	Out of Domain
WY	Campbell	Foundation Coal West, Inc.	Eagle Butte Mine	MD-1251	Out of Domain
WY	Johnson	Four Mile Ranch, Inc.	Koch Mine	CT-4145	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-1115	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-3449	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-1176	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-3585	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-3598	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-3766	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-3711	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-3982	Out of Domain
WY	Laramie	Frontier Oil and Refining Company	Frontier Refinery	wv-4092	Out of Domain
WY	Converse	Ft. Union Gas Gathering LLC	Medicine Bow Treating Plant	MD-1253	Out of Domain
WY	Natrona	Halliburton Services	Casper Facility	wv-3905	Waiver < 3.0 tpy
WY	Sweetwater	Halliburton Services	Rock Springs Sand/Barite Transloading Facility	wv-2902	Waiver < 3.0 tpy
WY	Sweetwater	Halliburton Services	Rock Springs Terminal	wv-2759	Waiver < 3.0 tpy
WY	Sweetwater	Harborlite Corporation	Green River Perlite Ore Processing	wv-3626	Waiver < 3.0 tpy
WY	Johnson	Harlan Barnum Ranch Limited Partnership	Harlan Pit	CT-3966	Out of Domain
WY	Sweetwater	Headwaters Resources, Inc.	Fly Ash Storage and Transfer Facility	wv-3454	Waiver < 3.0 tpy
WY	Converse	Headwaters Resources, Inc.	Portable Baghouse	wv-2982	Out of Domain
WY	Crook	Hettinger Welding, Inc.	Crushing/Screening	CT-3847	Out of Domain
WY	Crook	Hettinger Welding, Inc.	Hettinger Gypsum Mine	CT-3843	Out of Domain
WY	Sweetwater	Hudson Group LLC	Picket Lake #2	wv-3426	Waiver < 3.0 tpy
WY	Sweetwater	Hudson Group LLC	Picket Lake Portable Generator Sets	wv-3476	Waiver < 3.0 tpy
WY	Sweetwater	Hyland Enterprises, Inc.	Sweetwater Disposal	wv-3756	Waiver < 3.0 tpy
WY	Johnson	Indian Pipe Cattle Company, Inc.	Wedin Pit	CT-3818	Out of Domain
WY	Sweetwater	Infinity Oil & Gas of Wyoming	Pipeline 13-4R-18-100	wv-2849	Waiver < 3.0 tpy
WY	Sweetwater	Infinity Oil & Gas of Wyoming	Pipeline 1-4-18-100	wv-2844	Waiver < 3.0 tpy
WY	Uinta	Integrity Industries, Incorporated	Liquid Guar Suspension Facility	wv-4089	Waiver < 3.0 tpy
WY	Teton	Jackson Hole 2003, LLC	Tucker Ranch SD Lot 16	wv-2939	Waiver < 3.0 tpy
WY	Converse	Jim Huxtable	Huxtable Quarry	CT-3787	Out of Domain
WY	Johnson	Jim's Water Service	Falxa Pit #1	wv-3070	Out of Domain
WY	Sweetwater	J-W Operating Company	Cimallano 6 #1	wv-4291	Waiver < 3.0 tpy
WY	Laramie	Karl's Custom Koating, LLC	Powder Coating Facility	wv-3324	Out of Domain
WY	Johnson	Kennedy Oil	Stranahan #1	wv-3061	Out of Domain
WY	Johnson	Kennedy Oil	Stranahan #1	wv-3912	Out of Domain
WY	Campbell	KFx Incorporated	KFx Mine - K Fuels Plus Plant	MD-1228	Out of Domain
WY	Campbell	KFx Incorporated	KFx Mine - K Fuels Plus Plant	wv-4107	Out of Domain
WY	Johnson	KG Construction	Falxa Pit #2	CT-3970	Out of Domain
WY	Converse	Kinder Morgan Upstream, LLC	Douglas Gas Plant	MD-1136	Out of Domain
WY	Converse	Kinder Morgan Upstream, LLC	Douglas Gas Plant	wv-4246	Out of Domain

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Natrona	Kinder Morgan, Inc.	Casper Extraction Plant	wv-3681	Waiver < 3.0 tpy
WY	Natrona	Landmark Development, LLC	Barrow Material Excavation	wv-4212	Waiver < 3.0 tpy
WY	Portable	Lee Excavation, Inc.	Portable Extech Jaw Crusher	CT-4007	Portable
WY	Goshen	Lucky Gate Ranch, LLC	Lucky Gate Quarry	CT-3850	Out of Domain
WY	Converse	Manx Oil Corporation	Birdie Kinder Federal 1-31-2A	wv-2875	Out of Domain
WY	Converse	Manx Oil Corporation	Cheesbrough Fee 1	wv-2927	Out of Domain
WY	Converse	Manx Oil Corporation	Dunham 1-2	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Federal 3-20	wv-2927	Out of Domain
WY	Converse	Manx Oil Corporation	Federal Larsen 1-1	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Federal Mortons 2-28	wv-2927	Out of Domain
WY	Converse	Manx Oil Corporation	Federal XR 1-2	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Holmes C 1	wv-2927	Out of Domain
WY	Converse	Manx Oil Corporation	John Pepper Federal 1-31-2A	wv-2875	Out of Domain
WY	Converse	Manx Oil Corporation	Johnson 1-29	wv-2927	Out of Domain
WY	Converse	Manx Oil Corporation	Lebar Hoyt 1-2	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Lee Moore Federal 1-17-2A	wv-2875	Out of Domain
WY	Converse	Manx Oil Corporation	Moore Fee 1	wv-2875	Out of Domain
WY	Converse	Manx Oil Corporation	State 1-16	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	State 2-16	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	State 3-16	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Williams 1-15	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Williams 2-15	wv-2877	Out of Domain
WY	Converse	Manx Oil Corporation	Williams Battery	wv-2877	Out of Domain
WY	Carbon	Marathon Oil Company	Echo Springs 5-4	wv-3813	Waiver < 3.0 tpy
WY	Carbon	Marathon Oil Company	Echo Springs 6-2	wv-3751	Waiver < 3.0 tpy
WY	Carbon	Marathon Oil Company	Echo Springs 6-4	wv-3856	Waiver < 3.0 tpy
WY	Carbon	Marathon Oil Company	Echo Springs 7-2	wv-3778	Waiver < 3.0 tpy
WY	Carbon	Marathon Oil Company	Echo Springs 9-4	wv-3875	Waiver < 3.0 tpy
WY	Park	Marathon Oil Company	Oregon Basin North Chugwater Gas Facility	wv-3861	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 10-33	wv-2766	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 1-1-1	wv-4056	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 11-28 PAD	wv-2963	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 11-34 PAD	wv-2837	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 21-34 PAD	wv-2905	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 3-3-33	wv-3945	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 4-2-1	wv-4026	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 4-3-1	wv-4104	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 6-12	wv-2260	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 7-6	wv-2344	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 8-29A	wv-2507	Waiver < 3.0 tpy
WY	Sweetwater	Marathon Oil Company	Wamsutter 9-7 PAD	wv-3135	Waiver < 3.0 tpy
WY	Johnson	McCartney Engineering, LLC	Bombsite Compressor Station	CT-4086	Out of Domain
WY	Sublette	McMurry Oil Company	SAG 5-17	wv-3999	Waiver < 3.0 tpy
WY	Sublette	McMurry Oil Company	Wardell 1-9-28-108	wv-2870	Waiver < 3.0 tpy
WY	Portable	McMurry Ready Mix	Portable Air Separator	CT-4133	Portable
WY	Portable	McMurry Ready Mix	Portable Crusher	CT-4135	Portable
WY	Portable	McMurry Ready Mix	Portable screen	CT-4134	Portable
WY	Laramie	Meridian Granite Company	Granite Canyon Quarry	wv-2958	Out of Domain
WY	Laramie	Meridian Granite Company	Granite Canyon Quarry	wv-3080	Out of Domain
WY	Converse	Merit Energy Company	Manning Federal 1-33	wv-3179	Out of Domain
WY	Converse	Merit Energy Company	Moore Federal 2-3	wv-3180	Out of Domain
WY	Campbell	Merit Energy Company	Murphy Federal 1-6	wv-3178	Out of Domain
WY	Converse	Merit Energy Company	Sage Creek Gas Plant	MD-648A	Out of Domain
WY	Converse	Merit Energy Company	Sage Grouse Booster	MD-1196	Out of Domain
WY	Campbell	Merit Energy Company	Wright 1-34	wv-3229	Out of Domain
WY	Campbell	Merit Energy Company	Wright 4-34	wv-3229	Out of Domain
WY	Campbell	MIGC Incorporated	Carter Compressor Station	MD-1235	Out of Domain
WY	Niobrara	Millennium Oil and Gas LLC	CJ Thompson Central Battery	wv-3323	Out of Domain
WY	Natrona	Moncrief Oil	Cave Gulch 30-1	wv-3714	No Credit for Decrease at non-major source
WY	Sweetwater	Mountain Gas Resources	Higgins Unit 15-43A Dehydration Unit	wv-3967	Waiver < 3.0 tpy
WY	Sweetwater	Mountain Gas Resources	Laney Wash 21-2	CT-4175	<1.0 tpy
WY	Sweetwater	Mountain Gas Resources	Laney Wash 33-1 Dehydration Unit	wv-3959	Waiver < 3.0 tpy
WY	Sweetwater	Mountain Gas Resources	Patrick Draw Gas Plant	wv-3517	Waiver < 3.0 tpy
WY	Sweetwater	Mountain Gas Resources	Sevenmile Gulch Compressor Station	MD-1316	< 1.0 tpy
WY	Sweetwater	Mountain Gas Resources	Shiprock Federal 34-4	wv-3992	Waiver < 3.0 tpy
WY	Carbon	Nadel and Gussman Rockies LLC	Hatfield UPRR #2	wv-3946	Waiver < 3.0 tpy
WY	Sweetwater	Nance Petroleum Corporation	Creston Junction 13-10-20-92	wv-2778	Waiver < 3.0 tpy
WY	Campbell	Nance Petroleum Corporation	River Compressor Station	CT-4061	Out of Domain
WY	Natrona	Natural Gas Processing Co.	Boone Dome 1-10	wv-3310	Waiver < 3.0 tpy
WY	Natrona	Natural Gas Processing Co.	Boone Dome 3-9	wv-3310	Waiver < 3.0 tpy
WY	Natrona	Natural Gas Processing Co.	Boone Dome 5-9	wv-3310	Waiver < 3.0 tpy
WY	Natrona	Natural Gas Processing Co.	Boone Dome 6-15	wv-3310	Waiver < 3.0 tpy
WY	Natrona	Natural Gas Processing Co.	Fowler Federal 5	wv-3310	Waiver < 3.0 tpy
WY	Johnson	Newpark Environmental	Anadarko Skewed Water Treatment	wv-3646	Out of Domain
WY	Niobrara	Niobrara County	Boner Pit #2	wv-3366	Out of Domain
WY	Niobrara	Niobrara County	Thompson Mine	wv-2901	Out of Domain
WY	Niobrara	Niobrara County	Tollman Pit	wv-3367	Out of Domain
WY	Johnson	North Finn	Big Bend Section 36	wv-2993	Out of Domain
WY	Lincoln	Northwest Pipeline Corporation	Kemmerer Compressor Station	wv-3541	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Lincoln	Northwest Pipeline Corporation	Kemmerer Compressor Station	wv-3544	Waiver < 3.0 tpy
WY	Campbell	Optigas Inc.	AJ Compressor Station	MD-1149	Out of Domain
WY	Campbell	Optigas Inc.	Bad Ben	CT-3855	Out of Domain
WY	Campbell	Optigas Inc.	Barber Creek Compressor Station	CT-3389A3	Out of Domain
WY	Campbell	Optigas Inc.	Barber Creek Compressor Station	MD-1288	Out of Domain
WY	Johnson	Optigas Inc.	Becky Compressor Station	CT-4049	Out of Domain
WY	Johnson	Optigas Inc.	Big Mike Compressor Station	CT-3466A	Out of Domain
WY	Johnson	Optigas Inc.	Big Mike Compressor Station	MD-1315	Out of Domain
WY	Johnson	Optigas Inc.	Boots Compressor Station	CT-3327A	Out of Domain
WY	Johnson	Optigas Inc.	Boots Compressor Station	MD-1208	Out of Domain
WY	Campbell	Optigas Inc.	Ethan	CT-3851	Out of Domain
WY	Campbell	Optigas Inc.	Ethan	CT-3851A	Out of Domain
WY	Johnson	Optigas Inc.	Jennifer Compressor Station	CT-3279A	Out of Domain
WY	Johnson	Optigas Inc.	Jennifer Compressor Station	MD-1201	Out of Domain
WY	Johnson	Optigas Inc.	Kayla C Compressor Station	CT-3298A2	Out of Domain
WY	Johnson	Optigas Inc.	Kayla C Compressor Station	MD-1207	Out of Domain
WY	Campbell	Optigas Inc.	Kingsbury Land Compressor Station	CT-3388A	Out of Domain
WY	Campbell	Optigas Inc.	Mandy Q Compressor Station	MD-1154	Out of Domain
WY	Johnson	Optigas Inc.	Powder River Compressor Station	CT-3406A	Out of Domain
WY	Johnson	Optigas Inc.	Powder River Compressor Station	MD-1256	Out of Domain
WY	Campbell	Optigas Inc.	Shady Clair Compressor Station	CT-3653A	Out of Domain
WY	Campbell	Optigas Inc.	Shady Clair Compressor Station	CT-3653A2	Out of Domain
WY	Johnson	Optigas, LLC	Addie Compressor Station	CT-4059	Out of Domain
WY	Sweetwater	P4 Production L.L.C.	Rock Springs - Rotary Coking	wv-3023	Waiver < 3.0 tpy
WY	Campbell	Pacificorp	Wyodak Plant	wv-3081	Out of Domain
WY	Campbell	Pacificorp	Wyodak Plant	wv-3302	Out of Domain
WY	Campbell	Pacificorp	Wyodak Plant	wv-2868	Out of Domain
WY	Campbell	Pacificorp	Wyodak Plant	wv-3447	Out of Domain
WY	Campbell	Pacificorp	Wyodak Plant	wv-3436	Out of Domain
WY	Campbell	Pacificorp	Wyodak Plant	MD-1177	Out of Domain
WY	Laramie	Palomino Industries Inc.	Powder Coating System	wv-4075	Out of Domain
WY	Crook	Pete Lien & Sons Incorporated	Kokesh Pit	CT-3971	Out of Domain
WY	Lincoln	Petral Exploration LLC	Sage #21-7R Production	wv-2858	Waiver < 3.0 tpy
WY	Sublette	Petrogulf Corporation	Petrogulf State 36-1	wv-3584	Waiver < 3.0 tpy
WY	Sublette	Petrogulf Corporation	State 36-16	wv-3613	Waiver < 3.0 tpy
WY	Washakie	Petrogulf Corporation	UTP-USA 2-19-48-91	wv-3394	Waiver < 3.0 tpy
WY	Johnson	Pine Ridge Cattle Company, LLC	P.R. One Pit	CT-3797	Out of Domain
WY	Lincoln	Pittsburg and Midway Coal Company	Kemmerer Mine	wv-3587	Waiver < 3.0 tpy
WY	Lincoln	Pittsburg and Midway Coal Company	Kemmerer Mine	wv-4000	Waiver < 3.0 tpy
WY	Weston	Plains Marketing, L.P.	Mush Creek Station	wv-4117	Out of Domain
WY	Johnson	Powder River Sand and Gravel, LLC	Kennedy Pit	CT-3831	Out of Domain
WY	Uinta	Questar Exploration & Production Company	Butcher Knife Springs 9	wv-4186	Waiver < 3.0 tpy
WY	Carbon	Questar Exploration & Production Company	Creston Federal 32-2	wv-4031	Waiver < 3.0 tpy
WY	Lincoln	Questar Exploration & Production Company	Hailstone Unit 12	wv-2828	Waiver < 3.0 tpy
WY	Uinta	Questar Exploration & Production Company	Outer Blacks Fork 1-27	wv-2515	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 10-3	wv-3097	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 10-5	wv-3743	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 12-3	CT-4164	< 1.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 12-4	wv-3652	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 12-5	wv-3834	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 12-7	wv-3926	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Red Lakes South 12-8	wv-3925	Waiver < 3.0 tpy
WY	Lincoln	Questar Exploration & Production Company	Reynard Unit 17	wv-2816	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Wedge Unit 10	wv-3174	Waiver < 3.0 tpy
WY	Sweetwater	Questar Exploration & Production Company	Wedge Unit 13	wv-3698	Waiver < 3.0 tpy
WY	Sublette	Questar Gas Management Company	Pinedale SWD Facility	wv-2378	Waiver < 3.0 tpy
WY	Sublette	Questar Gas Management Company	Stewart Point Well 16-18 CDP	wv-3373	Waiver < 3.0 tpy
WY	Uinta	Questar Pipeline Company	Clear Creek Meter & Regulation Station	wv-3968	Waiver < 3.0 tpy
WY	Johnson	RDG Oil & Gas, LLC	Gravel Pit	wv-3677	Out of Domain
WY	Portable	Recycled Materials Company, Inc.	Crushing and Screeing plant	CT-3823	Portable
WY	Platte	Rissler and McMurry Company	Frederick Quarry	CT-3829	Out of Domain
WY	Portable	Robinson Construction	Portable Crushing and Screening	CT-4020	Portable
WY	Campbell	Rowdy Pipeline, LLC	20 Mile Creek	CT-3731A	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Benchmark Compressor Station	CT-4172	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Charity Compressor Station	CT-4137	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Coal Gulch Compressor Station	CT-4160	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Compass Compressor Station	CT-4173	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Hanslip Central Compressor Station	MD-1135	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Hatteras State Compressor Station	CT-4174	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Iberlin II Compressor Station	CT-4121	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Julianna Compressor Station	CT-4154	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Kline Draw Central Compressor Station	MD-1166	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Kline Draw Satellite 3	MD-1234	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	LX Bar Compressor Station	CT-2240A2	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Marine	CT-3894	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Mustang	CT-3865	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Nemesis II	CT-4052	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Pine Tree Central Compressor Station	MD-1020A	Out of Domain

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Johnson	Rowdy Pipeline, LLC	Pumpkin Creek Central Compressor Station	MD-751A2	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Riverbend Central Compressor Station	CT-3776A	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Rochelle Hills	CT-3842	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Rommel	CT-3689A	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Router Compressor Station	CT-4048	Out of Domain
WY	Johnson	Rowdy Pipeline, LLC	Router II Compressor Station	CT-4063	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Spotted Horse Central Compressor Station	MD-880A2	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Store Draw	MD-1105	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Sunburst Compressor Station	MD-1291	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	TD Southwest Compressor Station	MD-1117	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Thunder Basin Compressor Station	CT-4065	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	UCross Compressor Station	CT-4162	Out of Domain
WY	Campbell	Rowdy Pipeline, LLC	Uprising	CT-3848	Out of Domain
WY	Johnson	S&I Partnership	Redd Pit	CT-4077	Out of Domain
WY	Sweetwater	Samson Resources Company	Brooks Draw Federal No. 1-29	wv-3993	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	CEPO 23-7	wv-3880	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Christensen Ranch 13-1	wv-2406	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Christensen Ranch 18-1	wv-2405	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Deadman Federal 1	wv-3450	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Deadman Federal 1	wv-2454	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Deadman Federal 21-8	wv-2454	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #1-10	wv-2576	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #1-14	wv-2571	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #1-22	wv-2555	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #2-10	wv-2569	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #2-18A	wv-2575	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #2-22A	wv-2570	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #3-10	wv-2556	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #3-24	wv-2574	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #4-10	wv-2552	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #4-14	wv-2553	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs #4-22	wv-2597	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs 6-10	wv-3439	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs 6-22N	wv-3068	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs 6-28N	wv-3241	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs 7-24	wv-4020	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs Compressor Station	wv-2884	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs Condensate Stabilization Unit and Federal 3-22A	wv-2573	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs Federal 1-24	wv-2554	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Echo Springs Federal 1-28-20-92	wv-3029	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Echo Springs Federal 1-28-20-92	wv-3386	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Echo Springs Federal 8-10	wv-3788	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Echo Springs State 6-36N	wv-3831	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Federal 43-6	wv-2961	No Credit for Decrease at non-major source
WY	Sweetwater	Samson Resources Company	Powder Mountain 1-13E	wv-2407	Waiver < 3.0 tpy
WY	Carbon	Samson Resources Company	Red Creek 18-1	wv-3114	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Salt Wells 15-10	wv-3850	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Siberia Ridge 8-22	wv-2748	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	South Siberia Ridge 6-34	wv-2747	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	Union Federal2-11	wv-3779	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	UPRC 6-27	wv-2455	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	UPRC 7-27	wv-2456	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	UPRC 8-27	wv-3086	Waiver < 3.0 tpy
WY	Sweetwater	Samson Resources Company	UPRR 4-33	wv-2650	Waiver < 3.0 tpy
WY	Johnson	Sanjel USA Inc.	Oilfield Services Facility	wv-3460	Out of Domain
WY	Sweetwater	Schlumberger Technology Corporation	New Oilfield Services Bulk Facility	wv-3414	Waiver < 3.0 tpy
WY	Sweetwater	Shawnee Oil Development Company	Kilroy-Kirby #1 Production Facility	wv-4055	Waiver < 3.0 tpy
WY	Laramie	Simon Contractors	Cheyenne Facility	wv-4036	Out of Domain
WY	Natrona	Sinclair Casper Refining Company	Casper Refinery	wv-3184	Waiver < 3.0 tpy
WY	Natrona	Sinclair Casper Refining Company	Casper Refinery	wv-3196	Waiver < 3.0 tpy
WY	Natrona	Sinclair Casper Refining Company	Casper Refinery	wv-3411	Waiver < 3.0 tpy
WY	Natrona	Sinclair Casper Refining Company	Casper Refinery	wv-3412	Waiver < 3.0 tpy
WY	Carbon	Sinclair Wyoming Refining Company	Sinclair Refinery	wv-3143	Waiver < 3.0 tpy
WY	Carbon	Sinclair Wyoming Refining Company	Sinclair Refinery	wv-3231&3318	Waiver < 3.0 tpy
WY	Carbon	Sinclair Wyoming Refining Company	Sinclair Refinery	wv-3580	Waiver < 3.0 tpy
WY	Carbon	Sinclair Wyoming Refining Company	Sinclair Refinery	MD-1129A	<1.0 tpy
WY	Sweetwater	Solvay Minerals Incorporated	Green River Soda Ash Plant	wv-2926	Waiver < 3.0 tpy
WY	Sweetwater	Solvay Minerals Incorporated	Green River Soda Ash Plant	wv-3918	Waiver < 3.0 tpy
WY	Sweetwater	Southern Star Central Gas Pipeline, Inc.	Riner Station	wv-3254	Waiver < 3.0 tpy
WY	Park	Spomer Construction Company, Inc.	Karst Heart Mountain Mine	wv-4195	Waiver < 3.0 tpy
WY	Converse	Stone Energy Corporation	Federal Johnson 21-21	WV-2153	Out of Domain
WY	Goshen	TDS Collections	Colby Pond	CT-3910	Out of Domain
WY	Sublette	Teletractors, Incorporated	School Section Pit	wv-3975	Waiver < 3.0 tpy
WY	Goshen	The Western Sugar Cooperative	Torrington	wv-2867	Out of Domain
WY	Goshen	The Western Sugar Cooperative	Torrington	wv-3435	Out of Domain
WY	Niobrara	Thomson Gravel Quarry	Quarry #2	wv-3816	Out of Domain

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Sweetwater	Thorofare Resources Incorporated	Fireplace Rock #1 Compressor Station	wv-4027	Waiver < 3.0 tpy
WY	Johnson	Three Way, Inc.	Curutchet Quarry	CT-4036	Out of Domain
WY	Campbell	Thunder Basin Coal Company LLC	Coal Creek Mine	MD-1282	Out of Domain
WY	Converse	Thunder Creek Gas Services	Buckshot Treating Facility	MD-1142	Out of Domain
WY	Campbell	Thunder Creek Gas Services	FB-1156	MD-1197	Out of Domain
WY	Campbell	Thunder Creek Gas Services	FB-1233 Compressor Station	CT-2515A	Out of Domain
WY	Campbell	Thunder Creek Gas Services	FB-3525 Compressor Station	CT-2553A	Out of Domain
WY	Johnson	Thunder Creek Gas Services	Heldt Draw	CT-3990	Out of Domain
WY	Campbell	Thunder Creek Gas Services	North Kitty Booster Station	MD-858A	Out of Domain
WY	Campbell	Thunder Creek Gas Services	SC-0156 Compressor Station	MD-985A2	Out of Domain
WY	Campbell	Thunder Creek Gas Services	SC-0532 Compressor Station	CT-2546A3	Out of Domain
WY	Campbell	Thunder Creek Gas Services	SC-2325 Compressor Station	CT-2551A2	Out of Domain
WY	Campbell	Thunder Creek Gas Services	SC-2732 Compressor Station	MD-1026A	Out of Domain
WY	Campbell	Thunder Creek Gas Services	SC-3225 Compressor Station	CT-2552A3	Out of Domain
WY	Campbell	Thunder Creek Gas Services	SC-3543 Compressor Station	CT-2654A2	Out of Domain
WY	Campbell	Thunder Creek Gas Services	South Kitty (Kitty South #2)	MD-859A	Out of Domain
WY	Campbell	Thunder Creek Gas Services	Spotted Horse (FB-2055)	MD-1116	Out of Domain
WY	Campbell	Thunder Creek Gas Services LLC	SC-2524 Compressor Station	CT-4117	Out of Domain
WY	Campbell	Thunder Creek Gas Services LLC	SC-2624 Compressor Station	CT-4116	Out of Domain
WY	Portable	Tri-State Truck & Equipment Incorporated	Astec Mobile Screen, Model 391: CT-3811	CT-3811	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	Astec Mobile Screen, Model 391: CT-3811	CT-3811A	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	JCI Cone Plant : CT-3813	CT-3813	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	KPI Direct Screen: CT-3814	CT-3814	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	KPI Direct Screen: CT-3815	CT-3815	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	KPI HIS Plant Track Unit: CT-3812	CT-3812	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	Portable Astec Mobile Screen PSTC: CT-3810	CT-3810	Portable
WY	Portable	Tri-State Truck & Equipment Incorporated	Portable Astec Mobile Screen: CT-3809	CT-3809	Portable
WY	Sweetwater	True Oil LLC	Baxter Federal 32-26	wv-3973	Waiver < 3.0 tpy
WY	Campbell	Twenty Mile, LLC	Laramore #1	CT-3917	Out of Domain
WY	Sublette	Ultra Resources Incorporated	Warbonnet 8-8	CT-4167	< 1.0 tpy
WY	Teton	Valley Mortuary	Jackson Funeral Home	wv-4064	Waiver < 3.0 tpy
WY	Park	Voyager Exploration Incorporated	Silver Tip Unit 53-33	wv-3780	Waiver < 3.0 tpy
WY	Sweetwater	Warren E & P, Inc.	Pacific Rim Compressor Station #1	wv-3286	Waiver < 3.0 tpy
WY	Campbell	Western Gas Resources, Inc.	All Night Creek/Owl Compressor Station	MD-1244	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Baker Springs/Butcher Compressor Station	MD-1161	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Bear Draw North/Bruin North Compressor Station	CT-4118	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Bear Draw-Bruin Compressor Station	CT-4124	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Belle Creek Compressor Station	MD-1160	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Belle Creek Compressor Station	MD-1160A	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Bowman Compressor Station	CT-4122	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Bullwacker/Pine Ridge Compressor Station	MD-1174	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Bullwacker/Pine Ridge Compressor Station	MD-1289	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Cherry Compressor Station	MD-1296	Out of Domain
WY	Sweetwater	Western Gas Resources, Inc.	Church Butte	wv-3916	Waiver < 3.0 tpy
WY	Johnson	Western Gas Resources, Inc.	Cinderella	CT-3769A	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Cinderella	MD-1264	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Clarkellen Compressor Station	MD-1162	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Coach	CT-3877	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Deer Gulch Compressor Station	MD-1272	Out of Domain
WY	Fremont	Western Gas Resources, Inc.	Diamond State 36-31	wv-4126	Waiver < 3.0 tpy
WY	Johnson	Western Gas Resources, Inc.	Dry Fork Compressor Station	CT-4123	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Fleener	CT-3883	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Fletcher/Terhune	MD-1085A	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Flying Creek/Bridge Draw Compressor Station	MD-1262	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Galaxy	CT-3983	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Gibbon Compressor Station	MD-1300	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Gus	CT-3985	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Gus	MD-1275	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Hawaii/Maui Compressor Station	MD-1171	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Hickory Compressor Station	MD-1297	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Hidden Compressor Station	MD-1294	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Hollywood Compressor Station	MD-1274	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Hoosier/Chester	CT-3890	Out of Domain
WY	Fremont	Western Gas Resources, Inc.	Howard Ranch 23-15	wv-2227	Waiver < 3.0 tpy
WY	Johnson	Western Gas Resources, Inc.	Indian Creek/Crow Compressor Station	CT-4126	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Irvine Compressor Station	CT-4138	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Isolate Compressor Station	MD-1298	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Jaq Compressor Station	CT-4125	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Jim Beam Compressor Station	MD-1249	Out of Domain

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Campbell	Western Gas Resources, Inc.	Kitty Gas Plant	MD-1190	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Little Thunder/Stratus Compressor Station	MD-1133	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Malibu/Surfer Compressor Station	MD-1179	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Malibu/Surfer Compressor Station	MD-1263	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Mammoth	CT-3768A	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Milan	CT-3876	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Mills-Gillette Station	MD-1226	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Montgomery/Tabatha Compressor Station	CT-2131A (Expired Engines)	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Montgomery/Tabatha Compressor Station	MD-1164	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Morgan Draw/Crenshaw Hill	CT-3299 (expired)	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Morgan Draw/Crenshaw Hill	CT-3962	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Morgan Draw/Crenshaw Hill	MD-1265	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Oahu	CT-3893	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Outsider/Recluse Compressor Station	MD-1169	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Pinto/Spotted Horse	MD-704 & MD-561 (Expired/Removed Engines)	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Pinto/Spotted Horse	MD-1167	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Pinto/Spotted Horse	MD-1225	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Pumpkin/Bruno Compressor Station	MD-1113	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	River/Nile	CT-3991	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	River/Nile	CT-3991A	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Royal	CT-3986	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Scotch	CT-4006	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Senate	MD-1285	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Shooter	CT-3875	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Sioux/Jr. Reno Compressor Station	MD-988A	Out of Domain
WY	Fremont	Western Gas Resources, Inc.	Thomas 1-34 Dehydration Unit	wv-3649	Waiver < 3.0 tpy
WY	Campbell	Western Gas Resources, Inc.	Vail/Winter Park Compressor Station	CT-3262 (Expired)	Out of Domain
WY	Campbell	Western Gas Resources, Inc.	Vail/Winter Park Compressor Station	CT-3963	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Walker Compressor Station	MD-1273	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Whiskey Draw/Jack Daniels Compressor Station	MD-1170	Out of Domain
WY	Johnson	Western Gas Resources, Inc.	Wild Turkey Compressor Station	MD-1219	Out of Domain
WY	Lincoln	Westport Oil and Gas Company, L.P.	Bruff 21-15	wv-3858	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Bruff 4-29	wv-3833	Waiver < 3.0 tpy
WY	Uinta	Westport Oil and Gas Company, L.P.	Bruff 5-1	wv-3606	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Bruff 5-29	wv-3790	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Bruff 5-31	wv-2941	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Bruff 5-33	wv-3609	Waiver < 3.0 tpy
WY	Sweetwater	Westport Oil and Gas Company, L.P.	Champlin 206 F5	wv-3988	Waiver < 3.0 tpy
WY	Sweetwater	Westport Oil and Gas Company, L.P.	Champlin 285 H4	wv-2706	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Champlin 288 C-6	wv-4134	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Champlin 288 E-5	wv-4172	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 203-22-22-112	wv-2212	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 208-22	wv-2933	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 209-14	wv-2942	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 210-35	wv-3117	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 212-23-22-112	wv-2621	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 213-10	wv-3073	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 214-30	wv-3513	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 216-23	wv-3904	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 217-27	wv-3701	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 218-15	wv-3958	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 219-31	wv-3922	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 220-35	wv-4044	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 221-25 Well	wv-3976	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Cow Hollow 59	wv-2705	Waiver < 3.0 tpy
WY	Sweetwater	Westport Oil and Gas Company, L.P.	DiMaggio 11-8-15-94	wv-2296	Waiver < 3.0 tpy
WY	Sweetwater	Westport Oil and Gas Company, L.P.	Fabian Ditch 5-25	wv-2934	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Rocky Crossing USA 3-24	wv-3139	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Seven Mile Gulch 5-16	wv-3430	Waiver < 3.0 tpy
WY	Sweetwater	Westport Oil and Gas Company, L.P.	Seven Mile Gulch 5-23	wv-3017	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Shute Creek 4-13 Well	wv-4037	Waiver < 3.0 tpy
WY	Campbell	Westport Oil and Gas Company, L.P.	Thunder Basin Coal CBM Facility	wv-2852	Out of Domain
WY	Lincoln	Westport Oil and Gas Company, L.P.	Wilson Ranch 12-4	wv-2976	Waiver < 3.0 tpy
WY	Lincoln	Westport Oil and Gas Company, L.P.	Wilson Ranch 5-20	wv-2817	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Bruff Unit 36	wv-2790	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Bruff Unit 39	wv-2789	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Canyon Creek 34-R	wv-2684	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Canyon Creek Unit 38	wv-3306	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Canyon Creek/Vermillion Complex	wv-4032	Waiver < 3.0 tpy
WY	Uinta	Wexpro Company	Church Buttes 158	wv-4125	Waiver < 3.0 tpy
WY	Sublette	Wexpro Company	Johnson Ridge 12	wv-3441	Waiver < 3.0 tpy
WY	Carbon	Wexpro Company	Johnson Ridge S-71-28	wv-3442	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Leucite Hills Unit 4	wv-3197	Waiver < 3.0 tpy
WY	Sublette	Wexpro Company	Pinedale Unit 8	wv-3175	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	South Baxter 23	wv-2301	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	South Baxter Unit 24	wv-2914	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Sweetwater	Wexpro Company	South Baxter Unit 26	wv-2986	Waiver < 3.0 tpy
WY	Sweetwater	Wexpro Company	Trail Unit 20	wv-3892	Waiver < 3.0 tpy
WY	Sweetwater	Whiting Oil and Gas Corporation	Nitchie Gulch 3-21	wv-3883	Waiver < 3.0 tpy
WY	Sweetwater	Whiting Oil and Gas Corporation	North Nitche Gulch 40-36	wv-3884	Waiver < 3.0 tpy
WY	Lincoln	Williams Exploration & Production	Champlin 263 H-2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Exploration & Production	Falcone Federal 50-22	wv-2855	Waiver < 3.0 tpy
WY	Sublette	Williams Exploration & Production	Pixley Creek 4-28	wv-2669	Waiver < 3.0 tpy
WY	Lincoln	Williams Exploration & Production	Siberia Ridge Federal 4-2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Exploration & Production	Tierney 13-12-19-94	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Baldy Butte 33-1	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Baldy Butte 8-8-17-92	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Barrel Springs 11-2	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Barrel Springs 14-33-16-93	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Barrel Springs Federal 12-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Battle Springs 13-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Battle Springs 23-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Battle Springs 25-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Battle Springs 27-1	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Battle Springs 27-3	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Battle Springs 33-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Baumgartner Federal 3-6	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Berkley Federal #4	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Blue Gap II 1-13-15-93	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Blue Gap II 16-18-15-92	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Blue Gap II 3-18-15-92	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff 21-15	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff 4-29	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff 5-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff 5-18	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff 5-29	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Bruff 5-33	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	BS Federal 12-2	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	BSU 10A-11-16-93	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	BSU 11-1-16-93	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	BSU 11-12-16-93	wv-3342	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	BSU 2-6-16-93	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	BSU 3-24-16-93	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	BSU 7-15-16-93	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Buck Draw 11-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Buck Draw 17-1	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Buck Draw 31-1	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Buck Draw 33-1	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	C G Road 4-4	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Celsius Federal 1-14E	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	CG Road 9-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	CG Road 9-2	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Chain Lakes 19-1	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Chain Lakes 27-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Chain Lakes 29-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 206 F-5	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 221 Amoco C#2	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 A-11	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 A13	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 A-5	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 A-9	WV-4208	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 222 D12	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 D9	WV-4208	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 222 E10	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 E-11	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 E-8	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 E-9	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 G-12	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 G-6	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 G-7	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 222 G-8	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 242 A10	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 242 A6	WV-4208	Out of Domain
WY	Carbon	Williams Field Services Company	Champlin 242 A8	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 242 C 6	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 242 E6	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 242 H-10	WV-4208	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 242 H-12	WV-3822	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 242 H-13	WV-3822	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 242 J-12	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 254 D-2	wv-3342	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 261 B10	WV-3822	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Champlin 261 B12	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 261 I 1A	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 261 I 7	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 261 I-5	WV-3822	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Sweetwater	Williams Field Services Company	Champlin 261 I-9	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 270 B-2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 288 C-6	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 288 E-5	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 320 B-2	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 337 A7	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 337 G-11	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 337 G-5	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 337 G7	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Champlin 337 G9	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 357 C5-23	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 358 Bannon 5	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Champlin 452 L-2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cherokee Federal 32-2	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	CIG 5-10	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Coal Bank 11-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Coal Bank 1-2	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Coal Bank 23-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Coal Bank 35-1	wv-3342	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Coal Bank 5-3	WV-3822	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Coal Gulch 11-20-17-93	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 208-22	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 209-14	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 209-14	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 214-30	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 216-23	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 217-27	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 218-15	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 219-31	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 220-35	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 221-25	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 255-27	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 256-27	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Cow Hollow 269-31	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Creston Junction 13-10-20-92	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Creston Nose 1-9-18-92	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Creston Nose 5-32-18-92	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Creston Nose 8-18-18-92	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Creston Nose 9-30-18-92	WV-4208	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Daniel 2-16 CDM	WV-4207	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Dayton 19-6	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Delaney Rim 23-2	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Desert Flats 11-2	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Desert Flats 3-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Divide 15-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Divide 21-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Divide 27-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Divide 35-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Divide 5-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Divide 7-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Donley 26-10	WV-4206	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	E. Echo Spring 16-35-19-92	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	E. Echo Springs 111-33-19-92	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	E. Echo Springs 12-34-19-92	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	E. Echo Springs 13-35-19-92	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	E. Echo Springs 16-34-19-92	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	E. Echo Springs 6-34-19-92	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Echo N State 16-3 & 16-4	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs 21-2 CDM	wv-2855	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Echo Springs 2-2 CDM	WV-3822	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Echo Springs 5-4	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs 6-2	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs 6-30	WV-4206	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Echo Springs 6-4	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs 7-2	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Echo Springs 8-26-19-93	WV-4208	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Echo Springs 9-4	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs Federal 5-12	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs Federal 6-28N	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Echo Springs Federal 9-30	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Echo Springs State 3-16	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Eightmile 11-11	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Eightmile 11-13	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Eightmile 11-5	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Eightmile 11-7	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Eightmile 11-9	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Eightmile 13-7	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Eightmile 25-4	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Emigrant Hollow 35-20E	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Fabian Ditch 500-1E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Fabian Ditch 508-3E	WV-4206	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Lincoln	Williams Field Services Company	Fabian Ditch 5-25	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Fabian Ditch 561-33E	WV-4206	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Falcone Federal 80-22	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Falcone Federal 90-22	WV-4208	Out of Domain
WY	Lincoln	Williams Field Services Company	Fillmore Creek 15-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Fillmore Creek 27-1	wv-2855	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Fillmore Creek 5-19	WV-3822	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Fillmore Creek 5-29	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Fillmore Creek 9-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Filmore Creek 31-2	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Five Mile Ditch 13-20-21-93	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Fivemile 25-1	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Fivemile Ditch 15-20-21-93	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Flat Top 10-26-15-93	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Flat Top 11-10-15-93	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Flat Top 13-23-14-93	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Flat Top 14-2-15-93	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Flat Top 9-11-15-93	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Frewen 12-1	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Frewen 13-4	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Gasco CDM	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hamilton 34-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hams Fork Compressor Station	wv-2765	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 1-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 11-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 15-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 23-3	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 27-3	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 27-4	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 29-2	wv-2855	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	High Point 31-1	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	High Point 9-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T15X-8GN	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T21X-30G	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T25X-30G	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T25X-30G	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T31X-25G	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T52X-8G	wv-3342	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Hogsback T87X-20G	WV-4207	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Hogsback T87X-29G	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Horseshoe Bend 3-1	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Horseshoe Bend 5-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Horseshoe Bend 9-1	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Jawbone 31-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	LaBarge 31	WV-4207	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	LaBarge 35	WV-4207	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	LaBarge 36	WV-4207	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Labarge 38	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham 1-14	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Latham 2-18-20-93	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham 5-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham 6-14-20-93	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Latham Draw 1-1	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham Draw 17-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham Draw 29-1	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Latham Draw 29-2	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Latham Draw 3-1	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham Draw 7-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Latham Draw 9-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Lincoln Road Compressor Station	wv-2764	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Little Monument 44-28	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	LMU 14-23	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	LMU 14-23B	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	LMU 24-27	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	LMU 33-26	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	LMU 44-27	WV-4206	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Luman 15-3	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Luman 17-2	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Luman 25-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Mexican Flats 1-2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Mexican Flats 12-32-15-92	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Mexican Flats 1-3	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Mexican Flats 1-35-15-92	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Mexican Flats 19-1	WV-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Mexican Flats 19-2	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Mexican Flats 31-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Mexican Flats 33-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Minton A9	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Monument 17-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Monument 35-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Monument 7-1	wv-2855	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Lincoln	Williams Field Services Company	Monument Lake Federal 2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Monument Lake Federal 4	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Mounment Lake 25-1	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Muddy Creek 11-1	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Muddy Creek 15-1	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	North Wamsutter 16-18-21-94	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Opal Gas Plant	wv-3474	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Peach Flat State # 4	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Piqua 21-6	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Piqua 21-7	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Piqua 5-21	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Rasmussen 11-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Red Desert 15-3	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Red Desert 15-4	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Red Desert 17-6	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Red Desert 17-7	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Red Desert 20-2	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Red Desert 20-4	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Red Desert 29-3	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Red Desert 33-1	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Red Desert 6-6-20-95	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Red Wash 25-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Robbers Gulch 14-29-14-92	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Robbers Gulch 4-13-14-92	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Robbers Gulch 4-31-14-92	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Robbers Gulch 5-17-14-92	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Rocky Crossing USA 3-24	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Ruby Knolls 25-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Ruby Knolls 35-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	S. Siberia Ridge Fed 6-34	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Sage 21-7	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Sagebrush 433-35E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Seven Mile Gulch 28	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Seven Mile Gulch 5-16	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Seven Mile Gulch 5-21	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Seven Mile Gulch 5-23	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Seven Mile Gulch 6-22	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Seven Mile Gulch 6-23	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Shute Creek 13-04	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Shute Creek 15-12	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Shute Creek 3-32E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Shute Creek 4-13	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Shute Creek 50-31	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Siberia Ridge 6-23	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Siberia Ridge 7-23	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Siberia Ridge 8-23	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Siberia Ridge 9-23	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Siberia Ridge Federal 8-22	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Siberia Ridge Federal 9-22N	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Sourdough 1-22-22-93	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Sourdough Gulch 11-16-22-93	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	South Dug Springs 19-4	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	South Two Rim 13-1	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	South Two Rim 13-2	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	South Two Rim 15-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	South Two Rim 21-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	South Two Rim 25-1	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	South Two Rim 27-1	wv-3342	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	South Two Rim 35-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	State 1-16	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	State 3-36X CDP	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	State 3-36X CDP #2	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	State E3	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	State of Wyoming 24-6D	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	State of Wyoming 5	WV-4206	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Tierney II 22-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Tierney II 22-5	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tiernry II 5-3	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tiffen 1-29 CDM	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tiffen 29-5	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top 22-19	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top 38X-6G	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top 38X-6G	wv-2855	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Tip Top T11X-12 G1 & G2 CDM	WV-4207	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T23X-31G	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T26X-29G2	wv-2855	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Tip Top T37X-31G	WV-4207	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T45X-31G	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T52X-31G1	wv-2855	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Tip Top T53X-11G	WV-4207	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Tip Top T55X-6G	WV-4207	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Lincoln	Williams Field Services Company	Tip Top T72X-16S	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T72X-16S	wv-2855	Waiver < 3.0 tpy
WY	Sublette	Williams Field Services Company	Tip Top T72X-31 CT CDM	WV-4207	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T75X-17G	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tip Top T76X-1G1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Tripp 14-7	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	UPRC 8-27	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	UPRR 2-19	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	UPRR 2-3	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 1-1-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 1-2-29	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 13-12-20-94	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wamsutter 21-34 CDM	wv-2855	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 3-3-1	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 3-3-33	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 3-4-32	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 4-2-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 4-3-1	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter 5-12	WV-4208	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wamsutter 5-28 CDM	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wamsutter 5-28 CDM	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wamsutter 9-7	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wamsutter Federal 5-34	wv-3342	Waiver < 3.0 tpy
WY	Carbon	Williams Field Services Company	Wamsutter Federal 8-12 CDM	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 1-11	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 1-13	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 1-4	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 15-11	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 15-12	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 15-13	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 15-5	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 1-7	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 1-9	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 23-10	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 27-11	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 27-13	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 27-5	WV-4208	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	Wamsutter Rim 9-8	WV-3822	Waiver < 3.0 tpy
WY	Sweetwater	Williams Field Services Company	West Wamsutter 9X-34-21-95	WV-3822	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 210-9E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 212-14E	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 213-20E	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 214-28E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 216-22E	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 222-24E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 226-2E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 227-3E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 227-3E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 229-3E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 233-3E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 235-10E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 236-13E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 237-13E	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 240-20E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 241-21E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 244-23E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 245-23E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 246-12E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 247-13E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 248-14E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 249-17E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 251-17E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 253-28E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 254-29E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 256-7E	WV-4206	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 257-11E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 258-12E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 264-15E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 265-29E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 266-33E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes 5-25	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Whiskey Buttes BR 228-3E	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wild Rose 35-1	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Willow Creek 1-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wilson Ranch 12-4	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wilson Ranch 4-19	wv-2855	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wilson Ranch 5-17	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wilson Ranch 5-19	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wilson Ranch 5-7	WV-3821	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Windy Hill 5-1	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wyoming NCT 1-5	wv-3342	Waiver < 3.0 tpy

Table G.8 - State-Permitted Source Inventory - WDEQ-AQD Permitted Sources – Table of Excluded Sources

State	County Name	Company	Facility	Permit Number	Reason For Exclusion
WY	Lincoln	Williams Field Services Company	Wyoming NCT 2-5	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Field Services Company	Wyoming NCT 2-6	wv-3342	Waiver < 3.0 tpy
WY	Lincoln	Williams Production RMT Company	Hogsback T44X-17G	wv-2855	Waiver < 3.0 tpy
WY	Park	Windsor Energy Group, LLC	Skull Creek 31-2	wv-3076	Waiver < 3.0 tpy
WY	Big Horn	WYO-BEN Incorporated	Sage Creek Plant	wv-2692	Waiver < 3.0 tpy
WY	Laramie	Wyoming Department of Transportation	Deselms Pit	CT-4165	Out of Domain
WY	Platte	Wyoming Department of Transportation	Gray Quarry	CT-3892	Out of Domain
WY	Campbell	Wyoming Department of Transportation	Jayne Pit	CT-3858	Out of Domain
WY	Crook	Wyoming Department of Transportation	Simons Quarry	CT-3837	Out of Domain
WY	Weston	Wyoming Department of Transportation	State 16-44-60 Quarry	CT-4155	Out of Domain
WY	Goshen	Wyoming Ethanol Company	Torrington Plant	wv-3492	Out of Domain
WY	Platte	Wyoming National Guard	Camp Guernsey	wv-3950	Out of Domain
WY	Platte	Wyoming Premium Farms LLC	Farrowing Unit No. 1	wv-3027	Out of Domain
WY	Platte	Wyoming Premium Farms LLC	Finisher Unit No. 1	wv-3038	Out of Domain
WY	Campbell	Wyoming Red Rock	60 Bar Pit	MD-1137	Out of Domain
WY	Campbell	Wyoming Red Rock	Wyoming Red Rock State Pit	CT-3973	Out of Domain
WY	Weston	Wyoming Refining Company	Newcastle Refinery	MD-1132	Out of Domain
WY	Lincoln	XTO Energy Inc	Fontenelle Federal 12-24DX	wv-2215	Waiver < 3.0 tpy
WY	Lincoln	XTO Energy Inc	Fontenelle Federal 13-4	wv-2217	Waiver < 3.0 tpy
WY	Lincoln	XTO Energy Inc	Fontenelle Federal 41-22	wv-2216	Waiver < 3.0 tpy
WY	Campbell	XTO Energy Inc	Hartzog Draw Tank Battery 6	MD-1189	Out of Domain
WY	Campbell	XTO Energy Inc	Mud Springs Station	MD-699A	Out of Domain
WY	Campbell	XTO Energy Inc	Mud Springs Station	MD-1250	Out of Domain
WY	Fremont	Yates Petroleum Corporation	Copper Mountain Unit #1 Production Facility	wv-3628	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	DiMaggio Unit 2	wv-2568	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Eucker Federal #1	wv-3673	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Eucker Federal 2	wv-3849	Waiver < 3.0 tpy
WY	Sublette	Yates Petroleum Corporation	Gobblers Knob Federal 1	wv-2202	Waiver < 3.0 tpy
WY	Converse	Yates Petroleum Corporation	Goemmer Com 1	wv-2262	Out of Domain
WY	Sweetwater	Yates Petroleum Corporation	Hale Unit 5	wv-3990	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Monument Lake Federal 1	wv-3769	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Monument Lake Federal 2 Production Facility	wv-2990	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Peach Flat State #4 Production Facility	wv-3189	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Peach Flat State 2	wv-3767	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Peach Flat State 3	wv-2283	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Peach Flat State 3	wv-2347	Waiver < 3.0 tpy
WY	Carbon	Yates Petroleum Corporation	Peach Flat State 3	wv-3589	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Seaver Unit 1	wv-2389	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	South Bluewater Unit #1	wv-3534	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	South Bluewater Unit #1	wv-3346	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	South Bluewater Unit #1	wv-3902	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Strike State #4	wv-3561	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Strike State #4	wv-3952	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Tipton Federal 2	wv-3627	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Trestle Federal #1 Production Facility	wv-3768	Waiver < 3.0 tpy
WY	Sweetwater	Yates Petroleum Corporation	Wold State Com 1	wv-2498	Waiver < 3.0 tpy

Table G.9 - State-Permitted Source Inventory - WOGCC, COGCC, and UDNR-DOGM Table of Well NOx Emissions by State, for Wells Permitted after January 1, 2005

State	County	Total NO_x Emissions per County (tpy)	Percent of County within the Pinedale Modeling Domain	Total NO_x Emissions Modeled per County (tpy)
Wyoming	Big Horn	0.42	100%	0.42
	Lincoln	0.24	100%	0.24
	Uinta	0.36	100%	0.36
	Sweetwater	6.78	100%	6.78
	Sublette	0.24	100%	0.24
	Fremont	6.78	100%	6.78
	Natrona	1.20	40%	0.48
	Carbon	15.60	50%	7.80
	Park	1.92	100%	1.92
Total Emissions Modeled for Wyoming Counties				23.1
Utah	Summit	4.56	100%	4.56
	Daggett	5.04	100%	5.04
Total Emissions Modeled for Utah Counties				9.6
Colorado	Moffat	9.40	60%	5.64
	Routt	1.44	25%	0.36
Total Emissions Modeled for Colorado Counties				6.0
Total Emissions Modeled for all Counties				38.7

Table G.10 - RFD - Table of Sources- Includes NEPA Projects Through May 2006

EA/EIS Listed by Field Office	Pinedale Anticline (Include/Exclude)	Total NOx Emissions Remaining per Project Area (tpy)	Total SO2 Emissions Remaining per Project Area (tpy)	Total PM10 Emissions Remaining per Project Area (tpy)	Total PM2.5 Emissions Remaining per Project Area (tpy)
WYOMING					
Bridger-Teton National Forest					
Cliff Creek - MA 22	Include.	1.2			
Cottonwood Creek - MA 25	Include.	1.2			
Horse Creek - MA 24	Include.	1.2			
LaBarge Creek - MA 12	Include.	1.2			
Little Greys River - MA 31	Include.	1.2			
Lower Greys River - MA32	Include.	1.2			
Piney Creeks - MA 26	Include.	1.2			
Upper Hoback - MA 23	Include.	1.2			
Willow Creek - MA 49	Include.	1.2			
Buffalo Field Office					
Burnt Hollow Management Plan EA	Exclude - RMP Revision.				
Drainage POD-Torch E&P Corp.	Included as part of PRB. (PRB is outside domain)				
Other POD projects - many listed	Included as part of PRB. (PRB is outside domain)				
Powder River Basin	Include (13% of PRB is inside domain)	827.9	202.5	307.3	117.4
Casper Field Office					
Cave Gulch	Include.	264.5			
Cooper Reservoir (2004)	Include.	78.2			
Cody Field Office					
See Worland Office.					
Kemmerer Field Office					
Cutthroat Gas Processing Plant	Exclude - developed				
Eighth Granger Gas Plant Expansion	Exclude - developed				
Ham's Fork Pipeline	Include.	20.3			
Hickey Mountain-Table Mountain (oil)	Include.	14.1			
Horse Trap	Include.	26.8			
Moxa Arch	Include.	122.5			
Moxa Arch Area Infill	Include.	223.3			
Pioneer Gas Plant	Include.	37.5			
Riley Ridge	Include.	11.2			
Road Hollow Gas Plant	Include.	88.0	55.0	0.8	0.8
Lander Field Office					
Wind River (BIA lead agency)	Include.	517.9	3.2	574.7	91.0
Riverton Dome (BIA lead agency)					
Pappy Draw EA	Exclude - no info.				
Beaver Creek EA					

Table G.10 - RFD - Table of Sources- Includes NEPA Projects Through May 2006

EA/EIS Listed by Field Office	Pinedale Anticline (Include/Exclude)	Total NOx Emissions Remaining per Project Area (tpy)	Total SO2 Emissions Remaining per Project Area (tpy)	Total PM10 Emissions Remaining per Project Area (tpy)	Total PM2.5 Emissions Remaining per Project Area (tpy)
Pinedale Field Office					
Big Piney-LaBarge	Exclude - developed.				
Burley (oil)	Include	1.8			
Castle Creek	Exclude - Not given by FO as project area to include in RFD analysis.				
Fogarty Creek Unit 2524 Pipeline Production Facilities- Exxon	Exclude - per BLM 9/16/03.				
Hoback Basin	Exclude - per BLM 9/16/03.				
Jonah II EIS	Exclude - developed.				
Jonah Enterprise	Include	196.4			
Jonah Infill	Include.	645.1	32.6	273.4	124.7
Merna Pipeline	Exclude - developed.				
Moccasin Basin	Exclude - BLM 9/16/03.				
Soda Unit	Include.	1.4			
South Piney- Infinity & Williams	Include.	736.7	1.3	81.7	80.0
Tank Battery #5 - Enron	Included Big Piney/LaBarge CAP.				
Union Pass	Exclude - BLM 9/16/03.				
Upper Green River	Exclude - BLM 9/16/03.				
Williams - Compressor Station and Pipeline	Include.	19.1			
Yellow Point, road, Pipeline- MOC	Included in Jonah or Jonah II or as permitted source.				
Rawlins Field Office					
Atlantic Rim	Include.	1330.0	65.3	1119.8	247.5
Continental Divide/Wamsutter II	Exclude - developed.				
Continental Divide/Creston	Exclude - proposed action not yet defined and no emissions quantified.				
Creston-Blue Gap	Exclude - developed.				
Desolation Flats	Include.	328.3		46.5	20.3
Dripping Rock/Cedar Breaks	Exclude				
Hanna Draw CBNG Pilot Project EA and Development EIS	Exclude - outside of analysis area.				
Hay Reservoir	Exclude - developed.				
Hay Reservoir Pilot	Include.	1.1			
Mulligan Draw	Include.	3.1			
Scotty Lake CBNG Pilot Project EA	Include.	1.7			
Seminoe Road	Include.	434.5	42.2	515.3	121.0
Sierra Madre (oil)	Include.	1.2			
South Baggs	Include.	45.8			
Wind Dancer Natural Gas Development EA	Include.	3.5			

Table G.10 - RFD - Table of Sources- Includes NEPA Projects Through May 2006

EA/EIS Listed by Field Office	Pinedale Anticline (Include/Exclude)	Total NOx Emissions Remaining per Project Area (tpy)	Total SO2 Emissions Remaining per Project Area (tpy)	Total PM10 Emissions Remaining per Project Area (tpy)	Total PM2.5 Emissions Remaining per Project Area (tpy)
Rock Springs Field Office					
Bird Canyon	Exclude - included in Bird Opal Loop Pipeline.				
Bird-Opal Loop Pipeline	Exclude - developed.				
BTA Bravo	Include.	25.6			
Bitter Creek Shallow Gas Development Project	Include.	7.3			
Burlington Little Monument	Include.	17.2			
Copper Ridge Shallow Gas Proj	exclude - dead end				
East LaBarge	Exclude - BLM 9/16/03.				
Essex Mountain	Exclude - BLM 9/16/03.				
Fontenelle Natural Gas Infill Drilling	Include.	139.7			
Jack Morrow Hills	Include.	12.8			
Kennedy Oil Pilot	exclude - dead end				
Lower Bush Creek CBM	Include.	2.4			
Monell Oil Recovery	Include.	62.0	4.1	4.4	
Monell CO2 pipeline	Exclude - pipeline construction only.				
Opal-Loop Pipeline	Exclude - developed.				
Pacific Rim Shallow Gas Project	Include.	156.3			
Stage Coach	Include.	6.0			
Vermillion Basin	Include.	5.6			
Worland Field Office					
No projects or project areas within FO district.					
UTAH					
Salt Lake Field Office					
No oil and gas projects					
Vernal Field Office					
No oil and gas projects					
COLORADO					
Little Snake Field Office					
No oil and gas projects					
	Total Emissions Remaining	**6427.8**	**406.1**	**2923.9**	**802.8**

Appendix H

Regional Ozone Assessment of the PAPA and Other New Sources in the Region

1.0 INTRODUCTION

This Appendix presents an assessment of the potential ozone impacts due to the Pinedale Anticline Project Area (PAPA) sources and other potential new sources in the region. The potential impacts due to PAPA sources alone were not estimated because ozone is a regional problem due to all sources and there are no incremental ozone thresholds to address [e.g., Prevention of Significant Deterioration (PSD) Class I and II area increments]. Clearly, the ozone impacts due to PAPA sources plus all other potential new projects provide a conservative upper-bound estimate of the potential ozone impacts due to PAPA sources alone. The emissions associated with PAPA sources, and other potential new cumulative emissions, were added to a 2002 base case emissions scenario. The procedures recommended in EPA's latest (April 2007) ozone modeling guidance were used to evaluate the effects that the PAPA sources, along with other new sources in the region, would have on ambient 8-hour ozone concentrations. The ozone impacts were evaluated for two PAPA emission scenarios:

- The Proposed Action Alternative (Alternative B) plus other new cumulative emission projects; and
- Alternative C with Phase II Mitigation plus other new cumulative emission projects.

1.1 Background

PAPA Alternative source emissions would include oxides of nitrogen (NO_x), volatile organic compounds (VOC) and carbon monoxide (CO) that are precursors to ozone. Ozone is formed in the atmosphere due to a series of complex chemical reactions primarily involving VOC and NO_x in the presence of sunlight. The highest ozone concentrations typically occur on hot stagnant sunny days, although recent high ozone events have also occurred on cold winter days with snow cover in southwestern Wyoming. The current National Ambient Air Quality Standard (NAAQS) for ozone is defined as the three year average of the fourth highest daily maximum 8-hour ozone concentration with a threshold of 0.08 ppm (or 85 ppb). The state of Wyoming has also adopted a state standard for 8-hour ozone (WAAQS) that is the same as the federal NAAQS. Recent ozone measurements in southwestern Wyoming have raised concerns regarding the area's future attainment status. During 2005, the fourth highest observed ozone concentrations at the Jonah and Boulder monitoring sites in Sublette County, Wyoming were 76 and 80 ppb, which are getting close to the NAAQS. This is of particular concern because the Clean Air Science Advisory Committee (CASAC) recently recommended that EPA should lower the 8-hour ozone standard to 0.070 ppm (70 ppb). On June 20, 2007 EPA proposed to lower the 8-hour ozone NAAQS to the 70-75 ppb range and asked for comments on an appropriate level for the standard or whether values as low as 60 ppb or as high as the current 85 ppb standard should be considered. Thus, the effect of the proposed Project and other cumulative emissions in the region on ozone concentrations needs to be assessed as part of the Pinedale Anticline Project Supplemental Environmental Impact Statement (SEIS).

In the past, ozone impacts due to proposed new sources have been evaluated using the "Scheffe Tables" (Scheffe 1988). The Scheffe Tables consist of a lookup table of maximum potential incremental ozone concentration impacts due to a source based on VOC/NO_x emissions. The ozone increment from the source is added to the maximum measured background ozone and is compared against the ozone NAAQS to determine whether the new source(s) could potentially cause an exceedance of the ozone standard. However, the Scheffe Tables were designed for assessing maximum 1-hour ozone impacts, and their developer (Dr. Richard Scheffe of the EPA Office of Air Quality and Planning Standards) has opposed their continued use, so alternative approaches are needed to address ozone issues in a National Environmental Policy Act (NEPA) EIS.

EPA modeling guidance for 8-hour ozone modeling recommends the use of Eulerian photochemical grid models (PGMs) to address ozone issues (EPA, 2007; 2006; 1999; 1991). This is in contrast to the Lagrangian plume models that are typically used to model the air quality impacts due to a small number of sources. Modeling the chemistry of ozone formation, which is complex and highly nonlinear, requires accounting for all sources of ozone precursors including those from far upwind regions (i.e., transport). PGMs model emissions from all sources (e.g., on-road and non-road mobile, point, area, biogenic and other sources) which is necessary to simulate ozone formation. PGMs divide the modeling domain into an array of grid cells and require three-dimensional meteorological fields, gridded emissions, boundary conditions (i.e., transported pollutants from outside of the modeling domain) and other inputs. PGMs can incorporate state-of-science chemistry, transport, dispersion and deposition processes. To assess the potential impacts from the addition of new emission sources (e.g., the proposed Project and cumulative emissions) using PGMs, two simulations are typically performed:[1] a base case and a scenario where the new emissions are added to those of the base case. The difference in the two PGM simulations is the resultant incremental ozone impact due to the new sources.

There has been a reluctance to use PGMs for NEPA and PSD assessments of air quality and AQRV impacts from a single source or small group of sources due to the higher data (e.g., all sources are modeled) and computational requirements of PGMs. However, for ozone modeling, use of PGMs is recommended by EPA (EPA, 2007; 2001; 1999; 1991) and is the most reliable modeling approach.

1.2 Purpose

The purpose of this Appendix is to document the application of a PGM to estimate the potential ozone impacts due to the PAPA and other potential new sources in the region and compare those impacts with the NAAQS and WAAQS.

1.3 Approach

The approach used to perform the ozone impact assessment for the PAPA in Sublette County is based on a recent ozone assessment of the Moxa Arch Area Infill Project (BLM, 2007) with a few major updates. The Moxa Arch ozone modeling assessment used the Comprehensive Air Quality Model with extensions (CAMx; www.camx.com; ENVIRON, 2006) and a 2002 36/12/4 km modeling database adapted from the modeling performed by the Western Regional Air Partnership (www.wrapair.org; http://pah.cert.ucr.edu/aqm/308/index.shtml; Tonnesen et al., 2005; 2006). The major updates for the Pinedale Anticline Project ozone assessment were as follows:

- The emissions for the PAPA and other nearby projects were updated to incorporate current information; and
- The CAMx modeling results were post-processed using the new EPA Modeled Attainment Test Software (MATS) tool to assessment the ozone impacts of the Pinedale Anticline Project and other new sources in the region.

The following sections describe the ozone modeling approach and results in more detail.

[1] Note that some PGMs incorporate source apportionment as a diagnostic probing tool that can track the ozone formation due to separate groups of sources within a single simulation.

2.0 OZONE MODELING APPROACH

2.1 Model Selection

There are two main photochemical grid models that are currently being used to address 8-hour ozone issues:

- The Community Multi-scale Air Quality (CMAQ) modeling system (Byun and Ching, 1999) developed by EPA that is publicly available with no fee from the CMAS Center (http://www.cmascenter.org/); and
- The Comprehensive Air-quality Model with extensions (CAMx) that was developed by ENVIRON (2006) that can also be downloaded with no fee (www.camx.com).

Both CMAQ and CAMx are current state-of-science models capable of simulating ozone formation due to new sources, such as those being considered in this application. For this study, the CAMx model was selected for the following reasons:

- CAMx includes algorithms for enhancing photolysis rates due to the presence of snow on the ground, which may be important since some of the highest ozone measurements recorded in southwestern Wyoming have occurred in the winter when snow is present;
- CALMET meteorological data can be processed for input to CAMx, whereas CMAQ is designed to run solely off meteorological data from MM5 or WRF – the MM5 and WRF prognostic models have difficulty in simulating stagnant conditions because they try to "organize" the simulated flows, and therefore overestimate wind speeds during periods of light winds. On the other hand, if stagnant observations are input into CALMET they are reflected in the CALMET wind fields;
- CAMx incorporates two-way grid nesting that allows concentrations to feed back and forth between coarse and fine grids, whereas CMAQ only supports one-way grid nesting that just allows concentrations to flow from the coarser to the finer grids, but not vice versa. Thus, CAMx is able to estimate ozone impacts over a larger area more cost-effectively;
- CAMx includes a flexi-nesting feature that allows for the run time interpolation of coarse grid data to finer grids that is not available in CMAQ; and
- CAMx is easier to use and more flexible.

2.2 Selection of a Modeling Period and Development of Modeling Databases

The ozone issue in southwestern Wyoming is complicated by the fact that elevated ozone levels have been recorded in the winter, which is in contrast to most areas whose highest ozone events occur during the summer. Consequently, the concept of an "ozone season" is difficult to define for the region. Therefore an entire year has been simulated in order to be sure to capture all potential high ozone conditions in the region.

The development of an annual PGM database from scratch is quite labor and time intensive. Fortunately, the Western Regional Air Partnership (WRAP) has developed 2002 annual PGM modeling databases for the continental U.S. (Tonnesen et al., 2005; 2006) that can be adapted to assess the potential ozone impacts of the proposed Project as well as the other cumulative emissions sources in southwestern Wyoming, northeastern Utah and northwestern Colorado. Thus, the 2002 annual period was selected in order to leverage the WRAP modeling databases.

2.3 Development of a 2002 Ozone Modeling Database

The WRAP annual 2002 modeling database for the CAMx model was adapted for simulating ozone formation due to emissions from the Project and cumulative emissions in southeastern Wyoming and vicinity.

2.3.1 Modeling Domains and Grid Resolution

The WRAP developed a 2002 modeling database with a 12 kilometer (km) western U.S. modeling domain nested within a 36 km continental U.S. domain (Tonnesen et al., 2005; 2006). For simulating ozone formation from the Project and cumulative emissions in Wyoming and surrounding states, a higher resolution grid is needed, and is more consistent with EPA guidance (EPA, 2007; 2001; 1999; 1991). Thus, a 12/4 km two-way nested grid modeling domain was defined for simulating ozone due to emissions from the Project and cumulative emissions as depicted in Figure 2-1. To define boundary conditions (BCs) for the Project's 12/4 km modeling domain (i.e., the assumed concentrations along the lateral boundaries of the 12 km grid shown in Figure 2-1), a 2002 Base Case simulation was performed for the WRAP 36 km continental U.S. domain and the results were processed to generate hourly BC inputs for the 12/4 km domain (Figure 2-1). The resulting 36/12/4 km modeling domain used is shown in Figure 2-2 with one-way grid nesting between the 36 and 12 km grids and two-way grid nesting between the 12 and 4 km grids. Table 2-1 gives the definitions of the 36/12/4 km grid used in the ozone modeling.

The same vertical layer structure used by WRAP was used in this study (Tonnesen et al., 2005; 2006). The WRAP vertical layer structure consists of 19 vertical layers from the surface to 100 millibars (mb) [approximately 15 km above ground level (AGL)], with a surface layer that is approximately 35 meters (m) thick.

Table 2-1.
Grid definitions used in the Project's ozone modeling based on a Lambert Conformal Conic (LCC) projection with origin at (-97º, 45º) and true latitudes at (33º, 45 º).

Grid	X-Offset (km)	Y-Offset	NX	NY
36 km	-2,736.0	-2,088.0	148	112
12 km	-1,452.0	-192.0	89	86
4 km	-1,192.0	140.0	83	83

2.3.2 Meteorological Inputs

The CAMx meteorological inputs for the 36 km and 12 km grids were based on the WRAP 36 km and 12 km MM5 simulations, respectively (Kemball-Cook et al., 2004). The MM5CAMx preprocessor was used to process and reformat the MM5 output for hourly meteorological inputs into CAMx for the 36 and 12 km grids over the 2002 annual period.

For the 4 km grid, the CALMET model was used to generate wind and temperature fields for layers below approximately 3,000 m AGL. For winds above approximately 3,000 m AGL and other meteorological variables, the 12 km MM5 output were interpolated to 4 km and processed for input into CAMx.

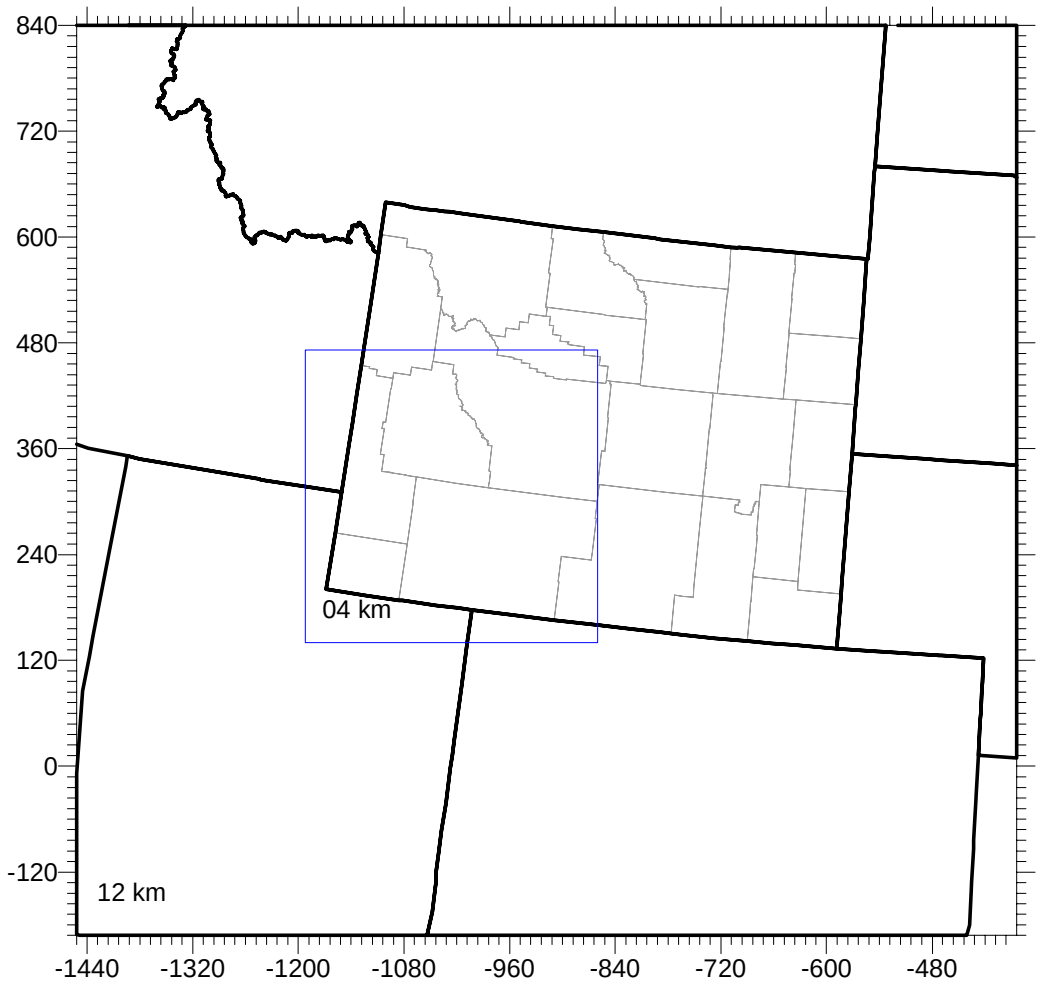

Figure 2-1. 2002 12/4 km two-way grid nested modeling domain used for the Project and cumulative emissions.

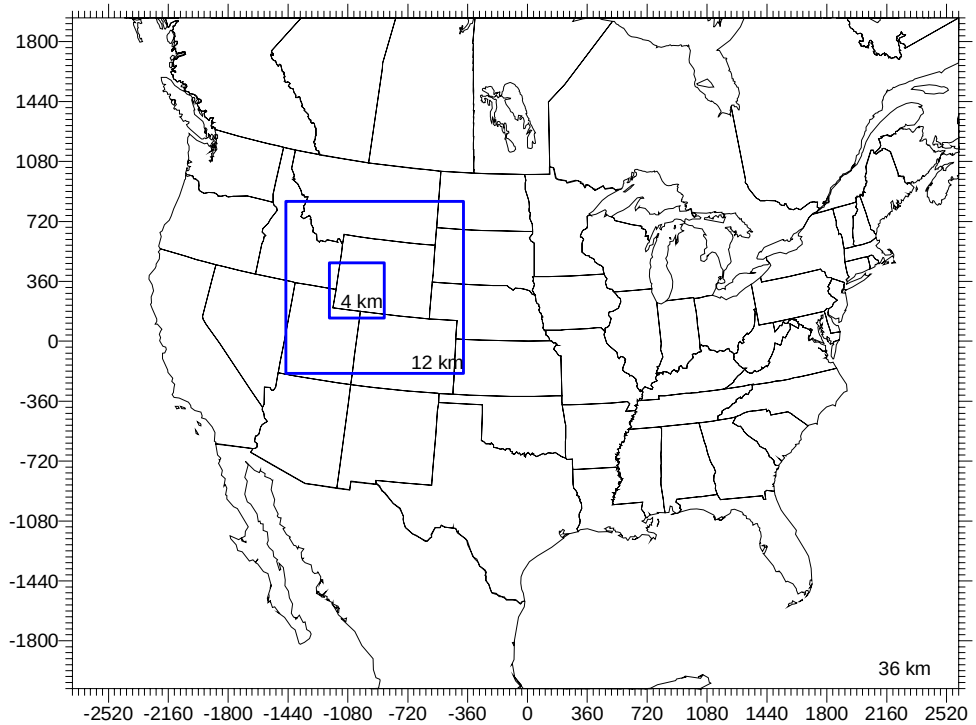

Figure 2-2. 2002 36/12/4 km ozone modeling domain for the Project and cumulative sources; one-way grid nesting was used between the 36 and 12 km grids, and two-way grid nesting was used between the 12 and 4 km grids.

For the 4 km wind field below 3,000 m AGL, CALMET was run in a similar manner as discussed in Section 5 of the Moxa Arch Area Infill Gas Development Project, *Air Quality Technical Support Document* (BLM, 2007). 12 km MM5 data was provided as input into CALMET for the initial guess field; CALMET then applied the diagnostic wind effects and integrated the surface and upper-air meteorological observations into the fields. There were two main reasons that CALMET was used for the 4 km wind fields rather than just interpolating the 12 km MM5 data onto the 4 km grid:

- The MM5 and other prognostic models have difficulty in simulating stagnant conditions, as discussed above. Stagnant conditions that limit vertical mixing are believed to be important for producing elevated ozone in southwestern Wyoming.

- The CALMET model introduces 4 km terrain effects through its diagnostic wind model that would not be present in the 12 km MM5 data.

Figure 2-3 displays the Project's 12/4 km modeling domain and the locations of the surface and upper-air meteorological monitoring sites used in the 4 km CALMET simulation. Also shown in Figure 2-3 are the locations of seven Clean Air Status and Trends Network (CASTNET) ozone monitoring sites used in the ozone model performance evaluation that is discussed in Section 3.

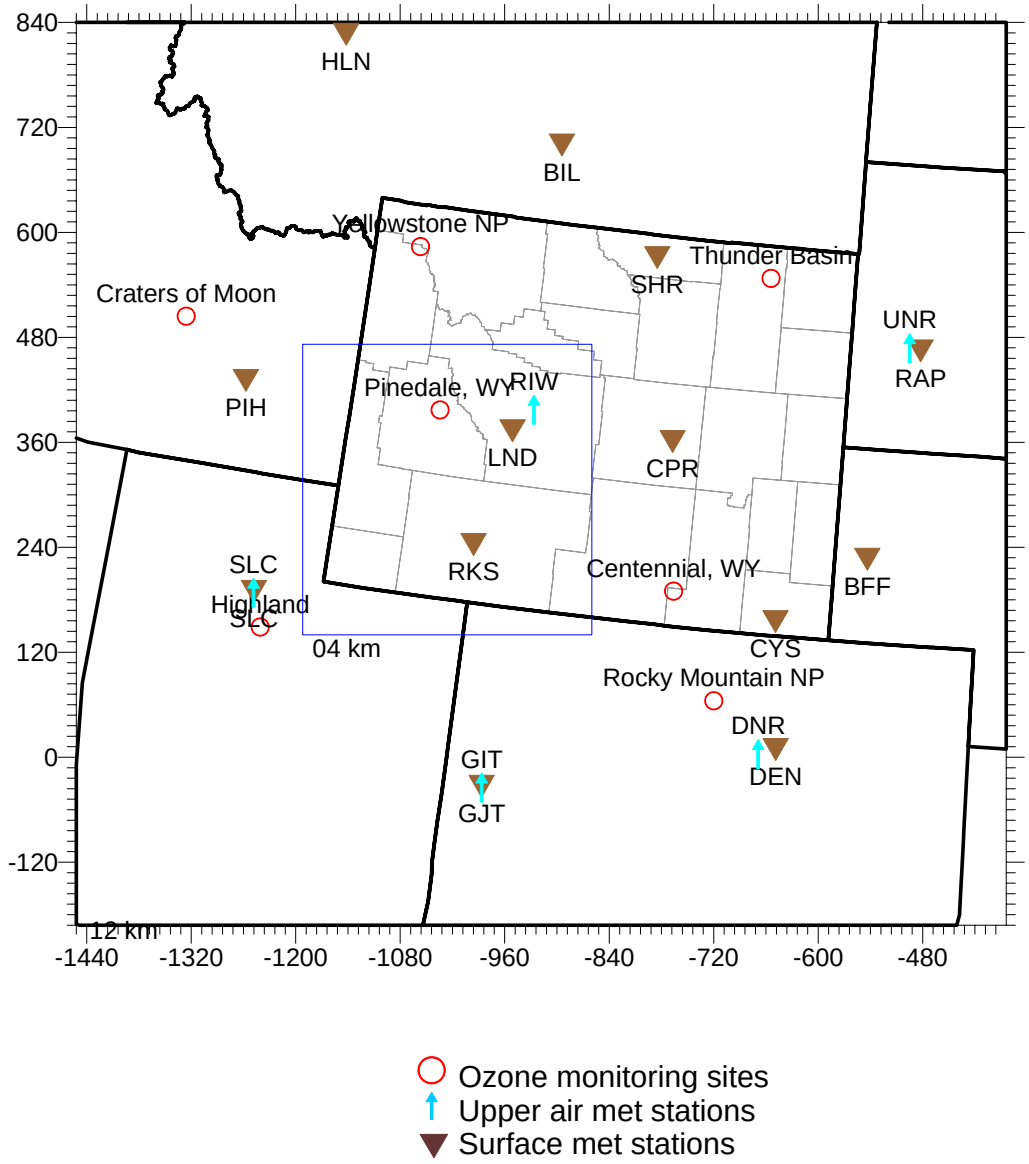

Figure 2-3. 2002 12/4 km modeling domain showing locations of surface and upper-air meteorological monitoring sites and seven ozone monitoring sites.

2.3.3 Emission Inputs

Three emission scenarios were generated for ozone modeling: a 2002 Base Case emissions scenario and two 2002 scenarios with the Base Case plus the Project and Cumulative Emissions. Project emissions for the Proposed Action Alternative (Alternative B) (referred to hereafter as Case 1) and Alternative C with Phase II Mitigation (referred to hereafter as Case 2) were used in the two Project plus Cumulative Emissions scenarios. The Cumulative Emissions were the same in the two Project plus Cumulative Emissions scenarios.

The emission inputs for the 2002 Base Case modeling were based on the WRAP 2002 36 km Base02b emission scenario. The WRAP Base02b 36 km emissions were used for the 2002 36 km CAMx simulation used to define the BCs for the 12/4 km domain. For the 2002 Base Case emissions scenario and the 12 km domain, the WRAP Base02b 36 km emissions were mapped to the 12 km grid and windowed to match the 12 km grid domain. The 4 km 2002 Base Case emissions were obtained by flexi-nesting the 12 km emissions. Flexi-nesting interpolates the surface gridded 12 km emissions to the 4 km grid and treats point source emissions at the grid resolution where the point source resides (e.g., 4 km).

A summary of the PAPA project emissions is shown in Attached Table 1. Cumulative emission inventory sources are shown in Attached Tables 2 through 5. A full description of the methods used for developing the cumulative emission inventory and processing it for input into air quality models may be found in the Moxa Arch Area Infill Gas Development Project, *Air Quality Technical Support Document* (BLM, 2007).

Reasonable Foreseeable Development (RFD) emissions for the Jonah Infill and South Piney NEPA projects were updated for this study (Attached Table 2), and the Wyoming Permitted Source and Reasonably Foreseeable Future Action (RFFA) cumulative emissions inventories developed for the Moxa Arch Infill Project were adjusted so that point sources in the Pinedale and Jonah project areas were not double counted. Attached Tables 3 and 4 show the sources contained in the Wyoming Permitted and RFFA cumulative emission inventories. Attached Table 5 details the County well emissions. Permitted sources in Colorado and Utah lying within the 4 km domain were also included in the cumulative emission inventory. Utah and Colorado Permitted sources are listed in Attached Tables 6 and 7.

Emissions for the Project and cumulative emissions were first gridded to the 4 km grid. Then, they were input into CAMx as point sources with locations at the center of the 4 km grid cell in which they are located. All Project and cumulative point sources were input as point sources in CAMx. A key component in the processing of the Project and cumulative emissions was the speciation of the VOC emissions into the CB05 chemical mechanism. For each source, a source classification code (SCC) was assigned so that it could be cross-referenced to the correct VOC speciation profile in the emissions modeling.

Figure 2-4 displays the 2002 Base Case low-level gridded and elevated point source emissions for the 12/4 km modeling domain. The low-level gridded emissions include on-road mobile, non-road mobile, area, biogenic, and low-level point sources. The fact that the 2002 Base Case emissions were based on the WRAP 36 km emissions is apparent in the low-level emissions. The urban areas of Denver and Salt Lake City are clearly evident in the 2002 Base Case emissions displays.

Figure 2-5 displays the elevated point source emissions for the cumulative emissions inventory used in both the PAPA Case1 and Case 2 scenarios. Since emissions from the Project and cumulative sources were all represented as point sources they can be treated by the high resolution 4 km grid. The low-level gridded emissions for the Project plus cumulative emissions scenario are the same as the 2002 Base Case (Figure 2-4a). Figure 2-6 displays the difference between the Case 1 and Case 2 Project and cumulative emissions and the 2002 Base Case emission scenarios. Emissions from the Pinedale and Jonah Projects are clearly evident, along with cumulative emissions in other project areas. The higher resolution representative of the Project and cumulative emissions is also apparent in Figure 2-6.

2.3.4 CAMx Model Options

CAMx model options specified for this application include the following:

- Use of the latest CB05 chemical mechanism.
- CMC fast chemistry solver.
- PPM advection solver.
- No Plume-in-Grid (PiG) algorithm.
- CAMx was run in the ozone-only mode (that is, the PM chemistry was turned off to speed up the simulations, as there is little feedback from PM to ozone chemistry).

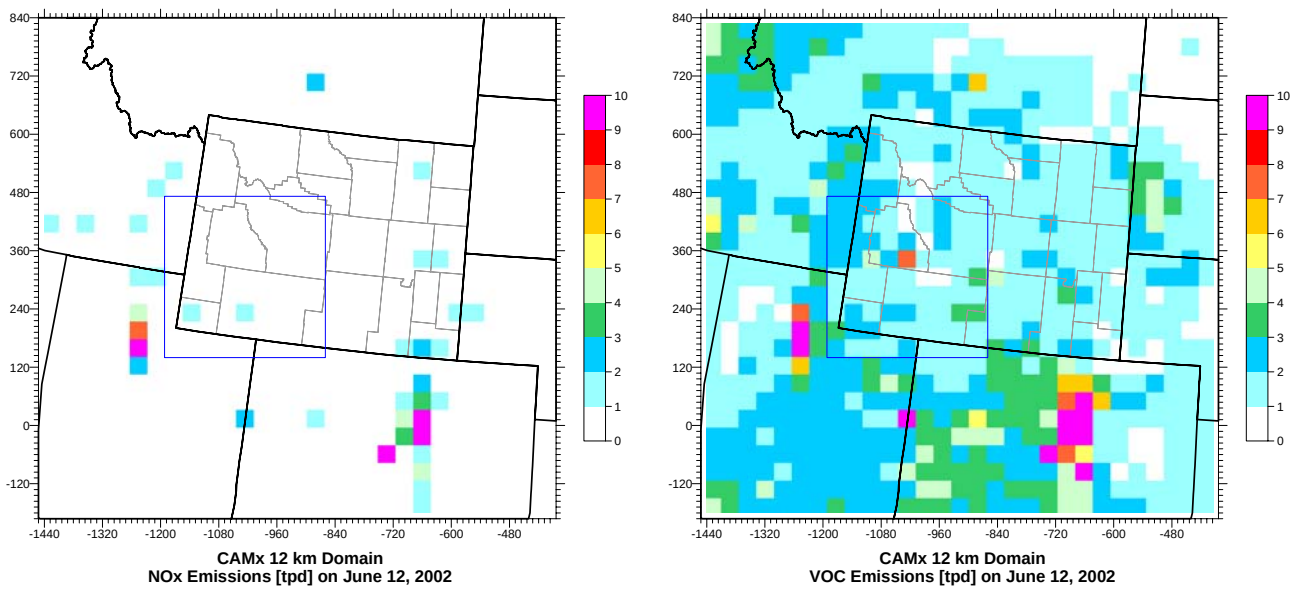

Figure 2-4a. Surface layer gridded NO_x (left) and VOC (right) emissions (on-road and non-road mobile, area, biogenic and low-level point sources) for the 2002 Base Case emissions scenario (tons per day).

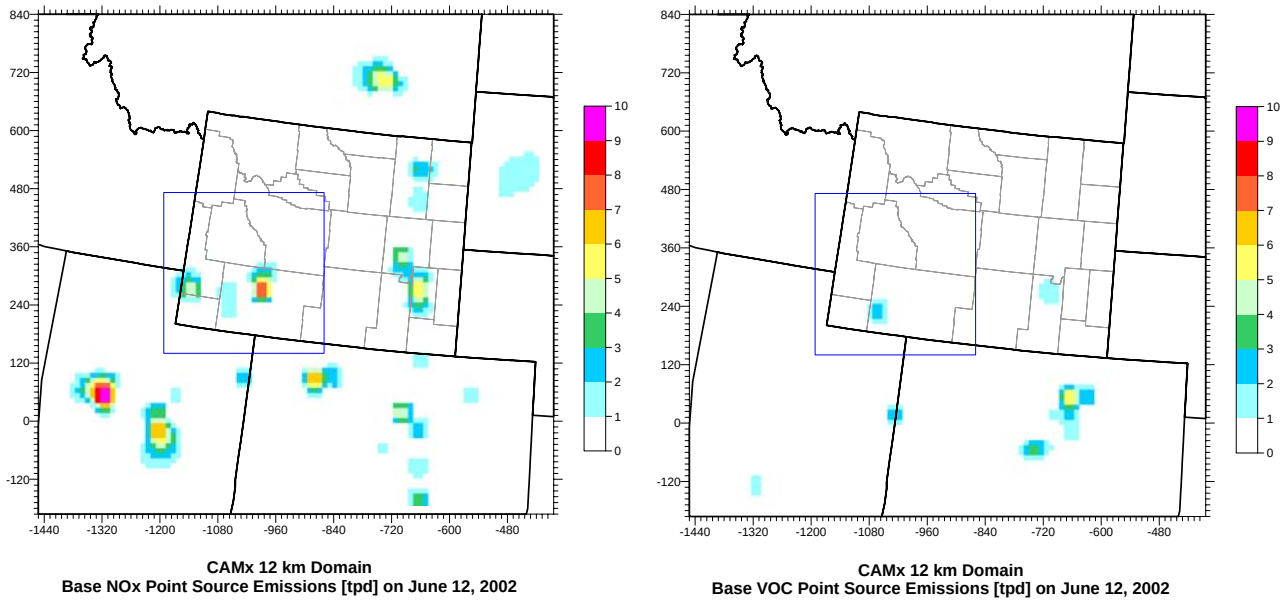

Figure 2-4b. Elevated point source NO_x (left) and VOC (right) emissions for the 2002 Base Case emissions scenario (tons per day).

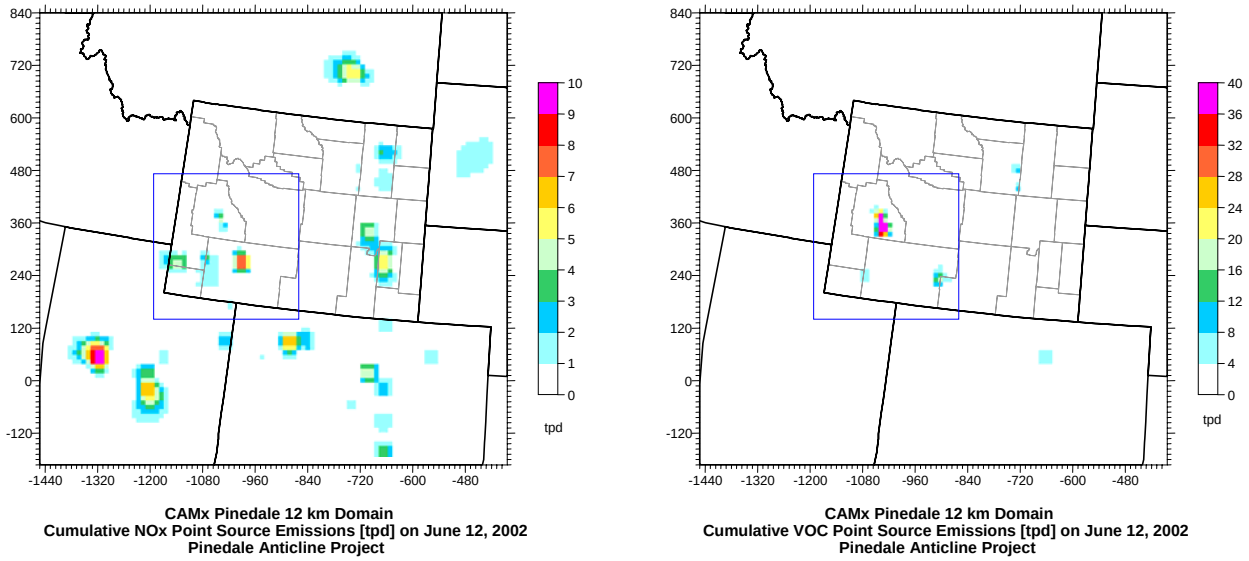

Figure 2-5. Cumulative NO_x (left panel) and VOC (right panel) emissions for June 12, 2002 (tons per day).

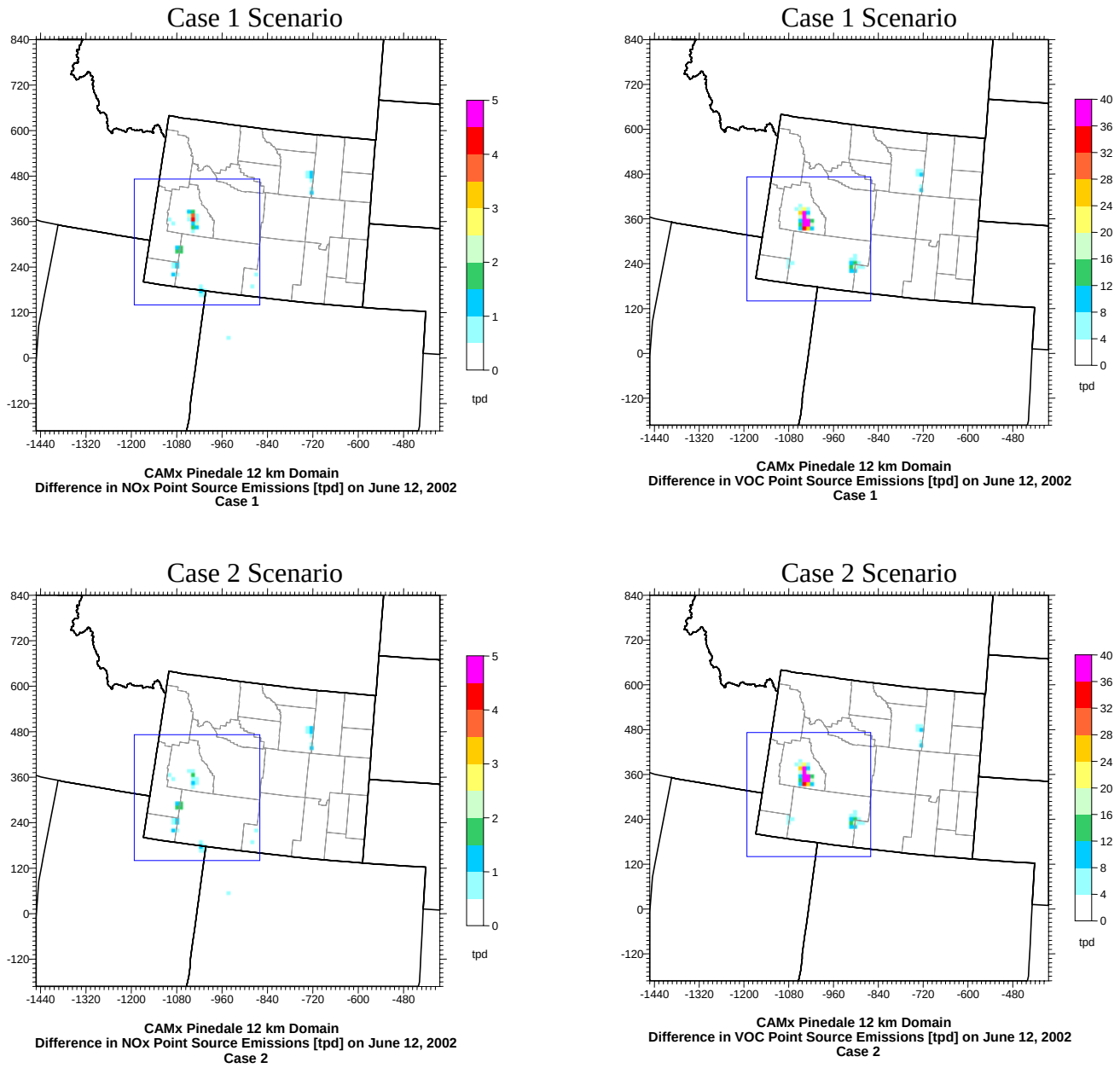

Figure 2-6. Differences in elevated point source NO_x (left panels) and VOC (right panels) emissions for the Project plus Cumulative minus the 2002 Base Case emissions scenario (tons per day) for the PAPA Case 1(upper panels) and Case 2 (lower panels) emission scenarios.

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3.0 2002 BASE CASE MODELING RESULTS

A 2002 12/4 km CAMx Base Case simulation was performed using the hourly boundary conditions (BCs) generated from the 2002 36 km continental U.S. CAMx and a model performance evaluation was conducted.

3.1 Comparison of Modeled versus Observed Peak 2002 Ozone Concentrations

The ozone standard is expressed as the three-year average of the fourth highest daily maximum ozone concentration at a monitor. Consequently, the model's ability to predict the highest ozone concentrations at an ozone monitor is of particular concern, and the focus of the evaluation should be on the fourth highest 8-hour ozone concentrations. Figures 3-1 and 3-2 display the spatial distribution of the fourth highest model-estimated daily maximum 8-hour ozone concentration during the 2002 modeling year on the 4 km and 12 km modeling domains, respectively. Also shown in Figures 3-1 and 3-2 are the fourth highest observed daily maximum 8-hour ozone concentrations that are plotted at the location of the monitoring site. The model-estimated fourth highest daily maximum ozone concentrations in the 4 km domain range from 50 to 84 ppb, with the highest values occurring in northeastern Utah and northwestern Colorado, and the lowest values occurring near Palisades Reservoir, Idaho on the Wyoming-Idaho border. However, most of the model-estimated fourth highest daily maximum 8-hour ozone concentrations are in the 60 to 80 ppb range. At the location of the Pinedale monitoring site, where the fourth highest observed value of 73 ppb is recorded, the modeled value is close to (~) 70 ppb.

In the 12 km grid, the maximum fourth highest model-estimated daily maximum 8-hour ozone concentrations occur downwind of the Salt Lake City (SLC) and Denver areas. This is consistent with the observed fourth highest daily maximum 8-hour ozone concentrations that recorded values of 82 ppb at the Highland monitor south of SLC and 87 ppb at the Rocky Mountain National Park (RMNP) monitor northwest of Denver. The spatial distributions of the predicted and observed fourth highest daily maximum 8-hour ozone concentrations are consistent with one another, with the possible exception of the Yellowstone NP monitor in northwestern Wyoming; the model estimates an isolated increase in ozone near Yellowstone, whereas the monitored value is the lowest in the domain (67 ppb).

The four highest modeled and observed daily maximum 8-hour ozone concentrations at the Pinedale and Centennial monitors during 2002 are shown in Table 3-1a. When performing 8-hour ozone projections, EPA recommends using the highest modeled daily maximum 8-hour ozone concentration near the monitor (within 15 km). Comparisons of the four highest modeled maximum values near the monitor with the four highest observed values are shown in Table 3-1b. There is good agreement between the modeled and observed four highest daily maximum 8-hour ozone concentrations at the two monitors, with differences, in percent (%), at the monitors ranging from -1.4% to -6.7% for Pinedale and -1.5% to -3.8% for Centennial. The agreement with the four highest observed daily maximum 8-hour ozone concentrations is even better when looking at the modeled maximum near the monitor with agreement ranging from -4.7% to +2.0% at Pinedale and -0.2% to -1.6% for Centennial.

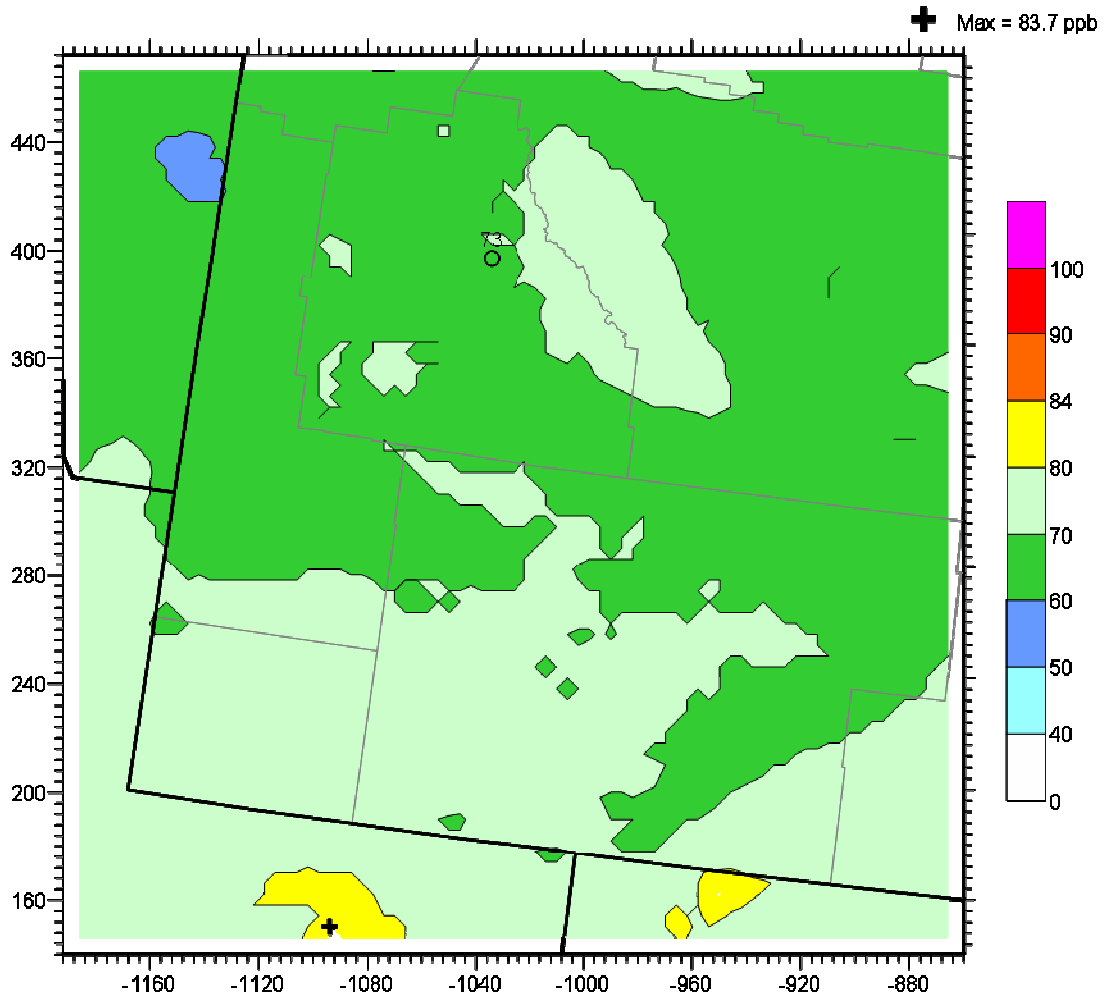


Figure 3-1. Model-estimated fourth highest daily maximum 8-hour ozone concentrations in the 4 km grid for the 2002 Base Case with superimposed observations.

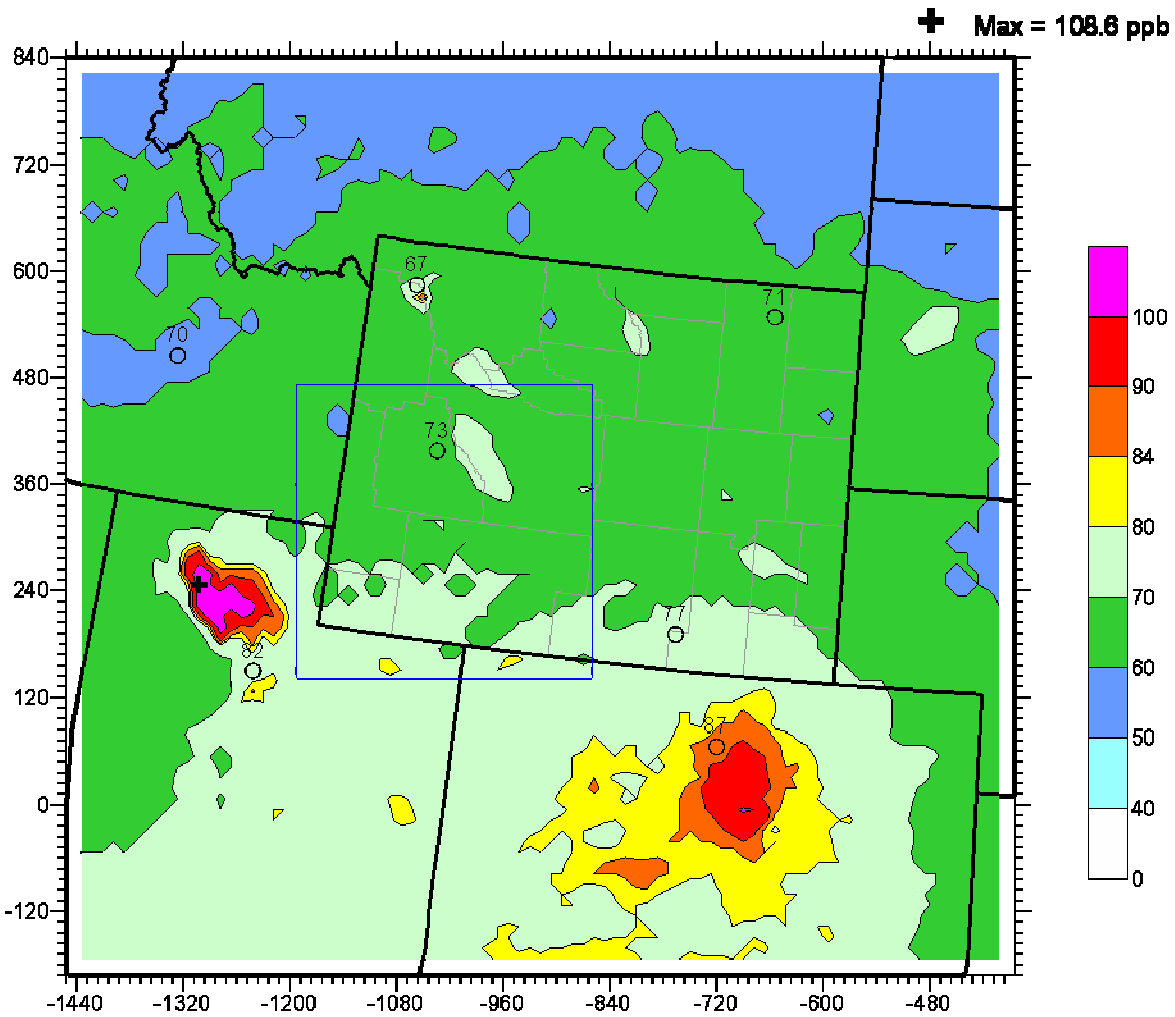


Figure 3-2. Model-estimated fourth highest daily maximum 8-hour ozone concentrations in the 12 km grid for the 2002 Base Case with superimposed observations.

Table 3-1a.
Comparison of four highest predicted and observed daily maximum 8-hour ozone concentrations at the Pinedale and Centennial monitoring sites for 2002.

Rank	Observed (ppb)	Predicted (ppb)	Difference (%)
Pinedale Monitor			
1st High	76.50	75.46	-1.4%
2nd High	76.41	71.27	-6.7%
3rd High	72.94	70.70	-3.1%
4th High	72.69	68.69	-5.5%
Centennial Monitor			
1st High	79.13	76.48	-3.3%
2nd High	79.00	76.01	-3.8%
3rd High	77.94	75.61	-3.0%
4th High	76.66	75.51	-1.5%

Table 3-1b.
Comparison of four highest predicted and observed daily maximum 8-hour ozone concentrations at the Pinedale and Centennial monitoring sites for 2002 using maximum modeled values near (< 15 km) the monitoring sites.

Rank	Observed (ppb)	Predicted (ppb)	Difference (%)
Pinedale Monitor			
1st High	76.50	78.01	+2.0%
2nd High	76.41	72.85	-4.7%
3rd High	72.94	72.70	-0.3%
4th High	72.69	72.06	-0.9%
Centennial Monitor			
1st High	79.13	78.29	-1.1%
2nd High	79.00	77.75	-1.6%
3rd High	77.94	76.80	-1.5%
4th High	76.66	76.47	-0.2%

3.2.1 Statistical Ozone Model Performance Evaluation

The modeled surface ozone concentrations estimates were compared against the observed ozone concentrations from the seven CASTNET monitoring sites shown in Figure 2-3 using graphical and statistical performance measures. Particular emphasis was placed on ozone model performance at the Pinedale CASTNET site as that was the only site located within the 4 km domain and it is situated close to the PAPA and the Bridger Class I area. The ozone model performance was also separately analyzed at the Centennial CASTNET site that lies just east of the 4 km domain.

Figures 3-3 and 3-4 compare time series of predicted and observed daily maximum 8-hour ozone concentrations for 2002 at the Pinedale and Centennial ozone monitors sites,

respectively. Although there considerable day-to-day variation between the modeled and observed 8-hour ozone concentrations, the model generally matches the magnitudes of the observed values on average for most of the year until around August, when the modeled values start to become lower than observed. In particular, the model fails to capture the relatively high observed ozone at the end of August 2002. The few modeled lowest 8-hour ozone days appear to be lower (~30 ppb) than the lowest observed days (~40 ppb). But the ozone concentrations on the highest modeled days (~75 ppb) match the observed concentrations well, although there appear to be fewer modeled high days than observed, which is due to the August-December 2002 underestimation period. The reasons why the model begins an underestimation tendency in August are unclear.

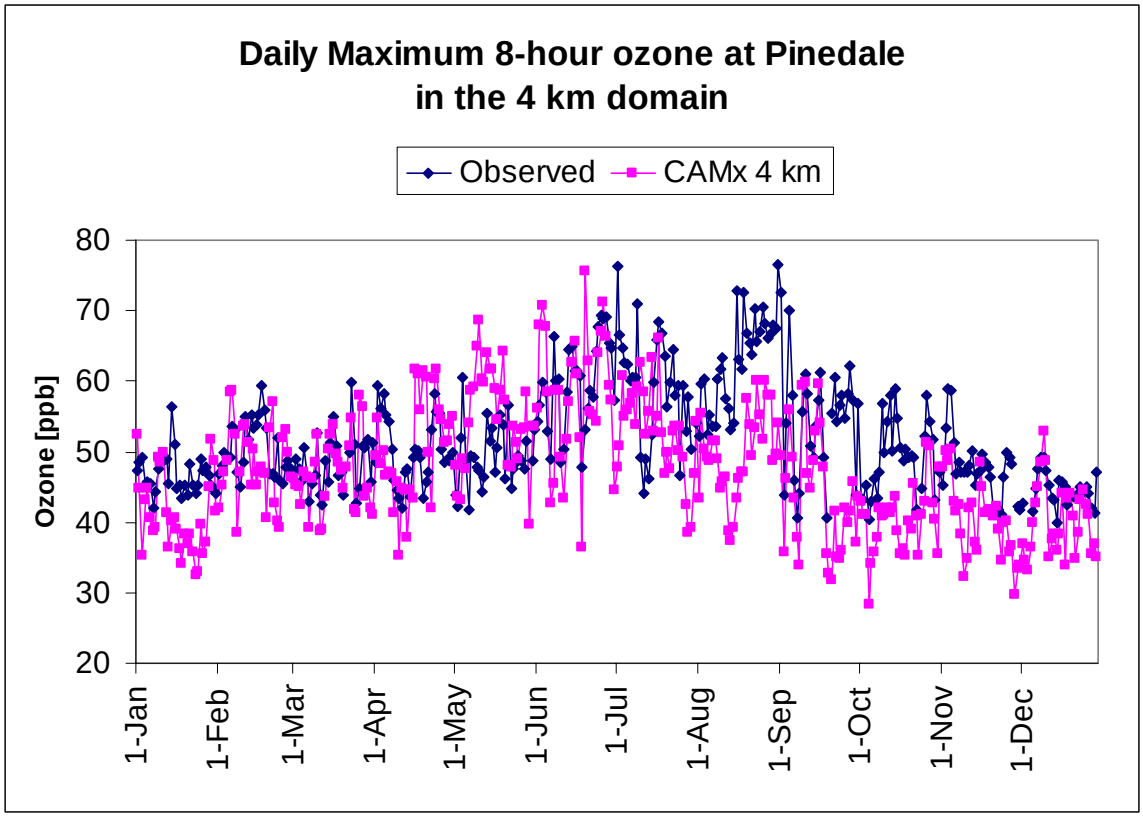


Figure 3-3. Comparison of predicted and observed daily maximum 8-hour ozone concentrations (ppb) at the Pinedale CASTNET site.

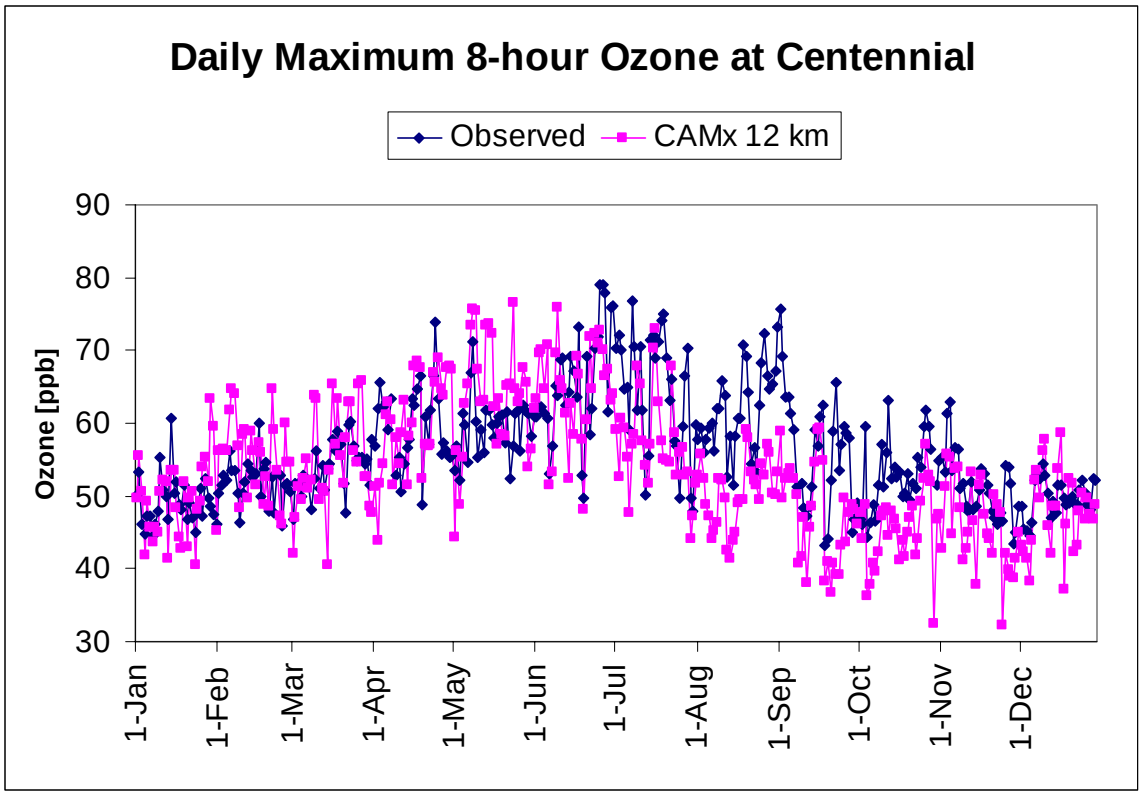


Figure 3-4. Comparison of predicted and observed daily maximum 8-hour ozone concentrations (ppb) at the Centennial CASTNET site.

EPA has developed model performance goals for 1-hour ozone statistical measures as follows (EPA, 1991):

- Mean Normalized Bias (MNB) $\leq \pm 15\%$
- Mean Normalized Gross Error (MNGE) $\leq 35\%$

Figures 3-5 and 3-6 displays the MNB and MNGE ozone performance metrics using the daily maximum 8-hour ozone concentrations by month for the, respectively, 4 km and 12 km modeling grids using "Soccer Plots". Soccer Plots plot the MNB statistical performance measure on the x-axis and MNGE metric on the y-axis with a box around EPA's MNB $\leq \pm 15\%$ and MNGE $\leq 35\%$ performance goals. When the monthly symbol falls within the box, EPA's MNB and MNGE model performance goals are achieved. For 7 of the 12 months of 2002, the monthly model performance statistics within the 4 km domain (i.e., the Pinedale ozone monitor) achieve EPA's MNB and MNGE performance goals. For the months of January, February, August, September and October the MNB is below -15% which does not achieve EPA's performance goal for this metric, although the MNGE metric goal (< 35%) is achieved by a fair margin (~20%) for all months. The worst performing month is August (-23% MNB), which is consistent with the Pinedale time series shown in Figure 3-3.

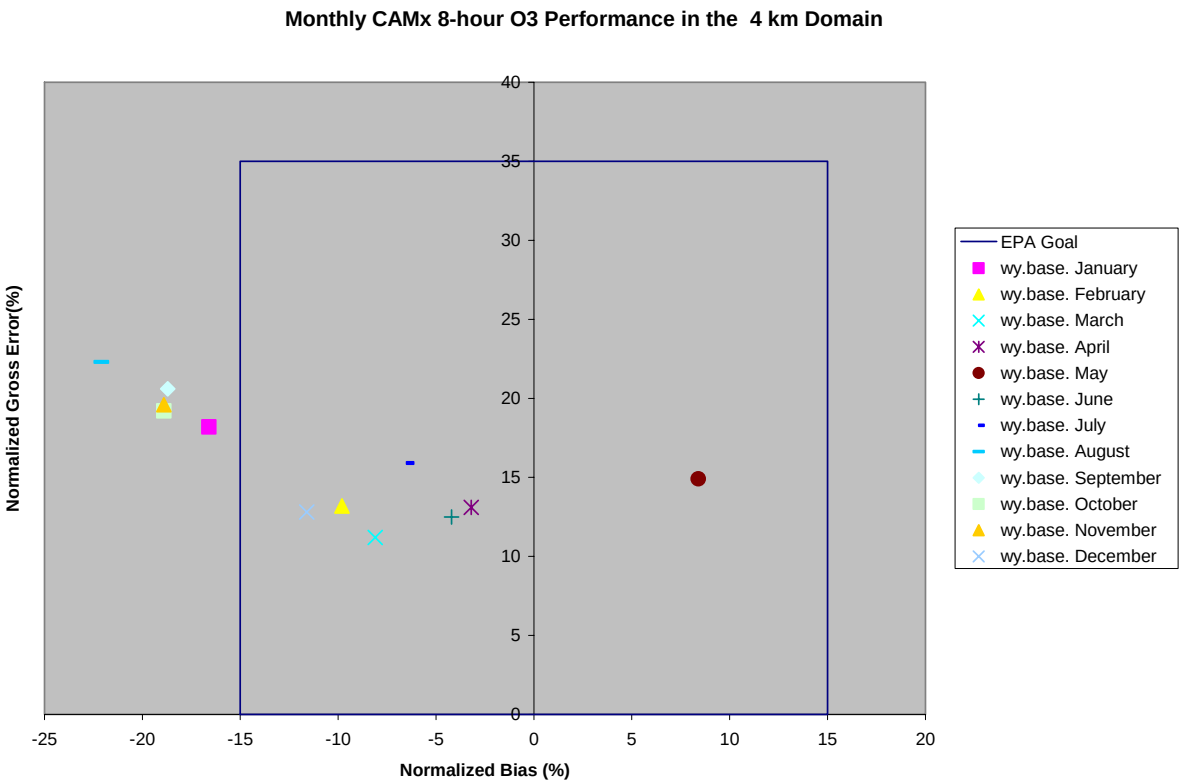


Figure 3-5. Soccer Plots of the monthly MNB versus MNGE for daily maximum 8-hour ozone concentrations in the 4 km grid (i.e., Pinedale monitoring site).

Better ozone model performance metrics are seen across the 12 km modeling domain within only two months (August and September) with MNB performance metric not achieving EPA's goals (Figure 3-6).

The comparisons of the predicted and observed 8-hour ozone concentrations presented in Figures 3-3 through 3-6 are for daily maximum 8-hour ozone concentrations paired in time (by day) and space (at the ozone monitor). When projecting 8-hour ozone concentrations, EPA guidance recommends using the daily maximum 8-hour ozone concentrations "near the monitor" to account for the fact that there may be small spatial displacements in the modeled ozone fields. The 1999 EPA draft 8-hour ozone modeling guidance, EPA recommended that predicted 8-hour ozone concentrations near the monitor should be within ±20% of the observed value on a majority of the days.

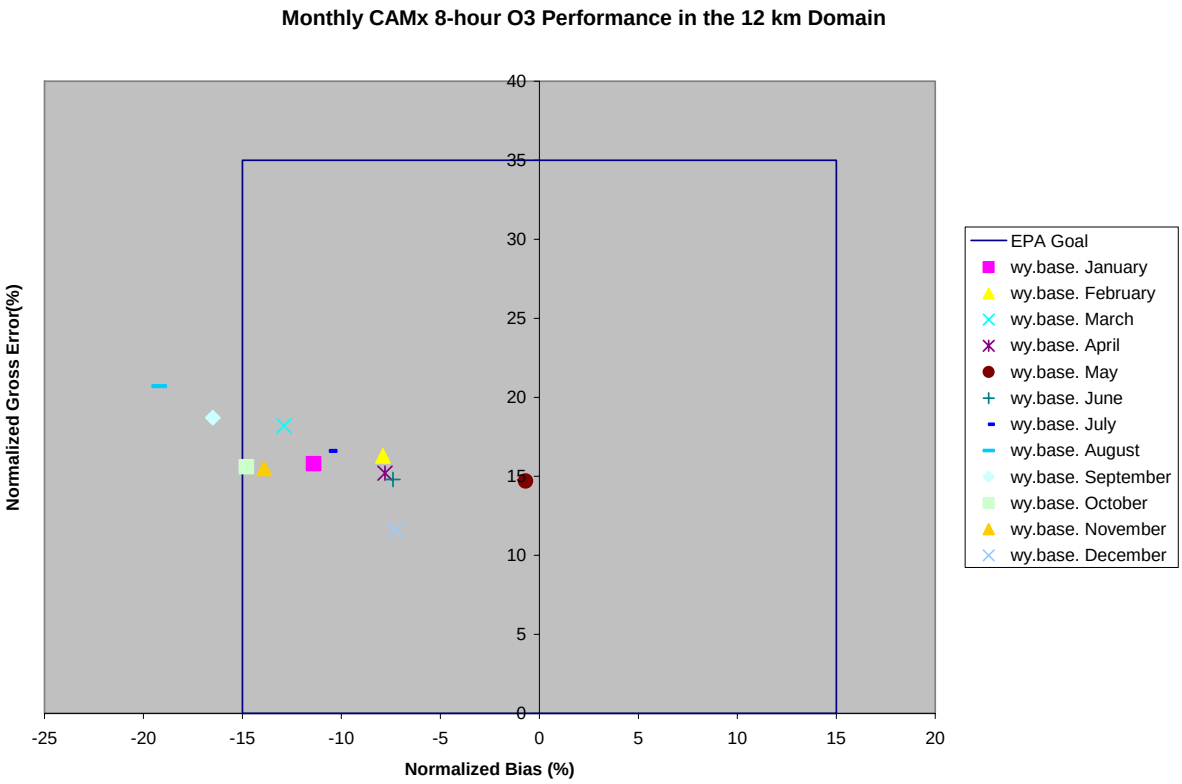


Figure 3-6. Soccer Plots of the monthly MNB versus MNGE for daily maximum 8-hour ozone concentrations in the 12 km grid (i.e., 7 CASTNet sites).

EPA guidance for making 8-hour ozone projections defines “near the monitor” as being within approximately 15 km, this turns out to be an array of 7 x 7 grid cells for the 4 km grid and 3 x 3 grid cells for the 12 km grid. The next issue is which model-estimated daily maximum 8-hour ozone concentration to match up with the observed value at the monitor, which is examined three ways:

Spatial Paired: Select the model estimated daily maximum 8-hour ozone concentrations at the monitor, as was done in the discussion above.

Maximum Value: Select the maximum model estimated daily maximum ozone concentrations in the array of cells (7 x 7 for 4 km and 3 x 3 for 12 km) centered on the monitor. This approach is identical to how modeled 8-hour ozone concentrations are selected for projecting 8-hour ozone concentrations.

Closest Value: Select the modeled daily maximum 8-hour ozone concentrations near the monitor that best matches the observed value.

Figure 3-7 displays the comparisons of the predicted and observed 8-hour ozone concentrations in a scatter plot for these three methods of matching the modeled values with the observed values at the Pinedale monitoring site. The 1:1 line of perfect agreement is a solid line and

predicted/observed pairs within the dotted lines are within ±20% of each other. Also shown in Figure 3-7 are the Quantile-Quantile (Q-Q) plots of the frequency distribution of the annual predicted and observed daily maximum 8-hour ozone concentrations. The closer the Q-Q plots are to the 1:1 sold line indicates how well the annual frequency distribution of the predicted and observed daily maximum 8-hour ozone concentrations matches each other. The Q-Q plots of predicted and observed daily maximum 8-hour ozone concentrations at the Pinedale monitor show the model under-predicting at low ozone concentrations but for the mid-level and higher ozone values matching much better, albeit with a slight underestimation tendency.

Figure 3-8 displays the same information as Figure 3-7 but for the Centennial monitor. Again, a vast majority of the modeled daily maximum 8-hour ozone concentrations are within ±20% of the observed value on the same day and the Q-Q plots indicate that the modeled and observed daily maximum 8-hour ozone concentrations in 2002 have a very similar frequency distribution, albeit with the modeled values slightly lower.

A comparison of the predicted and observed daily maximum ozone concentrations across all 7 sites in the 12 km domain is given in Figure 3-9. When looking at the maximum modeled value near the monitor (Figure 3-9, middle) there are a few days with extremely high modeled values (~100 ppb) with lower observed values (~40 ppb). These days occur at the Yellowstone NP monitor and are due to a highly localized modeled ozone spike (see Figure 3-2). The cause of this modeled localized ozone spike is unknown.

Table 3-2 summarizes the percent of the time EPA's within ±20% performance goal for daily maximum ozone concentrations is achieved for the Pinedale and Centennial monitoring sites and across all 7 CASTNET monitoring sites in the 12 km domain. At the Pinedale monitoring site, the predicted daily maximum 8-hour ozone value near the monitor is within ±20% of the observed value on 74%, 78% and 89% of the days during 2002 depending on whether the Spatially Paired, Maximum or Nearest value is used. Similar numbers for the Centennial site are 84%, 85% and 89% and for all the ozone monitoring sites 72%, 74% and 84%. Thus, the model is predicting daily maximum 8-hour ozone concentrations near the monitor to within ±20% of the observed value most of the time.

Table 3-2.
Summary of modeled daily maximum 8-hour ozone concentrations within 20% of the observed value on the same day at the Pinedale and Centennial monitors, across all 7 monitors in the 12 km domain and for the Spatial Paired, Maximum, and Nearest predicted value near the monitor.

	Spatially Paired	Maximum Value	Nearest Value
Pinedale 4 km (357 days)			
Within ±20%	74%	78%	89%
> +20%	6%	12%	2%
< -20%	20%	10%	9%
Centennial 12 km (359 days)			
Within ±20%	84%	85%	89%
> +20%	4%	6%	2%
< -20%	12%	9%	9%
12 km All Sites (2,287 days)			
Within ±20%	72%	78%	84%
> +20%	4%	8%	2%
< -20%	23%	14%	14%

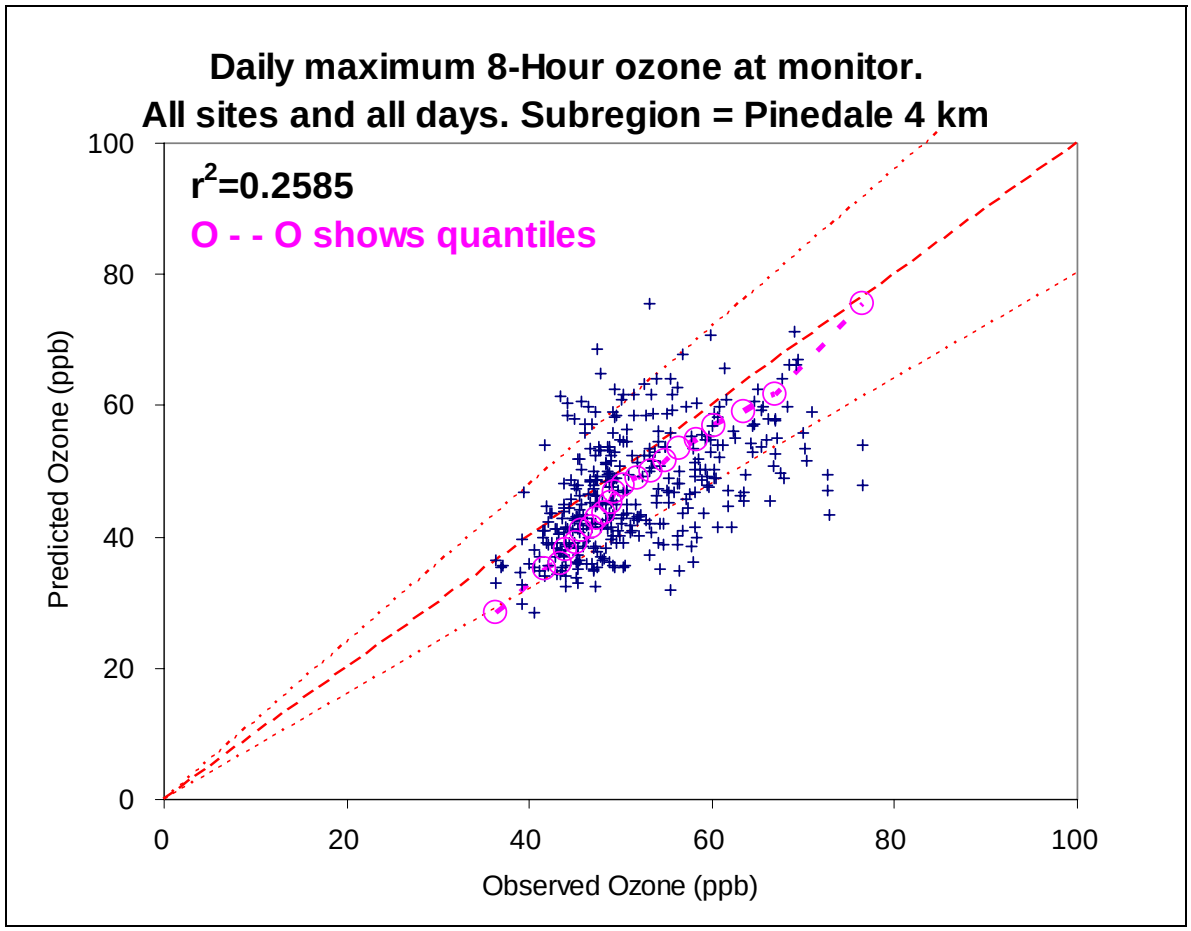


Figure 3-7a. Comparison of predicted and observed daily maximum 8-hour ozone concentrations at the Pinedale monitor using the Spatial Paired modeled value near the monitor.

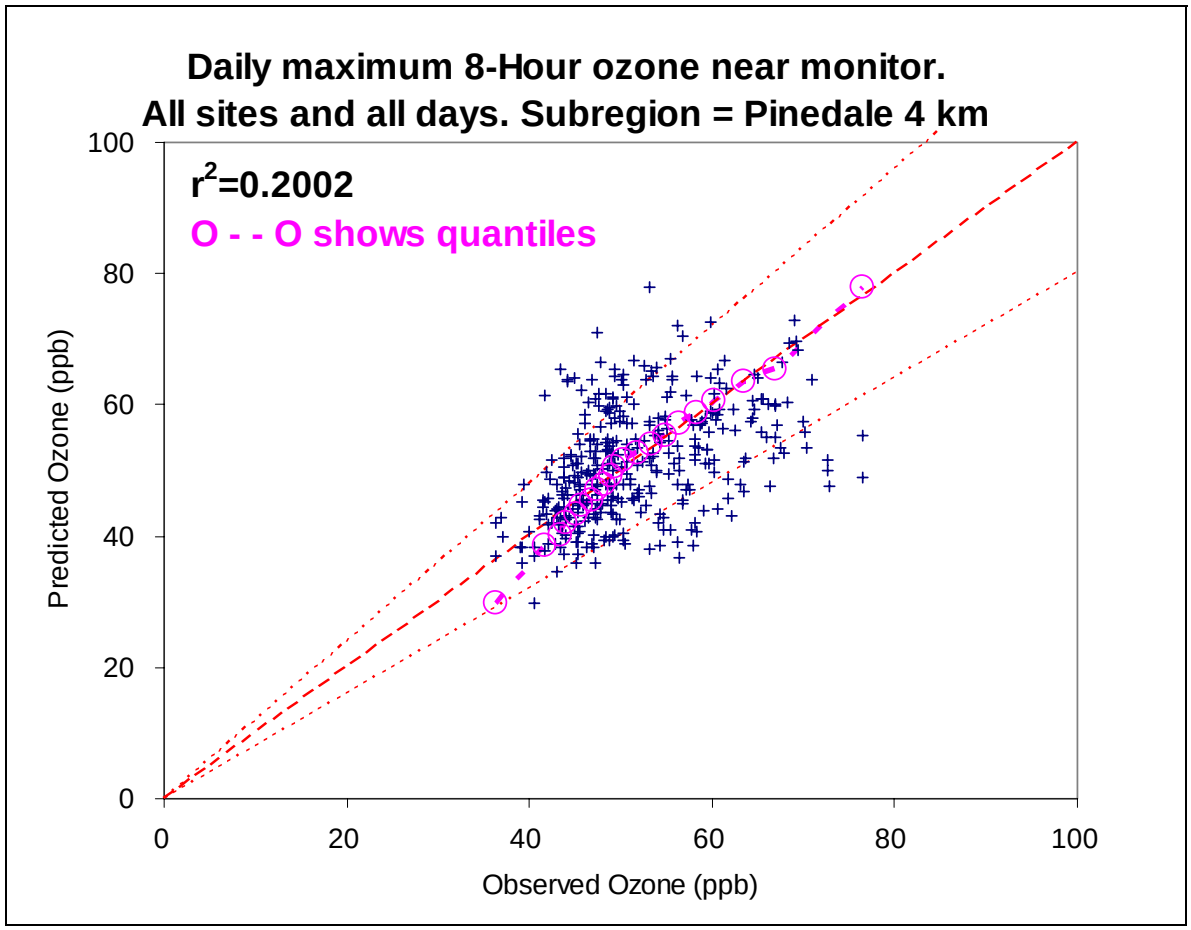


Figure 3-7b. Comparison of predicted and observed daily maximum 8-hour ozone concentrations at the Pinedale monitor using the Maximum modeled value near the monitor.

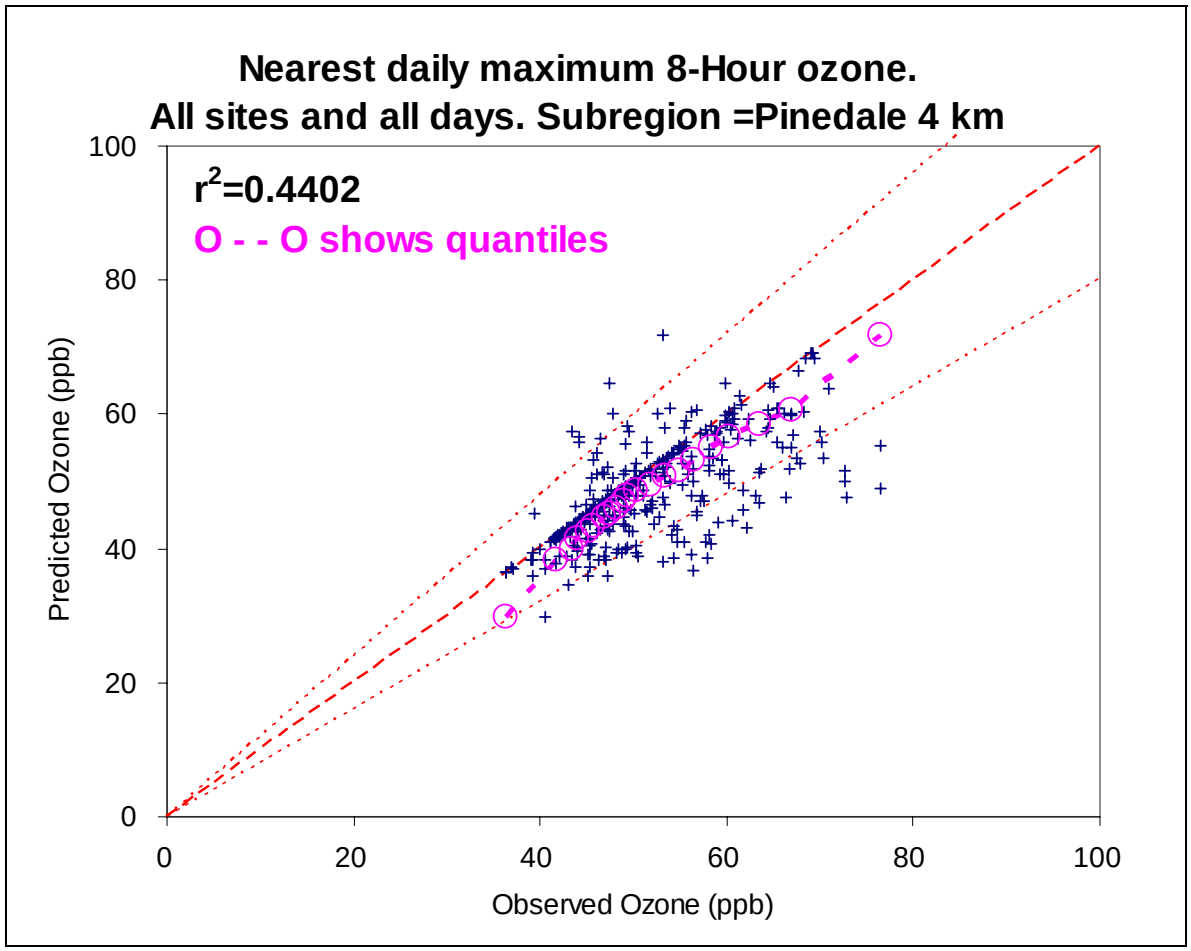


Figure 3-7c. Comparison of predicted and observed daily maximum 8-hour ozone concentrations at the Pinedale monitor using the Closest modeled value near the monitor.

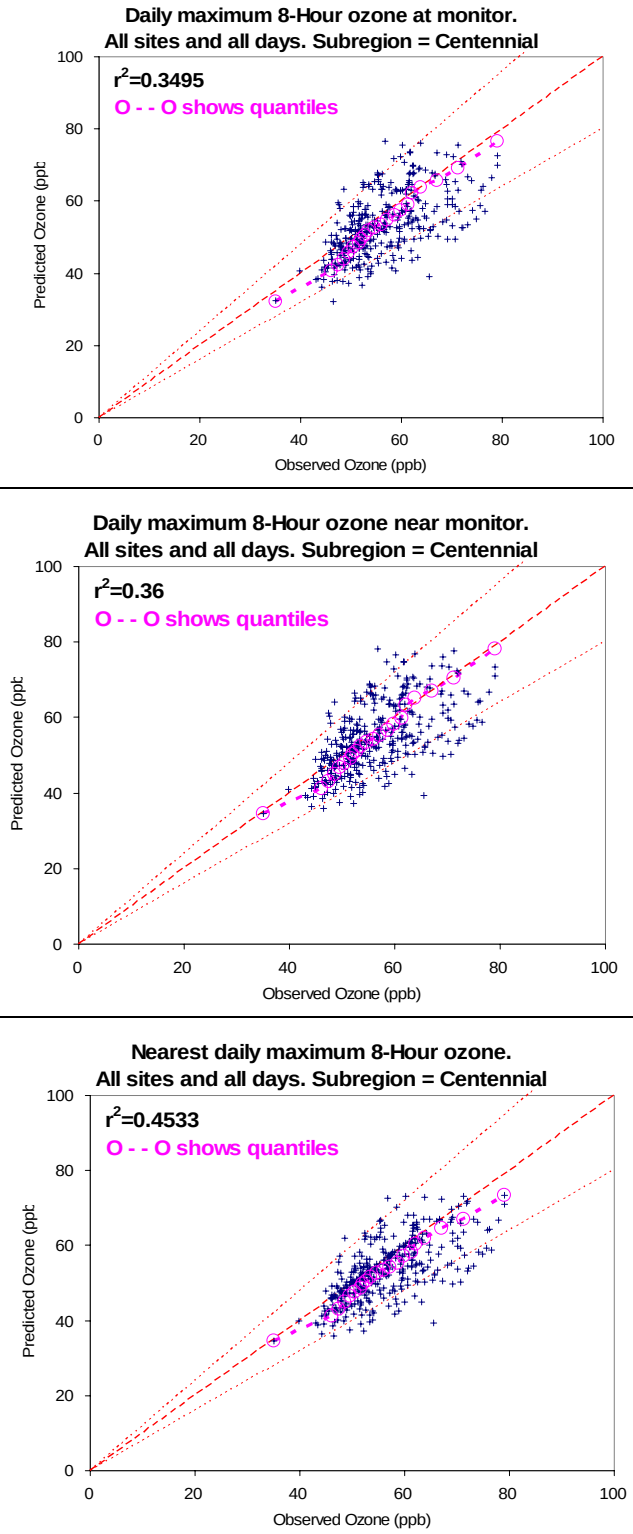


Figure 3-8. Comparison of predicted and observed daily maximum 8-hour ozone concentrations at the Centennial monitor using the Spatially Paired (top), Maximum (middle) and Closest (bottom) modeled value near the monitor.

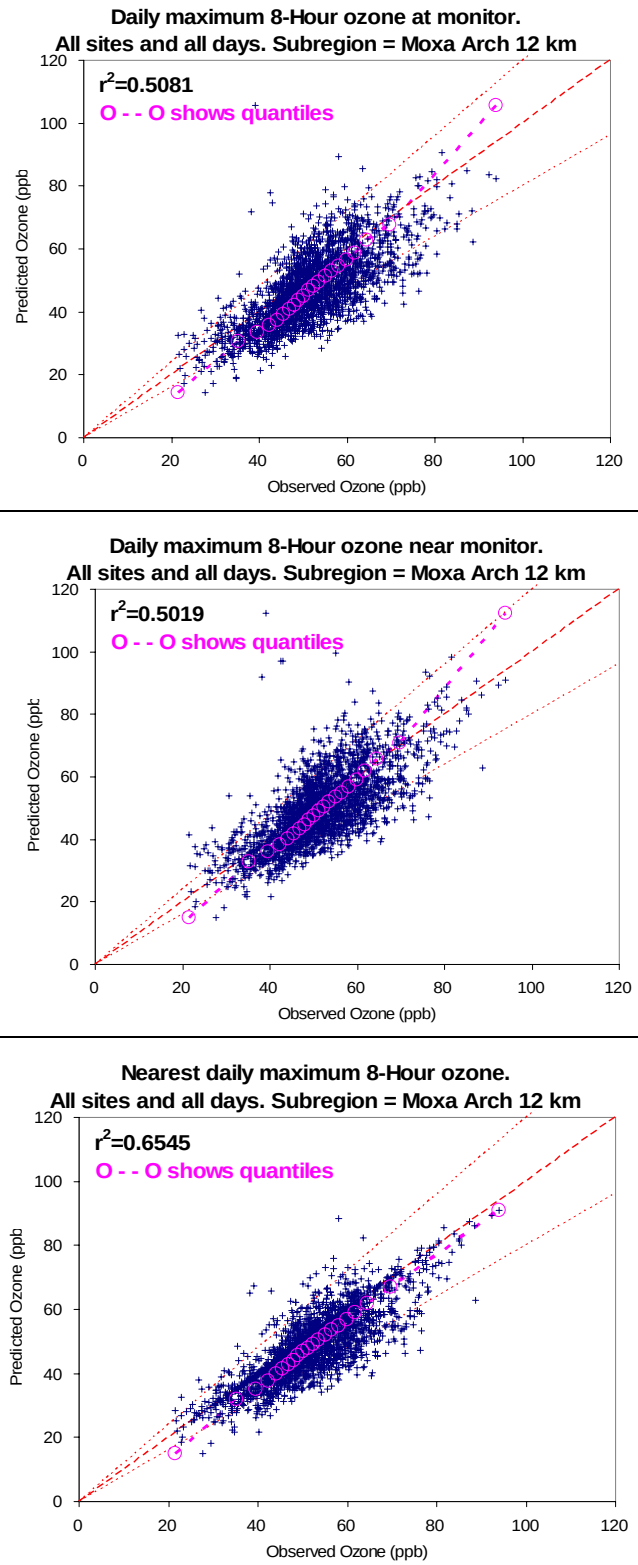


Figure 3-9. Comparison of predicted and observed daily maximum 8-hour ozone concentrations across 7 monitors in the 12 km grid using the Spatially Paired (top), Maximum (middle) and Closest (bottom) modeled value near the monitor.

3.3 Ozone Model Performance Evaluation Conclusions

The CAMx 2002 12/4 base case simulation reproduces the observed ozone to within EPA's performance goals, although with a small underestimation bias. The observed highest ozone concentrations at the Pinedale and Centennial CASTNET monitors in southwestern Wyoming are generally reproduced by the model to within ±5%. On a day-by-day basis, the observed daily maximum ozone concentrations are replicated by the model to within ±20% for a vast majority of the modeling days. Thus, the model appears to be reliable enough to perform an assessment of the potential ozone impacts of the Project and cumulative emissions.

4.0 OZONE IMPACT ASSESSMENT

The impact of the PAPA and other new sources in the region (cumulative emissions) on ozone concentrations were analyzed in two ways. The first approach follows EPA's guidance for projecting future year 8-hour ozone concentrations for determining attainment of the ozone NAAQS (EPA, 2007). The second approach uses the absolute model predictions and compares the modeled fourth highest 8-hour ozone concentration estimates with the 8-hour ozone NAAQS.

4.1 Results using EPA Guidance Ozone Projection Approach

EPA guidance for projecting future 8-hour ozone concentrations recommends using the photochemical grid model in a relative sense to scale current observed 8-hour ozone Design Values (EPA, 2007).

4.1.1 EPA Guidance 8-Hour Ozone Projection Procedures

A design value is defined as a three year average of the fourth highest daily maximum 8-hour ozone concentrations at a monitor. Model scaling factors called relative response factors (RRFs) are used to scale the observed design values in order to predict future year design values. RRFs are the ratio of the future-year to current-year modeled 8-hour ozone concentrations near a monitor site. By "near the monitor", EPA means within approximately 15 km of the monitor location. The future-year design value (DVF) is obtained from the current-year design value (DVC) as follows:

$$DVF = DVC \times RRF$$

The RRFs are calculated for all days in which the current-year modeled 8-hour ozone value is greater than a threshold. EPA recommends using a threshold value between 70 ppb and 85 ppb. This is done so that the model response to future changes in emissions is considered only on high ozone days of comparable conditions as those that produced the Design Values.

To perform 8-hour ozone projections, EPA has developed a Modeled Attainment Test Software (MATS) tool that uses modeling results, observed 8-hour ozone Design Values and EPA guidance (EPA, 2007) to project 8-hour ozone concentrations that reflects the change in emissions from a base case to alternative emissions scenario. The MATS tool was used to assess the effects that the Project and other cumulative emissions would have on 8-hour ozone concentrations in southwestern Wyoming. The following two links contain the website where the EPA MATS tool is available and the EPA ozone modeling guidance whose procedures are codified in MATS:

- http://www.epa.gov/scram001/modelingapps_mats.htm
- http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf

The EPA modeling guidance procedures (EPA, 2007) used in MATS uses the model in a relative fashion to scale observed current year 8-hour ozone Design Values (DVC) to the future (DVF) using RRFs as described above. EPA recommends using a DVC based on a three-year average of 8-hour ozone Design Values centered on the modeling year. For the 2002 modeling year, this would mean the DVC would be the weighted average of the fourth highest 8-hour ozone at a monitor from the years 2000, 2001, 2002, 2003 and 2004 using weights of 1, 2, 3, 2 and 1, respectively. To develop RRFs, EPA guidance recommends using current and future

modeling results for all days in which the current year daily maximum 8-hour ozone concentration near the monitor exceeds a threshold value. Using a 4 km grid, the maximum modeled daily maximum 8-hour ozone concentration in a 7 x 7 array of grid cells centered on the monitor is used. EPA recommends using an 8-hour ozone threshold concentration of 85 ppb and also recommends that RRFs be based on a minimum of 5 days although 10 days or more is preferred. EPA allows a reduction of the threshold value to 70 ppb to meet the minimum 5-10 days requirement. These procedures were developed mainly for ozone nonattainment areas where there are typically many days of elevated ozone concentrations than is observed in southwestern Wyoming.

For southwestern Wyoming, where ozone rarely exceeds 70 ppb, the minimum days requirement had to be relaxed a little in order to apply EPA's guidance procedures. In addition, many of the ozone monitoring sites in southwestern Wyoming have not been operating for 5 years therefore the DVCs were based on shorter time periods. For example, the Jonah, Daniel and Boulder ozone monitors that have recently recorded 8-hour ozone concentrations approaching the ozone NAAQS have only been operational for only two years. Calculation of a design value requires three years of valid data. Fortunately, the EPA MATS tool allows one to input the minimum number of years necessary to calculate the starting point DVCs. This number was specified as 1 so that MATS could use ozone data for the newer ozone monitoring in the 8-hour ozone projections. The following inputs to the MATS tool were specified to allow its application for this study:

- A threshold of 70 ppb was used (i.e., the RRF for a grid cell is based on the ratio of the average daily maximum 8-hour ozone concentrations for the Project+Cumulative Emissions to Base Case emissions scenario when the Base Case ozone is 70 ppb or greater); and
- RRFs and 8-hour ozone projections were performed at the ozone monitors using a minimum of 1 year of ozone data available to calculated the current year Design Values (DVCs);
- The minimum number of days required to develop RRFs was set to 1;
- The unmonitored area screening test in MATS was used to obtain projected 8-hour ozone Design Values across the entire 4 km grid. In this procedure, MATS interpolates the DVCs from the monitoring sites to obtain a gridded field of DVCs and then uses a gridded field of model derived RRFs to project 8-hour ozone Design Values throughout the domain; and
- EPA's Model Attainment Test Software (MATS) tool was used to project future-year 8-hour ozone design values (DVs) in unmonitored areas as well as at the monitors for comparison with the 8-hour ozone National Ambient Air Quality Standard (NAAQS) of 0.08 ppm (or 85 ppb).

4.1.2 Projected 8-Hour Ozone for the Project Following EPA Guidance

Table 4-1 summarizes the current and projected 8-hour ozone Design Values at the monitoring sites in southwestern Wyoming calculated with MATS for the PAPA Case 1 and Case 2 emission scenarios. The highest projected 8-hour ozone design value is 78.2 ppb at the Boulder monitor for the Case 1 scenario, which is 1.8 ppb higher than the current year Design Value (76.4 ppb). The highest projected 8-hour ozone design value for the Case 2 scenario is 76.5 ppb and also occurs at the Boulder monitor. This value is 0.1 ppb higher than the current year design value. Since all of the projected 8-hour ozone Design values are well below the 8-hour ozone NAAQS (85 ppb), the PAPA Case 1 and Case 2 emissions, along with all other

cumulative emissions in the area, are not projected to cause or contribute to any violations of the ozone NAAQS.

Table 4-1.
Projected 8-hour Ozone Design Values at the Monitoring Sites for the Pinedale Anticline Project Area Case 1 and Case 2 Emissions Scenarios.

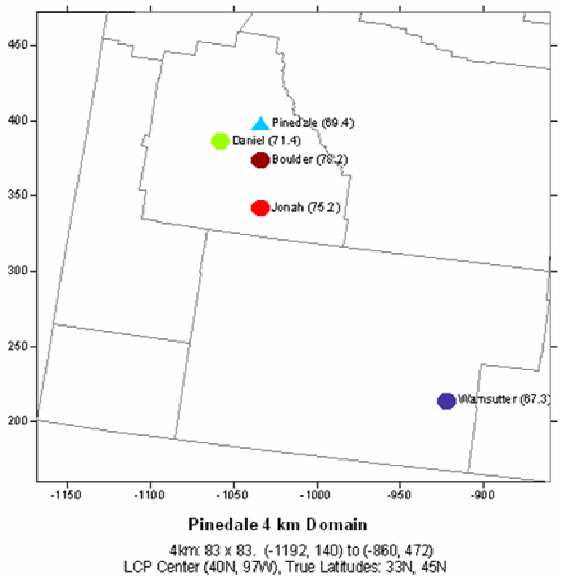
Site (# days DVC is based on)	Current DVC (ppb)	Case 1 Projected DVF (ppb)	Case 2 Projected DVF (ppb)	Number of Days >70 ppb in RRF
Jonah (2)	72.5	75.2	73.5	4
Boulder (2)	76.4	78.2	76.5	5
Daniel (2)	70.7	71.4	70.5	4
Wamsutter (1)	67.0	67.3	67.3	6
Pinedale (5)	68.9	69.4	68.8	6

The MATS unmonitored area screening analysis results for the Case 1 scenario are shown in Figure 4-1. The upper left hand panel shows the projected design value at each monitor, while the upper (lower) right hand panel shows the spatial fields of projected 8-hour ozone Design Values across the 4 km (12 km) domain. These fields of estimated future-year 8-hour ozone concentrations may be used to identify possible ozone hot spots where additional monitoring should be considered. The 4 km grid shows hot spots near the PAPA and northwest of the PAPA. The maximum projected 8-hour ozone design value for the Case 1 scenario anywhere in the unmonitored region was 77.2 ppb near Bondurant, Wyoming northwest of the PAPA, which was 6.7 ppb higher than the interpolated current-year DVC of 70.5 ppb for this location. However, the maximum impact near Bondurant is based on an RRF developed from a single day of modeling results above the 70 ppb threshold, so it is not clear whether this impact would have appeared had more ozone data above the threshold been available for the MATS analysis. The fact that a maximum was located in this area does suggest that additional monitoring may be indicated in this region. The spatial fields on the 12 km domain are consistent with the 4 km domain results, and show that maximum future year ozone in the 12 km grid are dominated by the Denver and Salt Lake City urban plumes.

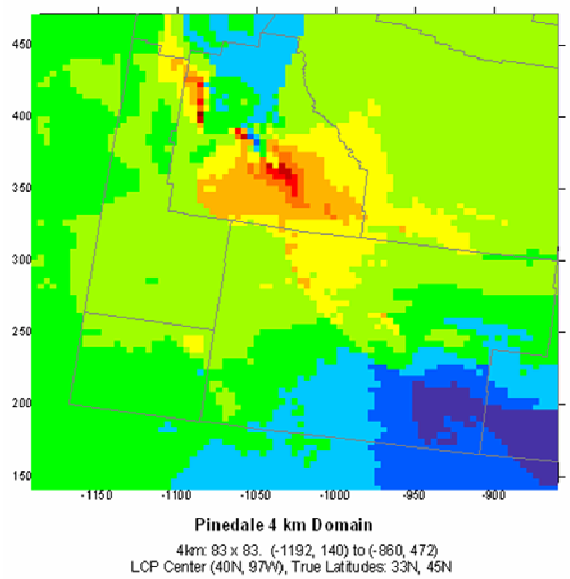
Figure 4-2 shows that the MATS spatial fields for the Case 2 scenario are similar to those of the Case 1 scenario, with smaller impacts near the PAPA reflecting the Case 2 scenario's lower emissions. The maximum projected 8-hour ozone design value in the unmonitored area for the Case 2 scenario was 75.5 ppb, which occurred in the PAPA and was 0.5 ppb higher than the 75.0 ppb current year design value. Away from the PAPA, the 12 km domain MATS projected ozone spatial fields for the PAPA Case 1 and Case 2 scenarios are nearly identical, with the Denver and Salt Lake City urban plumes showing up as the most prominent features.

The MATS analysis shows that the projected 8-hour ozone Design values away from the monitoring sites are also all less than the ozone NAAQS so that the PAPA Case 1 and Case 2 scenarios are not estimated to cause or contribute to any violations of the ozone NAAQS away from the monitoring sites.

Case 1
4km: Projected Ozone DVs



Case 1
4 km: Spatial Field of Projected Ozone DVs



Case 1
12 km: Spatial Field of Projected Ozone DVs

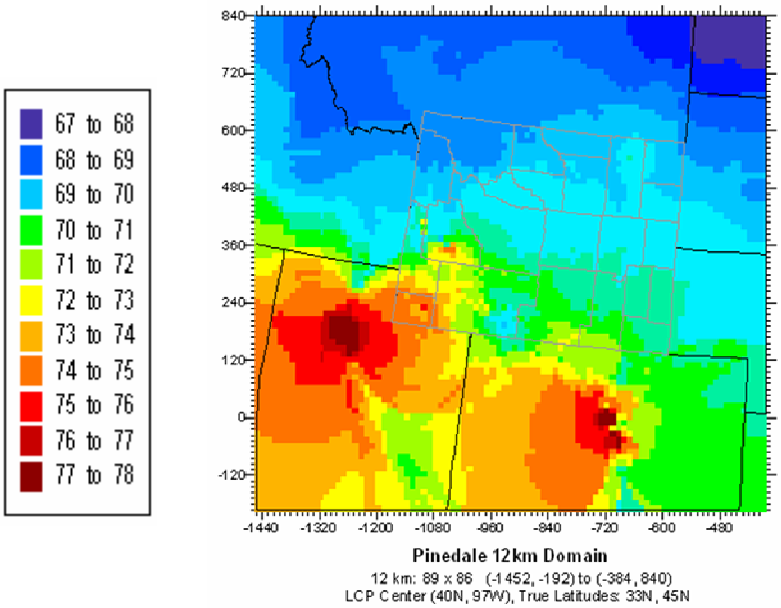


Figure 4-1. PAPA Case 1 Scenario MATS analysis. Top left panel: projected design values for monitors within the 4 km domain. Top right panel: spatial fields of projected ozone design values in the 4 km domain. Bottom right panel: spatial fields of projected ozone design values in the 12 km domain. Legend applies to both right hand panels.

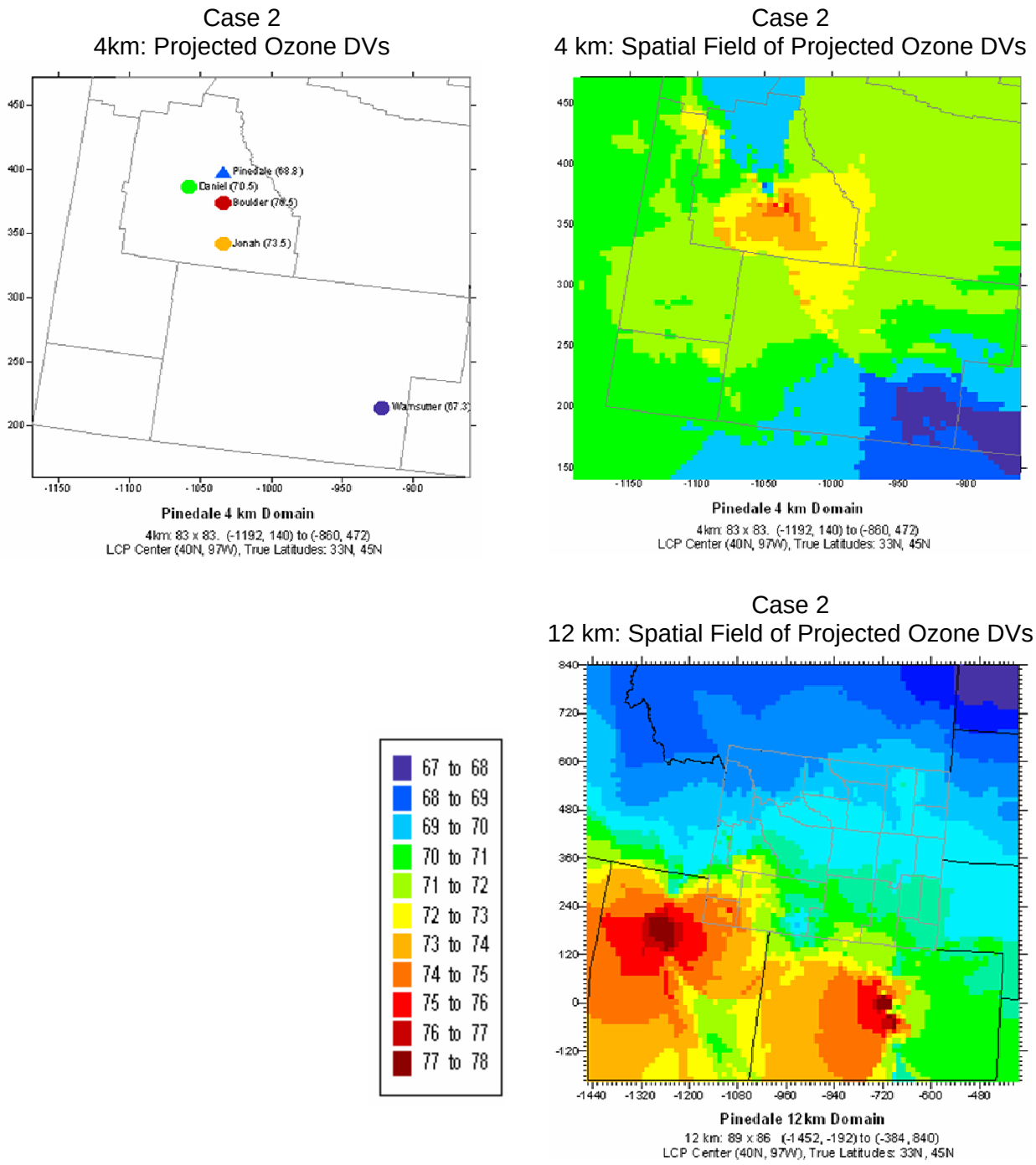


Figure 4-2. PAPA Case 2 Scenario MATS analysis. Top left panel: projected design values for monitors within the 4 km domain. Top right panel: spatial fields of projected ozone design values in the 4 km domain. Bottom right panel: spatial fields of projected ozone design values in the 12 km domain. Legend applies to both right hand panels.

4.2 Ozone Projections using Absolute Modeling Results

The second approach used for assessing the potential ozone impacts from the Project and other new sources in the region is to analyze the absolute modeled concentrations for the Project plus Cumulative Emissions for both the PAPA Case 1 and Case 2 scenarios.

4.2.1 Absolute Ozone Results in 12/4 km Domain

Figure 4-3 displays the estimated fourth highest daily maximum 8-hour ozone concentrations in the 4 km domain for the Base Case, PAPA Case 1 and Case 2 emission scenarios. For the base case (upper left hand panel), the maximum estimated 8-hour ozone concentration in the 4 km domain is 83.7 ppb, which occurs in northeastern Utah well south of the PAPA and other new sources. For both the Case 1 (lower left hand panel) and the Case 2 (lower right hand panel) scenarios, the fourth highest daily maximum 8-hour ozone concentration is 83.8 ppb, and is located in northwestern Colorado, well south of the project. Within the general location of the PAPA the maximum CAMx estimate fourth highest daily maximum 8-hour ozone concentrations are in the 80-85 ppb and 70-75 ppb range for the, respectively, PAPA Case 1 and Case 2 emission scenarios. For the Base Case and the PAPA Case 1 and Case 2 scenarios, then, all estimated fourth highest 8-hour ozone concentrations in the 4 km domain are less than the ozone NAAQS of 85 ppb and do not exceed the 8-hour ozone NAAQS.

The incremental change in the ozone formed in the 4 km domain due to the Case 1 scenario and Case 2 scenario Project and other Cumulative Emissions relative to the Base Case is shown in the top panels of Figure 4-4. The maximum estimated ozone increase is 14.8 ppb for the Case 1 scenario and 5.5 ppb for the Case 2 scenario. In both scenarios, the maximum incremental change occurs in the Pinedale/Jonah area. In the 12 km domain (not shown), the maximum ozone increase is smaller due to the coarser grid resolution and also occurs in the Pinedale/Jonah area.

The difference in the fourth highest daily maximum ozone concentration between the Case 1 and Case 2 scenarios is shown in the bottom panel of Figure 4-4. The maximum difference between the two scenarios is 11.5 ppb, and occurs in the Pinedale/Jonah area near the PAPA. The Case 1 scenario has higher 8-hour concentrations, consistent with its higher emissions.

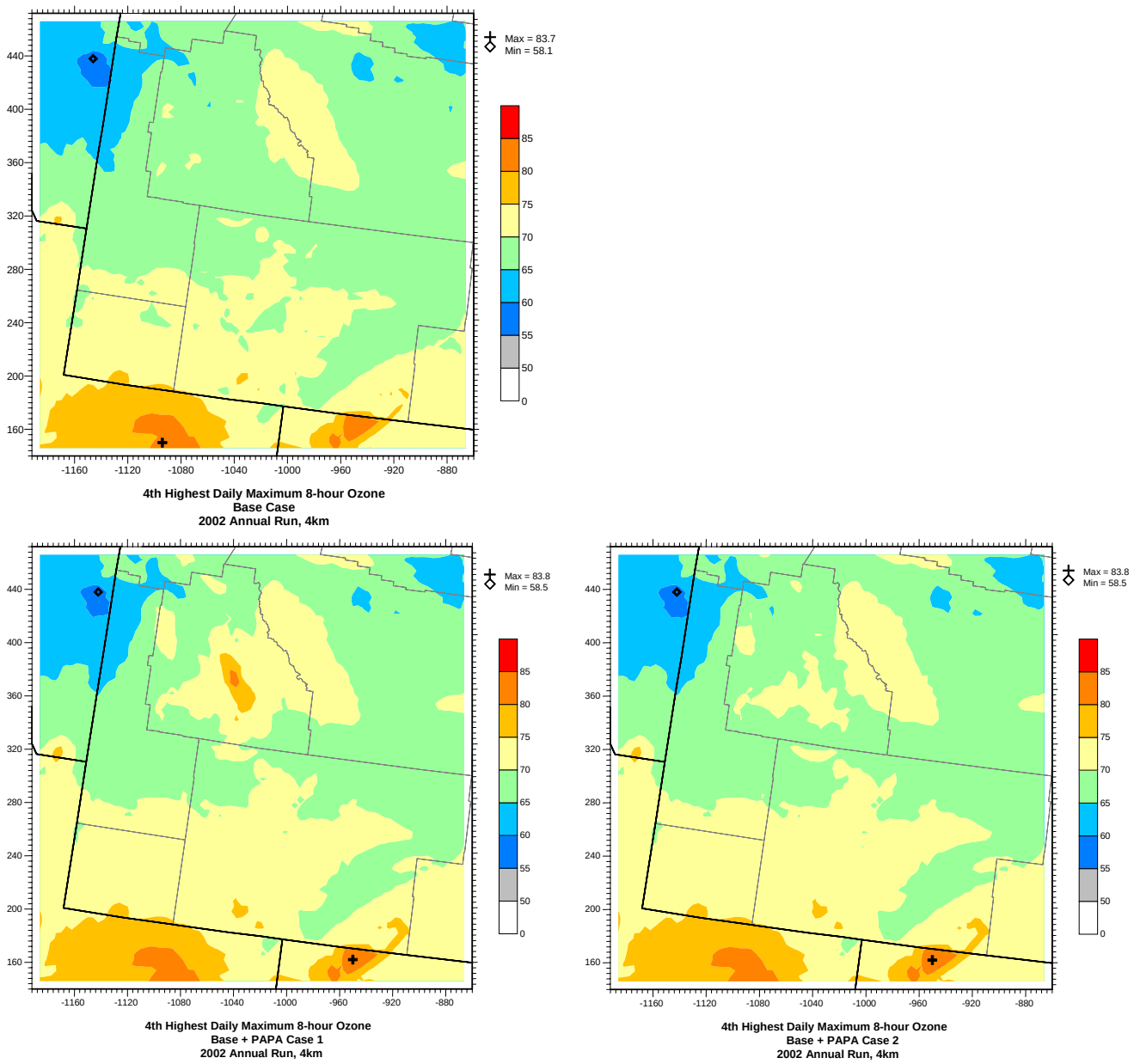


Figure 4-3. Fourth highest daily maximum 8-hour ozone in the 2002 Base Case (top), and when adding the PAPA Case 1 scenario (bottom left) and PAPA Case 2 scenario (bottom right).

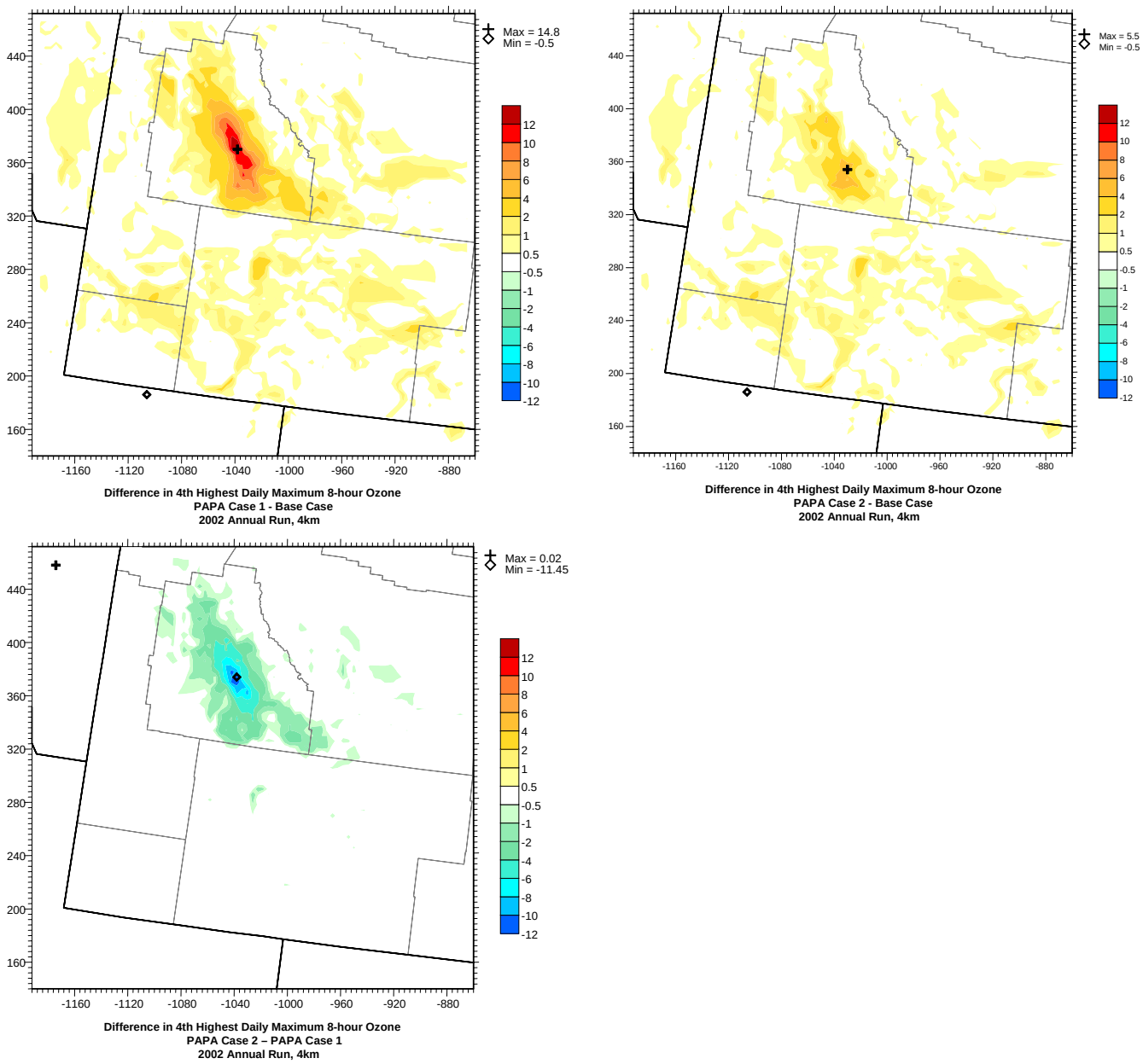


Figure 4-4. Impacts to the fourth highest daily maximum 8-hour ozone from the PAPA Case 1 scenario (top left) and from the PAPA Case 2 scenario (top right). Difference in the fourth highest 8-hour ozone in 2002 between the two PAPA scenarios (Case2 – Case 1).

4.3 Ozone Modeling Analysis Conclusions

Table 4-2 summarizes the maximum estimated 8-hour ozone concentrations near the PAPA and in the 4 km grid domain using the EPA RRF projection approach and the absolute model predictions from the 2002 Base Case and Project and Cumulative Emissions annual CAMx simulations. Using these two different analysis techniques, the maximum 8-hour ozone concentrations are projected to be below the 8-hour ozone NAAQS. Note that the maximum absolute model predictions on the 4 km grid for both scenarios occurred in northern Colorado, away from the site of the proposed Project.

Table 4-2.
Maximum projected 8-hour ozone concentrations near the Project in the 4 km grid domain due to Base Case emissions plus the Project and Cumulative Emissions and comparisons with the NAAQS.

Scenario	8-Hour Ozone NAAQS (ppb)	Projected Maximum 8-Hour Ozone (ppb)	
		EPA Guidance Approach	Absolute Model Predictions
PAPA Case 1	85	78.2	83.8*
PAPA Case 2	85	76.5	83.8*

* Occurs in northern Colorado away from the Project location

Since all of the projected 8-hour ozone Design values are below the 8-hour ozone NAAQS (85 ppb) then the PAPA Case 1 and Case 2 emissions scenarios, along with all other cumulative emissions in the area, are not projected to cause or contribute to any violations of the ozone NAAQS. The projected 8-hour ozone Design values away from the monitoring sites are also all below the ozone NAAQS therefore the both the PAPA Case 1 and Case 2 scenarios are not estimated to cause any violations of the ozone NAAQS away from the monitoring sites as well.

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ATTACHMENT

REGIONAL OZONE ASSESSMENT OF THE PINEDALE ANTICLINE PROJECT AND OTHER NEW SOURCES IN THE REGION

Table 1. Summary of Modeled Field-Wide Emissions (tpy), Pinedale Anticline Project.

Emissions	Alternative B PAPA Case 1	Alternative C (Phase 2) PAPA Case 2
Field Compression		
NO_x	532.1	421.9
CO	235.5	157.7
VOC	357.1	320.5
Granger Gas Plant		
NO_x	301.7	301.7
CO	322.8	322.8
VOC	140.2	140.2
Drill Rigs		
NO_x	4390.0	526.4
CO	3335.7	427.0
VOC	393.1	526.4
Fugitives		
NO_x	668.8	495.7
CO	484.2	551.6
VOC	1207.8	1927.3
Total		
NO_x	5892.6	1745.7
CO	4378.2	1459.0
VOC	2098.1	2914.4

Table 2. Reasonably Foreseeable Development (RFD) Sources

EA/EIS Listed by Field Office	Status	Total Pollutant Remaining Per Project Area					
		NO_x (tpy)	CO (tpy)	VOC (tpy)	SO2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Kemmerer Field Office							
Hicky-Mountain-Table Mountain	Include.	14.1	--	--			
Horse Trap	Include.	25.71	--	--			
Moxa Arch Area Infill (Proposed Action)	Include.	3477.4	4528.8	7058.6	69.2	434.2	235.9
Pioneer Gas Plant	Include.	19.6	--	--	--	0.02	0.02
Riley Ridge[3]	Include.	1.62	--	--			
Road Hollow	Include.	88.01	--	--	54.95	0.85	0.85
Lander Field Office							
Wind River	Include.	486.06	--	--	--	0.12	0.12
Pinedale Field Office							
Big Piney-LaBarge	Include.	2.52	--	--			
Burley	Include	5.1	--	--			
Castle Creek	Exclude - not given by FO as project area to include in RFD analysis						
Jonah II EIS	Exclude - developed.	--	--	--			
Jonah Infill (Preferred Alternative)	Include	696.7	4037.2	14084.5	34.1	1652.8	313.9
Merna Pipeline	Exclude - developed.	--	--	--			
Soda Unit	Include.	2.16	--	--			
South Piney- Infinity & Williams[2]	Include.	736.7	1380.8	969.4	1.3	47.09	47.09
Rawlins Field Office							
Atlantic Rim EIS	Include.	674.88	--	--	65.3	1119.77	247.51
Continental Divide/Wamsutter II EIS	Include.	173.52	--	--			
Creston-Blue Gap	Include.	2.06	--	--			
Desolation Flats	Include.	320	--	--			
Dripping Rock/Cedar Breaks	Exclude - John Spehar Rawlins FO.	--	--	--			
Hay Reservoir	Exclude - developed.	--	--	--			
Mulligan Draw	Include.	4.14	--	--			
Seminoe Road	Include.	318.74	--	--	42.16	515.31	121.02
Sierra Madre	Include.	6.9	--	--			
South Baggs	Include.	31.73	--	--			
Rock Springs Field Office							
Bird Canyon	Exclude - Included in Bird Opal Loop Pipeline.	--	--	--			
Bird-Opal Loop Pipeline	Exclude - developed.	--	--	--			
Black Butte Coal (Pit 14)	Include.	149.26	--	--	--	1074.94	--
BTA Bravo	Include.	48.22	--	--			
Copper Ridge Shallow Gas Project	Include.	193.08	--	--			
East LaBarge	Exclude - Renee Dana 9/16/03.	--	--	--			
Essex Mountain	Exclude - Renee Dana 9/16/03.	--	--	--			
Fontenelle Natural Gas Infill Drilling	Include.	204.68	--	--			
Hiawatha	Exclude - no emissions quantified	--	--	--			
Jack Morrow Hills	Include.	65.16	--	--			
Lower Bush Creek CBM (Kennedy Oil)	Include.	1.8	--	--			
Opal-Loop Pipeline	Exclude - developed.	--	--	--			
Stage Coach	Include.	89.39	--	--			
Vermillion Basin	Include.	7.56	--	--			

[2] Emissions from South Piney taken from Emissions Inventory, Table 2.6 pg 14.

[3] Four sour gas plants proposed as part of original proposed action in 1983. Because the field is nearly developed and these ancillary facilities have not yet been built, it is assumed they will not be developed and the plants are excluded from this inventory.

Table 3. Wyoming Included Permitted Industrial Sources

Wyoming State-Permitted Source Inventory - WDEQ-AQD Permitted Sources in Moxa Arch Infill Drilling Project Modeling Domain - Table of Included Sources (Including VOCs and HAPs)

County	Company	Facility	Permit No.	Height (m)	Temp (k)	Velocity (m/s)	Diameter (m)	NOx	PM10	SOx	CO	VOC	Formal-dehyde	HAP Total
Carbon	Anadarko E&P Company, LP	Federal 1691 8I Injection Well	MD-986					6.10			13.60	3.40	0.40	0.40
Carbon	Anadarko E&P Company, LP	Wild Cow Compressor Station	CT-3634					8.40			9.80	15.10	0.40	3.90
Carbon	Anadarko Gathering Company	Blue Sky	MD-950	11	730	71.6	0.25	17.50			5.80	5.20	0.80	0.80
Carbon	Anadarko Gathering Company	Blue Sky	MD-1070					28.60			22.50	10.30	1.49	1.49
Carbon	Anadarko Gathering Company	Doty Mountain Compressor Station	CT-3349	11	730.4	71.6	0.25	46.70			29.20	15.70	2.30	2.30
Carbon	Anadarko Gathering Company	Sun Dog CBM Unit Pod 6	MD-1092					16.70			5.60	5.60	0.78	0.78
Carbon	Devon Energy Production Company, L.P	Baggs Mainline/ Blue Gap Compressor Station	MD-1163					19.20			7.70	7.10	0.90	1.00
Carbon	Double Eagle Petroleum Company	Cow Creek Central Production Facility	MD-1047					45.40			13.80	14.00	2.00	2.00
Carbon	Double Eagle Petroleum Company	Cow Creek Unit 34-12	MD-1043A					2.90			6.60	8.60	0.60	0.60
Carbon	Double Eagle Petroleum Company	Cow Creek Unit 34-12	MD-962					13.20			4.00	3.00	0.70	0.70
Carbon	Marathon Oil Company	Standard Draw 5-10	MD-1243					5.30			10.70	2.10		0.40
Carbon	Merit Energy Company	Jons/Ruth Sweezy Compressor Station	MD-941					8.10			8.30	13.60	1.40	5.50
Carbon	Merit Energy Company	South Baggs Compressor Station	CT-3542	9.05	509.82	12.5	0.76	16.20			5.40	12.80	0.70	5.60
Carbon	Samson Resources Company	Echo Springs Compressor Station	CT-3432					34.60			27.70	14.90	1.90	1.90
Carbon	Western Gas Resources, Inc.	Snow Bank	CT-3778					18.20			33.20	6.40	0.80	1.00
Carbon	Williams Field Services Company	Echo Springs Samson Dehydrator Station	CT-3590					4.60			8.20	18.00		6.80
		Carbon County Total		9.82	633.80	30.08	0.51	291.70	0.00	0.00	212.10	155.80	15.17	35.17
Converse	Bowers Oil & Gas, Inc.	CBM #3 Antelope CM	CT-3709					3.50			3.50	3.20	0.21	0.21
Converse	Merit Energy Company	Sage Creek Gas Plant	MD-920	15	422	10	0.31	3.10			1.80	0.30		0.30
Converse	Thunder Creek Gas Services	Buckshot Treating Facility	MD-1142					15.00			5.40	21.50	1.50	1.50
		Converse County Total		9.82	633.80	30.08	0.51	21.60	0.00	0.00	10.70	25.00	1.71	2.01
Fremont	Bill Barrett Corporation	Poison Creek Compressor Station	CT-3788					39.40			13.20	34.10	1.80	2.40
Fremont	Burlington Resources Oil and Gas Co	MBE Compressor	MD-960					0.60			1.50	4.90	0.00	0.80
Fremont	Devon Energy Production Company, L.P	Beaver Creek East Station	MD-1112					0.00			0.00	8.00		6.90
Fremont	EnCana Oil and Gas (USA), Inc.	Frenchie Draw Graham Unit Central Tank Batte	CT-3436	15	422	10	0.31	4.00			1.00	31.60		0.60
Fremont	EnCana Oil and Gas (USA), Inc.	Frenchie Draw Satellite/Graham West Station	MD-980	9.05	509.82	12.5	0.76	18.00			25.10	7.80		0.70
Fremont	EnCana Oil and Gas (USA), Inc.	Frenchie Draw/Graham Unit #5	CT-3467	9.05	509.82	12.5	0.76	36.00			50.70	63.00	1.60	2.00
Fremont	EnCana Oil and Gas (USA), Inc.	Fuller Compressor Station	CT-3449	8.23	895.37	15.7	0.3	47.90			42.20	25.50	2.90	3.90
Fremont	EnCana Oil and Gas (USA), Inc.	GBU Monita 1 Central Facility	CT-3949					19.40			2.90	28.50	1.70	1.70
Fremont	EnCana Oil and Gas (USA), Inc.	Glasner Compression Facility	CT-4225					18.80			6.60	39.60		1.00
		Fremont County Total		9.82	633.80	30.08	0.51	184.10	0.00	0.00	143.20	243.00	8.00	20.00
Johnson	Rowdy Pipeline, LLC	Iberlin Compressor Station	CT-4199					24.80			49.20	24.80	1.70	1.70
Johnson	Rowdy Pipeline, LLC	Pumpkin Creek Central Compressor Station	MD-751A2					0.60			2.00	3.70	0.17	0.17
Johnson	Rowdy Pipeline, LLC	Shadow Compressor Station	CT-3387					24.60			15.60	9.80	1.20	1.20
Johnson	Western Gas Resources, Inc.	Beecher	CT-3729					74.40			29.70	49.10	4.24	4.24
Johnson	Western Gas Resources, Inc.	Bullwacker/Pine Ridge Compressor Station	MD-1289					96.00			31.80	64.20	4.50	4.50
Johnson	Western Gas Resources, Inc.	Cinderella	MD-1264					121.40			99.50	81.20	5.80	5.80
Johnson	Western Gas Resources, Inc.	Luke-Gus Compressor Station	MD-1275					65.10			161.90	62.00	4.40	4.40
Johnson	Western Gas Resources, Inc.	Ollie	CT-3728					74.40			29.70	49.10	4.24	4.24
Johnson	Western Gas Resources, Inc.	Pumpkin/Bruno Compressor Station	MD-922					59.00			73.70	50.20	1.60	3.30
Johnson	Western Gas Resources, Inc.	Pumpkin/Bruno Compressor Station	MD-1113					126.90			231.40	122.30	1.74	1.74
		Johnson County Total		9.82	633.80	30.08	0.51	667.20	0.00	0.00	724.50	516.40	29.59	31.29
Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-1021					0.00	0.00		0.00	4.80		
Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-1115A					0.00	0.00	0.00	3.10	0.00		0.00
		Laramie County Total		9.82	633.80	30.08	0.51	0.00	0.00	0.00	3.10	4.80	0.00	0.00
Lincoln	Duke Energy Field Services, LP	Muddy Creek Compressor Station	CT-3384					16.20			32.80	21.40	0.80	1.30
Lincoln	Williams Field Services Company	Opal Gas Plant	MD-917	16.69	742	1.37	34.17	(550.60)			32.00	155.30		25.70
		Lincoln County Total		9.82	633.80	30.08	0.51	(534.40)	0.00	0.00	64.80	176.70	0.80	27.00
Natrona	Bill Barrett Corporation	Cave Gulch #24 Compressor Station	CT-3900A					38.80			13.00	40.10	1.82	2.47
Natrona	Bill Barrett Corporation	Wallace Creek Compressor Station	MD-954	7.32	734.8	35.4	0.3	55.70			47.90	53.10	2.20	10.90
Natrona	McMurry Ready Mix	Portable Diesel Generator	CT-4296					61.70			8.20	1.40		0.80
		Natrona County Total		9.82	633.80	30.08	0.51	156.20	0.00	0.00	69.10	94.60	4.02	14.17
Sublette	Bill Barrett Corporation	Wild Horse Butte Compressor Station	CT-3687					39.80			15.80	36.60		2.50
Sublette	McMurry Oil Company	Stud Horse Butte 8-20-29-108	CT-3572					0.30			0.10	39.30		8.00
Sublette	Petrogulf Corporation	Petrogulf State 36-CPF (compressor station)	CT-4161					5.70			2.80	5.70		0.40
Sublette	Questar Gas Management Company	Mesa Well 15-6 CDP	CT-4064					10.60		0.40	9.10	4.10	0.40	0.40
		Sublette County Total		9.82	633.80	30.08	0.51	56.40	0.00	0.40	27.80	85.70	0.40	11.30
Sweetwater	Anadarko E&P Company, LP	Higgins Dehydration Facility	CT-4008					0.90		74.40	2.20	8.10		2.70
Sweetwater	Duke Energy Field Services, LP	Yates Bicycle Federal Compressor #18	CT-3477	9.05	509.82	12.5	0.76	6.30			1.90	23.40	0.40	4.20
Sweetwater	Duke Energy Field Services, LP	Yates Bicycle Federal Compressor #6	CT-3507	9.05	509.82	12.5	0.76	6.30			1.90	23.40	0.40	6.80
Sweetwater	Duke Energy Field Services, LP	Yates Huffy State Compressor #16	CT-3508	9.05	509.82	12.5	0.76	6.30			1.90	23.40	0.40	6.80
Sweetwater	Enterprise NGL Pipelines, LLC	Rock Springs Station	MD-1006					3.10			16.50	0.80	0.00	0.00
Sweetwater	Marathon Oil Company	Wamsutter A-7	MD-1248					5.30			10.70	2.10		0.40
Sweetwater	Mountain Gas Resources	Granger Gas Plant	MD-963	7.92	904	32.9	0.38	16.60			32.70	5.50	0.80	1.60
Sweetwater	Mountain Gas Resources	Hay Reservoir Central Compressor Station	MD-975	13.11	880.4	20	0.46	16.70			33.30	20.70	0.80	2.10
Sweetwater	Mountain Gas Resources	Sevenmile Gulch Compressor Station	MD-1316					0.60			0.40	2.40		0.28
Sweetwater	Mountain Gas Resources	Storm Shelter Compressor Station	MD-935	9.05	509.82	12.5	0.76	3.30			0.80	6.10		4.10
Sweetwater	Mountain Gas Resources	Wild Rose Compressor Station	CT-3412	6.7	903.7	32.9	0.38	120.60			232.70	41.40	8.40	9.30
Sweetwater	Pacificorp	Jim Bridger Plant	MD-1138					(4,946.00)	0.00	0.00	9,842.00	0.00		0.00
Sweetwater	Warren E & P, Inc.	Pacific Rim Generator Station #1	CT-3472	9.05	509.82	12.5	0.76	10.50			10.50	10.50	0.52	0.52
Sweetwater	Warren E & P, Inc.	Rifes Rim Compressor Station #1	CT-4072					10.50			10.20	5.10		0.70
Sweetwater	Western Gas Resources, Inc.	Church Butte	MD-1221					0.40			0.30	7.00		5.70
Sweetwater	Williams Field Services Company	Frewan Lake Compressor Station	MD-1242					15.90			17.80	23.70		0.10
		Sweetwater County Total		9.82	633.80	30.08	0.51	(4,722.70)	0.00	74.40	10,215.80	203.60	11.72	45.30
Uinta	Questar Gas Management Company	Lateral 1127	CT-3841					15.30			5.20	19.70	0.70	0.90
Uinta	Questar Pipeline Company	Leroy Storage Compressor Station	MD-1049					3.50			3.00	11.10		3.90
Uinta	Questar Pipeline Company	Leroy Well 10	MD-1218					0.10			0.10	3.50		1.60
Uinta	Questar Pipeline Company	Leroy Well 6	MD-1217					0.10			0.10	7.90		3.60
		Unita County Total		9.82	633.80	30.08	0.51	19.00	0.00	0.00	8.40	42.20	0.70	10.00
							Wyoming Total State-Permitted Source Emissions	(3,860.90)	0.00	74.80	11,479.50	1,547.80	72.11	196.24

Table 4. Wyoming Included RFFA Sources

Wyoming RFFA Source Inventory in Moxa Arch Infill Drilling Project Modeling Domain - Table of Included Sources (Including VOCs and HAPs)

County	Company	Facility	Permit No.	Height (m)	Temp (k)	Velocity (m/s)	Diameter (m)	NOx	PM10	SOx	CO	VOC	Formal-dehyde	HAP Total
Albany	Colorado Interstate Gas	Laramie Compressor Station	MD-360A					5.30			3.60	0.00		0.00
Albany	Mountain Cement Company	Laramie Cement Plant	MD-996					0.00	3.90	0.00	0.00	0.00		0.00
		Albany County Total		9.82	633.80	30.08	0.51	5.30	3.90	0.00	3.60	0.00	0.00	0.00
Carbon	Anadarko E&P Company, LP	Baton Rouge Federal 18-3	CT-3487					0.60			0.20	3.00		0.10
Carbon	Anadarko E&P Company, LP	Creston III 1-8	CT-3363					0.80			0.20	4.00		0.10
Carbon	Anadarko E&P Company, LP	Echo Springs 3-30	CT-3112					1.00			0.30	7.70		
Carbon	Anadarko E&P Company, LP	Echo Springs State 4-16 Well Site	CT-2927					1.70			0.40	8.90		
Carbon	Anadarko E&P Company, LP	Federal 1691 8I Injection Well	MD-1110					22.20			33.40	10.00	1.56	1.56
Carbon	Anadarko E&P Company, LP	Federal BF 2-30	CT-3043					1.30			0.40	6.90		
Carbon	Anadarko E&P Company, LP	Hanna Draw	CT-4009					57.30			56.10	32.60	3.00	3.00
Carbon	Anadarko E&P Company, LP	Narco State Pad Facility	CT-2578					0.50			0.20	3.10		
Carbon	Anadarko E&P Company, LP	Pickette Federal 8-3	CT-3476					0.70			0.20	4.10		0.10
Carbon	Anadarko E&P Company, LP	Wamsutter Federal 3-18	CT-2320					0.40			0.10	4.50		
Carbon	Anadarko Gathering Company	Doty Mountain Compressor Station	MD-1071					17.50			5.80	5.20	0.82	0.82
Carbon	Anadarko Gathering Company	Jolly Rogers Pod Compressor Station	MD-1063					11.70			23.30	5.20	0.58	0.58
Carbon	Anadarko Gathering Company	Jolly Rogers Pod Compressor Station	CT-3624					46.80			35.00	22.10	2.22	2.22
Carbon	Anadarko Gathering Company	Muddy Mountain Compressor Station	CT-3352	11	730.4	71.6	0.25	46.70			29.20	15.70	2.30	2.30
Carbon	Anadarko Gathering Company	Red Rim Compressor Station	MD-1065					17.50			5.80	5.20	0.82	0.82
Carbon	Anadarko Gathering Company	Red Rim Compressor Station	CT-3393	11	730.4	71.6	0.25	53.00			32.30	18.40	2.80	2.80
Carbon	BP America Production Company	Baldy Butte 17-1	CT-2522					1.00				16.20		
Carbon	BP America Production Company	Baldy Butte 19-1	CT-3322					0.40			0.10	12.00		1.50
Carbon	BP America Production Company	Baldy Butte 21-1	CT-3620					0.50			0.10	12.50		1.50
Carbon	BP America Production Company	Baldy Butte 31-1	CT-3953					0.40			0.10	12.10		1.50
Carbon	BP America Production Company	Baldy Butte 33-1	CT-4292					0.40			0.10	12.80		1.50
Carbon	BP America Production Company	Champlin 222 D9	CT-4222					0.40			0.10	12.60		1.50
Carbon	BP America Production Company	Champlin 222 E10	CT-4217					0.40			0.10	11.80		1.40
Carbon	BP America Production Company	Champlin 222 F3	CT-2208					0.70			0.10	14.10		
Carbon	BP America Production Company	Champlin 222 G12	CT-4312					0.40			0.10	12.70		1.50
Carbon	BP America Production Company	Champlin 242 A10	CT-4308					0.40			0.10	12.60		1.50
Carbon	BP America Production Company	Champlin 242 C3	CT-2209					0.70			0.10	14.10		
Carbon	BP America Production Company	Champlin 242 E5	CT-3371					0.40			0.10	12.00		1.50
Carbon	BP America Production Company	Champlin 242 E6	CT-4311					0.40			0.10	12.20		1.50
Carbon	BP America Production Company	Champlin 242 H10	CT-4256					0.30			0.10	11.40		1.40
Carbon	BP America Production Company	Champlin 242 J12	CT-4220					0.40			0.10	12.80		1.50
Carbon	BP America Production Company	Champlin 261 B10	CT-4215					0.40			0.10	12.30		1.50
Carbon	BP America Production Company	Champlin 278 D1A	CT-4157					0.30			0.10	11.10		1.40
Carbon	BP America Production Company	Champlin 278 E4	CT-3145					0.40			0.10	12.20		
Carbon	BP America Production Company	Champlin 337 G11	CT-4221					0.40			0.10	12.60		1.50
Carbon	BP America Production Company	Champlin 337 G7	CT-4276					0.40			0.10	12.40		1.50
Carbon	BP America Production Company	Champlin 444 I4	CT-2207					0.70			0.10	14.10		
Carbon	BP America Production Company	Coal Bank 1-2	CT-4096					0.40			0.10	12.50		5.50
Carbon	BP America Production Company	Coal Bank 5-3	CT-4216					0.40			0.10	13.60		1.60
Carbon	BP America Production Company	Coal Gulch 13-2	CT-3515					0.40			0.10	11.90		1.40
Carbon	BP America Production Company	Coal Gulch F3	CT-3083					0.40			0.10	13.20		
Carbon	BP America Production Company	Creston Federal 4-1	CT-3758					0.50			0.10	12.50		1.50
Carbon	BP America Production Company	Duck Lake 1-2	CT-3070					0.40			0.10	12.40		
Carbon	BP America Production Company	Duck Lake 23-2	CT-3294					0.40			0.10	11.90		1.50
Carbon	BP America Production Company	Duck Lake 25-01	CT-2983					0.90			0.20	12.30		
Carbon	BP America Production Company	Duck Lake 25-2	CT-3323					0.40			0.10	12.00		1.50
Carbon	BP America Production Company	Duck Lake 25-3	CT-3426					0.40			0.10	12.00		1.50
Carbon	BP America Production Company	Duck Lake 25-4	CT-3613					0.50			0.10	12.50		1.50
Carbon	BP America Production Company	Echo Springs 17-1	CT-3909					0.40			0.10	12.20		1.50
Carbon	BP America Production Company	Fillmore Creek 07-01	CT-3906					0.30			0.10	11.80		1.40
Carbon	BP America Production Company	High Point 11-1	CT-4153					0.30			0.10	11.70		1.40
Carbon	BP America Production Company	High Point 13-1	CT-3671					0.60			0.20	13.80		1.60
Carbon	BP America Production Company	High Point 15-1	CT-4214					0.40			0.10	13.50		1.50
Carbon	BP America Production Company	High Point 23-2	CT-3619					0.50			0.10	12.60		1.50
Carbon	BP America Production Company	High Point 23-3	CT-3936					0.30			0.10	12.40		1.50
Carbon	BP America Production Company	High Point 25-1	CT-3405					0.50			0.10	13.80		1.60
Carbon	BP America Production Company	High Point 25-2	CT-3600					0.40			0.10	14.20		1.60
Carbon	BP America Production Company	High Point 25-3	CT-3616					0.50			0.10	12.30		1.50
Carbon	BP America Production Company	High Point 27-1	CT-3431					0.50			0.10	14.90		1.60
Carbon	BP America Production Company	High Point 27-2	CT-3571					0.40			0.10	12.90		1.50
Carbon	BP America Production Company	High Point 27-3	CT-3927					0.30			0.10	13.70		1.50
Carbon	BP America Production Company	High Point 27-4	CT-3929					0.30			0.10	13.70		1.50
Carbon	BP America Production Company	High Point 29-2	CT-3944					0.30			0.10	12.90		1.50
Carbon	BP America Production Company	High Point 31-1	CT-4218					0.40			0.10	11.90		1.40
Carbon	BP America Production Company	Muddy Creek 5-5	CT-3201					0.40			0.10	12.60		
Carbon	BP America Production Company	South Rim 5-2	CT-3087					0.40			0.10	11.70		
Carbon	Cabot Oil & Gas Corporation	Coal Gulch #30-4	CT-2321					1.10			0.30	4.50		
Carbon	Cabot Oil & Gas Corporation	Lookout Wash #1	CT-2760					0.40			0.10	38.30		
Carbon	Cabot Oil & Gas Corporation	Lookout Wash 10-32-15-93	CT-2761					0.10			0.10	30.50		
Carbon	Cabot Oil & Gas Corporation	Lookout Wash 10-8-14-93	CT-2759					1.10			0.20	21.30		
Carbon	Cabot Oil & Gas Corporation	Lookout Wash 40-5-14-93	CT-3099					0.50			0.10	7.40		
Carbon	Cabot Oil & Gas Corporation	Lookout Wash 40-8-14-93	CT-3088					0.50			0.10	13.50		
Carbon	Cabot Oil & Gas Corporation	Lookout Wash Unit 40-8L	CT-4080					0.40			0.10	9.80		1.00
Carbon	Devon Energy Production Company, L.P.	Baggs Mainline/ Blue Gap Compressor Station	MD-1027					17.30			5.80	5.20	0.80	0.80
Carbon	Devon Energy Production Company, L.P.	Blue Gap No. 4-7-14-92	CT-2830					0.30				3.70		
Carbon	Devon Energy Production Company, L.P.	Coal Gulch No. 04-28-17-93	CT-2568					0.30			0.60	3.40		
Carbon	Devon Energy Production Company, L.P.	Coal Gulch No. 16-30-17-93	CT-2861					0.40			0.10	3.00		
Carbon	Devon Energy Production Company, L.P.	East Echo Springs 14-26-19-92	CT-3164					1.00			0.20	5.00		
Carbon	Devon Energy Production Company, L.P.	Standard Draw 1-18-18-93	CT-3079					3.20			0.30	3.20		
Carbon	Devon Energy Production Company, L.P.	Standard Draw 3-32-18-93	CT-2278					0.30			0.10	3.40		
Carbon	Double Eagle Petroleum Company	Cow Creek Unit 34-12	MD-1043					13.20			4.00	3.00	0.72	0.72
Carbon	Dudley & Associates, LLC	Seminoe Compressor Station	CT-2833	7.32	422	27.31	0.4	39.00			13.60	26.20	1.80	
Carbon	EnCana Oil and Gas (USA), Inc.	Lookout Wash 13-4	CT-3343					0.60			0.20	31.70		7.40
Carbon	EnCana Oil and Gas (USA), Inc.	TBI Federal 10-09	CT-2684					0.30			0.10	27.50		
Carbon	Kerr-McGee Oil & Gas Onshore LP	Standard Draw 14-3	CT-3042					3.00			2.70	3.70		
Carbon	Kerr-McGee Oil & Gas Onshore LP	Standard Draw 2-6-18-93	CT-3024					0.50			0.20	3.40		
Carbon	Marathon Oil Company	Standard Draw 11-10	CT-2206					0.40			1.10	9.40		
Carbon	Merit Energy Company	South Baggs Compressor Station	MD-1036					9.20			3.10	2.40	0.40	0.40
Carbon	Nearburg Producing Company	Fillmore 1-18	CT-3907					0.80			0.20	4.50		
Carbon	Nearburg Producing Company	Fillmore 1-19	CT-2885					2.40			0.60	12.70		
Carbon	Nearburg Producing Company	Fillmore 2-18	CT-3908					0.40			0.10	3.70		
Carbon	Nearburg Producing Company	Fillmore 3-19	CT-2884	11.77	450.54	9.51	0.82	6.40			1.60	24.90		
Carbon	Nearburg Producing Company	Fillmore 3-29	CT-3191	11.77	450.54	9.51	0.82	3.70			0.90	28.90		
Carbon	Nearburg Producing Company	Fillmore Federal 2-19	CT-3190	11.77	450.54	9.51	0.82	3.30			0.90	12.60		

Table 4 (continued). Wyoming Included RFFA Sources

Carbon	Nearburg Producing Company	Fillmore Federal 2-20	CT-3265	11.77	450.54	9.51	0.82	3.40			0.90	16.40		0.10
Carbon	Nearburg Producing Company	Fillmore Federal 4-19	CT-3263	11.77	450.54	9.51	0.82	4.80			1.20	23.70		0.20
Carbon	Nearburg Producing Company	Fillmore Federal 4-20	MD-888					0.40			0.10	3.80		0.20
Carbon	Nearburg Producing Company	Fillmore Federal 4-20	CT-3264	11.77	450.54	9.51	0.82	3.40			0.90	16.40		0.10
Carbon	Samson Resources Company	Echo Springs #2-24	MD-896					0.30			0.10	14.40		6.90
Carbon	Samson Resources Company	Echo Springs #23-10	CT-3111					1.50			1.30	13.10		
Carbon	Samson Resources Company	Echo Springs Compressor Station	MD-1123					0.00			0.00	9.10		0.40
Carbon	Samson Resources Company	Echo Springs Compressor Station	CT-3432A					1.20			1.20	1.10	0.10	0.10
Carbon	Shakespeare Oil Company	South Baggs Compressor Station	MD-807					12.30			1.60	14.70		
Carbon	Western Gas Resources, Inc.	Standard Draw 1-18-18-93	CT-3067					0.10				11.40		
Carbon	Western Gas Resources, Inc.	Standard Draw 16-18-18-93	CT-3122					0.10				11.60		
Carbon	Western Gas Resources, Inc.	Standard Draw 16-30-18-93	CT-3069					0.10				14.10		
Carbon	Wexpro Company	Creston Federal 22-3	CT-2580					1.70			0.70	11.70		
Carbon	Wexpro Company	Creston Federal Well 22-4	CT-2996					0.90			0.10	9.40		
Carbon	Williams Field Services Company	Duck Lake 23-1	CT-3002					0.90			0.20	13.00		
Carbon	Williams Field Services Company	Echo Springs Federal 4-6	CT-2811					0.30			0.10	11.20		
Carbon	Williams Field Services Company	Echo Springs Gas Plant	MD-1227					38.50			41.60	15.80		0.30
Carbon	Williams Field Services Company	Echo Springs Gas Plant	MD-606	10.67	560.93	24.43	1.72	119.90			150.20	13.50		
Carbon	Williams Field Services Company	Eight Mile Lake Station	MD-810					0.00			0.00	7.80		
Carbon	Yates Petroleum Corporation	Eucker Federal 1	CT-3386					1.40			0.30	5.40		0.10
Carbon	Yates Petroleum Corporation	Eucker Federal 2	CT-3347					1.20			0.30	4.30		0.10
Carbon	Yates Petroleum Corporation	Seaverson 1	CT-3543					1.60			0.80	11.20		1.40
		Carbon County Total		9.82	633.80	30.08	0.51	605.90	0.00	0.00	467.00	1,392.50	17.92	98.42
Converse	EOG Resources	Crotalus 1-19	CT-3005	15	422	10	0.31	1.00			0.20	11.10	0.00	
Converse	Jim Huxtable	Huxtable Quarry	CT-3787						20.30					
Converse	Kinder Morgan Upstream, LLC	Douglas Gas Plant	MD-1136					0.00			0.00	9.20		0.90
Converse	Kinder Morgan Upstream, LLC	Ross Booster Station	MD-814	9.05	509.82	12.5	0.76	41.50			99.80	53.50	2.00	
Converse	Merit Energy Company	Sage Grouse Booster	MD-743					51.90			93.60	11.50	1.50	
Converse	Thunder Creek Gas Services	Buckshot Treating Facility	MD-959	9.14	730.4	45.5	0.25	29.00			7.10	19.50	0.80	0.80
Converse	Western Gas Resources, Inc.	Sand Dunes Plant	MD-931	10.9	710.93	59.99	0.2	13.30			4.40	8.90	0.60	0.60
Converse	Wyoming Interstate Gas	Douglas Compressor Station	MD-637	12.5	755	38.4	1.22	27.50			30.60	8.80		
Converse	Yates Petroleum Corporation	Chinook Federal 1	CT-4321					1.00			0.30	3.40		0.10
		Converse County Total		9.82	633.80	30.08	0.51	165.20	20.30	0.00	236.00	125.90	4.90	2.40
Fremont	Bill Barrett Corporation	Deer Creek Compressor Station	CT-3690					39.90			11.20	36.50	1.56	2.21
Fremont	Bill Barrett Corporation	Talon 11-32	CT-4151					1.10			17.40	2.40		
Fremont	Bill Barrett Corporation	Talon 31-25	CT-4219					2.10			0.50	4.40		0.10
Fremont	Bill Barrett Corporation	Talon 41-32	CT-4152					0.80			17.30	0.60		
Fremont	Burlington Resources Oil and Gas Co	FEO 1-35 SWD	CT-3146					0.20				7.60		
Fremont	Burlington Resources Oil and Gas Co	MBE Compressor	CT-2735	9.05	509.82	12.5	0.76	25.60			12.80	15.40	1.80	
Fremont	Burlington Resources Oil and Gas Co	MDU #65	CT-2555					0.90			0.20	11.90		
Fremont	Burlington Resources Oil and Gas Co	MDU 56	CT-2696C					1.20			0.30	9.10		
Fremont	EnCana Oil and Gas (USA), Inc.	Castle Gardens Compression Facility	CT-4298					18.80			6.60	26.60		1.00
Fremont	EnCana Oil and Gas (USA), Inc.	Moneta Compressor Station	CT-3950					38.80			49.20	12.00	1.40	1.40
Fremont	Western Gas Resources, Inc.	Fee 1-8	CT-3035					14.40			0.00	0.10		
Fremont	Western Gas Resources, Inc.	Lysite Interconnect	MD-1141					21.20			6.90	16.00	0.90	4.70
Fremont	Wold Oil Properties Incorporated	S. Sand Draw 11-36	MD-1114					1.10			1.10	14.90	0.10	0.30
		Fremont County Total		9.82	633.80	30.08	0.51	166.10	0.00	0.00	123.50	157.50	5.76	9.71
Hot Springs	Merit Energy Company	Hamilton Dome Battery #4	CT-4180						4.20			12.00		0.20
		Hot Springs County Total		9.82	633.80	30.08	0.51	0.00	4.20	0.00	0.00	12.00	0.00	0.20
Johnson	Anadarko E&P Company, LP	Sussex B-2 Tensleep and C Production Battery	MD-1247					2.90		57.30	0.80	6.20		0.50
Johnson	Anadarko Petroleum Company	Pat Pod Compressor Station	CT-3538					46.80			35.10	22.00	2.20	2.20
Johnson	KG Construction	Falxa Pit #2	CT-3970						14.20					
Johnson	Meritage Energy Partners	Culp Draw Battery 14	CT-3216					1.20			0.30	3.10		0.00
Johnson	Rowdy Pipeline, LLC	Iberlin II Compressor Station	CT-4121					90.00			27.00	33.20		
Johnson	Rowdy Pipeline, LLC	Pumpkin Creek Central Compressor Station	CT-2242					43.90			18.10	12.40	2.80	
Johnson	Rowdy Pipeline, LLC	Pumpkin Creek Satellite 1	CT-2243					5.10			7.70	2.00		
Johnson	Rowdy Pipeline, LLC	Pumpkin Creek Satellite 1	CT-3377					24.60			6.10	9.80	1.20	1.20
Johnson	Rowdy Pipeline, LLC	Reno Compressor Station	CT-2619					5.10			2.60	2.00	0.26	
Johnson	Rowdy Pipeline, LLC	Shadow Compressor Station	CT-2244					5.10			7.70	2.00		
Johnson	Thunder Creek Gas Services	Heldt Draw	CT-3990					58.20			19.50	38.70	2.73	2.73
Johnson	Western Gas Resources, Inc.	Bowman Compressor Station	CT-4122					153.90			186.60	128.80	4.16	4.16
Johnson	Western Gas Resources, Inc.	Bullwacker/Pine Ridge Compressor Station	MD-801	7.5	866.48	42.37	0.25	32.40			64.80	32.40	0.30	
Johnson	Western Gas Resources, Inc.	Bullwacker/Pine Ridge Compressor Station	CT-2448	8	899.82	54.86	0.3	68.80			145.30	68.80	2.80	
Johnson	Western Gas Resources, Inc.	Cinderella	CT-3769					75.20			31.30	51.20	3.36	3.36
Johnson	Western Gas Resources, Inc.	Dewars Compressor Station	CT-3402					56.30			70.90	37.40	3.00	3.00
Johnson	Western Gas Resources, Inc.	Dry Fork Compressor Station	CT-4123					120.30			44.90	79.80	6.40	6.40
Johnson	Western Gas Resources, Inc.	Fletcher/Terhune	MD-1085					57.10			25.30	39.10	2.52	2.52
Johnson	Western Gas Resources, Inc.	Fletcher/Terhune	CT-3589					66.90			103.40	60.70	1.30	1.30
Johnson	Western Gas Resources, Inc.	Fletcher/Terhune	MD-1350					113.60			152.30	98.40	2.76	2.76
Johnson	Western Gas Resources, Inc.	Irvine Compressor Station	CT-4138					120.30			44.90	79.80	6.40	6.40
Johnson	Western Gas Resources, Inc.	Jaq Compressor Station	CT-4125					153.90			186.60	128.80	4.16	4.16
Johnson	Western Gas Resources, Inc.	Luke-Gus Compressor Station	CT-3985					98.50			32.60	65.40	4.60	4.60
Johnson	Western Gas Resources, Inc.	Royal	CT-3986					85.20			28.20	56.60	3.98	3.98
Johnson	Western Gas Resources, Inc.	Walker Compressor Station	CT-3408					56.30			70.90	37.30	3.00	3.00
Johnson	Western Gas Resources, Inc.	Walker Compressor Station	MD-1273					84.80			23.00	56.40	3.59	3.59
Johnson	Western Gas Resources, Inc.	Wild Turkey Compressor Station	MD-1219					13.30			4.40	8.80	0.62	0.62
Johnson	Western Gas Resources, Inc.	Wild Turkey Compressor Station	CT-3367					46.00			25.50	30.30	3.40	3.40
Johnson	Windsor Energy Group, LLC	Jepson Compressor Station	MD-755	6.86	729.8	47.71	0.31	6.10			3.10	5.90	0.40	
Johnson	Windsor Energy Group, LLC	Jepson Compressor Station	MD-565A	9.05	509.82	12.5	0.76	3.70			7.40	3.70	0.20	
Johnson	Windsor Energy Group, LLC	Jepson Compressor Station	MD-565	9.05	509.82	12.5	0.76	15.70			31.40	15.70		
		Johnson County Total		9.82	633.80	30.08	0.51	1,711.20	14.20	57.30	1,407.70	1,216.70	66.14	59.88
Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-839					0.00	0.00	0.00	0.00	9.50		0.60
Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-798					1.20	0.10	0.80	1.40	17.40		
Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-1380					0.00	2.14	0.00	0.00	0.00		0.00
Laramie	Frontier Oil and Refining Company	Frontier Refinery	MD-927					6.10	0.40		7.90	1.10		
		Laramie County Total		9.82	633.80	30.08	0.51	7.30	2.64	0.80	9.30	28.00	0.00	0.60
Lincoln	AKA Energy Group LLC	Waterfall Compressor Station	CT-3862					0.40			0.20	12.20		0.80
Lincoln	AKA Energy Group LLC	Waterfall Compressor Station	MD-1334					19.60			6.50	41.00		3.50
Lincoln	Belco Energy Corporation	Champlin 186 G-4	CT-2279					0.30			0.10	16.10		
Lincoln	BP America Production Company	Wilson Ranch 5-19	CT-4209					0.30			0.10	11.50		1.50
Lincoln	Burlington Resources Oil and Gas Co	MDU 9-5 PAD	CT-3707								0.10	9.10		2.00
Lincoln	Chevron USA, Inc.	Ballerina #10-2	CT-2312					1.80			0.40	14.30		
Lincoln	Chevron USA, Inc.	Ballerina #20-10	CT-2716					0.80			0.20	14.40		
Lincoln	Chevron USA, Inc.	Ballerina 40-3	CT-2670					1.20			0.20	18.60		
Lincoln	Chevron USA, Inc.	Ham's Fork 24-3	CT-2718					0.70			0.10	13.40		
Lincoln	Chevron USA, Inc.	Maraposa Federal #1	CT-2671					0.60				11.70		
Lincoln	Chevron USA, Inc.	Mariposa Federal 3	CT-2717					0.50				9.70		
Lincoln	Condor Exploration LLC	Horse Trap Federal #3-35	CT-2685					0.40			0.10	8.30		
Lincoln	Condor Exploration LLC	Slate Creek End Facility	CT-2617	7.62	422	12.5	0.25	8.00			8.00	11.50	0.50	
Lincoln	Enterprise Products	Pioneer Cryogenic Gas Plant	CT-4302					37.50			62.50	117.30		16.40

Table 4 (continued). Wyoming Included RFFA Sources

Lincoln	EOG Resources	Emigrant Hollow 31-21	CT-3711					0.10				19.30		7.00
Lincoln	EOG Resources	Emigrant Springs 20-21	CT-3029					0.20				13.10		
Lincoln	EOG Resources	Emigrant Springs 21-22	CT-3015					0.50			0.10	19.30		
Lincoln	EOG Resources	ESU 20-21 & 26-21	MD-868					0.60			0.20	4.90		0.80
Lincoln	EOG Resources	ESU 28-22	CT-3344									38.60		1.10
Lincoln	EOG Resources	GRBU 212-7	CT-2921									18.00		
Lincoln	EOG Resources	GRBU 216-12	CT-3116					0.10				47.80		
Lincoln	EOG Resources	Opal 4-21	CT-3557									16.80		6.90
Lincoln	Exxon Mobil Corporation	Shute Creek Treating Facility	MD-771	60.66	608	19.34	2.1	141.30	71.60	(1,566.00)	(8,520.20)	57.40		
Lincoln	Jonah Gas Gathering Company	JGGC/OTTCO Interconnect	MD-806					19.30			18.00	25.80		
Lincoln	Jonah Gas Gathering Company	JGGC/OTTCO Interconnect	MD-925	15	422	10	0.31	4.00			21.60	12.80		7.50
Lincoln	Jonah Gas Gathering Company	Pioneer Dew Point Depression Plant	MD-999					8.20			12.80	9.10	0.00	0.80
Lincoln	Jonah Gas Gathering Company	Pioneer Dew Point Depression Plant	CT-3117	15	422	10	0.31	19.60			17.90	32.40	0.80	6.20
Lincoln	Kern River Gas Transmission	Muddy Creek Station	MD-736	17.22	422	13.17	2.59	39.40			47.90	11.40		
Lincoln	Kern River Gas Transmission	Muddy Creek Station	MD-783	17.22	736	12.63	2.75	92.80			112.80	28.00	0.70	
Lincoln	Kerr-McGee Oil & Gas Onshore LP	Champlin 122 D4	CT-2561					0.50			0.20	15.50		
Lincoln	Kerr-McGee Oil & Gas Onshore LP	Champlin 288 C-4	CT-2401					0.50			0.20	16.40		
Lincoln	Kerr-McGee Oil & Gas Onshore LP	Grynberg Fed 1-31 #4	CT-2394					0.50			0.20	16.40		
Lincoln	Kerr-McGee Oil & Gas Onshore LP	Rocky Crossing 1-24	CT-3018					0.40			0.10	13.50		
Lincoln	Kerr-McGee Oil & Gas Onshore LP	Slate Creek 1-11-23-112	CT-3701					0.40			0.10	3.70		0.00
Lincoln	Kerr-McGee Oil & Gas Onshore LP	Wilson Ranch 4-17	CT-4140					0.80			0.20	5.00		0.10
Lincoln	Mountain Gas Resources	Ballerina 10-10	CT-2991									14.60		
Lincoln	Mountain Gas Resources	Hailstone #10	CT-2977									14.30		
Lincoln	Mountain Gas Resources	Helwig 10-8	CT-2562									14.20		
Lincoln	Mountain Gas Resources	Lansdale 28-2	CT-3212									14.50		6.10
Lincoln	Mountain Gas Resources	Lincoln Road 40-29	CT-2886									14.30		2.00
Lincoln	Mountain Gas Resources	Whiskey Butte 40-30	CT-2563									14.40		
Lincoln	Mountain Gas Resources	Ziegler's Wash 1-30	CT-3212									14.30		2.40
Lincoln	Northwest Pipeline Corporation	Kemmerer Compressor Station	MD-702	9.14	422	31.22	1.12	14.90	0.90	0.40	18.40	5.30		
Lincoln	Questar Exploration & Production Company	Reynard 12	CT-3497					1.80			0.40	3.90	0.00	
Lincoln	Questar Exploration & Production Company	Verne Valley 5	CT-2764					1.00			0.20	11.80		
Lincoln	Questar Exploration & Production Company	Verne Vally 8	CT-3540					0.60			0.00	21.60		1.70
Lincoln	Schmid Development LLC	River 10-18	CT-2564					0.80			0.20	6.00		
Lincoln	Wexpro Company	Lansdale 28-2	CT-2751					0.40			0.10	18.60		
Lincoln	Wexpro Company	Lansdale 28-4	CT-2752					0.40			0.10	24.60		
Lincoln	Wexpro Company	MFS 10-4	CT-2755					0.40				18.50		
Lincoln	Wexpro Company	MFS Fee 10-2 Well	CT-2749					1.30			0.20	29.10		
Lincoln	Williams Field Services Company	LaBarge Compressor Station	MD-675	9.05	509.82	12.5	0.76	2.70			8.40	17.20	0.00	
Lincoln	Williams Field Services Company	Opal Gas Plant	MD-1188					0.00			0.00	10.60		0.00
Lincoln	Williams Field Services Company	Opal Gas Plant	MD-917A					0.90			8.00	0.00		0.00
Lincoln	Williams Field Services Company	Opal Gas Plant	MD-1327					12.00			65.40	7.50		2.40
Lincoln	XTO Energy Inc	Fontenelle Compressor Station 14-27	MD-958					0.50			0.20	1.60		0.10
		Lincoln County Total		9.82	633.80	30.08	0.51	439.00	72.50	(1,565.60)	(8,107.80)	1,011.20	2.00	69.30
Natrona	Bill Barrett Corporation	Bull Frog 14-18	MD-1359					38.80			13.00	25.80		1.80
Natrona	Bill Barrett Corporation	Cave Gulch #24 Compressor Station	CT-3900					38.80			13.00	40.10	1.82	2.47
Natrona	Bill Barrett Corporation	Cave Gulch 1-29	MD-1312					38.80			64.80	32.40	1.80	1.80
Natrona	Bill Barrett Corporation	Cave Gulch Gas Conditioning Plant	MD-874	14.4	734.8	41.15	0.3	40.20			11.20	22.40	1.60	2.80
Natrona	Bill Barrett Corporation	Cave Gulch Gas Conditioning Plant	MD-626					61.50			71.70	59.80		
Natrona	Bill Barrett Corporation	Hitchcock Draw	CT-4076					35.60			38.90	29.10	1.72	1.72
Natrona	Bill Barrett Corporation	Stone Cabin 1	CT-3727					4.90			1.20	17.10		6.80
Natrona	Carl D. Underwood Oil & Gas	Burnt Wagon Gas Processing Plant	CT-2370	3.66	422	10	0.15	2.50			1.50	3.60		
Natrona	Chevron USA, Inc.	Bullfrog Compressor Station	MD-351A	5.94	633.71	37.03	0.3	2.30			3.50	1.20		
Natrona	Chevron USA, Inc.	Waltman # 57	CT-2897					1.20			0.20	12.60		
Natrona	Chevron USA, Inc.	Waltman #23	MD-668	11.77	450.54	9.51	0.82	11.60			5.80	11.60	0.90	
Natrona	Chevron USA, Inc.	Waltman 44 Compression Facility	MD-659	5.94	649	52.7	0.3	11.60			5.80	11.60	0.60	
Natrona	Chevron USA, Inc.	Waltman 66	CT-3494					1.20			0.20	11.50	0.70	
Natrona	Defense Technology Corporation	Casper Facilities	MD-762					0.80	0.00		0.10	7.20		
Natrona	EnCana Oil and Gas (USA), Inc.	GBU #7 Central Tank Battery	CT-4019					4.40			6.50	10.30		0.90
Natrona	EnCana Oil and Gas (USA), Inc.	Gun Barrel Central Tank Battery 16	CT-4003					2.70			1.30	25.70		0.80
Natrona	EnCana Oil and Gas (USA), Inc.	West Cave Gulch 4-36	CT-2900					0.20			1.10	17.90		
Natrona	Howell Petroleum Corporation	Salt Creek LACT 4	MD-1157					2.20		11.70	0.70	69.10	6.00	9.00
Natrona	Howell Petroleum Corporation	Salt Creek LACT 5 Tank Battery	MD-970					0.00			0.00	0.00		5.00
Natrona	Nance Petroleum Corporation	Austin Creek Gas Plant	MD-393A					0.00			0.00	11.40		0.20
Natrona	Nance Petroleum Corporation	SRMGU 27-32	MD-620	11.77	450.54	9.51	0.82	17.80			4.90	5.40		
Natrona	Nance Petroleum Corporation	Sun Ranch Federal 1	CT-3537					12.80			5.40	68.80		5.90
Natrona	Natrona County International Airport	Airport	MD-760	11.62	357.93	9.45	0.76	0.70	22.60	0.20	99.10	56.70		
Natrona	Platte Pipe Line Company	Casper Station	MD-803									20.20		
Natrona	Rissler and McMurry Company	Screening and Wash Plant, Casper	RE-174					8.70	0.50	0.03	0.50	0.80		
Natrona	Sinclair Casper Refining Company	Casper Refinery	MD-1075					0.00	0.00	0.00	0.00	1.00		
Natrona	Sinclair Transportation Company	Casper Station	MD-700									3.90		
		Natrona County Total		9.82	633.80	30.08	0.51	339.30	23.10	11.93	350.40	577.20	15.14	39.19
Platte	Suncor Energy (U.S.A.) Pipeline Company	Guernsey Crude Station	MD-636									93.10		
		Platt County Total		9.82	633.80	30.08	0.51	0.00	0.00	0.00	0.00	93.10	0.00	0.00
Portable	Birdsall Sand and Gravel	RE-191	RE-191					13.50	1.00	0.90	2.90	1.10		0.60
Portable	Lee Excavation, Inc.	Portable Extech Jaw Crusher	CT-4007					6.30	2.10	0.30	3.90	0.20		
Portable	Pete Lien & Sons Incorporated	RE-165	RE-165						3.30					
		Portable Location Total		9.82	633.80	30.08	0.51	19.80	6.40	1.20	6.80	1.30	0.00	0.60
Sublette	AEC Oil & Gas (USA) Incorporated	Stud Horse Butte 3-32	CT-2560					0.40			0.10	34.60		
Sublette	Bill Barrett Corporation	Wild Horse Compressor Station	CT-3688					39.80			15.80	36.60		2.50
Sublette	BP America Production Company	Stud Horse Butte 16-15	CT-2963					0.90			0.20	13.00		
Sublette	Chevron USA, Inc.	Birch Creek 134	CT-2997					0.60				16.10		
Sublette	Chevron USA, Inc.	Birch Creek 186	CT-2997					0.60				16.10		
Sublette	Chevron USA, Inc.	Birch Creek Compressor Station @ Battery A	MD-770					56.60			85.00	28.40	8.40	
Sublette	Chevron USA, Inc.	Birch Creek South End Compression	MD-744					0.10			0.00	14.10		
Sublette	Chevron USA, Inc.	Birch Creek Unit 190	CT-4202					0.30			0.10	6.00		2.80
Sublette	Devon Energy Production Company, L.P.	Yellowpoint North CS	CT-3735					6.30			3.00	4.70		1.40
Sublette	Devon Energy Production Company, L.P.	Yellowpoint South CS	CT-3734					6.30			2.90	4.50		1.20
Sublette	Encana Energy Resources Inc.	Castle Creek Compressor Station	CT-2226					2.20			2.20	1.10		
Sublette	EnCana Oil and Gas (USA), Inc.	Hacienda 6-19-28-108	CT-4248					0.40			0.10	19.70		4.90
Sublette	EnCana Oil and Gas (USA), Inc.	Stud Horse Butte 2-22	CT-4204					0.90			0.20	3.80		0.50
Sublette	EOG Resources	B South Tank Battery	CT-2229					0.90			2.60	31.10		
Sublette	EOG Resources	ELBU 56-4D	CT-3098									20.80		
Sublette	EOG Resources	GRBU 301-7d	CT-2990					0.20				16.50		
Sublette	EOG Resources	North LaBarge Shallow Unit Tract 16	MD-696	9.05	509.82	12.5	0.76	2.70			0.40	3.40		1.10
Sublette	Exxon Mobil Corporation	Tip Top T75X-14G	CT-3668					1.70			0.40	4.30		0.10
Sublette	Forest Oil Corporation	Elm Federal No. 23-22	CT-2547					0.40			0.80	40.10		
Sublette	Infinity Oil & Gas of Wyoming	Riley Ridge Compressor Facility #1 and Pod Compres	MD-808	7.32	797.2	45.2	0.3	16.70			5.00	11.70	0.90	
Sublette	Infinity Oil & Gas of Wyoming	Thompson Compressor Station	CT-3300	7.32	403	33.9	0.2	12.60			7.40	11.40	0.74	0.74
Sublette	Jonah Gas Gathering Company	Bird Canyon/County Line Compressor Station	MD-1122					3.00			1.00	2.20		0.30
Sublette	Jonah Gas Gathering Company	Bird Canyon/County Line Compressor Station	CT-2252A	12.19	726.48	29.75	0.7	63.90			33.50	50.10	7.70	

Table 4 (continued). Wyoming Included RFFA Sources

Sublette	Jonah Gas Gathering Company	Bridger Compressor Station	CT-4283					196.40			170.50	115.80		11.60
Sublette	McMurry Oil Company	Cabrito 12-25-29-108	CT-2888					1.00			0.30	15.30		
Sublette	McMurry Oil Company	Hacienda 14-30-28-108	CT-3443					0.30			0.10	18.70		7.00
Sublette	McMurry Oil Company	Jonah Federal 5-5-28-108	CT-2826					1.00			0.30	15.60		
Sublette	McMurry Oil Company	Jonah Federal 6-5-28-108	CT-2891					1.00			0.30	15.60		
Sublette	McMurry Oil Company	Stud Horse Butte 10-33 PAD	CT-2807					1.10			0.50	15.40		
Sublette	McMurry Oil Company	Stud Horse Butte 10-34-29-108	CT-2906					1.00			0.30	15.60		
Sublette	McMurry Oil Company	Stud Horse Butte 10-35 PAD	CT-2882					1.00			0.30	15.40		
Sublette	McMurry Oil Company	Stud Horse Butte 12-35 PAD	CT-2834					1.00			0.30	16.00		
Sublette	McMurry Oil Company	Stud Horse Butte 33-36-29-108	CT-3410					1.20			0.30	16.20		6.80
Sublette	McMurry Oil Company	Stud Horse Butte 3-36-29-108	CT-3057					0.10			0.30	16.90		
Sublette	McMurry Oil Company	Stud Horse Butte 4-35-29-108	CT-2866					1.00			0.30	16.30		
Sublette	McMurry Oil Company	Stud Horse Butte 6-29-29-108	CT-3073					0.30			0.10	40.60		
Sublette	McMurry Oil Company	Stud Horse Butte 6-35 PAD	CT-2883					1.00			0.30	15.30		
Sublette	McMurry Oil Company	Yellow Point 10-12-28-109 PAD	CT-2890					1.00			0.30	15.70		
Sublette	McMurry Oil Company	Yellow Point 14-12-28-109	CT-2818					1.00			0.30	15.10		7.00
Sublette	McMurry Oil Company	Yellow Point 2-13-28-109	CT-2815					1.00			0.30	15.20		
Sublette	McMurry Oil Company	Yellow Point 4-13-28-109	CT-2946					1.00			0.30	15.50		
Sublette	Mountain Gas Resources	Cow Hollow 68	CT-3076					0.30			0.10	14.20		
Sublette	Mountain Gas Resources	Jonah Compressor Station	CT-2280	7.62	904	28.66	0.41	54.90			102.70	36.40		14.20
Sublette	Mountain Gas Resources	Stud Horse Butte 14-24	CT-2413									12.30		
Sublette	Mountain Gas Resources	Stud Horse Butte 2-23	CT-2425									12.00		
Sublette	Mountain Gas Resources	Wild Horse	CT-4050					5.80			11.60	10.60	4.11	4.11
Sublette	Overland Trail Transmission, LLC	Whiskey Buttes 5	CT-3077					0.30			0.10	9.10		
Sublette	Questar Exploration & Production Company	Stewart Point Well 11-33 Pad	CT-2727					0.80			0.10	11.10		
Sublette	Questar Gas Management Company	Stewart Point Well 16-18 CDP	CT-4062					2.30		0.50	0.90	0.10	0.10	0.10
Sublette	Ultra Resources Incorporated	Boulder 5-19	CT-3175					0.60			0.20	7.90		
Sublette	Ultra Resources Incorporated	Boulder 7-19	CT-3304					0.30			0.10	31.00		7.50
Sublette	Ultra Resources Incorporated	Mesa 8-28 Pad	CT-3316					2.90			0.70	8.40		1.50
Sublette	Ultra Resources Incorporated	Mesa 9-34	CT-3288					0.80			0.20	10.50		6.80
Sublette	Ultra Resources Incorporated	Riverside 1-4 PAD	CT-3064					0.70			0.20	9.80		
Sublette	Ultra Resources Incorporated	Riverside 16-3 PAD	CT-3784					0.60			0.20	4.30		0.50
Sublette	Ultra Resources Incorporated	Riverside 2-2	CT-3046					0.30			0.10	12.50		
Sublette	Ultra Resources Incorporated	Riverside 4-10	CT-3268					0.50			0.10	11.00		6.80
Sublette	Ultra Resources Incorporated	Riverside 8-4 PAD	CT-3256					0.30			0.10	9.90		3.90
Sublette	Ultra Resources Incorporated	War Bonnet 6-23	CT-3162					0.80			0.20	10.80		
Sublette	Ultra Resources Incorporated	Warbonnet 13-24	CT-3350					0.90			0.30	4.10		1.80
Sublette	Ultra Resources Incorporated	Warbonnet 4-25	CT-3181					0.70			0.20	10.70		
Sublette	Ultra Resources Incorporated	Warbonnet 7-4	CT-3174					0.70			0.20	9.70		
Sublette	Williams Field Services Company	Big Piney Compressor Station	MD-677	9.05	509.82	12.5	0.76	3.10			9.70	21.40	0.00	
Sublette	Williams Field Services Company	Hogsback 87-30	CT-2791					0.30			0.10	13.60		
Sublette	Williams Field Services Company	LaBarge 28	wv00167					0.30			0.10	7.20		
Sublette	Williams Field Services Company	Saddle Ridge Compressor Station	MD-676	9.05	509.82	12.5	0.76	2.20			6.50	14.80	0.00	
Sublette	Williams Field Services Company	Tip Top 11-1	CT-2790					0.30			0.10	14.30		
Sublette	Williams Production Company	Riley Ridge 14-33F	CT-3232					0.30			0.10	32.60		5.00
		Sublette County Total		9.82	633.80	30.08	0.51	509.90	0.00	0.50	471.00	1,150.80	21.95	100.15
Sweetwater	Anadarko E&P Company, LP	Brady 46F	CT-2713					0.70			0.20	7.90		
Sweetwater	Anadarko E&P Company, LP	Chambers Federal 3-24	CT-2639					0.80			0.20	3.50		
Sweetwater	Anadarko E&P Company, LP	Red Desert 10-1	CT-3161					0.60			0.20	4.90		
Sweetwater	Anadarko E&P Company, LP	Table Rock Gas Plant	MD-767					104.20		80.10	20.50	18.90		
Sweetwater	Anadarko E&P Company, LP	Wells Bluff 13-1	MD-869					0.90			0.30	4.20		0.10
Sweetwater	Anadarko Gathering Company	Big Robbie Compressor Station	CT-3326	9.05	509.82	12.5	0.76	17.70			6.00	7.30	1.80	1.80
Sweetwater	Anadarko Petroleum Company	Greasewood Wash 11-35	CT-4095					69.30			21.30	16.80		0.21
Sweetwater	BCCK Engineering, Inc.	Pretty Water Gas Plant	CT-2969	15	422	10	0.31	13.80			18.60	8.10		3.10
Sweetwater	BP America Production Company	Barrel Springs 11-1	CT-3801					0.40			0.10	12.00		1.50
Sweetwater	BP America Production Company	Battle Springs 13-1	CT-3935					0.30			0.10	11.50		1.40
Sweetwater	BP America Production Company	Battle Springs 27-3	CT-4245					0.50			0.10	13.70		1.60
Sweetwater	BP America Production Company	Battle Springs 35-1	CT-3423					0.40			0.10	13.60		1.50
Sweetwater	BP America Production Company	Buck Draw 11-1	CT-4131					0.40			0.10	12.00		1.50
Sweetwater	BP America Production Company	Buck Draw 29-1	CT-3888					0.30			0.10	12.20		1.50
Sweetwater	BP America Production Company	CG Road Unit 35-6	CT-3535					0.30			0.10	12.20		1.50
Sweetwater	BP America Production Company	CG Road Unit 9-1	CT-3951					0.30			0.10	11.80		1.40
Sweetwater	BP America Production Company	CG Road Unit 9-2	CT-3960					0.30			0.10	13.30		1.50
Sweetwater	BP America Production Company	Chain Lakes 27-1	CT-4130					1.40			0.40	14.70		1.60
Sweetwater	BP America Production Company	Chain Lakes 29-2	CT-4100					0.50			0.10	14.80		1.60
Sweetwater	BP America Production Company	Champlin 221 A4	CT-3187					0.40			0.10	12.00		
Sweetwater	BP America Production Company	Champlin 222 A11	CT-4280					0.40			0.10	12.50		1.50
Sweetwater	BP America Production Company	Champlin 222 A13	CT-4316					0.40			0.10	11.80		1.50
Sweetwater	BP America Production Company	Champlin 222 A5	CT-4306					0.40			0.10	12.20		1.50
Sweetwater	BP America Production Company	Champlin 254 D2	CT-3989					0.40			0.10	13.30		1.50
Sweetwater	BP America Production Company	Champlin 257 B2	CT-3425					0.40			0.10	11.90		1.40
Sweetwater	BP America Production Company	Champlin 261 A5	CT-2974					0.90			0.20	12.20		
Sweetwater	BP America Production Company	Champlin 261 I-1A	CT-4249					0.50			0.10	14.20		0.60
Sweetwater	BP America Production Company	Champlin 261 I2	CT-3345					0.40			0.10	12.20		1.50
Sweetwater	BP America Production Company	Champlin 261 I3	CT-3351					0.40			0.10	12.90		1.50
Sweetwater	BP America Production Company	Champlin 261 I-5	CT-4241					0.40			0.10	13.10		1.50
Sweetwater	BP America Production Company	Champlin 261 I-7	CT-4230					0.40			0.10	12.50		1.50
Sweetwater	BP America Production Company	Champlin 263 B5 Well Site	CT-2837					0.40			0.10	16.60		
Sweetwater	BP America Production Company	Champlin 263 H2	CT-3924					0.10			0.30	11.90		1.50
Sweetwater	BP America Production Company	Champlin 270 B2	CT-3954					0.30			0.10	11.40		1.40
Sweetwater	BP America Production Company	Champlin 292 B3	CT-3210					0.40			0.10	12.20		1.50
Sweetwater	BP America Production Company	Champlin 320 B2	CT-3930					0.50			0.10	14.40		1.60
Sweetwater	BP America Production Company	Champlin 336 G2	CT-2972					0.90			0.20	12.00		
Sweetwater	BP America Production Company	Champlin 337 A7	CT-4315					0.40			0.10	13.20		1.50
Sweetwater	BP America Production Company	Champlin 337 G4 Well Site	CT-2659					0.30			0.10	14.10		
Sweetwater	BP America Production Company	Champlin 345 B2	CT-3007					0.90			0.20	12.30		
Sweetwater	BP America Production Company	Champlin 452 C5	CT-2934					0.90			0.20	12.50		
Sweetwater	BP America Production Company	Champlin 452 E5	CT-2917					0.90			0.20	12.70		
Sweetwater	BP America Production Company	Champlin 452 I2	CT-3939					0.30			0.10	11.80		1.40
Sweetwater	BP America Production Company	Champlin 452 L2	CT-3922					0.40			0.10	11.90		1.50
Sweetwater	BP America Production Company	Cherokee Federal 32-2	CT-4156					0.30			0.10	11.80		1.40
Sweetwater	BP America Production Company	Coal Bank 23-1	CT-3928					0.30			0.10	11.50		1.40
Sweetwater	BP America Production Company	Crooks Gap 10 S-3	CT-3107					0.40			0.10	15.70		
Sweetwater	BP America Production Company	Crooks Gap 11-4	CT-3469					0.40			0.10	13.00		1.50
Sweetwater	BP America Production Company	Crooks Gap 20-03	CT-3127					0.40			0.10	12.60		
Sweetwater	BP America Production Company	Crooks Gap Raod 10-02	CT-3252					0.40			0.20	12.10		1.50
Sweetwater	BP America Production Company	Crooks Gap Road 10 S-1	CT-3370					0.40			0.10	13.30		1.50
Sweetwater	BP America Production Company	Crooks Gap Road 10 S-2	CT-3105					0.40			0.10	14.00		
Sweetwater	BP America Production Company	Crooks Gap Road 10 S-4	CT-3375					0.40			0.10	15.30		1.60
Sweetwater	BP America Production Company	Crooks Gap Road 10-01	CT-3128					0.40			0.10	12.90		

Table 4 (continued). Wyoming Included RFFA Sources

Sweetwater	BP America Production Company	Crooks Gap Road 11-01	CT-3110	0.40	0.10	14.70		
Sweetwater	BP America Production Company	Crooks Gap Road 11-02	CT-3242	0.40	0.10	14.10		1.60
Sweetwater	BP America Production Company	Crooks Gap Road 11-3	CT-3250	0.90	0.20	20.60		2.00
Sweetwater	BP America Production Company	Crooks Gap Road 15-01	CT-3103	0.30	0.10	15.40		
Sweetwater	BP America Production Company	Crooks Gap Road 15-02	CT-3170	0.50	0.10	21.90		
Sweetwater	BP America Production Company	Crooks Gap Road 15-3	CT-3240	0.50	0.20	14.60		1.60
Sweetwater	BP America Production Company	Crooks Gap Road 15-4	CT-3189	1.10	0.30	25.10		
Sweetwater	BP America Production Company	Crooks Gap Road 15-5	CT-3485	0.60	0.20	15.40		1.70
Sweetwater	BP America Production Company	Crooks Gap Road 17-01	CT-2970	0.90	0.20	11.80		
Sweetwater	BP America Production Company	Crooks Gap Road 17-02	CT-3008	0.90	0.20	12.40		
Sweetwater	BP America Production Company	Crooks Gap Road 17-03	CT-2975	0.90	0.20	12.20		
Sweetwater	BP America Production Company	Crooks Gap Road 21-01	CT-3014	0.90	0.20	12.50		
Sweetwater	BP America Production Company	Crooks Gap Road 21-02	CT-3060	0.40	0.10	12.50		
Sweetwater	BP America Production Company	Crooks Gap Road 24	CT-2396	0.70	0.10	15.40		
Sweetwater	BP America Production Company	Crooks Gap Road 25-05	CT-3186	0.40	0.10	12.50		
Sweetwater	BP America Production Company	Crooks Gap Road 25-6	CT-3486	0.40	0.10	13.30		1.50
Sweetwater	BP America Production Company	Crooks Gap Road 25-7	CT-3495	0.40	0.10	12.10	1.50	
Sweetwater	BP America Production Company	Crooks Gap Road 26-5	CT-3376	0.40	0.10	13.40		1.50
Sweetwater	BP America Production Company	Crooks Gap Road 35-7	CT-3524	0.40	0.10	13.00		1.50
Sweetwater	BP America Production Company	Crooks Gap Road 35-S1	CT-3066	0.40	0.10	12.60		
Sweetwater	BP America Production Company	Crooks Gap Road 36-5	CT-3171	0.40	0.10	13.60		
Sweetwater	BP America Production Company	Crooks Gap Road 3-S1	CT-3434	0.40		13.50		1.50
Sweetwater	BP America Production Company	Crooks Gap Road 5-3	CT-3462	0.40	0.10	12.20		1.50
Sweetwater	BP America Production Company	Delaney Rim 23-2	CT-4253	0.60	0.20	15.40		1.70
Sweetwater	BP America Production Company	Delaney Rim 27-1	CT-3755	0.50	0.10	11.90		1.40
Sweetwater	BP America Production Company	Delaney Rim 36-02	CT-3080	0.40	0.10	11.90		
Sweetwater	BP America Production Company	Delaney Rim 5-1	CT-3611	0.40	0.10	12.10		1.50
Sweetwater	BP America Production Company	Desert Flats 11-2	CT-4310	0.40	0.10	12.20		1.50
Sweetwater	BP America Production Company	Desert Flats 15-1	CT-3534	0.30	0.10	13.00		1.50
Sweetwater	BP America Production Company	Desert Flats 19-1	CT-3885	0.40	0.10	12.40		1.40
Sweetwater	BP America Production Company	Desert Flats 29-1	CT-3725	0.50	0.10	11.60		1.40
Sweetwater	BP America Production Company	Desert Flats 3-1	CT-3923	0.40	0.10	12.30		1.50
Sweetwater	BP America Production Company	Divide 17-01	CT-3902	0.40	0.10	12.10		1.50
Sweetwater	BP America Production Company	Divide 21-1	CT-3987	0.30	0.10	11.70		1.40
Sweetwater	BP America Production Company	Divide 27-1	CT-4101	0.50	0.10	12.00		1.50
Sweetwater	BP America Production Company	Divide 5-1	CT-4097	0.40	0.10	12.10		1.50
Sweetwater	BP America Production Company	Divide 7-1	CT-4105	0.30	0.10	11.40		1.40
Sweetwater	BP America Production Company	Eight Mile 13-03	CT-3185	0.40	0.10	11.80		
Sweetwater	BP America Production Company	Eight Mile lake 11-13	CT-4295	0.60	0.20	15.80		1.70
Sweetwater	BP America Production Company	Eight Mile Lake 11-2	CT-3150	0.40	0.10	12.70		
Sweetwater	BP America Production Company	Eight Mile Lake 11-3	CT-3474	0.40	0.10	13.40		1.50
Sweetwater	BP America Production Company	Eight Mile Lake 11-4	CT-3526	0.40	0.10	12.50		1.50
Sweetwater	BP America Production Company	Eight Mile Lake 11-9	CT-4244	0.50	0.10	13.70		1.60
Sweetwater	BP America Production Company	Eight Mile Lake 13-7	CT-4251	0.40	0.10	13.10		1.50
Sweetwater	BP America Production Company	Five Mile 23-1	CT-4158	0.30	0.10	11.90		1.40
Sweetwater	BP America Production Company	Five Mile 7-1	CT-3140	0.40	0.10	13.00		
Sweetwater	BP America Production Company	Five Mile 7-2	CT-3428	0.40	0.10	12.00		1.50
Sweetwater	BP America Production Company	Five Mile Gulch 1	CT-3532	0.40	0.10	12.40		1.50
Sweetwater	BP America Production Company	Five Mile Gulch 19-1	CT-3211	0.40	0.10	12.40		1.50
Sweetwater	BP America Production Company	Five Mile Gulch 19-2	CT-3440	0.40	0.10	12.80		1.50
Sweetwater	BP America Production Company	Five Mile Gulch 29-01	CT-3137	0.40	0.10	12.80		
Sweetwater	BP America Production Company	Fivemile 15-1	CT-3898	0.30	0.10	12.10		1.40
Sweetwater	BP America Production Company	Fivemile 17-1	CT-3905	0.30	0.10	11.60		1.40
Sweetwater	BP America Production Company	Frewen 07-03	CT-2898	0.40	0.10	18.50		
Sweetwater	BP America Production Company	Frewen 12-1	CT-4314	0.40	0.10	13.00		1.50
Sweetwater	BP America Production Company	Frewen 15	CT-2526	1.00	0.20	15.80	0.20	
Sweetwater	BP America Production Company	Frewen 16-02	CT-2919	0.90	0.20	14.80		
Sweetwater	BP America Production Company	Frewen 16-03	CT-3106	0.40	0.10	20.40		
Sweetwater	BP America Production Company	Frewen 16-04	CT-3095	0.40	0.10	17.80		
Sweetwater	BP America Production Company	Frewen 16-05	CT-3281	0.40	0.10	12.80		1.50
Sweetwater	BP America Production Company	Frewen 18-02	CT-3074	0.40	0.10	13.10		
Sweetwater	BP America Production Company	Frewen 19	CT-2523	0.80	0.20	17.20		
Sweetwater	BP America Production Company	Frewen 19-04	CT-2935	0.40	0.10	13.60		
Sweetwater	BP America Production Company	Frewen 19-5	CT-3287	0.40	0.10	12.30		1.50
Sweetwater	BP America Production Company	Frewen 4-1	CT-3359	0.40	0.10	12.30		1.50
Sweetwater	BP America Production Company	Frewen 5-1	CT-3419	0.40	0.10	13.10		1.50
Sweetwater	BP America Production Company	Frewen 9-2	CT-3104	0.40	0.10	17.30		
Sweetwater	BP America Production Company	Frewen 9-3	CT-3109	0.40	0.10	14.50		
Sweetwater	BP America Production Company	Frewen 9-4	CT-3138	0.40	0.10	12.30		
Sweetwater	BP America Production Company	Frewen 9-5	CT-3565	0.40	0.10	12.90		1.50
Sweetwater	BP America Production Company	Frewen 9-6	CT-3553	1.20	0.30	16.50		1.70
Sweetwater	BP America Production Company	Frewen 9-7	CT-3564	1.00	0.20	13.60		1.50
Sweetwater	BP America Production Company	Frewen Unit 23-1	CT-3756	0.50	0.10	12.40		1.50
Sweetwater	BP America Production Company	Jawbone 31-1	CT-3932	0.30	0.10	12.10		1.50
Sweetwater	BP America Production Company	Latham Draw 17-1	CT-4102	0.30	0.10	11.90		1.40
Sweetwater	BP America Production Company	Latham Draw 29-1	CT-3988	0.50	0.20	14.90		1.60
Sweetwater	BP America Production Company	Latham Draw 29-2	CT-4277	0.40	0.10	12.40		1.50
Sweetwater	BP America Production Company	Latham Draw 3-1	CT-4240	0.40	0.10	12.30		1.50
Sweetwater	BP America Production Company	Latham Draw 5-1	CT-3926	0.30	0.10	13.20		1.50
Sweetwater	BP America Production Company	Latham Draw 7-1	CT-4098	0.40	0.10	12.20		1.50
Sweetwater	BP America Production Company	Lost Creek 25-1	CT-3446	0.30	0.10	11.50		1.40
Sweetwater	BP America Production Company	Lost Creek 27-1	CT-3629	0.40	0.10	12.00		1.50
Sweetwater	BP America Production Company	Luman 13-01	CT-3903	0.40	0.10	12.10		1.50
Sweetwater	BP America Production Company	Luman 15-1	CT-3599	0.50	0.10	14.70		1.60
Sweetwater	BP America Production Company	Luman 15-3	CT-4239	0.50	0.10	13.90		1.60
Sweetwater	BP America Production Company	Luman 17-1	CT-3527	0.60	0.20	15.60		1.70
Sweetwater	BP America Production Company	Luman 17-2	CT-4234	0.40	0.10	12.70		1.50
Sweetwater	BP America Production Company	Luman 19-2	CT-3621	0.50	0.10	12.60		1.50
Sweetwater	BP America Production Company	Luman 27-1	CT-3889	0.20		12.20		1.50
Sweetwater	BP America Production Company	Luman 5-1	CT-3435	0.40		13.60		1.50
Sweetwater	BP America Production Company	Luman 9-1	CT-3307	0.70	0.20	17.30		1.80
Sweetwater	BP America Production Company	Luman 9-2	CT-3566	0.50	0.20	14.10		1.60
Sweetwater	BP America Production Company	Mexican Flats 1-2	CT-3937	0.40	0.10	12.10		1.50
Sweetwater	BP America Production Company	Mexican Flats 19-1	CT-3934	0.50	0.20	14.40		1.60
Sweetwater	BP America Production Company	Mexican Flats 19-2	CT-4313	0.40	0.10	12.20		1.50
Sweetwater	BP America Production Company	Mexican Flats 21-1	CT-3552	0.50	0.20	11.70		1.40
Sweetwater	BP America Production Company	Mexican Flats 29-1	MD-1173	0.10		12.00		1.50
Sweetwater	BP America Production Company	Mexican Flats 31-1	CT-4099	0.40	0.10	12.60		1.50
Sweetwater	BP America Production Company	Mexican Flats 33-1	CT-4129	0.40	0.10	12.00		1.50
Sweetwater	BP America Production Company	Monument 17-1	CT-4128	0.30	0.10	11.70		1.40

Table 4 (continued). Wyoming Included RFFA Sources

Sweetwater	BP America Production Company	Monument 19-2	CT-2930					0.40		0.10	16.60		
Sweetwater	BP America Production Company	Monument 19-3	CT-3424					0.50		0.10	12.30		1.50
Sweetwater	BP America Production Company	Monument 27-1	CT-3887					0.30		0.10	12.00		1.50
Sweetwater	BP America Production Company	Monument 29-01 Well Site	CT-2876					0.50		0.10	19.90		
Sweetwater	BP America Production Company	Monument 29-3	CT-3286					0.40		0.10	13.10		1.50
Sweetwater	BP America Production Company	Monument 29-4	CT-3442					0.60		0.30	16.70		1.70
Sweetwater	BP America Production Company	Monument 31-01	CT-2971					0.90		0.20	12.10		
Sweetwater	BP America Production Company	Monument 9-1	CT-3899					0.40		0.10	12.10		1.50
Sweetwater	BP America Production Company	Monument Lake 25-1	CT-3941					0.30		0.10	12.80		1.50
Sweetwater	BP America Production Company	Monument Lake 29-02 Well Site	CT-2827					0.50		0.20	18.50		
Sweetwater	BP America Production Company	Monument Lake 33-2 Well Site	CT-2640					0.30		0.10	15.00		
Sweetwater	BP America Production Company	Red Desert 15-1	CT-3314					0.40		0.10	12.40		1.50
Sweetwater	BP America Production Company	Red Desert 15-2	CT-3448					0.40		0.10	12.60		1.50
Sweetwater	BP America Production Company	Red Desert 15-3	CT-3940					0.30		0.10	12.20		1.50
Sweetwater	BP America Production Company	Red Desert 36-3	CT-3346					0.40		0.10	12.10		1.50
Sweetwater	BP America Production Company	Red Wash 11-1	CT-3243					0.30		0.10	11.90		1.50
Sweetwater	BP America Production Company	Red Wash 15-1	CT-3884					0.50		0.10	12.20		1.50
Sweetwater	BP America Production Company	Red Wash 3-1	CT-3292					0.40		0.10	11.70		1.50
Sweetwater	BP America Production Company	Ruby Knolls 35-1	CT-3933					0.30		0.10	11.80		1.40
Sweetwater	BP America Production Company	Siberia Ridge 1-3	CT-3251					0.40		0.10	12.10		1.50
Sweetwater	BP America Production Company	Sourdough 31-1	CT-3821					0.50		0.10	12.10		1.50
Sweetwater	BP America Production Company	Sourdough Gulch 07-01	CT-3904					0.30		0.10	11.50		1.40
Sweetwater	BP America Production Company	Sourdough Gulch 16-2	CT-3293					0.30		0.10	11.90		11.90
Sweetwater	BP America Production Company	South Rim 5-3	CT-3188					0.40		0.10	12.20		
Sweetwater	BP America Production Company	South Two Rim 13-1	CT-3955					0.40		0.10	12.20		1.50
Sweetwater	BP America Production Company	South Two Rim 13-2	CT-4243					0.40		0.10	12.30		1.50
Sweetwater	BP America Production Company	South Two Rim 15-1	CT-4246					0.40		0.10	12.80		1.50
Sweetwater	BP America Production Company	South Two Rim 25-1	CT-4231					0.40		0.10	11.80		1.40
Sweetwater	BP America Production Company	Three Mile 1-1	CT-3754					0.50		0.10	11.90		1.40
Sweetwater	BP America Production Company	Tierney II 13-2	CT-3598					0.40		0.10	12.60		1.50
Sweetwater	BP America Production Company	Tierney II 22-03	CT-3149					0.40		0.10	15.70		
Sweetwater	BP America Production Company	Tierney II 23-2	CT-3310					0.40		0.10	14.50		1.60
Sweetwater	BP America Production Company	Tierney II 23-3	CT-3308					0.40		0.10	13.50		1.50
Sweetwater	BP America Production Company	Tierney II 23-4	CT-3282					0.40		0.10	14.10		1.60
Sweetwater	BP America Production Company	Tierney II 27-03	CT-3125					0.40		0.10	13.00		
Sweetwater	BP America Production Company	Tierney II 27-2	CT-3082					0.40		0.10	13.70		
Sweetwater	BP America Production Company	Tierney II 28-02	CT-3058					0.40		0.10	13.40		
Sweetwater	BP America Production Company	Tierney II 28-03	CT-3059					0.40		0.10	12.10		
Sweetwater	BP America Production Company	Tierney II 28-04	CT-3081					0.40		0.10	13.90		
Sweetwater	BP America Production Company	Tierney II 29-5 Well Site	CT-2741					0.50		0.20	16.00		
Sweetwater	BP America Production Company	Tierney II 33-03	CT-2968					0.90		0.20	13.30		
Sweetwater	BP America Production Company	Tierney II 33-04	CT-2973					0.90		0.20	14.00		
Sweetwater	BP America Production Company	Tierney II 33-2 Well Site	CT-2701					0.40		0.10	17.50		
Sweetwater	BP America Production Company	Tierney II 33-5	CT-3270					0.40		0.10	13.10		1.50
Sweetwater	BP America Production Company	Tierney II Unit 22-1	CT-4143					0.60		0.20	15.90		1.70
Sweetwater	BP America Production Company	Tierney II Unit 22-5	CT-4238					0.40		0.10	13.60		1.50
Sweetwater	BP America Production Company	Two Rim 03-01	CT-2878					0.40		0.10	15.20		
Sweetwater	BP America Production Company	Two Rim 11-1	CT-3374					0.40		0.10	11.70		1.50
Sweetwater	BP America Production Company	Two Rim 15-1	CT-3597					0.50		0.10	12.40		1.50
Sweetwater	BP America Production Company	Two Rim 17-1	CT-3650					0.50		0.10	12.30		1.50
Sweetwater	BP America Production Company	Two Rim 20-03	CT-2966					0.90		0.20	12.60		
Sweetwater	BP America Production Company	Two Rim 20-04	CT-3006					0.40		0.10	13.70		
Sweetwater	BP America Production Company	Two Rim 20-2	CT-2525					0.70		0.10	16.10	2.50	
Sweetwater	BP America Production Company	Two Rim 21-04	CT-2979					0.50		0.20	14.10		
Sweetwater	BP America Production Company	Two Rim 21-1	CT-3757					0.50		0.10	11.70		1.40
Sweetwater	BP America Production Company	Two Rim 27-1	CT-3675					0.50		0.10	12.00		1.40
Sweetwater	BP America Production Company	Two Rim 29-5	CT-3533					0.50		0.20	14.20		1.60
Sweetwater	BP America Production Company	Two Rim 29-6	CT-3528					0.40		0.10	14.50		1.60
Sweetwater	BP America Production Company	Two Rim 29-7	CT-3498					0.30		0.10	11.80		1.60
Sweetwater	BP America Production Company	Two Rim 2-S1	CT-3334					0.40		0.10	12.20		1.50
Sweetwater	BP America Production Company	Two Rim 30-03	CT-2936					0.90		0.20	12.30		
Sweetwater	BP America Production Company	Two Rim 3-2	CT-3313					0.40		0.10	12.70		1.50
Sweetwater	BP America Production Company	Two Rim 35-1	CT-3525					0.50		0.20	13.20		1.50
Sweetwater	BP America Production Company	Two Rim 36-02	CT-3160					0.40		0.10	12.80		
Sweetwater	BP America Production Company	Two Rim 36-4	CT-3311					0.40		0.10	12.30		1.50
Sweetwater	BP America Production Company	Two Rim Unit 21-5	CT-3959					0.40		0.10	13.60		1.50
Sweetwater	BP America Production Company	Two Rim Unit 9-1	CT-3886					0.50		0.10	12.00		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 1-11	CT-4281					0.40		0.10	12.00		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 1-13	CT-4307					0.40		0.10	12.40		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 1-4	CT-4257					0.40		0.10	12.30		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 15-13	CT-4250					0.40		0.10	12.40		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 15-2	CT-3726					0.40		0.10	11.60		1.40
Sweetwater	BP America Production Company	Wamsutter Rim 15-5	CT-4233					0.30		0.10	11.50		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 1-7	CT-4293					0.40		0.10	12.70		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 1-9	CT-4279					0.40		0.10	13.20		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 23-10	CT-4252					0.40		0.10	12.20		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 27-11	CT-4278					0.40		0.10	13.70		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 27-13	CT-4294					0.40		0.10	12.70		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 27-5	CT-4305					0.40		0.10	12.30		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 34-2	CT-3309					0.40		0.10	12.80		1.50
Sweetwater	BP America Production Company	Wamsutter Rim 9-1	CT-3759					0.50		0.10	11.90		1.40
Sweetwater	BP America Production Company	Wild Rose 13-01	CT-2925					0.90		0.20	12.10		
Sweetwater	BP America Production Company	Wild Rose 13-02	CT-2918					0.90		0.20	12.30		
Sweetwater	BP America Production Company	Wild Rose 13-03	CT-2967					0.90		0.20	12.10		
Sweetwater	BP America Production Company	Wild Rose 13-04	CT-2877					0.40		0.10	16.30		
Sweetwater	BP America Production Company	Wild Rose 35-1	CT-3931					0.40		0.10	11.80		1.40
Sweetwater	BP America Production Company	Windy Hill 5-01	CT-4235					0.30		0.10	11.40		1.40
Sweetwater	Cabot Oil & Gas Corporation	Wamsutter 30-26	CT-3241					1.20		0.30	4.90		0.10
Sweetwater	Chevron USA, Inc.	Table Rock Field-Battery #3	MD-746					0.20		0.60	4.70		
Sweetwater	Colorado Interstate Gas	Table Rock Compressor Station	MD-740					0.20		0.30	11.70	0.00	
Sweetwater	Devon Energy Production Company, L.P.	Red Lakes No. 16-6-18-94	CT-2714					0.40			3.50		
Sweetwater	EnCana Oil and Gas (USA), Inc.	Bravo Unit 02 Central Tank Battery	MD-617	7.32	422	47.85	0.3	19.00		0.80	11.30		
Sweetwater	EnCana Oil and Gas (USA), Inc.	Bravo Unit 02 Central Tank Battery	MD-688					26.50		11.70	51.30		
Sweetwater	EnCana Oil and Gas (USA), Inc.	Great Divide #14	CT-2922					1.40		0.40	8.30		
Sweetwater	EnCana Oil and Gas (USA), Inc.	Hay Reservoir Unit #77	CT-2660					1.40		0.40	4.80		
Sweetwater	EnCana Oil and Gas (USA), Inc.	Jade Unit 1	CT-2724					0.80		0.10	23.20		
Sweetwater	EOG Resources	North Ruger 35-29D	CT-3257					0.90		0.20	21.60		4.50
Sweetwater	Excalibar Minerals, Inc.	Kemmerer Plant	CT-4139					0.70	3.00	0.60			
Sweetwater	Forest Oil Corporation	Forest 1-4-17-94	CT-3097					0.50		0.10	3.90		
Sweetwater	Forest Oil Corporation	Forest 2-32-18-94	CT-3172					0.60		0.10	3.90		

Table 4 (continued). Wyoming Included RFFA Sources

Sweetwater	Forest Oil Corporation	Forest 9-32-18-94	CT-3108					0.40			0.10	3.40		
Sweetwater	Forest Oil Corporation	Wild Rose Federal 11-18	CT-3303					0.60			0.20	3.50		
Sweetwater	Forest Oil Corporation	Wild Rose Federal 11-26	CT-3482					0.50			0.20	3.10		0.10
Sweetwater	Forest Oil Corporation	Wild Rose Federal 2-18-17-94	CT-3147					0.50			0.10	4.40		
Sweetwater	Forest Oil Corporation	Wild Rose Federal 3-26	CT-3463					0.50			0.20	7.10		
Sweetwater	Forest Oil Corporation	Wild Rose Federal 9-18	CT-3317					1.20			0.30	6.00		0.10
Sweetwater	Kerr-McGee Oil & Gas Onshore LP	Echo Springs 4-28-20-93	CT-3554					0.30			0.00	3.20		0.00
Sweetwater	Kerr-McGee Oil & Gas Onshore LP	Shute Creek 23-8	CT-4108					0.20			0.10	3.40		0.20
Sweetwater	Kerr-McGee Oil & Gas Onshore LP	Shute Creek 43-7	CT-4107					0.40			0.10	3.40		0.20
Sweetwater	Marathon Oil Company	Wamsutter 12-32	CT-2703					0.60			0.20	8.60		
Sweetwater	Mountain Gas Resources	AM Tripp NCT 1-2	CT-3212									14.60		6.50
Sweetwater	Mountain Gas Resources	Bitter Creek 21-4	CT-3289									8.60		5.00
Sweetwater	Mountain Gas Resources	Black Butte 11-18-100 Compressor Station	CT-2605	9.14	422	39.62	0.25	7.70			15.40	7.90	0.50	
Sweetwater	Mountain Gas Resources	Black Butte 1-18-100 Compressor Station	CT-2373	12.19	422	42.37	0.25	5.80			11.60	6.00	0.50	
Sweetwater	Mountain Gas Resources	Black Butte 13-18-100 Compressor Station	CT-2606	9.14	422	39.62	0.25	5.80			11.60	6.00	0.30	
Sweetwater	Mountain Gas Resources	Black Butte 23-19-100 Compressor Station	CT-2397A					1.90			3.90	1.90	0.20	
Sweetwater	Mountain Gas Resources	Black Butte 25-19-100 Compressor Station	CT-2607					7.70			15.40	7.90	0.70	
Sweetwater	Mountain Gas Resources	Blue Forest 30-13F	CT-3115									8.30		6.40
Sweetwater	Mountain Gas Resources	Blue Forest 30-14A Well	CT-2923									14.50		2.50
Sweetwater	Mountain Gas Resources	Blue Forest 40-13 Well	CT-2924									9.40		6.80
Sweetwater	Mountain Gas Resources	Blue Forest 40-33	CT-2886									14.30		2.10
Sweetwater	Mountain Gas Resources	Bruff 2-14	CT-3212									13.70		6.80
Sweetwater	Mountain Gas Resources	Bruff 50-24	CT-2596									11.50		
Sweetwater	Mountain Gas Resources	Fabian Ditch 4-2	CT-3212									12.40		6.90
Sweetwater	Mountain Gas Resources	Fabian Ditch Compressor Station	MD-642	7.62	509.82	28.96	0.41	17.50			33.50	10.00	1.00	
Sweetwater	Mountain Gas Resources	Farson Cutttoff 34-26A	CT-2886					0.10				13.30		3.80
Sweetwater	Mountain Gas Resources	Farson Federal 40-35	CT-2886					0.10				12.70		6.80
Sweetwater	Mountain Gas Resources	Farson Federal 60-26	CT-2886									14.30		6.70
Sweetwater	Mountain Gas Resources	Govt. McNamara NCT 1-2	CT-3212									11.40		6.10
Sweetwater	Mountain Gas Resources	Granger Gas Plant	MD-644	4.88	833	24.38	0.06	4.20			2.90	10.70		
Sweetwater	Mountain Gas Resources	Hay Reservoir Central Compressor Station	CT-3101	6.1	422	42.03	0.3	29.00			56.20	35.10		
Sweetwater	Mountain Gas Resources	Horse Shoe Unit 10-34	CT-3143									9.60		6.50
Sweetwater	Mountain Gas Resources	Kinney Springs 3-1	CT-3433					0.10				11.80		6.60
Sweetwater	Mountain Gas Resources	Laney Rim 35-3	CT-3324					0.50			0.10	8.00		6.50
Sweetwater	Mountain Gas Resources	Laney Wash 21-2	CT-4175					0.10				8.00		6.60
Sweetwater	Mountain Gas Resources	Lincoln Road 20-34	CT-2886									14.40		2.20
Sweetwater	Mountain Gas Resources	Lincoln Road 20-9	CT-2886									14.40		1.20
Sweetwater	Mountain Gas Resources	Lincoln Road 40-26	CT-2886									14.30		6.50
Sweetwater	Mountain Gas Resources	Lincoln Road 40-34	CT-2886									14.30		1.20
Sweetwater	Mountain Gas Resources	Lincoln Road 65-4	CT-2886									14.40		2.00
Sweetwater	Mountain Gas Resources	Little Monument 40-27	CT-2886									12.50		6.80
Sweetwater	Mountain Gas Resources	Mesa Federal 40-24	CT-2886									14.40		6.90
Sweetwater	Mountain Gas Resources	Monument Butte 21-28	CT-2886									14.30		
Sweetwater	Mountain Gas Resources	Monument Butte 21-29	CT-2886					0.10				14.40		4.30
Sweetwater	Mountain Gas Resources	Moxa Unit	CT-3212									9.90		6.60
Sweetwater	Mountain Gas Resources	Platnium Federal 30-25	CT-2886									10.50		6.80
Sweetwater	Mountain Gas Resources	Raptor 10-17	CT-2886									14.20		2.50
Sweetwater	Mountain Gas Resources	Red Desert Gas Plant	MD-1143					61.60			115.20	50.50	3.00	3.10
Sweetwater	Mountain Gas Resources	State of WY NCT 2-1	CT-3212									13.80		6.40
Sweetwater	Mountain Gas Resources	Sugarloaf 40-19	CT-3212									14.80		3.60
Sweetwater	Mountain Gas Resources	Texaco V-1 HP	CT-2583									14.30		1.30
Sweetwater	Nance Petroleum Corporation	Monument Lake 4-28	CT-3717					0.30			0.10	47.40		6.90
Sweetwater	Nance Petroleum Corporation	Monument Lake Compressor	MD-949					1.10			4.90	2.20		1.60
Sweetwater	New Mexico Resources, LLC	Bitter Creek Zeolite Mine/Processing Plant	CT-3490	15	422	10	0.31	38.00	9.80	7.90	23.80	3.00		
Sweetwater	Northwest Pipeline Corporation	Green River Compressor Station	MD-1008					7.10			7.10	3.60		
Sweetwater	Questar Exploration & Production Company	Federal Well 19-1	CT-2976					0.90			0.10	17.60		
Sweetwater	Questar Exploration & Production Company	Red Lakes South 10-2	CT-3880					1.40			0.30	3.20		0.30
Sweetwater	Questar Exploration & Production Company	South Baxter Unit 22	CT-3548					0.60				12.80		6.50
Sweetwater	Questar Exploration & Production Company	Wedge 6	CT-2762					1.20			0.20	33.30		
Sweetwater	Questar Exploration & Production Company	Wedge Unit 14	CT-3820					1.20			0.30	25.70		8.10
Sweetwater	Questar Gas Management Company	Blacks Fork Gas Plant	MD-1106					1.10			0.20	6.10	0.00	0.70
Sweetwater	Questar Gas Management Company	Blacks Fork Gas Plant	MD-638	9.14	869	69.17	0.46	32.40			32.40	4.80	1.60	
Sweetwater	Questar Gas Management Company	Dripping Rock Compressor Station	MD-780					0.00			0.00	1.40		
Sweetwater	Questar Gas Management Company	Dripping Rock Compressor Station	MD-943					0.00			0.00	2.90	1.20	2.50
Sweetwater	Questar Gas Management Company	South Baxter Compressor Station	CT-3730					13.80			4.80	28.30		1.60
Sweetwater	Questar Gas Management Company	Vermillion Creek Compressor Station	MD-549A	9.05	509.82	12.5	0.76	3.60			4.30	0.00		
Sweetwater	Samson Resources Company	Battle Federal 1-30-24-94	CT-3504					11.60			5.80	11.60	0.80	0.80
Sweetwater	Samson Resources Company	Janet Federal 1	MD-1338					0.50			0.10	10.60		6.20
Sweetwater	Saurus Resources Incorporated	MH-1 Compressor Station	CT-2301	9.05	509.82	12.5	0.76	12.20			12.10	8.90	0.80	
Sweetwater	Saurus Resources Incorporated	MH-1 Compressor Station	MD-660	9.05	509.82	12.5	0.76	20.00			6.70	5.90	0.80	
Sweetwater	Simplot Phosphates LLC	Rock Springs Facility	MD-1130					0.00		145.90	0.00	0.00		
Sweetwater	True Oil LLC	Mull Federal 11-18	CT-3385					0.30			0.10	20.80		2.20
Sweetwater	Warren E & P, Inc.	Pacific Rim Compressor Station #1	CT-3471	9.05	509.82	12.5	0.76	17.10			5.70	11.10	0.80	0.80
Sweetwater	Western Gas Resources, Inc.	Church Butte	CT-2739					0.20			0.30	4.50		1.70
Sweetwater	Western Gas Resources, Inc.	Church Butte	MD-821					19.40			6.50	12.90	0.70	2.40
Sweetwater	Western Gas Resources, Inc.	Forest 1-4	CT-3021					0.10			0.00	14.60		
Sweetwater	Western Gas Resources, Inc.	Forest 2-32	CT-3142					0.10				12.10		
Sweetwater	Western Gas Resources, Inc.	Forest 3-4	CT-3047					0.10				14.30		
Sweetwater	Western Gas Resources, Inc.	Forest 4-32	CT-3037					0.10				14.30		
Sweetwater	Western Gas Resources, Inc.	Forest 9-32	CT-3020					0.10				14.30		
Sweetwater	Western Gas Resources, Inc.	Forest 9-4	CT-3023					0.10			0.00	14.50		
Sweetwater	Western Gas Resources, Inc.	Red Lakes 12-10	CT-2999					0.10				14.10		
Sweetwater	Western Gas Resources, Inc.	Red Lakes 13-6-18-94	CT-3096					0.10				11.90		
Sweetwater	Western Gas Resources, Inc.	Red Lakes 8-1	CT-3011					0.10				14.30		
Sweetwater	Western Gas Resources, Inc.	Redlakes #2	CT-2275					0.10			0.01	11.00		
Sweetwater	Western Gas Resources, Inc.	Tierney 2-32	CT-3209					0.10				11.60		2.00
Sweetwater	Western Gas Resources, Inc.	Wamsutter Regulator	MD-741	9.05	509.82	12.5	0.76	2.50			10.10	43.90	0.00	
Sweetwater	Western Gas Resources, Inc.	Wild Rose 11-18	CT-3239					0.10				10.20		6.40
Sweetwater	Western Gas Resources, Inc.	Wild Rose 1-26	CT-3048					0.10				14.10		
Sweetwater	Western Gas Resources, Inc.	Wild Rose 2-18	CT-3041					0.10				14.40		
Sweetwater	Western Gas Resources, Inc.	Wild Rose 9-18	CT-3291					0.10			0.00	14.40		6.00
Sweetwater	Western Gas Resources, Inc.	Wild Rose Federal 1-6	CT-3221					0.10				13.20		6.90
Sweetwater	Western Gas Resources, Inc.	Wild Rose Federal 2-10	CT-3126					0.10				11.30		
Sweetwater	Wexpro Company	Bruff 35	CT-2748					1.00			0.20	15.50		
Sweetwater	Wexpro Company	Canyon Creek 11	CT-2556					0.20				14.50		
Sweetwater	Wexpro Company	Canyon Creek 15	CT-2556					0.40				14.30		
Sweetwater	Wexpro Company	Canyon Creek 19	CT-2556					0.20				14.50		
Sweetwater	Wexpro Company	Canyon Creek 22	CT-2556					0.50				14.40		
Sweetwater	Wexpro Company	Canyon Creek 23	CT-2556					0.50				14.30		
Sweetwater	Wexpro Company	Canyon Creek 27	CT-2556					0.40				14.40		

Table 4 (concluded). Wyoming Included RFFA Sources

Sweetwater	Wexpro Company	Canyon Creek 6	CT-2556					0.10				14.40			
Sweetwater	Wexpro Company	Canyon Creek/Vermillion Complex	MD-605	15	422	10	0.31	34.10			46.40	30.70			
Sweetwater	Wexpro Company	Church Buttes 137	CT-2743					0.40			0.10	14.10			
Sweetwater	Wexpro Company	Church Buttes 49	CT-2743					0.40			0.10	14.20			
Sweetwater	Wexpro Company	Church Buttes 91	CT-2743					0.40			0.10	14.30			
Sweetwater	Wexpro Company	Church Buttes 96	CT-2743					0.50			0.10	14.40			
Sweetwater	Wexpro Company	Church Buttes Unit 104	CT-2743					0.40			0.10	13.30			
Sweetwater	Wexpro Company	Church Buttes Unit 106	CT-2743					0.40			0.10	11.70			
Sweetwater	Wexpro Company	Church Buttes Unit 109	CT-2743					0.40			0.10	14.20			
Sweetwater	Wexpro Company	Church Buttes Unit 117	CT-2743					0.30			0.10	12.00			
Sweetwater	Wexpro Company	Church Buttes Unit 119	CT-2743					0.40			0.10	14.40			
Sweetwater	Wexpro Company	Church Buttes Unit 124	CT-2743					0.40			0.10	11.00			
Sweetwater	Wexpro Company	Church Buttes Unit 125	CT-2743					0.30			0.10	14.40			
Sweetwater	Wexpro Company	Church Buttes Unit 126	CT-2743					0.40			0.10	12.10			
Sweetwater	Wexpro Company	Church Buttes Unit 130	CT-2743					0.40			0.10	14.10			
Sweetwater	Wexpro Company	Church Buttes Unit 133	CT-2743					0.30			0.10	10.70			
Sweetwater	Wexpro Company	Church Buttes Unit 138	CT-2743					0.40			0.10	11.20			
Sweetwater	Wexpro Company	Church Buttes Unit 29	CT-2743					0.30			0.10	14.30			
Sweetwater	Wexpro Company	Church Buttes Unit 30	CT-2743					0.30				12.30			
Sweetwater	Wexpro Company	Church Buttes Unit 32	CT-2743					0.20				13.90			
Sweetwater	Wexpro Company	Church Buttes Unit 34	CT-2743					0.20				14.30			
Sweetwater	Wexpro Company	Church Buttes Unit 40	CT-2743					0.30				12.00			
Sweetwater	Wexpro Company	Church Buttes Unit 41	CT-2743					0.60			0.10	13.90			
Sweetwater	Wexpro Company	Church Buttes Unit 43	CT-2743					0.60			0.10	11.80			
Sweetwater	Wexpro Company	Church Buttes Unit 46	CT-2743					0.60			0.10	14.20			
Sweetwater	Wexpro Company	Church Buttes Unit 47	CT-2743					0.40			0.10	13.70			
Sweetwater	Wexpro Company	Church Buttes Unit 51	CT-2743					0.30			0.10	14.40			
Sweetwater	Wexpro Company	Church Buttes Unit 52	CT-2743					0.30			0.10	14.30			
Sweetwater	Wexpro Company	Church Buttes Unit 60	CT-2743					0.30			0.10	13.10			
Sweetwater	Wexpro Company	Church Buttes Unit 94	CT-2743					0.50			0.10	10.50			
Sweetwater	Wexpro Company	Church Buttes Unit 99	CT-2743					0.50			0.10	13.40			
Sweetwater	Wexpro Company	Church Buttes Unit Well 155	CT-3012					0.40			0.20	8.70			
Sweetwater	Wexpro Company	Church Buttes Units 139	CT-2743					0.40			0.10	12.30			
Sweetwater	Wexpro Company	Kinney 13-1	CT-2710					1.40			0.30	14.10			
Sweetwater	Wexpro Company	Kinney 5	CT-2709					0.30				14.40			
Sweetwater	Wexpro Company	MFS 10-3	CT-2750					0.50			0.10	22.10			
Sweetwater	Wexpro Company	Trail 12	CT-2706					0.20				23.20			
Sweetwater	Wexpro Company	Trail 13	CT-2707					0.40				32.00			
Sweetwater	Wexpro Company	Trail 18	CT-2708					0.70			0.10	44.70			
Sweetwater	Wexpro Company	Trail Unit 21	CT-4237					0.80			0.20	11.50			2.40
Sweetwater	Wexpro Company	Trail Unit Well 15	CT-3258					0.40			0.10	11.00			4.20
Sweetwater	Williams Field Services Company	Janet Federal 10-34	CT-2812					0.30			0.10	9.10			
Sweetwater	Williams Field Services Company	Monument Lake Compressor Station	MD-1237					24.00			29.30	25.70			0.10
Sweetwater	Williams Field Services Company	Wamsutter 12-32	CT-2813					0.30			0.10	9.10			
Sweetwater	Williams Field Services Company	Washakie Point #49	CT-2705					1.00			0.20	5.20			
Sweetwater	Wyoming Interstate Company	Creston Compressor Station	CT-3563					16.50			7.40	11.50	1.60		1.60
		Sweetwater County Total		9.82	633.80	30.08	0.51	801.80	12.80	233.90	591.31	5,227.70	20.50		492.91
Uinta	Cabot Oil & Gas Corporation	Henry 11	MD-805					0.90			0.20	6.00			
Uinta	Clear Creek Storage Company LLC	Clear Creek Gas Storage Facility	MD-956					29.10			18.90	1.60			3.10
Uinta	Harper Contracting, Incorporated	Pit 26	CT-3380						11.20						
Uinta	Kern River Gas Transmission	Coyote Creek	CT-3003	5.39	422	12.5	0.41	44.00			52.90	13.20	0.30		
Uinta	Kerr-McGee Oil & Gas Onshore LP	Berkley Federal 4	CT-4132					0.20			0.10	3.00			0.20
Uinta	Kerr-McGee Oil & Gas Onshore LP	Grace 1-6 #4	CT-3592					0.30				22.30			0.30
Uinta	Questar Exploration & Production Company	Church Buttes 159	CT-4320					0.90			0.20	11.30			7.00
Uinta	Questar Exploration & Production Company	Eakin Ranch 4	CT-2763					1.50			0.40	13.20			
Uinta	Questar Gas Management Company	Emigrant Trail Gas Plant	MD-774					0.30			0.10	33.30	0.00		
Uinta	Union Tank Car Company	Evanston Facility	MD-881					1.00	0.00		0.00	0.00			1.50
Uinta	Wexpro Company	Bruff 13	CT-2745					0.60			0.10	21.90			
Uinta	Wexpro Company	Bruff 24	CT-2746					0.40				22.40			
Uinta	Wexpro Company	Bruff 33	CT-2747					0.20				34.70			
Uinta	Wexpro Company	Butcherknife Spring Unit 8	CT-2742					2.10			0.40	24.90			
Uinta	Wexpro Company	Church Buttes 59	CT-2744					0.30				14.40			
Uinta	Wexpro Company	Church Buttes Unit 103	CT-2744					0.40			0.10	11.60			
Uinta	Wexpro Company	Church Buttes Unit 105	CT-2744					0.40			0.10	14.40			
Uinta	Wexpro Company	Church Buttes Unit 107	CT-2744					0.40			0.10	14.40			
Uinta	Wexpro Company	Church Buttes Unit 11	CT-2744					0.10				14.20			
Uinta	Wexpro Company	Church Buttes Unit 110	CT-2744					0.40			0.10	14.40			
Uinta	Wexpro Company	Church Buttes Unit 111	CT-2744					0.40			0.10	13.60			
Uinta	Wexpro Company	Church Buttes Unit 113	CT-2744					0.40			0.10	13.80			
Uinta	Wexpro Company	Church Buttes Unit 114	CT-2744					0.40			0.10	14.40			
Uinta	Wexpro Company	Church Buttes Unit 120	CT-2744					0.50			0.10	12.40			
Uinta	Wexpro Company	Church Buttes Unit 127	CT-2744					0.40			0.10	12.90			
Uinta	Wexpro Company	Church Buttes Unit 128	CT-2744					0.40			0.10	14.40			
Uinta	Wexpro Company	Church Buttes Unit 129	CT-2744					0.40			0.10	11.20			
Uinta	Wexpro Company	Church Buttes Unit 134	CT-2744					0.40			0.10	11.60			
Uinta	Wexpro Company	Church Buttes Unit 140	CT-2744					0.40			0.10	14.40			
Uinta	Wexpro Company	Church Buttes Unit 4	CT-2744					0.60			0.10	12.80			
Uinta	Wexpro Company	Church Buttes Unit 55	CT-2744					0.60			0.10	12.10			
Uinta	Wexpro Company	Church Buttes Unit 65	CT-2744					0.60			0.10	14.20			
Uinta	Wexpro Company	Church Buttes Unit 68	CT-2744					0.30			0.10	14.20			
Uinta	Wexpro Company	Church Buttes Unit 79	CT-2744					0.50			0.10	11.10			
Uinta	Wexpro Company	Church Buttes Unit 93	CT-2744					0.40			0.10	11.70			
Uinta	Wexpro Company	Church Buttes Unit 95	CT-2744					0.30			0.10	11.10			
Uinta	Wexpro Company	Church Buttes Unit Well 154	CT-3013					0.40			0.20	14.60			
Uinta	Wexpro Company	Church ButtesUnit 36	CT-2744					0.20				12.80			
Uinta	Wexpro Company	Lansdale 10-1	CT-2753					0.80			0.10	21.00			
Uinta	Wexpro Company	Lansdale 4-3	CT-2754					0.40			0.10	18.80			
Uinta	Whiting Oil and Gas Corporation	Whiskey Springs 4	CT-3790					5.60			3.80	2.70			0.20
Uinta	Whiting Oil and Gas Corporation	Whiskey Springs C-1	CT-3789					2.50			2.10	24.10			3.40
Uinta	Whiting Petroleum	Big Springs 15-23	CT-3763					0.50			0.30	3.10			0.20
		Unita County Total		9.82	633.80	30.08	0.51	100.90	11.20	0.00	81.90	594.20	0.30		15.90
Unknown	BP America Production Company	Two Rim 36-3	CT-3312					0.40			0.10	12.10			1.50
Unknown	Devon Energy Production Company, L.P.	Yellow Point 6-1-28-109	CT-2642					0.30			0.10	14.40			
Unknown	EOG Resources	North Ruger 36-32D	CT-3372					0.90			0.20	8.40			4.50
Unknown	EOG Resources	North Ruger 36-32D	CT-3333					0.90			0.70	8.90			4.70
Unknown	McMurry Oil Company	Stud Horse Butte 12-29-29-108	CT-3118					0.30			0.10	48.40			
Unknown	Mountain Gas Resources	Stud Horse Butte 4-24	CT-2541									14.10	6.10		
Unknown	NFP West, RLLP	Farrowing Farms 1&2	CT-3685					0.96		3.50	0.08				
Unknown	Questar Gas Management Company	Creston 22-1 Compressor Station	CT-3691					39.80			39.70	9.40			2.60
Unknown	Ultra Resources Incorporated	War Bonnet 8-26 & War Bonnet 1-26D	CT-3244					1.30			0.40	4.20			0.50
Unknown	Ultra Resources Incorporated	Warbonnet 10-4 Facility	CT-4025					1.40			0.40	3.90			
Unknown	Ultra Resources Incorporated	Warbonnet 1-21	CT-4274					0.70			0.20	3.80			0.10
Unknown	Warren E & P, Inc.	Chicken Springs CS #1	CT-3710					11.30			5.50	10.90			0.80
Unknown	Wexpro Company	Creston Federal 22-2	CT-2579					1.10			0.30	15.30			
		Unknown Location Total		9.82	633.80	30.08	0.51	59.36	0.00	3.50	47.78	153.80	6.10		14.70
Washakie	Hiland Partners, LP	Worland Plant	MD-641					0.00		0.00	0.00	5.80			
Washakie	Red Butte Pipe Line Company	Chatham Station	MD-275A									1.20			
		Washakie County Total		9.82	633.80	30.08	0.51	0.00	0.00	0.00	0.00	7.00	0.00		0.00
			Wyoming Total State-Permitted Source Emissions					4,911.26	164.84	(1,257.67)	(4,318.31)	11,747.60	160.71		903.36

Table 5. State Permitted Wells: Colorado, Wyoming, and Utah

State-Permitted Source Inventory - COGCC, WOGCC, and UDNR-DOGM - Table of Wells by State, Permitted after January 1, 2001

State[1]	County[2]	Total NO_x Emissions per County (tpy)	Percent of County within the Moxa Modeling Domain	Total NO_x Emissions Modeled per County (tpy)
Colorado	Boulder	46.40	58.9%	27.33
	Garfield	1086.20	16.9%	183.02
	Jackson	27.80	100.0%	27.80
	Larimer	33.60	70.1%	23.55
	Moffat	113.40	100.0%	113.40
	Rio Blanco	454.80	86.6%	393.90
	Routt	9.00	100.0%	9.00
			Total Emissions Modeled for Colorado Counties	778.01
Utah	Daggett	0.20	100.0%	0.20
	Duchesne	-31.00	100.0%	-30.99
	Summit	-0.50	46.4%	-0.23
	Uintah	318.20	74.1%	235.82
			Total Emissions Modeled for Utah Counties	204.79
Wyoming	Albany	-1.70	100.0%	-1.70
	Carbon	77.10	100.0%	77.10
	Converse	-56.00	87.2%	-48.84
	Fremont	30.70	89.7%	27.53
	Hot Springs	-88.40	14.7%	-12.96
	Johnson	233.20	1.3%	3.10
	Laramie	-13.00	7.8%	-1.01
	Lincoln	47.20	97.4%	45.96
	Natrona	-112.30	100.0%	-112.26
	Sublette	272.20	100.0%	272.20
	Sweetwater	159.10	100.0%	159.10
	Unita	83.10	98.1%	81.54
	Washakie	-29.30	2.5%	-0.73
			Total Emissions Modeled for Wyoming Counties	489.04
			Total Emissions Modeled for Wyoming Counties	1471.84

[1] Counties for each state shown only if they are within Moxa modeling domain
[2] Counties that are within the Domain but are not listed here did not have any wells listed for the years of interest

Table 6. Utah Included Permitted Industrial Sources

Company Name	S ID	S Name	Cmpnt ID	Cmpnt Unit ID	Cmpnt Description	Cmpnt Stack ID	Stack Height (ft)	Stack Inner Diam (ft)	Stack Exit Temp (F)	Stack Act Flow Rate (cfs)	zPltnt DAQ Long Name	Pltnt ByYr Actual Emsn
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	19464	17	E G Dehydrator	0	0	0.00	0	0.0	VOC	2.6
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	11782	17	high-pressure tank trucks, propane cars	0	0	0.00	0	0.0	VOC	2.0
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5583	8	Reciprocating Driven IC Engines	3301	11.7	0.80	800	54.6	CO	34.0
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5582	7	Reciprocating Driven IC Engines	3300	33.7	0.80	800	54.6	CO	20.8
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5582	7	Reciprocating Driven IC Engines	3300	33.67	0.83	800	54.6	CO	20.8
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5582	07	Reciprocating Driven IC Engines	20309	33.7	0.80	800	54.6	CO	5.8
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5582	07	Reciprocating Driven IC Engines	20309	33.7	0.80	800	54.6	CO	5.8
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5580	05	Reciprocating Driven IC Engines	20307	33.7	0.80		0.0	CO	42.7
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5580	05	Reciprocating Driven IC Engines	20307	33.7	0.80		0.0	CO	42.7
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5578	3	Reciprocating Driven IC Engines	3296	33.67	0.83	800	54.6	CO	5.1
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5578	03	Reciprocating Driven IC Engines	20305	33.7	0.80	800	54.6	CO	24.9
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5578	03	Reciprocating Driven IC Engines	20305	33.7	0.80	800	54.6	CO	24.9
El Paso Field Operations Company	10005	Altamont Main Gas Processing Plant	5577	2	Reciprocating Driven IC Engines	3295	33.67	0.83	800	54.6	CO	26.1
El Paso Field Operations Company	10209	Altamont East Compressor Station	5589	3	Reciprocating Driven IC Engines	20315	31	1.00	800	54.6	CO	66.3
El Paso Field Operations Company	10209	Altamont East Compressor Station	5589	3	Reciprocating Driven IC Engines	20315	31	1.00	800	54.6	CO	31.6
El Paso Field Operations Company	10209	Altamont East Compressor Station	5589	3	Reciprocating Driven IC Engines	20315	31	1.00	800	54.6	CO	31.6
El Paso Field Operations Company	10209	Altamont East Compressor Station	5588	2	Reciprocating Driven IC Engines	20314	31	1.00	800	54.6	CO	44.4
El Paso Field Operations Company	10209	Altamont East Compressor Station	5588	2	Reciprocating Driven IC Engines	20314	31	1.00	800	54.6	CO	68.2
El Paso Field Operations Company	10209	Altamont East Compressor Station	5588	2	Reciprocating Driven IC Engines	20314	31	1.00	800	54.6	CO	68.2
El Paso Field Operations Company	10211	Altamont South Compressor Station	5598	1	Reciprocating Driven IC Engines	20324	31.3	1.30	650	202.9	PM2.5	1.5
El Paso Field Operations Company	10211	Altamont South Compressor Station	5598	1	Reciprocating Driven IC Engines	20324	31.3	1.30	650	202.9	PM10	1.5
El Paso Field Operations Company	10211	Altamont South Compressor Station	5598	1	Reciprocating Driven IC Engines	20324	31.3	1.30	650	202.9	CO	14.7
El Paso Field Operations Company	10219	Bluebell Gas Plant	173743	1	Flare - Emergency	2352	29	0.90	720	49.0	CO	25.0
El Paso Field Operations Company	10219	Bluebell Gas Plant	173743	1	Flare - Emergency	2352	29	0.89	720	49.0	CO	25.0
El Paso Field Operations Company	10219	Bluebell Gas Plant	173743	1	Flare - Emergency	2352	29	0.89	720	49.0	VOC	9.5
El Paso Field Operations Company	10219	Bluebell Gas Plant	12175	1	Submerged-Normal	0	0	0.00	0	0.0	VOC	5.9
El Paso Field Operations Company	10219	Bluebell Gas Plant	5615	13	Reciprocating Driven IC Engines	2357	19	0.72	300	2.0	CO	4.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5615	13	Reciprocating Driven IC Engines	2357	19	0.70	300	2.0	CO	4.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5615	13	Reciprocating Driven IC Engines	2357	19	0.72	300	2.0	VOC	1.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5615	13	Reciprocating Driven IC Engines	2357	19	0.70	300	2.0	VOC	1.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5615	13	Reciprocating Driven IC Engines	2364	25.5	1.17	750	38.0	CO	47.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5615	13	Reciprocating Driven IC Engines	2364	25.5	1.17	750	38.0	CO	47.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5614	12	Reciprocating Driven IC Engines	2356	19	0.72	300	2.0	CO	1.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5614	12	Reciprocating Driven IC Engines	2356	19	0.70	300	2.0	CO	1.8
El Paso Field Operations Company	10219	Bluebell Gas Plant	5605	3	Reciprocating Driven IC Engines	2354	29	0.89	720	49.0	CO	68.9
El Paso Field Operations Company	10219	Bluebell Gas Plant	5605	3	Reciprocating Driven IC Engines	2354	29	0.89	720	49.0	CO	68.9
El Paso Field Operations Company	10219	Bluebell Gas Plant	5605	3	Reciprocating Driven IC Engines	2362	29	0.89	720	49.0	CO	60.9
El Paso Field Operations Company	10219	Bluebell Gas Plant	5604	2	Reciprocating Driven IC Engines	2361	70	0.89	800	3.8	CO	29.6
El Paso Field Operations Company	10219	Bluebell Gas Plant	5603	1	Reciprocating Driven IC Engines	2352	29	0.89	720	49.0	CO	50.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	13181	Fugitive	Pipeline valves	0	0	0.00	0	0.0	VOC	2.0
Merit Energy Company	10679	Bridger Lake Plant	13181	Fugitive	Pipeline valves	0	0	0.00	0	0.0	VOC	2.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5498	8	Reciprocating Driven IC Engines	2265	13.5	0.83	690	49.3	CO	57.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5498	8	Reciprocating Driven IC Engines	2265	13.5	0.83	690	49.3	CO	46.0
Merit Energy Company	10679	Bridger Lake Plant	5498	8	Reciprocating Driven IC Engines	2265	13.5	0.83	690	49.3	CO	46.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5498	8	Reciprocating Driven IC Engines	2265	13.5	0.80	690	49.3	CO	57.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5494	4	Reciprocating Driven IC Engines	2261	13.5	0.83	690	49.3	CO	46.0
Merit Energy Company	10679	Bridger Lake Plant	5494	4	Reciprocating Driven IC Engines	2261	13.5	0.83	690	49.3	CO	46.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5494	4	Reciprocating Driven IC Engines	2261	13.5	0.80	690	49.3	CO	7.2
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5493	3	Reciprocating Driven IC Engines	2260	13.5	0.83	690	49.3	CO	50.3
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5493	3	Reciprocating Driven IC Engines	2260	13.5	0.83	690	49.3	CO	46.0
Merit Energy Company	10679	Bridger Lake Plant	5493	3	Reciprocating Driven IC Engines	2260	13.5	0.83	690	49.3	CO	46.0
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5493	3	Reciprocating Driven IC Engines	2260	13.5	0.80	690	49.3	CO	50.3
Whiting Oil and Gas Corporation	10679	Bridger Lake Plant	5491	1	Reciprocating Driven IC Engines	2258	14.5	0.80	690	49.3	CO	59.2
Simplot Phosphates LLC	10749	Vernal Phosphate Operations	13395	12	Road Maintenance	0	0	0.00	0	0.0	PM2.5	1.8
Simplot Phosphates LLC	10749	Vernal Phosphate Operations	6929	4	Tailings Dam Construction	0	0	0.00	0	0.0	PM10	1.2
Simplot Phosphates LLC	10749	Vernal Phosphate Operations	5244	01	Disturbed Area	0	0	0.00	0	0.0	PM2.5	4.2
Simplot Phosphates LLC	10749	Vernal Phosphate Operations	5244	01	Disturbed Area	0	0	0.00	0	0.0	PM10	21.0
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	172873	CBOP-3	Ethylen Glycol Dehy.	0	0	0.00	0	0.0	VOC	5.4
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	172873	CBDP-3	Ethylen Glycol Dehy.	0	0	0.00	0	0.0	Benzen	2.1
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	172873	CBDP-3	Ethylen Glycol Dehy.	0	0	0.00	0	0.0	Toluen	4.0
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	172873	CBDP-3	Ethylen Glycol Dehy.	0	0	0.00	0	0.0	VOC	10.5
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	172873	CBDP-3	Ethylen Glycol Dehy.	0	0	0.00	0	0.0	Toluen	4.4
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	172873	CBDP-3	Ethylen Glycol Dehy.	0	0	0.00	0	0.0	VOC	11.6
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5557	08	Taurus Turbine #8	2319	40	3.20	920	71503.0	CO	3.1
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5556	07	Taurus Turbine #7	2318	40	3.20	920	71503.0	CO	2.9
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5555	06	Taurus Turbine #6	2317	40	3.20	920	71503.0	CO	3.9
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5554	5	I-R KVSR Unit 5	2316	46	1.96	750	20678.0	CO	14.0
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5554	5	I-R KVSR Unit 5	2316	46	1.96	750	20678.0	VOC	9.3
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5553	4	I-R KVSR Unit 4	2315	46	1.96	750	20678.0	CO	13.4
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5553	4	I-R KVSR Unit 4	2315	46	1.96	750	20678.0	VOC	8.9
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5552	3	I-R KVSR Unit 3	2314	46	1.96	750	20678.0	CO	11.4
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5552	3	I-R KVSR Unit 3	2314	46	1.96	750	20678.0	VOC	7.6
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5551	02	I-R KVSR Unit 2	2313	46	1.96	750	20678.0	CO	16.6
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5551	2	I-R KVSR Unit 2	2313	46	1.96	750	20678.0	CO	13.1
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5551	2	I-R KVSR Unit 2	2313	46	1.96	750	20678.0	VOC	8.7
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5550	1	I-R KVSR Unit 1	2312	46	1.96	750	20678.0	CO	12.5
Questar Pipeline Company	11532	Kastler/Marushack Compressor Station	5550	1	I-R KVSR Unit 1	2312	46	1.96	750	20678.0	VOC	8.3
Ned B. Mitchell Inc.	12098	Vernal Asphalt Plant	20605	SN# CO	Hot Oil Plant, Counter Flow Drum	17113	18.6	2.80	185.5	346.0	CO	1.5

Table 7. Colorado Included Permitted Industrial Sources.

county fips	site id	pollutant code	emission process description	proc emis estim (tpy)	facility name	exit gas flow rate (acfm)	exit gas temp (F)	exit gas velocity (ft per s)	stack diam (ft)	stack height (ft)	construction permit number
081	0152	100414	GLYCOL DEHYDRATOR	1.34	JOURNEY OPERATING LLC	4	212	3.10	0.16	15	97MF0492
081	0152	108883	GLYCOL DEHYDRATOR	1.16	JOURNEY OPERATING LLC	4	212	3.10	0.16	15	97MF0492
081	0049	108883	DEHYDRATION REBOILER	1.07	QUESTAR GAS MANAGEMENT COMPANY	462	350	4.40	0.8	16	
081	0152	1330207	GLYCOL DEHYDRATOR	3.62	JOURNEY OPERATING LLC	4	212	3.10	0.16	15	97MF0492
081	0161	50000	CATERPILLAR G3512TALE RATED AT 812 HP	1.77	QUESTAR GAS MANAGEMENT CO. - LION C.S.	4386	0	93.10	1	15	01MF0787
081	0161	50000	WAUKESHA 17402GL ENGINE RATED AT 1,478 HP	4.10	QUESTAR GAS MANAGEMENT CO. - LION C.S.	0	1100	0.00	1	15	03MF0662
081	0076	50000	WAUKESHA NAT GAS FIRED ICE	1.03	QUESTAR GAS MANAGEMENT - E HIAWATHA C.S.	5498	865	11.60	1	15	04MF0936
081	0067	50000	WAUKESHA L5790GL #397932	1.75	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	6538	650	199.90	0.7	20	91MF625
081	0178	CO	INTERNATIONAL DUAL FUEL GENERATOR	26.23	KOCH EXPLORATION CO LLC - WALKER 12-4	1394	1040	0.00	0.33	7	03MF0810
081	0177	CO	INTERNATIONAL DIESEL/NAT GAS GENERATOR	26.23	KOCH EXPLORATION CO LLC - WALKER 12-2	1394	1040	0.00	0.33	7	03MF0809
081	0269	CO	INTERNATIONAL DUEL FUEL DIESEL/NAT GAS GENERATOR	26.23	KOCH EXPLORATION CO., LLC - CULVERWELL	1394	1040	0.00	0.33	7	03MF1070
081	0224	CO	INTERNATIONAL NAT GAS /DIESEL GENERATOR	6.26	KOCH EXPLORATION CO LLC - WALKER 3-4	1394	1040	0.00	0.33	7	03MF0812
081	0223	CO	JOHN DEERE, SN: RG6081A64535 ENG RATED AT 190 HP	6.26	KOCH EXPLORATION CO LLC - WALKER 3-2	1394	1040	0.00	0.33	7	03MF0811
081	0228	CO	JOHN DEERE/6081,SN:RG6081A164355 ENG RATED @ 190HP	6.26	KOCH EXPLORATION CO, LLC - WALKER 3-3	1394	1040	0.00	0.33	7	03MF0943
081	0143	CO	CATERPILLAR NAT GAS ENGINE RATED AT 95 HP	1.31	JOURNEY OPERATING, LLC - SANDHILLS LEASE	455	0	87.10	0.33	8	01MF0993
081	0272	CO	JOHN DEERE GENERATOR RATED AT 192 HP	6.26	KOCH EXPLORATION - WALKER 3-5	0	900	0.00	0.25	8	04MF1135
081	0168	CO	WASTE GAS FLARE RATED AT 0.15 MMBTU PER HOUR	68.30	KOCH EXPLORATION CO LLC - WALKER 12-5	191	0	37.20	0.3	8	02MF0371
081	0133	CO	CATERPILLAR G3306TA NAT GAS ENGINE	1.30	ARGALI EXPLORATION COMPANY	907	0	176.70	0.33	9	02MF0001
081	0168	CO	2 CUMMINS NAT GAS/DIESEL FUELED ICE	19.40	KOCH EXPLORATION CO LLC - WALKER 12-5	835	995	0.00	0.33	10	03MF0808
081	0169	CO	3 CUMMINS 6BT5.9 170 HP ICE	5.20	KOCH EXPLORATION CO LLC - WALKER 3-1	835	995	0.00	0.33	10	03MF0434
081	0157	CO	NATURAL GAS ENGINE RATED AT 147 HP	1.08	TRUE OIL LLC - CADDIS FEDERAL 33-9	425	0	82.70	0.3	10	00MF0474
081	0268	CO	CATERPILLAR, G3304 ENGINE RATED AT 95HP	2.00	WESTERN GAS RESOURCES - FEDERAL 1-14-28	0	1045	320.00	0.3	11	05MF0004
081	0108	CO	CATERPILLAR G3306-TA	1.50	NANCE PETROLEUM CORP - BLUE GRAVEL FACIL	1019	0	48.30	0.67	11	95MF004-2
081	0105	CO	WAUKESHA ICE 7817OU SN:218057	1.47	JETTA OPERATING CO., INC. CRAIG 1-7	500	0	169.60	0.25	13	94MF789
081	0248	CO	CATERPILLAR, G379-SI-TA-HCR RATED AT 405 HP	43.70	CEDAR RIDGE LLC - CF&8 CORP. #1	0	70	0.00	0.03	14	04MF0467
081	0161	CO	CATERPILLAR G3512TALE RATED AT 812 HP	12.50	QUESTAR GAS MANAGEMENT CO. - LION C.S.	4386	0	93.10	1	15	01MF0787
081	0075	CO	NATURAL GAS FIRED SATURN TURBINE	1.09	QUESTAR PIPELINE CO STATE LINE COMP STA	38967	850	242.20	1.5	15	95MF955-1
081	0169	CO	NATURAL GAS COMBUSTION	83.93	KOCH EXPLORATION CO LLC - WALKER 3-1	0	1000	0.00	0.33	15	02MF0686
081	0067	CO	WAUKESHA ENGINE RATED AT 1300 HP	12.39	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	4840	0	102.60	1	15	01MF0039
081	0161	CO	WAUKESHA 17402GL ENGINE RATED AT 1,478 HP	14.30	QUESTAR GAS MANAGEMENT CO. - LION C.S.	0	1100	0.00	1	15	03MF0662
081	0076	CO	WAUKESHA NAT GAS FIRED ICE	8.20	QUESTAR GAS MANAGEMENT - E HIAWATHA C.S.	5498	865	11.60	1	15	04MF0936
081	0152	CO	CAT G379TA NAT GAS ENGINE	20.04	JOURNEY OPERATING LLC	0	1037	18.90	0.5	16	97MF0493
081	0067	CO	CATERPILLER, G3516LE RATED @ 1,340 HP	2.50	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	0	1100	0.00	2	20	05MF0723
081	0067	CO	WAUKESHA L5790GL #397932	23.90	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	6538	650	199.90	0.7	20	91MF625
081	0049	CO	NATURAL GAS FIRED ICE	13.30	QUESTAR GAS MANAGEMENT COMPANY	0	1100	0.00	2	20	05MF0534
081	0153	CO	WAUKESHA ENGINE RATED AT 827 HP	25.90	WESTERN GAS RESOURCES INC SAND WASH STA	4090	515	14.00	1.44	25	97MF0649
081	0049	CO	WAUKESHA L7042G S/N193857	115.90	QUESTAR GAS MANAGEMENT COMPANY	4100	1050	126.30	0.8	28	
081	0049	CO	INGERSALL RAND 8-XVG	29.20	QUESTAR GAS MANAGEMENT COMPANY	1588	1025	48.90	0.8	32	
081	0049	CO	WAUKESHA L5788G 615HP #1B	118.30	QUESTAR GAS MANAGEMENT COMPANY	3436	1025	162.40	0.67	36	
081	0049	CO	615HP WAUKESHA L5788G #2	138.40	QUESTAR GAS MANAGEMENT COMPANY	3436	1025	162.40	0.67	36	
081	0178	NO2	INTERNATIONAL DUAL FUEL GENERATOR	31.23	KOCH EXPLORATION CO LLC - WALKER 12-4	1394	1040	0.00	0.33	7	03MF0810
081	0177	NO2	INTERNATIONAL DIESEL/NAT GAS GENERATOR	31.23	KOCH EXPLORATION CO LLC - WALKER 12-2	1394	1040	0.00	0.33	7	03MF0809
081	0269	NO2	INTERNATIONAL DUEL FUEL DIESEL/NAT GAS GENERATOR	31.23	KOCH EXPLORATION CO., LLC - CULVERWELL	1394	1040	0.00	0.33	7	03MF1070
081	0224	NO2	INTERNATIONAL NAT GAS /DIESEL GENERATOR	25.80	KOCH EXPLORATION CO LLC - WALKER 3-4	1394	1040	0.00	0.33	7	03MF0812
081	0223	NO2	JOHN DEERE, SN: RG6081A64535 ENG RATED AT 190 HP	25.80	KOCH EXPLORATION CO LLC - WALKER 3-2	1394	1040	0.00	0.33	7	03MF0811
081	0228	NO2	JOHN DEERE/6081,SN:RG6081A164355 ENG RATED @ 190HP	25.80	KOCH EXPLORATION CO, LLC - WALKER 3-3	1394	1040	0.00	0.33	7	03MF0943
081	0143	NO2	CATERPILLAR NAT GAS ENGINE RATED AT 95 HP	1.32	JOURNEY OPERATING, LLC - SANDHILLS LEASE	455	0	87.10	0.33	8	01MF0993
081	0272	NO2	JOHN DEERE GENERATOR RATED AT 192 HP	25.80	KOCH EXPLORATION - WALKER 3-5	0	900	0.00	0.25	8	04MF1135
081	0168	NO2	WASTE GAS FLARE RATED AT 0.15 MMBTU PER HOUR	8.00	KOCH EXPLORATION CO LLC - WALKER 12-5	191	0	37.20	0.3	8	02MF0371
081	0133	NO2	CATERPILLAR G3306TA NAT GAS ENGINE	43.40	ARGALI EXPLORATION COMPANY	907	0	176.70	0.33	9	02MF0001
081	0168	NO2	2 CUMMINS NAT GAS/DIESEL FUELED ICE	11.50	KOCH EXPLORATION CO LLC - WALKER 12-5	835	995	0.00	0.33	10	03MF0808
081	0169	NO2	3 CUMMINS 6BT5.9 170 HP ICE	21.45	KOCH EXPLORATION CO LLC - WALKER 3-1	835	995	0.00	0.33	10	03MF0434
081	0085	NO2	AJAX EA30 PUMPJACK ENGINE	4.72	QUESTAR E & P-JACKS DRAW 16	54	975	0.00	1.25	10	93MF1655-1XP
081	0157	NO2	NATURAL GAS ENGINE RATED AT 147 HP	8.50	TRUE OIL LLC - CADDIS FEDERAL 33-9	425	0	82.70	0.3	10	00MF0474
081	0156	NO2	CATERPIILLAR RATED AT 102 HP	7.13	TRUE OIL LLC - BTA FEDERAL #12-33	326	0	62.30	6	10	00MF0111
081	0268	NO2	CATERPILLAR, G3304 ENGINE RATED AT 95HP	2.00	WESTERN GAS RESOURCES - FEDERAL 1-14-28	0	1045	320.00	0.3	11	05MF0004
081	0108	NO2	CATERPILLAR G3306-TA	19.00	NANCE PETROLEUM CORP - BLUE GRAVEL FACIL	1019	0	48.30	0.67	11	95MF004-2
081	0105	NO2	WAUKESHA ICE 7817OU SN:218057	10.82	JETTA OPERATING CO., INC. CRAIG 1-7	500	0	169.60	0.25	13	94MF789
081	0248	NO2	CATERPILLAR, G379-SI-TA-HCR RATED AT 405 HP	36.00	CEDAR RIDGE LLC - CF&8 CORP. #1	0	70	0.00	0.03	14	04MF0467
081	0161	NO2	CATERPILLAR G3512TALE RATED AT 812 HP	15.70	QUESTAR GAS MANAGEMENT CO. - LION C.S.	4386	0	93.10	1	15	01MF0787
081	0169	NO2	NATURAL GAS COMBUSTION	9.79	KOCH EXPLORATION CO LLC - WALKER 3-1	0	1000	0.00	0.33	15	02MF0686
081	0067	NO2	WAUKESHA ENGINE RATED AT 1300 HP	12.39	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	4840	0	102.60	1	15	01MF0039
081	0161	NO2	WAUKESHA 17402GL ENGINE RATED AT 1,478 HP	14.30	QUESTAR GAS MANAGEMENT CO. - LION C.S.	0	1100	0.00	1	15	03MF0662
081	0076	NO2	WAUKESHA NAT GAS FIRED ICE	8.20	QUESTAR GAS MANAGEMENT - E HIAWATHA C.S.	5498	865	11.60	1	15	04MF0936
081	0152	NO2	CAT G379TA NAT GAS ENGINE	16.03	JOURNEY OPERATING LLC	0	1037	18.90	0.5	16	97MF0493
081	0067	NO2	CATERPILLER, G3516LE RATED @ 1,340 HP	19.40	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	0	1100	0.00	2	20	05MF0723
081	0067	NO2	WAUKESHA L5790GL #397932	19.20	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	6538	650	199.90	0.7	20	91MF625
081	0049	NO2	NATURAL GAS FIRED ICE	13.30	QUESTAR GAS MANAGEMENT COMPANY	0	1100	0.00	2	20	05MF0534
081	0153	NO2	WAUKESHA ENGINE RATED AT 827 HP	25.90	WESTERN GAS RESOURCES INC SAND WASH STA	4090	515	14.00	1.44	25	97MF0649
081	0049	NO2	WAUKESHA L7042G S/N193857	119.70	QUESTAR GAS MANAGEMENT COMPANY	4100	1050	126.30	0.8	28	
081	0049	NO2	INGERSALL RAND 8-XVG	33.40	QUESTAR GAS MANAGEMENT COMPANY	1588	1025	48.90	0.8	32	
081	0049	NO2	WAUKESHA L5788G 615HP #1B	99.40	QUESTAR GAS MANAGEMENT COMPANY	3436	1025	162.40	0.67	36	
081	0049	NO2	615HP WAUKESHA L5788G #2	107.40	QUESTAR GAS MANAGEMENT COMPANY	3436	1025	162.40	0.67	36	
081	0178	PM10	INTERNATIONAL DUAL FUEL GENERATOR	2.22	KOCH EXPLORATION CO LLC - WALKER 12-4	1394	1040	0.00	0.33	7	03MF0810
081	0177	PM10	INTERNATIONAL DIESEL/NAT GAS GENERATOR	2.22	KOCH EXPLORATION CO LLC - WALKER 12-2	1394	1040	0.00	0.33	7	03MF0809
081	0269	PM10	INTERNATIONAL DUEL FUEL DIESEL/NAT GAS GENERATOR	2.22	KOCH EXPLORATION CO., LLC - CULVERWELL	1394	1040	0.00	0.33	7	03MF1070
081	0224	PM10	INTERNATIONAL NAT GAS /DIESEL GENERATOR	1.83	KOCH EXPLORATION CO LLC - WALKER 3-4	1394	1040	0.00	0.33	7	03MF0812
081	0223	PM10	JOHN DEERE, SN: RG6081A64535 ENG RATED AT 190 HP	1.83	KOCH EXPLORATION CO LLC - WALKER 3-2	1394	1040	0.00	0.33	7	03MF0811
081	0228	PM10	JOHN DEERE/6081,SN:RG6081A164355 ENG RATED @ 190HP	1.83	KOCH EXPLORATION CO, LLC - WALKER 3-3	1394	1040	0.00	0.33	7	03MF0943
081	0272	PM10	JOHN DEERE GENERATOR RATED AT 192 HP	1.83	KOCH EXPLORATION - WALKER 3-5	0	900	0.00	0.25	8	04MF1135
081	0169	PM10	3 CUMMINS 6BT5.9 170 HP ICE	1.52	KOCH EXPLORATION CO LLC - WALKER 3-1	835	995	0.00	0.33	10	03MF0434
081	0178	SO2	INTERNATIONAL DUAL FUEL GENERATOR	2.07	KOCH EXPLORATION CO LLC - WALKER 12-4	1394	1040	0.00	0.33	7	03MF0810
081	0177	SO2	INTERNATIONAL DIESEL/NAT GAS GENERATOR	2.07	KOCH EXPLORATION CO LLC - WALKER 12-2	1394	1040	0.00	0.33	7	03MF0809
081	0269	SO2	INTERNATIONAL DUEL FUEL DIESEL/NAT GAS GENERATOR	2.07	KOCH EXPLORATION CO., LLC - CULVERWELL	1394	1040	0.00	0.33	7	03MF1070
081	0224	SO2	INTERNATIONAL NAT GAS /DIESEL GENERATOR	1.71	KOCH EXPLORATION CO LLC - WALKER 3-4	1394	1040	0.00	0.33	7	03MF0812
081	0223	SO2	JOHN DEERE, SN: RG6081A64535 ENG RATED AT 190 HP	1.71	KOCH EXPLORATION CO LLC - WALKER 3-2	1394	1040	0.00	0.33	7	03MF0811
081	0228	SO2	JOHN DEERE/6081,SN:RG6081A164355 ENG RATED @ 190HP	1.71	KOCH EXPLORATION CO, LLC - WALKER 3-3	1394	1040	0.00	0.33	7	03MF0943
081	0272	SO2	JOHN DEERE GENERATOR RATED AT 192 HP	1.71	KOCH EXPLORATION - WALKER 3-5	0	900	0.00	0.25	8	04MF1135
081	0168	SO2	2 CUMMINS NAT GAS/DIESEL FUELED ICE	1.50	KOCH EXPLORATION CO LLC - WALKER 12-5	835	995	0.00	0.33	10	03MF0808
081	0169	SO2	3 CUMMINS 6BT5.9 170 HP ICE	1.42	KOCH EXPLORATION CO LLC - WALKER 3-1	835	995	0.00	0.33	10	03MF0434
081	0178	VOC	INTERNATIONAL DUAL FUEL GENERATOR	2.49	KOCH EXPLORATION CO LLC - WALKER 12-4	1394	1040	0.00	0.33	7	03MF0810
081	0177	VOC	INTERNATIONAL DIESEL/NAT GAS GENERATOR	2.49	KOCH EXPLORATION CO LLC - WALKER 12-2	1394	1040	0.00	0.33	7	03MF0809

Table 7. Colorado Included Permitted Industrial Sources (continued).

county fips	site id	pollutant code	emission process description	proc emis estim (tpy)	facility name	exit gas flow rate (acfm)	exit gas temp (F)	exit gas velocity (ft per s)	stack diam (ft)	stack height (ft)	construction permit number
081	0269	VOC	INTERNATIONAL DUEL FUEL DIESEL/NAT GAS GENERATOR	2.49	KOCH EXPLORATION CO., LLC - CULVERWELL	1394	1040	0.00	0.33	7	03MF1070
081	0224	VOC	INTERNATIONAL NAT GAS /DIESEL GENERATOR	2.09	KOCH EXPLORATION CO LLC - WALKER 3-4	1394	1040	0.00	0.33	7	03MF0812
081	0223	VOC	JOHN DEERE, SN: RG6081A64535 ENG RATED AT 190 HP	2.09	KOCH EXPLORATION CO LLC - WALKER 3-2	1394	1040	0.00	0.33	7	03MF0811
081	0228	VOC	JOHN DEERE/6081,SN:RG6081A164355 ENG RATED @ 190HP	2.09	KOCH EXPLORATION CO, LLC - WALKER 3-3	1394	1040	0.00	0.33	7	03MF0943
081	0272	VOC	JOHN DEERE GENERATOR RATED AT 192 HP	2.09	KOCH EXPLORATION - WALKER 3-5	0	900	0.00	0.25	8	04MF1135
081	0168	VOC	WASTE GAS FLARE RATED AT 0.15 MMBTU PER HOUR	26.40	KOCH EXPLORATION CO LLC - WALKER 12-5	191	0	37.20	0.3	8	02MF0371
081	0168	VOC	2 CUMMINS NAT GAS/DIESEL FUELED ICE	1.00	KOCH EXPLORATION CO LLC - WALKER 12-5	835	995	0.00	0.33	10	03MF0808
081	0169	VOC	3 CUMMINS 6BT5.9 170 HP ICE	1.74	KOCH EXPLORATION CO LLC - WALKER 3-1	835	995	0.00	0.33	10	03MF0434
081	0108	VOC	REBOILER STILL VENT	1.57	NANCE PETROLEUM CORP - BLUE GRAVEL FACIL	1019	800	48.30	0.67	10	95MF004-1
081	0161	VOC	CATERPILLAR G3512TALE RATED AT 812 HP	3.10	QUESTAR GAS MANAGEMENT CO. - LION C.S.	4386	0	93.10	1	15	01MF0787
081	0152	VOC	GLYCOL DEHYDRATOR	17.01	JOURNEY OPERATING LLC	4	212	3.10	0.16	15	97MF0492
081	0169	VOC	NATURAL GAS COMBUSTION	20.40	KOCH EXPLORATION CO LLC - WALKER 3-1	0	1000	0.00	0.33	15	02MF0686
081	0067	VOC	WAUKESHA ENGINE RATED AT 1300 HP	6.25	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	4840	0	102.60	1	15	01MF0039
081	0161	VOC	WAUKESHA 17402GL ENGINE RATED AT 1,478 HP	7.10	QUESTAR GAS MANAGEMENT CO. - LION C.S.	0	1100	0.00	1	15	03MF0662
081	0076	VOC	WAUKESHA NAT GAS FIRED ICE	4.10	QUESTAR GAS MANAGEMENT - E HIAWATHA C.S.	5498	865	11.60	1	15	04MF0936
081	0152	VOC	CAT G379TA NAT GAS ENGINE	4.00	JOURNEY OPERATING LLC	0	1037	18.90	0.5	16	97MF0493
081	0049	VOC	DEHYDRATION REBOILER	4.30	QUESTAR GAS MANAGEMENT COMPANY	462	350	4.40	0.8	16	
081	0152	VOC	AMINE TREATING	6.73	JOURNEY OPERATING LLC	131	135	44.40	0.25	20	97MF0491
081	0067	VOC	CATERPILLER, G3516LE RATED @ 1,340 HP	1.00	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	0	1100	0.00	2	20	05MF0723
081	0067	VOC	WAUKESHA L5790GL #397932	1.00	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	6538	650	199.90	0.7	20	91MF625
081	0049	VOC	NATURAL GAS FIRED ICE	6.60	QUESTAR GAS MANAGEMENT COMPANY	0	1100	0.00	2	20	05MF0534
081	0153	VOC	WAUKESHA ENGINE RATED AT 827 HP	4.31	WESTERN GAS RESOURCES INC SAND WASH STA	4090	515	14.00	1.44	25	97MF0649
081	0049	VOC	WAUKESHA L7042G S/N193857	1.00	QUESTAR GAS MANAGEMENT COMPANY	4100	1050	126.30	0.8	28	
081	0049	VOC	INGERSALL RAND 8-XVG	2.90	QUESTAR GAS MANAGEMENT COMPANY	1588	1025	48.90	0.8	32	
081	0227	NO2	AJAX, DPC-230 LE NAT GAS ENG RATED AT 190 HP	3.70	TOM BROWN, INC - MOFFAT COUNTY 24-29	1062	368	33.90	12	190	04MF1324 XP
081	0227	CO	AJAX, DPC-230 LE NAT GAS ENG RATED AT 190 HP	5.60	TOM BROWN, INC - MOFFAT COUNTY 24-29	1062	368	33.90	12	190	04MF1324 XP
081	0227	VOC	AJAX, DPC-230 LE NAT GAS ENG RATED AT 190 HP	1.80	TOM BROWN, INC - MOFFAT COUNTY 24-29	1062	368	33.90	12	190	04MF1324 XP
103	0010	NO2	CAT G398 IC ENG 500 HP	10.60	CHEVRON USA - WILSON CREEK GAS PLT	2251	1100	107.70	0.67	15	97RB0187
103	0010	CO	CAT G398 IC ENG 500 HP	16.00	CHEVRON USA - WILSON CREEK GAS PLT	2251	1100	107.70	0.67	15	97RB0187
103	0010	VOC	CAT G398 IC ENG 500 HP	5.30	CHEVRON USA - WILSON CREEK GAS PLT	2251	1100	107.70	0.67	15	97RB0187
103	0010	SO2	EMERGENCY FLARE	1.00	CHEVRON USA - WILSON CREEK GAS PLT	0	0	0.00	0.3	30	03RB0233
107	0086	CO	NAT GAS FIRED WAUKESHA ICE	4.60	INFINITY OIL AND GAS OF WYO-WOLF MTN	0	899	693.00	0	0	05RO0546
107	0077	CO	DIESEL RECIPROCATING ENGINE RATED AT 2157 HP	1.05	TOWN OF OAK CREEK	12210	885	0.00	1	13	99RO0828
107	0086	CO	CONDENSATE STORAGE TANKS	5.00	INFINITY OIL AND GAS OF WYO-WOLF MTN	5916	700	10.00	2	20	05RO0547
107	0086	NO2	NAT GAS FIRED WAUKESHA ICE	13.10	INFINITY OIL AND GAS OF WYO-WOLF MTN	0	899	693.00	0	0	05RO0546
107	0077	NO2	DIESEL RECIPROCATING ENGINE RATED AT 2157 HP	3.97	TOWN OF OAK CREEK	12210	885	0.00	1	13	99RO0828
107	0086	NO2	CONDENSATE STORAGE TANKS	1.25	INFINITY OIL AND GAS OF WYO-WOLF MTN	5916	700	10.00	2	20	05RO0547
107	0061	SO2	COAL FIRED FURNACE	1.06	OAK CREEK JUNIOR HIGH S ROUTT CNTY SD	0	250	0.00	2.5	26	
107	0086	VOC	CONDENSATE STORAGE TANKS	16.30	INFINITY OIL AND GAS OF WYO-WOLF MTN	5916	700	10.00	2	20	05RO0547
107	0001	PM10	BOILER #1 - COAL	91.30	PUBLIC SERVICE CO HAYDEN PLT	781891	285	32.00	22	250	GRAND.000022
107	0001	CO	BOILER #1 - COAL	196.00	PUBLIC SERVICE CO HAYDEN PLT	781891	285	32.00	22	250	GRAND.000022
107	0001	SO2	BOILER #1 - COAL	1297.50	PUBLIC SERVICE CO HAYDEN PLT	781891	285	32.00	22	250	GRAND.000022
107	0001	NO2	BOILER #1 - COAL	4094.70	PUBLIC SERVICE CO HAYDEN PLT	781891	285	32.00	22	250	GRAND.000022
107	0001	VOC	BOILER #1 - COAL	23.50	PUBLIC SERVICE CO HAYDEN PLT	781891	285	32.00	22	250	GRAND.000022
057	0022	VOC	CONDENSATE TANKS	6.12	NIELSON & ASSOCIATES FEDERAL #8-3	0	70	0.00	0	0	
057	0012	VOC	TWO CRUDE OIL TANKS	9.03	NIELSON & ASSOCIATES INC -MCCALLUM FIELD	0	70	0.00	0.33	20	95JA129
057	0010	VOC	AG GASOLINE TANKS	10.85	CORKLE'S OIL CO	0	70	0.00	0	0	96JA301
057	0012	110543	VENTING OF CASINGHEAD GAS	2.18	NIELSON & ASSOCIATES INC -MCCALLUM FIELD	0	70	0.00	0.17	2	95JA129
057	0012	VOC	VENTING OF CASINGHEAD GAS	67.22	NIELSON & ASSOCIATES INC -MCCALLUM FIELD	0	70	0.00	0.17	2	95JA129
069	0255	VOC	VAPOR LOSS W/O CONTROL	4.55	SCHRADER OIL CO	0	70	0.00	0	0	
081	0231	100414	JW WILLIAMS GLYCOL DEHYDRATOR COMO UNIT	2.19	CHEVRON USA, INC. - DUNCAN 2-5	0	70	0.00	0	0	04MF0187
081	0167	108883	JW WILLIAMS GLYCOL DEHYDRATOR	1.12	CHEVRON USA, INC. - DUNCAN 3-2	0	70	0.00	0	0	02MF0306
081	0182	108883	PESCO GLYCOL DEHYDRATOR	1.12	CHEVRON USA - DUNCAN UNIT 2 #2	0	70	0.00	0	0	03MF0138
081	0189	108883	JW WILLIAMS GLYCOL DEHYDRATOR	1.20	CHEVRON USA - DYER C #2	0	70	0.00	0	0	03MF0145
081	0188	108883	P&A GLYCOL DEHYDRATOR	1.20	CHEVRON USA - DYER B #2	0	70	0.00	0	0	03MF0144
081	0184	108883	PESCO DEHYDRATOR	1.20	CHEVRON USA - DUNCAN B #5	0	70	0.00	0	0	03MF0140
081	0147	108883	CE NATCO SN: 6214	1.31	CHEVRON USA, INC. - DUNCAN 1-3	0	70	0.00	0	0	96MF515
081	0148	108883	CUSTOM GLYCOL DEHYDRATOR	1.75	J-W OPERATING COMPANY -SAND HILLS	0	70	0.00	0	0	99MF0798
081	0175	108883	JW WILLIAMS GLYCOL DEHYDRATOR	1.80	CHEVRON USA, INC. - DUNCAN B-12	0	70	0.00	0	0	03MF0136
081	0273	108883	HANOVER GLYCOL DEHYDRATOR, SN: CW1001	1.85	YATES PETROLEUM - BAKERS PEAK UNIT #2	0	70	0.00	0	0	05MF0264
081	0164	108883	JW WILLIAMS NATURAL GAS FIRED REBOILER GLYCOL DEHY	2.00	CHEVRON USA, INC. - VAN SCHAICK A-6	0	70	0.00	0	0	02MF0131
081	0191	108883	JW WILLIAMS DEHYDRATOR	2.03	CHEVRON USA - VAN SCHAIK UNIT #4	0	70	0.00	0	0	03MF0147
081	0166	108883	JW WILLIAMS GLYCOL DEHYDRATOR	2.03	CHEVRON USA, INC. - HIAWATHA B-3	0	70	0.00	0	0	02MF0282
081	0276	108883	J.W. WILLIAMS GLYCOL DEHYDRATOR	2.05	CHEVRON USA, INC. - VAN SCHAICK A-7	0	70	0.00	0	0	05MF0545
081	0183	108883	JW WILLIAMS GLYCOL DEHYDRATOR	2.13	CHEVRON USA - DUNCAN UNIT 2 #4	0	70	0.00	0	0	03MF0139
081	0163	108883	JW WILLIAMS GLYCOL DEHYDRATOR	2.24	CHEVRON USA, INC. - DUNCAN 1-5	0	70	0.00	0	0	02MF0130
081	0153	108883	ENERTEK DEHYVENT-1	2.26	WESTERN GAS RESOURCES INC SAND WASH STA	0	70	0.00	0	0	97MF0651
081	0153	108883	ENERTEC DEHYVENT-2	2.26	WESTERN GAS RESOURCES INC SAND WASH STA	0	70	0.00	0	0	97MF0652
081	0181	108883	JW WILLIAMS GLYCOL DEHYDRATOR	2.31	CHEVRON USA - DUNCAN UNIT 1 #4	0	70	0.00	0	0	03MF0137
081	0031	108883	TRIETHYLENE GLYCOL DEHYDRATOR	2.32	CHEVRON USA, INC. - VAN SCHAICK A-3	0	70	0.00	0	0	02MF0532
081	0186	108883	PESCO DEHYDRATOR	2.34	CHEVRON USA - DUNCAN B #10	0	70	0.00	0	0	03MF0142
081	0180	108883	JW WILLIAMS GLYCOL DEHYDRATOR	2.48	CHEVRON USA - DUNCAN 1-6	0	70	0.00	0	0	03MF0135
081	0192	108883	PESCO DEHYDRATOR	2.48	CHEVRON USA - VAN SCHAIK UNIT #5	0	70	0.00	0	0	03MF0148
081	0187	108883	JW WILLIAMS GLYCOL DEHYDRATOR	2.48	CHEVRON USA - DUNCAN B #11	0	70	0.00	0	0	03MF0143
081	0281	108883	JW WILLIAMS GLYCOL DEHYDRATOR, SN: 9100	2.52	CHEVRON USA- DUNCAN B-15	0	70	0.00	0	0	05MF0786
081	0159	108883	TWO GLYCOL DEHYDRATORS	2.97	CHEVRON USA, INC. - DUNCAN 3-3	0	70	0.00	0	0	00MF0511
081	0162	108883	JW WILLIAMS GLYCOL DEHYDRATOR	3.67	CHEVRON USA, INC. -DUNCAN VANSCHAICK 1-3	0	70	0.00	0	0	02MF0056
081	0049	108883	GLYCOL DEHYDRATOR	3.79	QUESTAR GAS MANAGEMENT COMPANY	0	70	0.00	0	0	GRAND.000007
081	0158	108883	TWO GLYCOL DEHYDRATORS	4.36	CHEVRON USA, INC. - VAN SCHAICK A-5	0	70	0.00	0	0	00MF0510
081	0111	110543	AMER & TEXAS DEHY SN: 981	1.04	THOMAS OP CO - POWDER WASH STATION	0	70	0.00	0	0	95MF0024
081	0111	110543	TEXAS GLY DEHY	1.04	THOMAS OP CO - POWDER WASH STATION	0	70	0.00	0	0	95MF0024
081	0220	110543	CONDENSATE STORAGE TANKS	1.20	NANCE PETROLEUM CORP - KOWACH #1-9	0	70	0.00	0	0	06MF0345
081	0230	110543	J.W.WILLIAMS GLYCOL DEHYDRATOR	1.85	CHEVRON USA, INC. (MO) - DUNCAN B-13	0	70	0.00	0	0	04MF0086
081	0189	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	1.01	CHEVRON USA - DYER C #2	0	70	0.00	0	0	03MF0145
081	0188	1330207	P&A GLYCOL DEHYDRATOR	1.01	CHEVRON USA - DYER B #2	0	70	0.00	0	0	03MF0144
081	0184	1330207	PESCO DEHYDRATOR	1.01	CHEVRON USA - DUNCAN B #5	0	70	0.00	0	0	03MF0140
081	0067	1330207	GLYCOL DEHYDRATOR	1.12	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	0	70	0.00	0	0	95MF922-1
081	0166	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	1.30	CHEVRON USA, INC. - HIAWATHA B-3	0	70	0.00	0	0	02MF0282
081	0175	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	1.53	CHEVRON USA, INC. - DUNCAN B-12	0	70	0.00	0	0	03MF0136
081	0191	1330207	JW WILLIAMS DEHYDRATOR	1.73	CHEVRON USA - VAN SCHAIK UNIT #4	0	70	0.00	0	0	03MF0147
081	0276	1330207	J.W. WILLIAMS GLYCOL DEHYDRATOR	1.79	CHEVRON USA, INC. - VAN SCHAICK A-7	0	70	0.00	0	0	05MF0545
081	0183	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	1.81	CHEVRON USA - DUNCAN UNIT 2 #4	0	70	0.00	0	0	03MF0139
081	0231	1330207	JW WILLIAMS GLYCOL DEHYDRATOR COMO UNIT	1.84	CHEVRON USA, INC. - DUNCAN 2-5	0	70	0.00	0	0	04MF0187
081	0181	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	1.88	CHEVRON USA - DUNCAN UNIT 1 #4	0	70	0.00	0	0	03MF0137
081	0031	1330207	TRIETHYLENE GLYCOL DEHYDRATOR	1.94	CHEVRON USA, INC. - VAN SCHAICK A-3	0	70	0.00	0	0	02MF0532
081	0186	1330207	PESCO DEHYDRATOR	2.00	CHEVRON USA - DUNCAN B #10	0	70	0.00	0	0	03MF0142
081	0180	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	2.12	CHEVRON USA - DUNCAN 1-6	0	70	0.00	0	0	03MF0135
081	0192	1330207	PESCO DEHYDRATOR	2.14	CHEVRON USA - VAN SCHAIK UNIT #5	0	70	0.00	0	0	03MF0148
081	0187	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	2.16	CHEVRON USA - DUNCAN B #11	0	70	0.00	0	0	03MF0143

Table 7. Colorado Included Permitted Industrial Sources (continued).

county fips	site id	pollutant code	emission process description	proc emis estim (tpy)	facility name	exit gas flow rate (acfm)	exit gas temp (F)	exit gas velocity (ft per s)	stack diam (ft)	stack height (ft)	construction permit number
081	0230	1330207	J.W.WILLIAMS GLYCOL DEHYDRATOR	2.20	CHEVRON USA, INC. (MO) - DUNCAN B-13	0	70	0.00	0	0	04MF0086
081	0164	1330207	JW WILLIAMS NATURAL GAS FIRED REBOILER GLYCOL DEHY	2.22	CHEVRON USA, INC. - VAN SCHAICK A-6	0	70	0.00	0	0	02MF0131
081	0163	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	2.30	CHEVRON USA, INC. - DUNCAN 1-5	0	70	0.00	0	0	02MF0130
081	0148	1330207	CUSTOM GLYCOL DEHYDRATOR	2.85	J-W OPERATING COMPANY -SAND HILLS	0	70	0.00	0	0	99MF0798
081	0159	1330207	TWO GLYCOL DEHYDRATORS	3.01	CHEVRON USA, INC. - DUNCAN 3-3	0	70	0.00	0	0	00MF0511
081	0162	1330207	JW WILLIAMS GLYCOL DEHYDRATOR	3.02	CHEVRON USA, INC. -DUNCAN VANSCHAICK 1-3	0	70	0.00	0	0	02MF0056
081	0147	1330207	CE NATCO SN: 6214	3.20	CHEVRON USA, INC. - DUNCAN 1-3	0	70	0.00	0	0	96MF515
081	0158	1330207	TWO GLYCOL DEHYDRATORS	3.99	CHEVRON USA, INC. - VAN SCHAICK A-5	0	70	0.00	0	0	00MF0510
081	0125	CO	WAUKESHA NATURAL GAS ENGINE	3.97	ROCKY MTN NAT GAS - BLUE GRAVEL	0	70	0.00	0	0	03MF0113
081	0112	CO	NATURAL GAS PROCESSED	10.13	ENSIGN OPERATING COMPANY	0	70	0.00	0	0	02MF0134
081	0246	CO	GENERAL MOTORS VORTEC 5700 ENGINE RATED AT 150 HP	22.40	CEDAR RIDGE LLC - BROWNLEE 24-1	0	70	0.00	0	0	04MF0465
081	0250	CO	GENERAL MOTORS VORTEC 5700 ENGINE RATED AT 150 TPH	22.40	CEDAR RIDGE LLC - ROBIDOUX 13-12-89 #1	0	70	0.00	0	0	04MF0470
081	0251	CO	GENERAL MOTORS, VORTEC 5700 NAT GAS ENGINE	22.40	CEDAR RIDGE LLC - ROBIDOUX 23-13 CBM #1	0	70	0.00	0	0	04MF0472
081	0251	CO	GENERAL MOTORS, VORTEC 8100 ENGINE RATED @ 240 HP	35.80	CEDAR RIDGE LLC - ROBIDOUX 23-13 CBM #1	0	70	0.00	0	0	04MF0471
081	0125	NO2	WAUKESHA NATURAL GAS ENGINE	6.78	ROCKY MTN NAT GAS - BLUE GRAVEL	0	70	0.00	0	0	03MF0113
081	0249	NO2	(2) PERKINS GENERATORS	7.80	CEDAR RIDGE LLC - MOFFAT 26-12-89 SWD #1	0	70	0.00	0	0	04MF0469 XP
081	0251	NO2	GENERAL MOTORS, VORTEC 5700 NAT GAS ENGINE	10.72	CEDAR RIDGE LLC - ROBIDOUX 23-13 CBM #1	0	70	0.00	0	0	04MF0472
081	0246	NO2	GENERAL MOTORS VORTEC 5700 ENGINE RATED AT 150 HP	10.72	CEDAR RIDGE LLC - BROWNLEE 24-1	0	70	0.00	0	0	04MF0465
081	0250	NO2	GENERAL MOTORS VORTEC 5700 ENGINE RATED AT 150 TPH	10.72	CEDAR RIDGE LLC - ROBIDOUX 13-12-89 #1	0	70	0.00	0	0	04MF0470
081	0112	NO2	NATURAL GAS PROCESSED	12.06	ENSIGN OPERATING COMPANY	0	70	0.00	0	0	02MF0134
081	0251	NO2	GENERAL MOTORS, VORTEC 8100 ENGINE RATED @ 240 HP	17.20	CEDAR RIDGE LLC - ROBIDOUX 23-13 CBM #1	0	70	0.00	0	0	04MF0471
081	0007	PM10	LOADING/UNLOADING/HAULING	1.10	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0007	PM10	LOADERS/HAUL TRUCKS	1.20	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0007	PM10	AUXILIARY COAL SYSTEM	1.40	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0007	PM10	SECONDARY CRUSHER HOUSE	2.00	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0222	PM10	FUGITIVE EMISSIONS	2.42	MOFFAT LIMESTONE INC - JUNIPER MT. GRAVE	0	70	0.00	0	0	03MF0462F
081	0265	PM10	FUGITIVE PARTICULATE EMISSIONS FROM HAUL ROADS	4.95	PLAINS MARKETING LP - BUCK PEAK STATION	0	70	0.00	0	0	04MF0104
081	0007	PM10	PILE MAINT./RECLAIM CONVY	6.70	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0007	PM10	CRUSHER/SCREENS	11.00	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0007	PM10	PRIMARY CRUSHER HOUSE	12.00	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0081	PM10	SAND & GRAVEL MINE: FUGITIVE DUST ACTIVITIES	16.87	LAFARGE WEST, INC. - BUNN RANCH PIT	0	70	0.00	0	0	97MF0469F
081	0122	PM10	UMTRA REMEDIATION-FUGITVE	20.72	UMETCO MINERALS CORP	0	70	0.00	0	0	95MF035
081	0058	PM10	SOIL RELOCATION/HAUL RDS	23.79	MOFFAT COUNTY LANDFILL	0	70	0.00	0	0	83MF249F
081	0007	PM10	HAUL TRUCKS	158.00	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0007	PM10	MINING ACTIVITIES-FUGTIVE	730.00	COLOWYO COAL CO	0	70	0.00	0	0	95MF1040
081	0088	VOC	SUBMERGED FILLING	1.25	KUM & GO	0	70	0.00	0	0	
081	0087	VOC	SUBMERGED FILLING	1.28	KUM & GO	0	70	0.00	0	0	
081	0089	VOC	SUBMERGED FILLING	1.38	KUM & GO	0	70	0.00	0	0	
081	0238	VOC	CONDENSATE TANK	1.50	THOMAS OPERATING CO. - PTASYNSKI #5	0	70	0.00	0	0	04MF0329
081	0241	VOC	CONDENSATE TANK	1.50	THOMAS OPERATING CO. - USA JOYCE WOLF #3	0	70	0.00	0	0	04MF0332
081	0237	VOC	CONDENSATE TANK	1.50	THOMAS OPERATING CO. - PTASYNSKI #4	0	70	0.00	0	0	04MF0328
081	0249	VOC	(2) PERKINS GENERATORS	1.60	CEDAR RIDGE LLC - MOFFAT 26-12-89 SWD #1	0	70	0.00	0	0	04MF0469 XP
081	0088	VOC	VAPOR LOSS W/O CONTROL	1.88	KUM & GO	0	70	0.00	0	0	
081	0091	VOC	TANK 010: GASOLINE BREATHING	1.90	TREVENEN OIL DISTRIBUTING	0	70	0.00	0	0	96MF157
081	0087	VOC	VAPOR LOSS W/O CONTROL	1.93	KUM & GO	0	70	0.00	0	0	
081	0091	VOC	TANK 012: GASOLINE BREATHING	1.93	TREVENEN OIL DISTRIBUTING	0	70	0.00	0	0	96MF157
081	0058	VOC	SOIL RELOCATION/HAUL RDS	1.94	MOFFAT COUNTY LANDFILL	0	70	0.00	0	0	83MF249F
081	0196	VOC	(2) 400 BARREL CONDENSATE TANKS	2.00	CHEVRON USA, INC. - VAN SCHAIK C-10	0	70	0.00	0	0	03MF0204
081	0171	VOC	CONDENSATE STORAGE TANK	2.00	ROCKY MOUNTAIN NATURAL GAS-BLUE GRAVEL	0	70	0.00	0	0	03MF0016
081	0242	VOC	CONDENSATE TANK	2.05	THOMAS OPERATING CO. - USA JOYCE WOLF #4	0	70	0.00	0	0	04MF0333
081	0089	VOC	VAPOR LOSS W/O CONTROL	2.08	KUM & GO	0	70	0.00	0	0	
081	0271	VOC	ENERTEK GLYCOL DEHYDRATOR	2.22	WEXPRO CO - W.B. LASHER #9	0	70	0.00	0	0	05MF0119
081	0275	VOC	PESCO GLYCOL DEHYDRATOR	2.22	WEXPRO CO - W.B. LASHER #7	0	70	0.00	0	0	05MF0325
081	0270	VOC	AMERICAN TANK GLYCOL DEHYDRATOR	2.41	WEXPRO COMPANY - W.B. LASHER #8	0	70	0.00	0	0	05MF0040
081	0153	VOC	ABOVE GROUND TANK	2.80	WESTERN GAS RESOURCES INC SAND WASH STA	0	70	0.00	0	0	01MF0366
081	0111	VOC	AMER & TEXAS DEHY SN: 981	3.53	THOMAS OP CO - POWDER WASH STATION	0	70	0.00	0	0	95MF0024
081	0111	VOC	TEXAS GLY DEHY	3.53	THOMAS OP CO - POWDER WASH STATION	0	70	0.00	0	0	95MF0024
081	0209	VOC	CONDENSATE STORAGE TANK	3.61	WEXPRO - POWDER WASH UNIT (TANK 353)	0	70	0.00	0	0	
081	0086	VOC	BREATHING AND WORKING	3.83	FLEISCHLI OIL CO	0	70	0.00	0	0	96MF0969
081	0234	VOC	CONDENSATE TANK	4.00	THOMAS OPERATING CO. - KLAENHAMMER #2	0	70	0.00	0	0	04MF0325
081	0236	VOC	CONDENSATE TANK	4.00	THOMAS OPERATING CO. - PTASYNSKI #3	0	70	0.00	0	0	04MF0327
081	0257	VOC	CONDENSATE TANK	4.02	WESTERN GAS RESOURCES - EVANS 41-29	0	70	0.00	0	0	04MF0565
081	0275	VOC	CONDENSATE TANK	4.20	WEXPRO CO - W.B. LASHER #7	0	70	0.00	0	0	05MF0326
081	0138	VOC	N SIDE COMP PEC GLY DEHY	4.90	QUESTAR GAS MANAGEMENT CO	0	70	0.00	0	0	
081	0260	VOC	CONDENSATE TANKS	4.92	SEMCRUDE L.P. - ILES GROVE	0	70	0.00	0	0	04MF0975
081	0167	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	5.00	CHEVRON USA, INC. - DUNCAN 3-2	0	70	0.00	0	0	02MF0306
081	0204	VOC	CONDENSATE STORAGE TANKS	5.07	PALADIN ENERGY - FEDERAL #28-11	0	70	0.00	0	0	
081	0274	VOC	CONDENSATE TANK	5.08	WESTERN GAS RES. - EVANS FEDERAL 43-28	0	70	0.00	0	0	GP01-WGRI
081	0200	VOC	CONDENSATE TANK	5.11	WESTERN GAS RESOURCES - FEDERAL 1-43-32	0	70	0.00	0	0	
081	0092	VOC	3 GASOLINE TANKS	5.29	SIMONS PETROLEUM, INC	0	70	0.00	0	0	96MF155
081	0193	VOC	CONDENSATE TANK	5.54	CHEVRON USA - DUNCAN VAN SCHAIK 1-2	0	70	0.00	0	0	
081	0156	VOC	JW WILIAMS GLYCOL DEHYDRATOR	5.72	TRUE OIL LLC - BTA FEDERAL #12-33	0	70	0.00	0	0	00MF0096
081	0086	VOC	FILLING	5.96	FLEISCHLI OIL CO	0	70	0.00	0	0	96MF0969
081	0188	VOC	P&A GLYCOL DEHYDRATOR	6.00	CHEVRON USA - DYER B #2	0	70	0.00	0	0	03MF0144
081	0184	VOC	PESCO DEHYDRATOR	6.00	CHEVRON USA - DUNCAN B #5	0	70	0.00	0	0	03MF0140
081	0182	VOC	PESCO GLYCOL DEHYDRATOR	6.00	CHEVRON USA - DUNCAN UNIT 2 #2	0	70	0.00	0	0	03MF0138
081	0189	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	6.00	CHEVRON USA - DYER C #2	0	70	0.00	0	0	03MF0145
081	0270	VOC	CONDENSATE TANK	6.03	WEXPRO COMPANY - W.B. LASHER #8	0	70	0.00	0	0	GP01-WEXPRO
081	0212	VOC	CONDENSATE STORAGE TANK	6.27	WEXPRO - POWDER WASH UNIT (TANK 315)	0	70	0.00	0	0	
081	0233	VOC	CONDENSATE TANK	6.50	THOMAS OPERATING CO. - KLAENHAMMER #1	0	70	0.00	0	0	04MF0324
081	0049	VOC	CONDENSATE TRUCK UNLOADING	6.60	QUESTAR GAS MANAGEMENT COMPANY	0	70	0.00	0	0	
081	0199	VOC	CONDENSATE TANK	6.60	WESTERN GAS RESOURCES - FEDERAL 1-23-33	0	70	0.00	0	0	
081	0265	VOC	EQUIPMENT VOC LEAKS	6.70	PLAINS MARKETING LP - BUCK PEAK STATION	0	70	0.00	0	0	04MF0104
081	0215	VOC	CONDENSATE STORAGE TANK	6.90	WEXPRO - POWDER WASH UNIT (TANK 422)	0	70	0.00	0	0	
081	0271	VOC	CONDENSATE STORAGE TANK	6.94	WEXPRO CO - W.B. LASHER #9	0	70	0.00	0	0	GP01-WEXPRO
081	0248	VOC	CATERPILLAR, G379-SI-TA-HCR RATED AT 405 HP	7.00	CEDAR RIDGE LLC - CF&8 CORP. #1	0	70	0.00	0.03	14	04MF0467
081	0213	VOC	CONDENSTAE STORAGE TANKS	7.06	WEXPRO - POWDER WASH (TANKS 356 & 357)	0	70	0.00	0	0	
081	0194	VOC	CONDENSATE TANK	7.64	CHEVRON USA - DUNCAN VAN SCHAIK 1-3 & 1-	0	70	0.00	0	0	
081	0277	VOC	HANOVER GLYCOL DEHYDRATOR	7.70	YATES PETROLEUM CORPORATION-BAKERS PEAK	0	70	0.00	0	0	05MF0552
081	0211	VOC	CONDENSATE STORAGE TANK	7.85	WEXPRO - POWDER WASH UNIT (TANK 300)	0	70	0.00	0	0	
081	0208	VOC	CONDENSATE STORAGE TANK	7.95	WEXPRO - POWDER WASH UNIT (TANK 329)	0	70	0.00	0	0	
081	0175	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	8.00	CHEVRON USA, INC. - DUNCAN B-12	0	70	0.00	0	0	03MF0136
081	0195	VOC	CONDENSATE TANK	8.20	CHEVRON USA - DUNCAN B-11	0	70	0.00	0	0	
081	0203	VOC	CONDENSATE STORAGE TANKS	8.71	PALADIN ENERGY - FEDERAL #28-7	0	70	0.00	0	0	
081	0240	VOC	CONDENSATE TANK	8.75	THOMAS OPERATING CO.- USA JOYCE WOLF #2	0	70	0.00	0	0	04MF0331
081	0239	VOC	CONDENSATE TANKS	8.75	THOMAS OPERATING CO. - JOYCE WOLF	0	70	0.00	0	0	04MF0330
081	0230	VOC	CONDENSATE TANK	8.76	CHEVRON USA, INC. (MO) - DUNCAN B-13	0	70	0.00	0	0	04MF0087
081	0191	VOC	JW WILLIAMS DEHYDRATOR	9.00	CHEVRON USA - VAN SCHAIK UNIT #4	0	70	0.00	0	0	03MF0147
081	0164	VOC	JW WILLIAMS NATURAL GAS FIRED REBOILER GLYCOL DEHY	9.00	CHEVRON USA, INC. - VAN SCHAICK A-6	0	70	0.00	0	0	02MF0131

Table 7. Colorado Included Permitted Industrial Sources (concluded).

county fips	site id	pollutant code	emission process description	proc emis estim (tpy)	facility name	exit gas flow rate (acfm)	exit gas temp (F)	exit gas velocity (ft per s)	stack diam (ft)	stack height (ft)	construction permit number
081	0273	VOC	HANOVER GLYCOL DEHYDRATOR, SN: CW1001	9.10	YATES PETROLEUM - BAKERS PEAK UNIT #2	0	70	0.00	0	0	05MF0264
081	0276	VOC	J.W. WILLIAMS GLYCOL DEHYDRATOR	9.10	CHEVRON USA, INC. - VAN SCHAICK A-7	0	70	0.00	0	0	05MF0545
081	0277	VOC	CONDENSATE TANK	9.16	YATES PETROLEUM CORPORATION-BAKERS PEAK	0	70	0.00	0	0	05MF0553
081	0198	VOC	CONDENSATE TANK	9.24	WESTERN GAS RESOURCES - EVANS 44-29	0	70	0.00	0	0	
081	0231	VOC	JW WILLIAMS GLYCOL DEHYDRATOR COMO UNIT	9.80	CHEVRON USA, INC. - DUNCAN 2-5	0	70	0.00	0	0	04MF0187
081	0230	VOC	J.W.WILLIAMS GLYCOL DEHYDRATOR	9.80	CHEVRON USA, INC. (MO) - DUNCAN B-13	0	70	0.00	0	0	04MF0086
081	0147	VOC	CE NATCO SN: 6214	9.90	CHEVRON USA, INC. - DUNCAN 1-3	0	70	0.00	0	0	96MF515
081	0183	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	10.00	CHEVRON USA - DUNCAN UNIT 2 #4	0	70	0.00	0	0	03MF0139
081	0166	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	10.00	CHEVRON USA, INC. - HIAWATHA B-3	0	70	0.00	0	0	02MF0282
081	0171	VOC	CONDENSATE STORAGE TANKS	10.00	ROCKY MOUNTAIN NATURAL GAS-BLUE GRAVEL	0	70	0.00	0	0	03MF0015
081	0163	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	10.00	CHEVRON USA, INC. - DUNCAN 1-5	0	70	0.00	0	0	02MF0130
081	0256	VOC	CONDENSATE TANKS	10.04	WESTERN GAS RESOURCES - FEDERAL 24-21	0	70	0.00	0	0	04MF0564
081	0031	VOC	TRIETHYLENE GLYCOL DEHYDRATOR	10.34	CHEVRON USA, INC. - VAN SCHAICK A-3	0	70	0.00	0	0	02MF0532
081	0067	VOC	GLYCOL DEHYDRATOR	10.40	QUESTAR GAS MGMT CO W HIAWATHA COMP STA	0	70	0.00	0	0	95MF922-1
081	0202	VOC	CONDENSATE STORAGE TANKS	10.45	PALADIN ENERGY - FEDERAL #28-3	0	70	0.00	0	0	
081	0281	VOC	JW WILLIAMS GLYCOL DEHYDRATOR, SN: 9100	10.64	CHEVRON USA- DUNCAN B-15	0	70	0.00	0	0	05MF0786
081	0243	VOC	CONDENSATE TANKS	10.70	NEXEN -- ILES DOME PUMP STATION	0	70	0.00	0	0	04MF0346
081	0197	VOC	CONDENSATE TANK	10.86	WESTERN GAS RESOURCES - EVANS 24-28	0	70	0.00	0	0	
081	0181	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	11.00	CHEVRON USA - DUNCAN UNIT 1 #4	0	70	0.00	0	0	03MF0137
081	0180	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	11.00	CHEVRON USA - DUNCAN 1-6	0	70	0.00	0	0	03MF0135
081	0192	VOC	PESCO DEHYDRATOR	11.00	CHEVRON USA - VAN SCHAIK UNIT #5	0	70	0.00	0	0	03MF0148
081	0186	VOC	PESCO DEHYDRATOR	11.00	CHEVRON USA - DUNCAN B #10	0	70	0.00	0	0	03MF0142
081	0255	VOC	CONDENSATE TANK	11.00	WESTERN GAS RESOURCES - EVANS FED. 22-28	0	70	0.00	0	0	04MF0563
081	0179	VOC	CONDENSATE TANK	11.72	MERRION OIL & GAS - NIGHTINGALE NO. 1	0	70	0.00	0	0	
081	0187	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	12.00	CHEVRON USA - DUNCAN B #11	0	70	0.00	0	0	03MF0143
081	0214	VOC	CONDENSATE STORAGE TANK	12.60	WEXPRO - POWDER WASH UNIT (TANK 438)	0	70	0.00	0	0	
081	0159	VOC	TWO GLYCOL DEHYDRATORS	13.70	CHEVRON USA, INC. - DUNCAN 3-3	0	70	0.00	0	0	00MF0511
081	0264	VOC	JW WILLIAMS GLYCOL DEHYDRATOR, SN: 426/1	13.90	QUESTAR EXPLORATION - IRISH CREEK 11-21	0	70	0.00	0	0	04MF1089
081	0206	VOC	CONDENSATE STORAGE TANK	16.12	WEXPRO - EAST HIAWATHA MOSU (TANK 344)	0	70	0.00	0	0	
081	0162	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	16.20	CHEVRON USA, INC. -DUNCAN VANSCHAICK 1-3	0	70	0.00	0	0	02MF0056
081	0210	VOC	CONDENSATE STORAGE TANK	16.47	WEXPRO - POWDER WASH UNIT (TANK 1475)	0	70	0.00	0	0	
081	0201	VOC	CONDENSATE TANK	18.99	WESTERN GAS RESOURCES - SMITH 1-35	0	70	0.00	0	0	
081	0153	VOC	ENERTEK DEHYVENT-1	19.30	WESTERN GAS RESOURCES INC SAND WASH STA	0	70	0.00	0	0	97MF0651
081	0153	VOC	ENERTEC DEHYVENT-2	19.30	WESTERN GAS RESOURCES INC SAND WASH STA	0	70	0.00	0	0	97MF0652
081	0158	VOC	TWO GLYCOL DEHYDRATORS	20.12	CHEVRON USA, INC. - VAN SCHAICK A-5	0	70	0.00	0	0	00MF0510
081	0049	VOC	GLYCOL DEHYDRATOR	23.28	QUESTAR GAS MANAGEMENT COMPANY	0	70	0.00	0	0	GRAND.000007
081	0219	VOC	CONDENSATE STORAGE TANKS	25.90	NANCE PETROLEUM CORP - VOLOSHIN-MORTON #	0	70	0.00	0	0	
081	0235	VOC	CONDENSATE TANK	27.50	THOMAS OPERATING CO. - KLAENHAMMER #3A	0	70	0.00	0	0	04MF0326
081	0217	VOC	CONDENSATE STORAGE TANK	29.05	WEXPRO - SUGARLOAF SCRUBBER (TANK 168)	0	70	0.00	0	0	
081	0148	VOC	CUSTOM GLYCOL DEHYDRATOR	32.00	J-W OPERATING COMPANY -SAND HILLS	0	70	0.00	0	0	99MF0798
081	0196	VOC	JW WILLIAMS GLYCOL DEHYDRATOR	38.69	CHEVRON USA, INC. - VAN SCHAIK C-10	0	70	0.00	0	0	03MF0203
081	0207	VOC	CONDENSATE STORAGE TANK	46.17	WEXPRO - EAST HIAWATHA MOSU (TANK 923)	0	70	0.00	0	0	
081	0218	VOC	CONDENSATE STORAGE TANKS	46.71	NANCE PETROLEUM CORP - NOLAND #1-15	0	70	0.00	0	0	
081	0049	VOC	CONDENSATE TANKS	47.20	QUESTAR GAS MANAGEMENT COMPANY	0	70	0.00	0	0	
081	0205	VOC	CONDENSATE STORAGE TANK	56.86	WEXPRO - EAST HIAWATHA MOSU (TANK 779)	0	70	0.00	0	0	
081	0220	VOC	CONDENSATE STORAGE TANKS	85.52	NANCE PETROLEUM CORP - KOWACH #1-9	0	70	0.00	0	0	06MF0345
103	0010	108883	OIL & GAS CUSTOM GLYCOL DEHYDRATOR	2.50	CHEVRON USA - WILSON CREEK GAS PLT	0	70	0.00	0	0	03RB0385
103	0014	PM10	B-MINE VENTILATION VENT	5.73	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	00RB0283
103	0014	PM10	COAL HAULING	837.18	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	03RB0569F
103	0014	PM10	COAL STOCKPILE	12.81	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	03RB0570
103	0014	PM10	HOPPER-LOADING	2.10	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	03RB0570
103	0014	PM10	RAILCAR LOADING	3.54	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	03RB0570
103	0014	PM10	COAL STOCKPILES	1.68	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	12RB802-2
103	0014	PM10	CRUSHER-HOPPER LOADING	1.75	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	12RB802-2
103	0014	PM10	LOADING TO TRUCK LOADOUT	2.10	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	12RB802-2
103	0014	PM10	TRUCK LOADING	3.54	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	12RB802-2
103	0014	PM10	REFUSE HAUL ROAD	24.97	BLUE MOUNTAIN ENERGY - DESERADO MINE	0	70	0.00	0	0	12RB802-3F
103	0010	VOC	EQUIPMENT LEAKS IN NATURAL GAS	11.70	CHEVRON USA - WILSON CREEK GAS PLT	0	0	0.00	0	0	94RB192-1
103	0010	VOC	CONDENSATE STORAGE TANK	15.55	CHEVRON USA - WILSON CREEK GAS PLT	0	70	0.00	0	0	02RB1010
103	0224	VOC	CONDENSATE TANK	21.90	TEXACO E & P - WILSON CREEK UNIT 66 TANK	0	70	0.00	0	0	
103	0010	VOC	OIL & GAS CUSTOM GLYCOL DEHYDRATOR	18.60	CHEVRON USA - WILSON CREEK GAS PLT	0	70	0.00	0	0	03RB0385
103	0010	VOC	CRUDE OIL: TANK TRUCK LOADING	19.55	CHEVRON USA - WILSON CREEK GAS PLT	0	70	0.00	0	0	03RB0234
107	0075	CO	CATERPILLAR DIESEL ENGINE	5.71	DUCKELS CONST INC - HOGUE GRAVEL PIT	0	70	0.00	0	0	06RO0252
107	0075	NO2	CATERPILLAR DIESEL ENGINE	21.48	DUCKELS CONST INC - HOGUE GRAVEL PIT	0	70	0.00	0	0	06RO0252
107	0009	PM10	4 MINE VENT FANS (PORTAL)-ACFM	11.07	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0009	PM10	OUTSIDE COAL CRUSHING	1.25	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0013	PM10	FUGITIVES	70.00	HAYDEN GULCH TERMINAL INC	0	70	0.00	0	0	05RO0020
107	0013	PM10	NON-FUGITIVE	1.02	HAYDEN GULCH TERMINAL INC	0	70	0.00	0	0	05RO0020
107	0009	PM10	COAL STOCKPILES	1.51	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0071	PM10	FUGITIVE EMISSIONS	1.05	TRANS COLO CONCRETE	0	70	0.00	0	0	90RO192
107	0009	PM10	DOZER ACTIVITY	36.58	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0080	PM10	GRAVEL PIT	4.07	ED HOCKIN TRUCKING, INC.	0	70	0.00	0	0	01RO0299
107	0009	PM10	FRONT END LOADERS MOVEMENT	2.42	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	
107	0009	PM10	HAUL ROADS	47.55	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0075	PM10	FUGITIVE DUST ACTIVITIES	3.42	DUCKELS CONST INC - HOGUE GRAVEL PIT	0	70	0.00	0	0	99RO0342F
107	0057	PM10	LANDFILL OPERATIONS	16.92	TWIN LANDFILL CORP. - MILNER LANDFILL	0	70	0.00	0	0	02RO0124
107	0009	PM10	LOW QUALITY COAL	8.00	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0009	PM10	WASTE ROCK LOADNG/UNLOADG	2.31	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0009	PM10	MAIN RAIL LOADOUT	5.25	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0081	PM10	FUGITIVE EMISSIONS	8.00	LAFARGE WEST, INC - RIVER VALLEY RESOURC	0	70	0.00	0	0	03RO0044F
107	0079	PM10	FUGITIVE EMISSIONS	15.02	PRECISION EXCAVATING, INC.	0	70	0.00	0	0	00RO0741F
107	0009	PM10	PRIMARY COAL CRUSHER	1.88	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0009	PM10	SCREEN - COAL WASH PLANT	1.00	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0009	PM10	SCREENING AT SECDRY CRSHR	11.70	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0009	PM10	SECONDARY COAL CRUSHER	6.00	TWENTYMILE COAL CO.- FOIDEL CREEK	0	70	0.00	0	0	93RO1204
107	0018	PM10	TOP SOIL, OVERBURDEN COAL-FUGITIVE EMISSIONS	180.00	SENECA COAL CO SENECA II W	0	70	0.00	0	0	82RO258F
107	0024	PM10	CONVEYORS/TRANSFER POINTS	3.31	LAFARGE WEST, INC. - STEAMBOAT SOUTH PIT	0	70	0.00	0	0	87RO030F
107	0024	PM10	SAND AND GRAVEL OPERATION	19.74	LAFARGE WEST, INC. - STEAMBOAT SOUTH PIT	0	70	0.00	0	0	87RO030F
107	0058	VOC	VAPOR LOSS W/O CONTROLS	2.26	BEAR RIVER VALLEY FARMERS COOP	0	70	0.00	0	0	02RO0072S
107	0057	VOC	LANDFILL OPERATIONS	1.85	TWIN LANDFILL CORP. - MILNER LANDFILL	0	70	0.00	0	0	02RO0124