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APPENDIX E PIPELINE AIR QUALITY MODELING REPORT

Alaska LNG

MAIN PIPELINE COMPRESSOR STATIONS FERC AIR QUALITY MODELING REPORT

USAP-PE-SRZZZ-00-000003-000



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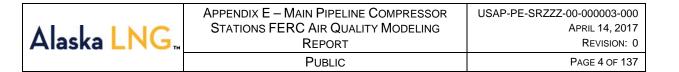
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1.0 INTRODUCTION

The purpose of this Federal Energy Regulatory Commission (FERC) Air Quality Modeling Report (Report) is to (1) outline the methodologies used to conduct the air dispersion modeling analysis required by the FERC for the Mainline compressor stations, and (2) provide the modeling analysis results. The methodologies used for the analysis are generally consistent with modeling procedures outlined in the Alaska Department of Environmental Conservation (ADEC) and the U.S. Environmental Protection Agency (EPA) air dispersion modeling guidance documents. The results of the air dispersion model analysis demonstrate that the Main Pipeline compressor stations will not cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS).

Note that this modeling analysis reflects the preliminary compressor station design parameters. The modeling and modeling report will be revised if the final design parameters (equipment, stack parameters, etc.) differ from the preliminary parameters.



2.0 FACILITY DESCRIPTION

Draft Resource Report No. 1 provides the project description for the new facilities. The facility description provided below addresses the Mainline and its associated compressor, heater, and meter stations.

A new 42-inch-diameter natural gas pipeline (Mainline) approximately 804 miles in length would extend from the Liquefaction Facility to the Gas Treatment Plant (GTP) in the Prudhoe Bay Unite (PBU), including the structures, equipment, and all other associated systems. The proposed design anticipates up to eight compressor stations; one standalone heater station, one heater station collocated with a compressor station, and six cooling stations associated with six of the compressor stations; four meter stations; 53 Mainline block valves (MLBVs); one pig launcher facility at the GTP meter station, one pig receiver facility at the Nikiski meter station, and combined pig launcher and receiver facilities at each of the compressor stations; and associated infrastructure facilities.

Each of the eight compressor stations are anticipated to trigger the minor air quality control permit requirements under 18 Alaska Administrative Code Chapter (AAC) 50.502(c)(1). In contrast to the Main Pipeline compressor stations, the potential emissions from the heating station and metering stations are anticipated to be below the minor air quality permitting thresholds under 18 AAC 50.502(c)(1). As a result, this model analysis report does not include those facilities.

Table 1 provides a list of the significant emission units planned for each compressor station configuration.

Figure 1 shows a map that depicts the proposed compressor station locations. Additional detailed maps of each compressor station are provided in Appendix A of this report.

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Figure 1: Compressor Station Location Map





Station	Station Type	Major Equipment (Number of Units)
Sagwon Compressor Station	Multi-Unit with Cooling	Gas Turbine Compressors (3) Power Generators (3) Auxiliary Utility Glycol Heaters (4) Waste Incinerator (1)
Galbraith Lake, Coldfoot, Ray River, Minto, and Healy Compressor Stations	Single-Unit with Cooling	Gas Turbine Compressor (1) Power Generators (3) Auxiliary Utility Glycol Heaters (3) Waste Incinerator (1)
Honolulu Creek Compressor Station	Single Unit without Cooling	Gas Turbine Compressor (1) Power Generators (2) Auxiliary Utility Glycol Heaters (3) Waste Incinerator (1)
Rabideux Creek Compressor Station	Single Unit with Heaters	Gas Turbine Compressor (1) Power Generators (2) Auxiliary Utility Glycol Heaters (3) Indirect Fired Gas Heaters (5) Waste Incinerator (1)

Table 1: Compressor Station Emission Unit Inventory

3.0 FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Under the Clean Air Act (CAA), the EPA has set NAAQS for the following pollutants:

- Nitrogen dioxide (NO₂);
- Particulate matter having an aerodynamic diameter of 10 microns or less (PM₁₀);
- Particulate matter having an aerodynamic diameter of 2.5 microns or less (PM_{2.5});
- Sulfur dioxide (SO₂);
- Carbon monoxide (CO);
- Ozone (O₃);
- Lead (Pb).

EPA has identified two types of standards. Primary standards have been established to protect public health with attention given to protecting sensitive populations such as the elderly or asthmatics. Secondary standards focus on public welfare protection and include items such as reducing visibility impairment and preventing damage to crops, livestock, and vegetation. All criteria pollutants have both a primary and secondary standard, except for CO. The State of Alaska adopted the federal NAAQS as Alaska Ambient Air Quality Standards (AAAQS) and established state ambient standards for two other air pollutants, reduced sulfur compounds and ammonia, under 18 AAC 50.010. ADEC has yet to revise the annual PM_{2.5} AAAQS to the same level as the primary annual PM_{2.5} NAAQS (12 μ g/m³) promulgated in December 2012. Table 2 provides a summary of the current NAAQS and AAAQS for comparison.

Air Pollutant	Averaging Period	NAAQS	AAAQS
Nitrogen Dioxide	1-Hour ¹ Annual	100 ppbv 53 ppbv	188 μg/m ³ 100 μg/m ³
Particulate Matter less than 10 Microns	24-Hour ²	150 μg/m ³	150 µg/m ³
Particulate Matter less than 2.5 Microns	24-Hour ¹ Annual ³	35 μg/m ³ 12 μg/m ³	35 μg/m ³ 15 μg/m ³
Sulfur Dioxide	1-Hour ⁴ 3-Hour ² 24-Hour ² Annual	75 ppbv 0.5 ppbv 	196 µg/m ³ 1,300 µg/m ³ 365 µg/m ³ 80 µg/m ³
Carbon Monoxide	1-Hour ² 8-Hour ² Annual	35 ppmv 9 ppmv 53 ppmv	40 mg/m ³ 10 mg/m ³ 100 mg/m ³
Ozone	8-Hour⁵	0.075 ppmv	0.075 ppmv
Lead	Rolling 3 Month Average	0.15 μg/m ³	0.15 μg/m ³
Ammonia	8-Hour ²		2.1 mg/m ³
Reduced Sulfur Compounds	30-Minute ⁶		50 μg/m ³

Table 2: National and Alaska Ambient Air Quality Standards

Sources: EPA 2015; ADEC 2015

Abbreviations:

---: Not Applicable µg/m3 = micrograms per cubic meter mg/m3 = milligrams per cubic meter ppbv = parts per billion by volume ppmv = parts per million by volume

¹ Standard is attained when the 3-year average of the 98th percentile of the distribution of daily maximum values is less than the standard.

² Second-highest average concentration not to be exceeded more than once in a year.

³ Annual PM2.5 primary standard is 12 μ g/m3; secondary standard is 15 μ g/m3.

⁴ Standard is attained when the 3-year average of the 99th percentile of the distribution of daily maximum values is less than 75 ppb, or 196 µg/m3.

⁵ Three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration.

⁶ Standard is referenced to sulfur dioxide and is not to be exceeded more than once per year.



4.0 BACKGROUND AIR QUALITY

Background ambient air quality data are required in a cumulative impact analysis to represent the contribution of ambient air pollutant levels from non-modeled sources. Background ambient air quality data collected at sites representative of the compressor stations were reviewed to establish background concentration values for each modeled pollutant at each compressor station. Tables 3-1 and 3-2 show the proposed background ambient air concentrations and the ambient air monitoring station locations and periods of record for each compressor station location, respectively. The information in these tables may be updated based on further review of available and applicable ambient air quality monitoring data.

lab	le 3: Ar	nbient A	ir Backo	ground	Concentr	ations f	or Proje	ect Com	oressor	Stations				
		Measured Background Concentration (µg/m³)												
	1	NO ₂		PM _{2.5}		со		SO ₂						
cs	1- Hour	Annual	24- Hour ¹	24- Hour ²	Annual ³	1- Hour⁴	8- Hour⁴	1- Hour⁵	3- Hour⁵	24- Hour ⁶	Annual			
Sagwon					2.3		458	5.2		5.4				
Galbraith Lake			35.6	7.1		573								
Coldfoot	61.2 ⁷	2.5	38.3	11.8	2.8						0.5			
Ray River														
Minto				10.2	2.4				6.2					
Healy														
Honolulu Creek	15.5 ⁸	1.9 ⁹	18.8	6.7	1.5	7,962	5,041							
Rabideux Creek]		33.4	5.6	1.7									

Table 3: Ambient Air Background Concentrations for Project Compressor Stations

¹ The background 24-hour PM10 value is represented by the highest first-high (H1H) 24-hour average concentration measured during the monitoring period.

² The background 24-hour PM2.5 value is represented by the 98th-percentile of the annual distribution of 24-hour PM2.5 concentrations measured during the monitoring period. If three years of data are available, the background 24-hour PM2.5 value is represented by the 3-year average of the 98th-percentile of the annual distributions of 24-hour PM2.5 concentrations.

³ For monitoring sites with three years of PM2.5 data, the annual PM2.5 background value is represented by maximum annual average PM2.5 concentration collected during the three-year period.

⁴ The background short-term average CO values are represented by the H1H 1-hour and 8-hour average CO concentrations measured during the monitoring period.

⁵ The background 1-hour SO2 value is represented by the 99th-percentile of the annual distribution of daily maximum 1-hour SO2 concentrations.

⁶ The background 3-hour and 24-hour average SO2 values are represented by the H1H 3-hour and 24-hour average SO2 concentrations measured during the monitoring period.

⁷ The background 1-hour NO2 value is represented by the 98th-percentile of the annual distribution of daily maximum 1-hour NO2 concentrations.

⁸ The background 1-hour NO2 value is represented by the two-year average of the 98th-percentile of the annual distribution of daily maximum 1-hour NO2 concentrations.

⁹ The background annual NO2 value is represented by the maximum annual average NO2 concentration collected during two discrete one-year monitoring periods.



	Representative Ambient Air Monitoring Station Locations and Periods of Record										
CS	NO2	PM10	PM2.5	СО	SO						
Sagwon Galbraith Lake		Linc Ener Umia 7/1/13 –	t, AK								
Coldfoot	Linc Energy LLC.	National Park Service		Linc Energy LLC.							
Ray River	Umiat, AK 7/1/13 – 6/30/14	(NPS) Gates of the Arctic	Tower Hills Mine	Umiat, AK 7/1/13 – 6/30/14							
Minto		IMPROVE Livengood, AK Bettles, AK 1/9/11 – 1/8/12			Linc Energy						
Healy		National Park S	Service (NPS)		Umiat, AK						
Honolulu Creek	Donlin Creek, LLC Donlin Gold Project ~16 mi north of	Denali National Pa IMPR Denal 1/1/12 - 1	OVE i, AK	Municipality of Anchoarge Garden Site	7/1/13 – 6/30/1						
Rabideux Creek	Crooked Creek, AK 12/1/10 – 11/30/11 4/17/12 – 4/16/13	National Park S Trapper IMPR Trapper C 1/1/12 – 1	Creek OVE reek, AK	Anchorage, AK 1/1/12 – 12/31/14							



5.0 MODELING METHODOLOGY

This section summarizes the modeling methodology used to analyze potential impacts from the operation of the compressor stations.

5.1 MODEL SELECTION

EPA-approved dispersion models AERMOD and AERSCREEN (version 14134) were used to estimate maximum ground-level pollutant concentrations for this analysis. AERSCREEN is an EPA-recommended screening model that interfaces with the MAKEMET program (version 09183) to generate a site-specific matrix of meteorological conditions and with the EPA-approved AERMOD model to execute screening model runs (EPA, 2011a and 2011c). AERSCREEN is recommended for use in modeling single-source emissions, but can also be used for assessing impacts from projects with multiple emission sources if the modeled impacts from each emission source are adequately overlaid. AERSCREEN also interfaces with the AERMOD terrain pre-processor, AERMAP, and Building Profile Input Program with Plume Rise Model Enhancements (BPIPPRM) to model the effects of building downwash on the dispersion of emissions. In addition, the AERSURFACE model (version 08009) was used to process land use and land cover (LULC) data to develop surface characteristic inputs used to generate meteorology parameters in AERSCREEN.

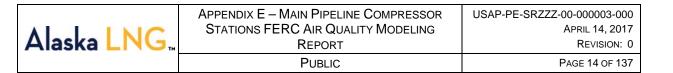
AERSURFACE cannot be used for modeling sources located in Alaska without modifying the AERSURFACE code. First, the AERSURFACE algorithms will only process 1992 National Land Cover Data (NLCD92) LULC data, and the NLCD92 database is not available for most of Alaska. Second, the AERSURFACE algorithms that convert study center coordinates, input as either Universal Transverse Mercator (UTM) or longitude/latitude coordinates, to Albers Conic Equal Area projection coordinates are specific to the continental United States. Therefore, the AERSURFACE model code was modified to obtain surface characteristics from available Alaska NLCD 2001 LULC data and to convert study center coordinates to Alaska Albers Conic Equal Area coordinates. In addition, the AERSURFACE code was modified to allow for monthly moisture assignments because the AERSURFACE code is designed to assign one surface moisture classification to all months of the modeling period. Appendix B contains additional detail about the AERSURFACE model provides appropriate surface characteristics.

5.2 METEOROLOGICAL DATA

Meteorological data for the screening model analyses were generated with the MAKEMET preprocessor using two different approaches. Appendix C contains detailed information about the methodologies used to prepare screening meteorological data.

For modeling short-term average impacts, the AERMOD model was used with screening meteorological data, but outside of the AERMOD screening mode. All model runs executed in this mode were configured to output the maximum 1-hour pollutant averages, which provide a conservative representation of all short-term (e.g., 3-hour, 8-hour, and 24-hour) average pollutant concentrations. This methodology ensures that the maximum short-term pollutant impacts were appropriately characterized, particularly for a screening model analysis of multiple emission point sources that are dispersed relative to adjacent model receptors.

For modeling annual average impacts, AERSCREEN was used to interface with AERMOD in screening mode and the maximum modeled 1-hour average concentrations were converted to annual averages using the AERSCREEN scaling factor of 0.1. When run in screening mode,



AERMOD assumes all model receptors are located along the plume centerline of each source and, therefore, the use of the AERSCREEN scaling factors is appropriate.

Because two different methodologies were used for modeling short-term and annual impacts, the maximum short-term concentration may occur at a different model receptor than the maximum annual concentration for the same pollutant.

5.3 ELEVATION DATA

Digital elevation datasets were obtained from the National Elevation Dataset (NED) and used as input to the latest version of AERMAP (version 11103). NED 2 arc second data were used for the Sagwon, Galbraith Lake, Coldfoot, and Ray River compressor stations because higher resolution data were not available. NED 1 arc second data were used for Minto, Healy, Honolulu Creek, and Rabideux Creek.

Each proposed compressor station location will be graded and the NED elevation data had to be modified to reflect the appropriate site elevations. Geographical Information System (GIS) software¹ was used to modify the NED elevation data input to AERMAP to account for the grading of the proposed compressor station sites. Compressor stations installed over permafrost (Sagwon, Galbraith Lake, Coldfoot, Ray River, Minto, and Healy) will be graded with fill only and Honolulu Creek and Rabideux Creek will be graded using cut and fill methods.

5.4 RECEPTOR GRIDS

EPA defines ambient air as that portion of the atmosphere, external to buildings, to which the general public has access (40 CFR 50). For the purpose of modeling source emissions, the area to which the facility owner or operator controls public access is not ambient air. Therefore, model receptors were placed along each compressor station fenceline to represent the ambient air boundary.

Pollutant concentrations were modeled within five Cartesian receptor grids centered on each compressor station. The receptor fields were referenced to North American Datum of 1983 (NAD83) UTM coordinates and consisted of a set of nested receptor grids developed to capture maximum modeled impacts. The receptor grids utilized for the modeling analyses include:

- A fenceline receptor field consisting of receptors spaced 25 meters (m) apart along each compressor station ambient air boundary.
- A near receptor field consisting of receptors spaced 25 m apart and extending outward from the ambient air boundary to a distance of approximately 100 meters.
- A mid receptor field consisting of receptors spaced 100 m apart and extending outward from the ambient air boundary to a distance of 1 kilometer (km).
- A far receptor field consisting of receptors spaced 250 m apart and extending outward from the ambient air boundary to distances of approximately 1 to 5 km.
- A coarse receptor field consisting of receptors spaced 500 m apart and extending outward from the ambient air boundary to distances of approximately 5 to 10 km.

Appendix D contains diagrams that show the receptor grids used for each compressor station.

¹ Global Mapper v. 16 from Blue Marble Geographics.

5.5 BUILDING DOWNWASH AND STACK HEIGHT

The modeling analysis followed the guidance provided in the EPA Guidelines for Determination of Good Engineering Practice Stack Height (EPA-450/4-80-023R, June 1985). Direction-specific building downwash dimensions for use as modeling inputs were calculated using BPIPPRM, version 04274. Building coordinates and heights for each structure that could influence a modeled emission unit were entered into BPIPPRM. The output dimensions were used to ensure that no stack exceeds good engineering practice (GEP) stack height and to provide the direction-specific downwash dimensions to AERSCREEN.

5.6 **EMISSION SOURCES**

This section describes the emission source data, including stack parameters used in this analysis. All emission units were modeled as vertical and uncapped point sources and all point source locations were referenced to NAD83 UTM coordinates.

5.6.1 Source Parameters and Emission Rates

The eight compressor stations that were modeled were divided into the four station types, as described in Section 1.1. Table 5 provides a summary of the annual potential emissions for each type of compressor station. Appendix E contains detailed emission rates and stack parameters for each compressor station emission unit. Appendix F contains emission calculations for each compressor station type.

Pollutant	Multiple Turbine C S [Sagwon]	Single Turbine C S w/ Cooling [Galbraith Lake, Coldfoot, Ray River, Minto, and Healy Compressor Stations]	Single Turbine C S w/o Cooling [Honolulu Creek]	Single Turbine C S w/ Cooling and Heaters [Rabideux Creek]	
NO _x	93.05	66.70	60.04	62.36	
СО	107.38	80.63	67.31	72.42	
SO2	0.79	0.54	0.52	0.55	
PM/PM ₁₀ /PM _{2.5} ¹	21.12	14.66	13.76	14.24	

Table 5: Compressor Station Total Emission Rates (tons/years)

5.6.2 Modeled Scenarios

The compressor stations will typically operate at or near full load. Therefore, only emission rates and stack gas exit temperatures and velocities at full load were modeled. Partial load scenarios were not modeled because the compressor stations are not designed to operate at loads significantly less than 100 percent load at site conditions. A partial load scenario may be possible during reduced gas throughput conditions; however, during reduced gas throughput one or more compressor stations are anticipated to be shut down in order to maintain the operating efficiencies of the other stations at or near full load.

Only two of the three turbines at Sagwon are anticipated to operate concurrently for any sustained period during normal operations. Therefore, all three possible operating scenarios were modeled as shown below:

¹ Potential PM₁₀ and PM_{2.5} emissions are conservatively assumed to equal potential PM emissions.



- Scenario 1: Concurrent operation of Turbines 1 and 2
- Scenario 2: Concurrent operation of Turbines 2 and 3
- Scenario 3: Concurrent operation of Turbines 1 and 3

5.7 NO₂ MODELING APPROACH

The NAAQS and AAAQS for nitrogen oxides (NO_X) are expressed in terms of NO₂. For modeling purposes, additional calculations and modeling approaches are used to determine NO₂ impacts from modeled NO_X emissions. Two approaches that can be used to account for the conversion of NO_x to NO₂ from the reaction with ambient ozone (O₃) concentrations are the Plume Volume Molar Ratio Method and the Ozone Limiting Method (OLM). For this analysis, the OLM approach was used in accordance with the EPA guidance memos, *Applicability of Appendix W Modeling Guidance for the 1-hour NO₂ National Ambient Air Quality Standard* (June 28, 2010) and *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO₂ National Ambient Air Quality Standard* (September 30, 2014). The OLM assumes that at any modeled receptor, the amount of NO that is converted NO₂ is determined by the ambient O₃ concentration. If the ambient O₃ concentration is less than the NO concentration is greater than or equal to the NO concentration, then all NO is assumed to be converted to NO₂.

The use of the OLM requires in-stack NO₂-to-NO_x ratios for the modeled emission units and background O₃ data. An in-stack NO₂-to-NO_x ratio of 0.3 was assumed for the turbines based on manufacturer specifications and an in-stack NO₂-to-NO_x ratio of 0.1 was assumed for the generators, heaters, and waste incinerators based on the source-specific in-stack NO₂-to-NO_x data provided in NO_2 -to-NO_x ratios per Source Tests Approved by the Alaska Department of Environmental Conservation, updated August 23, 2013.

On-site O₃ data are not available for the compressor station locations and, therefore, ambient O₃ concentrations input to OLM were based on ambient O₃ data collected at representative ambient air monitoring stations. Consistent with the ambient air data sources identified in Table 3-2, ambient O₃ data collected at the Linc Energy, LLC, Umiat, AK (Linc Umiat) monitoring site was used to represent ambient O₃ levels at the Sagwon, Galbraith Lake, Coldfoot, Ray River, and Minto compressor stations, and ambient O₃ data collected at the Donlin Creek, LLC. Donlin Gold Project (Donlin) monitoring site was used to represent ambient O₃ levels at the Healy, Honolulu Creek, and Rabideux Creek compressor stations. The highest 1-hour average O₃ concentration during the July 1, 2013 through June 30, 2014 monitoring period at the Linc Umiat monitoring site was 53.4 ppb and was input to OLM as a conservative proxy of ambient O₃ levels at the Sagwon, Galbraith Lake, Coldfoot, Ray River, and Minto sites. The highest 1-hour average O₃ concentration during the April 17, 2012 through April 16, 2013 monitoring period at the Donlin monitoring site was 55.6 ppb, which is the O₃ value input to OLM as a conservative proxy of ambient O₃ levels at the Healy, Honolulu Creek, and Rabideux Creek, and Rabideux Creek sites.

5.8 MODELED OFFSITE SOURCES

This analysis does not include modeled pollutant impacts from any offsite sources. The proposed compressor stations are located in remote areas away from other stationary sources. The only exception is Galbraith Lake. The Galbraith Lake compressor station will be located approximately one km from the Alyeska Pipeline Service Company, Trans Alaska Pipeline System Pump Station 4 (PS 4). The next version of this report will include modeling analyses for Galbraith Lake that consider the potential impacts from PS 4.



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Table 6 shows a summary of the screening model results. Detailed classified post maps illustrating the location of the maximum modeled pollutant impacts with respect to the modeled emission units are provided in Appendix G. To demonstrate that the model concentrations do not exceed applicable AAAQSs or NAAQSs, background concentrations have been added to the modeled results. As shown in Table 7 and Table 8, none of the AAAQSs or NAAQSs are exceeded for any pollutant.

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Table 6: Modeling Results (µ/m³)

		N	O ₂		PM ₁₀ /PM _{2.5} ¹			SO ₂				со		
Station	Max 1-hr	Distance (m)	Annual	Distance (m)	Max 24-hr	Distance (m)	Annual	Distance (m)	Max 1-hr ²	Distance (m)	Annual	Distance (m)	Max 1-hr³	Distance (m)
Sagwon (Sc. 1)	115.6	Fenceline	14.4	Fenceline	21.5	Fenceline	4.3	Fenceline	22.6	Fenceline	3.1	Fenceline	213.0	540
Sagwon (Sc. 2)	115.4	126	14.0	Fenceline	17.5	Fenceline	4.1	Fenceline	22.6	Fenceline	3.1	Fenceline	213.2	540
Sagwon (Sc. 3)	115.6	Fenceline	14.1	Fenceline	20.0	Fenceline	4.2	Fenceline	22.6	Fenceline	3.1	Fenceline	213.1	540
Galbraith Lake	114.8	185	13.2	99	19.3	602	3.4	99	22.7	Fenceline	2.9	Fenceline	274.2	329
Coldfoot	113.2	89	11.9	Fenceline	17.9	16	2.5	22	23.1	16	2.5	Fenceline	206.9	Fenceline
Ray River	116.1	103	11.9	Fenceline	15.5	132	2.2	Fenceline	18.1	Fenceline	2.6	Fenceline	195.1	132
Minto	113.2	81	11.9	Fenceline	15.4	Fenceline	2.0	Fenceline	19.3	Fenceline	2.2	Fenceline	139.7	96
Healy	119.0	85	12.1	117	16.7	Fenceline	2.9	116	21.5	Fenceline	2.4	Fenceline	226.1	228
Honolulu Creek	107.3	68	12.1	Fenceline	14.8	Fenceline	2.8	Fenceline	18.8	Fenceline	2.4	Fenceline	118.8	68
Rabideux Creek	120.6	67	12.1	84	18.4	Fenceline	3.1	Fenceline	22.7	44	2.5	19	207.8	Fenceline

 ¹ PM_{2.5} concentration assumed equal to PM₁₀ concentration.
 ² Maximum 3-hr and maximum 24-hr average SO₂ concentrations assumed equal to maximum 1-hr average concentration.
 ³ Maximum 8-hr average CO concentration assumed equal to maximum 1-hr average concentration.

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	NO ₂						PM	2.5 ¹				
	Ма	ax 1-hr Avera	ge	A	nnual Averag	е	Ма	x 24-hr Avera	ge	A	nnual Average	e
Station	Model Result	Back- ground	Total	Model Result	Back- ground	Total	Model Result	Back- ground	Total	Model Result	Back- ground	Total
Sagwon (Sc. 1)	115.6	61.2	176.8	14.4	2.5	16.9	21.5	7.1	28.6	4.3	2.3	6.6
Sagwon (Sc. 2)	115.4	61.2	176.6	14.0	2.5	16.5	17.5	7.1	24.6	4.1	2.3	6.4
Sagwon (Sc. 3)	115.6	61.2	176.8	14.1	2.5	16.6	20.0	7.1	27.1	4.2	2.3	6.5
Galbraith Lake	114.8	61.2	176.0	13.2	2.5	15.7	19.3	7.1	26.4	3.4	2.3	5.7
Coldfoot	113.2	61.2	174.4	11.9	2.5	14.4	17.9	11.8	29.7	2.5	2.8	5.3
Ray River	116.1	61.2	177.3	11.9	2.5	14.4	15.5	11.8	27.3	2.2	2.8	5.0
Minto	113.2	61.2	174.4	11.9	2.5	14.4	15.4	10.2	25.6	2.0	2.4	4.4
Healy	119.0	15.5	134.5	12.1	1.9	14.0	16.7	6.7	23.4	2.9	1.5	4.4
Honolulu Creek	107.3	15.5	122.8	12.1	1.9	14.0	14.8	6.7	21.5	2.8	1.5	4.3
Rabideux Creek	120.6	15.5	136.1	12.1	1.9	14.0	18.4	5.6	24.0	3.1	1.7	4.8
NAAQS			188			100			35			12
Max % of Standard			94.3%			16.9%			85.0%			55.0%
AAAQS			188			100			35			15
Max % of Standard			94.3%			16.9%			85.0%			44.0%

Table 7: NO₂ and PM Modeling Results Plus Background (µg/m³)

¹ PM_{2.5} concentration assumed equal to PM₁₀ concentration; only PM_{2.5} results shown here as PM_{2.5} standard more stringent than PM₁₀.

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	SO₂							C C	0			
	Ма	x 1-hr Averag	je ¹	А	nnual Averag	e	Ма	ax 1-hr Averag	je	Ма	x 8-hr Average	e ²
Station	Model Result	Back- ground	Total	Model Result	Back- ground	Total	Model Result	Back- ground	Total	Model Result	Back- ground	Total
Sagwon (Sc. 1)	22.6	5.2	27.8	3.1	0.5	3.6	213.0	573.0	786.0	213.0	458.0	671.0
Sagwon (Sc. 2)	22.6	5.2	27.8	3.1	0.5	3.6	213.2	573.0	786.2	213.2	458.0	671.2
Sagwon (Sc. 3)	22.6	5.2	27.8	3.1	0.5	3.6	213.1	573.0	786.1	213.1	458.0	671.1
Galbraith Lake	22.7	5.2	27.9	2.9	0.5	3.4	274.2	573.0	847.2	274.2	458.0	732.2
Coldfoot	23.1	5.2	28.3	2.5	0.5	3.0	206.9	573.0	779.9	206.9	458.0	664.9
Ray River	18.1	5.2	23.3	2.6	0.5	3.1	195.1	573.0	768.1	195.1	458.0	653.1
Minto	19.3	5.2	24.5	2.2	0.5	2.7	139.7	573.0	712.7	139.7	458.0	597.7
Healy	21.5	5.2	26.7	2.4	0.5	2.9	226.1	7,962.0	8,188.1	226.1	5,041.0	5,267.1
Honolulu Creek	18.8	5.2	24.0	2.4	0.5	2.9	118.8	7,962.0	8,080.8	118.8	5,041.0	5,159.8
Rabideux Creek	22.7	5.2	27.9	2.5	0.5	3.0	207.8	7,962.0	8,169.8	207.8	5,041.0	5,248.8
NAAQS			196			N/A		,	40,000	1	,	10,000
Max % of Standard			14.4%			N/A			20.5%			52.7%
AAAQS			196			80			40,000			10,000
Max % of Standard			14.4%			4.5%			20.5%			52.7%

Table 8: SO₂ and CO Modeling Results Plus Background (µg/m³)

¹ Maximum 3-hr and maximum 24-hr average SO₂ concentrations assumed equal to maximum 1-hr average concentration; only maximum 1-hr standard shown here as maximum 1-hr is most stringent. ² Maximum 8-hr average CO concentration assumed equal to maximum 1-hr average concentration.

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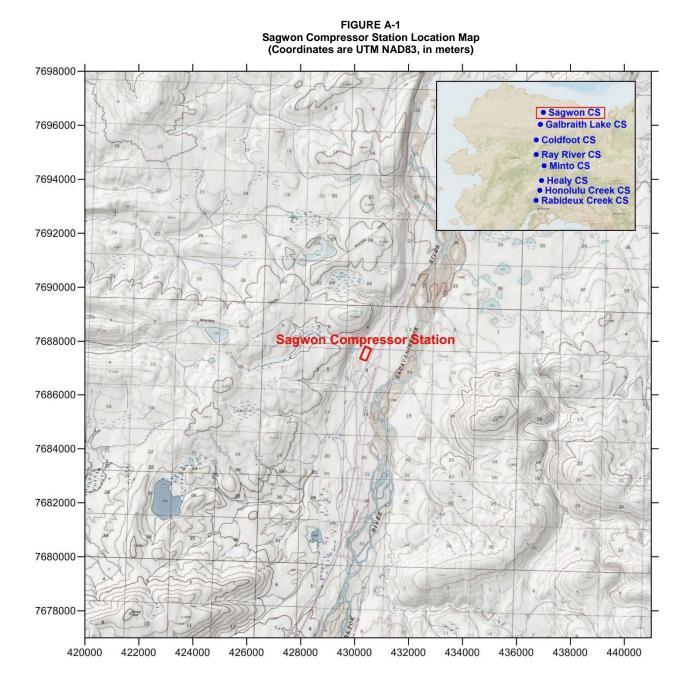


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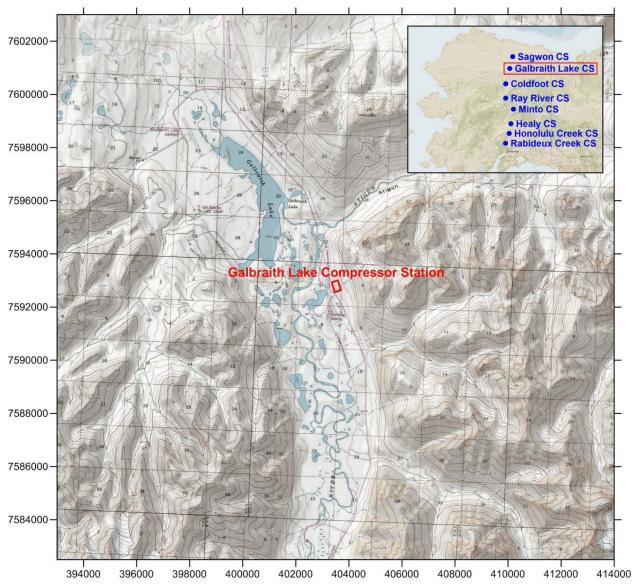
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Appendix A: Compressor Station Location Diagrams



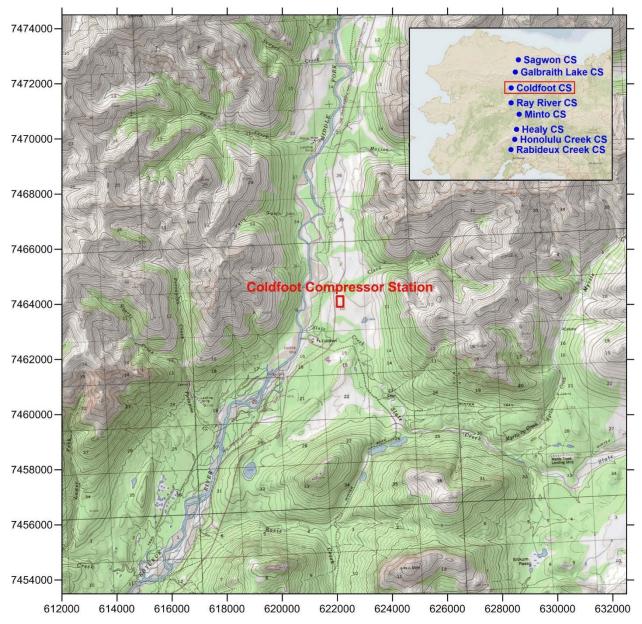
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FIGURE A-2 Galbraith Lake Compressor Station Location Map (Coordinates are UTM NAD83, in meters)



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FIGURE A-3 Coldfoot Compressor Station Location Map (Coordinates are UTM NAD83, in meters)



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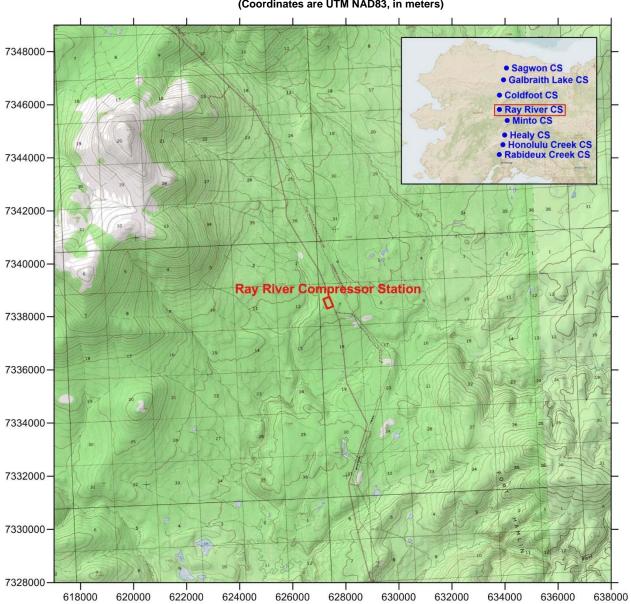


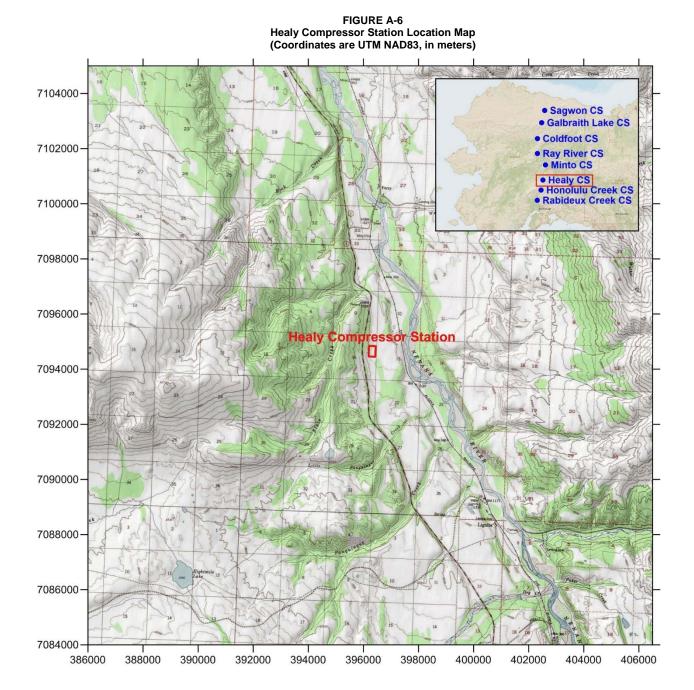
FIGURE A-4 Ray River Compressor Station Location Map (Coordinates are UTM NAD83, in meters)

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A 7242000. Sagwon CS
 Galbraith Lake CS Coldfoot CS Ray River CS
 Minto CS 7240000- Healy CS
 Honolulu Creek CS
 Rabideux Creek CS 7238000-7236000-7234000-Minto Compressor Station 6 7232000-7230000-7228000-7226000-7224000-414000 416000 418000 420000 422000 424000 426000 428000 430000 432000 434000

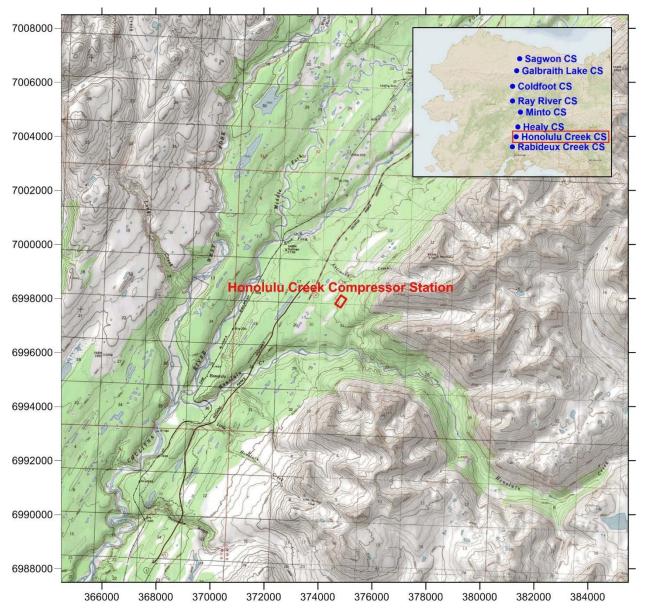
FIGURE A-5 Minto Compressor Station Location Map (Coordinates are UTM NAD83, in meters)

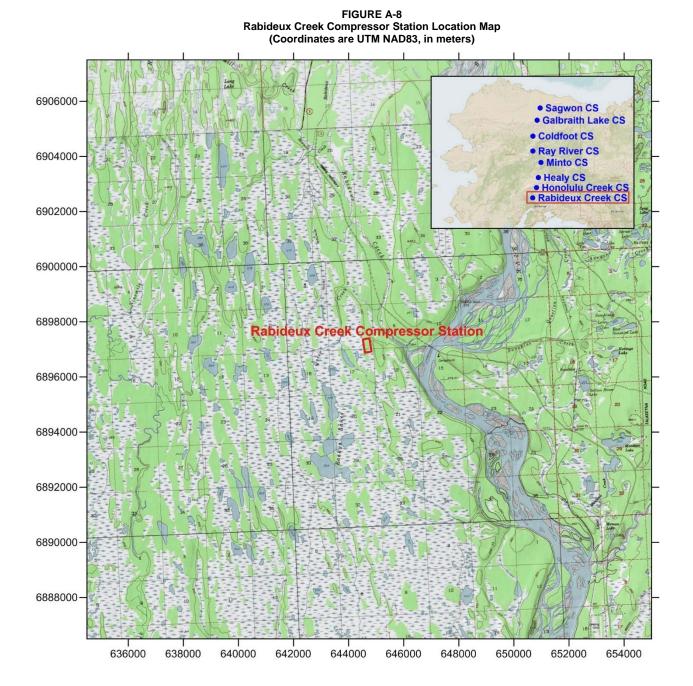
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FIGURE A-7 Honolulu Creek Compressor Station Location Map (Coordinates are UTM NAD83, in meters)





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Appendix B: Modified AERSURFACE Performance Evaluation

1.0 INTRODUCTION AND PURPOSE

The current and most efficient method of determining surface characteristics for input into Stage 3 of AERMET is with the USEPA-developed program called AERSURFACE. AERSURFACE requires land cover data as input in the form of National Land Cover Data (NLCD) files. AERSURFACE has been programmed to read the 1992 version of these files (1992 NLCD). However, 1992 NLCD files were not developed for Alaska. Only 2001 NLCD files were developed for Alaska and AERSURFACE currently cannot read these files. In order to use AERSURFACE, to increase efficiency and because it has a proven track record with reviewing authorities, the AERSURFACE code was modified to read the 2001 NLCD files and producing surface characteristics that are similar to surface characteristics produced using the methodology approved by the State of Alaska, a method was developed for determining the surface characteristics using ArcGIS and Excel (ArcGIS/Excel). This method follows guidance developed by ADEC for calculating surface characteristics (ADEC Land Use Guidance)¹. If the two methods (ArcGIS and modified AERSURFACE) produce similar results, it is concluded that the modified AERSURFACE code is acceptable to use.

2.0 STUDY DESIGN

ArcGIS has the ability to read 2001 NLCD files. Therefore, ArcGIS was used to estimate the fraction of each 2001 NLCD surface characteristic category that was within each sector of a 1 km radius circle centered on a representative compressor station location for the surface roughness length and within a 10 km x 10 km box centered on the site for the albedo and Bowen Ratio. These fractions were entered into an Excel spreadsheet which used this information to calculate the geometric mean Bowen Ratio, the mean albedo, and the inverse-distance weighted geometric mean surface roughness length for the sectors examined. These calculations were based on the methodology specified in the ADEC Land Use Guidance and this technique was approved by many reviewing authorities before AERSURFACE was available. Because the surface characteristic categories differ slightly between the 1992 NLCD and 2001 NLCD files, the only difference from previous applications of the ArcGIS/Excel technique to the current application is that the 2001 NLCD surface characteristic category prior to the calculations being performed. This mapping matches the mapping coded into the modified AERSURFACE program. Table A-1 shows how the 2001 NLCD categories were mapped to the 1992 NLCD categories.

3.0 DISCUSSION OF RESULTS/ANALYSIS

One of the compressor stations, Tatalina River, was used as a test site for this evaluation. The 1 km radius circle around the site was divided into three sectors. Surface characteristics were processed for these three sectors using the modified version of AERSURFACE and the ArcGIS/Excel method following the ADEC Land Use Guidance.

A comparison of the surface characteristics produced by the modified AERSURFACE code with the output produced using the ArcGIS/Excel technique is shown in Table A-2. As seen in Table A-2 for albedo and Bowen Ratio the results are identical with only a few exceptions and for surface roughness length, there are more differences overall, however, those differences are minor. Differences in surface

¹ ADEC Guidance re AERMET Geometric Means: How to Calculate the Geometric Mean Bowen Ratio and the Inverse-Distance Weighted Geometric Mean Surface Roughness Length in Alaska. Prepared by the Alaska Department of Environmental Conservation Air Permits Program Revised June 17, 2009. <u>http://dec.alaska.gov/air/ap/docs/Surface%20Parameter%20Geometric%20Mean%20%28Rev%202%206</u> <u>-17-09%29.pdf</u>.

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roughness length are generally less than 0.01 meters and were found to be related to small differences in total area per sector used by each of the methods. It was determined that if the surface characteristic values calculated by the two methods had been based on exactly the same area per sector, the agreement between the two techniques would have been imperceptible given the precision of the numbers shown. The reason that the two methods calculate slightly different total area per sector is related to differences in the precision of the methodology used to determine the sectors. To determine sectors, the ArcGIS/Excel relies on a more manual technique as opposed to the objective methodology used by AERSURFACE.

The effect of the difference in the total sector area calculated by the two techniques is suppressed when calculating albedo and Bowen Ratio given the larger area involved and because these two surface characteristics are calculated as a geometric mean rather than an inverse-distance weighted mean. Therefore, the differences between values calculated using the two different techniques on these parameters is not apparent in the values shown in Table A-2 given the precision of the numbers.

Even with the differences noted, it is clear the modified AERSURFACE code interprets the 2001 NLCD file correctly and produces results similar to the ADEC Land Use Guidance. Therefore, it is concluded that the modified AERSURFACE code is acceptable to use.



Table B-1 Land Use Category Mapping					
2001 NLCD Category ² Comparable 1992 NLCD Category ³					
Open Water – 11	Open Water – 11				
Perennial Ice, Snow – 12	Perennial Ice, Snow – 12				
Developed Open Space – 21	Urban/Recreational Grasses – 85				
Developed Low Intensity – 22	Low Intensity Residential – 21				
Developed Medium Intensity – 23	High Intensity Residential – 22				
Developed High Intensity – 24	Commercial/Industrial/Transportation – 23				
Barren Land Rock/Sand/Clay – 31	Bare Rock/Sand/Clay – 31				
	Unconsolidated Shore – 32				
Deciduous Forest – 41	Deciduous Forest – 41				
Evergreen Forest – 42	Evergreen Forest – 42				
Mixed Forest – 43	Mixed Forest – 43				
Dwarf Scrub – 51	Shrubland – 51				
Scrub/Shrub – 52					
Grassland/Herbaceous – 71	Grassland/Herbaceous – 71				
Sedge/Herbaceous – 72					
Lichens – 73					
Moss – 74					
Pasture/Hay – 81	Pasture/Hay – 81				
Cultivated Crops – 82	Row Crops – 82				
Developed, Open Space - 21	Urban – Recreational Grasses - 85				
Woody Wetlands – 90	Woody Wetlands – 91				
Palustrine Forested Wetlands – 91	Emergent Herbaceous Wetlands – 92				
Palustrine Scrub/Shrub Wetlands – 92					
Estuarine Forested Wetlands – 93					
Estuatrine Scrub/Shrub Wetlands – 94					
Emergent Herbaceous Wetlands – 95					
Palustrine Emergent Wetlands – 96					
Estuatrine Emergent Wetlands – 97					
Palustrine Aquatic Bed – 98					
Estuatrine Aquatic Bed – 99					

 ² From Multi-Resolution Land Characteristics Consortium (www.mrlc.gov).
 ³ United States Environmental Protection Agency 2008. AERSURFACE User's Guide (EPA-454/B-08-001). Office of Air Quality Planning and Standards. January 2008.

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		Compa	Table B-2 rison of Surface Ch	naracteristics		
	From Traditional Method		From AERSURFACE Sector 290-60 degrees			
	Sector 290-60 degrees					
Month	Albedo	Bowen Ratio	Surface Roughness	Albedo	Bowen Ratio	Surface Roughness
1	0.43	0.50	0.616	0.42	0.50	0.618
2	0.43	0.50	0.616	0.42	0.50	0.618
3	0.43	0.50	0.616	0.42	0.50	0.618
4	0.14	0.64	1.503	0.14	0.64	1.503
5	0.14	0.30	1.294	0.14	0.30	1.292
6	0.14	0.30	1.294	0.14	0.30	1.292
7	0.14	0.30	1.294	0.14	0.30	1.292
8	0.14	0.30	1.294	0.14	0.30	1.292
9	0.14	0.30	1.294	0.14	0.30	1.292
10	0.14	0.81	1.294	0.14	0.81	1.292
11	0.43	0.50	0.616	0.42	0.50	0.618
12	0.43	0.50	0.616	0.42	0.50	0.618
		ector 60-170 degree	s Surface	Sector 60-170 degrees		s Surface
Month	Albedo	Bowen Ratio	Roughness	Albedo	Bowen Ratio	Roughness
1	0.43	0.50	0.596	0.42	0.50	0.609
2	0.43	0.50	0.596	0.42	0.50	0.609
3	0.43	0.50	0.596	0.42	0.50	0.609
4	0.14	0.64	1.009	0.14	0.64	1.010
5	0.14	0.30	1.235	0.14	0.30	1.226
6	0.14	0.30	1.235	0.14	0.30	1.226
7	0.14	0.30	1.235	0.14	0.30	1.226
8	0.14	0.30	1.235	0.14	0.30	1.226
9	0.14	0.30	1.235	0.14	0.30	1.226
10	0.14	0.81	1.235	0.14	0.81	1.226
11	0.43	0.50	0.596	0.42	0.50	0.609
12	0.43	0.50	0.596	0.42	0.50	0.609
	Sector 170-290 degrees		Sector 170-290 degrees			
			Surface			Surface
Month	Albedo	Bowen Ratio	Roughness	Albedo	Bowen Ratio	Roughness
1	0.43	0.50	0.588	0.42	0.50	0.570
2	0.43	0.50	0.588	0.42	0.50	0.570
3	0.43	0.50	0.588	0.42	0.50	0.570
4	0.14	0.64	0.990	0.14	0.64	0.991
5	0.14	0.30	1.209	0.14	0.30	1.224

1.209

1.209

1.209

1.209

1.209

0.588

0.14

0.14

0.14

0.14

0.14

0.42

0.42

0.30

0.30

0.30

0.30

0.81

0.50

0.50

1.224

1.224

1.224

1.224

1.224

0.570

0.570

6

7

8

9 10

11

0.14

0.14

0.14

0.14

0.14

0.43

0.30

0.30

0.30

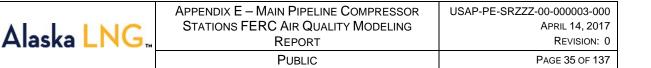
0.30

0.81

0.50

 12
 0.43
 0.50
 0.588
 0.43

 Note: Albedo and Bowen Ratio are unitless. Surface roughness lengths are given in meters.



Appendix C: Generation of Screening Meteorological Data

1.0 INTRODUCTION

Screening meteorological data was generated using the MAKEMET preprocessor which generates a sitespecific matrix of meteorological conditions for input to the AERMOD model. MAKEMET requires surface characteristics and seasonal climatological data as inputs to the program.

2.0 SURFACE CHARACTERISTICS

Appropriate surface characteristics including surface roughness length (z₀), B₀, and r must be provided to AERMET. Surface characteristics should be assigned following guidance provided in the current version of the AERMOD Implementation Guide (AIG) (USEPA, 2009b).

The AIG recommends that the surface characteristics be determined based on digitized land cover data. USEPA has developed the AERSURFACE processor (USEPA, 2008) that was used to determine the site characteristics based on digitized land cover data in accordance with recommendations found in the AIG. AERSURFACE incorporates look-up tables of representative surface characteristic values by land cover category and seasonal category. As discussed in Section 4.1 of modeling report, the AERSURFACE code was modified to allow its use in Alaska with NLCD 2001 data.

AERSURFACE was used to calculate surface characteristics for each site for 12, 30-degree sectors beginning from the North (0 or 360 degrees) and rotating clockwise.

3.0 SEASONAL CLASSIFICATION

In AERSURFACE, the various land cover categories are linked to a set of seasonal surface characteristics. As such, AERSURFACE requires specification of the seasonal category for each month of the year. The months assigned to the five seasonal categories offered by AERSURFACE are shown in Table B-1 below:

TABLE C-1 Monthly Seasonal Classifications Used in AERSURFACE				
Seasonal Category Seasonal Assignment Number Month				
Midsummer with lush vegetation	1	July		
Autumn with unharvested cropland	2	August		
Late autumn after frost and harvest, or winter with no snow	3	May, September		
Winter with continuous snow on ground	4	October through April		
Transitional spring with partial green coverage or short annuals	5	June		

4.0 TEMPERATURE

MAKEMET requires minimum and maximum temperatures to generate three ambient temperature values for which worst-case meteorological data is produced. Available climatological data from online sources including the National Climatic Data Center was reviewed, and seasonal record high and low temperatures for the most representative meteorological station were input into MAKEMET as indicated in Table B-2 below.

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	Table C-2 Minimum and Maximum Temperatures Per Seasonal Category Used in MAKEMET							
				Seasonal max/min (deg. K)				
Compressor Station	Meteorological Station	Meteorological Station Location	Season:	1	2	3	4	5
Seguer	Drudhoo Boy	70°15' N	Max Temp	301	300	293	285	301
Sagwon	Prudhoe Bay	148°20' W	Min Temp	271	268	256	239	265
Galbraith Lake,	Dettile	66° 32' N	Max Temp	307	304	303	292	306
Coldfoot, Ray River	Bettles	151° 18' W	Min Temp	271	264	255	236	270
Minto	Fairbanks	64° 48' N	Max Temp	308	307	305	298	309
MINO	Fairbanks	147° 52' W	Min Temp	275	270	257	242	271
Llach	Negere	64° 33' N	Max Temp	306	305	304	301	308
Healy	Nenana	149° 4' W	Min Temp	236	236	236	236	238
	Denali (Minchumina	63° 53' N	Max Temp	303	304	299	292	304
Honolulu Creek AP)	152° 18' W	Min Temp	271	263	259	239	271	
Dahidaux Croak	Tellestes	62° 19' N	Max Temp	305	305	304	298	309
Rabideux Creek	Talkeetna	150° 5' W	Min Temp	274	269	261	244	271

Climatological data from the sites listed in Table B-2 were examined to obtain the range of ambient temperatures that may be expected to occur at each compressor station. Once each month was assigned the appropriate seasonal classification (see Section 3.0 above) these temperatures were used to assign minimum and maximum temperatures in MAKEMET so that each season was represented by an appropriate range of ambient temperatures.

MAKEMET used the minimum and maximum temperatures to generate three ambient temperature values for which worst-case meteorological data was produced. The range of temperatures during spring, summer, and autumn varied by only about 20°F at each station, while the range of temperatures during the winter season varied by about 40°F. Therefore, to more accurately represent wintertime conditions, winter was divided into two temperature ranges.

5.0 WIND SPEED AND WIND DIRECTION

As suggested in the AERSCREEN User's Guide (USEPA, 2011a) the threshold wind speed and anemometer height were set to 0.5 m/s and 10 m, respectively. MAKEMET was set up to generate a matrix of conditions for wind directions from 5 degrees to 360 degrees in increments of 10 degrees so that modeled wind directions all fall within the center of one of the 12 land use sectors used in AERSURFACE, rather than on a sector boundary.

ADEC staff expressed concern that modeling with screening meteorological data outside of screening mode may not provide high enough resolution if 10-degree increments of wind direction were used (i.e., the maximum concentration at a receptor may occur with a wind direction in between the 36 directions modeled). Therefore, the screening meteorological data sets were modified so that the worst-case meteorology generated by MAKEMET for each of the 12 sectors was assigned to every one degree of wind direction in that sector. This resulted in very large meteorological data sets that, due to a limitation in AERMOD of a maximum of one hundred years of meteorological data, had to be split into two met data files. AERMOD was run twice for each meteorological data file, and the highest concentration at each receptor was determined using a spreadsheet.

For annual average modeling, it was not necessary to use the one degree meteorological data as AERMOD in screening mode ignores wind direction and assumes all receptors are directly downwind from all sources. Therefore the original meteorological datasets with 10 degree increments were used.

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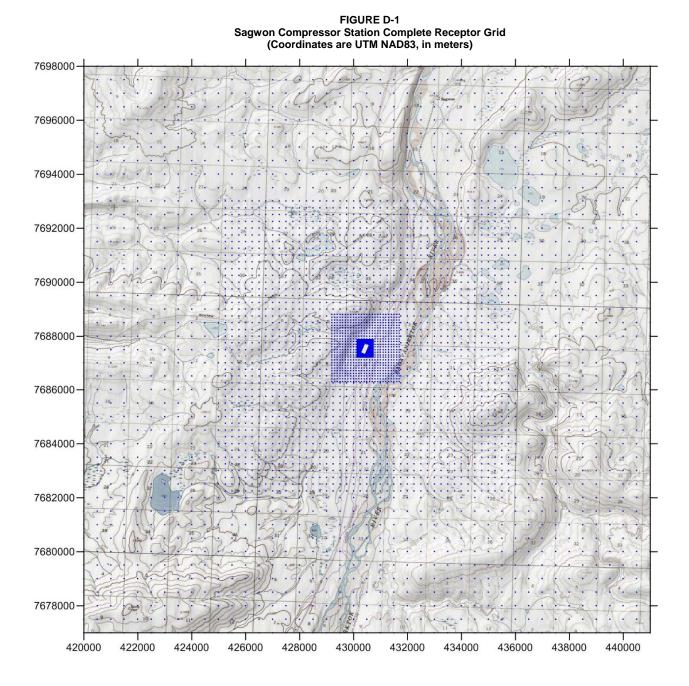
Details on the specific steps followed to run MAKEMET in order to produce the "worst-case" screening meteorology are described in a Standard Operating Procedure provided in Appendix D.

6.0 SOIL MOISTURE DETERMINATION

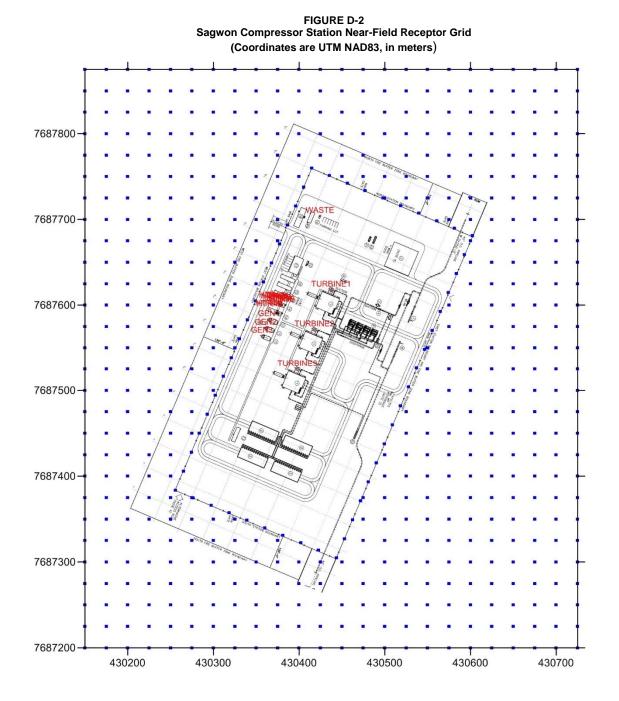
Since representative precipitation data were not available for each compressor station location, and since screening meteorological data which is not tied to a particular year was used, it was assumed that soil moisture conditions were "Average" for each month.

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Appendix D: Receptor Grid Diagrams

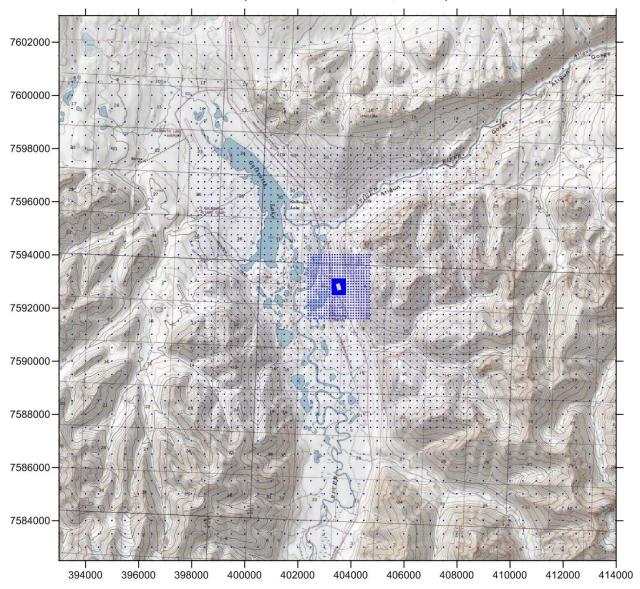


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FIGURE D-3 Galbraith Lake Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)



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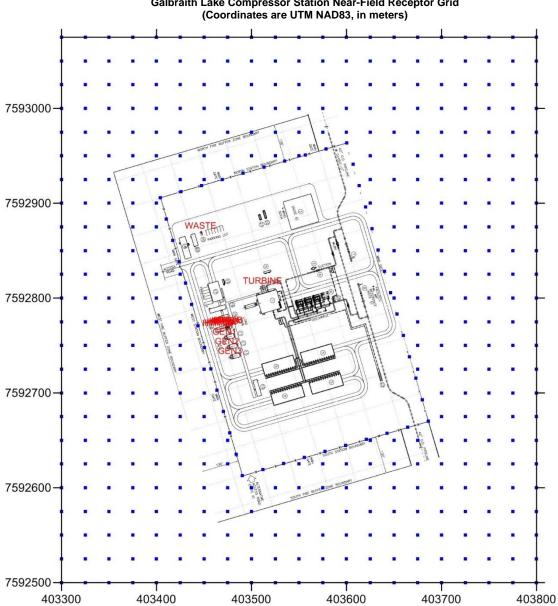
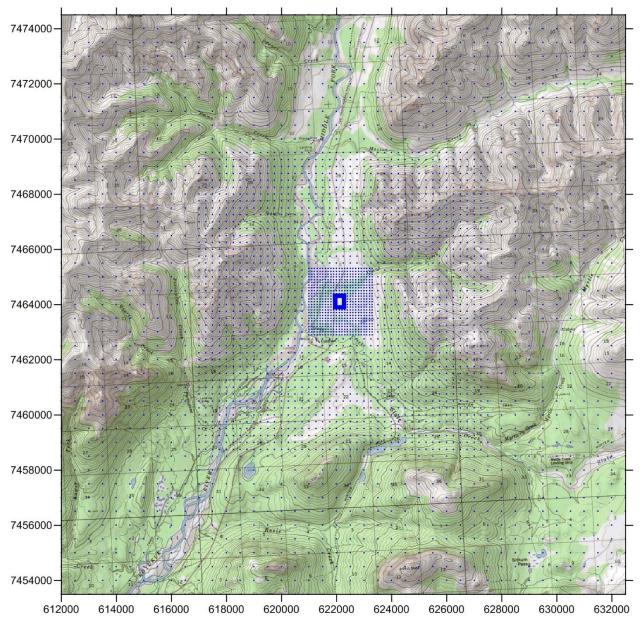


FIGURE D-4 Galbraith Lake Compressor Station Near-Field Receptor Grid (Coordinates are UTM NAD83, in meters)

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FIGURE D-5 Coldfoot Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)



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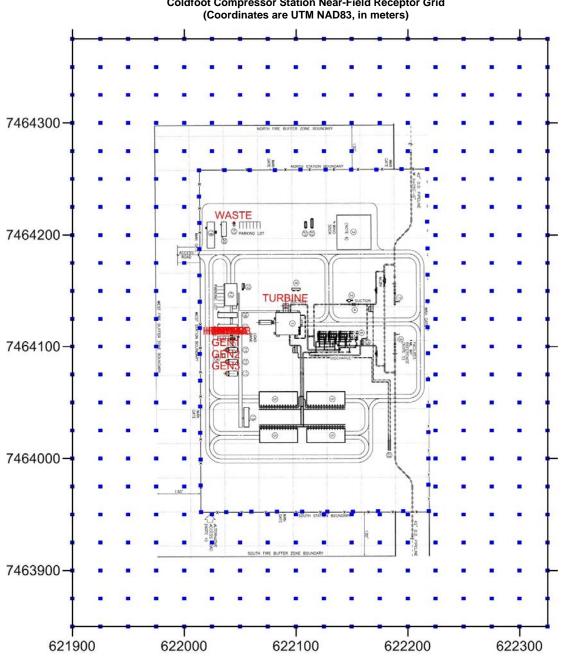


FIGURE D-6 Coldfoot Compressor Station Near-Field Receptor Grid (Coordinates are UTM NAD83, in meters)

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7348000-7346000-7344000-7342000-7340000-1 n. 7338000-7336000-7334000-7332000-7330000-10 7328000-618000 620000 622000 624000 626000 628000 630000 632000 634000 636000 638000

FIGURE D-7 Ray River Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)

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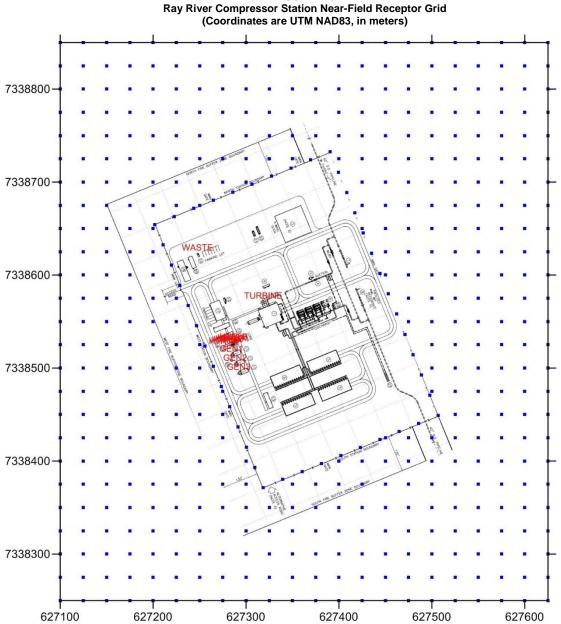


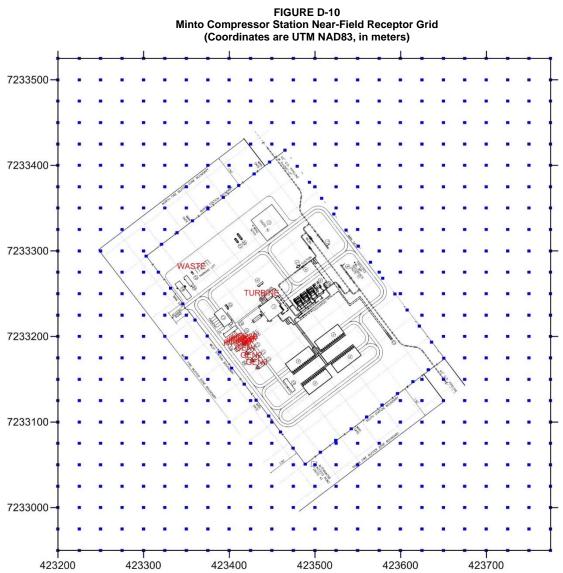
FIGURE D-8 Ray River Compressor Station Near-Field Receptor Grid (Coordinates are UTM NAD83, in meters)

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7242000-7240000-7238000-7236000-7234000-۲ 7232000-7230000-7228000-7226000-7224000-414000 418000 420000 422000 424000 426000 430000 416000 428000 432000 434000

FIGURE D-9 Minto Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)

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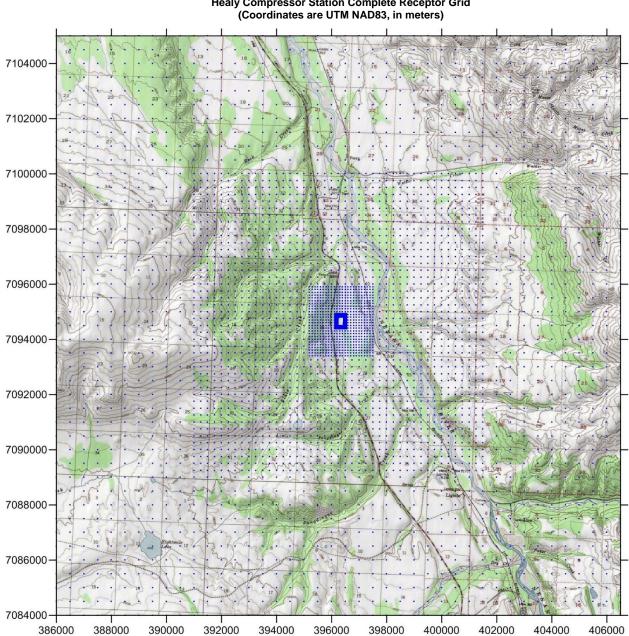


FIGURE D-11 Healy Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)

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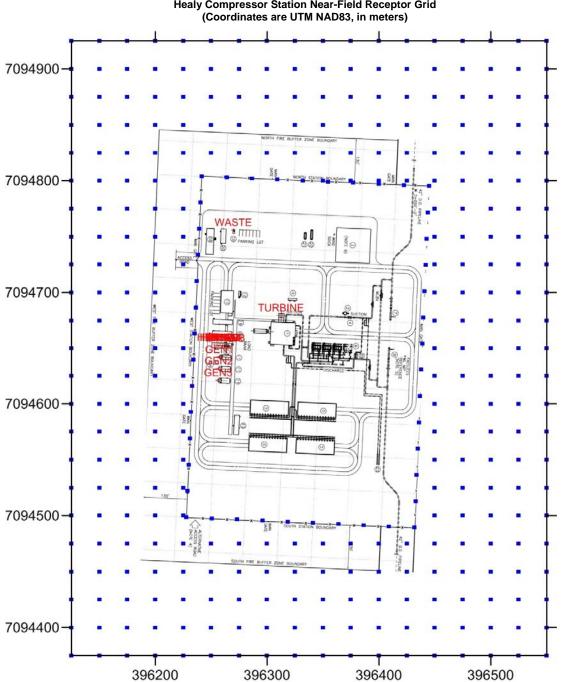
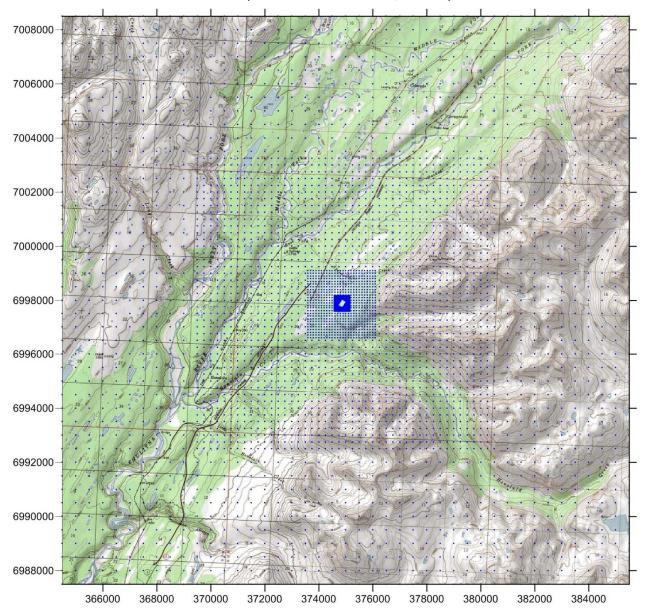


FIGURE D-12 Healy Compressor Station Near-Field Receptor Grid (Coordinates are UTM NAD83, in meters)

Alaska LNG"	APPENDIX E – MAIN PIPELINE COMPRESSOR STATIONS FERC AIR QUALITY MODELING REPORT	USAP-PE-SRZZZ-00-000003-000 APRIL 14, 2017 REVISION: 0
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FIGURE D-13 Honolulu Creek Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)



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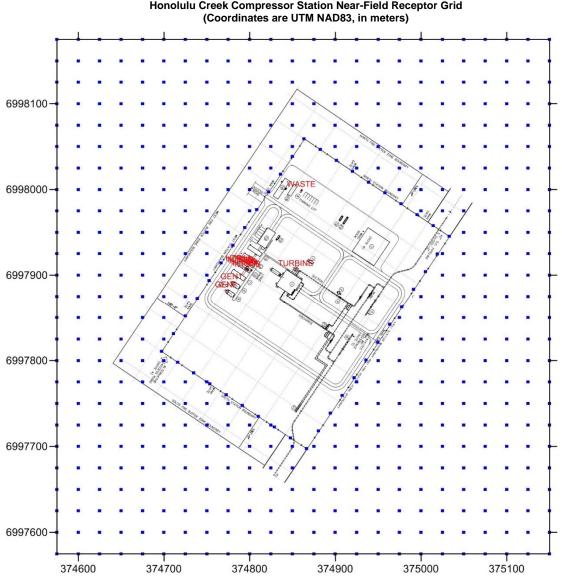
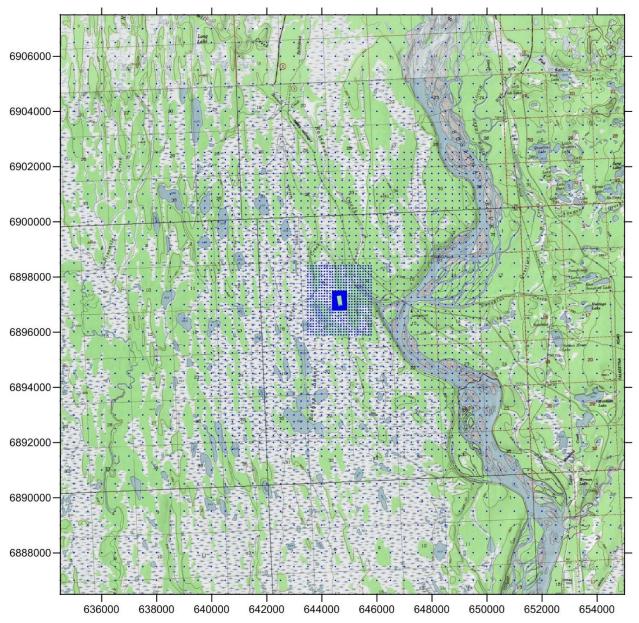


FIGURE D-14 Honolulu Creek Compressor Station Near-Field Receptor Grid (Coordinates are UTM NAD83, in meters)

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FIGURE D-15 Rabideux Creek Compressor Station Complete Receptor Grid (Coordinates are UTM NAD83, in meters)



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6897400-6897300-NAN . HEATER1 HEATER2 HEATER3 6897200 HEATER4 HEATER5 GE 6897100-00 6897000-IN INVASTE 00 OHON 04 6896900-6896800-644400 644500 644600 644700 644800 644900

FIGURE D-16 Rabideux Creek Compressor Station Near-Field Receptor Grid (Coordinates are UTM NAD83, in meters)

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Appendix E: Emission Rates and Source Parameters

TABLE E-1 Sagwon Compressor Station Emission Rates								
	NOx		PM/PM ₁₀ /PM _{2.5}		SO ₂		CO	
Emission Source	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Gas Turbine Compressor #1	8.590	37.62	2.158	9.45	0.081	0.353	8.720	38.19
Gas Turbine Compressor #2	8.590	37.62	2.158	9.45	0.081	0.353	8.720	38.19
Power Generator #1	1.521	6.66	0.205	0.90	0.006	0.026	3.042	13.33
Power Generator #2	1.521	6.66	0.205	0.90	0.006	0.026	3.042	13.33
Aux. Utility Glycol Heater	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #1	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #2	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #3	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Waste Incinerator ¹	0.0011	0.0047	0.0857	0.0267	0.1102	0.0029	0.6000	0.0156
Total		93.05		21.12		0.79		107.38

¹ NOx hourly emissions based on assuming continuous operation at the average hourly rate - maximum hourly emissions multiple by annual operating hours divided by 8,760 hours per year (EPA, 2011b). PM₁₀ and PM_{2.5} maximum hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO₂ and CO use maximum hourly emissions.

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TABLE E-2 Galbraith Lake, Coldfoot, Ray River, Minto, and Healy Compressor Stations Emission Rates								
	NOx PN		PM/PM ₁₀ /PM _{2.5}		SO ₂		СО	
Emission Source	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Gas Turbine Compressor	11.420	50.02	2.862	12.54	0.107	0.468	11.580	50.72
Power Generator #1	1.521	6.66	0.205	0.90	0.006	0.026	3.042	13.33
Power Generator #2	1.521	6.66	0.205	0.90	0.006	0.026	3.042	13.33
Aux. Utility Glycol Heater	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #1	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #2	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Waste Incinerator ²	0.0011	0.0047	0.0857	0.0267	0.1102	0.0029	0.6000	0.0156
Total		66.70		14.66		0.54		80.63

² NOx hourly emissions based on assuming continuous operation at the average hourly rate - maximum hourly emissions multiple by annual operating hours divided by 8,760 hours per year (EPA, 2011b). PM₁₀ and PM_{2.5} maximum hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO₂ and CO use maximum hourly emissions.

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Honolul	TAE u Creek Compres	LE E-3 sor Station I	Emission Rat	tes				
	NOx		PM/PM	10 /PM 2.5	S	O₂	СО	
Emission Source	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Gas Turbine Compressor	11.420	50.02	2.862	12.54	0.107	0.468	11.580	50.72
Power Generator	1.521	6.66	0.205	0.90	0.006	0.026	3.042	13.33
Aux. Utility Glycol Heater	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #1	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #2	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08
Waste Incinerator ³	0.0011	0.0047	0.0857	0.0267	0.1102	0.0029	0.6000	0.0156
Total		60.04		13.76		0.52		67.31

³ NOx hourly emissions based on assuming continuous operation at the average hourly rate - maximum hourly emissions multiple by annual operating hours divided by 8,760 hours per year (EPA, 2011b). PM₁₀ and PM_{2.5} maximum hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO₂ and CO use maximum hourly emissions.

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Rabideux C	TABLE E-4 Rabideux Creek Compressor Station Emission Rates										
	NC	Dx	PM/PM	10/PM _{2.5}	S	D ₂	со				
Emission Source	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr			
Gas Turbine Compressor	11.420	50.02	2.862	12.54	0.107	0.468	11.580	50.72			
Power Generator	1.631	7.15	0.230	1.01	0.007	0.029	3.263	14.29			
Aux. Utility Glycol Heater	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08			
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #1	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08			
Aux. Utility Glycol Heaters - Turbine Intake Air Preheating #2	0.255	1.12	0.022	0.10	0.002	0.007	0.247	1.08			
Indirect Fired Gas Heater #1	1.021	0.37	0.209	0.08	0.016	0.006	2.306	0.83			
Indirect Fired Gas Heater #2	1.021	0.37	0.209	0.08	0.016	0.006	2.306	0.83			
Indirect Fired Gas Heater #3	1.021	0.37	0.209	0.08	0.016	0.006	2.306	0.83			
Indirect Fired Gas Heater #4	1.021	0.37	0.209	0.08	0.016	0.006	2.306	0.83			
Indirect Fired Gas Heater #5	1.021	0.37	0.209	0.08	0.016	0.006	2.306	0.83			
Waste Incinerator ⁴	0.0011	0.0047	0.0857	0.0267	0.1102	0.0029	0.6000	0.0156			
Total		62.36		14.24		0.55		72.42			

⁴ NOx hourly emissions based on assuming continuous operation at the average hourly rate - maximum hourly emissions multiple by annual operating hours divided by 8,760 hours per year (EPA, 2011b). PM₁₀ and PM_{2.5} maximum hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO₂ and CO use maximum hourly emissions.

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	TABLE E-5 Sagwon Compressor Station Emission Rates											
Emission Source	Unit ID	Height (m)	Ref.	Exit Temp. (K)	Ref.	Exit Vel. (m/s)	Ref.	Diam. (m)⁵	Ref.	Instack NO₂:NOx Ratio	Ref.	
Gas Turbine Compressor #1	TURBINE1	12.45	1	776.48	9	20.45	15, 7	2.64	1	0.3	6	
Gas Turbine Compressor #2	TURBINE2	12.45	1	776.48	9	20.45	15, 7	2.64	1	0.3	6	
Power Generator #1	GEN1	5.49	1	886.48	10	41.72	12, 7	0.28	14	0.1	4	
Power Generator #2	GEN2	5.49	1	886.48	10	41.72	12, 7	0.28	14	0.1	4	
Aux. Utility Glycol Heater 1 (1 of 2)6	HTR1A	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 1 (2 of 2)	HTR1B	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 2 (1 of 2)	HTR2A	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 2 (2 of 2)	HTR2B	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 3 (1 of 2)	HTR3A	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 3 (2 of 2)	HTR3B	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 4 (1 of 2)	HTR4A	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Aux. Utility Glycol Heater 4 (2 of 2)	HTR4B	6.1	1	441.48	8	1.26	8, 7	0.43	14	0.1	4	
Waste Incinerator	WASTE	3.66	1	864.82	5	5.72	5	0.28	1	0.1	4	

 ⁵ All stacks circular with the exception of the Gas Turbine Compressor stacks, which are rectangular. Diameter for rectangular stacks calculated based on equivalent cross-sectional area.
 ⁶ Each glycol heater vents to two stacks; exit velocity reflects flow volume through two stacks.

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Gal	braith Lake, Coldfo	oot, Ray Rive		BLE E-6 and Healy Co	ompresso	r Stations Er	nission R	ates			
Emission Source	Unit ID	Height (m)	Ref.	Exit Temp. (K)	Ref.	Exit Vel. (m/s)	Ref.	Diam. (m) ⁷	Ref.	Instack NO₂:NOx Ratio	Ref.
Gas Turbine Compressor	TURBINE	20.27	1	736.48	2	17.23	2, 7	3.27	1	0.3	6
Power Generator #1	GEN1	5.49	1	886.48	10	41.72	12, 7	0.28	1	0.1	4
Power Generator #2	GEN2	5.49	1	886.48	10	41.72	12, 7	0.28	14	0.1	4
Aux. Utility Glycol Heater 1 (1 of 2) ⁸	HTR1A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 1 (2 of 2)	HTR1B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 2 (1 of 2)	HTR2A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 2 (2 of 2)	HTR2B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 3 (1 of 2)	НТRЗА	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 3 (2 of 2)	HTR3B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Waste Incinerator	WASTE	3.66	1	864.82	5	5.72	5	0.28	1	0.1	4

 ⁷ All stacks circular with the exception of the Gas Turbine Compressor stacks, which are rectangular. Diameter for rectangular stacks calculated based on equivalent cross-sectional area.
 ⁸ Each glycol heater vents to two stacks; exit velocity reflects flow volume through two stacks.

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	TABLE E-7 Honolulu Creek Compressor Station Source Parameters										
Emission Source	Unit ID	Height (m)	Ref.	Exit Temp. (K)	Ref.	Exit Vel. (m/s)	Ref.	Diam. (m) ⁹	Ref.	Instack NO ₂ :NOx Ratio	Ref.
Gas Turbine Compressor	TURBINE	20.27	1	736.48	2	17.23	2, 7	3.27	1	0.3	6
Power Generator	GEN1	5.49	1	886.48	10	41.72	12, 7	0.28	14	0.1	4
Aux. Utility Glycol Heater 1 (1 of 2) ¹⁰	HTR1A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 1 (2 of 2)	HTR1B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 2 (1 of 2)	HTR2A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 2 (2 of 2)	HTR2B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 3 (1 of 2)	НТRЗА	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 3 (2 of 2)	HTR3B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Waste Incinerator	WASTE	3.66	1	864.82	5	5.72	5	0.28	1	0.1	4

⁹ All stacks circular with the exception of the Gas Turbine Compressor stacks, which are rectangular. Diameter for rectangular stacks calculated based on equivalent cross-sectional area. ¹⁰ Each glycol heater vents to two stacks; exit velocity reflects flow volume through two stacks.

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	Rabi	deux Creek		BLE E-8 sor Station S	ource Pa	rameters					
Emission Source	Unit ID	Height (m)	Ref.	Exit Temp. (K)	Ref.	Exit Vel. (m/s)	Ref.	Diam. (m) ¹¹	Ref.	Instack NO ₂ :NOx Ratio	Ref.
Gas Turbine Compressor	TURBINE	20.27	1	736.48	2	17.23	2, 7	3.27	1	0.3	6
Power Generator	GEN1	5.49	1	897.59	11	47.31	12, 7	0.28	14	0.1	4
Indirect Fired Gas Heater 1 of 5	HEATER1	7.01	1	449.82	13	3.07	12, 7	1.19	14	0.1	4
Indirect Fired Gas Heater 2 of 5	HEATER2	7.01	1	449.82	13	3.07	12, 7	1.19	14	0.1	4
Indirect Fired Gas Heater 3 of 5	HEATER3	7.01	1	449.82	13	3.07	12, 7	1.19	14	0.1	4
Indirect Fired Gas Heater 4 of 5	HEATER4	7.01	1	449.82	13	3.07	12, 7	1.19	14	0.1	4
Indirect Fired Gas Heater 5 of 5	HEATER5	7.01	1	449.82	13	3.07	12, 7	1.19	14	0.1	4
Aux. Utility Glycol Heater 1 (1 of 2) ¹²	HTR1A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 1 (2 of 2)	HTR1B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 2 (1 of 2)	HTR2A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 2 (2 of 2)	HTR2B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 3 (1 of 2)	HTR3A	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Aux. Utility Glycol Heater 3 (2 of 2)	HTR3B	6.10	1	441.48	8	1.26	8, 7	0.43	14	0.1	4
Waste Incinerator	WASTE	3.66	1	864.82	5	5.72	5	0.28	1	0.1	4

¹¹ All stacks circular with the exception of the Gas Turbine Compressor stacks, which are rectangular. Diameter for rectangular stacks calculated based on equivalent cross-sectional area. ¹² Each glycol heater vents to two stacks; exit velocity reflects flow volume through two stacks.

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References and Notes

- 1. USAP-WP-MRZZZ-00-000001
- 2. Vendor data typical
- 3. Vendor data typical
- 4. In-stack NO₂-to-NOx ratio of 0.1 was assumed for the generators, heaters, and waste incinerators based on the source-specific in-stack NO₂-to-NOx data provided in *NO*₂-to-NOx ratios per Source Tests Approved by the Alaska Department of Environmental Conservation, updated August 23, 2013.
- 5. Vendor data typical
- 6. Vendor data typical
- 7. Velocity calculated according to acfm and stack diameter.
- 8. Vendor data typical
- 9. Vendor data typical
- 10. Vendor data typical
- 11. Vendor data typical
- 12. Calculated based on heat input rating, EPA Method 19 F-Factor, and stack temperature.
- 13. Assume ~85% efficient natural gas boiler, for stack temperature of 350F.
- 14. Stack shape TBD assume circular stack for modeling purposes.

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Appendix F: Emission Calculations

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TYPICAL FACILITY EMISSIONS CALCULATIONS

USAP-PE-SCCAL-00-000001-000

Rev	Date	Revision D	escription	Originator Reviewer / Response Endorser Code		Approver				
0	8-Sep-15	Issued for In-	formation	R. Bor	nderer				B. Leir	ninger
1	28-Mar-16	Issued for Re	eview	R. W	/oolf				B. Leininger	
1A	20-Jul-16	Issued for Review		R. W	/oolf				B. Leininger	
1B	12-Sep-16	Issued for Re	eview	R. Woolf					B. Leininger	
	Document	Country	Facility	Originator	Discipline	Туре	Sub-Type	Location	Sequence	Identifier
Control No.		US	AP	PE	S	С	CAL	00	000001	000



Public

TABLE OF CONTENTS

Excel Tab	Content
Cover Pages	Cover Page, Authorization Page, Modification Page, Table of Contents Page
Criteria Totals	Summary of typical compressor/heater station emissions totals
Single Unit with Cooling	Summary of calculated emissions for a typical Single Unit with Cooling compressor station
Multi-Unit with Cooling	Summary of calculated emissions for a typical Multi-Unit with Cooling compressor station
Single Unit without Cooling	Summary of calculated emissions for a typical Single Unit without Cooling compressor station
Metering Station	Summary of calculated emissions for a typical Metering station
Heater Station	Summary of calculated emissions for a typical Heater station
HAP EFs	Compressor/Heater station equipment Hazardous Air Pollutant (HAP) Emission Factors
HAP Totals	Summary of typical compressor/heater station HAP emissions totals
HAP Speciated	Summary of typical compressor/heater station HAP emissions for individual HAPs
Stack Parameters	Stack parameters used for compressior station dispersion modeling
GTP Gas Speciation	Chemical composition of Pipeline GTP Gas





Table 1: Compressor and Heater Station Combined Total Emissions Summary

		Compressor Station		Comproser Station		
		(Single w/Coolers) [Galbraith Lake,	Compressor Station	Compressor Station (Single w/o Coolers)		
		Coldfoot, Ray River,	(Multiple w/Coolers)	[Honolulu Creek,		Heater Station
		Minto, Healy]	[Sagwon]	Rabideux Creek]	Metering Station	[Theodore River]
NOx	(tons/yr)	161.04	184.61	131.65	-	49.29
VOC (NMHC)	(tons/yr)	20.97	33.55	13.87	2.39	16.20
PM/PM10/PM2.5	(tons/yr)	13.11	29.08	10.61	-	8.68
SO2	(tons/yr)	4.27	4.80	3.46	-	2.59
СО	(tons/yr)	244.14	247.82	200.47	-	103.39
CO2e	(tonnes/yr)	206,381.91	233,783.97	166,012.50	785.05	125,201.09
Total HAPs	(tons/yr)	8.34	10.73	6.63	0.01	4.17
Max Individual HAP	(tons/yr)	6.29	7.90	5.03	0.00	2.12

Compressor station emissions assume that turbines operate at temperatures > -20 degrees F or are equipped with pre-heat.



USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



Table 2: Emissions Summary - Compressor Station, Single Unit with Cooling

Pollutant	tons/year
NOx	161.04
VOC (NMHC)	20.97
PM/PM10/PM2.5	13.11
SO2	4.27
CO	244.14
CO2e	206,381.91

*VOC and CO2e emissions do not include emergency natural gas venting

*VOC and CO2e emissions do not include emergency natu	iral gas venting											
						Number of	Units Op.					
Equipment Information	Fuel Type	НН		Equipmen	Equipment Rating		Simult. Op. Hou			_		
Gas Turbine Compressor	Nat. Gas	1077 I	Btu/scf [22]	346 M	346 MMBtu/hr [1]		1	8,760	hr/yr [10]			
Power Generator	Nat. Gas	1077 I	Btu/scf [22]	14.70 M	1MBtu/hr [6]	3	2	8,760	hr/yr [10]			
Aux. Utility Glycol Heater	Nat. Gas	1077 I	Btu/scf [22]	10 M	IMBtu/hr [11]	2	2	8,760	hr/yr [10]			
Waste Incinerator	Refuse	4500 I	Btu/lb	575 lb	s/hr [11]	1	1	12	hr/yr [11]			
Combustion Criteria Pollutant Emission Factors	NO	x	VOC (N	MHC)	PM/PM1	L0/PM2.5	S	02	(0		
Gas Turbine Compressor	99.3 lb	/mmscf [2]	4.14	lb/mmscf [2,3]	0.0066	5 lb/mmBtu [4]	2.66	lb/mmscf [8]	144.89	lb/mmscf [2	:]	
Power Generator	0.5 g/	/bhp-hr [6]	0.14	g/bhp-hr [6]	0.01941	L lb/mmBtu [7]	2.66	lb/mmscf [8]	1.0) g/bhp-hr [6]	J	
Aux. Utility Glycol Heater	65.4 lb	/mmscf [13]	5.5	lb/mmscf [5]	7.6	5 lb/mmscf [5]	2.66	lb/mmscf [8]	99	lb/mmscf [1	.3]	
Waste Incinerator	3 lb	/ton [9]	3 lb/ton [9]		0.47	7 kg/hr [12]	0.05 kg/hr [12]		10 lb/ton [9]			
	NO	x	VOC (N	MHC)	IHC) PM/PM10		S	02	со		CO2e	
Combustion Emissions	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Gas Turbine Compressor	31.848	139.49	1.328	5.82	2.280	9.99	0.853	3.74	46.482	203.59	40,458.31	177,207.42
Power Generator #1	1.852	8.11	0.519	2.27	0.285	1.25	0.036	0.16	3.704	16.22	1,720.92	7,537.62
Power Generator #2	1.852	8.11	0.519	2.27	0.285	1.25	0.036	0.16	3.704	16.22	1,720.92	7,537.62
Aux. Utility Glycol Heater #1	0.608	2.66	0.051	0.22	0.071	0.31	0.025	0.11	0.924	4.05	1170.98	5,128.89
Aux. Utility Glycol Heater #2	0.608	2.66	0.051	0.22	0.071	0.31	0.025	0.11	0.924	4.05	1170.98	5,128.89
Waste Incinerator [14,15]	0.0012	0.0052	0.8625	0.0052	0.0857	0.0062	0.1102	0.0007	2.875	0.0173	782.20	4.69
Total		161.04		10.81		13.11		4.27		244.14		202,545.13
Major Source?		FALSE		FALSE		FALSE		FALSE		FALSE		
Combustion GHG Emission Factors	CH4 [16]	N20	[16]	CO2	[16]						
Gas Turbine Compressor	1.00E-03 kg	g/mmBtu	1.00E-04	kg/mmBtu	53.06	5 kg/mmBtu						
Power Generator	1.00E-03 kg	g/mmBtu	1.00E-04	kg/mmBtu	53.06	6 kg/mmBtu						
Aux. Utility Glycol Heater	1.00E-03 kg	g/mmBtu	1.00E-04	kg/mmBtu	53.06	6 kg/mmBtu						
Waste Incinerator	3.20E-02 kg	g/mmBtu	4.20E-03	kg/mmBtu	2,680.0) lb/ton [18]						

Alaska LNG

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



	Number	lb NG	Minutes	Events		VOC	[19]	CO2e [19]		
Compressor Seal and Blowdown NG Emissions [11]	of sources	/hr/source	/event	/year	lb NG/year	lb/year	ton/yr	lb/year	ton/yr	type ^c
Station Piping Including Gas to gas Exchangers,	1	737,900	5	1	6.15E+04	3875.38	1.94E+00	1.27E+06	6.35E+02	р
Aerial Coolers & Compressor Casing										
Unit Piping and Compressor	1	57,984	5	2	9.66E+03	609.05	3.05E-01	2.00E+05	9.99E+01	р
Station OPP - Suction Piping	1	63,850	1	1	1.06E+03	67.07	3.35E-02	2.20E+04	1.10E+01	e
Station OPP - Discharge Piping	1	6,410,608	1	1	1.07E+05	6733.58	3.37E+00	2.21E+06	1.10E+03	e
Inlet Piping Blowdown (Station Inlet ESDV to	1	474,270	7	1	5.53E+04	3487.15	1.74E+00	1.14E+06	5.72E+02	m
Comp Suction valve o/s building)										
Outlet Piping Blowdown (Comp discharge valve	1	1,096,463	7	1	1.28E+05	8061.93	4.03E+00	2.64E+06	1.32E+03	m
o/s building to Station outlet ESDV)										
Unit ESD - Discharge Blowdown	1	156,724	5	2	2.61E+04	1646.20	8.23E-01	5.40E+05	2.70E+02	m
Scrubber Dump - Sump (8ft ³) ^a	1	72	1	1	1.20E+00	0.08	3.78E-05	2.48E+01	1.24E-02	р
Pig trap - Launcher / Receiver (320ft ³) ^a	2	14,982	15	1	7.49E+03	472.10	2.36E-01	1.55E+05	7.74E+01	m
Gas / Hydraulic Valve operators (6ft ³) ^b	42	72	1	2	100.80	6.35	3.18E-03	2.08E+03	1.04E+00	р
Dry Gas Seals [21]	2		Conti	nuous			8.80E-01		7.95E+02	р
Total							9.96		3,772.27	

^a Emissions from these equipment are a mixture of natural gas, water, lube oil, and glycol - assumed to be 100% natural gas for emissions calculations

^b Emissions from these equipment are a mixture of natural gas, water, and oil - assumed to be 100% natural gas for emissions calculations

^c p = planned; e = emergency; m = maintenance

	TOC kg/hr	Total	V	ос	CO2e		
Piping Component Emissions [20]	/comp.	Comp.	lb/year	ton/yr	lb/year	ton/yr	
Valves	4.50E-03	46	2.52E+02	1.26E-01	8.26E+04	4.13E+01	
Flanges	3.90E-04	298	1.41E+02	7.07E-02	4.64E+04	2.32E+01	
Total				0.20		64.50	

[1] Vendor expected performance and emissions sheet. Rating was converted from LHV to HHV by multiplying by 1.11.

[2] Vendor expected performance and emissions sheet. 25 ppmv NOx, 15 ppmv HC, and 60 ppmv CO, all @ 15% O2.

[3] Assumed 80% of HC is methane (same as ratio of Methane to TOC found in AP-42 Table 3.1-2a).

[4] AP-42 Table 3.1-2a - Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines.

[5] AP-42 Section 1.4: Natural Gas Combustion.

[6] Vendor Technical Data Sheet. Rating was converted from LHV to HHV by multiplying by 1.11.

[7] AP-42 Section 3.2 - Natural Gas-fired Reciprocating Engines, Table 3.2-3 (Condensable + Filterable PM- 4-Stroke Rich Burn Engine).

[8] Assumed 16 ppmv total sulfur in natural gas. SO2 assumes all S oxidized to SO2.

[9] AP-42 Section 2.1 - Refuse Combustion - Table 2.1-12: Industrial/Commercial multi chamber combustor, TOC assumed = VOC.

[10] For permitting/modeling purposes, assumes 24/7 operation

[11] USAP-WP-MRZZZ-00-000001-000; Rev 3, dated 8/23/16.

[12] Performance Source Test Data.

[13] 50 ppmv NOx and 125 ppmv CO @ 3% O2, as provided by vendor.

[14] PM10 and PM2.5 max. hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO2, CO, and VOC use max. hourly emissions.

[15] NOx hourly emissions based on assuming continuous operation at the average hourly rate - max. hourly emissions multiplied by annual operating hours/8,760.

[16] Tables C-1 and C-2 to Subpart C of Part 98—Default CO2, CH4 and N2O Emission Factors for Various Types of Fuel

[17] Table A-1 to Subpart A of Part 98—Global Warming Potentials.

[18] AP-42 Table 2.1-8 - Emission Factors for Refuse Derived Fuel Fired Combustors.

[19] Based on speciation of Pipeline GTP natural gas from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)

[20] EPA Protocol for Equipment Leak Emissions (EPA-453/R-95-017; Nov. 1995) Table 2-4

[21] EPA OAQPS - Report for Oil and Natural Gas Sector Compressors Review Panel April 2014, Table 3-11. Dry Seal Centrifugal Compressors (15.9 ton CH4/compressor/yr; 0.44 ton VOC/compressor/yr) [22] Natural gas HHV as per Hysys calculation.



USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



Table 3: Emissions Summary - Compressor Station, Multi-Unit with Cooling

Pollutant	tons/year
NOx	184.61
VOC (NMHC)	33.55
PM/PM10/PM2.5	29.08
SO2	4.80
CO	247.82
CO2e	233,783.97

*VOC and CO2e emissions do not include emergency natural gas venting

VOC and CO2e emissions do not include emergency natura	i gas venting					Number of	Units Op.					
Equipment Information	Fuel Type	нн	v	Equipmer	nt Rating	Units	Simult. Op. Ho		s/unit			
Gas Turbine Compressor	Nat. Gas	1077 E	Btu/scf [22]	187 N	187 MMBtu/hr [1]		2	8,760	hr/yr [13]	•		
Power Generator	Nat. Gas	1077 E	1077 Btu/scf [22]		14.70 MMBtu/hr [6]		3	8,760	hr/yr [13]			
Aux. Utility Glycol Heater	Nat. Gas	1077 E	Stu/scf [22]	13 N	/MBtu/hr [12]	2	2	8,760	hr/yr [13]			
Waste Incinerator	Refuse	4500 E	Btu/lb	575 lb	os/hr [12]	1	1	12	hr/yr [12]			
Combustion Criteria Pollutant Emission Factors	NO	x	VOC (N	IMHC)	PM/PM	10/PM2.5	S	02	с	0		
Gas Turbine Compressor	99.3 lt	o/mmscf [2]	6.90	lb/mmscf [2,3]	0.015	5 lb/mmBtu [4]	2.66	lb/mmscf [8]	120.74	lb/mmscf [2	i)	
Power Generator	0.5 g	/bhp-hr [6]	0.14	g/bhp-hr [6]	0.01941	1 lb/mmBtu [7]	2.66	lb/mmscf [8]	1.0	g/bhp-hr [6]	J	
Aux. Utility Glycol Heater	65.4 lb	o/mmscf [11]	5.5	lb/mmscf [5]	7.6	5 lb/mmscf [5]	2.66	lb/mmscf [8]	99	lb/mmscf [1	.3]	
Waste Incinerator	3 lk	o/ton [9]	3	lb/ton [9]	0.47	7 kg/hr [10]	0.05	kg/hr [10]	10	lb/ton [9]		
	NC	x	VOC (NMHC)		PM/PM10/PM2.5		SO2		СО		CO2e	
Combustion Emissions	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Gas Turbine Compressor #1	17.201	75.34	1.195	5.2	2.799	12.26	0.461	2.02	20.920	91.63	21,851.11	95,707.88
Gas Turbine Compressor #2	17.201	75.34	1.195	5.2	2.799	12.26	0.461	2.02	20.920	91.63	21,851.11	95,707.88
Power Generator #1	2.056	9.00	0.576	2.5	0.285	1.25	0.036	0.16	4.111	18.01	1,720.92	7,537.62
Power Generator #2	2.056	9.00	0.576	2.5	0.285	1.25	0.036	0.16	4.111	18.01	1,720.92	7,537.62
Power Generator #3	2.056	9.00	0.576	2.5	0.285	1.25	0.036	0.16	4.111	18.01	1,720.92	7,537.62
Aux. Utility Glycol Heater #1	0.790	3.46	0.066	0.291	0.0917	0.40	0.032	0.14	1.201	5.26	1,522.27	6,667.56
Aux. Utility Glycol Heater #2	0.790	3.46	0.066	0.291	0.0917	0.40	0.032	0.14	1.201	5.26	1,522.27	6,667.56
Waste Incinerator [14,15]	0.00118	0.0052	0.86	0.0052	0.0857	0.0062	0.11	0.0007	2.875	0.0173	782.20	4.69
Total		184.61		18.62		29.08		4.80		247.82		227,368.43
Major Source?		FALSE		FALSE		FALSE		FALSE		FALSE		NA
Combustion GHG Emission Factors	CH4	[16]	N20	[16]	CO2	2 [16]						
Gas Turbine Compressor	1.00E-03 k	g/mmBtu	1.00E-04	kg/mmBtu	53.06	5 kg/mmBtu						
Power Generator	1.00E-03 k	g/mmBtu	1.00E-04	kg/mmBtu	53.06	5 kg/mmBtu						
Aux. Utility Glycol Heater	1.00E-03 k	g/mmBtu	1.00E-04	kg/mmBtu	53.06	5 kg/mmBtu						
Waste Incinerator	3.20E-02 k	g/mmBtu	4.20E-03	kg/mmBtu	2,680.00	0 lb/ton [18]						

Alaska LNG

USAP-PE-SCCAL-00-000001-000; Rev 1B

Compressor and Heater Station Emissions Calculations



	Number	lb NG	Minutes	Events		VOC [19]		CO2	e [19]	
Compressor Seal and Blowdown NG Emissions [12]	of sources	/hr/source	/event	/year	lb NG/year	lb/year	ton/yr	lb/year	ton/yr	type ^c
Station Piping Including Gas to gas Exchangers,	1	750,331	5	1	6.25E+04	3940.67	1.97E+00	1.29E+06	6.46E+02	р
Aerial Coolers & Compressor Casing										
Unit Piping - Compressor A	1	39,930	5	2	6.66E+03	419.42	2.10E-01	1.38E+05	6.88E+01	р
Unit Piping - Compressor B	1	39,930	5	2	6.66E+03	419.42	2.10E-01	1.38E+05	6.88E+01	р
Unit Piping - Compressor C	1	39,930	5	2	6.66E+03	419.42	2.10E-01	1.38E+05	6.88E+01	р
Station OPP - Suction Piping	1	63,850	1	1	1.06E+03	67.07	3.35E-02	2.20E+04	1.10E+01	e
Station OPP - Discharge Piping	1	6,410,608	1	1	1.07E+05	6733.58	3.37E+00	2.21E+06	1.10E+03	e
Inlet Piping Blowdown (Station Inlet ESDV to	1	486,772	7	1	5.68E+04	3579.07	1.79E+00	1.17E+06	5.87E+02	m
Comp Suction valve o/s building)										
Outlet Piping Blowdow (Comp discharge valve	1	1,110,527	7	1	1.30E+05	8165.34	4.08E+00	2.68E+06	1.34E+03	m
o/s building to Station outlet ESDV)										
Unit A ESD - Suction Blowdown	1	102,365	5	2	1.71E+04	1075.22	5.38E-01	3.53E+05	1.76E+02	m
Unit A ESD - Discharge Blowdown	1	107,806	5	2	1.80E+04	1132.37	5.66E-01	3.71E+05	1.86E+02	m
Unit B ESD - Suction Blowdown	1	102,365	5	2	1.71E+04	1075.22	5.38E-01	3.53E+05	1.76E+02	m
Unit B ESD - Discharge Blowdown	1	107,806	5	2	1.80E+04	1132.37	5.66E-01	3.71E+05	1.86E+02	m
Unit C ESD - Suction Blowdown	1	102,365	5	2	1.71E+04	1075.22	5.38E-01	3.53E+05	1.76E+02	m
Unit C ESD - Discharge Blowdown	1	107,806	5	2	1.80E+04	1132.37	5.66E-01	3.71E+05	1.86E+02	m
Scrubber Dump - Sump (8ft ³) ^a	1	72	1	1	1.20E+00	0.08	3.78E-05	2.48E+01	1.24E-02	р
Pig trap - Launcher / Receiver (320ft ³) ^a	2	14,982	15	1	7.49E+03	472.10	2.36E-01	1.55E+05	7.74E+01	m
Gas / Hydraulic Valve operators (6ft ³) ^b	53	72	1	2	127.20	8.02	4.01E-03	2.63E+03	1.31E+00	р
Dry Gas Seals [21]	6		Conti	nuous			2.64E+00		2.39E+03	р
Total							14.66		6,327.70	

^a Emissions from these equipment are a mixture of natural gas, water, lube oil, and glcol - assumed to be 100% natural gas for emissions calculations

^b Emissions from these equipment are a mixture of natural gas, water, and oil - assumed to be 100% natural gas for emissions calculations

^c p = planned; e = emergency; m = maintenance

	TOC kg/hr	Total	VOC		CO2e	
Fugitive Component Emissions [20]	/comp.	Comp.	(lb/year)	(tons/year)	(lbs/year)	(tons/year)
Valves	4.50E-03	64	3.51E+02	1.75E-01	1.15E+05	5.75E+01
Flanges	3.90E-04	390	1.85E+02	9.26E-02	6.07E+04	3.04E+01
Total				0.27		87.84

^d Any equipmentother than connectors, flanges, open-ended lines, pumps, or valves (i.e. compressors, diaphrams, drains, dump arms, hatches, instruments, meters, PRVs, polished rods, vents)

[1] Vendor expected performance and emissions sheet. Rating was converted from LHV to HHC by multiplying by 1.11.

[2] Vendor expected performance and emissions sheet. 25 ppmv NOx, 25 ppmv HC, and 50 ppmv CO, all @ 15% O2.

[3] Vendor estimated that 80% of THC is methane.

[4] Provided by vendor. Assumes PM10 = PM2.5

[5] AP-42 Section 1.4: Natural Gas Combustion

[6] Vendor Technical Data Sheet. Rating was converted from LHV to HHV by multiplying by 1.11.

[7] AP-42 Section 3.2 - Natural Gas-fired Reciprocating Engines, Table 3.2-3 (Condensable + Filterable PM- 4-Stroke Rich Burn Engine)

[8] Assumed 16 ppmv total sulfur in natural gas. SO2 assumes all S oxidized to SO2.

[9] AP-42 Section 2.1 - Refuse Combustion - Table 2.1-12: Industrial/Commerical multi chamber combustor, TOC assumed = VOC

[10] Performance Source Test Data

[11] 50 ppmv NOx and 125 ppmv CO @ 3% O2, as provided by vendor.

[12] USAP-WP-MRZZZ-00-000001-000; Rev 3, dated 8/23/16.

[13] For permitting/modeling purposes, assumes 24/7 operation

[14] PM10 and PM2.5 max. hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO2, CO, and VOC use max. hourly emissions.

[15] NOx hourly emissions based on assuming continuous operation at the average hourly rate - max. hourly emissions multiple by annual operating hours/8,760

[16] Table C-2 to Subpart C of Part 98—Default CH4 and N2O Emission Factors for Various Types of Fuel

[17] Table A-1 to Subpart A of Part 98—Global Warming Potentials.

[18] AP-42 Table 2.1-8 - Emission Factors for Refuse Derived Fuel Fired Combustors

[19] Based on speciation of Pipeline GTP natural gas from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)

[20] EPA Protocol for Equipment Leak Emissions (EPA-453/R-95-017; Nov. 1995) Table 2-4

[21] EPA OAQPS - Report for Oil and Natural Gas Sector Compressors Review Panel April 2014, Table 3-11. Dry Seal Centrifugal Compressors (15.9 ton CH4/compressor/yr; 0.44 ton VOC/compressor/yr)

[22] Natural gas HHV as per Hysys calculation.





Table 4: Emissions Summary - Compressor Station, Single Unit without Cooling

Pollutant	tons/year
NOx	131.65
VOC (NMHC)	13.87
PM/PM10/PM2.5	10.61
SO2	3.46
CO	200.47
CO2e	166,012.50

*VOC and CO2e emissions do not include emergency natural gas venting

f [2]	
[6]	
f [13]	
]	
CC	02e
	ton/yr
	141,684.18
1,374.91	6,022.13
1,374.91	6,022.13
1,170.98	5,128.89
1,170.98	5,128.89
3 782.20	4.69
7	163,990.91
	NA
yr 9 9 9 9 9 9 7 7 9 9 9 9 7 7 9 9 9 7 7 7 9 9 9 7 7 7 9	yr lb/hr 78 32,347.99 9 1,374.91 9 1,374.91 5 1,170.98 5 1,170.98 73 782.20 47

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



	Number	lb NG	Minutes	Events		VOC	[19]	CO2	e [19]	
Compressor Seal and Blowdown NG Emissions [11]	of sources	/hr/source	/event	/year	lb NG/year	lb/year	ton/yr	lb/year	ton/yr	type ^c
Station Piping	1	269,229	5	1	2.24E+04	1413.97	7.07E-01	4.64E+05	2.32E+02	р
Unit Piping and Compressor	1	57,984	5	2	9.66E+03	609.05	3.05E-01	2.00E+05	9.99E+01	р
Station OPP - Suction Piping	1	63,850	1	1	1.06E+03	67.07	3.35E-02	2.20E+04	1.10E+01	e
Station OPP - Discharge Piping	1	6,160,239	1	1	1.03E+05	6470.60	3.24E+00	2.12E+06	1.06E+03	e
Inlet Piping Blowdown (Station Inlet ESDV to	1	262,436	7	1	3.06E+04	1929.61	9.65E-01	6.33E+05	3.16E+02	m
Comp Suction valve)										
Outlet Piping Blowdown (Comp discharge valve	1	141,941	7	1	1.66E+04	1043.65	5.22E-01	3.42E+05	1.71E+02	m
to Station outlet ESDV)										
Unit A ESD - Discharge Blowdown	1	175,837	5	2	2.93E+04	1846.96	9.23E-01	6.06E+05	3.03E+02	m
Scrubber Dump - Sump (8ft ³) ^a	1	72	1	1	1.20E+00	0.08	3.78E-05	2.48E+01	1.24E-02	р
Pig trap - Launcher / Receiver (320ft ³) ^a	2	14,982	15	1	7.49E+03	472.10	2.36E-01	1.55E+05	7.74E+01	m
Gas / Hydraulic Valve operators (6ft ³) ^b	7	72	1	2	16.80	1.06	5.29E-04	3.47E+02	1.74E-01	р
Dry Gas Seals [21]	2		Conti	nuous			8.80E-01		7.95E+02	р
Total							4.54		1,994.63	

^a Emissions from these equipment are a mixture of natural gas, water, lube oil, and glcol - assumed to be 100% natural gas for emissions calculations

^b Emissions from these equipment are a mixture of natural gas, water, and oil - assumed to be 100% natural gas for emissions calculations

^c p = planned; e = emergency; m = maintenance

	TOC kg/hr	Total	VOC		CO)2e
Fugitive Component Emissions [20]	/comp.	Comp.	lb/year	ton/yr	lb/year	ton/yr
Valves	4.50E-03	25	1.37E+02	6.85E-02	4.49E+04	2.25E+01
Flanges	3.90E-04	58	2.75E+01	1.38E-02	9.03E+03	4.51E+00
Total				0.08		26.97

^d Any equipmentother than connectors, flanges, open-ended lines, pumps, or valves (i.e. compressors, diaphrams, drains, dump arms, hatches, instruments, meters, PRVs, polished rods, vents)

[1] Vendor expected performance and emissions sheet. Rating was converted from LHV to HHV by multiplying by 1.11.

[2] 25 ppmv NOx, 15 ppmv HC, and 60 ppmv CO, all @ 15% O2; Expected Performance and Emissions provded by vendor.

[3] Assumed 80% of HC is methane (same as ratio of Methane to TOC found in AP-42 Table 3.1-2a).

[4] AP-42 Table 3.1-2a - Emission Factors for Criteria Pollutants and Greenhouse Gases from Stationary Gas Turbines.

[5] AP-42 Section 1.4: Natural Gas Combustion

[6] Vendor Technical Data Sheet. Rating was converted from LHV to HHV by multiplying by 1.11.

[7] AP-42 Section 3.2 - Natural Gas-fired Reciprocating Engines, Table 3.2-3 (Condensable + Filterable PM- 4-Stroke Rich Burn Engine)

[8] Assumed 16 ppmv total sulfur in natural gas. SO2 assumes all S oxidized to SO2.

[9] AP-42 Section 2.1 - Refuse Combustion - Table 2.1-12: Industrial/Commerical multi chamber combustor, TOC assumed = VOC

[10] For permitting/modeling purposes, assumes 24/7 operation

[11] USAP-WP-MRZZZ-00-000001-000; Rev 3, dated 8/23/16.

[12] Performance Source Test Data

[13] 50 ppmv NOx and 125 ppmv CO @ 3% O2, as provided by vendor.

[14] PM10 and PM2.5 max. hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO2, CO, and VOC use max. hourly emissions.

[15] NOx hourly emissions based on assuming continuous operation at the average hourly rate - max. hourly emissions multiple by annual operating hours/8,760.

[16] Table C-2 to Subpart C of Part 98—Default CH4 and N2O Emission Factors for Various Types of Fuel

[17] Table A-1 to Subpart A of Part 98—Global Warming Potentials.

[18] AP-42 Table 2.1-8 - Emission Factors for Refuse Derived Fuel Fired Combustors

[19] Based on speciation of Pipeline GTP natural gas from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)

[20] EPA Protocol for Equipment Leak Emissions (EPA-453/R-95-017; Nov. 1995) Table 2-4

[21] EPA OAQPS - Report for Oil and Natural Gas Sector Compressors Review Panel April 2014, Table 3-11. Dry Seal Centrifugal Compressors (15.9 ton CH4/compressor/yr; 0.44 ton VOC/compressor/yr) [22] Natural gas HHV as per Hysys calculation.





Table 5: Emissions Summary - Metering Station

Pollutant	tons/year
NOx	0.00
VOC (NMHC)	2.39
PM/PM10/PM2.5	0.00
SO2	0.00
CO	0.00
CO2e	785.05

*VOC and CO2e emissions do not include emergency natural gas venting

	Number	lb NG	Minutes	Events		VOO	[2]	CO2	2e [2]	
Compressor Seal and Blowdown NG Emissions [1]	of sources	/hr/source	/event	/year	lb NG/year	lb/year	ton/yr	lb/year	ton/yr	type ^c
Station Piping, Meter Scrubber & Meter Runs	1	132,750	5	1	1.11E+04	697.19	3.49E-01	2.29E+05	1.14E+02	р
Station Piping - OPP	1	63,850	1	1	1.06E+03	67.07	3.35E-02	2.20E+04	1.10E+01	e
Station Piping - ESD Blowdown	1	711,376	5	1	5.93E+04	3736.08	1.87E+00	1.23E+06	6.13E+02	m
Scrubber Dump - Sump (8ft ³) ^a	1	72	1	1	1.20E+00	0.08	3.78E-05	2.48E+01	1.24E-02	р
Pig trap - Launcher / Receiver (320ft ³) ^a	1	14,982	15	1	3.75E+03	236.05	1.18E-01	7.74E+04	3.87E+01	m
Gas / Hydraulic Valve operators (6ft ³) ^b	7	72	1	2	16.80	1.06	5.29E-04	3.47E+02	1.74E-01	р
Total							2.34		765.78	

^a Emissions from these equipment are a mixture of natural gas, water, lube oil, and glcol - assumed to be 100% natural gas for emissions calculations

^b Emissions from these equipment are a mixture of natural gas, water, and oil - assumed to be 100% natural gas for emissions calculations

^c p = planned; e = emergency; m = maintenance

	TOC kg/hr	Total	VOC		CO	2e
Piping Component Emissions [3]	/comp.	Comp.	lb/year	ton/yr	lb/year	ton/yr
Valves	4.50E-03	16	8.76E+01	4.38E-02	2.87E+04	1.44E+01
Flanges	3.90E-04	63	2.99E+01	1.50E-02	9.81E+03	4.90E+00
Total				0.06		19.27

[1] USAP-WP-MRZZZ-00-000001-000; Rev 3, dated 8/23/16.

[2] Based on speciation of Pipeline GTP natural gas from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)

[3] EPA Protocol for Equipment Leak Emissions (EPA-453/R-95-017; Nov. 1995) Table 2-4





Table 6: Emissions Summary - Heater Station

Pollutant	tons/year	
NOx	49.29	
VOC (NMHC)	16.20	
PM/PM10/PM2.5	8.68	
SO2	2.59	
СО	103.39	
CO2e	125,201.09	
******	a standar a sana ta shuda a sa sa	

*VOC and CO2e emissions do not include emergency natural gas venting

Voc and coze emissions do not include emergency had						Number of	Units Op.					
Equipment Information	Fuel Type	HF	١V	Equipme	nt Rating	Units	Simult.	Operating	Hours			
Power Generator	Nat. Gas	1077	Btu/scf [3]	11.74 M	MMBtu/hr [1]	3	2	8,760	hr/yr [7]	-		
Indirect Fired Gas Heater	Nat. Gas	1077	Btu/scf [3]	24 1	/MBtu/hr [8]	9	9	8,760	hr/yr [7]			
Waste Incinerator	Refuse	4500	Btu/lb	575 l	bs/hr [8]	1	1	12	hr/yr [8]			
Combustion Criteria Pollutant Emission Factors	NC)x	VOC (N	IMHC)	PM/PM1	0/PM2.5	S	02	C	0		
Power Generator	0.5 g	/bhp-hr [1]	0.14	g/bhp-hr [1]	0.01941	lb/mmBtu [4]	2.66	lb/mmscf [5]	1.0	g/bhp-hr [1]	l	
Indirect Fired Gas Heater	39.3 lt	b/mmscf [2]	5.5	lb/mmscf [2]	7.6	lb/mmscf [2]	2.66	lb/mmscf [5]	84	lb/mmscf [2	.]	
Waste Incinerator	3 lb	o/ton [6]	3	lb/ton [6]	0.47	kg/hr [9]	0.05	kg/hr [9]	10	lb/ton [6]		
	NC)x	VOC (M	IMHC)	PM/PM1	0/PM2.5	S	02	C	0	CC	02e
Combustion Emissions	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Power Generator #1	1.689	7.40	0.473	2.07	0.228	1.00	0.029	0.13	3.377	14.79	1,374.91	6,022.13
Power Generator #2	1.689	7.40	0.473	2.07	0.228	1.00	0.029	0.13	3.377	14.79	1,374.91	6,022.13
Indirect Fired Gas Heater #1	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #2	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #3	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #4	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #5	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #6	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #7	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #8	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Indirect Fired Gas Heater #9	0.875	3.83	0.123	0.54	0.169	0.74	0.059	0.26	1.872	8.20	2,810.35	12,309.34
Waste Incinerator [10, 11]	0.0012	0.0052	0.8625	0.0052	0.0857	0.0062	0.1102	0.0007	2.875	0.0173	782.20	4.69
Total		49.29		8.98		8.68		2.59		103.39		122,832.98
Major Source?	-	FALSE		FALSE		FALSE		FALSE		FALSE		NA
Combustion GHG Emission Factors	CH4	[12]	N20	[12]	CO2	[12]						
Power Generator	1.00E-03 k	g/mmBtu	1.00E-04	kg/mmBtu	53.06	kg/mmBtu						

÷[==]	=+ [==]	++= (==)
1.00E-03 kg/mmBtu	1.00E-04 kg/mmBtu	53.06 kg/mmBtu
1.00E-03 kg/mmBtu	1.00E-04 kg/mmBtu	53.06 kg/mmBtu
3.20E-02 kg/mmBtu	4.20E-03 kg/mmBtu	2,680.00 lb/ton [14]
	1.00E-03 kg/mmBtu 1.00E-03 kg/mmBtu	1.00E-03 kg/mmBtu 1.00E-04 kg/mmBtu 1.00E-03 kg/mmBtu 1.00E-04 kg/mmBtu

USAP-PE-SCCAL-00-000001-000; Rev 1B

Compressor and Heater Station Emissions Calculations



	Number	lb NG	Minutes	Events		VOC	[15]	CO2	e [15]	_
Compressor Seal and Blowdown NG Emissions [8]	of sources	/hr/source	/event	/year	lb NG/year	lb/year	ton/yr	lb/year	ton/yr	type ^c
Station Piping & Heaters	1	325,202	5	1	2.71E+04	1.71E+03	8.54E-01	5.60E+05	2.80E+02	р
Station Piping - Inlet ESD	1	500,534	7	1	5.84E+04	3.68E+03	1.84E+00	1.21E+06	6.03E+02	m
Station Piping & Heaters - Outlet ESD	1	1,125,225	7	1	1.31E+05	8.27E+03	4.14E+00	2.71E+06	1.36E+03	m
Station Piping & Heaters - OPP	1	66,349	1	1	1.11E+03	6.97E+01	3.48E-02	2.29E+04	1.14E+01	e
Pig trap - Launcher / Receiver (320ft ³) ^a	2	14,982	15	1	7.49E+03	4.72E+02	2.36E-01	1.55E+05	7.74E+01	m
Gas / Hydraulic Valve operators (6ft ³) ^b	31	72	1	2	7.44E+01	4.69E+00	2.34E-03	1.54E+03	7.69E-01	р
Total							7.07		2,318.17	

^a Emissions from these equipment are a mixture of natural gas, water, lube oil, and glcol - assumed to be 100% natural gas for emissions calculations

^b Emissions from these equipment are a mixture of natural gas, water, and oil - assumed to be 100% natural gas for emissions calculations

^c p = planned; e = emergency; m = maintenance

	TOC kg/hr	TOC kg/hr Total VOC		VOC		02e
Fugitive Component Emissions [16]	/comp.	Comp.	(lb/year)	(tons/year)	(lbs/year)	(tons/year)
Valves	4.50E-03	44	2.41E+02	1.20E-01	7.90E+04	3.95E+01
Flanges	3.90E-04	134	6.36E+01	3.18E-02	2.09E+04	1.04E+01
Total				0.15		49.94

^d Any equipment other than connectors, flanges, open-ended lines, pumps, or valves (i.e. compressors, diaphrams, drains, dump arms, hatches, instruments, meters, PRVs, polished rods, vents)

[1] Vendor Technical Data Sheet. Rating was converted from LHV to HHV by multiplying by 1.11.

[2] AP-42 Section 1.4: Natural Gas Combustion, assume 30 ppmv (@ 3% O2) for Indirect Heater

[3] Natural gas HHV as per Hysys calculation.

[4] AP-42 Section 3.2 - Natural Gas-fired Reciprocating Engines, Table 3.2-3 (Condensable + Filterable PM- 4-Stroke Rich Burn Engine)

[5] Assumed 16 ppmv total sulfur in natural gas. SO2 assumes all S oxidized to SO2.

[6] AP-42 Section 2.1 - Refuse Combustion - Table 2.1-12: Industrial/Commerical multi chamber combustor, TOC assumed = VOC

[7] Assume 24/7 operation for modeling/permitting purposes

[8] USAP-WP-MRZZZ-00-000001-000; Rev 3, dated 8/23/16.

[9] Performance Source Test Data

[10] PM10 and PM2.5 max. hourly emission rate multiplied by 2/24 to compensate for incinerator operation of 2 hours per day. SO2, CO, and VOC use max. hourly emissions.

[11] NOx hourly emissions based on assuming continuous operation at the average hourly rate - max. hourly emissions multiple by annual operating hours/8,760

[12] Table C-2 to Subpart C of Part 98—Default CH4 and N2O Emission Factors for Various Types of Fuel

[13] Table A-1 to Subpart A of Part 98—Global Warming Potentials.

[14] AP-42 Table 2.1-8 - Emission Factors for Refuse Derived Fuel Fired Combustors

[15] Based on speciation of Pipeline GTP natural gas from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)

[16] EPA Protocol for Equipment Leak Emissions (EPA-453/R-95-017; Nov. 1995) Table 2-4

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



Table 7: Equipment Hazardous Air Pollutant (HAP) Emission Factors

Factor	Value	Units
Natural Gas HHV	1077	Btu/scf
Refuse HHV	4500	Btu/lb
Equipment		Rating
Gas Turbine Compressor (346 MMBtu/hr)	346	MMBtu/hr
Gas Turbine Compressor (276 MMBtu/hr)	276	MMBtu/hr
Gas Turbine Compressor (187 MMBtu/hr)	187	MMBtu/hr
Power Generator (14.7 MMBtu/hr)	14.7	MMBtu/hr
Power Generator (11.7 MMBtu/hr)	11.7	MMBtu/hr
Aux. Utility Glycol Heater (13 MMBtu/hr)	13	MMBtu/hr
Aux. Utility Glycol Heater (10 MMBtu/hr)	10	MMBtu/hr
Indirect Fired Gas Heater	24	MMBtu/hr
Waste Incinerator	575	lbs/hr

Natural Gas Turbine HAP Emissions

Natural Gas Turbine HAP Emissions	Natural Gas Turbine HAP Emissions						pment Emission	s (lbs/hr)
						Gas Turbine	Gas Turbine	Gas Turbine
						Compressor	Compressor	Compressor
						(346	(276	(187
Federal 112(b)(1) Listed HAP	CAS #	EF Value	EF Units	EF Source	(lb/MMBtu)	MMBtu/hr)	MMBtu/hr)	MMBtu/hr)
1,3-Butadiene	106990	6.05E-08	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	6.05E-08	2.09E-05	1.67E-05	1.13E-05
Acetaldehyde	75070	1.28E-04	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	1.28E-04	4.42E-02	3.54E-02	2.39E-02
Acrolein	107028	5.11E-06	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	5.11E-06	1.77E-03	1.41E-03	9.54E-04
Benzene (including benzene from gasoline)	71432	2.85E-06	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	2.85E-06	9.85E-04	7.87E-04	5.32E-04
Ethyl benzene	100414	4.67E-06	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	4.67E-06	1.61E-03	1.29E-03	8.71E-04
Formaldehyde	50000	2.41E-03	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	2.41E-03	8.33E-01	6.66E-01	4.50E-01
Naphthalene	91203	7.12E-07	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	7.12E-07	2.46E-04	1.97E-04	1.33E-04
Polycylic Organic Matter/PAH	NA	1.44E-07	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	1.44E-07	4.98E-05	3.98E-05	2.69E-05
Propylene Oxide	75569	2.86E-05	lb/MMBtu	EPA Turbine HAP Memo ^{a,c}	2.86E-05	9.88E-03	7.90E-03	5.34E-03
Toluene	108883	2.07E-05	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	2.07E-05	7.15E-03	5.72E-03	3.86E-03
Xylenes (isomers and mixture)	1330207	1.01E-05	lb/MMBtu	EPA Turbine HAP Memo ^{a,b}	1.01E-05	3.49E-03	2.79E-03	1.88E-03

^a EPA Memo Revised HAP Emission Factors for Stationary Combustion Turbines, OAR-2002-0060, IV-B-09, 8/22/03

^b HAP Emission Factor for Lean Premix Turbines Firing Natural Gas >90% Load - with and without Duct Firing <50MW

^c HAP Emission Factor for Flame Turbines Furing Natural Gas - All Loads > 50MW (no test data for lean pre-mix turbine < 50MW)





Natural Gas IC Engine HAP Emissions					EF	Equi	ipment Emissions (lbs/hr)
						Power	Power
						Generator	Generator
						(14.7	(11.7
Federal 112(b)(1) Listed HAP	CAS #	EF Value	EF Units	EF Source	(lb/MMBtu)	MMBtu/hr)	MMBtu/hr)
1,1,2,2-Tetrachloroethane	79345	2.53E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	2.53E-05	3.72E-04	2.97E-04
1,1,2-Trichloroethane	79005	1.53E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.53E-05	2.25E-04	1.80E-04
1,3-Butadiene	106990	6.63E-04	lb/MMBtu	AP42 Table 3.2-3; 07/00	6.63E-04	9.74E-03	7.78E-03
1,3-Dichloropropene	542756	1.27E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.27E-05	1.87E-04	1.49E-04
Acetaldehyde	75070	2.79E-03	lb/MMBtu	AP42 Table 3.2-3; 07/00	2.79E-03	4.10E-02	3.28E-02
Acrolein	107028	2.63E-03	lb/MMBtu	AP42 Table 3.2-3; 07/00	2.63E-03	3.87E-02	3.09E-02
Benzene (including benzene from gasoline)	71432	1.58E-03	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.58E-03	2.32E-02	1.86E-02
Carbon Tetrachloride	56235	1.77E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.77E-05	2.60E-04	2.08E-04
Chlorobenzene	108907	1.29E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.29E-05	1.90E-04	1.51E-04
Chloroform	67663	1.37E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.37E-05	2.01E-04	1.61E-04
Ethyl benzene	100414	2.48E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	2.48E-05	3.64E-04	2.91E-04
Ethylene dibromide (Dibromoethane)	106934	2.13E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	2.13E-05	3.13E-04	2.50E-04
Formaldehyde	50000	2.05E-02	lb/MMBtu	AP42 Table 3.2-3; 07/00	2.05E-02	3.01E-01	2.41E-01
Methanol	67561	3.06E-03	lb/MMBtu	AP42 Table 3.2-3; 07/00	3.06E-03	4.50E-02	3.59E-02
Methylene chloride (Dichloromethane)	75092	4.12E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	4.12E-05	6.05E-04	4.84E-04
Naphthalene	91203	9.71E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	9.71E-05	1.43E-03	1.14E-03
Polycylic Organic Matter/PAH	NA	1.41E-04	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.41E-04	2.07E-03	1.66E-03
Styrene	100425	1.19E-05	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.19E-05	1.75E-04	1.40E-04
Toluene	108883	5.58E-04	lb/MMBtu	AP42 Table 3.2-3; 07/00	5.58E-04	8.20E-03	6.55E-03
Vinyl Chloride	75014	7.18E-06	lb/MMBtu	AP42 Table 3.2-3; 07/00	7.18E-06	1.06E-04	8.43E-05
Xylenes (isomers and mixture)	1330207	1.95E-04	lb/MMBtu	AP42 Table 3.2-3; 07/00	1.95E-04	2.87E-03	2.29E-03





Natural Gas Heater HAP Emissions

EF

Equipment Emissions (lbs/hr)

						Aux. Utility	Aux. Utility	
						Glycol Heater	Glycol Heater	Indirect Fired
Federal 112(b)(1) Listed HAP	CAS #	EF Value	EF Units	EF Source	(lb/MMBtu)	(13 MMBtu/h	r) (10 MMBtu/hr) Gas Heater
Benzene (including benzene from gasoline)	71432	8.00E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	7.43E-06	9.66E-05	7.43E-05	1.78E-04
Formaldehyde	50000	1.70E-02	lb/MMscf	VCAPCD AB 2588 ^{c,d}	1.58E-05	2.05E-04	1.58E-04	3.79E-04
Polycylic Organic Matter/PAH	NA	4.00E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	3.71E-06	4.83E-05	3.71E-05	8.91E-05
Naphthalene	91203	3.00E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	2.79E-06	3.62E-05	2.79E-05	6.69E-05
Acetaldehyde	75070	4.30E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	3.99E-06	5.19E-05	3.99E-05	9.58E-05
Acrolein	107028	2.70E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	2.51E-06	3.26E-05	2.51E-05	6.02E-05
Propylene Oxide	75569	7.31E-01	lb/MMscf	VCAPCD AB 2588 ^{c,d}	6.79E-04	8.82E-03	6.79E-03	1.63E-02
Toluene	108883	3.66E-02	lb/MMscf	VCAPCD AB 2588 ^{c,d}	3.40E-05	4.42E-04	3.40E-04	8.16E-04
Xylenes (isomers and mixture)	1330207	2.72E-02	lb/MMscf	VCAPCD AB 2588 ^{c,d}	2.53E-05	3.28E-04	2.53E-04	6.06E-04
Ethyl Benzene	100414	9.50E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	8.82E-06	1.15E-04	8.82E-05	2.12E-04
Hexane	110543	6.30E-03	lb/MMscf	VCAPCD AB 2588 ^{c,d}	5.85E-06	7.60E-05	5.85E-05	1.40E-04
Arsenic Compounds (inorganic including arsine)	NA	2.00E-04	lb/MMscf	AP-42Table 1.4-4; 7/98	1.86E-07	2.41E-06	1.86E-06	4.46E-06
Beryllium Compounds	NA	0.000012	lb/MMscf	AP-42Table 1.4-4; 7/98	1.11E-08	1.45E-07	1.11E-07	2.67E-07
Cadmium Compounds	NA	1.10E-03	lb/MMscf	AP-42Table 1.4-4; 7/98	1.02E-06	1.33E-05	1.02E-05	2.45E-05
Chromium Compounds	NA	1.40E-03	lb/MMscf	AP-42Table 1.4-4; 7/98	1.30E-06	1.69E-05	1.30E-05	3.12E-05
Cobalt Compounds	NA	8.40E-05	lb/MMscf	AP-42Table 1.4-4; 7/98	7.80E-08	1.01E-06	7.80E-07	1.87E-06
Manganese Compounds	NA	3.80E-04	lb/MMscf	AP-42Table 1.4-4; 7/98	3.53E-07	4.59E-06	3.53E-06	8.47E-06
Mercury Compounds	NA	2.60E-04	lb/MMscf	AP-42Table 1.4-4; 7/98	2.41E-07	3.14E-06	2.41E-06	5.79E-06
Nickel Compounds	NA	2.10E-03	lb/MMscf	AP-42Table 1.4-4; 7/98	1.95E-06	2.53E-05	1.95E-05	4.68E-05
Selenium Compounds	NA	2.40E-05	lb/MMscf	AP-42Table 1.4-4; 7/98	2.23E-08	2.90E-07	2.23E-07	5.35E-07
C		- ·						

^c Natural Gas Fired External Combustion Equipment <10MMBtu (HAP EF for heaters <10MMBtu used for 10 and 13 MMBtu Aux. Utility Glycol Heaters and 24 MMBtu Indirect Heaters , <10MMBtu/hr HAP EFs are larger than HAP EF for >10 MMBtu/hr)

^d Ventura County Air Pollution Control District AB 2588 Combustion Emission Factors Document - dated May 17, 2001

Waste Incinerator HAP Emissions					EF	Equipment Emissions (lbs/hr)
Federal 112(b)(1) Listed HAP	CAS #	EF Value	EF Units	EF Source	(lb/ton)	Waste Incinerator
Arsenic Compounds (inorganic including arsine)	NA	5.94E-03	lb/ton	AP-42 Table 2.1-8; 10/96*	5.94E-	03 1.71E-03
Cadmium Compounds	NA	8.75E-03	lb/ton	AP-42 Table 2.1-8; 10/96*	8.75E-	03 2.52E-03
Chromium Compounds	NA	1.40E-02	lb/ton	AP-42 Table 2.1-8; 10/96*	1.40E-	02 4.03E-03
Mercury Compounds	NA	5.50E-03	lb/ton	AP-42 Table 2.1-8; 10/96*	5.50E-	03 1.58E-03
Nickel Compounds	NA	4.36E-03	lb/ton	AP-42 Table 2.1-8; 10/96*	4.36E-	03 1.25E-03
Lead Compounds	NA	2.01E-01	lb/ton	AP-42 Table 2.1-8; 10/96*	2.01E-	01 5.78E-02
Hydrochloric acid	7647010	6.97	lb/ton	AP-42 Table 2.1-8; 10/96*	6.97E+	00 2.00E+00
*For an "Uncontrolled" unit						

Compressor Seal and Blowdown and Piping Component HAP Emissions

Based on speciation of Pipeline GTP natural gas from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



All Equipment					Equi	pment Emissions	s (lbs/hr)			
		Gas Turbine	Gas Turbine		Power	Power				
		Compressor	Compressor	Gas Turbine	Generator	Generator	Aux. Utility	Aux. Utility		
		(346	(276	Compressor	(14.7	(11.7	Glycol Heater	Glycol Heater	Indirect Fired	Waste
Federal 112(b)(1) Listed HAP	CAS #	MMBtu/hr)	MMBtu/hr)	(187 MMBtu/ł	nr) MMBtu/hr)	MMBtu/hr)	(13 MMBtu/hr) (10 MMBtu/h	r) Gas Heater	Incinerator
1,1,2,2-Tetrachloroethane	79345	0.00E+00	0.00E+00	0.00E+00	3.72E-04	2.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,2-Trichloroethane	79005	0.00E+00	0.00E+00	0.00E+00	2.25E-04	1.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106990	2.09E-05	1.67E-05	1.13E-05	9.74E-03	7.78E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Dichloropropene	542756	0.00E+00	0.00E+00	0.00E+00	1.87E-04	1.49E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75070	4.42E-02	3.54E-02	2.39E-02	4.10E-02	3.28E-02	5.19E-05	3.99E-05	9.58E-05	0.00E+00
Acrolein	107028	1.77E-03	1.41E-03	9.54E-04	3.87E-02	3.09E-02	3.26E-05	2.51E-05	6.02E-05	0.00E+00
Arsenic Compounds (inorganic including arsine)	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-06	1.86E-06	4.46E-06	1.71E-03
Benzene (including benzene from gasoline)	71432	9.85E-04	7.87E-04	5.32E-04	2.32E-02	1.86E-02	9.66E-05	7.43E-05	1.78E-04	0.00E+00
Beryllium Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-07	1.11E-07	2.67E-07	0.00E+00
Cadmium Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-05	1.02E-05	2.45E-05	2.52E-03
Carbon Tetrachloride	56235	0.00E+00	0.00E+00	0.00E+00	2.60E-04	2.08E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chlorobenzene	108907	0.00E+00	0.00E+00	0.00E+00	1.90E-04	1.51E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroform	67663	0.00E+00	0.00E+00	0.00E+00	2.01E-04	1.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-05	1.30E-05	3.12E-05	4.03E-03
Cobalt Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-06	7.80E-07	1.87E-06	0.00E+00
Ethyl benzene	100414	1.61E-03	1.29E-03	8.71E-04	3.64E-04	2.91E-04	1.15E-04	8.82E-05	2.12E-04	0.00E+00
Ethylene dibromide (Dibromoethane)	106934	0.00E+00	0.00E+00	0.00E+00	3.13E-04	2.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	50000	8.33E-01	6.66E-01	4.50E-01	3.01E-01	2.41E-01	2.05E-04	1.58E-04	3.79E-04	0.00E+00
Hexane	110543	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.60E-05	5.85E-05	1.40E-04	0.00E+00
Hydrochloric acid	7647010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+00
Lead Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E-02
Manganese Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.59E-06	3.53E-06	8.47E-06	0.00E+00
Mercury Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.14E-06	2.41E-06	5.79E-06	1.58E-03
Methanol	67561	0.00E+00	0.00E+00	0.00E+00	4.50E-02	3.59E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene chloride (Dichloromethane)	75092	0.00E+00	0.00E+00	0.00E+00	6.05E-04	4.84E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	91203	2.46E-04	1.97E-04	1.33E-04	1.43E-03	1.14E-03	3.62E-05	2.79E-05	6.69E-05	0.00E+00
Nickel Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.53E-05	1.95E-05	4.68E-05	1.25E-03
Polycylic Organic Matter/PAH	NA	4.98E-05	3.98E-05	2.69E-05	2.07E-03	1.66E-03	4.83E-05	3.71E-05	8.91E-05	0.00E+00
Propylene Oxide	75569	9.88E-03	7.90E-03	5.34E-03	0.00E+00	0.00E+00	8.82E-03	6.79E-03	1.63E-02	0.00E+00
Selenium Compounds	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.90E-07	2.23E-07	5.35E-07	0.00E+00
Styrene	100425	0.00E+00	0.00E+00	0.00E+00	1.75E-04	1.40E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Foluene	108883	7.15E-03	5.72E-03	3.86E-03	8.20E-03	6.55E-03	4.42E-04	3.40E-04	8.16E-04	0.00E+00
/inyl Chloride	75014	0.00E+00	0.00E+00	0.00E+00	1.06E-04	8.43E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (isomers and mixture)	1330207	3.49E-03	2.79E-03	1.88E-03	2.87E-03	2.29E-03	3.28E-04	2.53E-04	6.06E-04	0.00E+00
Total		9.02E-01	7.21E-01	4.87E-01	4.76E-01	3.81E-01	1.03E-02	7.94E-03	1.91E-02	2.07E+00





Table 8: Total HAP Emissions Summary

	-	Major	
Facility Type	HAPs (tons/year)	Source?	
Single Unit with Cooling	8.34	FALSE	
Multi Unit with Cooling	10.73	FALSE	
Single Unit wo Cooling	6.63	FALSE	
Metering Station	0.01	FALSE	
Heater Station	4.17	FALSE	

			Total HAPs
Single Unit with Cooling	Operating Hours/Year	lb HAP/hr	(tons/year)
Gas Turbine Compressor (346 MMBtu/hr)	8760	9.02E-01	3.95
Power Generator (14.7 MMBtu/hr)	17520	4.76E-01	4.17
Aux. Utility Glycol Heater (10 MMBtu/hr)	17520	7.94E-03	0.07
Waste Incinerator	52	2.07E+00	0.05
Compressor Seals and Blowdown	8760	2.13E-02	0.09
Piping Components	8760	4.03E-04	0.00
		Total	8.34
			Total HAPs
Multi Unit with Cooling	Operating Hours/Year	lb HAP/hr	(tons/year)
Gas Turbine Compressor (187 MMBtu/hr)	17520	4.87E-01	4.27
Power Generator (14.7 MMBtu/hr)	26280	4.76E-01	6.26
Aux. Utility Glycol Heater (13 MMBtu/hr)	17520	1.03E-02	0.09
Waste Incinerator	52	2.07E+00	0.05
Compressor Seals and Blowdown	8760	1.27E-02	0.06
Piping Components	8760	2.32E-04	0.00
		Total	10.73
			Total HAPs
Single Unit wo Cooling	Operating Hours/Year	lb HAP/hr	(tons/year)
Gas Turbine Compressor (276 MMBtu/hr)	8760	7.21E-01	3.16
Power Generator (11.7 MMBtu/hr)	17520	3.81E-01	3.33
Aux. Utility Glycol Heater (10 MMBtu/hr)	17520	7.94E-03	0.07
Waste Incinerator	52	2.07E+00	0.05
Compressor Seals and Blowdown	8760	3.93E-03	0.02
Piping Components	8760	7.13E-05	0.00
		Total	6.63
			Total HAPs
Metering Station	Operating Hours/Year	lb HAP/hr	(tons/year)
Compressor Seals and Blowdown	8760	2.02E-03	0.01
Piping Components	8760	5.09E-05	0.00
		Total	0.01
			Total HAPs
Heater Station	Operating Hours/Year	lb HAP/hr	(tons/year)
Power Generator (11.7 MMBtu/hr)	17520	3.81E-01	3.33
Indirect Fired Gas Heater	78840	1.91E-02	0.75
Waste Incinerator	52	2.07E+00	0.05
Compressor Seals and Blowdown	8760	6.13E-03	0.03
Piping Components	8760	1.32E-04	0.00
		Total	4.17

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



Table 9: Speciated HAP Emissions Summary

Single Unit with Cooling

Federal 112(b)(1) Listed HAP	Gas Turbine Compressor (346 MMBtu/hr)	Power Generator (14.7 MMBtu/hr)	Aux. Utility Glycol Heater (10 MMBtu/hr)	Waste Incinerator	Compressor Seals and Blowdown	Piping Components	Total (tons)
1,1,2,2-Tetrachloroethane	0.00E+00	6.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E-03
1,1,2-Trichloroethane	0.00E+00	3.94E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-03
1,3-Butadiene	1.83E-01	1.71E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.54E-02
1,3-Dichloropropene	0.00E+00	3.27E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.64E-02
Acetaldehyde	3.87E+02	7.18E+02	6.99E-01	0.00E+00	0.00E+00	0.00E+00	5.53E-01
Acrolein	1.55E+01	6.77E+02	4.39E-01	0.00E+00	0.00E+00	0.00E+00	3.47E-01
Arsenic Compounds (inorganic including arsine)	0.00E+00	0.00E+00	3.25E-02	8.88E-02	0.00E+00	0.00E+00	6.07E-05
Benzene (including benzene from gasoline)	8.63E+00	4.07E+02	1.30E+00	0.00E+00	6.98E-03	1.38E-04	2.08E-01
Beryllium Compounds	0.00E+00	0.00E+00	1.95E-03	0.00E+00	0.00E+00	0.00E+00	9.76E-07
Cadmium Compounds	0.00E+00	0.00E+00	1.79E-01	1.31E-01	0.00E+00	0.00E+00	1.55E-04
Carbon Tetrachloride	0.00E+00	4.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-03
Chlorobenzene	0.00E+00	3.32E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-03
Chloroform	0.00E+00	3.53E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-03
Chromium Compounds	0.00E+00	0.00E+00	2.28E-01	2.09E-01	0.00E+00	0.00E+00	2.19E-04
Cobalt Compounds	0.00E+00	0.00E+00	1.37E-02	0.00E+00	0.00E+00	0.00E+00	6.83E-06
Ethyl benzene	1.41E+01	6.39E+00	1.55E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-02
Ethylene dibromide (Dibromoethane)	0.00E+00	5.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-03
Formaldehyde	7.29E+03	5.28E+03	2.77E+00	0.00E+00	0.00E+00	0.00E+00	6.29E+00
Hexane	0.00E+00	0.00E+00	1.02E+00	0.00E+00	3.08E-02	6.09E-04	5.28E-04
Hydrochloric acid	0.00E+00	0.00E+00	0.00E+00	1.04E+02	0.00E+00	0.00E+00	5.21E-02
Lead Compounds	0.00E+00	0.00E+00	0.00E+00	3.00E+00	0.00E+00	0.00E+00	1.50E-03
Manganese Compounds	0.00E+00	0.00E+00	6.18E-02	0.00E+00	0.00E+00	0.00E+00	3.09E-05
Mercury Compounds	0.00E+00	0.00E+00	4.23E-02	8.22E-02	0.00E+00	0.00E+00	6.23E-05
Methanol	0.00E+00	7.88E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E-01
Methylene chloride (Dichloromethane)	0.00E+00	1.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.30E-03
Naphthalene	2.15E+00	2.50E+01	4.88E-01	0.00E+00	0.00E+00	0.00E+00	1.38E-02
Nickel Compounds	0.00E+00	0.00E+00	3.42E-01	6.52E-02	0.00E+00	0.00E+00	2.03E-04
Polycylic Organic Matter/PAH	4.36E-01	3.63E+01	6.51E-01	0.00E+00	0.00E+00	0.00E+00	1.87E-02
Propylene Oxide	8.66E+01	0.00E+00	1.19E+02	0.00E+00	0.00E+00	0.00E+00	1.03E-01
Selenium Compounds	0.00E+00	0.00E+00	3.90E-03	0.00E+00	0.00E+00	0.00E+00	1.95E-06
Styrene	0.00E+00	3.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-03
Toluene	6.27E+01	1.44E+02	5.95E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-01
Vinyl Chloride	0.00E+00	1.85E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.24E-04
Xylenes (isomers and mixture)	3.06E+01	5.02E+01	4.42E+00	0.00E+00	0.00E+00	0.00E+00	4.26E-02
						Total (tons)	8.25

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



Table 9: Speciated HAP Emissions Summary

Multi Unit with Cooling

			Aux. Utility Glycol				
	Gas Turbine Compressor	Power Generator	Heater (13		Compressor Seals		
Federal 112(b)(1) Listed HAP	(187 MMBtu/hr)	(14.7 MMBtu/hr)	MMBtu/hr)	Waste Incinerator	and Blowdown	Piping Components	Total (tons)
1,1,2,2-Tetrachloroethane	0.00E+00	9.77E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.89E-03
1,1,2-Trichloroethane	0.00E+00	5.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.95E-03
1,3-Butadiene	1.98E-01	2.56E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-01
1,3-Dichloropropene	0.00E+00	4.91E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-03
Acetaldehyde	4.18E+02	1.08E+03	9.09E-01	0.00E+00	0.00E+00	0.00E+00	7.48E-01
Acrolein	1.67E+01	1.02E+03	5.71E-01	0.00E+00	0.00E+00	0.00E+00	5.17E-01
Arsenic Compounds (inorganic including arsine)	0.00E+00	0.00E+00	4.23E-02	8.88E-02	0.00E+00	0.00E+00	6.55E-05
Benzene (including benzene from gasoline)	9.32E+00	6.10E+02	1.69E+00	0.00E+00	1.03E-02	1.88E-04	3.11E-01
Beryllium Compounds	0.00E+00	0.00E+00	2.54E-03	0.00E+00	0.00E+00	0.00E+00	1.27E-06
Cadmium Compounds	0.00E+00	0.00E+00	2.33E-01	1.31E-01	0.00E+00	0.00E+00	1.82E-04
Carbon Tetrachloride	0.00E+00	6.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-03
Chlorobenzene	0.00E+00	4.98E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.49E-03
Chloroform	0.00E+00	5.29E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-03
Chromium Compounds	0.00E+00	0.00E+00	2.96E-01	2.09E-01	0.00E+00	0.00E+00	2.53E-04
Cobalt Compounds	0.00E+00	0.00E+00	1.78E-02	0.00E+00	0.00E+00	0.00E+00	8.88E-06
Ethyl benzene	1.53E+01	9.58E+00	2.01E+00	0.00E+00	0.00E+00	0.00E+00	1.34E-02
Ethylene dibromide (Dibromoethane)	0.00E+00	8.23E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-03
Formaldehyde	7.88E+03	7.92E+03	3.60E+00	0.00E+00	0.00E+00	0.00E+00	7.90E+00
Hexane	0.00E+00	0.00E+00	1.33E+00	0.00E+00	4.54E-02	8.29E-04	6.89E-04
Hydrochloric acid	0.00E+00	0.00E+00	0.00E+00	1.04E+02	0.00E+00	0.00E+00	5.21E-02
Lead Compounds	0.00E+00	0.00E+00	0.00E+00	3.00E+00	0.00E+00	0.00E+00	1.50E-03
Manganese Compounds	0.00E+00	0.00E+00	8.04E-02	0.00E+00	0.00E+00	0.00E+00	4.02E-05
Mercury Compounds	0.00E+00	0.00E+00	5.50E-02	8.22E-02	0.00E+00	0.00E+00	6.86E-05
Methanol	0.00E+00	1.18E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.91E-01
Methylene chloride (Dichloromethane)	0.00E+00	1.59E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.96E-03
Naphthalene	2.33E+00	3.75E+01	6.34E-01	0.00E+00	0.00E+00	0.00E+00	2.02E-02
Nickel Compounds	0.00E+00	0.00E+00	4.44E-01	6.52E-02	0.00E+00	0.00E+00	2.55E-04
Polycylic Organic Matter/PAH	4.71E-01	5.45E+01	8.46E-01	0.00E+00	0.00E+00	0.00E+00	2.79E-02
Propylene Oxide	9.35E+01	0.00E+00	1.55E+02	0.00E+00	0.00E+00	0.00E+00	1.24E-01
Selenium Compounds	0.00E+00	0.00E+00	5.08E-03	0.00E+00	0.00E+00	0.00E+00	2.54E-06
Styrene	0.00E+00	4.60E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.30E-03
Toluene	6.77E+01	2.16E+02	7.74E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-01
Vinyl Chloride	0.00E+00	2.77E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-03
Xylenes (isomers and mixture)	3.30E+01	7.53E+01	5.75E+00	0.00E+00	0.00E+00	0.00E+00	5.70E-02
						Total	10.67

USAP-PE-SCCAL-00-000001-000; Rev 1B Compressor and Heater Station Emissions Calculations



Table 9: Speciated HAP Emissions Summary

Single Unit wo Cooling

Federal 112(b)(1) Listed HAP	Gas Turbine Compressor (276 MMBtu/hr)	Power Generator (11.7 MMBtu/hr)	Heater (10 MMBtu/hr)	Waste Incinerator	Compressor Seals and Blowdown	Piping Components	Total (tons)
1,1,2,2-Tetrachloroethane	0.00E+00	5.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.60E-03
1,1,2-Trichloroethane	0.00E+00	3.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03
1,3-Butadiene	1.46E-01	1.36E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.83E-02
1,3-Dichloropropene	0.00E+00	2.61E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-03
Acetaldehyde	3.10E+02	5.74E+02	6.99E-01	0.00E+00	0.00E+00	0.00E+00	4.42E-01
Acrolein	1.24E+01	5.41E+02	4.39E-01	0.00E+00	0.00E+00	0.00E+00	2.77E-01
Arsenic Compounds (inorganic including arsine)	0.00E+00	0.00E+00	3.25E-02	8.88E-02	0.00E+00	0.00E+00	6.07E-05
Benzene (including benzene from gasoline)	6.90E+00	3.25E+02	1.30E+00	0.00E+00	3.18E-03	5.77E-05	1.67E-01
Beryllium Compounds	0.00E+00	0.00E+00	1.95E-03	0.00E+00	0.00E+00	0.00E+00	9.76E-07
Cadmium Compounds	0.00E+00	0.00E+00	1.79E-01	1.31E-01	0.00E+00	0.00E+00	1.55E-04
Carbon Tetrachloride	0.00E+00	3.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-03
Chlorobenzene	0.00E+00	2.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-03
Chloroform	0.00E+00	2.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-03
Chromium Compounds	0.00E+00	0.00E+00	2.28E-01	2.09E-01	0.00E+00	0.00E+00	2.19E-04
Cobalt Compounds	0.00E+00	0.00E+00	1.37E-02	0.00E+00	0.00E+00	0.00E+00	6.83E-06
Ethyl benzene	1.13E+01	5.10E+00	1.55E+00	0.00E+00	0.00E+00	0.00E+00	8.97E-03
Ethylene dibromide (Dibromoethane)	0.00E+00	4.38E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E-03
Formaldehyde	5.83E+03	4.22E+03	2.77E+00	0.00E+00	0.00E+00	0.00E+00	5.03E+00
Hexane	0.00E+00	0.00E+00	1.02E+00	0.00E+00	1.40E-02	2.54E-04	5.20E-04
Hydrochloric acid	0.00E+00	0.00E+00	0.00E+00	1.04E+02	0.00E+00	0.00E+00	5.21E-02
Lead Compounds	0.00E+00	0.00E+00	0.00E+00	3.00E+00	0.00E+00	0.00E+00	1.50E-03
Manganese Compounds	0.00E+00	0.00E+00	6.18E-02	0.00E+00	0.00E+00	0.00E+00	3.09E-05
Mercury Compounds	0.00E+00	0.00E+00	4.23E-02	8.22E-02	0.00E+00	0.00E+00	6.23E-05
Methanol	0.00E+00	6.29E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E-01
Methylene chloride (Dichloromethane)	0.00E+00	8.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-03
Naphthalene	1.72E+00	2.00E+01	4.88E-01	0.00E+00	0.00E+00	0.00E+00	1.11E-02
Nickel Compounds	0.00E+00	0.00E+00	3.42E-01	6.52E-02	0.00E+00	0.00E+00	2.03E-04
Polycylic Organic Matter/PAH	3.48E-01	2.90E+01	6.51E-01	0.00E+00	0.00E+00	0.00E+00	1.50E-02
Propylene Oxide	6.92E+01	0.00E+00	1.19E+02	0.00E+00	0.00E+00	0.00E+00	9.41E-02
Selenium Compounds	0.00E+00	0.00E+00	3.90E-03	0.00E+00	0.00E+00	0.00E+00	1.95E-06
Styrene	0.00E+00	2.45E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-03
Toluene	5.01E+01	1.15E+02	5.95E+00	0.00E+00	0.00E+00	0.00E+00	8.54E-02
Vinyl Chloride	0.00E+00	1.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.39E-04
Xylenes (isomers and mixture)	2.44E+01	4.01E+01	4.42E+00	0.00E+00	0.00E+00	0.00E+00	3.45E-02
· · · ·						Total (tons)	6.62

Metering Station

-	Compressor Seals and		
Federal 112(b)(1) Listed HAP	Blowdown	Piping Components	Total (tons)
Benzene (including benzene from gasoline)	1.64E-03	4.12E-05	8.39E-07
Ethyl benzene	0.00E+00	0.00E+00	0.00E+00
Hexane	7.23E-03	1.82E-04	3.70E-06
Toluene	0.00E+00	0.00E+00	0.00E+00
Xylenes (isomers and mixture)	0.00E+00	0.00E+00	0.00E+00
		Total (tons)	0.00

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Table 9: Speciated HAP Emissions Summary

Heater Station

	Power Generator (11.7	Indirect Fired Gas		Compressor Seals		
Federal 112(b)(1) Listed HAP	MMBtu/hr)	Heater	Waste Incinerator	and Blowdown	Piping Components	Total (tons)
1,1,2,2-Tetrachloroethane	5.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.60E-03
1,1,2-Trichloroethane	3.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-03
1,3-Butadiene	1.36E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.82E-02
1,3-Dichloropropene	2.61E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-03
Acetaldehyde	5.74E+02	7.55E+00	0.00E+00	0.00E+00	0.00E+00	2.91E-01
Acrolein	5.41E+02	4.74E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-01
Arsenic Compounds (inorganic including arsine)	0.00E+00	3.51E-01	8.88E-02	0.00E+00	0.00E+00	2.20E-04
Benzene (including benzene from gasoline)	3.25E+02	1.41E+01	0.00E+00	4.96E-03	1.07E-04	1.70E-01
Beryllium Compounds	0.00E+00	2.11E-02	0.00E+00	0.00E+00	0.00E+00	1.05E-05
Cadmium Compounds	0.00E+00	1.93E+00	1.31E-01	0.00E+00	0.00E+00	1.03E-03
Carbon Tetrachloride	3.64E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-03
Chlorobenzene	2.65E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-03
Chloroform	2.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-03
Chromium Compounds	0.00E+00	2.46E+00	2.09E-01	0.00E+00	0.00E+00	1.33E-03
Cobalt Compounds	0.00E+00	1.48E-01	0.00E+00	0.00E+00	0.00E+00	7.38E-05
Ethyl benzene	5.10E+00	1.67E+01	0.00E+00	0.00E+00	0.00E+00	1.09E-02
Ethylene dibromide (Dibromoethane)	4.38E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E-03
Formaldehyde	4.22E+03	2.99E+01	0.00E+00	0.00E+00	0.00E+00	2.12E+00
Hexane	0.00E+00	1.11E+01	0.00E+00	2.19E-02	4.71E-04	5.55E-03
Hydrochloric acid	0.00E+00	0.00E+00	1.04E+02	0.00E+00	0.00E+00	5.21E-02
Lead Compounds	0.00E+00	0.00E+00	3.00E+00	0.00E+00	0.00E+00	1.50E-03
Manganese Compounds	0.00E+00	6.68E-01	0.00E+00	0.00E+00	0.00E+00	3.34E-04
Mercury Compounds	0.00E+00	4.57E-01	8.22E-02	0.00E+00	0.00E+00	2.70E-04
Methanol	6.29E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E-01
Methylene chloride (Dichloromethane)	8.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-03
Naphthalene	2.00E+01	5.27E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-02
Nickel Compounds	0.00E+00	3.69E+00	6.52E-02	0.00E+00	0.00E+00	1.88E-03
Polycylic Organic Matter/PAH	2.90E+01	7.03E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-02
Propylene Oxide	0.00E+00	1.28E+03	0.00E+00	0.00E+00	0.00E+00	6.42E-01
Selenium Compounds	0.00E+00	4.22E-02	0.00E+00	0.00E+00	0.00E+00	2.11E-05
Styrene	2.45E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-03
Toluene	1.15E+02	6.43E+01	0.00E+00	0.00E+00	0.00E+00	8.95E-02
Vinyl Chloride	1.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.39E-04
Xylenes (isomers and mixture)	4.01E+01	4.78E+01	0.00E+00	0.00E+00	0.00E+00	4.40E-02
					Total (tons)	4.14

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Table 10: AAQS Modeling Stack Parameters

MULTI UNIT With Cooling							Stack Flow		Stack Flow							
MULTI UNIT With Cooling	Height (m)	Source	Temp (C)	Temp (F)	Temp (K)	Source	(ACFM)	Source	(m³/min)	Velocity (m/s)	Source	ID (m)	Shape	Source	NO2:NOx	Source
- Gas Turbine Compressor (160 MMBtu/hr)	12.45	1		900	755.37	2	247262	8		21.37	6	2.64	Square	1	0.3	5
- Power Generator (14.7 MMBtu/hr)	5.49	1		1179	910.37	7	7736	8		59.55	6	0.28	Circular	1	0.1	3
 Aux. Utility Glycol Heater (13 MMBtu/hr) 	9.14	1		347	448.15	1	3369	8		7.84	6	0.51	Circular	1	0.1	3
- Waste Incinerator	5.13	1	592		864.82	4				5.72	4	0.28	Circular	1	0.1	3
SINGLE UNIT With Cooling																
- Gas Turbine Compressor (325 MMBtu/hr)	21.03	1		879.93	744.22	9	425074	9		53.53	6	2.18	Circular	1	0.3	3
- Power Generator (14.7 MMBtu/hr)	5.49	1		1179	910.37	7	7736	8		59.55	6	0.28	Circular	1	0.1	3
 Aux. Utility Glycol Heater (10 MMBtu/hr) 	9.14	1		347	448.15	1	2591	8		7.45	6	0.46	Circular	1	0.1	3
- Waste Incinerator	5.13	1	592		864.82	4				5.72	4	0.28	Circular	1	0.1	3
SINGLE UNIT WO Cooling																
- Gas Turbine Compressor (279 MMBtu/hr)	21.03	1		966.43	792.28	9	345122	9		43.46	6	2.18	Circular	1	0.3	3
- Power Generator (11.7 MMBtu/hr)	5.49	1		1136	886.48	7	6018	8		46.33	6	0.28	Circular	1	0.1	3
 Aux. Utility Glycol Heater (10 MMBtu/hr) 	9.14	1		347	448.15	1	2591	8		7.45	6	0.46	Circular	1	0.1	3
- Waste Incinerator	5.13	1	592		864.82	4				5.72	4	0.28	Circular	1	0.1	3
HEATER STATION																
- Power Generator (11.7 MMBtu/hr)	5.49	1		1136	886.48	7	6018	8		46.33	6	0.28	Circular	1	0.1	3
- Indirect Fired Gas Heater	11.28	1		800	699.82	1	9711	8		4.09	6	1.19	Circular	1	0.1	3
- Waste Incinerator	5.13	1	592		864.82	4				5.72	4	0.28	Circular	1	0.1	3

METERING STATION

None

* There are 2 stacks for each 3 MMBtu/hr Aux. Utility Glycol Heater.

Sources

[1] Worley Parsons Spreadsheet - USAP-WP-MRZZZ-00-000001-000; Rev 3, dated 8/23/16.

[2] Vendor Predicted Emission Performance

[3] In-stack NO2-to-NOX ratio of 0.1 was assumed for the generators, heaters, and waste incinerators and a value of 0.3 for turbines, based on the source-specific in-stack NO2-to-NOX data provided in NO2-to-NOX ratios per Source Tests Approved by the Alaska Department of Environmental Conservation, updated August 23, 2013.

[4] Performance Source Test Data

[5] Provided by vendor

[6] Velocity calculated according to acfm and stack diameter

[7] Vendor Technical Data Sheet

[8] Calculated based on heat input rating, EPA Method 19 F-Factor, and stack temperature

[9] Vendor expected performance and emissions sheet





Table 11: Pipeline GTP Natural Gas Outlet Speciation Data

Common ant			GTP	Outlet		
Component	(mol%)	MW	MWi	(lb/lb)	VOC	CO2e
N ₂	0.765	28.01	0.21	1.21E-02	FALSE	
CO ₂	0.005	44.01	0.00	1.24E-04	FALSE	1
H ₂ S	0.0003	34.08	0.00	5.78E-06	FALSE	
C ₁	91.097	16.04	14.61	8.27E-01	FALSE	25
C ₂	5.764	30.07	1.73	9.81E-02	FALSE	
C ₃	1.974	44.1	0.87	4.93E-02	TRUE	
nC ₄	0.134	58.12	0.08	4.41E-03	TRUE	
iC ₄	0.175	58.12	0.10	5.75E-03	TRUE	
nC ₅	0.037	72.15	0.03	1.51E-03	TRUE	
iC ₅	0.035	72.15	0.03	1.43E-03	TRUE	
2-Methylpentane	0.001	86.18	0.00	4.88E-05	TRUE	
n-Hexane	0.004	86.18	0.00	1.95E-04	TRUE	
Methylcyclopentane	0.001	84.16	0.00	4.76E-05	TRUE	
Benzene	0.001	78.11	0.00	4.42E-05	TRUE	
Cyclohexane	0.001	84.16	0.00	4.76E-05	TRUE	
n-Heptane	0.003	100.21	0.00	1.70E-04	TRUE	
Methylcyclohexane	0.001	98.186	0.00	5.55E-05	TRUE	
Toluene	0		0.00	0.00E+00	TRUE	
n-Octane	0.001	114.23	0.00	6.46E-05	TRUE	
E-Benzene	0		0.00	0.00E+00	TRUE	
p-Xylene	0		0.00	0.00E+00	TRUE	
o-Xylene	0		0.00	0.00E+00	TRUE	
n-Nonane	0		0.00	0.00E+00	TRUE	
n-Decane	0		0.00	0.00E+00	TRUE	
Total	100		17.68	1		
lb VOC/lb Natural Gas	0.063					
lb CO2e/lb Natural Gas	20.67	1				
HHV (BTU/ft ³)	1090.2	-				
Molecular weight	17.68					

*Speciation data from Alaska LNG Design Basis Document (USAP-WP-YBDES-00-000002-000)



Appendix G: Modeling Results Diagrams

				I		mun	n 1-H	łr Á	vera	ge N	tatio O₂ C M N/	once	entra	ation	s (μ)						
83	83	77	77	77	53	514	40	40	42	42	42	42	41	40	39	39	37	36	35	34	34	3β	3
84	86	86	81	82	54	55	43	43	45	45	45	44	44	43	42	41	39	38	36	35	34	34	3
91	89	89	83	86	82	56	47	47	48	48	48	47	47	45	44	43	41	40	38	36	35	34	53
687800 - 95	96	93	96	89	91	55	54	51	52	/52	52	51	50	48	46	45	43	42	40	38	36	35	2
97	100	102	101	104	95	86	58	56	56	56	56	55.	53	51	49	47	45	43	41	39	37	35	100
89	104	108	111	110	101	98	59	60	60	59	75	5 64	57	54	52	49	47	45	43	39	37	35	3
69	78	113	113	114	113	96	75	61/	63	01	_	-	75	753	56	52	48	145	43	40	38	36	3
687700 72	71	72	113	114	113	106	92	64	67 8	T	VASTI	E	~	1	and and a second	58 ⁴ 64	4 54	47	744	41	39	37	54
64	66	69	70	84	111	99	90	66	145			Fior.	00		/		P	-5	47	42	40	38	-
95	99	104	82	65	67	87	79	77	11/3	A			88		Mag	7	Part and a second	60 /59	48	43	41	38	10
106	102	106	104	99	99	85	69	800	#1/15-	H.	TURE		2		1	1	64	59	47	43	41	39	2
687600 ¹³	114	115	114	113	103	88/	74	82			+	51	AL	9	A	1	66	54	51	48	45	42	4
14	115	115	115	114	107	- 87	91		EN C	TUP	RBINE	H		19	16	176	72	54	52	49	46	43	4
14	115	114	85	83	83 /	88	116	GEN	10	A	- H	THE REAL		47	La	THE	62	54	52	49	45	43	4
87	90	93	75	72	.74	82	108		TL	RBIN	ESH	D	1	41	14	773	56	53	51	48	45	42	2
687500-87	77	61	63	68	73	8 68/	*//		P	OH	1		6	7/	12	72	55	53	50	47	44	42	
5β7 500 - 5β	55	59	61	63	64	78	1			No the	M	La la	11		69 /65	53	51	51	49	46	43	41	
54	53	57	59	61	6274	IR	the	10		1			11	67	60	50	47	44	47	44	42	40	
49	52	54	56/	58	68	A				in the second second	Z	11 .	1	64 61	52	47	45	43	41	39	41	39	-
687400 48	50	52	53	55	53		1	0		Contraction of the second	M	/	1	51 56	47	45	43	41	39	38	36	37	2
47	48	50 /	51	59 54				1		5	3/	1	58	49	45	43	41	40	38	36	36	35	-
46	47	48	-50	51	51	59 54	58	57		~	2	/5	3 53	45	43	41	39	38	36	36	35	35	-
46	46	47	48	48	48	49	49	5 48	53	. 52		151	44	43	41	39	38	36	36	35	35	35	
297200 ⁴⁵	46	47	46	46	46	46	46	46	-	45	50	496	42	41	39	37	36	36	35	35	35	34	-
687300 ⁴⁰ 44	44	46	45	44	44	43	44	44	42	A	42/	41	40	39	38	37	36	35	35	34	34	34	
40	44	45	45	44	42	42	42	41	40	40	40	39	38	37	37	36	35	35	35	34	34	33	
ap	43	44	44	43	42	41	40	40	39	39	39	38	38	37	36	36	35	34	34	33	33	32	
Ī	42	43	43	43	42	40	40	39	38	38	38	37	37	36	36	35	34	34	33	33	32	32	

7687200 91	9.3	3020	00	5.1	100	1	110	9.1	- 6	1 3040		0.0		1	11.00	0.1		1		1.5	20	1	0
	9.7	9.9	9.6	9.7	÷.	9.7	1	1.	9.5	9.5	9.4	8	9.0	191	8.5	8.3	7.8	7.9	1.1	7.5	7.2	7.2	6
		1	. 5.	1.0		3	12	100			. C.	SQ.		20			137	÷.	100			1	
										10.5 9.9	- /			9.6 9.1	9.2 8.9	9.0 8.6	8.3	8.3 8.1	11	8.0	7.8	7.6	
687300 ^{10.6}									-	1	18 1	/				9.3	9.0	8.7	8.4	8.2	8.0	7.8	
						IN AU			1	11.5	11.5/	1	11.0					9.0	8.7	8.4	8.2	8.0	
11.3	11.3	11.4	41.4	114	11.4	11.5	11.0	1.6	6	5		11	201				9.8	1.1	1	<u>.</u>	3.	8.1	
11.3	11.4	11.4	11.4	11.5	111.7	11.7	1.6		1		y.	1	1	1.1	1.	2.1	10.2	- E.,			0.1	8.3	
687400 ^{11,4}							11	11	1	0	A		11				10.6					8.5	
			11.6		1	S	L	Contraction of the second seco	- Aller	and the second	K	/									9.1		
11.4	1.5		1.12	/	1	1	Te	() All	H			11 .		11:0			11.3					8,9	
11.5				1		ile	1	~				A	4	11/	9		10				9.6	9,1	1
687500 ^{<u>11</u>.5}				1		1//			L	of the	N	C	M	Han	N210	11.9	11.4	11.3	11.0	10.3	9.7	9.2	
			11.8		/		6		TY	RBINE	3	2))	1	4	11/1	4					9.9		
			11.7		/		13,5//		The state	K	-			\$/	10	12200	11.6	11.4	11.3	10.6	10.0	9.4	
11.5	11.6	11.8	11.7	11.6	12.0	12.9	13.1	GEN	000	TUR	BINE	H		A	16	Mak	11.9	11.4	11.3	10.7	10.0	9.4	
687600 ^{11.5}	11.6	11.7	11.7	11.5	12.0	12.9	13.2	14/0			to	SH.	Horne	140	A	T	1/19	11.4	11.3	10.7	10.0	9.4	
11.5	11.6	11.7	11.7	11.5	11.5	12.7	13.1	13		He	TURE	INET	A		A	6	11/9	11.7	11.3	10.6	9.9	9.3	
11.5	11.6	11.7	11.7	11.6	11.4	12.4	12/9	13.21	4/1/	1010				1:31	NO	7	1	17	11.3	10.5	9.8	9.3	
11.4	11.5	11.6	11.7	11.6	11.5	11.4	12.5	12.7	1337		- Patricine	Kor	00	-	1	_					9.7	9.1	
687700 ^{11.4}	11.5	11.5	11.7	11.7	11.6	11.5	11.5	11.5	11.9	AFT	ASTE	1	-		A CONT	1,0 11	11.3 81.6	14.3	10.7	10.0	9.5	9.0	3
11.3	11.4	11.5	11.6	11.7	11.6	11.6	11.6	11.6/	11.6	12/5	,	4	12.1	12.8	11.6	11/4	11.3	11.0	10.4	9.8	9.3	8.8	1
11.2	11.3	11.4	11.5	11.5	11.6	11.7	11.6	11.6	1.6	11.7	2.2	21.8	11.6	11.5	714	11.4	11.2	10.6	10.0	9.5	9.0	8.5	-
10.7									/		-	~							9.7	9.2	8.7	8.3	
687800 ^{10.3}	10.7	10.9	11.3	11.3	11.4	11.4	11.4	11.5	11.5	17.5	11.5	11.4	11,4	11.3	11.1	10.7	10.2	9.8	9.3	8.9	8.5	8.1	
1.1										11.4										8.5	8.2	7.8	
511	9.8	10.0	10.2	10.3	10.4	10.6	10.8	10.9	11.0	11.0	10.9	10.7	10.5	10.2	9.9	9.6	9.3	8.9	8.6	8.2	7.9	7.6	

FIGURE G-2 Sagwon Compressor Station Modeling Results Annual Average NO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

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FIGURE G-3 Sagwon Compressor Station Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

8.3	8.3	718	7.9	7.7	5.5	5[6	5.0	5.5	5.9	6]3	7.3	7.5	7.4	712	5.8	5.7	5.3	419	5.3	5.0	4.8	4]6	5.8
8 4	8.6	8.5	8.1	8.3	6.2	5.8	5.2	5.7	6.4	6.8	8.1	8.3	8.2	7.7	6.0	5.6	5.3	5.9	5.6	5.3	5.5	6.4	62
94	8.8	8.9	8.4	8.6	8.2	8.0	5.5	5.8	6.8	7.3	9.0	9.2	8.9	7.9	5.9	5.9	6.4	6.4	6.0	7.1	6.8	6.9	6
7687800 ⁹⁸	9.9	9.2	9.6	8.9	9.2	8.8	9.6	5.9	7,1*	18.0	10.1	10.1	9.7	7.3	6.3	6.5	7.5	8.0	7.5	7.9	7.5	7,1	67
	10.4	10.4	10.0	10.3	9.5	9.4	10.5	11.5	6.9	8.7	11.5	10.7	10.3	6.7	6.7	9.2	8.8	9.0	8.2	7.8	7.6	7.5	7
94	10.7	11.0	11.3	10.9	9,9	9.9	11.2	12.2	13.0	8.8	3.3	92.1		9.2	111	10.5	9.8	9.4	9.2	8.5	8,1	7.6	74
79	8.5	11.5	12.0	12.5	11.2	10.6	11.9	11.8	10.5	13/4	3		14.2	162.02	12.3	11/2	10.6	19.9	9.3	8.7	8.3	8.2	7 9
687700-81	8.1	8.0	12.0	12.4	11.6	10.9	12.0	12.6	12.0	15/7	NAST	E	-		and the second	6,6	11.6	10.1	/8.5	8.2	7.8	7.5	7
68	8.0	8.1	7,9	8.8	11.0	10.7	11.6	/12.5	147.5		Contra Co	e (or		-	-		A A	18/3	8.0	7.1	6.5	6.1	58
94	9.8	10.2	8.3	9,1	9.7	10.2	11/2	12.2	16/3	TH.	ka				NO	7/	1	9.9	8.2	7.5	6.9	6.3	58
10.4	10.0	10.4	10.2	10.0	10.9	11.6	10.7	1019	300	HIG	TUR	BINET	2		L	5	10/1	9.3	7.8	7.3	6.8	6.3	5 8
687600 11.4	12.0	12.5	12.2	11.4	12.6	13.4	12.8	13/4		A SE	T	SAL	Har	e a	N.	1	10.2	8.5	8.4	8.1	7.8	7.4	70
				13.8		1	1	5/4/GI		TU	RBINE	AL		O PA	16	13	513.0	10.5	10.0	9.6	9.0	8.5	79
12.6	13.4	12.4	12.7	14.2	15.7	16:8	21/1 17/4	PER	The state	The	0	A		67	10	14456	12.3	10.8	10.2	9.6	9.0	8.9	8
93	10.3	11.8	12.9	13.7	14.3	15.1	19:0		TY	RBIN	ES	\mathbb{N}	1	4	N	12.8	11.1	10.6	10.0	9.5	8.9	8.7	7 8
7687500 ⁹⁴									2	of	K		F	74	N3/4	13.0	9.8	8.4	8.2	8.6	8.5	8.1	76
90				12,6		- F//				1 miles		X	41	134	12/5	9.3	10.0	9.7	9.0	7.9	6.9	6.3	64
79	8.0	10.1	11.6	12.4	1314	6/	TA	Lo	-	1		11	11	12		10.2	8.2	8.6	8.8	8.4	8.0	7.4	64
72	8.5	10.1	10.9	11.6	12/9	Ĉ				() () () () () () () () () () () () () (Z	11 .	1	12// 12.3 2/5	10.8	9.8	9.2	8.1	7.0	7.8	7.7	7.4	70
7687400 ⁸⁰	8.7	9.5	10.2	10.7	1/7		1			0	M		/12/	11.6	10.2	9.5	8.8	8.2	7.2	6.7	6.3	6.9	68
76	8.2	8.9	9.3	10/1	108	117				1 1	Ŋ/	1	141/5	10.6	9.7	9.0	8.3	7.8	7.3	6.4	6.0	5.3	57
7 1	7.7	8.1	8.6	9.1	10.1	10.9	11.4.07	5 7	4			/8	60.3	9.7	9.1	8.6	7.9	7.3	6.9	6.4	5.7	5.4	50
67	7.1	7.5	8.0	8.3	9.4	9.6	7.1	6.9	735	7.4	-	17.6	7.9	8.9	8.5	8.0	7.4	7.0	6.5	6,1	5.7	5.2	4 8
7687300 ⁶²	6.6	7.0	7.2	8.2	8.6	8.0	6.1	6.4	64	6.5	16.6	664	6.8	8.2	7.8	7.5	7.0	6.5	6.1	5.7	5.4	5.1	46
58	6.1	6.4	7.0	7.5	7.7	6.2	5.7	5.9	5.9	-6,0	5.9/	5.7	5.8	7.5	7.2	6.9	6.5	6.2	5.8	5.4	5,1	4.8	4 6
54	6.0	6.1	6.7	6.9	6.6	5.5	5.5	5.6	5.6	5.6	5.5	5.3	5.3	6.7	6.7	6.4	6.1	5.8	5.4	5.1	4.8	4.6	43
5 7	5.8	5.9	6.2	6.3	5.5	5.3	5.2	5.2	5.2	5.3	5.2	5.0	5.0	5.4	6.1	5.9	5.7	5.4	5.2	4.8	4.5	4.3	4 1
7687200 56	5.7	5.7	5.8	5.7	5.4	5.1	5.0	4.9	5.0	5.0	4.9	4.8	4.7	4.8	5.7	5.5	5.3	5.1	4.8	4.5	4.3	4.1	3 9
001200	4	3020	00		4	1 3030	00		4	1 3040	00		4	1 3050	00		4	1 3060	00		4	1 3070	00

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FIGURE G-4 Sagwon Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

007200	4	3020	00		4	1 3030	00		4	1 3040	00		4	1 3050	00		4:	1 3060	00		4	1 3070	00
7687200	•	1,1	1.1	• 1,1	1,1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	.8	(
11	1.1	1.1	1.2	1.1	1.1	1.1	1,1	1.1	1.1	1.1	1.1	1,1		•	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	(
11	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1,1	1,1	1,1	1.0	1.0	0.9	0.9	0.9	0.9	
687300 ¹²	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1/3	1.3/	1.3	1.3	1.2	1.2	1.2	1.1	1,1	1.0	1.0	0.9	0.9	
1	1.2	1.3	1.3	1.3	1.3	1.4	1.4a	1.4	14	1.5	1.6	1.6.5	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9	1
12	1.3	1.3	1.4	1.4	1.5	1.5	1.5	0 1.6	8 17	17		11	1.5	1.5	1.4	1.3	1.3	1.2	1.2	1,1	1.0	1.0	
13	1.3	1.4	15	- And and a	1.6	1.8	1.8	.8		19	y.	1	81.8	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.1	1.0	
687400 13	1.4	1.5	1.6	1.8	1 88		1		1	S-	5	1	2.1	1.8	1.6	1.6	1.5	1.0	1.3	1.2	1.2	1,1	
	1.6 1.5	1.7	17	1.7	20	4	1	Contraction of the second			T	/) 2	2.2	1.7	1.7	1.6	1.5	1.0	1.4	1.2	1.2	
14	1.6	1.7	1.8	1.9	2.0.			Contraction of the second	H	3	7	// .		2.8	1.9	1.9	1.8	1.6	1.6	1.4	1.3	1.3	
16	1./	1.8	1.9	2.0	2.1	2.4	4	~	. /			T	1	2.	4.4	2.0	1.9	1.7	1.6	1.5	1,4	1.3	
687500	1.7	1.9	2.0	2.0	/2.1	2.5	1		*	N	K	Q	M	1	2.0	2.4	1.9	1.8	1.7	1,6	1.4	1,3	
16	1.8	1.9	2.0	2.1	2/2	2.5	9//		TY	RBIN	1		1	Y	2	/2.6	2.0	1,9	1.7	1.6	1,5	1.4	
17	1.8	1.9	2.0	2.1	2.3	2.6	3.8		70	B		5	Contra Contra	2/1	10)	241	2.2	1.9	1.8	1,6	1.5	1.4	
17	1.8	1.9	2.0	2.2	2.3	2.7	2.9 3.4	GEN	100	TUP	BINE	H			A	2.7	2.5	2.0	1.8	1.7	1,5	1.4	
687600 17	1.8	1.9	2.0	2.2	2.3	2.7	3.0	3 DE		a la	K	M	Hom	040	11	1	2.6	2.0	1.8	1.7	1.5	1.4	
1 6	1.8	1,9	2.0	2.2	2.3	2.6	3.0	3.5	2005	HI-	TURE	SINET			AL C	K	2.1	2.3	1.8	1.7	1,5	1.4	
1,6	1.8	2.0	2.0	2,1	2.3	2.5	2.8	3.1	4.1	10/0	0	1		L	NOR	7/	12.9	2.5	1.8	1.6	1.5	1.4	
16	1.7	1.9	2,1	2.1	2.2	2.4	2.6	2.9	33	D		for	00	l el	1)	- Ale	26	1.8	1.6	1,5	1,4	
7687700 ^{_15}	1.7	1,9	2,1	2.1	2,2	2.3	2.5	2/7	3.14	F	VASTI	Th	/	_	1	2 2	92.3	1.9	/1.8	1,6	1.4	1,3	
1 5	1.7	1.8	2.0	2.2	2.2	2.4	2.5	2.6	2.9	4.0	~	Ì	310	35	2.6	23	2.1	1.9	1.7	1.5	1,4	1.3	
14	1.6	1.7	1.9	2.1	2.3	2.4	2.5	2.7	2.7	2.8	3.	63.0	2.7	2.6	Din 24	2.2	2.0	1.8	1.7	1,5	1.3	1.2	
14	1.5	1.7	1,8	2.0	2,1	2.3	2.4	2.6	2.7	2.7	2.7	2.7	2.6	2.4	2.3	2,1	1,9	1.8	1.6	1,4	1,3	1,2	
687800 ¹³	1.4	1.6	1.7	1.8	2.0	2,1	2.2	2.3	2.4	2.5	2.5	2.5	2.4	2,2	2.1	2.0	1.8	1.7	1.5	1.4	1,2	1,1	
13	1,4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.2	2,2	2,2	2,1	2.1	1.9	1.8	1.7	1.6	1.4	1.3	1.2	1,1	
-	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.4	1.3	1.2	1.1	1.0	

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FIGURE G-5 Sagwon Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

1001200	4	1 3020	00		4	3030	00		4	1 3040	00		4	1 3050	00		4	1 3060	0		4	1 3070	00
7687200 25	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1
26	2.6	2.7	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1
26	2.7	2.7	2.8	2.7	2.7	2.7	2,7	2.6	2.6	2.6	2.5	2.3	2.3	2.2	2.2	2.2	2,1	2,1	2,1	2.0	2.0	1,9	1
2,5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2/1	2.6/	2.4	2.4	2.3	2.3	2.2	2,2	2,2	2,1	2,1	2.0	2.0	1
7687300 ^{_25}	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2:8	2.8	2.8	22.6	2.4	2,4	2.3	2.3	2.3	2.2	2,2	2.2	2.1	2,1	2
26	2.6	3.0	3.0	3.1	3.1	3.0	3.0	2.9	3.3	3.1	30/	2.8	2,5	2.4	2,4	2.4	2,3	2.3	2,3	2.2	2.2	2,1	14
26	2.7	2.8	31	32	3.2	3.3	3.5 43	3.4	3			12	92.9	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	1
27	2.8	2.9	3.1	3.6	3.6	35				1))	1	230	2.7	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	
7687400 27	2.9	3.0	3.0	3.4	3,8	1	1	1		0	M	/	13.1	3.0	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2
28	2.9	3.0	3.0/	3.2	3,9	Ĉ				(in the second s	Z	11 .		3.4	2.9	2.7	2.7	2.6	2.5	2.5	2.4	2.4	2
28	2.9	3.0	3.0	3.2	3,7		the	10					1	3.	5 3.3	2.9	2.7	2,6	2.6	2.5	2.5	2,4	2
28	2.9	3.0	3.1	3.2	3.4	4.4/				-		WH W	11		3.7	3.1	2.8	2.7	2.7	2.6	2.6	2.5	2
7687500 ^{_28}	2.9	3.1	3.2	3.2	3.4	3.7		/	Z	04	L		(C	K	3.9	3.6	3.0	2.9	2.9	2.7	2.6	2.6	1
28	3.1	3.4	4.4	4.3	.3/4	3.6	4.5		TL	RBIN	ES	7	/	14	3	93.9	3.1	3.2	3.0	2.8	2.7	2.6	**
3 1	4.1	5.1	5.3	6.5	6.2	3.5	4.6	GEN	10	The second	e de	H			Le	441	4.2	3.4	3.2	3.0	3.6	3.6	
30	3.8	5.9	7.1	7.5	8.9	-8.3	3.8	1 / GI	END	TUP	RBINE			P	16	64	5.9	4.5	4.0	4.8	4.2	3.7	~
7687600 ³⁶	4.7	5.9	6.9	9.3		11.5	and	5			A	51	AL	9	A	1	10/2	6.5	5.8	5.0	4.4	3.9	
39	5.1	6.5	8.1	9.7	100	12.7			1/18	1ª	9 TUD	BINET	7	The second secon	1	-	10	6 8.7	6.1	5.3	4.5	4.0	~
4 5	5.8	7.3	8.7	161		13.2	- 1		1/	A			00		NO	7	A	10/3 /9.8	6.5	5.4	4.7	4.1	
47	6.1	7.6	9.3			13.7		1	(ARRENT		(C)	e lor		-		1	1	18,8	6.7	5.6	4.8	4.2	3
7687700 47	6.1	7.7	9,3			14.0		1		1142	WAST	È		- DE	21.6	1,8 14	02.2	14.5	7	10.5		9.7	9
42	5.6	7.2	8.7			13.6			/	12/	6	10.	5.9 9.0 9.182	25.6	15.8	14/4	13.6	1.		10	10.6	151	
37	4.9	6.4	8.1			12.7	1.		1	5	9.8	.18.5	9.0	11.8	14.2	13.5	12.6			10.9	1.	9.7	g
7687800 ²⁸ 34	4.5	5.3	6.9	8.5	÷.,	12.1			/			6.5						11.5			1	9.7	g
	3.6	4.8	6.5	8.0	9.8	1	12.4		4.3		5.1	5.0	4.8	4.4	5.2	4.5	-	10.3		1	9.6	9.1	8
28	3.4	4.5	6.2	7.8	9.1	10.3		3.6	3.6	3.8	4.2	4.2	4.0	3.9	3.9	4.1	3.9	4.0	6.0	9.2	8.7	8.9	8
2.8	3.4	4.3	5.1	6.0 7.0	3.8	3 <u>1</u> 0	3.1	3.2	3.2	313	3.7	3.7	3.8	317	3.7	3.6	3.4	314	3.3	3.1	3 <u>.0</u> 7.1	2] 9 8.3	7

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FIGURE G-6 Sagwon Compressor Station Modeling Results Annual Average SO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

7687200	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0
09	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0
10		1.0	- 5	1.0		1.0			0.9	•	/		1	÷.,									
7687300 ¹⁰	1.0	1,1	1.0	1.0	1.0	1.0	0.9	0.9	019	1.0	0.9/	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0
10	1,1	1,1	1.0	1.0	1.0	1.0	1.0	0.9	A la	1.2	11/	1.4	0.9	0,9	0.9	0.9	0.9	0.9	0.9	0,8	0.8	0.8	0
11	1,1	1.1	10	1.0	1.0	1,1	121	2 1	2 12			11	21.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0
11	1,1	1.1	1.0	1.1	1.2	1.2	12		1		Y)	1	112	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0
7687400 11	1,1	1,1	1.0	1.0	2	1		1	2	Contraction of the second	A		1,8	1.2	0.9	0,9	0.9	0.9	0.9	0.9	0.9	0.9	0
10	1,1	1,1	1.0/	1.0	1.3	C	L	in the second se	L	() ()	K		1	1.3	1.0	1.0	0,9	0.9	0.9	0.9	0.9	0.9	0
10	1,1	1,1	1.0	1.0	1.0	B	10	1ºm	A				1	14	1,2	1.0	1,0	1,0	0.9	0.9	0.9	0,9	0
10	1.0	1.0	1,0	1.0	1.0	1.4				Jan -	-	The second secon	4	and a set	1.5	1,1	1.0	1.0	1.0	0.9	0.9	0,9	0
7687500 10	1.0	1.0	1.0	1.0	/1.1	44			T	of	P		(C	H	N.S.	1.5	1,1	1.0	1.0	1.0	0.9	0.9	0
10	1.0	1.0	1,1	1,1	-1/1	1.2	1.6		тц	ABIN	ESH	\mathbb{N}	1	AJ	K	61.5	1,1	1,1	1.0	1.0	1,0	0.9	C
10	1.0	1.0	1,1	1,1	1.2	1.2	1.3	GEN	10	The		H		67	10	1155	1.2	1,1	1,1	1,0	1.0	0,9	C
10	1.0	1,1	1,1	1.2	1.2	-1.3	1.3	8 GI		TUP	RBINE			P	16	A	1.6	1.2	1,1	1,1	1.0	1.0	0
7687600	1.0	1.1	1,1	1.2	1.3	1.3/	1.4	2.0	5		TURE	SINE	AL	ø	A	1	17	1.2	1,1	1,1	1.0	1.0	C
10	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.2		1º	0	00		4	1	-	lij	1.5	1.2	1.1	1.0	1.0	1
10	1,1	1.1	1.2	1.3	1.4	1.4	1.6	1.6	20	D			00		10	7	the second	17	1.2	1,1	1,1	1.0	1
7687700 ¹⁰	1,1	1,1	1.2	1.3	1.4	1.5 1.5	1.6	17	20		S ITT)	TTT		/		1.	914.8	1.3	1.2	4.1	1,1	1.0	1
10	1,1	1,1	1.2	1.3	1.4	1.5	1.6	1.7	2.0	3.	WAST	~	1	3.9	1.7	1,5	1.4	13	1.2	1,1	1,1	1.0	1
10	1,1	1,1	1.2	1.3	1.4	1.4	1.6	1.7	1.8	2.0 2.9	1-2	72.1	1.8	1.7	ant Gara	1.4	1.3	1.3	1.2	1,1	1,1	1.0	1
10	1,1	1,1	1,2	1.2	1.3	1.4	1.5	1.6	1.7	1.7	1.8	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1,1	1.0	1.0	1
7687800 10	1.0	1,1	1,1	1.2	1.3	1.3	1.4	1.5	1.6*	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1,2	1,1	1,1	1.0	1.0	C
10	1.0	1,1	1,1	1.2	1.2	1.3	1.3	1.4	1,5	1.5	1,5	1.5	1.5	1.4	1,3	1.3	1,2	1.2	1,1	1,1	1.0	1.0	C
10	1.0	1.0	1.1	1,1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1,1	1,1	1.0	1.0	0.9	0

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	Maximum 1-Hr	FIGURE G-7 pressor Station Average CO Co tes are UTM NA	Modeling Resunctions (μ		
642	90	151	151	36	

7688400	_	682				99			_	151	-		-	151	-		-	36	_			зр	
7688300 —		139				178				213				39				33				32	
7688200 —		124				140				40				36				35				34	
' 688100 —		62				38				38				38				37				36	
7688000 —		67				38				39				43				42				38	
7687900		87				60				47				52				47				38	
94	95	90	91	88	66	66	43	44	49	51	53	56	57	56	54	53	50	47	44	42	40	38	4
96	98	96	93	95	66	68	47	49	53	55	58	62	64	62	59	55	51	47	44	42	40	45	4
109	100	101	96	98	93	69	54	53	58	59	63	70	73	69	62	57	52	48	45	50	47	48	4
687800 114	114	104	108	101	104	66	67	59	64	65	70	82	83	74	64	57	53	56	53	55	52	50	1
117	121	121	112	116	108	96	74	80	7.1/	71	77	100	92	73	63	65	61	63	58	55	53	53	
111	124	128	130	122	110	112	78	85	191	80 10	94	34124	84	69	The state	73	68	66	64	59	56	53	
100	103	133	139	143	125	106	83	88	91	124	-		99	185	86	79	74	169	65	61	58	57	
687700 104	104	103	141	141	131	116	100	101	106	4F	MAST	E	/		- and	8	7 75	64	60	57	55	53	
90	106	106	99	105	125	108	106	/116	4334	M		· · · ·	00	l sil	2	7	1	70	54	47	43	41	
106	109	114	91	94	101	109	123	139	192	1010	10	1	The second	1	20	1	175	68	56	49	44	41	
			113			1.1.1	12	8/1	0/5	HI-CO	TUR	BINET			1	X	79	69	55	50	45	42	
687600 127	134	139	135	126	116	133	138	70 12		OFF.	K	All	t	000	A	1	19	61	57	55	53	50	ĥ
144 145	152	157	147	135	131	1/51	158 203	GEN	200	TU	RBINE				10	M	109	83	78	73	68	63	
145	154	145	113	127	139	154	198		16	K	A		AL A	\$/	10	1219	98	84	79	73	68	64	3
108	112	116	112	121	126	143	6		TU	RBIN	ES	11	1	4	114	96109	88	83	77	72	66	62	
7687500 199	103	95	100	117	/125	123	11	1	1	·	X	11	(C	the	115	105	75	72	69	68	65	60	

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FIGURE G-8 Sagwon Compressor Station Operating Scenario 2 Modeling Results Maximum 1-Hr Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

83	83	717	77	77	53	54	40	40	42	42	42	42	41	40	39	39	37	36	35	34	34	3β	32
84	86	86	81	82	54	55	43	43	45	45	45	44	44	43	42	41	39	38	36	35	34	34	33
91	89	89	83	86	82	56	47	47	48	48	48	47	47	45	44	43	41	40	38	36	35	34	33
7687800 ⁹⁵	96	93	96	89	91	55	54	51	52	/52	52	51	50	48	46	45	43	41	40	38	36	35	34
97	100	102	101	104	95	86	58	56	56	56	56	55.	53	51	49	47	45	43	41	39	37	35	34
89	104	108	111	110	101	98	59	60	60	59	75	5 64	57	54	Dar 52	49	47	45	43	39	37	35	34
69	78	113	113	114	113	96	75	61	63	84			P	75B	56 71	52	48	45	43	40	38	36	35
7687700-72	7.1	72	113	114	113	106	92	64	67 8	J.F.	VAST	Th	/		Canona	6	4 54	47	/ 44	41	39	37	3
64	66	69	70	84	111	99	90	66	775	N		for	00	1	1	-	la	-51	46	42	40	38	36
95	99	104	82	65	67	87	79	78	113	1010	9		1	L	Ne	1/	1	59	48	43	41	38	36
106	102	106	104	99	99	85	70	810	100	PH	TUR	BINET	1		A	6	66	59	47	43	41	39	37
7687600 13	114	115	114	113	103	88	74	821			T	SIL	Horn	B	M	77	12	54	51	48	45	42	40
114	115	115	115	114	107	15	78	B7 GE	000	TU	BINE	H			16	100	72	54	52	49	46	43	40
114	115	114	85	83	73	1740	-76 -92		10	The				\$/	10	110	62	54	51	49	45	43	40
87	90	93	75	66	- 67	71 8	6///		TY	RBIN	ES	7))	1	4	17	7873	56	53	51	48	45	42	40
7687500-87	77	61	63	64	67	672		1	2	of the	R		F	Horas	12	72	55	53	50	47	44	42	39
53	55	59	61	62	64	78				100	-	H	41	1 319	69 /65	53	51	51	48	46	43	41	39
54	53	57	59	61	627		170	Long and	A			11		64	60	50	47	46	47	44	42	40	38
49	51	54	56	58	68	C	L	······································	L	()	K		1	64 64	52	47	45	43	42	40	41	39	37
7687400 ^{_48}	50	52	53	55	63 /			111	-	Completion of the second	M		64	59	49	45	43	41	39	38	37	37	37
47	48	50	51	59 54	59	59			1		Y/	1	653	52	45	43	41	40	38	36	36	35	34
46	47	48	50	51	51	54	58	57	6			15	\$ 57	48	43	41	39	38	37	36	35	35	34
46	46	47	48	48	48	49	49	48	52	52	50 /	53	48	45	41	39	38	36	36	35	35	35	34
7687300 ^{_45}	46	47	46	46	46	46	46	46	45.	45	14	496	43	41	39	37	36	36	35	35	35	34	33
44	44	46	45	44	44	44	44	44	42	42	42/	41	40	39	38	37	36	35	35	34	34	34	33
42	44	45	45	44	42	42	42	41	40	40	40	39	38	37	37	36	35	35	35	34	34	33	32
42	43	44	44	43	42	41	40	40	39	39	39	38	38	37	36	36	35	34	34	33	33	32	32
7687200 41	42	43	43	43	42	40	40	39	38	39	38	37	37	36	36	35	34	34	33	33	32	32	31

						(Co	ordi	nate	s ar	e UT	M N	AD8	3, in	mete	ers)								
9.4	9.4	9] 5	9.6	9.7	9.8	9 1 9	10.1	10.2	10.2	1Q.2	10.1	10.0	9.9	9[6	9.4	9,1	8.8	815	8.2	7.9	7.6	7]4	7.1
97	9.8	10.0	10.2	10.3	10.4	10.6	10.8	10.9	11.0	11.0	10.9	10.7	10.5	10.2	9.9	9.6	9.3	8.9	8.6	8.2	7.9	7.6	7
10.0	10.2	10.4	10.7	11.0	11.2	11.3	11.3	11.3	11.4	11.4	11.3	11.3	11.3	10.9	10.5	10.1	9.7	9.3	8.9	8.5	8.2	7.8	7
7687800 ^{10.3}	10.7	10.9	11.3	11.3	11.4	11.4	11.4	11.5	11.5	17.5	11.5	11.4	11,4	11.3	11.1	10.7	10.2	9.8	9.3	8.9	8.5	8,1	7
10.7	11.2	11.3	11.4	11.4	11.5	11.5	11.6	11.6	11.6	11.6	11.6	11.5	11.5	11.4	11.3	11.3	10.7	10.2	9.7	9.2	8.7	8.3	7
11.2	11.3	11.4	11.5	11.5	11.6	11.7	11.6	11.6	1.6	11.7	12	21.8	211.6	11.5	14	11.4	11.2	10.6	10.0	9.5	9.0	8.5	
11.3	11.4	11.5	11.6	11.7	11.6	11.6	11.6	11.6	11.6	12/6	~	1	121	12.8	11.6	11/4	11.3	11.0	10.4	9.8	9.3 9.5	8.8	8
7687700 11.4	11.5	11.5	11.7	11.7	11.6	11.5	11.5	17.4	11.4	AF	VASTI	E	-		- And	1.0 11	81.6	14.3	/10.7	10.0	9.5	9,0	8
11,4	11.5	11.6	11.7	11.6	11.5	11.4	11.9	/12.4	143.5	The second		5 401-		-	1						9.7		8
11.5	11.6	11.7	11.7	11.6	11.4	12.3	12/	13.0	13/1/	100			1		NO	1/	1	11.7	11.3	10.5	9.8	9.3	8
11.5	11.6	11.7	11.7	11.5	11.6	12.7	13.1	13!	0	He	TURE	BINE1	À		A	6	116	11.7	11.3	10.6	9.9	9,3	8
7687600 11.5	11.6	11.7	11.7	11.5	12.3	12.9	13.2	14/0			T	51	Hor	e a	A.	T	2,0	11.4	11.3	10.7	10.0	9.4	8
				11.6		1	1	3/8/GI	ENE	TUP	BINE	H	The	19	16	121	11.9	11.4	11.3	10.7	10.0	9,4	8
11.5	11.6	11.7	11.7	11.6	12.3	13:0	13/4	4	70	The	-	A		47	10	1120	11.6	11.4	11.3	10.6	10.0	9.4	8
11.5	11.6	11.7	11.8	11.7	11.8	12.9	1319		TY	RBINI	10	M	1	14	Na	192.0	11.5	11.4	11.2	10.5	9,9	9,3	8
7687500 11.5	11.6	11.7	11.7	11.7	/11.6	123			1	of	R		F	74	120	11.9	11.4	11.3	11.0	10.3	9.7	9.2	8
11.5	11.6	11.6	11.7	11/1	11.7	12/6						The second secon	4		2/0	11.5	11.4	11.3	10.7	10.1	9.6	9,1	8
11.4	11.5	11.6	11.6	11.7	1112	0	T	Lou	JA				1	11	9 11.7	11.4	11.3	11.0	10.4	9.8	9.4	8,9	8
11.4	11.5	11.5	11.6	11.6	11/9	Ć	A A			·····	N	11 .	× 1	11.8	11.5	11.3	11.1	10.5	10.0	9.6	9.1	8.7	8
7687400 11.4	11.4	11.5	11.5	11.5	1/8			7/		67	M	/						10.1				8.5	8
				11.5		117)	1	141/6	11.4	11.1	10.7	10.2	9.8	9.4	9.0	8.7	8.3	8
11.3	11.3	11.4	41.4	114	11.4	11.5	1.6	1.6	.6			/1	61.5	11.0	10.6	10.2	9.8	9.4	9.1	8.7	8.4	8.1	7
11.0	11.3	11.3	11.3	11.3	113	11.3	11.3			5 11.5	11 =/	/11/5	11.0	10.5	10.1	9.8	9.3	9.0	8.7	8,4	8.2	8.0	7
7687300	10.9	11.2	11.3	11.3	11.2	11.2	11.2	11.1	11.1	11.3	11/4	114.3	10.4	10.0	9.6	9.3	9.0	8.7	8.4	8.2	8.0	7.8	7
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				10.8					-	1	18	/		9.6	9.2	9.0	8.6	8.3	8.2	8.0	7.8	7.6	7
98	10.1	10.3	10,4	10.3	10.2	10.1	10.1	10.0	10.0	9.9	9.8	9.6	9.5	9.1	8.9	8.6	8.3	8,1	7.9	7.7	7.6	7.4	7
95	9.7	9.9	10.0	10.0	9.8	9.7	9.6	9.5	9.5	9.5	9.4	9.2	9.0	8.8	8.5	8.3	8.0	7.9	7.7	7.5	7.4	7.2	6
7687200 91	9.3	9.5	9.6	9.7	9,5	9.3	9.2	9.1	9.1	9.1	9.0	8.8	8.7	8.5	8.3	8.1	7.8	7.6	7.5	7.3	7.2	7.0	6
01200	4	3020	00		4	3030	00		4	1 3040	00		4	3050	0		4	3060	00		4	1 3070)0

FIGURE G-9 Sagwon Compressor Station Operating Scenario 2 Modeling Results Annual Average NO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

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FIGURE G-10 Sagwon Compressor Station Operating Scenario 2 Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

	4	3020	00		4	3030	00		4	1 3040	00		4	3050	0		43	1 3060	0		4	3070	00
7687200 56	5.7	5.7	5.8	5.8	5.9	6.1	6.3	6.3	6.4	6.4	6.1	6.0	5.9	6.8	6.5	6.2	5.9	5.5	5.2	4.9	4.6	4.4	4
57	5.8	5.9	5.9	6.2	6.4	6.5	6.8	6.9	7.0	6.9	6.6	6.4	7.4	7.4	7.0	6.7	6.3	5.8	5.5	5.2	4.9	4.6	4
54	6.0	6.1	6.1	6.2	6.8	7.0	7.3	7.5	7.6	7.5	- /	7.0	8.3	8.1	7.7	7.2	6.6	6.3	5.8	5,5	5.2	4.7	4
5 6	6.0	6.2	6.1	6.3	7.3	7.6	7.9	8,1	8.2	8/1	1.1	7.5	9.3	8,8	8.3	7.8	7.1	6.6	6.2	5.8	5.2	4.9	4
7687300 ⁵ 7	5.9	6.3	6.3	6.5	7.3	8.1	8.4	8.7	819	8.9	9.2	98.3	10.1	9.5	8.9	8.2	7.5	7.0	6.6	5.7	5.5	5.1	4
59	6.2	6.4	6.7	6.8	74	8.7	9.0	10 9.4	10	5 9.9		12/1	11.0	10.3	9.6	8.8	8.0	7.4	6.5	6.0	5.4	5,1	£
61	6.5	6.9	70	50	7.5	9.1 8.7	10.3	0.5)		/13	1	10.9	10.0	9.2	8.5	7.4	6.4	6.4	5.6	6.3	e
63	6.8	7.2	7.6	8.8 7.8						5	3/	1	11	11.7		9.7	8.3	7.7	6.7	6.7	7.4	7.4	(
687400 ⁶ 1	6.9	7.5	19		1.0	1	1				M			3/7		9.3	8.7	7.6	8.0	8,1	7.8	7.4	(
83	8.6	7.5	8.1/	8.5	9.6	A			-	() ()	Z	11 .	1	12/9 13.5 3/7			8.6	8.8	8.5	13	7.8	7.3	e
86	9.4	10.2	- PL	1	8.80	ilf	1	To		1		11	1	11	10.4	9.0	9.0	9.2	8.9	8.5	7.4	6.5	6
7687500 92 83	1.1	100	- 51	11,8		111			6	10 m	K	C)	1	TAR	10.7	1	10.1		8.5	7.7	7.5	7.5	1
			1.	10.7	1	-13	5		0	AL OF	1		1	T	13/5	13.1	9.5	8.4	8.9	8.9	8.4	7.9	3
92	9.4	9.8	9.5		19.7		13/3		TL	ABIN	ES	3	and the second	2/1	10 /2	13.1	100	10.5	9.9	9.3	8.6	7.9	
						13.7	15/5	GEN		TU	RBINE	H			4	Alera	12.4	9.6	9.1 9.9	8.5 9.2	7.8 8.4	7.2	
687600 11.4						1	14	4/3 GI		6	Fr		Aler	010	11	19	9.6	7.8	7.4	6.9	6.3	5.9	-
			- 20		1.0	12.3	19	11.9	15	The s	TURE	SINET			N	A	9.8	8.8	7.0	6.7	6.3	5.8	
94	9.8	- B.	-19	110	152	11.1	In la	4	1/16	D	6	0		L	0	1	/10/	40.7	9.3	8.3	7.0	5.5	1
70		8.6	1.57	12	100	10.7	e le	100	11	N			00		1	5	A	16/2 1/0	9.9	9.5	9.3	8.6	e
7687700 ^{_81}	8.1	8.1				10.9	10.2	1	ABER -	LU 6	S.TT)	Th	/	~	1	11	19.6	8.9	/ 8.5	9.2	9.8	9,6	8
79	8.5	11.5				10.6		1		134	~		14.2	162.02	12.3	11/2	10.6	199	9.3	8.7	8.3	8.7	9
94	10.7	11.0	11.3	10.9	9,9	9.9	11.2	12.2	13.0	8.6 10/	16	22.1	8.3	9.2	11	10.5	9.8	9.4	9.2	8.5	8,1	7.6	1
10.0	10.4	10.4	10.0	10.3	9.5	9.4	10.5	11.5	7.0	8.4	11.1	10,4	8.6	6.5	6.7	9.2	8.8	9.0	8.2	7.8	7.6	7.5	7
7687800 ⁹⁸	9.9	9.2	9.6	8.9	9.2	8.8	9.6	6.3	6.8	7.8	9.5	9.5	8.5	6.7	6,2	5.9	6.8	8.0	7.5	7.9	7.5	7,1	6
94	8.8	9.0	8.4	8.6	8.2	8.0	5.7	6.0	6.4	7.2	8.4	8,5	8,1	6.4	5.8	5.6	5.5	6.1	5.8	7.1	6.8	6.9	6
84	8.6	8.5	8.1	8.3	6.2	5.8	5.3	5.6	5.9	6.6	7.6	7.7	7.4	6.5	6.0	5.6	5.1	5.3	5.4	5.1	5.5	6.4	e
				100																			

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FIGURE G-11 Sagwon Compressor Station Operating Scenario 2 Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

1001200-	4	1 3020	0		4	1 3030	00		4	1 3040	00		4	1 3050	0		4	1 3060	00		4	1 3070)0
7687200	1.4	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1
15	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1
15	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.3	1
16	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	the	1.7/	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4	1
687300	1.6	1.7	1.7	1.7	1.7	1.7	and the form	1.7	12T	1.7	1.9/	1.9.8	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1
16	1.7	1.8	1.8	1.7	17	1.7	1.7	2. 1.7	0 19	1.9		1.0	1.7	1.6	1.6	1.6	1.6	1.6	1.6	• 1 <u>.</u> 5	1.5	1.4	
17	1.8	1.8	1.8	1.8	1.8	2.0	2.0	2.0	T	1	0	1	.02.0	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	
687400 18	1.8	1.8	1.8	2.0	.20					A La	3/	1	2.8	1.9	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1
	1.8	1.8	1.8	1.9	2		T	0	- And		T) 2	2.2	1.9	1.8	1.7	1.6	1.6	1.6	1.6	1.6	ĺ,
18	1.8 1.8	1.9	2.0	2.0	2.3		Al G	- Company	-	() (C)	7	11 .	1	2.5	2.3	2.0	1.8	1.7	1.6	1.6	1.6	1.6	
18	1.8	2.0	2,1	2.2	2.3	2.1	4	1				T	1	2.	6	2.1	1.9	1.8	1.7	1.6	1.6	1.6	
7687500 17	1.9	2.0	2,1	2.2	2.3	2.9	1		×.	N	K	Q	1	T	2.1	2.5	2.0	1.8	1.7	1.7	1.6	1.6	1
17	1.9	2.0	2,1	2.2	2/4	2.7	3///		TY OF	RBIN	-		1	4	24	/2.6	2.0	1.9	1.7	1.7	1,6	1.6	
17	1,9	2.0	2,1	2.2	2.5	2.9	3.2		The .	A		2	the second	2/1	10)	2015	2.2	1.9	1.7	1.7	1.7	1.6	
17	1.9	2.0	2,1	2.2	2.5	2.9	3.1 3.1	GEN	C D D	TU	RBINE				A	27	2.5	1.9	1.8	1,7	1,7	1.6	
687600 17	1.9	2.0	2,1	2.2	2.4	2.8	3.0	3.5/6			the	A	the	0180	11	1	2.6	1.9	1.8	1.7	1.7	1.6	
17	1.8	1.9	2.1	2.2	2.3	2.6	3.0	3.5	15	HI-CO -	TURE	BINET			All s	1	2.1	2.3	1.7	1.7	1.7	1.6	
17	1.8	1.9	2.0	2.1	2.3	2.4	2.7	2.9	3.8	1010	6	1		L	NOR	7/	12.0	2.5	1.8	1.7	1.7	1.6	
17	1.7	1.9	2.0	2.1	2.2	2.4	2.5	2.7	33	N		tor	00	1	1	7	The	20	1.8	1.7	1.7	1,6	4
7687700-17	1.7	1.9	2,1	2.1	2,2	2.3	2.4	2/6	2.9	pA	ASTI	Th	/		- ADMA	22	92.7	1.9	1.7	1.7	1,6	1,6	1
17	1.7	1.8	2.0	2.2	2.2	2.4	2.5	2.6	2.8	4	~	Ì	3,6	3.5	2.6 3.4	23	2.1	1.9	1.7	1.7	1.6	1.5	-
16	1.7	1.7	1.9	2.1	2,2	2.4	2.5	2.7	2.7	2.7	3.6	63.0	2.7	2.6	24	2.2	2.0	1.8	1.7	1.6	1.6	1.5	
16	1.6	1.7	1,8	2.0	2,1	2.3	2.4	2.6	2.7	2.7	2.7	2.7	2.6	2.4	2.3	2,1	1.9	1.8	1.7	1.6	1.5	1,5	1
7687800 15	1.6	1.6	1.7	1.8	2.0	2,1	2.2	2.3	2.4	2.5	2.5	2,4	2.4	2,2	2,1	2.0	1.8	1.7	1.6	1.5	1,5	1.5	ł
15	1.5	1.5	1.6	1.7	1.8	1,9	2.0	2,1	2,2	2.2	2,2	2.2	2,1	2,1	1.9	1.8	1.7	1.6	1.5	1.5	1,5	1,4	
15	1.5	1.5	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.5	1.5	1.4	1.3	2

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;	Sagv			•				•	atin	g Sc						sults	5
				(Co	ordi	nate	s ar	e UT	M N	AD8	3, in	met	ers)				
2	5.1	6.0	3.8	310	3,1	3.2	3.2	313	3.7	3.7	3.8	317	3.7	3.6	3.4	314	3

2.8	3.2	412	5.1	6.0	3.8	310	3,1	3.2	3.2	3]3	3.7	3.7	3.8	3[7	3.7	3.6	3.4	3]4	3.3	3.1	3.0	219	7.4
27	3.4	4.3	5.9	7.0	8.0	4.4	3.2	3.4	3.5	3.6	3.7	3.8	3.9	3.9	3.8	3.7	3.7	3.5	3.3	3.2	7.1	8.3	80
28	3,4	4.5	6.2	7.8	9.1	10.3	4.6	3.6	3.6	3.8	4.2	4.2	4.0	3.9	3.9	4.1	3.9	4.0	6.0	9.2	8.7	8.9	88
7687800 ²⁸	3.6	4.8	6.5	8.0	9.8	11.3	12.4	4.4	4.3	14.7	5.1	5.0	4.8	4.4	5.2	4.5	4.9	10.3	9.7	10.1	9.6	9.1	87
34	4.5	5.3	6.9	8.5	10.4	12.1	13.5	14.8	5.3	5.9	6.7	6.5	5.9	6.6	6.9	11.9	11.3	11.5	10.6	10.0	9.7	9.7	94
37	4.9	6.4	8.1	9.8	10.9	12.7	14.4	15.7	16.7	7.9	11	18.5	9.0	11.8	14.2	13.5	12.6	12.1	11.8	10.9	10.4	9.7	95
42	5.6	7.2	8.7				15.3		/	12/	0	1	18.2	2056	15.8	1	13.6	12.7	12.0	11.2	10.6	10.5	10.2
7687700 47	6.1	7.7	9,3	11.0	12.5	14.0	15.5	16.2	15.5	AF	VAST	Ē	/		21.6	1,3 14	02.2	14.5	711.0	10.5	10.1	9.7	93
47	6.1	7.6	9.3				14.9	1	Kunder		Contraction of the second	e tor		-	-		an.	18,8	6.7	5.6	4.8	4.2	37
4 5	5.8	7.3	8.7	10.2	11.8	13.2	14/4	15.62	21/0	A			00		NO	77	A	10/3	6.5	5.4	4.7	4.1	37
39	5.1	6.5	8.1	9.7	10.9	12.7	13.8	1319	6	1 Ha	TUR	BINET	7	T	1	1	10,	6 8.7	6.1	5.3	4.5	4.0	36
7687600 ³⁶	4.7	5.9	6.9	9.3	10.4	11.5	10.4	5			4	SAL	Ale	a la	A	1	8.4	6.5	5.8	5.0	4.4	3.9	35
30	3.8	5.9	7,1	7.5	8.9	-8.3	3.8	GI	EN D	TUP	RBINE	H		019	16	6.4	5.9	4.5	4.0	4.8	4.2	3.7	33
3 1	4.1	5.1	5.3	6.5	6.2	3.5	4.5	SER	The state	A	· All	H		1	10	44	4.2	3.4	3.2	3.0	3.6	3.6	33
28	3.1	3.4	4.4	4.3	.3/4	3.6	4.6		тц	RBIN	ES	M	1	AU	3	93.9	3.1	3,2	3.0	2.8	2.7	2.6	31
7687500 ^{_28}	2.9	3.1	3.2	3.2	3.4	3.7			Z	of	K		F	76	3.9	3.6	3.0	2.9	2.9	2.7	2.6	2.6	25
28	2.9	3.0	3.1	3.2	3.4	4.4/				- Aller		The second secon	11		3.7	3.1	2.8	2.7	2.7	2.6	2.6	2,5	24
28	2.9	3.0	3.0	3.2	3.7.	ell	The	1º		1			1	3.	5 3.3	2.9	2.7	2.6	2.6	2.5	2.5	2,4	24
28	2.9	3.0	3.0/	3.2	3,9	C				() ()	Z	11 .	۵(3.4	2.9	2.7	2.7	2.6	2.5	2.5	2.4	2.4	23
7687400 ^{_27}	2.9	3.0	3.0	3.4	3,8	1	1	1		0	M	/	/3.1	3.0	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.3	23
27	2.8	2.9	3,1	3.6	3.6	35		1		7	S/	1	230	2.7	2,5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	22
26	2.7	2.8	31	32	3.2	3.3	3.5 43	4				/2	92.9	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	21
26	2.6	3.0	3.0	3.1	3.1	3.0	3.0	2.9	332	3.1		2.8	2,5	2.4	2,4	2.4	2.3	2.3	2.3	2.2	2.2	2,1	21
7687300 ^{_25}	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2:8	2.8	2.8	27.6	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2,1	20
25	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2/1	2.6/	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2,1	2.0	2.0	19
26	2.7	2.7	2.8	2.7	2.7	2.7	2,7	2.6	2.6	2.6	2.5	2.3	2.3	2.2	2.2	2.2	2,1	2,1	2,1	2.0	2.0	1,9	19
26	2.6	2.7	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.2	2,2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	19
7687200 25	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2,1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	18
	4	3020	00		4	3030	00		4	3040	00		4	3050	00		4	3060	00		4	3070	00

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FIGURE G-13 Sagwon Compressor Station Operating Scenario 2 Modeling Results Annual Average SO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

001200	4	3020	00		4	1 3030	00		4	1 3040	00		4	1 3050	0		4	1 3060	00		4	1 3070	00
687200 09	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	C
0 9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	c
10	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	c
10	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0,9	0.9/	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	С
687300 ¹⁰	1.0	1,1	1.0	1.0	1.0	1.0	1.0u	0.9	019	1.0	11/	1.1.1	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	(
10	1,1	1,1	1.0	1.0	10	1.0	1.0	0.9	2 1.2	1.2		11/12	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0,8	0.8	0.8	(
1	1,1	1.1	10	1.0	1.0	1.2	12	.2	ſ	2		1	21.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	
687400 11 11	1,1	1.1	1.0	1.2	1.2			1		A	3/	1	12	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
	1,1	1.1	10	1.0	2		1	S A			T	1)]	1.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
10	1.1	1,1	1.0/	1.0	1,8	A		and the second	-	() (C)	2	11 .		1.4	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	
10	1.1	1.0 1.1	1.0	1.0	1.0.		H	1				T	1	14	1.2	1,1 1.0	1.0	1.0	0.9	0.9	0.9	0.9	4
687500 1 0	1.0	1.0	1.0 1.0	1.0	1.1	1			5	N	R	Q	1	Tak	1.5	1.5	1,1	1.0	1.0	1.0	0.9	0.9	
10	1.0	1.0	1.0	1,1	1	1.2	5///		1	ALL A	1		6	7	1.5	61.5	1.1	1,1	1.0	1.0	1,0	0.9	
10	1.0	1.0	1,1	1,1	1.2	1.2	1.5		70	A	0	2	- A	21	6)	1165	1.2	1,1	1,1	1.0	1.0	0.9	
10	1.0	1,1	1,1	1.2	1.2	1.3	1.3	GEN	200	TU	RBINE	ALL.			4	A TA	1.6	1.2	1,1	1,1	1.0	1.0	
687600	1.0	1,1	1,1	1,2	1.3	1.3	1.4	8/G		Contra Co	the	A	Acre	240 m	11	1	17	1,2	1,1	1,1	1.0	1.0	
10	1,1	1,1	1.2	1.2	1.3	1.4	1.5	1.7	55	HI-CO -	TUR	BINET	11		All s	K	11	1.5	1.2	1,1	1.0	1.0	
1 0	1,1	1,1	1.2	1.3	1.3	1.4	1.5	1.6	2.2	10%	60	1	A	La	0	7/	13	1.7	1.2	1,1	1,1	1.0	
10	1,1	1,1	1,2	1.3	1.4	1.5	1.6	/1.7	29	N		e tor	00	l est	1	7	The	-11	1.2	1,1	1,1	1.0	
687700 ¹⁰	1,1	1,1	1,2	1.3	1.4	1.5	1,6	1/17	2.0	P	AST	E	-		Calour	1.	91.4	1.3	/1.2	1,1	1,1	1.0	
1 0	1,1	1,1	1.2	1.3	1.4	1.5	1.6	1,7/	2.0	3.4	~	1	2.4	S.S.	1.7	15	1.4	13	1.2	1,1	1,1	1.0	
1 0	1,1	1,1	1.2	1.3	1.4	1.4	1.6	1.7	1.8	2.0	2.5	72.1	1.8	1.7 1.7	art Gara	1.4	1.3	1.3	1.2	1,1	1,1	1.0	
10	1,1	1.1	1,2	1.2	1.3	1.4	1.5	1.6	1.7	1.7	1.8	1.7	1.7	1,6	1.5	1.4	1.3	1.2	1.2	1,1	1.0	1.0	
687800-10	1.0	1,1	1,1	1.2	1.3	1.3	1.4	1.5	1.6*	1.6	1.6	1,6	1.6	1.5	1.4	1.3	1.3	1,2	1.1	1,1	1.0	1.0	
10	1.0	1,1	1,1	1.2	1.2	1.3	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.3	1.2	1.2	1,1	1,1	1.0	1.0	
10	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9	6

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	68				99				151				151				36	-			30	1
	139				178				213				39				33				32	
	124				140				40				36				35				34	
	62				38				38				38				37				36	
	67				38				39				43				42				38	
	87				60				47				52				47				38	
95	90	91	88	66	66	44	45	49	51	53	56	57	56	54	53	50	47	44	42	40	38	40
98	96	93	95	66	68	48	49	53	55	58	62	64	62	59	55	50	47	44	42	40	45	4
100	101	96	98	93	69	54	54	58	59	63	71	73	69	63	56	52	48	45	50	47	48	4
114	104	108	101	104	66	67	60	65	65	70	82	83	74	64	57	52	56	53	55	52	50	4
121	121	112	116	108	96	74	80	72/	71	77	100	92	73	63	65	61	63	58	55	53	53	5
124	128	130	122	110	112	78	85	91	80 106	13	4124	84 69	69	The Free Party	73.	68	66	64	59	56	53	5
103	133	139	143	125	107	84	1	92	124	1	~	X	183	86 118	79	74	169	65				5
104			÷.	1.0	150		1	107	5/	1°m	TT	-	-		8	0 69/	63			1.3.		5
12		1.5				. /.	C	11	$\widehat{\mathcal{N}}$			040	1 sil	1/000	5	K	68		46	-	1.	40
12.0	1.1					- 10	139		1º	8		5	L		1	17	67		4/	-		4
					1	12	146	15	The s	TURE	BINET		/	N	A	77						4
152	157	147	135	120	130	145	78 GE	AL	10 FE	Pr		the	10/00	1/6		105						4
							GEN	BA	-	BINE	H			A	110							5
							1	/	REIN	-	0	100	1/1	1	0010		1.5					5
		1.0				0//		9	- All	1		6	7	11/1		12.1	0.5	1	12.1	1.50		1
	98 100 114 121 124 103 104 106 109 112 134 152 154 112 103	62 67 95 90 98 96 100 101 114 104 121 121 124 128 103 133 104 103 104 103 106 106 109 114 112 117 134 139 152 157 154 145 112 116 112 116	62 67 95 90 91 98 96 93 100 101 96 114 104 108 121 121 112 124 128 130 103 133 139 104 103 141 105 104 99 109 114 91 112 117 113 134 139 135 134 135 137	62 67 90 91 88 98 96 93 95 90 91 88 98 96 93 95 100 101 96 98 114 104 108 101 121 121 112 116 124 128 130 122 103 133 139 143 104 103 141 141 105 106 99 105 112 117 113 107 134 139 135 126 152 157 147 135 154 145 106 111 112 116 96 104 134 39 135 126 152 157 147 135 154 145 106 111 112 116 96	62 67 95 90 91 88 66 98 96 93 95 66 100 101 96 98 93 114 104 108 101 104 124 128 130 122 110 103 133 139 143 125 104 103 141 141 131 106 106 99 105 125 109 114 91 96 102 112 117 113 107 113 134 139 135 126 16 152 157 147 135 120 154 145 106 111 120 154 145 106 111 120 154 145 106 111 120 154 145 106 104 170 154 145 106 104 170 154 1	62 38 67 38 67 38 95 90 91 88 66 66 98 96 93 95 66 68 100 101 96 98 93 69 114 104 108 101 104 66 124 128 130 122 110 112 103 141 141 131 116 106 102 100 104 105 125 106 102 110 112 109 114 91 96 102 100 112 104 105 126 116 139 143 128 109 114 91 96 102 110 128 134 139 135 126 116 139 142 145 106 111 120 139	62 38 67 38 67 38 97 60 95 90 91 88 66 64 98 96 93 95 66 68 48 100 101 96 98 93 69 54 114 104 108 101 104 66 67 124 128 130 122 110 112 78 103 133 139 143 125 107 84 104 103 141 141 131 116 100 104 103 141 141 131 126 107 109 114 91 96 102 100 128 112 117 113 128 131 138 132 131 138 132 139 145 177 1161 126 116	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	62 38 67 38 97 60 95 90 91 88 66 64 45 49 98 96 93 95 66 68 48 49 53 100 101 96 98 93 69 54 54 58 114 104 106 66 68 48 49 53 121 121 112 16 108 96 74 80 72 124 128 130 122 110 112 78 85 91 103 133 139 143 125 107 84 89 92 104 103 141 141 131 116 100 101 107 109 114 91 96 102 100 125 139 192 112 139 139 192	62 38 38 36 67 38 39 87 60 47 95 90 91 88 66 66 44 45 49 51 98 96 93 95 66 68 48 49 53 55 100 101 96 93 69 54 54 58 59 114 104 104 66 67 60 65 65 121 121 122 110 112 78 85 91 80 103 133 139 143 125 100 101 107 113 126 139 122 126 139 122 126 139 122 126 139 122 126 139 122 126 139 122 126 139 122 126 126 126 126 126 <	62 38 36 67 38 39 67 38 39 87 60 47 95 90 91 88 66 66 44 45 49 51 53 90 91 88 66 66 44 45 49 51 53 90 91 88 66 66 44 45 49 51 53 90 91 88 66 66 44 45 49 53 55 58 100 101 104 66 67 60 65 70 121 121 122 100 102 74 80 72 71 77 124 128 130 122 100 101 107 117 130 104 103 141 131 116 100 101 107	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	62 38 38 67 38 39 67 38 39 87 60 47 95 90 91 88 66 64 45 49 51 53 56 57 98 96 93 95 66 68 48 49 53 55 58 62 64 100 101 104 66 67 60 72 71 77 70 82 83 121 122 110 104 66 67 60 65 65 70 82 83 121 121 112 116 108 96 74 80 72 71 77 82 83 121 121 122 110 122 130 122 130 124 143 124 143 124 143 124 144 144	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	62 38 38 38 38 67 38 39 43 67 88 60 47 52 90 91 88 66 64 45 49 51 53 56 57 56 54 90 91 88 66 64 49 51 53 56 57 56 54 90 91 88 66 64 49 53 55 58 62 64 62 59 101 104 66 67 60 65 65 70 82 83 74 64 121 121 102 106 97 107 107 107 107 107 107 107 107 107 107 107 107 107 107 107 107 <	62 38 36 38 67 39 39 43 67 60 47 52 95 90 91 88 66 66 44 45 49 51 53 66 57 56 54 55 90 91 88 66 66 48 49 53 55 58 62 64 62 59 55 100 101 104 66 67 60 65 65 70 82 83 74 64 57 121 122 101 102	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	62 38 38 38 39 43 42 67 39 39 43 42 87 60 47 52 47 95 90 91 88 66 66 44 45 49 51 53 56 57 56 54 53 50 47 95 90 91 88 66 66 44 45 49 51 53 56 57 56 54 53 50 47 98 96 93 95 66 67 60 55 56 67 73 69 55 50 47 100 101 124 126 106 67 60 65 65 70 82 83 74 64 57 52 56 51 63 14 64 67 73 69 63 74 69 64 </td <td>62 38 35 38 37 67 38 39 43 42 67 38 39 43 42 95 90 91 88 66 64 45 49 51 53 56 57 56 54 53 50 47 44 96 90 95 86 66 64 45 49 51 53 56 57 56 54 52 47 44 96 90 95 86 69 49 49 53 55 58 62 64 62 59 55 50 47 44 100 101 104 66 67 60 57 70 82 83 74 64 55 58 134 124 124 124 124 126 100 127 71 77 100 92 73 <</td> <td>62 38 39 39 39 39 39 39 39 39 39 39 39 39 39 43 42 67 38 39 47 52 47 44 42 95 90 91 88 66 66 44 45 49 51 53 56 54 53 50 47 44 42 96 93 95 66 68 48 49 53 55 58 62 69 53 55 59 55 50 47 44 42 100 101 96 98 93 69 54 59 63 71 73 69 63 55 59 50 47 44 42 114 104 108 101 104 66 67 69 63 71 73 69 69 69 6</td> <td>62 38 39 37 67 38 39 43 42 67 38 39 43 42 95 90 91 88 66 64 45 49 51 53 56 57 59 50 47 44 42 40 99 96 93 95 66 64 45 49 51 53 56 57 59 50 47 44 42 40 90 90 91 88 66 64 45 49 51 53 56 57 59 50 47 44 42 40 100 101 96 98 98 69 54 58 59 63 71 73 68 66 64 65 52 121 121 126 108 104 107 107 109 42</td> <td>62 38 39 37 36 67 38 39 43 42 39 67 38 39 43 42 39 97 60 47 52 47 39 95 90 91 86 66 44 45 40 51 63 56 57 50 47 44 42 40 38 96 90 91 86 66 64 45 50 56 57 50 47 44 42 40 38 90 91 96 93 96 64 49 55 59 62 64 62 59 55 50 47 44 40 40 101 102 102 102 102 102 102 102 102 102 102 102 102 102 102 102 102 102</td>	62 38 35 38 37 67 38 39 43 42 67 38 39 43 42 95 90 91 88 66 64 45 49 51 53 56 57 56 54 53 50 47 44 96 90 95 86 66 64 45 49 51 53 56 57 56 54 52 47 44 96 90 95 86 69 49 49 53 55 58 62 64 62 59 55 50 47 44 100 101 104 66 67 60 57 70 82 83 74 64 55 58 134 124 124 124 124 126 100 127 71 77 100 92 73 <	62 38 39 39 39 39 39 39 39 39 39 39 39 39 39 43 42 67 38 39 47 52 47 44 42 95 90 91 88 66 66 44 45 49 51 53 56 54 53 50 47 44 42 96 93 95 66 68 48 49 53 55 58 62 69 53 55 59 55 50 47 44 42 100 101 96 98 93 69 54 59 63 71 73 69 63 55 59 50 47 44 42 114 104 108 101 104 66 67 69 63 71 73 69 69 69 6	62 38 39 37 67 38 39 43 42 67 38 39 43 42 95 90 91 88 66 64 45 49 51 53 56 57 59 50 47 44 42 40 99 96 93 95 66 64 45 49 51 53 56 57 59 50 47 44 42 40 90 90 91 88 66 64 45 49 51 53 56 57 59 50 47 44 42 40 100 101 96 98 98 69 54 58 59 63 71 73 68 66 64 65 52 121 121 126 108 104 107 107 109 42	62 38 39 37 36 67 38 39 43 42 39 67 38 39 43 42 39 97 60 47 52 47 39 95 90 91 86 66 44 45 40 51 63 56 57 50 47 44 42 40 38 96 90 91 86 66 64 45 50 56 57 50 47 44 42 40 38 90 91 96 93 96 64 49 55 59 62 64 62 59 55 50 47 44 40 40 101 102 102 102 102 102 102 102 102 102 102 102 102 102 102 102 102 102

FIGURE G-14 Sagwon Compressor Station Operating Scenario 2 Modeling Results Maximum 1-Hr Average CO Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

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FIGURE G-15 Sagwon Compressor Station Operating Scenario 3 Modeling Results Maximum 1-Hr Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

83	83	717	77	77	53	54	40	40	42	42	42	42	41	40	39	39	37	36	35	34	34	3β	32
84	86	86	81	82	54	55	43	43	45	45	45	44	44	43	42	41	39	38	36	35	34	34	3
91	89	89	83	86	82	56	47	47	48	48	48	47	47	45	44	43	41	40	38	36	35	34	3
7687800 ⁹⁵	96	93	96	89	91	55	54	51	52	/52	52	51	50	48	46	45	43	42	40	38	36	35	34
97	100	102	101	104	95	86	58	56	56	56	56	55	53	51	49	47	45	43	41	39	37	35	3
89	104	108	111	110	101	98	59	60	60	59	75	5 64	57	54	Dar 52	49	47	45	43	39	37	35	3
69	78	113	113	114	113	96	75	61	63	84	~		15	763	56	52	48	145	43	40	38	36	3
7687700 72	71	72	113	114	113	106	92	64	67 8	17	VAST	Th	/		Calour	6	4 54	47	44	41	39	37	3
64	66	69	70	84	111	98	90	66	745	N		for	00	1	1	-	- And	-51	46	42	40	38	3
95	99	104	82	65	67	87	79	78	113	1010	60		1	L	None	1/	1	59	48	43	41	38	3
106	102	106	104	99	99	85	70	810	100	HIG	TUR	SINE1	1		A.	6	66	59	47	43	41	39	3
7687600 1 3	114	115	114	113	103	88	68	821			The	SH.	Harr	180	A	77	12	54	51	48	45	42	4
114	115	115	115	114	107	80	86	B8/GI GEN	C C C	TU	RBINE				16	178	72	54	52	49	46	43	4
114	115	114	85	83	78	83%	94		76	K	-		THE REAL	\$/	10	110	62	54	51	49	45	43	4
87	90	93	75	66	-74	79 • 8	ø///		TY	ABIN	29	211	L	4	17	7:73	56	53	51	48	45	42	4
7687500-87	77	61	63	64	69	872			2	A	R		(C)	Hate	12	71	55	53	50	47	44	42	3
53	55	59	61	62	64	78	1			-		A	5/	67	/65	53	51	51	48	46	43	41	3
54	53	57	59	61	627		10 a	(and	H			11.		64	60	50	47	44	47	44	42	40	3
49	51	54	56	58	68	C	Z		L	······································	K		1	61 61	52	47	45	43	41	39	41	39	3
7687400 ^{_48}	50	52	53	55	63			11	1	0	A		/ 58	56	47	45	43	41	39	38	36	37	3
47	48	50	51	59 54	59	59	50				Y/	1	556	49	45	43	41	40	38	36	36	35	3
46	47	48	50	51	51	54	5857	57 5	6			15	3 53	45	43	41	39	38	36	36	35	35	3
46	46	47	48	48	48	49	49	48	52	52	50	51	44	43	41	39	38	36	36	35	35	35	3
7687300-45	46	47	46	46	46	46	46	46	45.	45	4	496	42	41	39	37	36	36	35	35	35	34	3
44	44	46 •	45	44	44	44	44	44	42	4/2	42/	41	40 •	39	38	37	36	35	35	34	34	34	3
42	44	45	45	44	42	42	42	41	40	40	40	39	38	37	37	36	35	35	35	34	34	33	3
42	43	44	44	43	42	41	40	40	39	39	39	38	38	37	36	36	35	34	34	33	33	32	3
7687200 41	42	43	43	43	42	40	40	39	38	38	38	37	37	36	36	35	34	34	33	33	32	32	3

						(Co	ordi	nate	s ar	e UT	M N	AD8	3, in	mete	ers)								
9.4	9.4	9[5	9.6	9.7	9.8	9 1 9	10.1	10.2	10.2	10.2	10.1	10.0	9.9	9[6	9.4	9.1	8.8	815	8.2	7.9	7.6	7]4	7.
97	9.8	10.0	10.2	10.3	10.4	10.6	10.8	10.9	11.0	11.0	10.9	10.7	10.5	10.2	9.9	9.6	9.3	8.9	8.6	8.2	7.9	7.6	7
10.0	10.2	10.4	10.7	11.0	11.2	11.3	11.3	11.3	11.4	11.4	11.3	11.3	11.3	10.9	10.5	10.1	9.7	9.3	8.9	8.5	8.2	7.8	7
7687800 10.3	10.7	10.9	11.3	11.3	11.4	11.4	11.4	11.5	11.5	17.5	11.5	11.4	11,4	11.3	11.1	10.7	10.2	9.8	9.3	8.9	8.5	8.1	7
10.7	11.2	11.3	11.4	11.4	11.5	11.5	11.6	11.6	11.6	11.6	11.6	11.5	11.5	11.4	11.3	11.3	10.7	10.2	9.7	9.2	8.7	8.3	7
11.2	11.3	11.4	11.5	11.5	11.6	11.7	11.6	11.6	11.6	11.7	12	21.8	211.6	11.5	14.4	11.4	11.2	10.6	10.0	9.5	9.0	8.5	8
11.3	11.4	11.5	11.6	11.7	11.6	11.6	11.6	11.6	11.6	12/8	~	1	121	12.8	11.6	11/4	11.3	11.0	10.4	9.8	9.3 9.5	8.8	8
7687700 11.4	11.5	11.5	11.7	11.7	11.6	11.5	11.5	17.4	11.4	6FT	VASTI	E	-		Canal A	1.0 11	81.6	14.3	/10.7	10.0	9.5	9,0	8
11.4	11.5	11.6	11.7	11.6	11.5	11.4	12.1	/12.5	13.9		- Almon	tor	9.00	1	/		1	114	11.3	10.3	9.7	9.1	8
11.5	11.6	11.7	11.7	11.6	11.4	12.3	12/8	13.0	13/8	10	1		1		Ne	/	1	1/7	11.3	10.5	9.8	9.3	8
11.5	11.6	11.7	11.7	11.5	11.4	12.6	13.1	1314	100	He	TURE	SINET	À		A	6	116	11.7	11.3	10.6	9,9	9,3	8
7687600 11.5	11.6	11.7	11.7	11.5	12.0	12.8	13.1	13/0		A REAL	T	51	Afren	8	A.	17	2,0	11.4	11.3	10.7	10.0	9.4	8
				11.6		1	1	3/6/GI	EN DE	TU	BINE	H		a	16	12	11.9	11.4	11.3	10.7	10.0	9.4	8
11.5	11.6	11.7	11.7	11.6	11.8	12:9	13/2	2	76	The	OH	A		47	10	1200	11.6	11.4	11.3	10.6	10.0	9.4	8
11.5	11.6	11.7	11.8	11.7	11.5	12.5	3		TY	RBINI	19	M	1	14	h	192.0	11.5	11.4	11.2	10.5	9,9	9,3	8
7687500 11.5	11.6	11.7	11.7	11.7	/11.6	11278			1	of	L		F	76	120	11.9	11.4	11.3	11.0	10.3	9.7	9.2	8
11.5	11.6	11.6	11.7	11/1	11.7	12/2				1		X	1		2/0	11.5	11.4	11.3	10.7	10.1	9.6	9,1	8
11.4	11.5	11.6	11.6	11.7	1112	6	The second	1º	-	1			1	11	9 11.7	11.4	11.3	11.0	10.4	9.8	9.4	8.9	8
11.4	11.5	11.5	11.0	11.6	11/9	C	and a			in the second second	N	11 .	1	11.8	11.5	11.3	11.1	10.5	10.0	9.6	9.1	8.7	8
7687400 11.4	11.4	11.5	11.5	11.5	1/8					0	M								9.7			8.5	8
11.3	11.4	11.4	11.4	11/	11.7	117					<u></u>	1	141/6	11.4	11.1	10.7	10.2	9.8	9.4	9.0	8.7	8.3	8
11.3	11.3	11.4	41.4	114	11.4	11.5	1.6	1.6	.6			/11	61.5	11.0	10.6	10.2	9.8	9.4	9.1	8.7	8.4	8.1	7
								111 12		5 11.5		/11/5	11.0	10.5	10.1	9.8	9.3	9.0	8.7	8.4	8.2	8.0	7
7687300 10.6	10.9	11.2	11.3	11.3	11.2	11.2	11.2	11.1	1/1.1	11.3	11/4	144.3	10.4	10.0	9.6	9.3	9.0	8.7	8.4	8.2	8.0	7.8	7
									~	10.5	18	/		9.6	9.2	9.0	8.6	8.3	8.2	8.0	7.8	7.6	7
98	10.1	10.3	10.4	10.3	10.2	10.1	10.1	10.0	10.0	9.9	9.8	9.6	9.5	9.1	8.9	8.6	8.3	8.1	7.9	7.7	7.6	7.4	7
95	9.7	9.9	10.0	10.0	9.8	9.7	9.6	9.5	9.5	9.5	9.4	9.2	9.0	8.8	8.5	8.3	8.0	7.9	7.7	7.5	7.4	7.2	6
7687200 91	9.3	9.5	9.6	9.7	9.5	9.3	9.2	9.1	9.1	9.1	9.0	8.8	8.7	8.5	8.3	8.1	7.8	7.6	7.5	7.3	7.2	7.0	6
007200	4	1 3020	00		4	1 3030	00		4	1 3040	00		4	1 3050	0		4	1 3060	00		4	1 3070	00

FIGURE G-16 Sagwon Compressor Station Operating Scenario 3 Modeling Results Annual Average NO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
ALL INC	STATIONS FERC AIR QUALITY MODELING	APRIL 14, 2017
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	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
	STATIONS FERC AIR QUALITY MODELING	April 14, 2017
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,	une 2	von	Com	nro	seor	Stat			E G-		onar	in 3	Mod	مانام	n Ro	sults	
				m 24	-Hr	Aver	age	PM₁	/PM	2.5 C	once	ntra	tion		.		,
3	7.9	7.7	5.5	516	4.1	4.4	4.6	4]9	5.7	5.9	5.9	519	5.8	5.7	5.3	419	5.4

8.3	8.3	718	7.9	7.7	5.5	5[6	4.1	4.4	4.6	419	5.7	5.9	5.9	5[9	5.8	5.7	5.3	419	5.4	5,1	4.8	4]5	5.8
84	8.6	8.5	8.1	8.3	6.2	5.8	4.2	4.5	4.8	5.3	6.3	6.5	6.4	6.1	6.0	5.6	5.1	6.0	5.8	5.4	5.5	6.4	62
94	8.8	8.9	8.4	8.6	8.2	8.0	4.8	4.6	5.0	5.6	6.9	7.0	7.0	6.6	6.4	5.6	6.6	6.6	6.1	7.1	6.8	6.9	68
7687800 ⁹ 8	9.8	9.2	9.6	8.9	9.2	8.8	9.6	5.0	5.1	/5.9	7.7	7.7	7.7	7.1	6.8	6.5	7.7	8.0	7.5	7.9	7.5	7.1	67
	10.4	10.4	10.0	10.3	9.5	9.4	10.5	11.5	5.5	6.2	8.8	9.6	8.6	7,7	6.4	9.2	8.8	9.0	8.2	7.8	7.6	7.5	73
94	10.7	11.0	11.3	10.9	9,9	9.9	11.2	12.2	13.0	1 6.8	0.2	32.1	8.3 0 14:2	9.2	111	10.5	9.8	9.4	9.2	8.5	8.1	7.6	74
79	8.5	11.5	12.0	12.5		10.6			/	9.5		15	14.2	10202	12.3	11/2	10.6	19.9	9.3	8.7	8.3	8.2	79
7687700 ^{_8} 1	8.1	8.0	12.0	12.3	11.6	10.9	12.0	17.6	12.0	15/4	VAST	E	/	1	0.0	11/2	.99.5	8.9	78.5	8.2	7.8	7.5	72
68	8.0					10.7		1	10000		Contraction of the second	n ior	Ba		1	_	P.S	44	6.1	5.8	6.0	5.9	54
94	9.7	10.2	8.0	8.0	9.2	10.2	11/2	12.21	16/3	The state	2		36		NO	17	Por a	8.3	6.4	6.2	6.0	4.7	44
10.4	10.0	10.4	10.2	9.6	9.6	9.8	11.3	1119	4	HA	TURE	BINET	2	P	1	5	8.	8.0	6.5	6.0	5.6	5.3	4 9
7687600 11.4	12.0	12.5	12.2	11.4	10.1	9.9	11.1	13/8		TO THE	T	Sal la	Har	æ	A.	12	10.0	8.1	7.5	7.2	6.8	6.4	60
						13.2	1.	4/5/61	A R	TU	RBINE	AL		ON	16	8.8	9.2	7.8	7.3	7.0	6.7	6.3	60
12.6	13.4	12.4	10.3	11.7	13.3	14:8	164	GEN	10	A	0	A		67	to	9904	8.4	7.0	6.5	6.5	6.3	6.0	57
92	9.4	9.8	10.3	11.0	12.8	13.5	H		тų	RBIN	ESH	M	1	14	19	28.8	7.1	7.2	6.8	6.0	5.7	5.3	53
7687500 ^{_9} 2	8.4	8.5	10.1	11.2	12.0	41.3		1	1	of	L		(C	74	9.6	9.1	7.6	7.0	6.5	6.2	5.9	5.4	50
65	7.6	8.6	9.4	10/1	10.3	10/6				- Aller		17	11	199	8.8	7.3	7.6	7,1	6.7	6.3	5.9	5.5	52
64	7.2	7.8	8.5	8.9	8.40	0	TA	Lo	-				11	11	10.0	8.6	7.3	6.4	5.9	5.8	5.8	5,6	53
61	6.4	7.0	7.5	7.6	9.8	Ĉ				() () () () () () () () () () () () () (K		ð (1	11.3	8.7	7.3	8.2	7.7	6.6	5.5	5.0	4.5	44
7687400 ⁵⁹	6.3	6.7	1.1	7.6	3.#					0	M	/	/11/	1	8.3	7.1	6.4	6.9	7.3	6.8	6.3	4.9	42
59	6.2	6.5	6.8	7.5	8.1	9.6				11	Ŋ/	1	10%	9,1	7.7	7.0	6.1	5.5	5.3	6.4	6.4	5.9	55
58	6.1	6.4	6.9	7.0	7.0	11.1	13.1	3.1	7			/10	9.8	8.1	7.2	6.6	6.0	5.2	4.8	4.5	5.1	5.7	54
58	6.0	6.2	6.5	6.6	7.8	10.8	11.2	A Local	12	11.0	0.6	9.8	8.3	7.3	6.7	6.2	5.7	5.2	4.6	4.3	4.0	3.9	4 8
7687300 57	5.9	6.3	6.3	6.3	8.9	9.9	10.2	10.5	10.3	10.0	19.0	884	7.4	6.9	6.4	5.8	5.4	5.0	4.7	4.2	3.9	3.7	35
56	6.0	6.2	6.1	6.4	8.7	9.0	9.3	9.5	9.4	-9/2	8.1/	7.7	6.9	6.5	6.0	5.6	5.1	4.7	4.5	4,2	3.8	3.6	35
54	6.0	6,1	6,1	7.2	7.9	8.2	8.6	8.6	8.5	8.4	7.5	7.2	6.4	6.0	5.7	5.3	4.9	4.6	4.3	4.0	3.8	3.5	34
57	5.8	5.9	5.9	7.0	7.2	7.4	7.8	7.8	7.8	7.7	6.9	6.7	6.0	5.6	5.3	5.0	4.7	4.4	4.1	3.9	3.7	3.5	33
7687200 <u>56</u>	5.7	5.7	5.9	6.4	6.6	6.8	7.1	7.1	7.1	7.0	6.3	6.1	5.9	5.3	5.0	4.8	4.5	4.2	4.0	3.8	3.6	3.4	32
	4	3020	00			3030				3040				3050	00		4	3060	00		4	3070	00

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000	
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FIGURE G-18 Sagwon Compressor Station Operating Scenario 3 Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

007200-3-	4	1 3020	0		4	1 3030	00		4	1 3040	00		4	1 3050	0		4	1 3060	00		4	1 3070	00
687200	1,1	1,1	1,1	1,1	1,1	1,1	1.1	1,1	1,1	1.1	1,1	1,1	1,1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	(
11	1,1	1,1	1,1	1,1	1,1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1,1	1,1	1.0	1.0	1.0	0.9	0.9	0.9	0.8	(
11	1.2	1,2	1.2	1.2	1,2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1,1	1,1	1.0	1.0	0,9	0.9	0.9	1
12	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1/4	1.4/	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	0.9	0.9	
687300 ¹²	1.2	1.3	1,4	1.4	1.4	1.5	1.50	1.5	15	1.6	1.7	1.1.6	1.5	1,4	1.4	1.3	1.2	1.2	1.1	1.1	1.0	0.9	
12	1.3	1.4	1.5	1.5	16	1.6	1.6	1.6	9 18	1.8		1.8	1.6	1.5	1.5	1.4	1.3	1,3	1.2	1,1	1,1	1.0	
13	1.4	1.5	1.6	1.6	1.7	1.9	1.9	.9		9	2	1	91.9	1.6	1.6	1.5	1.4	1.3	1.3	•	1,1	1.1	
687400 ¹⁵	1.5	1.6	1.7	1.9	1.9					1	5/	1	201	1.8	1.7	1.6	1.5	1.4	1.4	1.3	1.2	1.1	
	1.6	1.7	1.8	1.8		5	1	() ()	- And		T	/	$)^{2}$	2.1	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	
15	1.6	1.8	1.8/	1.9	2.2			Here of	-		2	11 .	1	2.4	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	
16	1.7	1.8	1.9	2.0	2.2	2.0	4	1		1		M	1	2.1	2.3	1.9	1.8	17	1.6	1.5	1.4	1.3	
7687500 ¹⁷	1.8	1.9	2.0	21	2.2	21			*	N	X		1	Toring .	2.6	2.0	1.9	1.7	1.6	1.5	1.4	1.3	
17	1.8	1.9	2.0	2.1	2.2	• 3	1//		19	AL OF	1		1	7	2.6	2.4	1.9	1.9	17	1.6	1.0	1.3	
17	1.8	2.0	2.1	2.2	2.3	2.6	3.A		TI	(DEL		2	and a	2/1	10	260	2.2	1.9	1.8	1,6	1.5	1.4	
17	1.8	2.0	2,1	2.2	2.4	L	2.9	GEN		TU	BINE	H		H	1	27	2.5	1.9	1.8	1.6	1,5	1.4	
687600 17	1.8	1,9	2,1	2.2	2.3	2.7	3.0	3 3/61		Co The	the		Zem	040	11	1	2.6	1.9	1.8	1.6	1.5	1,4	
17	1.8	1,9	2.0	2.2	2.3	2.6	2.9	3.5	15	The .	TURE	SINET	11		2	×	27	2.3	1.8	1.6	1.5	1.4	
16	1.8	1.9	2.0	2,1	2.3	2.4	27	3.0	3.9	10/0	0	1		L	10	/	2.9	2.5	1.8	1.6	1.5	1.3	
16	1.7	1.9	2.0	2.1	2.2	2.4	2.5	2.7	33	N		101	00	1 sil	1)	The	2.6	1.8	1.6	1.4	1.3	
687700-15	1.7	1.9	2,1	2.1	2,2	2.3	2,5	2/7	3.04	T	VASTI CONTO	Th	~		1	2	92.3	1.9	/1.7	1,6	1,4	1,3	
15	1.6	1.8	2.0	2.2	2.2	2.4	2.5	2.6	2.8	4.2	~		- Sie	35	2.6	23	2.1	1.9	1.7	1.5	1.4	1.2	
14	1.6	1.7	1.9	2,1	2,2	2.4	2.5	2.7	2.7	2.7	3.	63.0	2.7	2.6	24 Anna	2.2	2.0	1.8	1.7	1.5	1.3	1.2	
14	1.5	1.6	1,8	2.0	2,1	2.3	2.4	2.6	2.7	2.7	2.7	2.7	2.6	2.4	2.3	2,1	1.9	1.8	1.6	1.4	1,3	1,1	
687800 ¹³	1.4	1.6	1,7	1.8	2.0	2,1	2.2	2.3	2.4	2.5	2.5	2,4	2.4	2,2	2.1	2.0	1.8	1,7	1.5	1.4	1,2	1,1	
13	1,4	1,5	1.6	1,7	1.8	1.9	2.0	2.1	2,2	2,2	2.2	2,2	2,1	2,1	1.9	1.8	1.7	1,6	1.4	1,3	1,2	1.0	
12	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.4	1.3	1.2	1.1	1.0	

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	Sagv		Com Maxi	mun	n 1-ŀ	<mark>r</mark> A۱	ion (ge S	atin O₂ C	g Sc once	entra	ation	s (μ			sult	5
2	5.1	6.0	3.8	310	3,1	3.2	3.2	3]3	3.7	3.7	3.8	3]7	3.7	3.6	3.4	3]4	3

2.8	3.2	412	5.1	6.0	3.8	310	3.1	3.2	3.2	3]3	3.7	3.7	3.8	317	3.7	3.6	3.4	3]4	3.3	3.1	3.0	219	7.4
27	3.4	4.3	5.9	7.0	8.0	4.4	3.2	3.4	3.5	3.6	3.7	3.8	3.9	3.9	3.8	3.7	3.7	3.5	3.3	3.2	7.1	8.3	80
28	3.4	4.5	6.2	7.8	9.1	10.3	4.6	3.6	3.6	3.8	4.2	4.2	4.0	3.9	3.9	4.1	3.9	4.0	6.0	9.2	8.7	8.9	88
7687800 ^{_28}	3.6	4.8	6.5	8.0	9.8	11.3	12.4	4.4	4.3	4.7	5.1	5.0	4.8	4.4	5.2	4.5	4.9	10.3	9.7	10.1	9.6	9.1	87
34	4.5	5.3	6.9	8.5	10.4	12.1	13.5	14.8	5.3	5.9	6.7	6.5	5.9	6.6	6.9	11.9	11.3	11.5	10.6	10.0	9.7	9.7	94
37	4.9	6.4	8.1	9.8	10.9	12.7	14.4	15.7	16.7	7.9	11	18.5	9.0	11.8	142	13.5	12.6	12.1	11.8	10.9	10.4	9.7	95
42	5.6	7.2	8.7	10.2	11.9	13.6	15.3	15.2	13.5	17/2	_	•	18.2			14/4	13.6	12.7	12.0	11.2	10.6	10.5	10.2
7687700 47	6.1	7.7	9,3	11.0	12.5	14.0	15.5	18.2	15.5	AF	NAST		-		and and	1,3	02.2	14.5	/11.0	10.5	10.1	9.7	93
47	6.1	7.6	9.3				14.9	1	Kunder		Completing of	s tor		-	1	_		18,8	6.7	5.6	4.8	4.2	37
4 5	5.8	7.3	8.7	10.2	11.8	13.2	14/4	15.62	21/0	The	6		1		New	7/	1	10/3	6.5	5.4	4.7	4.1	37
39	5.1	6.5	8.1	9.7	10.9	12.7	13.8	1319	600	HI-	TURE	BINET	1		A	6	100	8.7	6.1	5.3	4.5	4.0	3,6
7687600 ³⁶	4.7	5.9	6.9	9.3	10.4	11.5	10.4	5.4			T	SIL	How	e a	A.	The	8.4	6.5	5.8	5.0	4.4	3.9	35
30	3.8	5.9	7,1	7.5	8.9	-8.3	3.8	GE	ENE	TU	RBINE	H		O M	16	6.4	5.9	4.5	4.0	4.8	4.2	3.7	33
3 1	4.1	5.1	5.3	6.5	6.2	3.5	3.8	A STATE	76	A	O	A		47	10	44	4.2	3.4	3.2	3.0	3.6	3.6	33
28	3.1	3.4	4.4	4.3	.3/4	3.6	4.0		TY	RBIN	ES	M	1	14	- /3	93.9	3.1	3,2	3.0	2.8	2.7	2.6	31
7687500 ^{_28}	2.9	3.1	3.2	3.2	3.4	3.7	11		Z	A	P		T	76	3.9	3.6	3.0	2.9	2.9	2.7	2.6	2.6	25
28	2.9	3.0	3.1	3.2	3.4	4.4				-		The second secon	4		3.7	3.1	2.8	2.7	2.7	2,6	2,6	2,5	24
28	2.9	3.0	3.0	3.2	3,7		T	Lou	JA				1	3.	5 3.3	2.9	2.7	2,6	2.6	2.5	2.5	2,4	24
28	2.9	3.0	3.0/	3.2	3.9	C	and the			()	N		۵(3.3	2.9	2.7	2.7	2.6	2.5	2.5	2.4	2.4	23
7687400 ^{_27}	2.9	3.0	3.0	3.4	3,8	11		7/		87	M		13.1	3.0	2.7	2,6	2,5	2,5	2.5	2,4	2.4	2.3	23
27	2.8	2.9	3.1	3.6	3.6	35				1))	1	230	2.7	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	22
26	2.7	2.8	31	3.2	3.2	3.3	3.5 43	4 3	3			/2	92.9	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.2	21
26	2.6	3.0	3.0	3.1	3.4	3.0	3.0	2.9	3.4	3.1	201	2.8	2,5	2,4	2.4	2,4	2.3	2.3	2.3	2.2	2.2	2,1	21
7687300 ^{_25}	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.8	218	2.8	128	27.6	2.4	2,4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	20
2 5	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2/1	2.6/	2.4	2.4	2,3	2.3	2.2	2,2	2,2	2.1	2,1	2.0	2.0	19
26	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.5	2.3	2.3	2.2	2.2	2.2	2,1	2,1	2.1	2.0	2.0	1,9	1.9
26	2.6	2.7	2.7	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	19
7687200 25	2.6	2.6	2.6	2.6	2.6	2.5	2,4	2.4	2.4	2.4	2.3	2.2	2,1	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	18
	4	3020	00		4	3030	00		4	3040			4	3050	00		4	3060	00		4	3070	00

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FIGURE G-20 Sagwon Compressor Station Operating Scenario 3 Modeling Results Annual Average SO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

001200	4	1 3020	00		4	T 3030	00		4	1 3040	00		4	1 3050	0		4	1 3060	00		4	1 307(00
7687200 09	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0
0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0
10	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0
10	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0/9	0.9/	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	c
687300-10	1.0	1,1	1.0	1.0	1.0	1.0	1.00	0.9	019	1.0	11/	1.1.1	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	(
10	• 1,1	1,1	1.0	1.0	10	1.0	1.0	0.9	2 12	1.2		11/1/2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0,8	0.8	0.8	
11	1,1	1.1	10	1.0	1.0	1.2	12	1.2	ſ	1	9	1	21.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	
687400 ¹¹	1.1	1,1	1.0	1.2	1.2		1	1	1	1 h	3/	1	1.2	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
	1,1	1.1	1.0	1.0 1.0	2	M	1	(Caller	- And		T	/) 1	1.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1
10	1,1	1,1	1.0	1.0	1.0.		Al a	Service of the servic	H	0	2	11 .	1	1.4	1,2	1.0	1.0	1.0	0.9	0.9	0.9 0.9	0.9	
10	1.0	1.0	1.0	1.0	1.0	1.4	4	~	./			T	1	1,	(1,1	1.0	1.0	1.0	0.9	0.9	0.9	1
687500 10	1.0	1.0	1.0	1.0	/1,1	15			4	N	R		M	the	1.5	1.5	1,1	1.0	1.0	1.0	0.9	0.9	
10	1.0	1.0	1.0	1,1	-1/1	1.2	5		TU	RBIN	ESH		1	Y		61.5	1,1	1,1	1.0	1.0	1.0	0.9	
10	1,0	1.0	1,1	1,1	1.2	1.2	1.5		76	K	1	0	the second	\$/1	10	1165	1.2	1,1	1,1	1,0	1.0	0.9	
10	1.0	1,1	1,1	1,2	1.2	1.3	1.3	GEN	CO CO CO	TU	RBINE				10	A.	1.6	1.2	1,1	1,1	1.0	1.0	
687600 10	1.0	1,1	1,1	1,2	1.3	1.3	1.4	20		Contra la	The	A	How	240	A	7	17	1,2	1,1	1,1	1.0	1.0	
10	1,1	1,1	1.2	1.2	1.3	1,4	1.5	1.2	00	THE STATE	TUR	BINEI	1		A	6	17	1.5	1,2	1,1	1.0	1.0	
10	1,1	1,1	1,2	1.3	1.3	1.4	1.5	1.6	2.2	1010			1	1	10	1/	1	1.7	1.2	1,1	1,1	1.0	
10	1,1	1,1	1,2	1.3	1.4	1,5	1.6	/1.7	295			tor	- 00	1	1		and the second s	41	1.2	1,1	1,1	1.0	ł
7687700 10	1,1	1,1	1,2	1.3	1.4	1.5	1,6	1/7	2.02	T	NAST		/		Carrie	1.	91.4	1.3	/1.2	1,1	1,1	1.0	ł
10	1,1	1,1	1.2	1.3	1.4	1.5	1.6	1.7/	2.0	2.9		-	2.4	3.3	1.7	15	1.4	13	1.2	1,1	1,1	1.0	
10	1,1	1,1	1.2	1.3	1.4	1.4	1.6	1.7	1.8	2.0	2.5	72.1	1.8	THE RATES	16	1.4	1.3	1.3	1.2	1,1	1.1	1.0	
1007000	1,1	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.7	1.8	1.7	1.7	1,6	1.5	1.4	1.3	1.2	1.2	1,1	1.0	1.0	
7687800-10	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.6*	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1,1	1.0	1.0	
10	1.0	1,1	1,1	1.2	1.2	1.3	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.3	1.2	1.2	1,1	1,1	1.0	1.0	
10	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9	

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7688400		€₽				99				151				151				36				3p	1
7688300 —		139				178				213				39				-33				32	
7688200-		124				140				40				36				35				34	
7688100 —		62				38				38				38				37				36	
7688000 —		67				38				39				43				42				38	
7687900-		87				60				47				52				47				38	
7087900 - 94	95	90	91	88	66	66	44	45	49	51	53	56	57	56	54	53	50	47	44	42	40	38	4
96	98	96	93	95	66	68	48	49	53	55	58	62	64	62	59	55	50	47	44	42	40	45	4
109	100	101	96	98	93	69	54	54	58	59	63	71	73	69	62	57	52	48	45	50	47	48	4
7687800 1 4	114	104	108	101	104	66	67	60	65	65	70	82	83	74	64	57	53	56	53	55	52	50	4
117	121	121	112	116	108	96	74	80	7.2/	71	77	100	92	73	63	65	61	63	58	55	53	53	5
111	124	128	130	122	110	112	78	85	91	80 10	1	4124	84	69	and the second	73	68	66	64	59	56	53	4
100	103	133	139	143	125	107	84	89	92	124	~		99	182	86 118	79	74	169	65	61	58	57	-
7687700 104	104	103	141	141	131	116	100	101	107	45	NAST		-	_	1000	10 8	67	63	60	57	55	53	5
90	106	106	99	105	125	108	107	/117	1334	n		141	00		1	>	K	69	53	47	43	41	4
106	109	191	91	91	99	109	123	139	192	To.	10	1	T	1	10/	/	17	67	55	48	44	41	4
	112	5	113		106	120	131	1569	0/5	HIN .	TUR	BINET			2/12	1	77	67	54	49	44	42	4
7687600 127	134	139	135	126	111	128	133	79 G		10 IE	K	7	the	0100	HI	1	78	59	55	52	49	46	4
144	152	157	147	135	121	140	146 203	79 GE	200	TU	RBINE	ALL.		H	1	88	84	65	60	57	53	49	4
145	154	145	106	118	131	1482	169			K	-	5	-	1/	10)	900	74	64	60	57	53	50	4
					/	140	\$//		TL	KBIN	ESH	11	1	Y	1	1 87	67	63	59	55	52	48	4
7687500 109	103	87	100	112	/122	123/	11	1	4	A	1	11	10	the	112	84	66	62	57	54	51	47	4

FIGURE G-21 Sagwon Compressor Station Operating Scenario 3 Modeling Results Maximum 1-Hr Average CO Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

Alaska	ING	
HIdskd	ТН	

FIGURE G-22
Galbraith Lake Compressor Station Modeling Results
Maximum 1-Hr Average NO ₂ Concentrations (µg/m ³)
(Coordinates are UTM NAD83, in meters)

7593100 26			-	217		_		29	-			36				110				99
27	27	27	28	28	28	28	29	29	32	36	37	36	39	48	61	75	114	114	115	13
27	28	28	29	29	29	30	30	31	32	35	39	37	37	40	52	68	100	115	114	1:5
28	29	30	30	31	31	31	32	33	33	36	39	39	38	38	44	59	72	113	115	14
7593000- ³⁰	31	31	32	33	33	34	35	35	35	36	40	42	41	39	38	51	64	71	113	15
31	32	33	34	35	36	36	38	38	37	38	40	43 47	44	42	39	40	55	67	71	13
32	34	35	37	38	40	40	43	42	425	462	49	49	43	44	41	39	44	56	66	73
34	36	38	40	43	46 61	51	61	42 60	Oyan			145	43	44	44	41	39	43	47	52
7592900- ³⁶	38	41	44	590	01		_	/	-	1	1)	547	44	45	43	39	38	40	43
38	41	44	46	50	3 N	ASTE	m.	0		100 mil	A	F	56	44	43	44	41	38	37	35
39	43	46	48	52	10		100		1		5	1	55	5 43	42	42	42	39	37	35
41	45	48	51	56	15	M		TUR		1	0000	1	A	5645	41	41	40	41	38	36
⁴² /592800	46	49	52	60	80	26	303	TUR			M		Ring	56	40	39	38	39	38	36
43	47	49	52	62	74	TT H	T	R S	T		Taiward.	P	4	55	41	37	36	37	39	36
43	49	53	73	77	69	88	GENU	P.C.		1	0	3	#	2)5	47 52	36	35	35	39	36
88	93	97	103	84	68	7695		1	(O)	- Aller			X	1	49	35	33	34	37	35
7592700- ⁸⁷	104	105	108	97	63	74	12	D			0	F		Je	47	39	32	32	34	36
96	104	110	113	68	68	58	82	C	2			-			174	5 39	31	31	32	36
104	113	112	80	72	66	52	61				57	55	581	50	42	37	30	30	30	35
102	109	85	80	51	46	47	53	59 5	9 59	58	52	49	41	37	33	31	29	29	29	32
7592600 ⁹⁸	79	83	66	42	43	44	44	52	48	43	39	37	34	33	32	31	30	29	28	29
73	76	71	53	39	40	40	39	40	39	37	35	34	32	32	31	30	29	28	27	27
70	71	55	50	36	36	37	36	35	35	34	33	32	31	31	30	29	28	27	26	26
68	53	49	39	33	34	34	33	33	32	32	31	30	30	30	29	28	27	26	25	24
7592500 <u>56</u>	51	47	30	31	31	32	31	31	30	30	29	29	29	29	28	27	26	25	24	24

40330	0	1	4	T 0340	00		4	1 0350	00		1.1	T 0360			4	T 0370	00		4	0380
7592500 85	8.7	9.0	9.2	9.4	9.5	9.6	9.6	9.6		9.3	9.1	8.9	8.6	8.4	8.1	7.8	7.5	7.2	7.0	68
89	9.2	9.5	1.5	10.0	1.5			150	. 5.1	1. A	131	9.4	9.1	8.8	8.5	8.1	7.8	7.4	7.2	70
94	9.8			10.9			/							9.2	8.9	8.5	8.1	7.7	7.4	73
A CONTRACTOR OF A				11.3				100	1.00	SCAUM PHE	-			9.7	9.3	8.8	8.4	8.0	7.8	77
7592600						-	1	1.0	12.0.7				-	1	9.7	9.2	8.7	8.3	8.2	84
	1.5		1.10	11.4	120	10.00	11	8	8 11	81.1.0	11.8	STATION BOUN	11.5	11.3	10.4	9.5	9.0	8.7	8.6	92
				11.4			117	-	_			11.0	11198	1.8 1	11:5	11.3	9.3	9.0	9.2	10.1
				11.3			5111	UL	1	-	1	/		-	11	11.4	9.6	9.4	9.8	10.6
7592700 11.4	11.4	11.4	11.4	10.5	8.9	8.11	2.6	T	-		0	F		10	117	11.4	9.9	9.8	10.5	10.8
11.4	11.4	11.4	11.3	9.2	8.2	819.	GEN	P	6	The	·	\square	A H	1	1.8	10.8	10.3	10.2	11.1	10.9
11.5	11.4	11.4	10.9	9.0	8.3	10.7	GEN2	2		1	-		#	211	9 11.6	11.1	10.6	10.6	11.3	11.0
		11.4		1	8.5	E1.4	HG	R	L	L	TT.	y	4	11.9	11.4	11.3	11.0	11.2	11.3	11.0
7592800 11.5	11.4	11.4	11.3	9.6	8.5		300	TUR		P/S			To sta	11.9	11.4	11.3	11.3	11.3	11.3	11.0
11.5	11.5	11.5	11.4	10.9	10,5	a			0	11	200	1F		1.9.5	11.4	11.4	11.4	11.4	11.3	10.9
11.4	11.5	11.5	115	1 11.4	19	D B BAR	and un	1	-	T	5	11	111.	911.5	11.4	11.4	11.4	11.4	11.3	10.8
		11.5	1		.0	ASTE	TI	0	0 83	() BILL	K	F	11.8	11.5	11.5	11.5	11.4	11.3	11.3	11.8
7592900 11.1	11.3	11.4	11.5	1120	12.0			/	5	/	1)	11.86	11.5	11.5	11.5	11.4	11.3	12.1	11.0
10.5	11.1	11.8	11.4	11.5	11.5	11.7	12.01	2.0	in the second se			the t	1,1.4	11.5	11.5	11.4	11.4	11.8	11.3	11.1
				11.3		19.4	11.4	11.4	114	811.5	11.2	511.	11.5	11.5	11.4	11.4	12.0	11.3	11.3	11.1
94	9.8	10.2	10.6	10.9	11.1	11.3	11.3	11.3	11.2	11.3	11.3									
7593000 ⁹ 0	9.3	9.6	9.9	10.1	10.3	10.4	10.4	10.4	10.4	10.8	11.3	11.4	11.4	11.4	11.3	11.3	11.3	11.3	11.5	11.5
85	8.8	9.1	9.3	9.5	9.6	9.7	9.7	9.7	9.9	10.4	11.3	11.4	11.3	11.3	11.6	11.3	11.3	11.4	11.5	11.5
8 1	8.3	8.5	8.7	8.9	9.0	9.1	9.1	9.2	9.5	10.4	11.3	11.3	11.3	12.0	11.2	11.2	11.3	11.6	11.4	11.5
717	7.9	8.1	8.2	814	8.5	8.5	8.6	817	9.3	10.5	10.9	1 <u>q</u> .9	12.1	10.9	11.0	11.0	11.5	11.4	11.5	11.3

FIGURE G-23 Galbraith Lake Compressor Station Modeling Results Annual Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

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FIGURE G-24 Galbraith Lake Compressor Station Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

7593400 217		_	_		218	_			410	- 1			19,4	5	_		14	4				11.5	11	.9	19.2		1	1.7	-	10
20	1				3.0				3.8				10.3				11	A				15.9	9	R	14.2			9,3		18
593300 ² 6					3.0				3.0				19.5				1	.0				10.0	0		14.2					19
					3,4				4.3				5,2				16	4				16.2	15	15	8.8		1	6.8		19
593200 ³¹					e.																				4					
593100 ³ 5	i				4.1				4.0				4,4				11	.4				13.1	18	.6	13.6		1	1.3		11
36		8	4.0	4,2	4.3	4.3	4.2	4.1	3.9	3.8	4.0	4.5	4,9	5.1	5,2	6.0	7.	7 12	2.8 1	3.5	14,9	14.1								
35	5 3.	8	4.1	4.3	4.4	4.4	4.3	4,2	3.8	3,8	4.2	5.1	5.1	5.5	5.4	5.	6.	7 10	0.1 1	3.4	13.6	14.7								
34	1 3.	7	4.0	4.3	4.5	4.6	4.4	4.4	4.3	4.2	4.5	5.6	5.7	6,1	6,1	5.	5.	8 7	1 1	1.4	13.4	13.6								
593000 ³ 1	3.	5	3.9	4.4	5.0	5,2	5,0	4.8	5,1	4,9	4.9	5,9	6,9	7.0	7.0	6.	6.	0 6	3 7	7,1	11.5	13.2	12	.5	16.3		7	.3		1
32		6	4.1	4.8	5.7	6.3	6.0	6.1	6.1	5,9	5.6	6.3	7.4	7,9	7,6	7.	6.	0 5	5 6	3.6	7,1	11.7								
33	3 3.	6	4,1	4.9	6.5	7.9	14	7.3	7.2	6.7	3 6.8 1	18.4	9.	8.5	8,1	7.0	6.	4 5	7 1	5.5	6.5	7.3								
3,4	3.	7	4.9	4.6	6.4	10.2	10.2	12.0	12.0	And I			Cart of	9.78.5	7.8	7.	6	1 4	3 4	4,2	4.7	5,1								
592900 ³ 6	3 3.		4.3 \	4.8	6.6		-	_	1	-	100	11	1	8.80		5.8	4	3 4	0 3	3.7	3.9	4.2	15	.6	16.1		1	0.2		1
8,8	3 10	.0 1	1,4	12.6	12.9	4 187	VAST	Fm	3	00 0	Acr	1	F	7.5	4.6	4.6	4.	3 4	.0 3	3,8	3.6	3.5								
88	3 10	.0 1	1.5	11/9	10.8	福見	100	The second			M	1	11	s = lb	9 4.6		4.	3 4	1 3	3.8	3.6	3.5								
88	3 9.	8	1.4	12.1		- 10	6	Line	TUR	BING	At	0	H		5.94.9		4	2 4	0 4	4,0	3.7	3.5								
592800 ^{_8} 5	9.	4 1	0.0	11,1	11.9	14.2	11110	Sel 10	a		HE	E	4	10.00	6.0 6.9		4	1 3	9 3	3.9	3.8	3.5	13	.2	11.2		1.	4.2		1
71	7.	4		10.0	18		10.5	GEN	A 12	- Fe	H	indread k	T	4		.8			.0 4	4 <u>1</u>	4.0	3.7								
64	11.2		20			10.4	124	GEN	AP-		1	0	R	đ	1	5.6	100			3.8	3.9	3,6								
1	6 9 <u>.</u>		1	10.3	23	9.3	10.3	4	1	-	and the	and the second	m		1	5.3 5.4			÷		3.9	3.6								
002100	5 10					8.7	12.1	31.0	I	10 person		-	1	Y)	er	5				5.1	3.7	3.5	4	7	12,6		1	5.2		
	3 10					11.4	8.6	10.			/			Geto	5.7	0.0	484			3.2	3.4	3.6								
						11.2		9	3	0	0 7 6	7.1	6.6	6519	\ ·	41	11			20	3.2	3.5								
1	1 12		2.1		8.4	7.5	6.7	-	82	8.3 6	6.0	5.0	5.9	4.9	1	~.			10		2.0	3.3			7.8		à	0.0		
592600 ¹¹				8.9	7.3	6,1	5.8		20	5	6.0 5.3	5.2	45	4.1	3.8		1.5		8.4		20	3.1	3		7.8		1	0.0		
93	1.1		÷.,	7.1 6.1	6.0 4.5	5.3	5.2	1	5.7	5.6	5.3	4.9	4.5	4.1	•						÷.,	3.1 3.0								
89	5 6.	2	1	4.8	4.0	4.6	4.7	1.5	4.8	4.8	4.9	4.4	4.4		1.5	3.	0		63	197	3.0	11.1								
	6		5.8	3.7	3.9	4.4	4.4	4.4	4.0	4.4	4.3	4.2	4.0	3.8		3.	1.1			2	Tr.,	3.0	3	0	29		4	1.4		1
7592500 / 1 4033	0.	-	0.0	1.1	0340				1035		4.5		0360	150	5.0	1.1	403	1.00			1.0	T 03800	403	Sec	 40400	0		1	4(-

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FIGURE G-25 Galbraith Lake Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

1.5 1.5 1.7 1.7 1.9 2.0 2 <u>.</u> 1 2 <u>.</u> 2	5 1,6 7 1,8	1.6 1.8	1.6	1.5	1.5	1.6		100								
1.9 2.0	7 1 <u>,</u> 8	18					1.8	1.8	1.8	2.4	1.7	1.6	1.7	1.8	2.2	25
		.0	1.8	1.7	1.7	1.7	1,9	1.8	1.8	1,9	2,1	1.7	1.7	1.8	1.8	23
2.1 2.2	2.0	2.0	2.0	2.0	1.9	1.9	1,9	2.0	1.8	1.8	1.9	1.7	1.7	1.7	1.7	18
	2 2.3	2.3	2.3	2.2	21	2.0	2.0	2.0 2.3	2.0	1.8	1.8	3.4	1.7	1.7	1,7	17
2.3 2.4	2.5	2.5	2.5	2.5	2.4	228	2.0	2.4	2.0	1.9	1.8	1.9	2.4	1.7	1.6	16
2.5 2.5	5 2.4	25	3.1.	3.3					.52.0	1.9	1.9	1.8	1.9	2.2	1.7	16
2.5 2.4	1 2.9	-	_	/	5	-	1	-1-1	2251	1.9	1,9	1.8	1.8	1.9	2.4	17
2.4 2.1	218	ASTE	TTI	0	(G) (§\$)	C and	T	F	2.5	1.9	1,8	1.9	1.8	1.8	1.8	22
2.8 2.1	0117	D B PAR	uni kon		1		5	16	2.5	1.8	1.7	1.8	1.8	1.8	1.7	17
2.3 2.0	22	M		TUR		4	0	1F	A	4.9	1.7	1.6	1,7	1.8	1.8	17
2,1 1.5	1.7	順	- Plan	TUR	0		B	41	(O. Harris	243	1.6	1.5	1.6	1.8	1.8	17
1.9 1	1.5	18	16	Ba	Taj		Oncount	44	4	2.3	1,6	1.5	1.5	1.6	1.8	17
1.8 1.6	5 1.3	15	GENU	000				3	#	24	1.9	1.5	1.5	1.5	1.8	17
1.7 1.5	5 1.4	1.2.5		1	()	- Ale		#)			1.9	1.4	1.4	1.5	1.7	17
1,6 1,5	5 1,4	1.4		D	- Co		0	5)) '	Ja	1,9	1.6	1.4	1,4	1,6	17
1,6 1,5	5 1.5	1.5	1.9	C		1		~		1	t b	91.6	1.4	1.4	1.5	17
1.6 1.5	5 1,5	1.5	1.1	0			2.0	2.1	2210	2.0 1	117	1.6	1.4	1.4	1.4	17
1.6 1.5	5 1,5	1.5	1.6	20 2	0 2.0	2.0	1.9	1.9	1,6	1.5	1.4	1.4	1.4	1,3	1,4	15
1,6 1,5	5 1.5	1.5	1,6	19	1.7	1.7	1.6	15	1.4	1.4	1,4	1.4	1.3	1.3	1.3	14
1.5 1.5	5 1.5	1,5	1.5	1.6	1.5	1.5	1,5	1.4	1.4	1.4	1,4	1.3	1.3	1.3	1.3	13
1.4 1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1,4	1.4	1.3	1.3	1.3	1.3	1.3	12
1.4 1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.2	12
1.4 1.4	1.4	1.4	1.4	1.4 T	1.4	1.4	1.4	1.3 T	1.3	1.3	1.3	1.3	1.3	1.2	1.2	12
	1.4 1.4	1.4 1.4 1.4 1.4 1.4 1.4 1 403400	<u>1,4 1,4 1,4 1,4</u>	<u>1,4 1,4 1,4 1,4 1,4</u>	1.4 1.4 1.4 1.4 1.4 1.4	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4</u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 </u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 </u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 </u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 </u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.3 1.3 1.3 1.3</u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 </u>	<u>1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3</u>	<u>1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 </u>	<u>1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 </u>	<u>1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 1,4 </u>

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FIGURE G-26 Galbraith Lake Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

216	2.8	2.8	2.9	310	3.0	3.3	3.4	318	3.9	4.6	5.3	612	6.6	6.7	7.3	811	8.8	9.1	11.0	11.9
28	2.9	3.0	3.1	3.2	3.3	3.6	3.7	4.7	4.4	4.8	6.1	6.4	6.6	6.9	7.0	7.6	8.7	9.0	9.2	10.6
29	3.1	3.2	3.3	3.4	3.5	3.8	4.5	5.5	5.4	5.2	6.2	6.6	6.9	6.8	7,1	7.3	8,1	8.0	8.4	91
7593000 ³¹	3.2	3.4	3.5	3.7	3.7	3.9	5.5	6.5	6.3	6.2	6,1	7.3	6.9	7.0	7.0	5.9	6.8	7.2	7.6	82
32	3.3	3.6	3.7	4.0	4.3	4.9	7.8	7.9	75	6.9	6.8	7.1	7.5	6.2	5.7	5.4	5.9	6.5	6.8	72
32	3.5	3.7	4.3	5.0	5.5	6.4	9.4	9.2	8.6	98140	4 9.7	9.1	6.9	6.6	5.7	5.2	5.1	5.6	5.8	59
33	3.6	4.1	5.0	6.1	7.3	18.3	15.4 1	5.4 1	Dargen -			in g	67	6.5	5.6	4.8	4.4	4.3	4.6	48
7592900 ^{_34}	3,6	4.4	5.7	7.8	11.3		_	/	5	-	1)	8.678	5.7	5,6	4.8	4.0	3.7	3.7	38
	12.8	14.6	16.2	12 16.6	IN	ASTE	m	0	1	in Barrow	K	F	6.8	4.5	4.1	4.0	3.6	3.3	3.1	29
11.3	12.8	14.8	153	13.9	15		UNI UN		1	T	5	11	6.	4 4.3	3.7	3.6	3.5	3.2	3.0	29
11.3	12.6	14.6	15.5	15.6	197	1			0	11-	200	11		3.4	3.2	3.2	3,2	3.1	2.9	28
7592800 11.0	12.0	12.8	14.3	15.3	18.3	I	3103	TUR	BINE		MAR	HI	10,11	44.0	3.0	3.0	3.0	3.0	2.9	28
91	9.5	11.3	12.8	1453	15.1	13.3m	The second	Ba	Te		HT-	-p	4	3,9	3.0	2.8	2.8	2,9	2.9	28
83	8.6	9.6	12.1	12.7	13.4	53	GEN	Pe		1	_		#	2)3.	3.3 3.5	2.7	2.7	2.7	2.9	27
79	8.3	8.7	11.3	11.7	11.9	4.0	BLA	1	(I) (I)	The				1	3.3	2.5	2.5	2.6	2.8	27
7592700 76	8.0	10.1	10.5	10.7	10.9	3.74	T	D	PINT		6	F)) '	10	3,2	2.8	2.4	2.5	2.7	27
72	7.8	9.2	9.5	9.4	9.7	3.5	46	1	1					3	13	12.8	2.3	2.4	2.5	26
70	7.9	8.0	8.4	8.2	8.3	3.3	4.0	9			3.6	3.4	3333	3.2	219	2.7	2.3	2.3	2.4	25
67	6.9	6.9	7.3	6.9	6.8	3.2	3.6	2 3	.9 3.	9 3.8	3.4	3.2	2.7	2.6	2.4	2.2	2.2	2,2	2,3	24
7592600 55	5.5	5.9	6.0	5.7	4.9	3.0	3,1	36	3.3	3.0	2.7	25	2.4	2.3	2,2	2.2	2.1	2,1	2.2	23
4 7	4.6	5.0	4,4	4.6	3.6	2.9	2.7	2.8	27	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2,1	21
37	3.8	4.1	3.5	3.7	2.7	2.7	2.5	2.5	2.5	2.4	2,4	2.3	2.2	2.2	2_1	2.0	2.0	2.0	2.0	20
28	3.0	3.2	2.6	2.8	2.6	2.6	2.4	2.4	2.4	2.3	2,3	2,2	2.2	2,1	2.0	2.0	1.9	1,9	1.9	19
7592500 23	2.4	2.4	2.4	2.4	2.5	2.5	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.8	1.8	1.8	18
40330	00		4	0340	00		4	0350	00		4	0360	00		4	0370	00		4	0380

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FIGURE G-27 Galbraith Lake Compressor Station Modeling Results Annual Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

40330	00		4	0340	00		4	0350	00		4	0360	00		4	0370	00		4	0380
7592500 07	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	06
07	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	06
07	0.7	0.7	0,7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	07
07	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0,7	0.7	0.7	0.7	0.7	0.7	07
7592600 07	0.7	0.7	0.8	0.8	0.8	0.8	0,9	10	0.9	0.9	0.8	07	0.7	0.7	0.7	0.7	0.7	0.7	0.7	08
07	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1 1	11.	111	1.0	1.0	0.8	0.8	0.7	d.7	0.7	0.7	0.7	08
08	0.8	0.9	0.9	0.9	0.9	0.9	1.2	-			1.1	1.0	1100	1.0	elo	0.8	0.7	0.7	0.8	0,9
08	0.9	0.9	1.0	1.0	1.0	1.0	14	C	1	1				1	1	0.8	0.7	0.7	0.8	09
7592700 ^{_0} 9	0.9	1.0	1,1	1,1	1,1	1.2	15	D	3		G	F		10	10	0.9	0.7	0.8	0,9	09
10	1.0	1,1	1,2	1.2	1.2	1.4	p 4	1	Gunner	The	-		A	1	1.0	0.8	0.8	0.8	0.9	09
10	1,1	1.2	1.3	1.3	1.4	100 STOR	GENU	000		1		5	A	2	1.0	0.8	0.8	0.8	0.9	09
11	1,2	1.3	1.4	1.5	1.6	20	El.	RE	Te		T	-P	4	1.2	0.9	0.9	0.9	0.9	0.9	0,9
7592800 12	1.3	1.4	1.6	1.6	1.8	順	300	TUR	0				10.11	132	0.9	0.9	0.9	0.9	0.9	09
12	1.3	1.5	1.6	1.7	20	M		TUD	BINE	11-	2			3.0	1.0	1.0	1.0	1.0	0.9	0,9
12	1.4	1.6	1.6	1.7	29		UNI LOT	1	1	T	5	11		4 1.0	1.0	1.0	1.0	0.9	0.9	09
12	1.4	1.6	1.7	1.8	M	ASTE	m	0	0 8	in Burn	K	F	1.4	1,1	1,1	1,1	1.0	0.9	0.9	08
7592900 12	1,4	1.6	1.7	123	2.4			/	5	/	1)	1.153	1,1	1,1	1,1	1.0	0,9	0.8	08
12	1.3	1.5	1.6	1.7	1.8	1.9	2.3	2.2	an again			13.3 -	.51.2	1.2	1,1	1.0	0.9	0.9	0.8	07
11	1.2	1.4	1.5	1.6	17	1.7	1.7	1.6	1.52	01.5	1.0	1.4	1.3	1.2	1,1	1.0	0.9	0.8	0.7	07
11	1,2	1.3	1,3	1.5	1.5	1.5	1.5	1.4	13	1.3	1.3	1.3 1.4	1,3	1,1	1,1	0.9	0.8	0.8	0.8	08
7593000 ¹⁰	1,1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1,3	1.3	1.2	1,1	1.0	0.9	0.8	0.8	0.9	10
09	1.0	1,1	1,1	1.2	1,2	1.2	1.2	1,1	1,1	1.2	1.3	1.2	1,1	1.0	0.9	0.8	0.8	0.9	1.0	13
0,9	0.9	1.0	1.0	1.0	1,1	1.1	1,1	1.0	1,1	1.1	1.2	1,1	1.0	0.9	0.9	0.8	0.9	1.0	1.3	15
018	0.8	0.9	0.9	0]9	1.0	1.0	1.0	1]0	1.0	1,1	1,1	110	0.9	0.9	0.8	018	0.9	1.3	1.5	115

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FIGURE G-28 Galbraith Lake Compressor Station Modeling Results Maximum 1-Hr Average CO Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

35 37 41 46 49	37 40 44 47 51	39 42 47 52 57	37 40 44 50 57	41 45 51	41 45 51	46 49	45 46 48	48	50	50	46				104						198
37 41 44 46 49	40 44 47 51	42 47 52	40 44 50	51	131	46 49	46	48	50	50	46				104						100
37 41 44 46 49	40 44 47 51	42 47 52	44 50	51	131	46 49		48	50	-					124				145	274	130
41 44 46 49	51			51	131	49	48			50	48	47	53	67	84	140	151	163	155		
44 46 49	51				51	-		49	51	53	51	49	48	57	75	112	147	152	163		
46 49	51		57	100		53	51	51	53	56	55	52	51	49	64	79	125	147	152		
49	5	57		59	58	58	53	53	54	57	59	57	55	52	55	70	79	126	145	184	239
			65	70	68	62	57	56	57	59	61 68	62	59	55	52	60	74	79	128		
	53	60	72	84	80	68	64	63,	686	71	14.5	67	64	58	55	52	61	72	81		
52	56	62	75	107	139	96	90	0			18	32 ⁶⁸	65	62	58	54	50	52	57		
55	61	67	896	-	-	_	/	5	-	11)	822	64	64	60	56	50	47	47	151	237
70	80	88	90	8	ASTE	TT	0	1 ST	100	T	F	81	65	64	60	56	52	48	45		
70	80	83	96	23	D Gine	ani (C)		1	X	1	16	84	65	63	61	57	53	50	46		
69	80	89	105	141	a		TUD	90	11	0000	all P	A	8469	62	60	57	54	51	47		
72	83	96	112	148	26 T	2100	TUR		DA	MAR		1000	843	61	58	56	54	51	48	145	165
74	84	100	118	139	149	EL6	RE	T		-	1	4	84	63	57	54	52	52	48		
71	81	98	115	136	178	GEN	P		1	/		At	~ 1	72	55	52	51	51	48		
00	105	118	113	129	1529	DEN	10-		The	()				74	53	50	49	50	47		
29	128	135	114	121	1411	83	D	HILL	THE REAL PROPERTY AND INCOMENT		1		J.	- X.	59	48	47	48	47	52	13
31	154	152	127	128	116	168	Ż	1			~				8 59	46	45	46	46		
71	164	133	132	127	102	146	9			00	92	852	80	65	56	45	43	44	44		
67	145	136	103	87	91	12	8	10 10	8103	4 99 91	82	68	59	52	46	43	41	41	41		
38	145	124	83	77	80	83	95	87	78	68	62	56	50	47	43	40	39	39	39	38	85
32	128	99	68	66	69	69	71	68	64	60	55	51	47	44	41	38	37	36	37		
26	100	81	57	59	61	61	61	59	57	54	50	47	44	41	38	36	35	35	36		
96	85	63	52	54	55	54	54	53	51	49	47	44	41	38	36	34	34	35	36		
93	75	47	48	49	50	50	48	48	47	45	43	41	38	36	34	34	34	35	35	36	35
5 7 7 6 7 7 7 10 12 13 13 12 19	22 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2 56 5 61 0 80 0 80 0 80 2 83 4 84 1 81 00 105 29 128 31 154 71 164 57 145 38 145 32 128 26 100 6 85	2 56 62 5 61 67 0 80 88 0 80 83 9 80 89 2 83 96 4 84 100 1 81 98 20 105 118 20 105 118 21 128 135 31 154 152 71 164 133 57 145 136 38 145 124 32 128 99 26 100 81 6 85 63 3 75 47	2 56 62 75 5 61 67 896 0 80 88 90 0 80 89 105 2 83 96 112 4 84 100 118 1 81 98 115 2 83 96 112 4 84 100 118 1 81 98 115 20 105 118 113 20 105 118 113 21 128 135 114 31 154 152 127 71 164 133 132 32 128 99 68 32 128 99 68 26 100 81 57 6 85 63 52 32 75 47 48	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	9 53 60 72 84 80 68 64 63 676 77 2 56 62 75 107 109 96 90 86 1 77 5 61 67 86 139 108 139 9 80 83 96 123 108 139 2 83 96 112 148 96 4 84 100 118 139 96 90 105 113 1 81 98 115 136 178 676 2 128 135 114 121 141 83 31 154 152 127 128 116 166 71 164 133 132 127 102 128 181 13 132 127 102 128 181 15 136 178 676 183 96 11 14 121 141 83 31 154 152 127 128 116 166 5 145 136 103 87 91 102 108 145 124 83 77 80 83 95 87 78 68 62 32 128 99 68 66 69 69 71 68 64 60 55 32 128 99 68 66 69 69 71 68 64 60 55 32 128 99 68 66 69 69 71 68 64 60 55 33 75 47 48 49 50 50 48 48 47 45 43	9 53 60 72 84 86 68 64 63 68 64 73 68 64 63 68 64 77 77 77 77 77 77 77 77 77 77 77 77 77	9 53 60 72 84 80 68 64 63 676 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	9 53 60 72 84 95 68 64 63 68 64 77 67 64 58 2 56 62 75 107 109 96 90 86 77 64 58 5 61 67 $\frac{96}{123}$ 68 65 62 8 8 90 123 10 109 66 90 86 64 63 68 64 64 64 8 8 90 123 10 108 88 90 123 10 108 108 108 108 108 108 108 108 108	9 5.3 60 72 84 80 68 64 6.3 67 67 64 58 55 2 56 62 75 107 109 96 90 86 77 67 64 58 55 2 56 62 75 107 109 96 90 86 77 67 64 58 55 2 56 62 75 107 109 96 90 86 77 67 64 58 65 2 58 61 67 88 90 103 107 109 90 90 86 64 60 0 80 83 96 112 148 10 108 109 90 91 92 72 55 1 81 98 115 126 178 90 90 92 82 85 56 1 81 98 115 126 178 91 102	9 53 60 72 84 96 68 64 63 66 68 64 63 66 68 64 63 68 68 64 63 68 68 64 63 68 68 64 63 68 68 65 62 58 54 65 55 54 54 53 51 49 47 44 41 38 36 34 $\frac{1}{12}$	9 53 60 72 84 86 64 63 66 67 67 64 58 55 52 61 2 56 62 75 107 109 96 90 86 77 77 67 64 58 55 52 61 2 56 62 75 107 109 96 90 86 77 77 67 64 58 54 50 5 61 67 84 65 63 61 57 53 9 80 83 96 123 144 96 122 149 97 54 2 83 96 112 149 10 100 106 107 107 107 107 107 108 105 54 52 51 107 54 52 51 107 54 52 51 107 54 52 51 107 54 52 51 107 54 52	9 53 60 72 84 80 68 64 63 66 67 67 64 58 55 52 61 72 2 56 62 75 107 109 96 90 80 82 68 65 62 58 54 50 52 5 61 67 84 66 62 58 54 50 52 68 99 108 99 108 99 108 81 65 64 60 56 52 48 9 80 83 96 12 148 1 16 57 53 50 9 80 89 105 14 12 148 1 12 148 1 16 58 61 57 54 51 2 83 96 112 148 13 126 17 63 50 49 50 10 105 118 113 127 12	9 53 60 72 84 46 68 64 63 676 12 77 64 58 55 52 61 72 81 2 56 62 75 107 109 96 90 8 0 8 15 1 13 1 2 12 1 4 12 1 4 1 8 10 1 0 8 1 10 1 0 8 1 0 9 1 10 1 0 8 1 0 9 1 0 2 1 8 1 10 1 0 8 1 0 9 1 0 2 1 0 8 1 1 0 1 0 8 1 0 9 1 0 2 1 0 8 1 0 10 1 0 8 1 0 9 1 0 2 1 0 8 1 0 10 1 0 8 1 0 9 1 0 2 1 0 8 1 0 10 1 0 8 1 0 9 1 0 2 1 0 8 1 0 10 1 0 8 1 0 9 1 0 2 1 0 8 1 0 10 1 0 8 1 0 9 1 0 2 1 0 8 1 0 10 1 0 8 1 0 10 1 0 8 1 0 10 1 0 8 1 0 10 1 0 8 1 0 1 1 0 8 1 0 1 1 0 1 1 0 8 1 0 1 1 0 8 1 0 1 1 0 8 1 0 1 1	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

FIGURE G-29	
Coldfoot Compressor Station Modeling Results	
Maximum 1-Hr Average NO₂ Concentrations (μg/m (Coordinates are UTM NAD83, in meters)	³)

29	27	27	27	28	28	28	29	29	30	30	30	зp	31	31	33	312	30
40	28	28	29	29	29	30	30	31	31	31	31	32	32	32	34	33	31
42	35	30	30	31	31	31	32	32	32	33	33	33	33	33	34	34	32
7464300 44	45	31	33	36	37	33	34	35	35	35	36	36	35	34	34	35	33
46	46	43	41	45	46	45	45	44	44	43	42	44	36	35	35	35	34
47	49	52	45	49	9 4	9 47	7 47	.46	TATION 4704	AP7 45	43	14.5	41 37	36	36	35	33
50	53	54	61	55	B		_	_			1	St-St	42 38	36	35	35	34
7464200-53	55	55	67	59			TTI	0		(a upon		1	43 36 41	35	35	35	34
46	56	57	67	70		Y			Y		10	6	136 42	34	35	35	34
48	53	55	61	87	07	De la	THE			3	ACM		36 42	34	34	34	33
53	54	54	77	94	4	E E E		BINE	以		Ĩ		\$36 43	33	34	34	33
7464100-98	103	104	80	95	03 GE		§ 4	10		1 27		te and	40 ³⁵	32	32	32	31
102	113	109	87	61	GE GE					CHANGS	14	198.0	3937	29	28	27	26
107	106	99	53	50					Ø		V		388	29	27	26	25
103	103	53	42	41	44					•			3787	27	26	25	24
7464000-89	57	51	38	44	14C	-							409	27	25	24	23
52	49	37	35	43	14)	398	28	27	24	22
48	32	30	33	40	4141.4	2 4 2 4	2 4242	2 441	42	41	40	398	337	27	26	25	24
30	29	26	31	36	37	39	39	38	36	39	38	37	35	26	25	24	24
7463900-30	24	24	28	32	32	34	33	33	32	34	34	33	32	25	24	23	23
26	23	23	23	24	24	25	25	25	24	24	26	25	25	24	23	22	22
21	22	22	22	22	23	23	23	23	22	22	24	24	23	23	22	21	21
6219	00		6	2200	00		6	2210	00		6	2220	00		6	2230	00

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FIGURE G-30 Coldfoot Compressor Station Modeling Results Annual Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

612	6.5	6.7	6.9	711	7.3	7.4	7.5	715	7.4	7.4	7.3	7[1	6.9	6.6	6.5	6]1	5.6
68	7.1	7.4	7.7	7.9	8.0	8.1	8.2	8.2	8.2	8.1	7.9	7.7	7.5	7.2	7.0	6.5	60
74	7.8	8.1	8,4	8.7	8.9	9.0	9.1	9.0	8.9	8.8	8.6	8.4	8.1	7.7	7.5	7.0	64
7464300 80	8.5	8.9	9.9	11.0	11.2	10.3	10.4	10.4	10.2	10.0	9.7	9.3	8.8	8.3	7.9	7.5	69
87	9.3						11.6						9.5	8.8	8.4	7.9	73
95	10.1	10.6	11.5	11.7	1.7 11	.7 11	.7 11.	7 11.6	511.6	11.5	11.4	72.0	A. C. S.	9.3	8.8	8.3	76
10.1	10.8	11.3	11.7			ACT	-	_		-	7	-Contraction	1.3 10.6	9.7	9.1	8.6	80
7464200 10.7	11.3	11.5	11.8	11.9	19 W		TTT 101.101	0		(i) 17001	7	1	11.4 11.1	10,0	9,4	8.8	82
Contraction and the second	11.4		124	1-14		Y			Y		1	h	11.3	10.2	9,5	8.9	82
11.3	11.5	11.4	11.3	10.4				BINE		(3)	VEW.			10.3	9.6	8.9	82
11.3	11.4	11.3	9.2	11.4		F			区	9	Ĩ		11.3	10.3	9.6	8.9	81
7464100 11.3	11.4	11.1	9.5	11.3	I GE		8	1		即		To the	11.6.3	10.1	9.4	8.7	80
	11.4			10.7	0.6 GE			1	nes and	CHANG?	14	198 10	11.3.4	9.9	9.2	8.5	78
11.3	11.4	11.4	11.4	11.3	q.6				Ø		V		11.55	9.6	8.8	8.2	75
11.0	11.3	11.4	11.5	11.7	1.6				(C)				11.54	9.1	8.4	7.8	72
7464000 10.5	11.2	11.3	11.6	11.8	1.8	-							11.4.4	8.7	8.0	7.4	68
the second se	10.6				1)	11.8.3	8.2	7.6	7.0	65
92	9.8	10.4	11.4	11.7	119.9	1.71,7	4117	711.6	6 1116	11.5	11.4	11133	190.6	7.6	7.1	6.6	61
85	9.0	9.5	11.3	11.5	11,6	11.6	11.5	11.5	11.4	11.4	11.3	10.6	9.9	7.1	6.6	6.1	57
7463900-78	8.2	8.6	10.0	11.3	11.3	11.3	11.3	11.2	10.8	10.3	9.8	9.2	8.6	6.6	6.1	5.7	53
72	7.5	7.9	8.1	8.3	8.4	8.5	8.4	8.2	8.0	7.7	7.3	7.0	6.5	6.1	5.7	5.3	50
66	6.9	7.1	7.3	7.5	7.6	7.6	7.5	7.4	7.2	6.9	6.6	6.3	6.0	5.6	5.3	4.9	46
62190	00		6	2200	00		6	2210	00		6	2220	00		6	2230	00

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FIGURE G-31 Coldfoot Compressor Station Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

414	4.9	4.7	3.3	315	3.7	3.8	3.4	317	3.5	3.7	3.5	312	3.0	3.1	3.2	311	3.0
4 8	5.1	5.4	4.3	3.9	4.2	4.3	4.1	4.1	3.8	3.8	3.4	3.2	3.1	3.1	3.3	3.2	30
4 7	5.4	5.7	5.3	4.3	4.8	5.0	5.1	4.7	4.2	3.8	3.5	3.3	3.2	3.2	3.3	3.3	31
7464300 47	5.1	5.3	6.1	6.3	6.5	6.2	6.2	5.4	5.0	4.6	4,1	3.5	3.4	3.3	3.3	3.4	32
10.3	8.2	5.5	7.1	9.0	8.8	9.4	7.9	8.7	7.8	6.9	4.3	4.0	3.7	3.5	3.4	3.4	33
11.3	11.3	12.1	12.3	8.6		1.9 10	.6 8.7	9.6	ANO 8.9	4.7	4.3		4.1	3.7	3.6	3.4	32
12.6	12.3	12.9	16.7	17.9	8		-			_	7	D. Press	4.2	3.9	3.4	3.4	33
7464200 ⁵²	5.4	5.5	8,2	11.3			TTI Ini ini	0		() ()	1	1	4.6 3.9 4.2	3.4	3.4	3.4	33
4 6	5.4	5.9	8.7	184		Y			Y		10	5	3.5	3.3	3.4	3.4	33
4 7	5.7	6.7	7.6	11.8	4.0					(3)	VER		4.0	3.8	3.6	3.3	32
51	6.1	7.3	10,5	12.4				BINE	[状]	() ()	Ĩ		13.9 4.2	3.6	3.5	3.3	32
7464100 ⁹⁴	10.2	10.3	10,6	13.3	4.6 6		8	J.		野		Constant of	4.3.7	3.3	3.1	3.1	31
the second se	11.8	10.8	8.7	8.8	GE			-		CHANGE	14	198.10	3.3.6	3.0	2.8	2.7	25
11.4	11.1	10.0	5.5	7.4 8	34				Ø		V		3.3.7	2.8	2.7	2.6	25
11.3	11,1	5.9	4.6	6.2	5.5					-			3.3.6	2.7	2.6	2.5	24
7464000 10.5	6.7	6.0	4.0	4.74	19C		-L						3.3.8	2.6	2.5	2.4	23
65	6.3	4.1	3.7	4.74	8							1	387	2.7	2.6	2.4	22
60	3.7	3.4	3.7	4.54	64.64	.74.64	64.5	4 4432	412	4,1	39	3388	33.6	2.6	2.6	2.5	24
38	3.4	2,9	3.6	4.3	4	4.4	4.3	4.1	3,9	4.0	§ 3.8	3.6	3.5	2.6	2.5	2.4	24
7463900 ³⁴	2.7	2.8	3.3	3.8	3.9	3.9	3.9	3.7	3.5	3.4	3.4	3.3	3.2	2.5	2.4	2,3	23
30	2.6	2.7	2.8	2.9	2.9	3.0	3.0	2.9	2.8	2.7	2.7	2.6	2.5	2.4	2.3	2,3	22
24	2.5	2.6	2.7	2.7	2.8	2.9	2.8	2.8	2.7	2.6	2.5	2.6	2.5	2.4	2.3	2.3	22
62190	00		6	2200	00		6	2210	00		6	2220	00		6	2230	00

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-32 Coldfoot Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

114	1.4	1.5	1.5	115	1.5	1.6	1.6	1[6	1.6	1.6	1.6	116	1.6	1.7	1.8	117	1.7
14	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.8	17
1 5	1,6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	17
7464300 16	1.6	1.7	1.8	1.9	2.0	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.8	1.8	18
16	1.7	1.8	2.1	2.5	2.4	2.4	2.4	2.5	2.4	2,3	2.2	2.4	1.8	1.7	1.8	1.8	18
16	1.7	1.8	2,1	2.42	4 2	2 2.	2 24	2.5	ATTO 2.4.		2.2	2.1	2.0	1.7	1.8	1.8	18
17	1.8	1.8	21	2.3	2	ACTE	_	-			1	0-0	1.8	1.7	1.7	1.8	18
7464200 17	1.7	1.8	2,0	2.3	4 W		111 In 101	0	1	(9 mesi		1	2.1 1.8 2.1	1.7	1,7	1.7	18
17	1.7	1.7	1.9	2.3	50	Y			Y		1	5	1.8	1.6	1,7	1.7	17
16	1.7	1.6	1.8	2.0	0	Di Dia	THE	BINE		() • 9.87	MIN	9	1.7	1.6	1.6	1.6	16
16	1,6	1,5	1.7	2.0	9	H	-		以	() ()	Ĩ	4	1.7 2.1	1.6	1,6	1.6	16
7464100 15	1.6	1.5	1.7	1.8	8 G		8	- El	쀜	野		Constant of the second	2.8.6	1.5	1,5	1.5	15
15	1.6	1.4	1	1.8	GE			1		DHAHGI	14	-9 <u>1</u>	2,68	1.5	1.5	1.5	15
15	1.5	1.5	1.6	1.9	19				0		V		1.99	1.4	1.4	1.4	14
15	1.5	1.5	1.5	1.8	8			- I	minini ©	•			1,9.9	1.4	1.4	1.4	14
7464000 14	1.4	1.4	1.6	1.91	80								1:88	1,4	1.4	1.3	13
14	1,4	1.4	1.5	1.9	9)	1.8.8	1.3	1.3	1.3	13
14	1.4	1.4	1.5	1.9	9.91	.9 <u>1,9</u> 1.	91.9.	1 199	119	1.8	1.8	1188	1,8,8	1.3	1.3	1.3	13
13	1.3	1.4	1.5	1.8	18	1.8	1.8	1.8	1.8	1.8	1.8	1.2	1.7	1,3	1.3	1.2	12
7463900 ¹³	1.3	1.3	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1,5	1.3	1.2	1.2	12
13	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	12
12	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	12
62190	00		6	2200	00		6	2210	00		6	2220	00		6	2230	00

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-33 Coldfoot Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

511	5.2	5.5	2.5	216	2.7	2.7	2.9	3[1	3.1	3.3	3.0	219	2.8	2.7	2.6	215	2.3
53	5.5	5.8	3.6	2.8	2.9	2,9	3.4	3.6	3.6	3.5	3.3	3.2	3.0	2.9	2.8	2.6	22
5 5	5.8	5.8	5.7	3.0	3,2	3.2	4.0	4.0	5.1	4.4	3.9	3.4	3.3	3.1	2.7	2.4	21
7464300 57	5.8	5.4	4.8	4.3	4.7	4.3	4.5	6.6	6.4	5.8	5.2	4.2	3.3	3.1	2.7	2.5	22
10 mm - 10 ft - 10	10.5	4.8	4.7	6.5	7.4	1.00	200 A.	2 (1) (10.1	8,9	5.6	4.4	3.6	3.2	2.9	2.6	23
14.6	14.6	15.6	15.7	6.9	.2 9	7 8.	5 11.	2 12.3	311.5		5.4	4.7	4.3 3.8	3.4	3.0	2.7	23
16.2	15.8	16.6	21.5	23.1	0.6	ACTE	_				Y	201-0	4.4 3.9	3.4	3.0	2.6	24
7464200 67	6.8	7,1	10.3				TTT 101 101	0		(9 TRON		1	4.5 3.6	3.1	2.8	2.5	23
53	5.7	7.3	10.7	14:0		Y			Y		10	10	3.9 3.2 4.6	2.7	2.4	2.2	20
52	5.3	6.6	94	11.7	1.3			BINE		0	MDW		3.8	3.2	2.7	2.2	19
4 8	5.0	5.5	8,1	9.8	3		-	0	以次	() ()	Ĩ		13.5 4.0	2.9	2.5	2.1	18
7464100 ⁴ 2	4.7	4.7	6.6	7.4		- -	8	-D		野		To man	2.57	2.5	2.3	2.0	17
37	3.9	4.3	5.8	5.64	GE GE			-	ns	O-ANG	14	- Sec. In	2,2.1	1.8	1.9	1.8	16
29	3,4	3.6	4.5	4.12	6				Ø				2.4.1	1.7	1.7	1.6	16
24	2.6	3.0	2.5	2.62	22					•			2 0 0	1.6	1.6	1.6	15
7464000 ² 0	2.2	2.4	1.8	2.02	200	-	-						220.0	1.6	1.5	1.5	15
17	1.8	1.6	1.6	1.81	8)	1.9.9	1.5	1.5	1.4	14
1 5	1.6	1.3	1.5	1.7 1	8.81	.9 <u>1,9</u> 1	91.9.	9 1 88	1188	1.7	1.9	1199	1.9.8	1.4	1.4	1.4	14
14	1.3	1.3	1,5	1.8	18	1.8	1.7	1.7	1.7	1.7	§ 1,7	1.8	1.8	1,4	1.4	1.4	14
7463900-13	1.2	1.3	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.6	1.7	1,4	1,4	1.3	13
12	1,2	1.2	1,2	1.2	1.3	1.3	1.3	1.3	1,3	1.2	1.2	1,2	1.4	1.3	1.3	1.3	13
11	1,2	1.2	1,2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	13
62190	0		6	2200	00		6	2210	00		6	2220	00		6	2230	00

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-34 Coldfoot Compressor Station Modeling Results Annual Average SO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

14	1.5	1.5	1.6	1[6	1.6	1.6	1.6	1]6	1.6	1.6	1.6	117	1.7	1.7	1.8	118	1.7
1 5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	17
1 5	1.6	1.7	1,7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.8	18
7464300-16	1.7	1.7	1.8	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	18
16	1.7	1.8	2.2	2.5	2.5	2.5	2.5	2.5	2.5	2,3	2.2	2.4	1.8	1.8	1.8	1.8	18
1 7	1.8	1.8	2,2	2.52	5 2	4 2.	5 2.5	2,5	2,5		2.3	2.2	2.1	1.8	1.8	1.8	18
17	1.8	1.9	2.2	2.4	4	ACTE		_		-	7	CO-C	1.8	1.8	1.8	1.8	18
7464200 17	1.8	1.9	2,2	2.4	5 W			0	Same	(a 11001		1	1.8 2.1	1.7	1.8	1.8	18
1 7	1.8	1.8	2,2	2.5	5	Y			Y		1	6	1.8	1.7	1,7	1.7	17
16	1.7	1.8	22	2.5	5		THE	BINE	ł	Ø	ALC: N	G	1.7	1.6	1.7	1.7	17
1 6	1.7	1.7	2	2.4	4	E C	-	BINE	[洪	9841 (6)	Ĩ	P	1.7	1.6	1,6	1.6	16
7464100	1.6	1,7	2.0	2.3	.3 GE		§ 4	-L		野		LO MAR	2.8.6	1.5	1.6	1.6	16
15	1.5	1.6	1.9	2.2	2 GE	10 a		1		DHANGS	14	- 48 19	1.9.8	1.5	1.5	1.5	15
15	1.5	1.5	1.8	2,12							V		1.99	1.5	1,5	1,5	14
14	1.4	1.5	1.7	2.02	0			may 1	IIIIIIII ©				1,9.9	1.4	1,4	1.4	14
7464000 14	1.4	1,4	1.6	1.91	90	1 							1:88	1,4	1,4	1.4	13
14	1.4	1.4	1,6	1.91	9)	1.8.8	1.3	1.3	1.3	13
13	1.3	1,4	1.5	1.8	9.81	.91 <u>,8</u> 1.	91.8.	3 1 88	1188	1.8	1.8	1188	1.8.7	1.3	1.3	1.3	13
13	1.3	1.3	1.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8	§ 1,7	1.7	1.7	1.3	1.3	1.2	12
7463900 ¹³	1.3	1.3	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.2	1,2	1,2	12
12	1,3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	12
12	1,2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	11
62190	0		6	2200	0		6	2210	0		6	2220	00		6	2230	00

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-35 Coldfoot Compressor Station Modeling Results Maximum 1-Hr Average CO Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

	312	34	36	39	411	43	43	40	41	39	37	38	38	37	35	36	36	33
	43	36	39	42	45	48	48	45	46	43	41	42	40	38	37	36	35	34
	45	39	42	46	50	54	55	53	51	47	46	45	43	40	38	37	36	34
7464300	48	48	46	55	65	72	68	65	57	53	53	50	46	43	40	38	37	35
	72	57	49	65	78	94	98	82	69	64	61	56	54	46	43	40	38	36
	79	79	85	86	81		19 10	6 82		68	ARY 64	59	10.0	50 49	45	42	39	36
	88	86	90	117	126	39	ACTO	_	_		_	1	00-0	54 52	47	43	38	36
7464200	57	59	59	94	110	05 W		TTI Is 12 ⁶	0		() ()		1	5/	47	40	38	37
	61	65	61	93	136	65	Y			Y		10	A	59 59 54	44	40	37	36
	67	81	94	93	166	92		THE	BINE		0	-	0	54 51 57	45	41	37	36
	71	86	103	149	172		F			r状	(B)	Ĩ		52 58	45	41	37	35
7464100	197	116	115	15	189			8	-U		即		Station Station	58 ⁵²	45	41	37	34
	125	137	123	98	127	36 GE	Re C		-		CHANGE	14	197	52 ¹	43	39	35	32
	138	132	116	78	1081	22				Ø		V		4,40	32	31	29	27
	142	135	75	61	90	94	0		mal		•			409	30	29	27	26
7464000	136	89	79	54	68	The C		-L						4212	30	27	26	25
	90	91	50	44	51	56)	421	30	29	26	24
	82	47	41	40	48	4949 5	1 495	0 45	557	54	50	454	422.	400	29	28	27	26
	50	43	31	37	44	45	47	45	44	46	43	42	40	38	28	27	27	26
7463900	43	34	29	34	39	40	41	40	39 •	38	38	37	36	35	27	26	26	25
	37	26	28	29	29	30	31	31	30	29	29	29	28	27	26	26	25	24
	28	25	26	27	28	28	29	29	28	27	26	27	27	26	26	25	24	24
62	190	00		6	2200	00		6	2210	00		6	2220	00		6	2230	00

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-36 Ray River Compressor Station Modeling Results Maximum 1-Hr Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

19	19	20	21	21	22	22	22	212	23	22	22	212	21	21	20	19	18	18	17	117	16
19	20	21	21	22	23	23	24	24	24	24	24	23	23	22	21	20	19	19	18	17	17
7338800-20	21	22	22	23	24	24	25	25	25	25	25	24	24	23	22	21	20	20	19	18	17
21	22	23	23	24	25	26	26	27	27	27	26	26	25	24	23	22	21	20	20	19	18
22	23	23	24	25	26	27	27	28	28	-28	28	27	26	26	24	23	22	21	20	19	18
23	23	24	25	26	27	28	29	29	30	30 34	33	32 29	28	27	26	25	23	22	21	20	19
7338700-23	24	25	26	27	29	31	32 39	334	35	-	to	33	30	29	27	26	25	23	22	21	20
24	25	26	28	30	32 40	484	39		-	-		34	32 35	30	29	27	26	25	23	22	20
25	26	28	31	30	40			1	2	a Man	L	6	35	32	30	29	27	26	24	22	21
25	28	30	33	374	4	AST	TTA	0	0 81	Y	1	12	13	6 34	31	30	28	26	25	23	22
7338600-26	29	32	35	34	42	Dan	Hall Mar	1		11	0.000	1/1		385	32	31	29	27	25	24	22
27	30	33	36	30	38	6	0	TU	REINE	int	0		100	36	34	32	30	28	26	24	23
27	31	34	35	32	40	59	1		A O	HE		5	41	3	5 34 35	32	31	28	26	25	23
30	33	35	35	40	45	679		Rate	27	TAPE	and the second		L	P		33	31	29	27	25	24
7338500-30	33	48	68	59	120	68	IO G			1	1	O	M	11	35	33	31	29	27	25	24
46	53	84	115	114	103	62	23	A	F	·	L		A	1		333	30	29	27	25	24
75	98	113	116	116	114	48	57 51	X	P	-	21	1		/	1	32		28	26	25	24
81	104	115	116	116	87	47	40	43		1	/			3\$5.	34 33	37	29	28	26	25	23
7338400	113	115	115	115	77	49	44	44	2		37	35	34 34	33	32	30	29	27	25	24	23
7338400 - 98	112	115	116	84	74	53	42	-39	38	38 37 37	34	34	33	32	31	29	28	26	25	24	22
94	112	114	112	73	53	47	39	35	34	34	34	* 33	32	31	30	28	27	26	24	23	22
98	106	112	72	69	47	40	35	34	34	33	33	32	31	30	28	27	26	25	24	23	22
700000 89	100	78	67	58	43	33	32	33	32	32	31	30	29	28	27	26	25	24	23	22	21
7338300- ⁸⁹ 85	79	64	64	44	41	30	31	31	31	30	30	29	28	27	26	25	24	23	22	21	21
76	59	59	54	40	• 38	29	29	29	29	28	28	27	27	26	25	24	23	23	22	21	20
62710	1			1 2720			-	1 2730			-	1 2740		-		2750	000			1 2760	

62710	00		6	2720	0		6	2730	00		6	2740	00		6	2750	00		6	2760	00
83	9.1	9.8	10.3	10.7	10.9	11.1	11.2	11.2	11.0	10.8	10.6	10.2	9.8	9.4	9.0	8.5	8.0	7.5	7.0	6.5	(
87	9.7	10.5	11.1	11.3	11.4	11.4	11.4	11.4	11.4	11.3	11.3	11.1	10.6	10.1	9.6	9.1	8.5	7.9	7.4	6.9	6
338300 ^{_92}	10.3	11.3	11.4	11.4	11.5	11.5	11.5	11.5	11.5	11.5	11.4	11.4	11.3	10.8	10.2	9.6	9.0	8.4	7.8	7.3	(
97	11.0	11.4	11.5	11.6	11.6	11.7	11.7	11.7	11.7	11.6	11.5	11.5	11.4	11.3	10.8	10.1	9.5	8.8	8.2	7.6	1
10.2	11.3	11.5	11.6	11.7	11.7	11.7	11.7	11.7	11.7	11.7	117	11.6	11.5	11.4	11.3	10.8	10.0	9.3	8.6	8.0	
10.7	11.4	11.6	11.6	11.7	11.7	11.8	11.8	11.8	12.8		11.7	11.7	11.6	11.5	11.4	11.3	10.5	9.7	9.0	8.3	
338400 11.2	11.5	11.6	11.7	11.7	11.8	11.8	11.9	11,9	.8	. 11	8.11.1	114			11.5				9.3	8.6	
11.3	11.5	11.6	11.7	11.8	11.7	11.7	11.7	17.8	1	1	/		11.7	11.22	1.6	14:4	11.3	10.5	9.6	8.8	
11.4	11.5	11.6	11.7	11.7	11.5	11.4	10	3	Me	-	1	1			11	17	411.3	10.7	9.8	9.0	
C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1				11.5	1/m	7.5	73	J	E Su	·····	L		B		-	1415	11.4	11.0	10.0	9.2	
338500 11.4	11.4	11.6	11.6	11.3	7.8	7.3	8 G	NAP CONTRACT			h	O T	M	11	1	11.5 1.6•	11.4	11.1	10.0	9.2	
11.4	11.4	11.6	11.5	11.1	6.4	7990		REE	51	ales.	(mark)		5	P	11.7	11.5	11.4	11.0	10.0	9.1	
				11.3	1 51	6.5	10		0	BH	A	H	41	8 9 / A 3	.7 11.7	11.5	11.4	10.9	9.8	9.0	
the second s			1	11.4	0.0	10	6	TU	REIM	arth	0		10	11.8	11.6	11.5	11.3	10.7	9.6	8.7	
338600 11.3			1		14.9	Dam	Hall LUT	1		11	0.00	11		1.67	11.5	11.4	11.3	10.3	9.3	8.5	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		11.4		11	.9 W	AST	ITT	0	0 80	Y	1	17	111:		11.5				8.9	8.1	
		11.4			11.8	and the second	/	1	5	and a	1				11.4				8.5	7.8	
338700 <u>9</u> 0 96	10.4	11,3	11.4	11.4	11.5	115	1.8 11	8	¥.	-	1	111	.6	10.54	11.2		- C	8.8	8,1	7.4	
	-				12.	1	HER 200.	1	1	11.6	Les a	11.5	121	1	10.4	1.8	9.0	8.3	5	7.0	
84	8.3 9.0	8.9 9.6		10.9	1			1	T	11.4	10.8	1.4		10.2	8.8 9.6	8.2	7.7 8.3	7.2	6.7 7.2	6.6	
72	7.7	8.2	8.6 9.4	9.1	1.	÷8.,		÷.	1.5	10.1	22.	9.5	9.1	8.6 9.4	8.1	7.6	7.2	6.7	6.3	5.8 6.2	
338800 68	7.1	7.5	7.9	8.3	8,6	8.9	9.1	9.2	9.2	9.1	8.9	8.6	8.3	7.9	7.4	7.0	6.6	6.3	5.8	5.4	
	6.6	7.0	7.3	7.6	7.9	8.1	8.2		8.3	8.3	8.1	7.9	7.6	7.3	6.9	6.5	6.1	5.8	5.4	5.0	
	1.1	1.5	10			19	-		1.50	1.5		- C.		1.1	1		1.	1.20	1.00		

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FIGURE G-37 Ray River Compressor Station Modeling Results Annual Average NO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

5<u>18 6.1 6.4 6.7 710 7.2 7.4 7.5 716 7.6 7.6 7.4 712 7.0 6.7 6.3 610 5.7 5.4 5.0 417 4.</u>3

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FIGURE G-38 Ray River Compressor Station Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

20	2.0	2.0	2.1	21	2.5	2.6	2.6	215	2.6	2.4	2.3	212	2.1	2.0	2.0	119	1.8	1.8	1.7	117	1.6
20	2.0	2.1	2.2	2.2	2.8	3.0	3.0	2.8	2.9	2.6	2.5	2.3	2.2	2.1	2.0	2.0	1.9	1.9	1.8	1.7	17
7338800 ^{_20}	2,1	2.2	2,3	2,3	3,1	3.4	3.4	3.2	3.1	3.0	2.5	2.4	2.3	2,2	2,1	2.0	2.0	1,9	1,9	1.8	17
21	2.2	2.2	2.3	2.4	3.2	3.6	3.6	3.5	3.3	3.1	2,6	2.5	2.5	2.4	2.3	2.2	2,1	2.0	1.9	1.8	18
21	2,2	2.3	2,4	2.5	3.0	3.6	3.5	3.3	3.2	27	2.7	2.7	2.6	2.5	2,4	2.3	2.2	2,1	2,0	1.9	18
22	2,3	2.4	2.5	2.7	2.8	3.3	3.0	2.9	2.9	2.9	3.2	2.8	2.7	2.6	2.5	2,4	2.3	2.2	2.1	2.0	19
7338700 23	2,4	2.4	2.7	3.1	3.4	3.5	3.3	3.0	3.4	- al	1.ar	3.2	3.0	2.8	2.7	2.5	2.4	2.3	2.2	2,1	19
23	2,4	2.6	3.0	3.6	4.3	5.4.6	3.3 .4	PL-	/	5	1		3.1 3.6	2.9	2.8	2.7	2.5	2.4	2,3	2,1	20
36	3.6	3.3	3.1	4.6	0.0		/	/	1 20	Carlo O	T	4	35	3.1	2.9	2.8	2.7	2.5	2.3	2,2	21
5 5	6.3	7.1	9.5	9.9 9.9	1 W	AST	ATT		00	Y	1	R	3	53.3	3.1	2.9	2.8	2.6	2.4	2,3	21
7338600 51	5.7	5.9	7.	8.5	14.0	100	1	1	0	111	0			3,54	3.2	3.0	2.9	2.7	2.5	2,3	22
44	4.7	6.0	7,1	8.4	110	9	Are	TU	RBINE	ich.	0	Ħ	10	3.5	3.3	3.1	2.9	2.7	2.5	2.4	22
40	4.8	5.6	6.5	79	9.3	10.4	10	A L	A O	HE		1	44	A 13	.5 3.4	3.2	3.0	2.8	2.6	2.4	23
4 2	4.9	5.8	6,4	7.0	7.6	918		E as	- 1	TAPE:			5	H	3.4	3,2	3.0	2.8	2.6	2.5	23
7338500 38	4.5	5.2	6.6	6.3	7.3	9.8	1.3 G			1	the second	0	M	11	3	3.2	3.0	2.8	2.7	2.5	24
4 5	5.2	8.5	13.2	12.1	10.2	8.6	19.3	Y	E.	······································			D		~	32	3.0	2.8	2.7	2.5	24
7 5	9,9	11.5	14.6	14.0	12.0	7,1	7.6		Ma	-	1	1	/		3.	231	3.0	2.8	2,6	2.5	24
83	11.2	14.1	14.6	14.6	9.5	5.4	5,6	4.9	1	/			3.7	3.34	3.3	3.1	2.9	2.8	2.6	2.5	24
7338400 11.0	13.0	14.4	14.7	14.4	8.9	5.3	4.6	4.8	8	4	4.2	4.0	3.6	3.4	3.2	3.0	2.9	2.7	2.6	2,5	24
and the second se			15.5	10.3	9.0	6.0	4.5	4.5	4.5	4.4	4.2	3.8	3.6	3.3	3,1	3.0	2.8	2.7	2,6	2.5	23
10.5	12.7	14.1	13.7	9.8	7.1	5.4	4,2	4.2	4.2	4.1	3.9	3.7	3.5	3.3	3,1	2.9	2.8	2.7	2.6	2.4	23
10.6	12.0	13.1	9.4	9.0	5.3	4.5	4.0	3.9	3.9	3.9	3.7	3.6	3.4	3.2	3.0	2.9	2.7	2.6	2.5	2.4	23
7338300	11.4	9.7	8.5	7.4	5.1	3.7	3.8	3.6	3.7	3,6	3.5	3.4	3.2	3.1	2.9	2.8	2.7	2.6	2.5	2.4	23
97	9.6	8.2	8,1	5.5	4.9	3.5	3.6	3.4	3.4	3.4	3.3	3.2	3.1	3.0	2,9	2.8	2.7	2.6	2.5	2.4	23
8 8	7.4	7.5	6.9	4.7	4.5	3.3	3.4	3.2	3.2	3.2	3.1	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	23

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FIGURE G-39 Ray River Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

017	0.7	0.7	0.8	018	0.8	0.8	0.9	0] 9	0.9	0.9	0.8	018	0.8	0.8	0.7	0]7	0.6	0.6	0.6	015	0.5
07	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	05
7338800 ⁰ 8	0.8	0.9	1.0	1.0	1,1	1,1	1,1	1,1	1,1	1,1	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	06
09	0.9	1.0	1,1	1.1	1.2	1,2	1,2	1,3	1.2	1.2	1,1	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	06
10	1.0	1.1	1,2	1.2	1.3	1.3	1.4	1.4	1.4	13	1.3	1.2	1,1	1,1	1.0	0.9	0.9	0.8	0.8	0.7	06
10	1,1	1.2	1.3	1.3	1.3	1.4	1.4	.5 ton	1.5	1.5	1.7	1.5	1,2	1.2	1,1	1.0	1.0	0.9	0.8	0.8	07
7338700 11	1.2	1.3	1.3	1.4	14	1.5	1.5	1.6	1.8	-	the second secon	1.6	1.4	1.3	1.2	1,1	1.0	0.9	0.9	0.8	07
12	1.3	1.4	1.4	1.4	1.5	1.85	1.5		/	5	1)	1.5 1.8	1.4	1,3	1.2	1.1	1.0	0,9	0.8	08
13	1.4	1.4	1.4	1.8	1.0		/	/	2	mone o	T	1	1.8	1,5	1.4	1.3	1,2	1,1	1.0	0,9	08
13	1.4	1.5	1.5	1.5	8	AST	FITT		0 31	Y	1	P	11/1	81.6	1.5	1.3	1,2	1,1	1.0	0.9	08
7338600 14	1.5	1.5	1.6	1,4	22	Dam		1	~	JII.	2			1.67	1.5	1.4	1.3	1,2	1,1	1.0	09
14	1,5	1.6	1.6	1.4	15	1	Lie	TU	RBINA	ich.	0	The second	10	1.8	1.6	1.5	1.3	1.2	1,1	1.0	0,9
14	1.6	1.7	1.6	14	1.3	15	1	E L	A O	H		5	44	8 1/2	.8	1.5	1.4	1.3	1,1	1.0	09
14	1.6	1.8	1,7	1.5	1.2	144		REE E	-1	ME	and the second		5	H	1.7	1.5	1.4	1.3	1,1	1,1	10
7338500 14	1.6	1.8	1.7	1.5	3	1.2	4 6	R A		1	hum	O	M	11	2	1.6	1.4	1,3	1.2	1,1	10
14	1.5	1.7	1.8	1.7	1.5	1.3	42		F		L		B			1.5	1.4	1,3	1.2	1,1	10
14	1.5	1.7	1.8	1.8	1.7	1.6	1.5		Me	10	71	1	/	-		1	5 1.4	1.2	1,1	1.0	10
13	1.5	1.6	1.8	1.9	1.8	1.8	1.8	M	1	1			17	1.7.7	1.7.8	1,5	1.3	1.2	1,1	1.0	09
7338400 13	1.5	1.6	1.6	1.8	1.9	1.9	1.9	1.9	8	4	1.8	17	1.7 T.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	09
12	1,4	1.6	1.7	1.7	1.7	1.8	1.8	.4.8	18	8.7	1.7	1,7	1.6	1.5	1.4	1.3	1.2	1,1	1.0	1.0	09
12	1.3	1.5	1.6	1.7	1.7	1.7	1,7	1.7	1.5	1.7	1.7	1.6	1.5	1.4	1,3	1.2	1.2	1,1	1.0	0.9	09
1 1	1.3	1.4	1.5	1.6	1.7	1.7	1.7	1.7	17	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1_1	1.0	1.0	0.9	08
7338300 11	1.2	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.3	1.3	1.2	1,1	1.0	1.0	0.9	0.8	08
10	1.1	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1,2	1.2	1,1	1,1	1.0	0.9	0.9	0.8	07
10	1.0	1,1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1,1	1.1	1.0	1.0	0.9	0.9	0.8	0.8	07
62710	0		6	1 2720	00		6	1 2730	00		6	1 2740	00		6	1 2750	00		6	1 2760	00

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FIGURE G-40 Ray River Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

112	1.3	1.3	1,4	1[4	1.6	1.6	1.9	20	2.0	2.0	1.9	16	1.2	1.2	1.2	112	1.2	1.2	1.2	111	1,1
13	1.3	1.4	1.4	1.5	1.8	2.0	2.3	2.4	2.3	2.3	2.1	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	11
7338800 13	1,4	1.4	1.5	1.6	2,1	2.4	2.8	2.9	2.8	2.7	1.9	1.3	1.3	1.3	1,2	1.2	1.2	1.2	1,2	1.2	11
14	1.4	1.5	1.6	1.7	2.3	2.8	3.2	3,2	3.3	2.9	1.5	1.4	1.3	1,3	1.3	1.2	1.2	1,2	1.2	1,2	12
14	1.5	1.7	1,8	2.0	2,1	2.8	3.2	3.2	3.4	17	1.6	1.5	1,4	1,3	1.3	1.3	1.2	1,2	1,2	1.2	12
15	1.7	1.8	2,0	2.3	2,4	2.5	2.6	2.8	2.4	1.9	1.9	1.7	1,5	1.4	1,3	1.3	1.3	1.2	1.2	1,3	12
7338700-16	1.8	2.0	2.3	2.7	2.9	3.1	3.0	27	2,5		- Jan	1.8	1.6	1,4	1.8	1.9	1.7	1.5	1,4	1.3	13
16	1.9	2.2	2.6	3.2	3.8	5.40	1.1	2	-		1		3.7 4.4	3.2	2.7	2.2	1.9	1.6	1,5	1.4	13
43	4.3	4.0	3.5	4.6	5.1		/	/	1	and a	R	6	4.3	3.4	2.8	2.3	2.0	1.6	1.5	1.4	13
70	7.8	8.7	9.7	12.4	7	VAST	FTT		0 00	Y	1	17	3	93.4	2.8	2.4	2.0	1.7	1.5	1.4	13
7338600 ^{_6} 3	6.8	7.2	8.8	10.3	18.1	Dam	400	1		11	Quero	1/1		3.64	2.8	2.3	2.0	1.7	1.5	1.5	14
53	5.8	7.5	8.9	10.4	13.5	18	Cia	TU	REINE	tor	0	and the	10	2.7	2.2	2.0	1.8	1.6	1,5	1.4	14
5 1	6.0	7.1	8,1	9 8	11.2	12.8	6		-	HE	A	3	41	8 1/2	.5 1.4	1.4	1.4	1.4	1.4	1.4	14
52	6.2	7.2	8.1	8.7	9.3	89	F	RES.	51	m	(mark)		5	P	1,4	1.4	1.4	1.4	1.4	1.4	14
7338500 47	5.6	6.5	7.2	7.8	10 A	6.5	G G				A Com	0	ST.	W	1.5	1.5	1.4	1.4	1.4	1.4	14
41	4.9	5.6	6.4	6.7	5.6	4.8	38		F	·	L		F)	1 let		15	1.4	1.4	1.4	1,4	14
3 4	4.1	4.7	5.1	5.4	4.9	3.7	2.1	M	The	10	71	1	0)	1 /	5 1.4	1.4	1.4	1.4	14
29	3.3	3.8	3.9	4.2	4.1	3.2	1.9	20		1	//			1.65	5.5	14	1.4	1.4	1.4	1.4	14
7338400 ⁻²⁴	2.7	3.1	3.3	3.2	3.4	2.7	1.7	1.7	7		1.6	16	1.5	1.5	1.5	1.4	1.5	1.5	1.4	1.4	14
20	2.3	2.5	2.7	2.6	2.7	2.3	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1,4	14
17	2.0	2.1	2.3	2.2	2.3	2.1	1.6	1.6	1.6	1.6	1.5	THE TO	1.5	1.5	1.5	1.5	1.5	1.4	1,4	1.4	13
16	1.7	1.9	2.0	2.0	2.0	1.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	13
7338300 15	1.6	1.7	1.7	1.8	1.8	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	13
1330300-	1.5	1.6	1.6	1.7	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	13
14	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.3	1.3	13
62710	0			1				2730				1 2740			6	2750	00			1 2760	

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FIGURE G-41 Ray River Compressor Station Modeling Results Annual Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

012	0.3	0.3	0.3	0[3	0.4	0.4	0.4	014	0.3	0.3	0.3	013	0.2	0.2	0.2	012	0.2	0.2	0.1	011	0.1
03	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0,2	0.2	0.2	0.1	01
7338800 ⁰³	0.4	0.4	0.5	0.5	0,6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0,2	0.2	0.2	0.2	0.2	0,1	01
04	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	01
05	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	97	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	01
05	0,6	0.7	0.8	0.8	0.9	0.9	0,9	0.9	0.9	0.8	0.9	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	02
7338700 ^{_06}	0.7	0.8	0.8	0.9	10	1.1	1,1	1.0	11	- st	Party -	0.8	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	02
07	0.8	0.8	0.9	1.1	1.3	1.84	.6,	1.0.	-	5)	0.6 0.8	0,5	0,4	0.3	0,3	0,2	0,2	0,2	02
07	0.8	0.9	1.0	16	1.0		/	/	2	and a	R	4	8.7	0.5	0.4	0.3	0.3	0.2	0.2	0.2	02
07	0.8	0.9	1.1	1.6	10	AST	FTT	0	0 81	Y	1	17	10	70.6	0.5	0.4	0.3	0.3	0.2	0.2	02
7338600 ⁰⁷	0.8	0.9	1.	1.4	26	Dam	400	1		11	0			066	0.5	0.4	0.3	0.3	0.2	0.2	02
07	0,8	0.9	1.0	1.2	1.5	6	(TU	RBIN	tor	0		10	0.6	0.5	0.4	0.3	0,3	0.2	0.2	02
06	0.7	0.8	0.9	10	1,2	13	10		0	HE		3	41	1 0	.5 0.4	0.4	0.3	0.3	0.2	0.2	02
06	0.7	0.8	0,9	0.9	1.0	TAL	-	Bas	5	TAPE	(mer and		5	P	0,4	0.3	0.3	0.2	0.2	0.2	02
7338500 ⁰⁵	0.6	0.7	0.8	0.9	0,9	1.0	0 G			1	AT	O	S.	11	0.4	0.3	0.3	0.2	0.2	0.2	02
05	0.5	0.6	0.7	0.8	0.8	0.9	89		F	·	L		A	1 let		03	0.3	0.2	0.2	0.2	02
04	0.5	0.6	0.6	0.7	0.7	0.7	0.7	3	Re		JL	1	/		0) à.	0.2	0.2	0,2	0.2	02
03	0.4	0.5	0.5	0.6	0.6	0.6	0,6	a.		1	/			0.83	2.3.5	0.3	0.2	0.2	0.2	0.2	02
7338400 ⁰³	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	5		0.4	84	0.4	tim 1	0.3	0.2	0.2	0.2	0.2	0.2	02
02	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4		0.40.4	0.3	0.3	0.3.	0.3	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	13.	1.0	0,3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
7338300 ⁰²	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.2	0.2		.0.2	.0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		0.2	.0.2	0.2	0.2	0.2	02
62710	00		6	2720	00		6	1 2730				1 2740	1.5			2750			6	1	00

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FIGURE G-42 Ray River Compressor Station Modeling Results Maximum 1-Hr Average CO Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

21	22	22	23	2β	24	25	25	214	25	24	24	214	23	22	22	21	20	20	19	18	18
21	22	23	24	24	26	28	27	26	26	26	25	25	24	24	22	22	21	20	20	19	18
7338800-22	23	24	25	25	28	31	30	28	27	27	27	26	26	25	24	23	22	21	20	20	19
23	24	25	26	27	29	34	32	30	29	29	28	28	27	26	25	24	23	22	21	20	19
24	25	26	27	29	30	34	31	30	30	30	30	29	29	28	26	25	24	23	22	21	20
24	26	27	30	32	33	34	35 00	33	32	32	36	34 31	30	29	28	27	25	24	23	22	21
7338700-25	27	30	33	36	38	40	39 49	380	37	- ar	tot	36	33	31	29	28	27	25	24	23	21
26	29	32	35	40	46 56	559	19, 101	P.P.	/	1	1) .	34 38	33	31	30	28	27	25	23	22
28	30	34	39	51			/	/	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	and a	T	\$	38	34	33	31	29	28	26	24	23
40	45	51	56	71	M	AST	FTT	3	jë 🖉	Y	1	P	3	9 36	34	32	31	29	27	25	24
7338600-37	41	43	50	62	100	100 m	1	1	0	W.	0			388	35	33	32	30	27	26	24
32	35	42	50	60	79	3	An	TU	REINE	D		Ħ	10	38	36	34	32	30	28	26	25
32	36	42	49	58	82	120	10		A O	HE		3	44	3	8 37 38	35	33	31	29	27	25
32	37	43	55	71	92	1308		Ras Ella	- 1	TAPE		-	5	H	37	35	33	31	29	27	26
7338500-33	38	52	73	77	105	140	62 G			1	hann	0	M	11	1	36	33	31	29	28	26
50	57	96	148	136	114	125	195	9	E.	·			D) 81	~	335	33	31	29	28	26
86	114	132	169	160	137	103	110	2	Ma	0	1	1	/		3	6 34	33	31	29	27	26
96	135	172	173	171	118	79	81	6X	1	/	/		39	378	37 36	34	32	30	29	27	26
7338400 135	163	181	181	177	116	63	60	575	1	4	6 44	42	38	36	35	33	31	30	28	27	26
137	157	191	195	137	119	74	48	.47	47	47 45	43	39	36	35	34	32	31	29	28	26	25
131	164	183	181	140	103	68	45	43	43	42	40	37	36	34	33	32	30	29	27	26	25
137	156	171	129	129	70	56	42	40	40	39	37	36	35	33	32	31	29	28	27	26	25
7338300 131	147	129	116	103	66	48	39	37	37	36	36	35	33	32	31	30	29	28	26	25	25
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	126	111	110	75	63	42	36	35	35	35	34	34	32	31	30	29	28	27	26	25	24
115	99	100	94	60	58	36	34	33	33	33	33	32	31	30	29	28	27	26	25	25	24

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FIGURE G-43 Minto Compressor Station Modeling Results Maximum 1-Hr Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

21	22	23	23	23	21	20	20	19	19	19	19	1β	18	18	17	117	16	16	15	16	14	14	13
7233500-22	23	24	24	24	23	21	21	20	20	20	20	19	19	19	18	18	17	17	16	15	15	14	14
22	23	24	25	25	24	23	22	22	21	21	21	21	20	20	19	19	18	17	17	16	15	15	14
22	24	25	26	26	25	24	23	23	23	23	22	22	21	21	20	19	19	18	17	17	16	15	15
22	24	26	27	27	26	25	25	24	~24	_ 24	33 ²⁴	23	23	22	21	20	20	19	18	17	17	16	15
7233400-22	24	26	27	28	27	26	26	26	26	34	34	25	24	23	22	21	20	20	19	18	17	16	16
200400	24	26	27	28	28	27 28 37	27	273	6 35		tes.	³⁵ 26 36	25	25	24	23	21	20	19	18	18	17	16
22	24	26	27	28	28	28	28	37	/	2)	36	27 30	26	25	24	22	21	20	19	18	17	16
23	25	26	27	28	28	37 36	and a state	1	5	10	S		115	7 27	26	25	23	22	21	20	19	18	17
24	25	27	28	27.	37		1	0	900 SE	Ý	1.	16		37	27	25	24	23	21	20	19	18	17
7233300 ^{_24} 25	26	27	28	29	41	WAS	RE a	/	//	M		A	X.	Store Con	28 28 37	26	25	23	22	20	19	18	17
25	27	28	28	31	346	20	and a	//		P.ms	K	ALL	the	1 ste	37	3@7	26	24	22	21	20	19	17
25	27	28	29	33	34	41	A	100	TUR	BINE			1	N	Ð	36		25	24	22	21	19	18
26		1.50	29	• /	33	28	B A	1th	6		THE		N	A	11		27 35	28	101	121	22		18
7233200 26	27	28		33	1		13	5	EANR			X	O HE		A.	191	3	4 20	26	24	1.5	20	
40	27	28	30	34	33	28	41 4	ALS .	BE	R	S	And the second second	1 mm	9	Ŋ		34	32	28	26	24	22	20
25	27	28	29	33	34	74	55	47	66	X	Re.	and a	>	//		36,*	3532	al .	29	27	25	23	21
25	27	28	36	63	97	105	93	44	457	12		1	/	2.	37	10001	31	30	29	27	25	23	21
7233100-26	31	45	78	89	107	113	103	47	33	34	S	/		38	31	31	30	29	28	26	25	23	21
34	53	72	78	96	101	113	80	43	34	34	44	39	38	29	29	30	29	28	27	26	24	23	21
54	62	67	84	90	105	107	79	48	34	32	31	129	28	27.	27	28	27	26	26	25	24	22	21
53	58	73	78	94	99	80	74	47	33	29	28	27	27	26	25	26	26	25	25	24	23	22	21
7233000-50	63	67	78	86	91	70	64	43	30	27	27	26	25	24	24	24	24	24	24	23	22	21	20
54	58	63	76	80	72	66	51	43	29	25	25	25	24	23	22	22	22	22	21	21	20	20	19
50	54	66	70	73	59	61	41	41	28	24	24	23	23	22	21	21	20	20	19	19	18	18	17

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FIGURE G-44 Minto Compressor Station Modeling Results Annual Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

514	5.9	6.2	6.5	613	5.9	5.6	5.6	55	5.5	5.5	5.4	512	5.1	4.9	4.7	415	4.2	4.0	3.7	314	3.2	2.9	2.7
7233500 57	6.2	6,6	7.0	6.9	6.5	6.2	6.1	6.1	6.1	6.1	6.0	5.8	5.6	5.4	5.2	4.9	4.6	4.3	4.1	3.8	3.5	3.2	29
60	6.6	7.1	7.5	7.5	7.1	6.8	6.8	6.8	6.8	6.7	6.6	6.4	6.2	6.0	5.7	5.4	5.1	4.7	4.4	4.1	3.8	3.4	32
62	6.9	7.5	8.0	8.2	7.8	7.5	7.5	7.5	7.5	7.4	7.3	7.1	6.9	6.6	6.2	5.9	5.5	5.2	4.8	4.4	4,1	3.7	34
63	7,1	7.9	8.5	8.7	8,5	8.3	8.3	8.3	8.3	.8.2	1.2	7.8	7.5	7.2	6.8	6.4	6.0	5.6	5.2	4.8	4.4	4.0	36
7233400 66	7.3	8.1	8.9	9.2	9,2	9.1	9.1	9.2	9.2	114	11.3	8.6	8.2	7.8	7.4	6.9	6.5	6.0	5.5	5.1	4.7	4.2	38
69	7.6	8.4	9.2	9.7	9.9	10.0	10.1	10.2	.5		13	11045	9.0	8.5	8.0	7.5	7.0	6.4	5.9	5.4	4.9	4.5	4 1
73	8.0	8,7	9,5	10,1	10.5	10.7	19.0	16	1	2)	11.	5 9.8	9,2	8.6	8.0	7.4	6.8	6.3	5,7	5.2	4.7	43
77	8.4	9.2	10.0	10.6	11.1	10.7 11 1.7	7	1	1 des	9.00 × 00	\gg	X	1 vi	.60.0	9.3	8.6	7.9	7.2	6.6	6.0	5.5	5.0	4 5
7233300 ⁸ 1	8.9	97	10.5		11.2		/	0	200 Star	X		11	٩))	11.6	9.9	9.1	8.3	7.6	6.9	6.3	5.7	5.1	46
85	9.3	/	11.0	X	1.8	WAS	RE	1	//	M	00	AL.	X	N.C.	1.6	9.5	8.7	7.9	7.2	6.5	5.9	5.3	48
88	9.7	10.6	11.3	11.4	11.3	20	A	//	TUR	RIKIA	35	all's	th'	1%	1	11.6.0	9.0	8.2	7.4	6.7	6.0	5.4	4 9
90	10.0	10.8	11.3	114	11.4	10.8		100		AL S				N	K	11	5 _{9.5}	8.5	7.7	6.9	6.2	5.6	50
7233200 91				1	. 3	~	6.2	Y		N.	all		1	A	1	1	11.4	.3 ^{9.3}	8.3	7.4	6.6	5.8	51
des in recent 12			11.4		1		4.9	3Hill		Ra	/	M	and the second s	1	3	81	1	1.	9.1	8.1	7.2	6.2	53
			11.3			12		8.2 5.3	COE)	M.	Si	ALL DE LE DE	5	1	//	1	1.40	10.5	9.6	8.6	7.6	6,5	56
88			11.3		151		1 a	8.2	874	q	R	1	//	/	11.6	11.5	10.7	10.1	9.4	8.6	7.6	6.6	57
7233100-85		191	11.0	1.2.1	100	107.1			6.0	111	C.	//		11	91.3	11.0	X	9.6	9.0	8.3	7.4	6.5	57
82	8.9	9.7				11.4				N			11.3	11.0	10.7	10.4	9.7	9.0	8.5	8.0	7.2	6.3	56
78	8.4	9.1									1			10,1			9.0	8.5	8.0	7.6	6.9	6.2	55
73	7.9	8.5	9.1			10.6				1		2010	h	1		8.6	8.3	7.9	7.6		6.6	5.9	53
	7.4	7.9	8.5	8.9	9.4	9.8		10.2				1	9.1	8.6	8.1	7.7	7.4	7.2	6.9	6.5	6.1	5.5	49
7233000 ⁶⁹ 64	6.9	7.3	7.8	8.2	8.6	8.9	9.1	9.2	9.2	9.1	8.9	8.6	8.3	7.9	7.5	7.0	6.7	6.3	6.0	5.7	5.3	4.8	43
50	6.4	53	7.1	25	-1.							357	1.1		-	1.5		1.1			4.6	4.2	30
^ع ام 42320	0.4	6.8	1.1	7.5 T 2330	7.8	8.0	8.2	8.3 1 2340	8.3	0.3	8.1	7,9 1 2350	7.6	7.2	6.9	6.5 1 2360	6.1	5.7	5.3	5.0 1 2370		4.2	50

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				Max		n 24	-Hr	Aver	FI esso age es are	r Sta PM₁	/PM	Mo 2.5 C	once	entra	tion		g/m³))	
2	23	24	24	213	22	21	22	211	20	19	18	118	18	17	17	117	16	16	

23	2.3	2.4	2.4	213	2.2	2,1	2.2	2[1	2.0	1.9	1.8	118	1.8	1.7	1.7	117	1.6	1.6	1.5	115	1.4	1.4	1.4
7233500 ^{_23}	2.4	2.4	2.5	2.6	2.4	2.4	2.4	2.3	2.2	2.0	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.5	14
23	2.4	2.5	2.5	2.9	2.8	2.8	2.7	2.6	2.4	2.1	2.0	2.0	2.0	1.9	1,9	1.8	1.8	1.7	1.6	1.6	1.5	1.5	14
23	2.4	2.5	2,6	3.1	3.2	3.2	3.0	2.8	2,2	2.2	2,2	2.1	2,1	2.0	2.0	1,9	1.8	1.8	1.7	1.6	1,6	1,5	15
22	2.4	2.6	2.7	3.1	3.6	3.5	3.2	3.0	2.4	2.4	2.3	2.3	2.2	2,2	2,1	2.0	1.9	1,8	1.8	1.7	1,6	1,6	15
7233400 ²²	2.4	2.6	2.7	2.8	3.8	3.5	3.0	2.8	2.5	3.3	3.3	2,4	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.8	1.7	1.6	16
22	2.3	2.5	2.7	2.8	3.2	3.0	2.7	2.73	5		les.	34.8	2.5	2.4	2.3	2.2	2,1	2.0	1.9	1.8	1.7	1.7	16
22	2.3	2.5	2,7	2.8	2.9	2.9	3.8	3.0	1	2	1	3.	2.7 3.7	2.5	2.4	2.3	2,2	2.1	2.0	1,9	1.8	1.7	16
23	2.4	2.5	2.7	2.9	3.4	1.8	ber .	1		30 O	S)	X	13	.62.6	2.5	2.4	2.3	2,1	2.0	1.9	1.8	1.7	17
7233300 ^{_23}	2,5	2,8	2.7	342	4.8		/	0	00	X		91	٩)	3.6	2.6	2.5	2.4	2.2	2.1	2.0	1.9	1.8	17
24	2,5	2.7	2.7	4.0	77	WAS	TE	1		M	00	AL.	Xr	0.10	2.7	2.6	2.4	2.3	2,1	2.0	1.9	1.8	17
24	3.2	4.8	6.2	7.8	9.3	A.	A	/	TUR		S-	RE	12	1)))	3.25.7	2.5	2.3	2.2	2.1	1,9	1.8	18
36	3.7	4.4	5,2	4.5	8.5	0.2	8	100	1			ax.			K	3.	2.6	2.5	2.3	2.2	2.0	1,9	1,8
7233200 ³⁴	3.3	2.9	2.9	5.3	6.7	7.3	10.1	1	Cases	~	arth		5	-	11	11	3.4	32.7	2.5	2,4	2.2	2.0	19
25	2.7	2.7	4.1	5.0	5.4	5.7	5.9	D.2		Se	1	M		-)	84	1	3.2	2.8	2.6	2,4	2.2	20
25	2.6	3.4	4.3	4.2	4,2	7.2	5.4	6.8	9.6		Sal	A REAL PROPERTY AND IN COMPANY	5	1	/		3.43.4	3.0	2.9	2,7	2.5	2,3	21
25	2.6	3.6	3.9	6.2	9.4	10.4	9.2	5.3	6.8		Mr.		//		3.6	3.5	3.0	3.0	2.9	2.7	2.6	2.4	22
7233100 ^{_24}	3.0	4.4	7.6	8.7	10.8	11.7	10.4	5.0	4.6	6.3	Ģ	//		43	93.3	3.2	3.0	2.9	2.8	2.7	2.6	2.4	23
34	5,1	7.0	7.6	9.7	10.2	11.8	8.4	4.8	3.5	3.7 3.7	4.9	16	3.5	3.3	3.3	3.2	3.1	2.9	2.8	2.7	2.6	2.4	23
52	6.0	6.5	8.6	9.2	11.0	11.4	8.8	5.7	3.9	3.4	3.54	784	3.2	3,1	3.1	3.1	3.0	2,9	2.8	2.7	2.6	2.4	23
52	5.6	7.4	7.9	9.9	10.5	9.0	8.6	5.7	3.8	3.2	3.3	3.2	3.1	3.0	2.9	2.9	2.9	2.8	2.8	2.7	2.6	2.4	23
7233000 ⁴⁸	6.4	6.9	8.3	9.2	9,7	8.0	7.5	5.4	3.5	3.0	3.1	8.1	2.9	2.8	2.7	2.7	2.7	2.7	2.6	2.6	2.5	2.4	23
56	6.0	6.7	8.1	8.5	8.0	7.5	6.1	5.3	3.5	2.8	2.9	2.9	2.8	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2.2	21
52	5.5	7.1	7.5	7.8	6.7	6.9	5.0	5.1	3.4	2.6	2.7	2.7	2.7	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.1	2.1	20
42320	0		4	1 2330	00		4	1 2340	00		4	1 2350	00		4	2360	00	-	4	1 2370	00		

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FIGURE G-46 Minto Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

0[6	0.7	0.7	0.8	018	0.7	0.7	0.7	017	0.6	0.6	0.6	0[6	0.6	0.5	0.5	015	0.5	0.5	0.4	0]4	0.4	0.3	0.3
7233500 07	0.7	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	03
07	0.8	0.9	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	04
08	0.9	1.0	1,1	1,1	1,1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	04
08	1.0	1.1	1,2	1.2	1.2	1.2	1,2	1.2	1.1	1,1	1.5.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	04
7233400 ^{_09}	1.0	1,1	1.2	1.3	1.3	1.2	1.2	1.3	1.3	1.6	1.6	1,1	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	04
10	1,1	1.2	1.3	1.3	1.3	1.2	1.3	1.3	8		fig.	1.6,2	1,1	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	05
10	1,1	1.2	1,2	1.2	12	1.2	1.8	1.1	1	2)	1.	12	1,1	1.0	0,9	0.8	0,8	0.7	0,6	0.6	0,5	05
1 1	1.2	1.2	1.2	1.2	1,2	6 1.6	3.	1	1 and the second	340	\geq	R	11	.71.2	1,1	1.0	0.9	0.8	0.7	0.7	0.6	0.6	05
7233300 11	1.2	1,8	1.2	1,2	1.6	٠,	/	0	80 Sta	X		11	Q)	1.7	1.1	1.0	0.9	0.8	0.8	0.7	0.6	0.6	05
12	1,3	1.3	1.2	1.3	17	WAS	RELO	1		M	00	AL)	X	0.00	1.6	1,1	0.9	0.9	0.8	0.7	0.7	0.6	0,5
12	1.3	1.4	1.3	1.3	1.4	10	A	//	TUR	BINE	S-	all's	14	1)))	1.5.1	1.0	0.9	0.8	0.7	0.7	0.6	06
12	1.3	1.4	1,4	1.4	1.3	1.4	5	100	1			ar.		S	K	14	1.0	0.9	0.8	0.8	0.7	0.6	06
7233200 12	1.3	1.4	1.5	1.5	1.4	1.0	14	1	and a		All		1		1	1	1.4	31.0	0.9	0.8	0.7	0.7	06
12	1.3	1.4	1.5	1.6	1.5	1.1	0.9	Anthe		Se	1	M		-	3		1	1.2	1.0	0.9	0.8	0.7	06
11	1.2	1.4	1,5	1.6	1,6	1.3	1.0	0.9	ECHE S		Sam	ALC	5	1	/	1	1.	12	1.1	1.0	0.8	0.7	06
10	1.2	1.3	1,4	1.5	1.6	1.5	1.3	1,1	1.1		He	V	//	/	1.5	1.5	1.2	1	1.0	1.0	0.8	0.7	06
7233100-10	1,1	1.2	1.3	1.4	1.5	1.5	1.4	1.4	1.3	13		//		1.6	61.3	1.2	17	1.1	1.0	0.9	0.8	0.7	06
0.9	1.0	1,1	1.2	1.3	1.4	1.4	1.4	1.4	1.3	1.3	8	٩.,	1.5	1.2	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.7	06
08	0.9	1.0	1,1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.21	.612	1.2	1,1	1.1	1.0	1.0	0.9	0.9	0.9	0.8	0.7	06
08	0.9	0.9	1.0	1,1	1.1	1.2	1.2	1.2	1.2	1	1.2	and the	4	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	06
7233000 08	0.8	0.9	0.9	1.0	1.0	1.1	1,1	1.1	1,1	1,1	1,1	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	06
07	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	05
07			•	0.8	.9	.9	0.9	.9	.9	0.9	0.9	•	0.8	0.8	.08	0.7	0.7	0.6	0.6	•	0.5	0.5	04
42320	1.5	-		1 2330	-		1.1	1 2340			199	1			1.1	1	1.00			1			

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FIGURE G-47 Minto Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

114	1.5	1.5	1.8	118	1.7	1.7	1.7	117	1.6	1.2	1,1	111	1.0	1,1	1.1	1[1	1,1	1,1	1.0	1[0	1.0	1.0	1.0
7233500 14	1.5	1.5	1.7	2,1	2.0	2.1	2.1	2.0	1.9	1,1	1,1	1,1	1.0	1.0	1,1	1,1	1,1	1,1	1,1	1.0	1.0	1.0	10
14	1.4	1.4	1.5	2,4	2.3	2.5	2.5	2.4	2.1	1.2	1,1	1.0	1.0	1.0	1.0	1,1	1.1	1,1	1,1	1.0	1.0	1.0	0.9
1 3	1.4	1.5	1.6	2.8	2.8	3.0	3.0	2.9	1.8	1.3	1,2	1,1	1.0	1.0	1.0	1.0	1,1	1,1	1,1	1.0	0.9	0.8	07
1 3	1,4	1.6	1,7	2.7	3.2	3.4	3,2	3.2	1.5	1.3	1.7	1,2	1,1	1.0	1.0	1.0	1.0	1,0	1.0	0,9	0.8	0.7	0
7233400 13	1.5	1.7	1.8	2.0	3.3	3.3	3.1	2.9	1.7	1.9	1.8	1,3	1.2	1,1	1.0	0.9	0.9	0.8	0.8	0.7	0.6	0.5	04
13	1.5	1.8	2.0	2.2	2.7	26	2.3	2.12	6		63.	1.8.3	1.2	1,1	1.0	0.9	0.7	0.6	0.5	0.5	0.4	0.4	04
14	1.6	1.8	2,1	2.4	2.6	2.7	3.8	3.0	1	2	1	1.	1.2	1.0	0.9	0.7	0.6	0.5	0.4	0,4	0.3	0,3	03
14	1.6	1.9	2.3	2.7	3.04	4.4).		1 and	940 9	\mathcal{D}	X	115	20.8	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.2	02
7233300 15	1.7	2,0	2.4	2,9	4.3		/	0	2.5 Spi	X		91	٩)	0.8	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	02
15	1.7	2.0	2.9	4.9	9.6	WAS	TE	1		M	8	A.	Xr	O of the	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0,1
28	3.9	5.9	7.7	9.7	11.3	310	A	//	TUR)	RE	en'	1	111.	0.0.2	0.2	0,2	0.1	0,1	0,1	0,1	0
44	4.6	5.4	6.4	5.3	10.5	11,2	S	100	1			BX.			K	0.2	0.2	0.1	0,1	0,1	0,1	0,1	0
7233200 4 1	3.9	3.4	2.9	6.6	8.4	8.6	4.8	1			arth		1	-	11	1	0,1	10.1	0.1	0.1	0.1	0,1	01
25	1.4	1.7	5.3	6.1	6.7	6.8	3.2	duction of		Se	1	H		-	3)	8	1	0,1	0.1	0.1	0.1	0,1	0
12	1.3	4.3	5.5	5.4	5,1	5.2	2.6	1.3	1.2		Sam	A REAL PROPERTY AND IN COMPANY	5	1	/	c	0.	61	0.1	0,1	0,1	0,1	0,0
12	2,7	4,6	4.9	4.8	4.8	5.0	2.0	1.2	0.0.8	*	Mr.		//		0.1	0.1	0,1	81	0.1	0,1	0,1	0.0	0,0
7233100 16	3.3	3.8	4.2	4.2	4.2	4.2	2.0	1.0	0.7	0,64	()	//		0.1	10.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	00
23	2.8	3.1	3.2	3.5	3.5	3.4	1.8	1.0	0.7	0.4	0.4	0.2	8.2	0.1	0.1	0.1	0,1	0,1	0,1	0,1	0.0	0.0	0,0
20	2.2	2.5	2.6	2.7	2.8	2.6	1.6	0.9	0.7	0.4	0.30			0,1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0
16	1.8	1.9	2,1	2.1	2.2	2.1	1.5	0.9	0.6	0.4	0.3	0.2	4	0.1		0.1	0.1	0,1	0.0	0.0	0.0	0.0	0
7233000 14	1.5	1.6	1.7	1.7	1.8	1.7	1.3	0.8	0.6	0.4	0.3	0.2	0.2	0.1	0,1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	00
12	1.3	1.4	1.4	1.4	1.5	1.4	1.2	0.8	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	o
11	1.1	1.2	1.2	1.2	1.3	1.2	1.1	0.8	0.6	0.4	0.3	0,2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0
42320	0		4	1 2330	00		4	1 2340	00		4	2350	00		4	2360	00	-	4	2370	00	2.2	

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FIGURE G-48 Minto Compressor Station Modeling Results Annual Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

3 0.4 4 0.2 4 0.5 5 0.6 6 0.6 6 0.6 6 0.6 6 0.6 6 0.7 6 0.7 6 0.7 6 0.7	0.5 0.5 0.6 0.6 0.6 0.6 0.6 0.7 0.8	0.4 0.5 0.6 0.6 0.7 0.7 0.8	0.4 0.5 0.6 0.6 0.7	0.4 0.4 0.5 0.6 0.6	0.3 0.4 0.5 0.6	0.3 0.4 0.5 0.6	1	0.3 0.4 0.4	0.3 0.3 0.4	0.2 0.3 0.3	0.2 0.3 0.3	0.2 0.2 0.3	0.2 0.2 0.2	0.1 0.2 0.2	0.1 0.1 0.2	0.1 0.1 0.1	0.1 0.1 0.1	0.1 0.1 0.1	0.1 0.1 0.1	0.1 0.1 0.1	0 1 0 1 0 1
4 0.5 5 0.5 5 0.6 6 0.6 6 0.6 6 0.7	5 0.5 5 0.6 5 0.6 5 0.6 5 0.6 5 0.7 5 0.8	0.6 0.6 0.6 0.7 0.8	0.5 0.6 0.6 0.7	0.5 0.6 0.6	0.5 0.6 0.6	0.5	0.5	0.4	0.4	1.			-					10	2		1
5 0.5 5 0.6 6 0.6 6 0.6 6 0.7	5 0.6 5 0.6 5 0.6 5 0.7 5 0.8	0.6 0.6 0.7 0.8	0,6 0,6 0,7	0.6 0.6	0.6	0.6	6.6	•	e.*	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0,1	0,1	01
5 0.6 6 0.6 6 0.6 6 0.6	5 0.6 5 0.6 5 0.7 5 0.7	0.6 0.7 0.8	0.6	0.6	0.6	/	1	0.5	0.5							-					
6 0.6 6 0.6 6 0.6	5 0.6 5 0.7 5 0.8	0.7	0.7	•	1000	0.6	1		0.7	0.4	0.4	0,3	0.2	0,2	0.2	0,2	0,1	0,1	0,1	0,1	01
6 0.6 6 0.6 6 0.7	0.7	0.8	-/4	07	5363	10	0.6	0.8	0.7	0.5	0.4	0.3	0.3	0,2	0.2	0.2	0,1	0,1	0.1	0.1	01
.6 0.6	0.8	1	0.9		0.7	0.70	.8		13	07.5	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0,1	0.1	0,1	01
6 0	1	0.9		0.9	0.7	100	1	2	1	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0,1	0,1	0,1	01
	/		1,11	1.5	1			1.0 Mar.	\mathcal{D}	X	115	70.4	0.4	0.3	0.2	0.2	0.2	0,1	0,1	0,1	01
6 07	0.8	1,0	1.5		/	0	309 V	X		11		0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	01
	0.8	1,1	17	WAS	TE .	1		M	00	A.	X	and the second	0.4	0.3	0.2	0.2	0.2	0,1	0.1	0.1	01
6 0.6	6.0	1.0	1.2	A Co	A	//	TUR)	AL	et l	1)))	0.4.3	0.3	0.2	0.2	0,1	0,1	0.1	01
6 0.6	0.7	0.0	1.1	14	4	100	1			ax.				0,4	N	0.2	0.2	0.2	0,1	0,1	01
6 0.6	0.6	0.8	0.8	0.9	12	12	and a	~	all		1	21	I.	1	1	30.2	0.2	0.2	0.2	0.1	01
6 0.6	0.6	0.6	0.7	0.7	0.7	- Children		Se	1	H		1	3	8	1	0.2	0.2	0.2	0.2	0.2	01
5 0.6	0,6	0.6	0,6	0.6	0,6	0.6	0.8		Same	And the second second	5	1	/			0.2	0.2	0,2	0,2	0,2	0,1
5 0.5	0,6	0.6	0.6	0.6	0.6		114		Mr.		//			0.3	0.2	9.2	0.2	0.2	0.2	0.2	01
4 0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0,75	()	//		0.	40.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
3 0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5		8.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
3 0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.30	40.3	0.2	0,2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	01
2 0.2	0,3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	h	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	01
2 0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	01
2 0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0,1	01
1 0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	01
6 6 6 5 5 4 3 3 2 2	0.6 0.6 0.6 0.6 0.5 0.4 0.4 0.3 0.2 0.2	0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.5 0.6 0.4 0.5 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.1 0.2	0.6 0.7 0.9 0.6 0.6 0.8 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.5 0.6 0.6 0.4 0.5 0.5 0.4 0.4 0.4 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2	0.6 0.7 0.9 1.1 0.6 0.6 0.8 0.8 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.5 0.6 0.6 0.6 0.4 0.4 0.4 0.5 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2	0.6 0.7 0.9 1.1 0.6 0.6 0.8 0.8 0.9 0.6 0.6 0.6 0.7 0.7 0.6 0.6 0.6 0.7 0.7 0.6 0.6 0.6 0.6 0.6 0.5 0.6 0.6 0.6 0.6 0.4 0.5 0.5 0.5 0.6 0.4 0.4 0.4 0.5 0.5 0.3 0.3 0.3 0.4 0.4 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	0.6 0.7 0.9 1.1 1.4 0.6 0.6 0.8 0.8 0.9 1.2 0.6 0.6 0.6 0.7 0.7 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.5 0.6 0.6 0.6 0.6 0.6 0.6 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	0.6 0.7 0.9 1.1 1.4 <th1.4< th=""> <th1.4< th=""> <th1.4< th=""></th1.4<></th1.4<></th1.4<>	0.6 0.7 0.9 1.1 1.4 0.4 0.6 <td>0.6 0.7 0.9 1.1 1.4 0.6 0.6 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.6<td>0.6 0.7 0.9 1.1 1.4 <t< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></t<></td></td>	0.6 0.7 0.9 1.1 1.4 0.6 0.6 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.6 <td>0.6 0.7 0.9 1.1 1.4 <t< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></t<></td>	0.6 0.7 0.9 1.1 1.4 <t< td=""><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td><td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td></t<>	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					

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FIGURE G-49 Minto Compressor Station Modeling Results Maximum 1-Hr Average CO Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

24	25	26	26	26	24	22	22	21	21	20	20	20	20	19	19	18	18	17	17	16	16	15	15
7233500-24	26	26	27	26	25	23	23	22	22	22	21	21	21	20	20	19	19	18	17	17	16	16	15
25	26	27	28	28	26	25	24	23	23	23	23	22	22	21	21	20	19	19	18	18	17	16	16
25	26	28	29	29	27	26	26	25	25	24	24	24	23	22	22	21	20	20	19	18	17	17	16
24	26	28	30	30	31	29	27	26	26	26	26 35	25	25	24	23	22	21	20	20	19	18	17	17
7233400-24	26	28	30	30	31	29	28	28	28	37	36	27	26	25	24	23	22	21	20	19	19	18	17
24	26	28	30	31	31	31	31	303	9 39		bs.	3828	27	27	25	24	23	22	21	20	19	18	17
24	26	28	30	32	35	35	35	40	1	2)	38	29 39	28	27	25	24	23	22	21	20	19	18
25	27	28	31	35	39	35 35 52		1	5	40	\geq		112	0 29	28	27	25	24	22	21	20	19	18
7233300-26	27	29	33	379	52		/	0	200 Stor	Ú		14		40	29	28	26	25	23	22	21	20	19
233300 - 27	28	30	33	39	58	WAS	RE .	1		M		A	X	0.14	10 310	28	27	25	24	22	21	20	19
27	29	34	44	56	69	370	A	//	TUR	RINA	35		en!	14	1	390	28	26	24	23	21	20	19
27	29	32	37	40	61	103		100		1.5		ar.	-	S	K	38	29	27	26	24	22	21	20
7233200 ^{_28}	29	30	34	40	48	53	98	12	and and	N.	A.C.		1	A	I.	1	37	s 30	28	26	24	22	20
28	29	30	34	39	46	52	83	39		Ra	/	M	and the second second	15	3	8	1	35	30	28	26	24	22
28	29	30	33	38	44	79	76	139 97	I ZO		Sam	and the second second	5	1	/		3834	34	32	30	28	25	23
27	29	30	39	68	104	117	103	77	912		AP .	/	//	/	10	39	33	83	31	30	28	26	24
7233100-27	33	48	84	96	124	133	119	59	66	913		//		4	3 35	34	38	32	31	30	28	26	24
37	57	77	84	112	118	140	101	60	48	6 46	8		47	45 35	34	33	32	31	30	29	27	26	24
58	66	72	99	106	131	138	110	74	49	37	37 4	48	33	32%	31	31	31	30	29	29	27	26	24
57	62	86	92	118	126	114	•	75	49	34	34	34	31	30	29	30	29	29	29	28	27	26	24
55	75	80	98	111	117	101	99	73	47	31	32	21	30	28	28	27	28	27	27	27	26	25	23
7233000-56			97	103	98	95	81	1.	- 51		29	29	28	27	26	26		25	1.1	-80	24	23	20
	69 64	79	00			•		71	46	29		29					25		25	25		23	Ĩ
ما 42320	64	85	90	95 1 2330	85	88	67	67 1 2340	44	27	27	27 1 2350	27	26	25	24 1 2360	24	23	23	23 1 2370	22	21	40

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FIGURE G-50
Healy Compressor Station Modeling Results
Maximum 1-Hr Average NO ₂ Concentrations (µg/m ³)
(Coordinates are UTM NAD83, in meters)

105	62	43	314	35	31	29	218	28	28	28	217	26	25	24	2β	23	22
7094900 109	98	49	36	34	31	30	29	29	29	28	28	27	26	25	24	23	23
118	117	54	38	35	32	31	31	30	30	29	29	28	27	26	25	24	23
1 8	112	53	42	35	33	33	33	32	32	31	30	29	28	27	26	25	24
116	90	48	45	38	36	35	34	34	33	32	31	30	29	28	27	26	25
7094800-92	78	45	46	42	48	49 4	8 ¥	7 .46	446	444	39	437	405	29	27	26	24
99	71	49	51	47	5Å					1.0		0-000-0	420	30	27	26	24
84	56	53	58	51	59 W		TIT	0	0	inoni (j)	7	1	4 8 9	28	27	26	25
66	53	56	61	61				9		3	1	6	4240	29	28	26	25
7094700-60	52	61	72	81	5	10		0	M		Tel .		4340	29	28	27	26
93	73	64	85	88			TUR	BINE	r#	0	ä	0	341	30	28	27	26
119	119	110	83	92	GE		-		唐 南		H,		441	30	28	27	26
38	45	53	64	78 97				al f	LT Dece	NOCE -			⁴ 40	30	28	27	26
7094600 41	76	93	69	81			۲	1	0	1	5	14		29	27	26	25
119	118	58	60	70/9						Y		4	3/	29	27	26	25
118	68	50	58	68	C		۲		۲	3		4	35	28	27	26	25
85	63	47	52	534						2	e (41	35	29	26	25	24
7094500-79	40	45	48	419	49	47	46	45	44 4	14 4	3 4	11	34	28	27	25	24
42	39	42	44	41 ^{(horr}	41	37	37	39	38	37	36	35	31	27	26	25	24
39	38	39	42	38	35	-32	**32	1 03 1	31	30	29	28	27	26	25	24	23
42	37	38	40	37	34	31	31	30	30	29	28	27	26	25	24	23	23
7094400 ⁴¹	36	36	38	37	33	31	30	29	28	28	27	26	25	24	23	23	22
40	36	34	35	36	32	30	29	28	27	27	26	25	24	23	23	22	21
		3	9620	00		3	9630	00		3	9640	00		3	9650	00	

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FIGURE G-51 Healy Compressor Station Modeling Results Annual Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

E F	11.2	10.3	7.9	7[8	7.4	6.7	6.2	610	5.8	5.7	5.5	5 <u>1</u> 3	5.1	4.9	4.7	415	4.3	4.0
7094900	11.8	11.8	9.0	8.5	7.9	7.2	6.8	6.6	6.4	6.2	6.0	5.7	5.5	5.2	5.0	4.7	4.5	4
		11.9		9.4	8.4	7.7	7.5	7.2	7.0	6.8	6.5	6.2	5.8	5.6	5.3	5.0	4.7	4
	11.9	12.0	10.1	10.4	8.9	8.4	8.2	8.0	7.8	7.4	7,1	6.7	6.3	5.9	5.6	5.3	4.9	4
	12.1	11.9	11.2	115	9.7	9.4	9.2	8.9	8.6	8.2	7.7	7.3	6.8	6.3	5.9	5.5	5.2	4
7094800 12.0	12.1	11,9	11.8	11.8	10.7	1.9 1	1.9 11	.9 11	.9 11.	81115	198	10.76	9.9	9.21	6.3	5.8	5.4	50
	12.1	11.8	11.9	11.9	11.1	1.9		_					A-080-0	9.83	6.7	6.0	5.6	5
1.19	11.9	11.9	12.0	12.0	11.0	2.0 M		TTT 9 Lot	0	1	(interlighted)	7	J	0938	6.9	6.3	5.7	5
				11.9	9,0	10	30			-	(NOTE S)	1	6	018.2	7.2	6.5	5.9	5
7094700 11.8	12.0	12.1	12.0	10.4	8.5	o 5 妇	10		0	M		5		110.5	7.3	6.6	6.0	58
	12.0	12.1	11.9	9.3	9.6		E E	TUR	BINE	rtt.	Sicte	a l	Q	140.7	7.5	6.7	6.1	5
	12.0	12.1	11.8	9.9	10.4	2 GE			et-			1	0.	f 0.7	7.5	6.7	6.1	5
	12.0	12.1	11.9	9.4	9.1	GE GE	100		4	- Inco	AGE .	11		1.6	7.4	6.7	6.1	5
7094600 ^{11.8}	12.0	12.0	11.9	10.7	8.5			ø	-	G		5		10.2	7.3	6.6	6.0	5
	11.9	12.0	12.0	11.9	9,6	8					Y		10	.1 9.5	7,1	6.4	5.9	5
	11.8	11.9	11,9	12.0	11.8	C		0		3	3		10	8.7	6.8	6.2	5.7	5
	11.5	11.8	11.9	11.9	1118	9					2	1	9	8.2	6.5	6.0	5.5	5
7094500 ^{10.4}	10.6	11.3	11.8	11.8	1118	11.9	11.9	11.8	11.8 1	1.7 1	1.0 10	.4 9.	1	7.7	6.2	5.7	5.3	50
100 C	9.7	10.3	10.8	11.3	10.5	10.6	10.0	9.8	10.2	9.8	9.2	8.5	8.0	7.0	5,8	5.5	5.1	4
	9.0	9.4	9.8	10.1	9.5	8.8	8.3	8.0	10 07 17 10	7.4	7.0	66	6.2	5.8	5.5	5.2	4.9	4
-5.154	8.3	8.6	8.9	9.2	8.7	8.0	7.5	7.2	7.0	6.7	6.4	6.1	5.8	5.5	5,2	4.9	4.7	4
7094400 ^{_84}	7.9	8.0	8.1	8.3	8.1	7.4	6.9	6.6	6.4	6.1	5.9	5.7	5.4	5.2	4.9	4.7	4.4	4
	7.6	7.4	7.5	7.6	7.6	6.9	6.3	6.0	5.8	5.6	5,5	5.3	5.1	4.9	4.7	4.4	4.2	4

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FIGURE G-52 Healy Compressor Station Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

12.1	6.6	4.3	410	3.9	3.9	3.8	316	3.4	3.2	3.1	219	2.7	2.5	2.4	213	2.2	2.2
7094900 13.2	10.7	4.9	4.3	4.3	4.3	4.2	4.1	3.8	3.6	3.2	3.0	2.7	2.5	2.5	2.4	2.3	22
	12.6		4.6	4.7	4.9	4.9	4.6	4.4	3.9	3.3	3.1	2.9	2.6	2.5	2.5	2.4	23
13.0	11.5	5.3	4.8	5.1	5.6	5.7	5.3	5.0	4.1	3.8	3.1	2.9	2.8	2.6	2.5	2.4	23
11.8	9.0	4.7	5.0	5.4	6.6	7.3	6.3	5,1	5.0	4.5	3.6	3.1	2.8	2.7	2.6	2.5	24
7094800 ^{<u>11</u>.6}	12.6	14.7	8.0	5.5	3.0 1	1.6 11	.4 %	9 84	7720	434	3.9	3.7	3.35	2.8	2.7	2.6	23
11.9	13.4	13.5	16.4	14.0	316							W 0-000-0	43.9	3.0	2.6	2.5	24
99	10.9	10.4	98	8.3	30 W		TTI 10 Lar	0	C INC	1000	7		4,3.9	2.7	2,7	2.5	24
64		7.4			5			G	() x0	(D) (NOTE 4)	11	6	4.3.9	2.8	2.7	2.6	25
7094700 ⁵ 9	8.1	12.6	14.1	13.8		10		0	M		Tel .	\square	3.9	2.8	2.7	2.6	25
9 1	9.7	11.3	12.7	13.2			TUR	BINE	r#	0 9000	a l	0	.34.1	2.9	2.7	2.6	25
12.5	12.7	10.8	1.6	12.8	GE	and the second	đ	- Ch	原則		1	-	24.0	2.9	2.7	2.6	25
57	6.4	7.6	9.1	11.0	GE GE	1111		al-	LT LT	HALL .	11		. ³ 3.9	2.9	2.7	2.6	25
7094600 44	7.8	9.5	9.8	11.6			٥	1	۲	1	5	14	² 3.8	2.9	2.7	2.6	25
	13.0	7.7	8.8	10.1	4	0				TY		4	² 3.6	2.8	2,7	2.6	25
14.9	8.8	6.7	7.9	889	C		0		0	5		4	3.4	2.7	2.6	2.5	24
10.7	8.0	6.0	7.0	775	_					2	ol	4	3.4	2.9	2.6	2.5	24
7094500 10.2	5.0	5.8	6.1	6634	6.5	5.9	5.6	5.2	4.9 4	.5 4	.2 4.	11	3.3	2.8	2.6	2.5	23
6 1	4.8	5.2	5.6	5.4	5.4	4.9	4.7	4.7	4.3	4.0	3.5	-x	3.1	2.7	2.6	2.5	23
4 3	4.6	4.9	5,3	5.0	4.8	4.3	* * 1 0	3:8	3.5	3.3	30	2.8	2.7	2.6	2.5	2.4	23
46	4.4	4.7	5,1	4.8	4.5	4.0	3.8	3.6	3.4	3.2	3.0	2.7	2,6	2.5	2.4	2.3	23
7094400 47	4.4	4.5	4.8	4.7	4.3	3.9	3.6	3.4	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.3	22
4 7	4.3	4.3	4.6	4.7	4.1	3.7	3.5	3.3	3.2	3.0	2.9	2.7	2.6	2.5	2,4	2.3	22
		3	9620	00		3	9630	00		3	9640	00		3	9650	00	

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FIGURE G-53 Healy Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

H	2.0	1.9	1.6	114	1,3	1.2	1.2	111	1,1	1.0	0.9	018	0.8	0.7	0.6	0[6	0.6	0
7094900 ^{_20}	2.2	2.3	1.9	1.6	1,5	1.4	1.3	1.3	1,2	1.2	1,1	1.0	0.9	0.8	0.7	0.6	0,6	0
	2.3	2.6	2.2	1,9	1.7	1.6	1,6	1,5	1.4	1.3	1,2	1,1	1.0	0.9	0.8	0.7	0.6	0
	2.6	2.8	2.3	2,1	1.8	1.8	1,7	1.7	1.6	1.5	1,4	1.2	1,1	0.9	0.8	0.7	0.7	0
	2.8	2.9	2.4	2.3	1.9	1.9	1,9	1.9	1.8	1.7	1.5	1,3	1.2	1,0	0.9	0.8	0.7	0
7094800 27	2.9	2.8	2.4	2.3	1,9		2.3 2	.3 2	5 24	,2223	20	1.35	1.5	1.53	0.9	0.8	0.7	0
	2,9	2.6	2.5	2,4	1.7		-	_					0.000.07	1.65	1.0	0.8	0.7	0
	2,6	2.5	2.5	24	1.6	24 N		m	0	1000 - 10000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1	(NOTE 3)		Ţ	1.6.5	1.0	0.9	0.8	0
	2.2	2.4	2.5	2.4	1,6					-	8	1	6	1.6.5	1.0	0.9	0.8	C
7094700 ²²	2.2	2.4	2.3	2.1	1.6	a E						5		.9.5	1.0	0.9	0.8	C
	2,1	2.2	2.1	.8	1.6	9	F	TUR	BINE	đ	Sixte	a	Q	.61,4	1.0	0.9	0.8	C
	2.0	2.1	2.0	65	1.6	6 GE	and a second	-	J.			1	0	51.4	0.9	0.8	0.8	C
	1,9	2.0	1,9	1.5	1.4	GET	0 0 0		46	7604	AT A	11		.5 _{1.3}	0,9	0.8	0.7	C
7094600 17	1.7	1.8	1.8	1.5	1.3			۲	-tr	G	-			4 ⁴ 1.2	0.9	0.8	0.7	C
- 11	1.6	1.7	1.7	1.6	1.3	5					M		1.	1,1	0.8	0.8	0.7	C
	1.5	1.5	1,6	1,6	1,56	C		0		۲	3)	1	1:	1.0	0.8	0.7	0.7	C
	1.3	1.4	1.4	1.5	1145						_	-(1	0.9	0.8	0.7	0.7	C
7094500	1.3	1.2	1.3	1.3	11 34	1.4	1.4	1.3	1.3	1.3 1	.2 1	2 1.	1 11	0.9	0.7	0.7	0.7	C
	1.3	1.2	1,1	1,2	1.1	ALTERNA 1.1	1,1	1.0	1,1	1.0	1.0	1.0	0.9	0.8	0.7	0.7	0.6	¢
	1,2	1,1	1,1	1,1	1.0	0.9	0,9	0.9	··· 0:9··	0.8	0.8	08	0.7	0.7	0.7	0.7	0.6	C
- 1 k	1,1	1,1	1.0	1,1	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0,7	0.7	0.7	0.6	0.6	C
7094400 ¹²	1,1	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	C
-	1,1	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0,7	0.7	0.7	0.6	0.6	0.6	0.6	C

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FIGURE G-54 Healy Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

8.3	6.8	3.3	311	3.1	2.9	2.8	217	2.6	2.8	2.6	215	2.3	2.1	1.9	118	1.7	1.6
7094900 ⁹⁵	7.7	4.8	3.2	3.2	3.0	2.9	2.8	2.9	3.1	3.0	2.8	2.6	2.3	2.1	1.9	1.8	16
10.1	9.5	5.4	3.5	3.4	3.2	3,1	3.0	4.4	3.8	3.4	3.2	2.8	2.6	2.3	2.0	1.7	16
99	9.1	4.0	4.0	3.8	3.9	3.9	3.7	5.5	4.8	4.7	3.9	3.3	2.9	2.5	2,1	1.8	16
13.0	11.2	4.2	4.8	4.7	5.1	5.3	6.7	6.3	6.4	5.8	4.5	3.5	3.0	2.6	2.2	1.9	17
7094800	16.2	18.9	10.3	6.2	8.4 9	.6 9	.4 9	5 10,	8,9920	4.2	4.8	4.6	436	2.6	2,1	1.8	15
15.3	17.2	17.4	21.1	17.9	0.9							W 0+090-0	440	2.7	2.2	1.8	16
12.7	13.9	13.4	12.6	10.4	6.6 W	ASTE	TH	0	0	UND C	7	ľ	4.5.2	2.9	2,4	2.1	18
23	2.5	5.0	13.9	16,4	2			(3	() x0	(j) (WOTL 6)	1	6	4.8.4	3.0	2.5	2.1	18
7094700 ^{_3} 9	10.4	16.2	18.2	17.7		10			M		r.		.4.2	2.9	2.4	2.0	18
	12.4					G	TUR	BINE	r#	0 3478		0	.44.0	2.6	2.2	1.9	17
87	10.5	12.1	13.0	12.7	GE		a	-			Η,	6 11	53.2	2.4	2,1	1.8	16
73	8,3	9.8	18.6	4.0	GE			al-	TTTT	F		all	42.2	1.8	1.8	1.7	16
7094600 ⁵⁵	6.5	7.4	8.2	3.3			(ii)	-l-	۲	1	5	2	32.2	1.7	1.7	1.6	15
4 4	4.4	5.4	3.8	325						N		2	3 2.1	1.7	1,6	1.6	15
34	3.8	4.2	3.1	333	C		0		0	3		2	2.0	1.6	1,6	1.5	15
2,8	3.1	2.9	2.9	2390	_					Ð	el le	2	1.9	1.6	1.5	1.5	14
7094500 ^{_2} 7	2.8	2.6	2.8	22/8	2.9	2.8	2.4	2.4	2.3 2	.3 2	2 2.	11	1.8	1.5	1.5	1.5	14
2 5	2.4	2.5	2.6	2.5	2.5	2.3	2.1	2.2	2.1	2.1	2.0	1.9	1.8	1.5	1.5	1.4	14
2 3	2.3	2.4	2.5	2.4	2.2	2.0	" eq:90	11 1948 M	1.8	1.7	17	1.6	1.5	1,5	1.4	1.4	14
22	2.2	2.3	2.4	2.3	2,1	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.4	14
7094400 ²¹	2.2	2.2	2.3	2.3	2.1	1.9	1.7	1.7	1.6	1.6	1,5	1.5	1.5	1.4	1.4	1.4	14
21	2.1	2.1	2,2	2.2	2.0	1.8	1.7	1,6	1.6	1.5	1.5	1.5	1.4	1.4	1,4	1.4	13
		3	9620	00		3	9630	00		3	9640	00		3	9650	00	

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FIGURE G-55 Healy Compressor Station Modeling Results Annual Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

0.9	0.9	0.9	0[9	0.9	0.9	0.8	018	0.7	0.7	0.6	015	0.4	0.3	0.3	012	0.2	0.2
7094900 10	1,1	1.2	1,2	1.2	1,1	1,1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.2	02
11	1.3	1.4	1.5	1.4	1.3	1.3	1,2	1,2	1.0	0.9	0.7	0.6	0.5	0.3	0.3	0.2	02
12	1.6	1.6	1.7	1.5	1.5	1.5	1.5	1.4	1.2	1,1	0.9	0.7	0.5	0.4	0.3	0.2	02
14	1.7	1.8	1,9	1.7	1.7	1,7	1.6	1.6	1.4	1.2	1.0	0.8	0.6	0.5	0.3	0.3	02
7094800 16	1.8	1.9	2,1	1.9	2.3 2	3 2	3 2	3 2	1290	h.77	1.3	11.21	1.08	0.5	0.4	0.3	02
16	1.8	2.0	2,2	1.8	22	_	_					* 0+09 -0	109	0.5	0.4	0.3	02
15	1.8	2.0	22	1.8	4 W		TIT	0	1 100	UNOT C	7	J	1.0.9	0.5	0,4	0.3	02
14	1.7	1.9	2.2	1.9	2			1.0		(a) (i)	11	6	1.0.9	0.5	0,4	0.3	02
7094700 13	1.6	1.8	2.0	1.9	3	Jo		0	M		E.	\square	.0.8	0.5	0.4	0.3	02
12	1,4	1.6	18	1.7			TUR	BINE	r#	(E) autre	ă I	0	.9.8	0.4	0.3	0.3	02
1 1	1,2	1.4	6	1.6	GER	A REAL PROPERTY AND A REAL	af 1				Ħ,		80.6	0.4	0.3	0.2	02
0,9	1.0	1,2	1.3	1.3	GE			4		ACC -	11	10 A	70,5	0.3	0.3	0,2	02
7094600 07	0.8	0.9	1.0	1.0	5		۲	-		1	5		⁶ 0.4	0.3	0.2	0.2	02
0,6	0.7	0.7	0.8	0.88								0	0.4	0.2	0,2	0.2	02
05	0.5	0.6	0.6	006	C		0		0	51		0	0.3	0.2	0.2	0.2	02
04	0.4	0.4	0.5	9055						2	-(0:	0.3	0.2	0.2	0.2	02
7094500 ⁰³	0.3	0.4	0.4	0044	0.4	0.4	0.4	0.4	0.3 (0.3 0	3 0.	1 1	0.2	0.2	0,2	0.2	02
03	0.3	0.3	0,3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0_2	0.2	0.2	0.2	02
03	0.2	0.3	0.3	0.3	0.2	0.2	0.2	·· 0.2··	0,2	0.2	02	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.2	0,3	0.2	0,2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
7094400 ⁰²	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	01
		3	9620	00		3	9630	00		3	9640	00		3	9650	00	

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	Ма	Healy Co ximum 1	-Hr	ress Ave	sor s rage	e CO	on I Co	Mode ncer	ntrat	ions	s (μg)							
1		(Coord	128 128	tes a	48 48	46	NA 47	D83 , 45	, in r 44	nete 42	40	38	36	34	32	28	27	26	25	24
7094900 ¹⁸⁵	110	133	140	115	54	51	51	50	48	46	44	41	38	36	32	30	28	27	25	24
7094900-	1.		142	137	59	56	55	55	54	51	48	44	40	37	34	32	30	28	26	25
			143	127	59	60	59	62	62	59	53	47	43	39	36	34	31	29	27	26
			130	101	63	65	65	72	76	68	58	51	44	41	38	35	33	31	29	27
7094800 ^{_162}	121	109	105	88	103	7	70	90 1	18 1	16 8	9 74	666	58	52	548	444	36	32	30	27
120120-0			109	94	95	115	98	88							1000	508	38	33	30	26
			92	83	91	98	96	04 W		TTI			100	7	1	5250	38	31	28	27
			80	91	104	116	415	26				00) ×6	e e	IL	6	5147	33	30	29	27
7094700 ¹⁶⁵	131	76	81	99	116	139	152		10		00	Y		r.		4845	33	30	29	28
			100	103	124	165	168		F	TUR	BINE	rtt	0	a	Ø	5047	34	30	29	28
			138	141	129	166	181	7 GE		7	관					5148	35	31	29	28
			77	91	107	132	156 19	GET				Tesh	IJ	1	79.71	⁵³ 48	36	31	29	28
7094600-74	51	38	54	92	115	139	165 18	5		۲	-	G		5	_)]]	⁵³ 47	35	31	29	27
			180	158	109	124	1446						N			45	34	30	28	27
			199	120	94	111	123		1	۲		۲	5)		5	43	33	29	28	27

70 73

47 47 47 44 39 36 35 33 32

80 84

72 73

54 46

49 42 40 38 36 34 32 30 28 27 26 25 24

72 69 65 59 54 49 45

59 56

147 109

49 49 50 51 51

61 63 65

55 57 57

49 46

172 142

51 46 42 38 31

34 32 30 28 27 26 25

41 33

27 26

29 28 26

27 26

28 26

27 26

25 24

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FIGURE G-57 Honolulu Creek Compressor Station Modeling Results Maximum 1-Hr Average NO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

24	25	26	25	25	26	26	27	27	28	26	27	29	217	26	31	30	29	28	27	27	2[7	26	24
26	26	27	27	26	27	27	28	28	29	27	28	30	28	31	33	32	29	28	28	28	28	26	2
26	27	28	29	29	28	28	29	29	30	29	31	30	29	34	35	32	31	29	29	29	28	27	2
6998100 ^{_29}	28	29	30	31	29	30	30	31	32	32	33	32	31	33	35	33	31	30	30	30	29	28	2
54	34	31	32	33	33	31	32	33	33	34/	32	32	34	38	35	33	32	32	32	32	30	30	3
66	69	45	33	33	35	35	34	35	35	/36	36	40	-	38	36	34	33	34	33	32	33	33	4
68	75	81	61	37	38	41	36	37	37	37 4	5		43	421	37	35	34	35	34	33	35	38	7
6998000 7 2	79	86	94	85	41	44	42	41/	39	42	TAYA	STE		1	1 41	36 40	34	35	36	35	37	66	7
75	82	90	96	104	105	45	48	43	4649	The	0	TTT -		~~~~		40	387	83	36/	40	64	83	7
86	93	98	99	103	99	90	48	48	59	A.			00	8.21	2	<	1	37	/32	36	86	76	5
83	92	98	101	101	94	79	50	70 68 mm		E .	3	-	T	Lo	n @	1	1	337	32	39	88	66	3
6997900 ⁻⁷⁰	74	77	82	79	70	52	52	7///		0	URBI	NE			X	-	38	35	36	47	81	51	2
56	53	44	41	38	37	43	57	GEN	10	*	No for	A	a	1	77	D	39' / 38	34	45	91	62	32	3
44	45	41	35	34	35	46	- Cli	-			1		Y	2/	6	190	35	42	95	76	40	29	3
33	29	30	31	/32	384	5		~				-	Sh/	1	A	37	41	55	86	52	30	32	3
6997800 ^{_27}	28	28	29	31	434	43				1		4	Y	14	139	37	51	96	65	33	31	32	3
25	25	27	28	29	31	35	444	1				A	\Box	A	35	52	107	84	44	30	33	32	3
23	24	26	27	28	30	31	32	44	43			//	47	37	43	82	96	72	34	33	33	34	3
22	23	24	25	27	29	30	30	30	34	401	1	39	/38	37	49	100	83	52	30	32	32	33	3
6997700 ^{_21}	22	23	24	27	28	28	28	20	29	31	73	3838	34	44	78	92	63	36	29	31	32	34	3
20	21	22	25	26	27	27	27	28	28	131	37/	33	39	45	98	76	45	29	30	31	32	35	3
19	20	22	24	25	25	26	26	26	28	31	33	33	38	76	85	58	33	27	30	31	32	34	3
18	19	22	23	24	24	24	25	25	28	34	31	34	40	92	70	45	31	26	29	29	32	33	3
6997600 ¹⁸	20	21	22	22	23	23	23	25	29	30	30	35	65	81	57	37	30	25	27	28	30	32	3
18	20	20	21	21	21	22	23	25	30	29	31	36	80	73	52	32	26	24	26	27	28	30	3

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FIGURE G-58 Honolulu Creek Compressor Station Modeling Results Annual Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

6.3	6[6	6.8	7.1	7.3	7[6	7.9	8.2	8.6	819	9.2	9.5	9.9	912	8.9	8.9	8.9	86	8.3	8.0	7.7	7[4	7.0	6.7
66	6.9	7.3	7.6	7.9	8.2	8.6	8.9	9.2	9.6	9.8	10.2	10.6	9.7	9.7	9.7	9.3	9.0	8.7	8.4	8.1	7.7	7.3	69
70	7.4	7.8	8.2	8.5	8,9	9.3	9.7	10.0	10.5	10.8	11.3	11.1	10.4	10.5	10.4	9.9	9.5	9.1	8.8	8.4	8.0	7.6	72
6998100 ⁻⁷³	7.8	8.3	8.7	9.2	9.7	10.2	10.7	11,1	11.6	11.8	11.8	11.8	10.8	10.9	11.1	10.5	10.0	9.5	9.1	8.7	8.3	7.8	74
77	8.3	8.8	9.4	10.0	10.5	11.1	11.5	11.8	11.8	11.9	11.8	11.8	11.8	11.8	11.8	11.2	10.5	10.0	9.5	9.0	8.6	8,1	77
8 1	8.7	9.3	10.1	10.8	11.1	11.4	11.6	11.8	11.8	11.9	11.9	12.1					111	10.4	9,9	9.3	8.8	8.3	79
85	9.1	9.9	10.6	11.0	11.4	11.7	11.5	11.5	11.8	11.8	6		12.1	1220	11.9	11.8	11.6	10.8	10.2	9.6	9,1	8.6	83
6998000 ⁸ 8	9.6	10.4	10.8	11.2	11.4	11,2	10.6	10.2	10,2	120	Toyas	STE		A	2.0	011.9	11.8	11.2	10,4	9,8	9.3	8.8	84
Contract Contract Pro-	9.9	10.6	10.9	11.2	10.9	10.1	9.3	8.3	9.11	A	N OI	and the		1	1		1188	14	10.7	10.0	9.5	9,1	82
93	10.1	10.6	10.9	11.0	10.3	9.2	6.8	5.6	7.9	A.			6	351	2	~	X	1.8	810.7	10.1	9.9	8.9	82
94	10.3	10.7	11.0	10.8	9.9	8.2	5.4	9.7		-	9	.0	T	L	0		1	1,87	10.8	10.3	9.7	8.8	8 1
6997900 ⁹⁴	10.3	10.6	10,9	10.7	9.8	8.1	5.8	GEN		0	URBI	NE		1	K.	-	1		11.0		9.6	8.7	80
93	10.2	10.5	10.8	10.8	10.0	9.010	p	ALINE OF	6	4	A	A	A a	1	27	Di	1.9	11.8	11.0	10.3	9.4	8.6	77
92	10.1	10.5	10.7	10,9	10.5	11.9	- Million		\geq		-	Column Column	H	T/	6 1	12.0	11.8	11.7	11.1	10.1	9.2	8.3	75
9 0	9.7	10.3	10.6	10.8	11.8	ø		\geq	Ŵ			7	\$/	1.10	120	11.9	11.8	11.6	10.7	9.8	8.9	8.1	73
6997800 ⁸⁷	9.4	10.1	10.4	10.6	12.01	2.0	>			Ÿ			Y	NZ	02.0	11.9	11.8	11.3	10.3	9.4	8.6	7.8	71
8 3	8.9	9.6	10.1	10.4	10.6	11.8	12200	100			X	H	\bigcirc	1726	11.9	11.8	11.8	10.9	9.9	9.0	8.2	7.5	68
7 9	8.5	9.0	9.6	10.0			10.9			\sum	al	1	12	0° 11.9	11.8	11.8	11.2	10.4	9.5	8.6	7.9	7.1	65
7 5	8.0	8.5	9.0	9.4	9.9	10.1	10.3	10,5	12. 11.8	11290	1	11,8	/11.8	11.8	11.8	11.4	10.6	9.8	9.1	8.3	7.6	7.0	63
6997700 ⁻⁷ 2	7.6	8.0	8.4	8.8	9.1	9.4	9.6	9.8	10.1	10.8	118	118.8	11.8	11.6	11.3	10.7	10.0	9.3	8.6	8.0	7.3	6.7	61
6 8	7.1	7.5	7.8	8.1	8.4	8.7	8.9	9.1	9.4	10.2	11.5	11.3	11.2	11.0	10.7	10.1	9.4	8.7	8.1	7.6	7.0	6.4	59
6 5	6.7	7.0	7.3	7.6	7.8	8.0	8.2	8.4	9.0	9.9	10.7	10.6	10.5	10.4	10.0	9.4	8.8	8.3	7.7	7.2	6.7	6.2	57
62	6.4	6.6	6.8	7.0	7.2	7.4	7.5	7.8	8.7	10.0	9.9	10.0	9.9	9.8	9.3	8.8	8.3	7.9	7.4	6.9	6.4	6.0	56
6997600 ⁵ 9	6.1	6.3	6.4	6.6	6.7	6.9	7.0	7.4	8.6	9.3	9.4	9.5	9.4	9.1	8.7	8.3	7.9	7.5	7.1	6.7	6.2	5.8	55
56	5.8	5.9	6.1	6.2	6.3	6.5	6.7	7.3	8.5	8.8	8.9	8.9	8.9	8.6	8.2	7.8	7.5	7.1	6.7	6.3	6.0	5.7	53
3	7460	0		3	7470	0		3	7480	0		3	7490	00		3	7500	00		37	7510	0	

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
ALL INC	STATIONS FERC AIR QUALITY MODELING	April 14, 2017
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FIGURE G-59
Honolulu Creek Compressor Station Modeling Results
Maximum 24-Hr Average PM ₁₀ /PM _{2.5} Concentrations (µg/m ³)
(Coordinates are UTM NAD83, in meters)

2.3	214	2.5	2.5	2.5	2]9	3.6	4.3	4.6	217	2.5	2.6	2.8	217	2.6	3.1	3.2	313	3.3	3.5	3.7	318	3.5	3.2
24	2.5	2.6	2.7	2.6	3.3	4.6	5.6	6.4	4.9	2.6	2.8	2.9	2.7	3.1	3.3	3.3	3.4	3.3	3.5	3.6	3.7	3.5	32
25	2.6	2.7	2.8	3.1	4.1	5.1	7.0	8.1	7.5	3.0	3.0	3.0	2.8	3.3	3.5	3.3	3.3	3.4	3.8	3.7	3.4	3.2	31
6998100 ²⁸	2.7	2.8	3.0	3.6	4.8	6.1	7.4	9.9	11.2	5.8	3/2	31	3.1	3.3	3.5	4.0	4.4	4.4	4.0	3.6	3.3	3.1	31
53	3.4	3.0	3,2	4.3	5.5	6.5	8.4	10.1	12.7	10.6	3.5	3.2	3.8	3.9	4.8	5.5	5.0	4.5	4.3	3.8	3.3	3.3	33
64	6.7	4.4	3.5	4.7	6,1	7.5	9.1	10.5	12.2	14.6	5.7	6.1	5.0	4.6	5.5	5.3	5.3	4.7	4.4	3.8	3.4	3.5	46
66	7.3	7.9	6.0	4.9	6.4	8.1	9.7	11.2	11.5	9.6	A		6.0	445	4.4	4.00	5.3	5.2	4.4	3.8	3.6	4.2	80
6998000 ⁷ 0	7.7	8.4	9,1	8.3	6,6	8,4	10.1	11,7	12.2	146	AYA	STE		4	De A	4,5	5.2	5,3	4.8	4,3	4.2	7,2	91
76	8.0	8.7	9.3	10.1	10.2	5.9	7.3	8.3	1113		N Sr	tene ion		1		4.2	4.23	1.3	5.0	5.0	6.8	9.3	94
8 9	9.6	9.9	9.8	10.0	9,6	8.7	6.8	7.4	10,5	A			60	8.1	~		1	34	3.6	4.0	9.0	9.2	83
8 8	9.7	10.0	10.1	10.0	9.2	7.6	5.7	87	12	e a	Ð	-	J.	Lo	(in the second	/	K	4420	3.4	4.4	9.3	8.2	71
6997900 ⁷⁶	7.9	8.1	8.4	7.9	6.9	5.1	6.8	GEN	210	0	URBI	INE			Ľ	-	14.9	3.7	3.8	4.7	8.9	7.6	57
6 4	6.1	5.2	4.6	4.0	4.4	5.16	3	SEAR	10	4	N	Q	A	1	27	D	1.1 /3.9	3.6	4.7	9.3	7.9	6.4	49
5 3	5.3	4.8	3.9	3.9	4.0	5.9			X			and	W.	T.	6 /4	1/2	3.7	4.3	9.4	8.1	6.8	5.3	4 7
4 0	3.1	3.3	3.3	3.4	4.3	2		X	Ŵ				Sh /	1-3 P.	AC	⁶ 4.0	4.1	5.5	9.1	7.3	5.6	4.8	48
6997800 ^{_2} 9	2.9	3.1	3.2	3.4	4.9	5.2				Ŵ		X	Y	14	93.8	3.6	5.0	9.7	7.7	6.0	5.1	4.9	50
27	2.9	3.0	3.2	3.3	3.6	4.5	5 5521				Y	A		400	3.4	5.1	10.7	8.8	6.7	5.3	5.0	4.9	53
2 7	2.9	3.0	3.1	3.2	3.6	3.6	3.8	4.7 4.4	4.3				4.	3.6	4.2	8.1	9.9	7.8	5.7	5.0	5.0	5.2	56
2 7	2.8	2.9	3.0	3.2	3.5	3.4	3.3	3.2	3.5	1 3490	1	38	3.9	3.7	4.9	10.0	9.0	6.7	5.3	4.8	4.9	5.0	54
6997700 ^{_2} 6	2.7	2.8	2.9	3.2	3.3	3.2	3.1	3.0	3.0	3.1	3.8	3.3/7	3.3	4.4	7.8	9.7	7.3	5.9	4.9	4.6	5.0	5.2	53
26	2.7	2.7	2.9	3.0	3.1	3.0	3.0	2.9	2.9	\$.0	3.6	3.3	3.8	4.5	10.0	8.4	6.4	5.2	4.5	4.6	5.0	5.3	55
2 5	2.6	2.6	2.8	2.8	2.9	2.8	2.8	2.8	2.8	3 <u>.</u> 1	3.3	3.2	3.8	7.9	9.7	7.3	5.7	4.9	4.5	4.7	4.9	5.2	54
24	2.5	2.7	2.7	2.7	2.7	2.7	2.6	2.7	2.9	3.4	3.1	3.4	4.0	9.8	8.6	6.7	5.5	4.8	4.3	4.5	4.9	5.1	53
6997600 ^{_2} 4	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	3.0	3.1	3.0	3.5	6.9	9.5	7.8	6.2	5.3	4.8	4.1	4.2	4.7	4.9	50
23	2.5	2.6	2.6	2.6	2.5	2.5	2.5	2.7	3.1	2.9	3.1	3.6	8.7	9.3	7.4	5.8	5.0	4.6	3.9	4.2	4.5	4.7	4 8
3	T 87460	00		3	1 7470	0		3	T 7480	0		3	1 7490	00		3	T 7500	00	_	3	T 7510)0	

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000	
	STATIONS FERC AIR QUALITY MODELING	April 14, 2017	
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FIGURE G-60 Honolulu Creek Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

0.7	018	0.8	0.9	0.9	1]0	1,1	1.2	1.3	114	1.5	1.6	1.7	116	1.5	1.4	1.4	1]3	1.2	1,1	1,1	111	1.0	0.9
0 8	0.8	0,9	1.0	1.0	1,1	1.2	1.4	1.5	1.6	1.7	1.8	1.9	1.7	1.7	1.7	1.6	1.4	1.3	1.3	1,2	1.1	1.0	09
08	0,9	1.0	1.0	1.2	1,3	1,4	1.5	1.7	1.8	2.0	2.1	2,1	2.0	2.0	1,9	1.8	1.6	1.5	1.4	1.3	1,1	1.0	10
6998100 ^{_0} 9	0.9	1.0	1,1	1.3	1.4	1.6	1.7	1.9	2.1	2,2	2.3	83	2,1	2,1	2.2	2.0	1.8	1.6	1.5	1.4	1,2	1,1	11
09	1.0	1.1	1,2	1.4	1.6	1.7	1.9	2,1	2.2	2.4	2.3	2.3	2.3	2.6	2.4	2.2	2.0	1.8	1.6	1.5	1.3	1,2	12
1 0	1.0	1,2	1.3	1.5	1,7	1.8	2,0	2.1	2.3	2.3	2.3	2.7	2.5	2.8	26	2.4	2.1	1,9	1.7	1,5	1.4	1.3	13
1 0	1,1	1.2	1.4	1.6	1.7	1.8	2.0	2.1	2.1	1.9	3		27	2288	2.8	2.5	2.3	2.0	1.8	1.6	1.5	1.4	14
6998000 ^{_1} 0	1,1	1.3	1,4	1.5	1.7	1.8	1,9	2.0	1.9	2.2	Toyas	STE		2	Barra	2.5	2.3	20	1.8	1.7	1.6	1,5	14
11	1.2	1,3	1,4	1.5	1.6	1.7	1.7	1.7	2.8		N OL	TTTTT ON ON ON		-		2.5	2232	10	1.8/	1.7	1.6	1,5	15
11	1,2	1.3	1.4	1.4	1,5	1.5	1/4	1.3	1.9	A			00	3.1	1		1	2/18	1.7	1,6	1.6	1.6	14
11	1,2	1.3	1.3	1,4	1,4	1.3	1.1	15	12	e a	9	~	J.	Lo	0	1	P	1.98	1.7	1.7	1.7	1.6	13
6997900 ^{_1}	1,2	1.2	1.3	1.3	1.4	1.2	112	GEN	20	0	URBI	NE		1	K	-	2.9	1.8	1.7	1.7	1.7	1.4	12
11	1.2	1,2	1.2	1.3	1.3	1.31	.0	SENR.	16	*	S	I	La a	1	77	D	2.0	1.7	1.8	1.7	1.5	1.3	11
1	1.2	1.2	1.2	1.3	1.3	1			\geq		1		Ŵ	T/	6 /2	2/0	1.8	1.8	1.8	1.7	1.4	1.2	10
10	1.1	1.2	1.2	1.2	1.4			X	Ŵ					1		* 1.8	1.8	1.8	1.8	1.5	1.3	1.1	09
6997800 ^{_1} 0	1,1	1.1	12	1.2	1.6	.7	X			Ŵ		X	Y	11/2	91.8	1.7	1.8	1.8	1.6	1.3	1.2	1.0	09
0 9	1.0	1.1	1.2	1.2	1.2	1.3	6 1166	7			Y	H	\bigcirc	1 (8 m)	1.7	1.8	1.8	1.8	1.4	1.2	1.1	1.0	09
0 9	1.0	1.0	1.1	1,1	12	1.2	1.2	1.6	1.6			11	T.	³ 1.6	1.7	1.8	1.7	1.6	1.3	1,1	1.0	0.9	09
0 9	0.9	1.0	1.0	1.1	1.1	1.1	2.4.2	1.2	1.4	6 1166	1	1.5	/1.5	1.5	1.7	1.7	1.7	1.4	1.3	1.1	1.0	0.9	09
6997700 ^{_08}	0.9	0.9	0.9	1.0	1.0	1.1	1.1	11	1.2	1.2	热	1.4/4	1.4	1.5	1.6	1.6	1.5	1.3	1.1	1.0	0.9	0.9	08
0 8	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.2	1.3/	1.3	1.4	1.5	1.6	1.6	1.3	1.2	1.1	1.0	0.9	0.9	08
0 7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0		1.2	1.2	1.3	1.5	1.6	1.4	1.2	1.1	1.0	0.9	0.9	0.9	08
0 7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	08
6997600 ^{_0} 7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.0	1.1	1.1	1.2	1.3	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.8	08
06	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	1.0	1.0	1.1	1.2	1.3	1.4	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	07
3	7460	00		3	1 7470	0		3	7480	00		3	7490	00		3	7500	00		3	7510	0	

	APPENDIX E – MAIN PIPELINE COMPRESSOR STATIONS FERC AIR QUALITY MODELING	USAP-PE-SRZZZ-00-000003-000 April 14, 2017
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FIGURE G-61 Honolulu Creek Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

1.7	119	2.1	2.5	2.9	316	4.6	5.4	5.6	312	2.1	2,1	2,2	210	2.0	2.2	2.3	2[1	2.0	2.0	2.3	214	2,3	2.0
17	2.0	2.4	2.8	3.3	4.3	5.9	7.2	8.2	6.2	2.3	2.5	2.4	2.0	2.1	2.4	2.3	2.2	2.1	2.2	2.7	2.7	2.4	21
1,9	2.2	2.5	3.1	4.0	5.3	6.6	8.9	10.4	9.5	3.6	3.0	2.8	2.3	2.6	2.6	2.4	2.5	3.0	3.0	2.8	2.5	2.3	23
6998100 ^{_20}	2.4	2.8	3.7	4.6	6.2	7.8	9.6	12.7	14.3	7.4	3.5	3,2	2.8	3.1	3.0	4.0	4.2	3.7	3.4	3.4	2.9	2.6	25
21	2.5	3.1	4,2	5.5	7.1	8.4	10.7	13.0	16.3	13.6	4.0	3.5	3.8	3.8	4.7	5.4	4.9	4.7	4.4	3.9	3.4	3,1	30
22	2.6	3.3	4.5	6.0	7.8	9.7	11.7	13.5	15.7	18.7	7.3	6.1	5.1	4.5	54	5,5	5.6	5.5	5.3	4.5	4.1	3,8	36
22	2.7	3.5	4.7	6.3	8.3	10.4	12.5	14.3	14.8	12.3	A		6.2	550	4.9	5.6	6.4	6.5	5.5	4.7	4.6	4.3	4 1
6998000 ^{_2} 2	2,7	3.5	4.8	6.4	8,5	10.8	13.0	15.0	15.7	184	TAVAS	STE		A	5	5.5	6.4	6.8	6.2	5,5	5.4	4,9	64
20	2.4	3.0	3.8	4.8	5.9	7.5	9.3	10.6	1416	8	N DI	ALL AND	-	1	1	5.1	551	\$.3	6.4	6.4	5.9	6.4	82
19	2.3	2.8	3.6	4.6	5.2	6.7	8.6	9.2	13,1	A.			60	841	2		1	24.9	4.4	5.2	5.6	8.5	90
1 8	2,1	2.5	3.0	3.8	4.7	5.3	6.4	8.6	12	A A	3	0	5	L	000	1	Par	54.9	4.3	5.7	7.0	9.3	81
6997900 ^{_16}	1.9	2.3	2.8	3.1	3.8	4.5	333	GEN		0 1	URBI	NE			K	1	5.7	4.6	4.9	6.0	8.6	9.0	69
1,6	1.8	1,9	2,3	2.7	3.0	2.02	10	SEAR S	16	4	N	Y	A	1	17	D	4.8	4.7	6.0	7.9	9.5	7.7	59
1 5	1.6	1.7	2.0	1.9	1.7	2.4	- Clin		\sum		1	Sugar	H		6 /4	4.6	4.3	5.6	5.9	9.8	8.3	6.5	52
14	1.4	1.5	1.5	1.5	1.9	7		X	Ŵ				5/	1-100	A	3.9	4.5	5.8	9.4	9.0	6.9	5.7	4 7
6997800 ¹ 3	1.3	1.3	2.4	1.5	19:	2.0	\geq			Ÿ		1	Y	13	58.5	3.6	5.0	8.1	9.5	7.5	6.2	5.1	40
12	1.3	1.3	1.3	1.4	1.5	1.9	22222				X	H	\bigcirc	221	2.8	4.6	5.6	9.1	8.2	6.4	5.4	4.4	34
12	1.3	1.3	1.3	1.3	1.5	1.6	1.7	2.1	2.0	\sum	al	1	20	2.0	2.4	4.7	7.5	9.0	7.1	5.6	4.8	3.8	30
12	1.2	1.3	1.3	1.3	1.5	1.5	- 4.5	1.6	1.8	0	1	1.9	/1.9	1.8	2.8	4.7	8.4	8.1	6.4	5.4	4.5	3.8	29
6997700 ¹ 2	1.2	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.6	Xis.	1.9.9	1.8	2.4	3.4	7.0	8.4	7.0	5.8	5.0	4.2	3.5	28
1 1	1.2	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.8	1.7	1.9	2.7	5.0	8.0	7.3	6.0	5.2	4.5	3.9	3.1	27
1 1	1.1	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.7	1.6	2.1	3.0	6.7	7.7	6.4	5.6	4.8	4.2	3.7	3.0	26
1 1	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.8	1.6	1.7	2.3	4.6	7.5	6.9	6.0	5.3	4.7	4.1	3.5	3.0	25
6997600 ¹	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.6	1.6	1.5	1.9	2.6	6.0	7.2	6.3	5.6	5.2	4.6	4.1	3.4	2.9	25
1 1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.7	1.5	1.6	2.1	3.6	6.4	6.8	5.8	5.2	4.9	4.4	3.9	3.5	3.0	25
3	7460	00		3	7470	00		3	7480	0		3	7490	00		3	7500	00		3	7510	0	

	APPENDIX E – MAIN PIPELINE COMPRESSOR STATIONS FERC AIR QUALITY MODELING	USAP-PE-SRZZZ-00-000003-000 APRIL 14, 2017
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FIGURE G-62 Honolulu Creek Compressor Station Modeling Results Annual Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

0.2	012	0.2	0.3	0.3	014	0.5	0.6	0.7	018	0.9	1.0	1,1	110	0.9	0.8	0.7	0[6	0.5	0.5	0.5	014	0.4	0.3
02	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1,1	1.2	1.3	1,2	1.2	1,1	0.9	0.8	0.7	0.6	0.5	0.5	0.4	03
02	0.3	0.3	0.4	0.5	0.6	0.8	0.9	1,1	1,2	1,4	1,6	1.6	1.5	1.4	1.3	1,2	1.0	0.8	0.7	0,6	0.5	0.4	04
6998100 ⁰²	0.3	0.3	0.4	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1/8	1.8	1.6	1.6	1.6	1,4	1,1	0.9	0.8	0.7	0.5	0.5	04
02	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.5	1.7	1.9	1.8	1.8	1.9	2.0	1.8	1.6	1.3	1,1	0.9	0.7	0.6	0.5	05
03	0.3	0.4	0.5	0.7	0,9	1.1	1.4	1.6	1.8	/1.9	1.9	2.3	2.1	2.2	20	1.7	1.5	1.2	1.0	0.8	0.7	0.6	05
03	0.3	0.4	0.5	0.7	1.0	1.2	1.4	1.6	1.8	1.8	A		2.3	2232	2.1		1.5	1.3	1.0	0.8	0.7	0.6	06
6998000 ⁰ 3	0.3	0.4	0,6	0.7	1.0	1,2	1,5	1.7	1.7	25	Toyas	STE		-A	2	1.9	5.6	13	1,1	0,9	0.7	0.7	09
03	0.3	0.4	0.5	0.7	0.9	1.2	1.5	1.7	2.0	To	N DI	Serve (0)		1	Í.	1.8	1.185	12	1.9	0.9	0.8	0.9	10
03	0.3	0.4	0.5	0.7	0.9	1,1	1/4	1.6	2.2	A.			60	811	2		A	3/19	0.9	0.8	0.8	1,1	10
03	0.3	0.4	0.5	0.6	0.8	1.0	1.2	230	12	P	9		5	Li	0	1	K	1.10	0.8	0.8	1.0	1,1	09
6997900 ⁰²	0.3	0.3	0.4	0.6	0.7	0.9	1,3	GEN		0	URBI	NE			Ľ	1	1.7	0.9	0.8	0.8	1,1	1.0	07
02	0.3	0.3	0.4	0.5	0.6	0.81	10	GEN	6	*	S	Y	A a	1	17	D	1.1	0.8	0.8	1,0	1,1	0.8	06
02	0.3	0.3	0.3	0.4	0.5	0.8	- M		\geq		1	Siles 1	H		6 /2	N.0	0.8	0.8	0.8	1.1	0.9	0.7	06
02	0.2	0.3	0.3	0.4	0.5	6		X	Ŵ					1-3- 10 A	Joge -	0.8	0.8	0.8	1.1	1.0	0.8	0.6	05
6997800 ⁰ 2	0.2	0.2	0.3	0.3	0.5		\geq			Ÿ		16	Y	19	70.7	0.7	0.7	1.0	1.0	0.8	0.7	0.6	05
0	0.2	0.2	0.2	0.3	0.3	Q. 0.4	0055	1			Y	H	\bigcirc	95	0.5	0.7	0.8	1.1	0.9	0.7	0.6	0.5	04
02	0.2	0.2	0.2	0.2	0.3	0.3	0.3	Q.5	2.4	\supset	al		0.	0.4	0.5	0.7	1.0	1.0	0.8	0.6	0.5	0.4	03
0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	4	1	0.4	/0.4	0.4	0.5	0.6	1.0	0.9	0.7	0.6	0.5	0.4	03
6997700 ⁰ 2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	2.4	0.9.3	0.3	0.5	0.5	0.9	0.9	0.7	0.6	0.6	0.5	0.4	03
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	p.2	0.3	0.3	0.3	0.4	0.7	0.9	0.8	0.7	0.6	0.5	0.4	0.4	03
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.3	03
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.3	03
6997600 ⁰ 2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.7	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.3	03
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	03
3	7460	00		3	7470	0		3	7480	00		3	7490	00		3	7500	00		3	7510	00	

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FIGURE G-63 Honolulu Creek Compressor Station Modeling Results Maximum 1-Hr Average CO Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

26	217	28	27	27	218	28	30	33	зр	28	29	31	29	29	34	34	3β	33	35	37	3ß	35	32
27	28	29	30	28	29	32	40	45	34	29	30	32	30	34	36	35	34	34	36	37	37	35	33
28	29	30	31	32	30	36	49	57	53	32	33	33	31	37	38	36	34	34	35	36	35	33	32
6998100- ³¹	30	31	33	34	34	43	52	69	78	41	35	34	34	36	38	36	36	39	37	36	35	33	33
58	37	33	34	35	39	46	59	71	89	75/	35	34	36	41	38	44	41	38	37	36	35	35	36
71	74	49	35	36	43	53	64	74	86	/102	40	53	44	41	45	43	42	38	37	36	37	38	4
73	81	87	66	39	45	57	68	78	80	67 • 10	-		52	435	40	38	40	38	38	37	39	45	84
6998000-77	85	93	101	92	46	59	71	82/	86	104	TANAS	STE		1	4	39	37	38	39	39	42	77	96
88	88	96	103	112	113	52	53	59	8296	TA	N Dr	TITI OF OF		~		43	440	86	40/	43	73	99	94
105	112	114	111	110	106	96	73	75	76	A			00	3.1	2		4	39	/35	39	98	96	80
105	114	115	115	112	102	85/	79	112		A.	3		T	Lo	10	1	A	496	35	43	101	84	61
6997900 ⁻⁹²	96	95	96	89	77	71	946	GEN		0 10	URBI	NE			X	-	144	38	39	52	97	69	54
80	77	67	57	48	44	63 8	36	JENR OF	10	*	No for	A	a	1	17	D	43/	37	50	103	79	53	65
69	69	62	50	40	42	62	, la				1		H		6 /	43	38	46	104	90	57	64	69
52	39	34	35	36	435	2						-	SI	1	AS	40	45	61	101	67	60	70	69
6997800 - ³⁰	31	32	84	36	49	53	_			1		6	Y	14	5/42	40	56	108	80	59	67	72	72
28	30	32	33	35	-36	45	592					H		ANA	38	57	119	99	60	67	73	7,1	77
28	30	31	32	34	37	37	38	49	46			//	43	39	47	90	110	87	60	73	73	75	81
27	29	30	31	32	35	35	34	33	38	4.84	1	42	/41	41	54	111	100	67	58	70	71	72	78
6997700 ^{_27}	28	29	30	32	32	32	32	32	32	34	140	4741	37	48	86	107	79	56	63	68	72	76	1
26	27	28	30	31	31	31	31	30	31	133	39/	36	42	50	110	92	61	58	66	68	72	77	80
25	26	27	29	30	30	30	29	29	31	34	36	36	42	86	103	76	56	60	66	68	71	76	78
24	25	28	28	28	29	28	28	28	31	37	34	37	45	106	90	64	55	59	63	65	71	73	76
6997600 ^{_23}	25	27	27	27	27	27	27	28	32	33	33	38	74	100	78	58	55	55	60	61	68	71	72
23	25	26	26	26	26	26	26	28	33	32	34	40	93	96	73	55	50	54	58	60	64	67	70

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FIGURE G-64 Rabideux Creek Compressor Station Modeling Results Maximum 1-Hr Average NO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

64440	00		6	4450	00		6	4460	00		6	4470	00		6	4480	00		6	4490
6896800 21	21	22	23	23	25	27	28	31	33	33	33	33	34	35	35	34	32	31	31	31
21	22	22	23	24	26	28	31	33	34	34	35	35	36	36	35	34	33	32	33	33
22	22	23	24	26	27	30	35	35	35	35	37	36	37	37	36	36	34	34	34	34
22	23	24	25	27	29	32	36	39	36	35	37	38	40	38	37	36	35	35	35	37
6896900 ^{_23}	23	24	26	28	30	34	38	38	38	38	39 Base	40	108 42us	40	39	37	36	35	37	39
24	25	25	27	29	31	37	394		43	43	44	43	43	41	40	39	38	37	39	42
24	25	26	28	30	32	39	4	E	C		T	45	46	16 4	6 464	6 42	41	40	43	47
24	26	28	30	33	36	40	433	1	11	() () () ()	6	0			49	49	47	45	51	52
6897000-27	28	30	33	36	40	43	44	P	-	4	5	6	407 004	ASTE	54	57	53	51	60	59
29	32	33	36	40	44	47	49	5	08		0		-1	儿	62	67	61	64	69	54
31	33	36	38	42	48	54	9	-	1000	TY.	HUL	BALE	en		788	79	70	74	66	59
32	35	38	41	45	51	63 59			Pla	Barrian	To	1		H	0508	88	74	83	75	58
6897100- ³³	37	40	44	48	56	76 70 63 63 59	F	5		Carling Carling		avoi	NH H	SILI	9 81	81	104	99	86	76
35	38	42	47	51	60	76	in the	L.M.	H	1	-	1		12 74 F	74	17	121	121	114	105
36	39	43	48	53	62	80				EATE	R4		-Tera.	- AND	63	104	121	120	119	1 8
37	42	44	50	57	68	85	1		HT TH	ATER	2	t	+	17-	-66	63	117	119	118	17
6897200- ³⁸	42	46	51	58	1.1	5 mour	A HOLYLS H	(F	HE	ATER	1	T	1	77 75 77	64	55	79	110	105	12
38	42	46	51	58	708	p		10-100	- Jan		15	-	ti	2 72	62	52	48	82	102	97
38	42	45	50	55	72	X	tor young I	and the second second	and writer	Information		~		5 63	58	50	50	51	81	92
6897300- ³⁰ 38	41	44	49	54	100	4	1	1 de la	a la	212	-	1	60	57	51	46	54	53	51	74
6007200 36	39	42	46	50	N/S	1	1	1	1	1	1	1	56	53	48	44	55	55	53	49
35	38	41	44	47	765	X	200	6 50	58	100	1	L	1 St	49	45	42	52	54	49	44
34	36	39	41	44	145	50	50	T	50	1.	53	51	48	45	41	38	41	46	39	37
6897400 - 3 ¹ 32	34	36	39	41	44	46	41	42-	-43-	45	45	43	43	40	37	34	32	36	36	35
	33	35	36	38	41	39	35	36	37	40	40	39	38	36	33	30	27	29	34	33
29	31	32	34	35	38	34	31	32	32	35	36	35	34	32	30	27	24	24	31	32
26 28	28 29	29 31	30 32	31 33	29 33	26 28	26 29	26 29	29	32	29 32	28 32	27 30	25 28	26	24	23	23	22	28 30

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FIGURE G-65 Rabideux Creek Compressor Station Modeling Results Annual Average NO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

64440	0		6	4450	00		6	4460	00		6	4470	00		6	4480	00		6	44900
6896800 ⁴³	4.5	4.7	4.9	5.2	5.5	6.0	6.5	7.4	7.8	7.9	8.0	8.1	8.2	8.2	8,1	8.0	7.9	7.7	7.5	75
4 5	4.7	4.9	5.2	5.4	5,9	6.5	7.2	7.9	8.2	8.4	8.6	8.7	8.8	8.8	8.7	8.6	8.4	8.3	8.2	81
46	4.8	5,1	5.4	5.8	6.3	7.0	8.2	8.5	8.8	9.0	9.2	9.4	9.5	9.5	9.4	9.2	9.1	9.0	8.8	86
4 8	5.0	5.3	5.7	6,2	6.8	7.5	8.5	9.4	9.4	9.8	10.0	10.2	10.3	10.3	10.2	10.0	9.9	9.6	9.3	92
6896900 ⁴ 9	5.2	5.5	6,1	6.5	7.1	8.2	9.2	9.7	10.1	10.5	10.9 Becar	11.1	11.2	11.2	11.1	10.9	10.6	10.3	10.0	98
5 1	5.4	5.7	6.2	6.8	7,5	8.9	9.8	9 10	510191	11.7	11.8	11.8	11.8	11.8	11.8	11.8	11.5	11.1	10.7	10.5
52	5.5	5.9	6.4	7.1	7.8	9.6	194	to a	510191		11.0	11.8	1.9 1	1.9 11	.9119	91.9	11.8	11.8	11.6	11.3
54	5.7	6.1	6.7	7.5	8.3	10.1	10.9	1	11	() ()		0						11.9		
6897000 ⁵⁵	5.9	6.3	6.9	7.8	8.9	10.0	11.4	Y	T	-	5		tor all	ASTE	11.9	12.0	12.0	12.0	12.0	11.8
5 5	6.0	6.6	7.3	8.2	9.5	10.4	11.7	1			6			儿				12.0		
56	6.1	6.7	7.4	8.2	9.7	11.4		1	III WALL	TH.	Hauses	CHARACTER IN THE	a	0	1.20	11.9	12.1	12.1	12.0	11.9
5 7	6.2	6.7	7.4	8.2	9.6	11.8	0		The lo	1 Dianola	Fo	Te			9. B	11.8	12.1	12,1	12.0	11.9
6897100 ⁵⁷	6.2	6.8	7.6	8.4	10.0	113	-	7		12 CONTRACTOR		China -	AL DI		32.0	11.8	12.1	12.1	12.0	11.9
58	6.2	6.8	7.6	8.4	9.8	11.7	So to	EX.	H	L Lange	t	-			011.9	11.8	12.1	12.1	12.0	11.9
57	6.2	6.7	7.4	8.2	9.3	11.4				EATE	R4		GEN	1012.0	11.8	11.9	12.1	12.1	11.9	11.9
57	6.3	6.6	7.3	8.1	8.9	1.1	1		HT.	ATER	R2 R3	+	-	11.	a-1x1-8	12.0	12.1	12.0	11.9	11.8
6897200 ⁵⁶	6.1	6.5	7.2	7.8	8.61	5.5	A HOLYIS H	(F.	HE	ATER	1	1	1	11.9	12.0	12.0	12.0	11.9	11.8	11.7
54	5.9	6.4	7.0	7.5	8.6	8		10-100	alm.		Ser.		1	1000	11.9	11.9	11.9	11.8	11.7	11.1
5 3	5.8	6.2	6.7	7.1	8.9	Lavance .	at vinne 1	na nume a		Taba	0		0	11.9	1			11.7		10.4
53	5.6	6.0	6.4	6.8	88	1	X	1 m	and the second	11 1	And a	1	The	11.8	1.8	11.6	11.4	11.0	10.4	98
6897300 ⁵ 1	5.4	5.6	6.1	6.5	83	1	1	1	1	1	1	Y	18.9	12	11.2	11.0	10.6	10,1	9.7	89
48	5.1	5.5	5.9	6.1	188	8.1 8	4	17.8 m	OF HOLES	and the	L	J	tet	10.3	10.2	10.0	9.7	9.4	8.7	79
47	4.9	5.2	5.6	5.8	6.3	1	they are	X	8.0	11	9.3	9.3	933	9.5	8.7	8.8	9.0	8.0	6.8	63
6897400 ⁴ 3 45	4.7	5.0	5.3	5.5	6.0	6.4	6.9	7.2	-7.6	7.5	7.6	18	8.6	8.	7.6	7.5	7.1	6.4	6.0	57
c007400 43	4.6	4.8	5.0	5.3	5.7	5.9	6.2	6.5	6.8	6.9	7.0	7.0	7.5	7.3	6.8	6.3	5.9	5.7	5.6	54
42	4.4	4.6	4.8	5.0	5.5	5.7	5.9	6.1	6.2	6.1	6.5	6.6	6.5	6.4	6.1	5.7	5.5	5.4	5.3	51
40	4.2	4.4	4.6	4.8	5.2	5.4	5.5	5.6	5.7	5.7	5.9	6.0	5.8	5.5	5.3	5.2	5.2	5.1	5.0	49

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-66 Rabideux Creek Compressor Station Modeling Results Maximum 24-Hr Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

56	5.9	6.2	6.4	6[6	6.1	5.5	5.6	5[6	5.6	6.3	6.3	611	5.8	5.3	5.0	417	4.4	4.1	3.9	317
59	6.3	6.6	6.9	7.2	7.1	6.0	6.1	6.2	6.2	6.9	7.0	6.9	6.5	6.1	5.6	5.1	4.8	4.4	4.2	40
62	6.6	7.0	7.3	7.7	8.1	7.0	6.8	6.9	7.0	7.8	7.9	7.7	7.4	7.0	6.5	5.9	5.2	4.8	4.4	42
6897400 ⁶⁵	6.9	7.4	7.8	8.2	8.8	8.3	7.6	7.9	8.0	8.9	8.9	8.5	8.4	7.9	7.2	6.6	5.8	5.3	4.8	45
68	7.3	7.8	8.3	8.8	9.5	9.8	8.8	9.1	-9.4	TRT	10.0	9.6	9.5	8.8	8,1	7.6	7.0	6.1	5.3	49
71	7.6	8.2	8.8	9.3	101	10.8	10.0	10.7	10.9	1129	12.9	13	1066	10.0	9.0	8.5	8.0	7.2	6.2	56
74	8.0	8.6	9.4	10.0	12212	2.1	3.4 1	0 12	S HOTAR	- Carl	S	1	16		10.2	9.3	8.6	7.9	7.2	68
6897300 77	8.3	8.9	9.8	10.7	13.4	1	1	1	1	1	1	N	18.5	11.9	10.9	10.0		8.4	8.0	74
79	8.6	9.3	10.3	11.3	148	1	1	1 m	a la	Turn	-	1	13	12.9	1.6	10.5	9.6	8.9	8.3	8 1
79	8.8	9.5	10.6	11.7	15	4 avance	at visiting)	an anna		in the second	a	-	14	.1	- 1	11.2		9.1	8.9	96
80	8.8	9.6	10.8	12.2	15.0	.2		10-100	-1.1-		15		1	6.3 16.3	14.0	11.9	10.4	9.4	10.5	99
6897200 ^{_80}	8.8	9.6			14.9	1.1	A HOLYLS H	The I	HE	ATER	1	1	M	17.1	14.5	12.4	10.6	11.0	10.5	10.9
79	8.8	9.4		12.3		8.4	1		= m	ATER	2 3	+	+1	17.5	.14.8	12.6	11.5	13.1	12.3	11.4
75	8.3	9 <u>.</u> 1	10.2	.50	1.2	17.4	-//			EATE	R4 R5	1	-+	185	14.3	1		13.6	1.11	1.1
74	8.1	8.9	10.0	11.1	13.0	16.8	50	M	Har.		6		GEN	1216.6	14.3	13.2				
6897100 ⁻⁷¹	7.8	8.6	9.6		12.3	15.6	A	L		Deces		an	Sel E	21117	3	14.5				
67	7.5	8.1	9.0	9.8	11.2	14.	2	th	P	-	P	1	D D D	9	Eyes .	15.2				12
65	7.1	7.7	8.2	9.2	10.6	10	3	1	NOUS	TYC	HU	BINE	01	F	1	-		14.3	13	
61	6.7	6.9	7.7	8.6	9.7	1 10.5	22	1	00		0	2	(2 10)	Æ	1.59	16.1	1.51		. . .	
6897000 ⁵⁷	5.9	6.4	7.0	7.8	8.6	9.4	10.9	13	1	X	5	-	10	ASTE						
51	5.5	5.9	6.5	7.1	7.7	8.5	912 811 76	1	TT	(3)		0	till.	USU		115.4		15.4		
49	5.2	5.5	5.9	6.5	6.9	7.4	6.97	$\left(\right)$	L	_		1		0.9 13	1	1.	1-	- 91	9.0	99
46	4.9	5.2	5.6	5.9	6.3	6.4		6.4	6.67	3.8	7.4	7.6	54	10.1		1.4.5.	8.5	7.6	7.0	65
	4.6	4.8	5.2	5.5	5.6	5.5	5.8	5.9	第5 6.1	6.4	6.7		- 7.4.us	1	8.5	8.3	7.9	7.3	6.7	63
6896900 <u>4</u> 4 42	4.3	4.5	4.8	5.1	5.1	5.1	5.4	5.5	1	5.9	6.2	6.4	6.6	7.1	7.4	7.4	7.2	6.8	6.3	60
40	4.1	4.3	4.5	4.6	4.6	4.8	5.2	5.3	5.4	5.6	5.7	5.9	6.1	6.4	6.6	6.7	6.6	6.4	6.1	57
39	3.9	4.1	4.2	4.1	4.3	4.6	4.8	5.0	5.1	5.3	5.4	5.5	5.7	5.9	6.1	6.2	6.2	6.1	5.9	57
	3.8	3.9	3.9	3.9	4.1	4.3	4.5	4.7	4.8	4.9	5.1	5.2	5.3	5.5	5.7	5.8	5.9	5.8	5.7	55
6896800 38 64440			- 5	1 4450				1 4460				1		-		1		-	-	44900

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FIGURE G-67 Rabideux Creek Compressor Station Modeling Results Annual Average PM₁₀/PM_{2.5} Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

64440	0		6	4450	00		6	4460	00		6	4470	00		6	4480	00		6	4490
6896800 ⁰⁵	0.5	0.6	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.2	11
06	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.4	13
oe	0,6	0.7	0.7	0.8	0.8	1.0	1.2	1.4	1.5	1.6	1,8	1.9	1.9	1.9	1,9	1.8	1.8	1.7	1,6	15
06	0.7	0.7	0.8	0.8	0.9	1,1	1,3	1:5	1.7	1.9	2.0	2.1	2.2	2.2	2,2	2.1	2,1	1.9	1.8	17
6896900 ⁰ 7	0.7	0.8	0.8	0.9	1.0	1.2	1.5	1.7	1.9	2	2.3	2.4	2.5	-2.5	2.5	2,4	2.3	2,1	2.0	19
07	0.7	0.8	0.9	1.0	1,1	1.3	1.6	74-1.9	22:11	3.4	2.6	2.7	2.7	2.7	2.7	2.7	2.5	2.4	2.2	21
07	0.8	0.9	0.9	1,1	1.2	1.5	118	No.	C	-		2.7	2.7 2	.6 2	62.6	7 2.8	28	2.6	2.4	22
08	0.8	0.9	1.0	1,1	1.3	1.5	18	1	11	(a sided	Non I	0			2.9	2.9	2.9	2.8	2.6	24
6897000 ⁰⁸	0,9	1.0	1,1	1,2	1,4	1.6	118	1		4	5	-	101 00	ASTE	31	2.8	2.9	2.9	2.8	24
08	0.9	1.0	1_1	1.3	1.5	1.6	1.8	1	08	5	0		1-	N	3.0	12.8	2.9	2.9	2.7	23
09	1.0	1,1	1,2	1.3	1.6	1.8		1	NOU2	TA.	HUL HOUSES	BANE	or	e	2/37	2.8	2.9	2.8	2,6	23
09	1.0	1,1	1.2	1.4	1,6	2.0	2		Pla	1 Danote	Fo	7	S S S S		2.7	2.6	2.9	2.7	2.5	22
6897100 ⁰⁹	1.0	1,1	1.3	1.4	1.8	23	F	1		Succession of the second secon		040	NI ST.		62.6	24	2.6	2.5	2.3	21
0.9	1.0	1,2	1.3	1.5	1.8	244	10 Miles	L.	H		-	1		12 C-	2.5	2.3	2.4	2.3	2.1	19
09	1.0	1,1	1.3	1.5	1.9	25				EATE	R4		n-a	207	2.4	2.3	2.2	2.1	1.9	18
091200	1,1	1,1	1.3	1.5	1.9	24	1		HT TH	ATER	2 23	+		27		2.2	2.0	1.9	1,7	16
6897200 ⁰ 9	1.0	1.1	1.3	1.5	1.82	2	VA HOLYLS H	nis It	HE	ATER	1	1	N	27	2.4	2.1	1.9	1.7	1.5	15
09	1.0	1,1	1.3	1.4	1.8	141		0-90	-1-		55		2	5	2.2	2.0	1.7	1.6	1.4	13
09	1.0	1.1	1.2	1.3	1.14	L	int stature of	and	aniwina ©	Infinition		1	-	2	2.0	1.8	1.6	1.5	1.4	12
6897300 08	1.0	1.0	1,1	1.2	TR	1	H	Y	at the second		-	1	A	161	1.8	1.6	1.5	1.4	1.3	12
Ť	0.9	1.0	1,1	1.2	14	T	1	/	1	1	1	1	A	1.8	1.6	1.5	1.4	1.3	1.2	11
08	0.9	0.9	1.0	1.1	133	44	1 A	13 7	THE BOARD	45	X	X	15	4.5	1.5	1.4	1.3	1.2	1,1	10
07	0.8	0.9	1.0	1.0	Tex.	TX	T	17	14	1.	1	4.5	14	1×	1.3	1.2	1.2	1.1	0.9	08
6897400 07 07	0.7	0.8	0.9	0.9	1.0	1,1	1.2	1.2	-12	1.1	1.1	1.1	1.1	V	1.1	1.1	1.0	0.9	0.8	07
06	0.7	0.7	0.8 0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.8	0.7	0.7	0.6	07
06	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	06
06	0.6	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	07	0.7	0.6	0.6	06

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FIGURE G-68 Rabideux Creek Compressor Station Modeling Results Maximum 1-Hr Average SO₂ Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

6896800 16 64440		1.0		1 4450		2.1		4460		0.2		1 4470	-	2.0		1		2.4	-	4490
16	1.7	1.7	1.7	1.8	2.0	2.4	2.8	3.2	3.6 3.0	3.7	3.8	3.9	3.8	3.1	2.7	2.7	2.7	2.6	2.4	23
16	1.7	1.8	1.8	2.0	2.3	2.6	3.3	3.7	3.9	4.2	4.4	4.4	4.4	3.8	3.1	3.1	3.0	2.8	2.5	24
17	1.7	1.8	1.9	2,1	2.5	2.9	3.7	14:0×		5.4	5.0	4.9	5.3	4.6	3.6	3.5	3.3	3.0	2.7	25
6896900	1.7	1.8	2.0	2.3	2.6	3.3	4.1	4.9	5.8	6%	6.6 Near		5.9		4.4	4.2	3.7	3.2	2.8	30
17	1.8	1.8	2.0	2.4	2.8	3.6	1	20.6.3	32	*	8,4	1.5	6.4	6.0	5.7	5.0	4.2	3.5	3,3	33
17	1.8	1.8	2.0	2.4	2.9	4.0	545	113	-7.0	8.1	0.0	0.0			67.2	1.	53	5.6	11.6	
1 7	1.8	1.9	2.1	2.5	3.0	4.1	57	(L	(MOTE 5			+	-	10.9	919.8	22.7		1.	-D
6897000 ¹⁷	1,9	2.0	2.3	2.7	3,2	4.0	58	手	T	-0-	6 6	69		ASTE		19.7	22.0	20.0	- 24	E
1 7	1.9	2.0	2.3	2.6	3.1	3.6	5.4	1	1			-		N			21.5	20.1	17.0	13.2
17	1.8	2.0	2,2	2.5	3.0	3.7	15	ta	III wow	TH.	HOU ME	₩	al	e III	22.08	21.1	19.5	18.4	15.7	12.8
17	1.8	2.0	2,1	2.3	2,6	2.8	4 @	111	and the	Dimote	To B	BIALE		E.	19.3	18.6	17.6	15.9	13.7	11.3
6897100 ¹⁷	1.8	1.8	2.0	2,1	2.4	2.6			T	₿8°		an	NH SHE		16.1	15.9	14.9	13.0	11.4	96
17	1.8	1.8	2,0	2,1	2.4			P.M.		Date -	T	-		12	011.5	12.3	11.6	10.8	9,0	75
17	1.8	1.8	1.9	2.1	2,2	26				EATE	R5	+	GEN	11100	8.4	9.3	9.1	7.9	7.2	58
17	1.8	1,8	1.9	2.0	2.1	25]		HT.	ATER	2	t	-)-1	114	s-5.9	6.8	6.2	6.0	5.4	44
6897200 ¹⁷	1.7	1.8	1.9	2.0	2,12	4	A HOLYLS H	(F.	HE	ATER	1	1	1	2.8 3.0 310	4.1	4.7	4.4	4.4	3.8	35
1 6	1.7	1.8	1.9	1.9	2.7	4		0-265	-la-	_	55		2	2.7	3.2	3.0	3.3	3.2	3.1	28
16	1.7	1.7	1.8	1.9	23	All and	in sures	and a series and		in and	() ()		in the second se	4 2.6	2.7	2.6	2.8	2.6	2.6	26
16	1.7	1.7	1.8	1.8	28	4	H		a la		-	1	X	1 1	2.4	2.4	2.5	2.4	2.3	23
6897300 ¹⁵	1.6	1.6	1.7	1.8	22	S	1	/	1	1	1	Z	22	2.3	2.3	2.3	2.2	2.2	2.2	21
15	1.5	1.6	1.7	1.7	201	X	No to	18 2	19.21	A CAR	X	X	X	22	2.2	2.2	2.1	2.1	2.0	19
14	1.5	1.6	1.6	1.7	NX	T8	-	17	19	1.1	21	21	21	24 No	2.0	2.0	2.0	1.9	1.7	16
6897400 - 4 14	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.8-	1.0	18	1.8	1.9	2.0	1.9	1.8	1.8	1.8	1.6	1,4 1,5	14
14	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.6	1.7	1.7 1.8	1.7	1.7	1.6	1.5	1.4	1.4	1.4	14
14	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.4	14
13	1.4	1.4	1,4	114			10	10	10		4.0		4.0							

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-69 Rabideux Creek Compressor Station Modeling Results Annual Average SO₂ Concentrations (μg/m³) (Coordinates are UTM NAD83, in meters)

64440	00		6	4450	00		6	4460	00		6	4470	00		6	4480	00		6	44900
6896800 ⁰²	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.6	05
02	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.9	1.0	1,1	1,1	1.2	1,1	1,1	1.0	0.9	0.8	07
02	0.2	0.2	0.2	0.3	0.3	0.4	0,6	0.7	0.9	1,1	1,3	1.4	1.5	1.5	1.4	1.4	1.2	1,1	1,0	08
02	0.2	0.2	0,2	0.3	0.4	0.5	0.7	0.9	1.1	1.4	1.5	1.7	1.8	1,8	1.8	1.7	1.5	1.3	1,1	10
6896900 ⁰ 2	0.2	0.2	0.3	0.3	0.4	0.6	0.8	1.1	1.3	1.50	1.8	2.0	10 2 1 1 IS	-2,1	2.1	1.9	1.8	1.6	1.3	12
0,2	0.2	0.2	0.3	0.3	0.4	0.7	1.9	0-1.3	11:5	1.8	2,0	-	2.3	2,3	2.3	2.2	2.0	1.8	1.5	13
02	0.2	0.2	0.3	0.4	0.5	0.8	1.1	- Country	-		2.1	2.3	2.3 2	.3 2	32.3	3 2.4	22	1.9	1.7	14
02	0.2	0.2	0.3	0.4	0.5	0.8	11	1		() (MOIE 6		0		-	24	2.5	2.3	2,1	1.8	15
6897000 ⁰²	0,2	0.2	0.3	0.4	0,5	0.8	11	Y	T	4	18	100	tor or	ASTE	24	2.5	2.3	2,1	1.9	15
02	0.2	0.3	0.3	0.4	0,5	0.8	1.0	5			10			儿	23	12.5	2.3	2,1	1.8	14
02	0,2	0.2	0,3	0.4	0.5	0.8		+		T.	HOUXS	E ANE	en	-	2/33	2.3	2,1	2.0	1,7	14
02	0.2	0,2	0,3	0.3	0.5	0.7		IT	Pla	ID MINOLIO	To	1	1 O O	ill.	2.2	2	2.0	1.8	1,5	12
6897100 ⁰²	0.2	0.2	0.3	0.3	0.4	0.6	F1	1		section constant		040	NI II	I I	01.9	1.8	1.7	1.5	1.3	11
02	0.2	0.2	0.3	0.3	0.4	0.5	States -	业	F	- Line of	-	-			1.6	.5	1,4	1,3	1,1	0,9
0 2	0.2	0.2	0.2	0.3	0.3	04				EATE	R4	-	TAB.	85	1.3	1.2	1.2	1,1	0.9	07
02	0.2	0.2	0.2	0.3	0.3	04	1		HT TH	ATER	12 73	t	+-	0.8	a-4:0	1.0	0.9	0.8	0,7	06
6897200 ⁰²	0.2	0.2	0.2	0.2	0.30		SA MOLIVIS H	(E	HE	ATER	1	1	1	0.7 0.8	0.8	0.7	0.7	0.6	0.5	04
02	0.2	0.2	0.2	0.2	0.3	3		10-100	s.l.m.		5		0	5 0.6	0.6	0.6	0.5	0.5	0.4	04
02	0.2	0.2	0.2	0.2	0.03	A and	t surf and	and and a		-	(a)		0	4 0.4	0.5	0.4	0.4	0.4	0.3	03
02	0.2	0.2	0.2	0.2	of	2	X		attention to	111	and the second	1	04	0.4	0.4	0.3	0.3	0.3	0.3	03
6897300 02	0.2	0.2	0.2	0.2	02	N	N	1	1	1	1	1	03	0.3	0.3	0.3	0.3	0.3	0.3	03
02	0.2	0.2	0.2		0022	220	N/O	0.0	0.2.2	No la construction de la constru	X	L	03	0,3	0.3	0.3	0.3	0.3	0.2	02
02	0.2	0.2	0.2	0.2	toz.	52	-	11	1.	1.1	11	0.2	023	03	0.2	0.2	0.2	0.2	0.2	02
6897400 ⁰²	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-0.2	0.2	0.2	0.2	0.2	02	0.2	0.2	0.2	0.2	0.2	02
1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02
02	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	02

	APPENDIX E – MAIN PIPELINE COMPRESSOR	USAP-PE-SRZZZ-00-000003-000
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FIGURE G-70 Rabideux Creek Compressor Station Modeling Results Maximum 1-Hr Average CO Concentrations (µg/m³) (Coordinates are UTM NAD83, in meters)

70 74 78 82 86 90	74 78 83 87 92	77 82 87 93	80 85 92	80 90 98	68 79 93	69 76	70 78	70 78	77	78	77	73	69	63	57	53	50	47	45
74 78 82 86	83 87	87	92	121	101		78	78											
82 86	87		130	98	93				86	88	86	82	78	72	66	58	54	50	47
86	1.5	93	00		93	86	88	90	99	98	95	93	88	80	74	65	59	54	51
	92		98	106	110	99	103-	105	12	110	107	106	97	90	84	78	69	60	56
90		99	105	13	120	120	120	121	1329	133	125	118	TH	100	94	89	80	70	63
	97	106	113	1887	43	50 1	5 13	Da MORANTE	1 Ser	D	Y	128	122	113	103	95	88	80	75
94	101	111	121	151	1	1	1	1	1	1	1	139	VIJ2	120	111	102	93	89	83
97	105		128	1000	1	1		atternet the	Tunn	-	1	150	143	128	116	107	98	131	97
100		1.5	133	178	X	C muter so	and and a	athurnan (Tabatut	annin a	~	6	2	145	124	111	101	1.5	11
- 34		-11		TALEY)	1		10-100	-la-		CAT		1		154		1			115
	1.					NOLYIS H	nix 1	HE	ATER	1	1	1	93 189	1					121
	9.				1	1		I THE	ATER	2	+		194	-				12.	126
1	1.00				195	11			- HO				120	1.5	1.				132
		-	1.		187	Si Si	M	He	10			E GEN	PILL	165	1			1.	13
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Alaska LNG.	APPENDIX E – MAIN PIPELINE COMPRESSOR STATIONS FERC AIR QUALITY MODELING REPORT	USAP-PE-SRZZZ-00-000003-000 April 14, 2017 REVISION: 0
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Appendix H: MAKEMET Screening Meteorology Standard Operating Procedure

1.0 INTRODUCTION AND PURPOSE

In lieu of hourly site-specific or National Weather Service (NWS) Automated Surface Observing System (ASOS) data, screening meteorology input data for modeling conducted with AERMOD was developed for each compressor station site using the MAKEMET pre-processor. This screening meteorology input data consists of a matrix of "worst-case" meteorological conditions. This procedure describes how to generate the worst-case input file using MAKEMET.

2.0 GENERATION OF MAKEMET SCREENING METEOROLOGY

Screening meteorological input files will be developed using the following procedure for all compressor stations utilizing screening meteorology for dispersion modeling.

- 1. For each site divide a 1-km radius circle centered on the main block valve into twelve 30° sectors. Run the modified AERSURFACE for each site and sector to determine the surface characteristics according to season. The procedure for determining seasonal classifications and seasonal temperature ranges is described in the project FERC Dispersion Modeling Protocol.
- 2. Create a MAKEMET input ASCII text file for each of the 12 sectors around the site for a total of 12 input files. Each MAKEMET input files consists of the following prompts:

Enter Surface meteorology file name [output file] Enter Profile meteorology file name [output file] Enter minimum wind speed (m/s) <<set to a default of 0.5 m/s for all sites according to the FERC Dispersion Modeling Protocol>> Enter anemometer height (m) <<set to a default of 10 m for all sites according to the FERC Dispersion Modeling Protocol>> Enter number of wind directions Enter starting wind direction Enter clockwise increment Enter Min and Max ambient temperature (K) Enter Albedo Enter Bowen Ratio Enter Surface Roughness (m) Append another file (i.e. next season)

- a. The objective is to create 12 MAKEMET input files (one per sector) sufficient to cover 36 wind directions starting at 5° and incrementing by 10° and ending at 355°. To meet that objective using 12 sectors, each file is limited to 3 wind directions. Therefore, for the first sector (from 0° to 30°), the 'starting wind direction' should be 5° with a clockwise increment of 10°. Hence the first sector will contain 5°, 15° and 25°. The second sector should contain 35°, 45° and 55°, and so on.
- For the last four inputs (Min and Max Temperature, Albedo, Bowen Ratio, and Surface Roughness), the values are entered for the first season modeled, Winter with snow (1st half). The Min and Max Temperature, Albedo, Bowen Ratio and Surface Roughness values were determined for the site, season and sector determined in Step 1.
- c. MAKEMET allows the user to append another set of inputs provided the same directions are utilized. Utilizing this option, the other four seasons, namely Winter with snow (2nd half), Spring, Summer and Autumn, are entered within the same input file for a given set of wind

directions (i.e., all 5 seasons are contained within the MAKEMET input file for a single sector).

- d. Continue adding seasons into the single sector input file until all 5 seasons have been added and then start creating the input file for the next of the 12 sectors until input files for all sectors have been created.
- 3. Once the MAKEMET input files are created, run MAKEMET in a batch mode, passing in the input files for each sector to the program one at a time.
- 4. Once the twelve pairs of MAKEMET-generated surface and profile files are created concatenate them to produce a single surface and profile pair of files for each site.
- 5. Though the MAKEMET surface and profile files are formatted similar to a Stage 3 AERMET surface and profile files, some additional manipulation needs to be conducted so that they are compatible with running AERMOD outside of "screening mode" as follows.
 - a. Replace the timestamp, with a sequential dummy timestamp (comprised of the year, month, day or month, Julian day and hour) in both the profile and surface files. Due to variations in the seasonal temperature ranges, each site will have a slightly different period length but all will be approximately twelve years long.
 - b. For the Ozone Limiting Method (OLM) processing associated with NO2, fill both the surface and profile files with 'missing data' so that each file represents a record of complete calendar years.
 - c. In the surface files, for the final five columns, replace the AERSCREEN index numbers with the appropriate 'missing' values for the corresponding AERMET variables.
 - d. The latest version of AERMET (11053) has an additional column in the surface file which notes if any missing winds have been substituted and if so, from what data set. Since no substitutions were performed, fill the final columns with 'NAD'.
 - e. Finally, mark the surface file and profile file with a dummy header line using coordinates and call numbers for the Barrow NWS station so that AERMOD