Equitrans Expansion Project

Docket No. CP16-__-000

Resource Report 9 – Air Quality and Noise

October 2015

Equitrans Expansion Project
Resource Report 9 – Air Quality and Noise

Resource Report 9 Filing Requirements	
Information	**Location in Resource Report**
Minimum Filing Requirements	
1. Describe the existing air quality, including background levels of nitrogen dioxide and other criteria pollutants that may be emitted above EPA-identified significance levels. (§ 380.12(k)(1))	Section 9.1.2.2
2. Quantitatively describe existing noise levels at noise-sensitive areas such as schools, hospitals, or residences and include any areas covered by relevant state or local noise ordinances: • Report existing noise levels as the L_{eq} (day), L_{eq} (night), and L_{dn} and include the basis for the data or estimates. • For existing compressor stations, include the results of a sound level survey at the site property line and nearby noise-sensitive areas while the compressors are operated at full load. • For proposed new compressor station sites, measure or estimate the existing ambient sound environment based on current land uses and activities. • Include a plot plan that identifies the locations and duration of noise measurements, the time of day, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement. (§ 380.12(k)(2)(i-iv))	Section 9.2.3 and Appendix A
3. Estimate the impact of the project on air quality, including how existing regulatory standards would be met. • Provide the emission rate of nitrogen oxides from existing and proposed facilities, expressed in pounds per hour and tons per year for maximum operating conditions, include supporting calculations, emission factors, fuel consumption rates, and annual hours of operation. • For major sources of air emissions (as defined by the Environmental Protection Agency), provide copies of applications for permits to construct (and operate, if applicable) or for applicability determinations under regulations for the prevention of significant air quality deterioration and subsequent determinations. (§ 380.12(k)(2)(i-ii))	Section 9.1.5 and Appendices C and D
4. Provide a quantitative estimate of the impact of the project on noise levels at noise-sensitive areas, such as schools, hospitals, or residences. • Include step-by-step supporting calculations or identify the computer program used to model the noise levels, the input and raw output data and all assumptions made when running the model, far-field sound level data for maximum facility operation, and the source of the data. • Include sound pressure levels for unmuffled engine inlets and exhausts, engine casings, and cooling equipment; dynamic insertion loss for all mufflers; sound transmission loss for all compressor building components, including walls, roof, doors, windows and ventilation openings; sound attenuation from the station to nearby noise-sensitive areas; the manufacturer's name, the model number, the performance rating; and a description of each noise source and noise control component to be employed at the proposed compressor station. For proposed compressors the initial filing must include at least the proposed horsepower, type of compression, and energy source for the compressor.	Section 9.2.4 and Appendix A

Resource Report 9 Filing Requirements	
Information	**Location in Resource Report**
• Far-field sound level data measured from similar units in service elsewhere, when available, may be substituted for manufacturer's far-field sound level data. • If specific noise control equipment has not been chosen, include a schedule for submitting the data prior to certification. • The estimate must demonstrate that the project will comply with applicable noise regulations and show how the facility will meet the following requirements: ▪ The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day- night sound level (L_{dn}) of 55 dBA at any pre-existing noise-sensitive area (such as schools, hospitals, or residences). ▪ New compressor stations or modifications of existing stations shall not result in a perceptible increase in vibration at any noise-sensitive area. (§ 380.12 (k)(4)(i-v))	
5. Describe measures and manufacturer's specifications for equipment proposed to mitigate impact to air and noise quality, including emission control systems, installation of filters, mufflers, or insulation of piping and buildings, and orientation of equipment away from noise-sensitive areas. (§ 380.12 (k)(5))	Sections 9.1.7 and 9.2.4

FERC Environmental Information Request for Resource Report 9 Dated September 28, 2015		
Information		**Location in Resource Report**
Air Quality	1. Revise section 9.1.2.1 to include a general description of the climate conditions in the areas of Pennsylvania and West Virginia where the EEP would be located.	Section 9.1.2.1
	2. Revise table 9.1-1 to include climate parameters for the other Project-affected counties (Allegheny, PA; Washington, PA; and Wetzel, WV).	Section 9.1.2.1
	3. Revise section 9.1.2.2 to include the current State Ambient Air Quality Standards for Pennsylvania and West Virginia.	Section 9.1.2.2
	4. Revise section 9.1.2.3 to include a table for ambient air quality monitoring data for the Project components located in Allegheny County (PA), Washington County (PA), and Wetzel County (WV).	Section 9.1.2.3
	5. Revise table 9.1-4 to include the closest federal Class 1 areas to all of the Project components.	Section 9.1.2.4
	6. Include the following information in section 9.1.3:	
	a. include a discussion of the mitigation measures that would be used to minimize air emission from burning, applicable state and local regulations, and any required state or local permits;	Section 9.1.4, Section 9.1.5, and Appendix 9-D

FERC Environmental Information Request for Resource Report 9 Dated September 28, 2015		
	Information	**Location in Resource Report**
	b. include a list of all project-related emission sources, quantified emissions of criteria air pollutants (NO_x, CO, PM_{10}, $PM_{2.5}$, SO_2, VOC, HAP, GHG), and fugitive emissions in tons per year for both construction and operation phases. Include supporting calculations, emission factors, fuel consumption rates, vehicle and equipment power ratings, utilization rates, hours of operation, and list all specific control measures assumed in the emission calculations;	Appendix 9-B and Appendix 9-C
	c. include a discussion of all mitigation measures that would be implemented to reduce air pollution from Project-related activities; and	Section 9.1.7
	d. include regional cumulative air emissions data for the Project. Include an inventory of proposed and reasonable foreseeable air emission sources in the counties (or other distance as necessary) where stationary sources are proposed, documenting their location, distance from the proposed Project, estimated or permitted emissions, for each criteria pollutant in tons per year and identify the potential incremental cumulative impacts of the Project. The emissions sources should include, but not be limited to: FERC jurisdictional projects, intrastate pipelines and compression, gathering pipelines, gas processing facilities, gas wells, industrial or commercial facilities, housing developments, etc.	Section 9.1.7
	7. Include an air quality screening (AERSCREEN) or refined analysis (AERMOD or EPA-approved alternative) of the proposed Redhook Compressor Station demonstrating that the increase in emissions of criteria pollutants do not result in local exceedance of the National Ambient Air Quality Standards (NAAQS); state ambient air quality standards; or cause or contribute to any violations of the NAAQS. This modeling should:	Appendix 9-E
	a. include all input parameters (emission rate, stack height, stack temperature, exit velocity, etc.) and justify the basis of any assumptions;	Appendix 9-E
	b. include a narrative describing and justifying the use of meteorological data, terrain data, etc. For any mitigation measures, or air pollution control equipment, include data to justify control efficiency; and	Appendix 9-D and Appendix 9-E
	c. include output data showing maximum impacts outside the fenceline (the EPA-defined ambient air boundary), and at sensitive receptors in the area (schools, hospitals, nursing homes, etc.).	Appendix 9-E
	8. Indicate whether Equitrans would install any blowdown facilities, if so, estimate the number of yearly releases and the volume of VOC released per blowdown.	Appendix 9-C

FERC Environmental Information Request for Resource Report 9 Dated September 28, 2015		
Information		**Location in Resource Report**
Noise	1. Revise RR9 to include all noise-sensitive areas (NSAs) within 0.5-mile of the Redhook Compressor station and all proposed meter stations. RR9 should be updated to include ambient noise surveys and estimated noise levels during operations for all NSAs.	Section 9.2.2 and 9.2.3
	2. Revise all tables in section 9.2.2 to include the type of NSA.	Section 9.2.2
	3. Include specific mitigation measures in section 9.2.4 to be employed for each location of noise sources to minimize noise impacts on the nearest sensitive areas during construction and operations.	Sections 9.2.5, 9.2.6 and 9.2.7.
	4. Include the following information in section 9.2.4:	
	a. include an inventory of all noise generating equipment that would be operated and the corresponding noise levels during construction and operations phases; and	Sections 9.2.4, 9.2.5 and 9.2.6
	b. include the resulting noise levels due to the proposed Project's construction and operation and the predicted noise levels at NSAs. The predicted noise level should take into account the existing ambient noise levels at the proposed Project and affected NSA locations. Include any assumptions and the methodologies used in estimating the predicted noise levels.	Section 9.2.5 and 9.2.6
	5. Include information regarding whether any blowdown facilities would be constructed as part of the proposed Project and indicate whether blowdown facilities would be installed with a silencer or other noise mitigation measures. Additionally, estimate the noise impact for all NSAs within 0.5-mile distance to the blowdown facilities.	Sections 9.2.4 and 9.2.7

RESOURCE REPORT 9
AIR QUALITY AND NOISE

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
BACT	Best Available Control Technology
BAT	Best Available Technology
bhp	brake horsepower
CadnaA	Computer-Aided Noise Abatement
CAT	Caterpillar
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CSR	Code of State Rules
dB	decibel
dBA	"A-weighted" decibel
dscfm	dry standard cubic feet per minute
EPA	U.S. Environmental Protection Agency
Equitrans	Equitrans, L.P.
FERC or Commission	Federal Energy Regulatory Commission
GHG	greenhouse gas
GP-5	General Permit No. 5
gr/dscf	grains per dry standard cubic foot
HAP	hazardous air pollutant
HDD	horizontal directional drilling
hp	horsepower
Hz	hertz
km	kilometer
kWe	kilowatts of electricity
LAER	Lowest Achievable Emission Rate
L_{dn}	day-night average (or time-weighted) sound level
L_{eq}	equivalent sound level
m^3	cubic meters
MACT	Maximum Achievable Control Technology
MMBtu/hr	million British thermal unit per hour
MEG	ethylene glycol
MRR	Greenhouse Gas Mandatory Reporting Rule
MVP	Mountain Valley Pipeline
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NNSR	Nonattainment New Source Review

NSA	Noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
OTR	Ozone Transport Region
PADEP	Pennsylvania Department of Environmental Protection
Pa Code	Pennsylvania Code
$PM_{2.5}$	Particulate matter, less than or equal to 2.5 micrometer (µm)
PM_{10}	Particulate matter, less than or equal to 10 µm
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million volumetric dry
Project	Equitrans Expansion Project
PSD	Prevention of Significant Deterioration
psia	pounds per square inch atmosphere
psig	pounds per square inch gage
RACT	Reasonably Available Control Technology
RICE	reciprocating internal combustion engines
SAAQS	State Ambient Air Quality Standards
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan(s)
SO_2	sulfur dioxide
TEG	tri-ethylene glycol
tpy	tons per year
VOC	volatile organic compounds

RESOURCE REPORT 9
AIR QUALITY AND NOISE

INTRODUCTION

Equitrans, L.P. (Equitrans) is seeking a Certificate of Public Convenience and Necessity from the Federal Energy Regulatory Commission (FERC or Commission) pursuant to Section 7(c) of the Natural Gas Act authorizing it to construct and operate the Equitrans Expansion Project (Project) located in three counties in Pennsylvania and one county in West Virginia. Equitrans plans to construct approximately 7.87 miles of pipeline (at multiple separate locations), a new compressor station, an interconnect with the proposed Mountain Valley Pipeline (MVP), and ancillary facilities. In addition, Equitrans is seeking authorization pursuant to Section 7(b) of the Natural Gas Act to abandon an existing compressor station following the construction of the new compressor station.

The Project is designed to transport natural gas from the northern portion of the Equitrans system south to the new interconnect with MVP, as well as to existing interconnects with Texas Eastern Transmission, LP (Texas Eastern), Dominion Transmission, Inc., and Columbia Gas Transmission, LLC. The Project will provide shippers with additional flexibility to transport natural gas produced in the central Appalachian Basin to meet the growing demand by local distribution companies, industrial users, and power generation facilities located in local, northeastern, Mid-Atlantic, and southeastern regions of the United States. The Project will also increase system reliability, efficiency, and operational flexibility for the benefit of all Equitrans customers. The Project is designed to add up to 600,000 dekatherms per day of north-south firm capacity on the Equitrans system.

Resource Report 1 provides a complete summary of the Project facilities (see Tables 1.2-1 and 1.2-2) and a general location map of the Project facilities (Figure 1.2-1).

ENVIRONMENTAL RESOURCE REPORT ORGANIZATION

Resource Report 9 includes a discussion of air quality and noise in the Project area and potential Project impacts. Resource Report 9 is prepared and organized according to the FERC *Guidance Manual for Environmental Report Preparation* (FERC 2002), issued August 2002. Air quality resources and potential impacts from the Project are discussed in Section 9.1, while Section 9.2 addresses noise issues, including both construction and operational noise impacts.

9.1 AIR QUALITY

9.1.1 Air Quality Overview

The proposed equipment at the Redhook Compressor Station is listed below:

- Two (2) Caterpillar (CAT) G3616 natural gas compressor engines (rated at 5,350 horsepower [hp] each at 0 degrees Fahrenheit [°F]) equipped with oxidation catalysts;
- Two (2) Solar Taurus-70 natural gas-fired turbines (rated at 11,311 hp each at 0°F);
- One (1) tri-ethylene glycol (TEG) dehydration unit (rated at 50 million standard cubic feet per day) equipped with an associated reboiler (heat input rated at 0.77 MMBtu/hr) and an enclosed flare (rated at 7.00 MMBtu/hr);
- Ten (10) natural gas-fired Capstone C-200 microturbines (each rated at 200 kilowatts of electricity [kWe] for power generation);
- Two natural gas-fired fuel/start gas heaters (rated at 0.77 MMBtu/hr heat input each);
- One (1) 8,820 gallon produced fluid tank;
- Seven (7) miscellaneous storage tanks; and
- Associated piping and components.

The scope of the Project covered in this resource report will involve the removal of the Pratt Compressor Station and the construction of the Redhook Compressor Station. In addition to the new compressor station, Equitrans plans to construct approximately 7.87 miles of pipeline, an interconnect with the MVP, and ancillary facilities.

9.1.2 Project Air Quality Impacts

Upon completion of the Project design, Equitrans will quantify the impact to ambient air quality due to the Project. Project environmental impacts are required to be addressed through avoidance, minimization, or offset through mitigation measures. Upon identifying these impacts, measures will be proposed to avoid, minimize, and/or mitigate any potential adverse impacts from noise and air emissions, or other potential environmental impacts. The impacts of the construction and operation of the Project on air quality are summarized in the following sections.

In addition to meeting requirements of FERC, Equitrans is required to obtain a number of other clearances and permits as will be set forth in Exhibit J to the application. Equitrans will comply with applicable permit requirements, so that the Redhook Compressor Station operates in a manner that protects human health and the environment. Equitrans will submit a Plan Approval application to the Pennsylvania Department of Environmental Protection (PADEP) for the Redhook Compressor Station. The PADEP will review this application and will issue the necessary permits in accordance with its rules and regulations. Construction will not commence on the Redhook Compressor Station until the Plan Approval has been issued.

9.1.2.1 Climate

The Redhook Compressor Station is located in Greene County, Pennsylvania, which has a temperate climate. Other project activities in Allegheny and Washington Counties, Pennsylvania, and Wetzel County, West Virginia, will be exposed to similar climate conditions. Table 9.1-1 summarizes a selection of climate parameters for Greene County as a representative for the entire project.

Table 9.1-1

Climate Parameters for Greene County

Monitor	COOP ID	Approximate Distance and Direction from Station/ Terminal	Average Daily Minimum Temperature – January (°F) a/	Average Daily Maximum Temperature – July (°F) a/	Annual Precipitation (inches) b/, c/
Waynesburg 1 E	WYNP1	2.4 miles SW	17.1	83.4	34.6
Point Marion Lock 8	PMRP1	16.9 miles SE	19.0	84.2	41.8

Source: The Pennsylvania State Climatologist 2015
a/ Calculated from average of data from 2012, 2013, and 2014
b/ Daily precipitation calculated using: Daily Precipitation (in.) = Daily Rainfall (in.) + (Daily Snowfall (in.) /10)
c/ Data calculated from average annual precipitation of 2012, 2013, and 2014

9.1.2.2 Existing Air Quality

Table 9.1-2 summarizes the National Ambient Air Quality Standards (NAAQS) that are currently in effect. Note that Pennsylvania also has State Ambient Air Quality Standards (SAAQS) for Beryllium, Fluorides, and Hydrogen Sulfide. The Redhook Compressor Station is not expected to be a source of these pollutants, but they have been provided in Table 9.1-2 for general information. Any area that does not meet the NAAQS for the corresponding pollutant is known as a non-attainment area. The Redhook Compressor Station is located in Greene County, Pennsylvania, which is classified as in attainment with all NAAQS except for ozone and fine particulate matter ($PM_{2.5}$). The Commonwealth of Pennsylvania is in the Ozone Transport Region (OTR), and therefore, the entire state is classified as moderate nonattainment for ozone. Monongahela Township in Greene County is designated as moderate nonattainment for the 1997 and 2006 $PM_{2.5}$ NAAQS; all other portions of Greene County are designated as attainment with the annual and 24-hour $PM_{2.5}$ NAAQS. The Redhook Compressor Station is not located in Monongahela Township and is therefore located in a $PM_{2.5}$ attainment area.

Table 9.1-2

National and State Ambient Air Quality Standards for Criteria and Select Other Pollutants a/

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide (CO)	9 ppm (10,000 μg/m^3)	8-hour	None
	35 ppm (40,000 μg/m^3)	1-hour	None
Lead	0.15 μg/m^3	Rolling 3-month Average	Same as Primary
Nitrogen Dioxide (NO_2)	53 ppb (100 μg/m^3)	Annual (Arithmetic Mean)	Same as Primary
	100 ppb (188 μg/m^3)	1-hour	None
Particulate Matter (PM_{10})	150 μg/m^3	24-hour	Same as Primary
Particulate Matter ($PM_{2.5}$)	12 μg/m^3	Annual (Arithmetic Mean)	15 μg/m^3

Table 9.1-2 National and State Ambient Air Quality Standards for Criteria and Select Other Pollutants a/			
Pollutant	**Primary Standards**	**Averaging Times**	**Secondary Standards**
	35 µg/m^3	24-hour	Same as Primary
Ozone	75 ppb	8-hour	Same as Primary
Sulfur Dioxide (SO_2) b/	0.03 ppm (80 µg/m^3)	Annual (Arithmetic Mean)	0.02 ppm
	0.14 ppm (365 µg/m^3)	24-hour	None
	None	3-hour	0.5 ppm (1,300 µg/m^3)
	75 ppb (196 µg/m^3)	1-hour	None
Beryllium c/	0.01 µg/m^3	30-day	None
Fluorides c/	5 µg/m^3	24-hour	None
Hydrogen Sulfide c/	0.005 ppm	24-hour	None
	0.1 ppm	1-hour	None

Source: EPA (2015) and 25 Pa Code 131.3
a/ Greene County is in attainment for all criteria pollutants except ozone and $PM_{2.5}$. However, the only township that is not in attainment for $PM_{2.5}$ is Pittsburgh-Beaver Valley.
b/ The existing annual and 24-hour SO_2 standards will be revoked one year after the effective dates in areas with designated status for the revised SO_2 NAAQS.
c/ SAAQS are provided for Pennsylvania. West Virginia does not have any additional SAAQS.

9.1.2.3 Monitoring Data

Ambient air quality monitoring data is collected by state and federal agencies to determine ambient air quality for a regional area. This data is then used by the regulatory agencies to compare an area's air quality to the NAAQS. Table 9.1-3 presents recent existing ambient air quality data from representative monitoring stations surrounding the Redhook Compressor Station site. These stations were chosen due to their proximity to the Redhook Compressor Station, similarity in land use and topography between the monitor sites and the station, and quality and quantity of available data. The project activities in Allegheny and Washington Counties, Pennsylvania, and Wetzel County, West Virginia, are each expected to have similar ambient air quality conditions.

Table 9.1-3 Ambient Air Quality for the Project Sites							
Pollutant	**Site**	**Monitor ID**	**Distance from Station**	**Year of Data**	**Averaging Times**		**NAAQS (µg/m^3)**
					Averaging Period	**Value (µg/m^3)**	
Carbon Monoxide (CO)	Charleroi Waste Treatment Plant Charleroi, PA	421250005	19.9 mi. NE	2012-2014	8-hour	1,718.4	10,000
				2012-2014	1-hour	2,864.0	40,000
Lead	Wheeling Warwood Water Plant, WV	540690010	32.7 mi. W	2012-2014	Rolling 3-month Average	0.04	0.15
Nitrogen Dioxide (NO_2)	Charleroi Waste Treatment Plant Charleroi, PA	421250005	19.9 mi. NE	2014	Annual	16.1	100
				2012-2014	1-hour	68.4	188
Particulate Matter (PM_{10})	Charleroi Waste Treatment Plant Charleroi, PA	421250005	19.9 mi. NE	2012	24-hour	34.0	150

Table 9.1-3

Ambient Air Quality for the Project Sites

Pollutant	Site	Monitor ID	Distance from Station	Year of Data	Averaging Times		NAAQS (µg/m^3)
					Averaging Period	Value (µg/m^3)	
Particulate Matter ($PM_{2.5}$)	US 119 & Airport Blvd. Morgantown, WV	540610003	21.4 mi. SE	2012-2014	Annual	8.8	12
				2012-2014	24-hour	18.0	35
Ozone	4.8 km SE of Holbrook, PA Not in a City	420590002	10.4 mi. SW	2012-2014	8-hour	133.5	147
				2012	1-hour	188.5	236
Sulfur Dioxide (SO_2)	Charleroi Waste Treatment Plant Charleroi, PA	421250005	19.9 mi. NE	2013	Annual	8.5	80
				2013	24-hour	23.6	365
				2014	3-hour	69.7	1,300
				2012-2014	1-hour	67.2	196

9.1.2.4 Class 1 Areas

Federal Class I areas are certain areas established by Congress, such as wilderness areas and national parks, that are afforded special protection under the Clean Air Act. Once designated as a Class I area, that area cannot be redesignated to another (lower) classification. Class I areas are allowed the smallest degree of air quality deterioration through New Source Review (NSR) / Prevention of Significant Deterioration (PSD) permitting, and special considerations must be made in the NSR permitting process when a Class I area is located close to a proposed site. NSR applicability will be evaluated once all aspects of the Project are finalized, and Class I modeling requirements will be reviewed if the Project requires PSD review. However, preliminary potential emission estimates presented in Table 9.1-5 indicate the Redhook Compressor Station will be a minor source and therefore not be subject to PSD or Class I modeling. The Class I areas nearest to the proposed location of the Redhook Compressor Station have been identified in Table 9.1-4.

Table 9.1-4

Federal Class I Areas Closest to the Project Sites

Class I Area	Managing Agency	Direction from Site	Distance to Site	
			Kilometers	Miles
Class I Areas near Redhook Compressor Station				
Dolly Sods, WV	National Forest Service	Southeast of Redhook	~122	~76
Otter Creek, WV	National Forest Service	Southeast of Redhook	~110	~68
Shenandoah, VA	National Forest Service	Southeast of Redhook	~220	~137
Class I Areas near Webster Interconnect				
Dolly Sods, WV	National Forest Service	Southeast of Webster	~120	~75
Otter Creek, WV	National Forest Service	Southeast of Webster	~100	~62
Shenandoah, VA	National Forest Service	Southeast of Webster	~215	~134
Class I Areas near Mobley Tap				
Dolly Sods, WV	National Forest Service	Southeast of Mobley	~120	~75
Otter Creek, WV	National Forest Service	Southeast of Mobley	~100	~62
Shenandoah, VA	National Forest Service	Southeast of Mobley	~215	~134

9.1.3 Air Quality Impacts and Mitigation

Both the short-term/temporary and long-term air quality impacts associated with the Project will be analyzed. Short-term and temporary air quality impacts will result from construction activities necessary to install the pipeline, and the turbines, engines, heaters, and other equipment at the Redhook Compressor Station. Long-term impacts will result from the operation of the turbines, engines, and other equipment at the Redhook Compressor Station. From a regulatory standpoint, the emissions and associated air quality impacts are addressed in two separate ways:

1. Pre-Construction Permitting – Pre-Construction (and operation) permitting addresses the emissions and associated impacts from the operational equipment and sources at the facilities. Depending on the major/minor source status of the Redhook Compressor Station and the location of the Project, PSD, Nonattainment NSR (NNSR), and/or associated state permitting programs would ensure that the installation of new air emissions sources (i.e., operational equipment) would meet required emission levels through the installation of appropriate control technologies, and meet other regulatory requirements, where appropriate. A pollutant that triggers a PSD and/or NNSR major source threshold will be subject to additional review and requirements. The potential regulatory applicability of permitting programs to the Project is discussed in Sections 9.1.4 and 9.1.5. Please note that while air dispersion modeling may not be a regulatory requirement, Equitrans has modeled the emissions of all criteria pollutants resulting from the Redhook Compressor Station to ensure that all NAAQS standards will be met upon startup of the sources at the Station. The modeling approach and results are provided in Appendix 9-E.
2. General Conformity – General Conformity addresses the sources of emissions not covered by permitting actions (e.g., construction activities) and ensures that they conform to the applicable State Implementation Plan(s) (SIP). Generally, these include the short-term/temporary emissions from construction activities and new emissions increases from non-permitted emission sources such as mobile sources.

Sections 9.1.4 and 9.1.5 discuss air quality permitting requirements. Section 9.1.6 discusses the General Conformity analysis.

9.1.4 Air Permitting Requirements

Title 25, Chapter 127, Section 11 of the Pennsylvania Code (25 Pa Code 127.11) requires certain stationary sources of air pollutant emissions to receive a permit before construction, modification, reactivation or installation of such source. Emissions from construction of the pipeline are temporary and do not require a Plan Approval. However, the air pollutant emission sources to be installed at the Redhook Compressor Station will require a Plan Approval issued by the PADEP to authorize construction. The Plan Approval requires demonstration that Best Available Technology (BAT) will be employed for the proposed new source of air pollution, and includes a detailed regulatory applicability study. The construction permit application for the Redhook Compressor Station has been prepared and is attached as part of Appendix 9-D. The federal and state regulations that generally apply to the construction of the Redhook Compressor Station and the pipeline are discussed in the following section.

The Pennsylvania Code contains regulations that fall under two main categories: those regulations that are generally applicable (e.g., permitting requirements) and those that have specific applicability (e.g., sulfur compound emissions from combustion units). The generally applicable requirements are straightforward (e.g., filing of emission statements) and, as such, are not discussed in further detail. The specific requirements associated with the Project are discussed in the following section.

9.1.5 Regulatory Applicability

This section lists air quality regulations that may be applicable to the Project based on the current design.

9.1.5.1 Federal Air Quality Regulations

Major New Source Review and Title V Operating Permit

The Title V Operating Permit program applies to stationary sources with the potential to emit over 100 tons per year (tpy), or a lower major source threshold defined by nonattainment status, of any individual criteria air pollutant, 10 tpy of any individual Hazardous Air Pollutant (HAP), or 25 tpy of combined HAPs. Since this site is in Greene County, Pennsylvania, which is in the ozone transport region, a major source threshold of 50 tpy is applicable for VOC. Maximum potential emissions for NO_X, VOC, and total HAP from the Redhook Compressor Station will not exceed the major source thresholds for Title V. Therefore, the Redhook Compressor Station will be a minor source with respect to the Title V Program after the construction of the Project.

With respect to greenhouse gases (GHGs), the U.S. Environmental Protection Agency (EPA) had previously incorporated provisions into the existing Title V rules via the Greenhouse Gas Tailoring Rule. These included the specification of a major source threshold and subject to regulation/significant emission rate of 100,000 tpy and 75,000 tpy of carbon dioxide equivalent (CO_2e), respectively[1], for current projects. On June 23, 2014, the U.S. Supreme Court decision in *Utility Air Regulatory Group v. EPA* effectively changed the permitting procedures for GHGs under the PSD and Title V programs[2]. In essence, GHGs remain "subject to regulation" but only for sources which otherwise trigger Title V requirements. As such, the Redhook Compressor Station is not subject to the regulation of GHG emissions, as it does not trigger Title V requirements.

The federal NSR program applies to major stationary sources. The NSR permitting regulations are comprised of two programs: 1) PSD for projects located in areas where specified pollutant levels have met the NAAQS; and 2) NNSR for projects located in areas where pollutant levels have not attained the corresponding NAAQS. The NSR program regulates the installation of new major sources or major modifications to existing major sources. The Redhook Compressor Station is located in Greene County which is classified as attainment with all NAAQS except for ozone and $PM_{2.5}$ (certain areas, but not the proposed location). The state of Pennsylvania is in the OTR and therefore the entire state is classified as moderate nonattainment for ozone. The Redhook Compressor Station will be a minor source of all regulated pollutants; therefore NSR will not be triggered by this Project.

[1] CO_2e is carbon dioxide equivalents calculated as the sum of the six well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) with applicable global warming potentials per 40 CFR 98 applied.
[2] http://www.supremecourt.gov/opinions/13pdf/12- 1146_4g18.pdf

Table 9.1-5 NSR Major Source Thresholds				
Pollutant	**Potential Site-Wide PTE (tpy) a/**	**Major Source Threshold (tpy)**	**NSR Program**	**Subject to Major NSR?**
PM_{10}	18.58	250	PSD	No
$PM_{2.5}$	18.58	250	PSD	No
SO_2	3.24	250	PSD	No
CO	76.69	250	PSD	No
NO_X	92.73	100	NNSR b/	No
VOC	30.59	50	NNSR	No
CO_2e	167,091	NA c/	PSD	No
a/ PTE includes site-wide emissions from all sources, including storage tanks, fugitive leaks, and blowdowns. b/ NO_2 is also a regulated PSD pollutant with a major source threshold of 250 tpy. c/ Only applicable if another pollutant exceeds major source threshold for PSD. NSR = noise sensitive receptor; PTE = Potential to Emit; tpy = tons per year				

The estimated emissions as a result of the Project, as shown in Table 9.1-5, are below major source thresholds for NSR under 25 Pa Code Section 127, Subchapter E and PSD permitting under 25 Pa Code Section 127, Subchapter D. As such, NSR is not applicable to the plan approval application.

National Emission Standards for Hazardous Air Pollutants (NESHAP or MACT)

Regulatory requirements for facilities subject to National Emissions Standards for Hazardous Air Pollutants (NESHAP) standards, otherwise known as Maximum Available Control Technology (MACT) Standards for source categories, are contained in 40 CFR Part 63. Part 61 NESHAP standards are defined for specific pollutants, while Part 63 NESHAPs are defined for source categories where allowable emission limits are established on the basis of a MACT determination for a particular major source. A major source of HAP is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. Part 63 NESHAPs apply to sources in specifically regulated industrial source categories (CAA Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

Historically, NESHAPs have only been applicable to major sources of HAP. However, recently the EPA has been promulgating area source NESHAP standards to address area (or minor) source categories that represent ninety percent of the emissions of a specific list of urban air toxics under Section 112(c) of the Clean Air Act. Potential HAP emissions from the proposed Redhook Compressor Station will be below the major source thresholds, and therefore, the facility will be an area source of HAP. The potential applicability of specific MACT standards to the Redhook Compressor Station is discussed below.

NESHAP Subpart HH – Oil and Natural Gas Production Facilities

Glycol dehydration units are potentially subject to Subpart HH. This standard applies to such units at natural gas production facilities that are major or area sources of HAP emissions. The Redhook Compressor Station is a transmission facility; therefore, this facility will not be subject to Subpart HH.

NESHAP Subpart HHH – Natural Gas Transmission and Storage Facilities

Glycol dehydration units are potentially subject to Subpart HHH, NESHAP from Natural Gas Transmission and Storage Facilities. This standard applies to such units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector), but upstream of the distribution sector. The proposed Redhook Compressor Station is a transmission facility and is an area source of HAP emissions. Therefore, this facility will not be subject to Subpart HHH.

NESHAP Subpart YYYY – Stationary Combustion Turbines

Stationary combustion turbines located at facilities that are major sources of HAPs are potentially subject to Subpart YYYY, NESHAP for Stationary Combustion Turbines. Subpart YYYY establishes emissions and operating limitations for lean premix gas-fired, lean premix oil-fired, diffusion flame gas-fired and diffusion flame oil-fired stationary combustion turbines. The proposed Redhook Compressor Station is a minor source of HAP and therefore is not subject to the requirements of this subpart.

NESHAP Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

Stationary reciprocating internal combustion engines (RICE) at both area and major sources of HAP emissions are potentially subject to Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE). Stationary RICE at facilities that are major sources of HAP are considered new if they are ordered after June 12, 2006. Per 40 CFR §63.6590(c), new area source stationary RICE are required to meet the requirements of this MACT standard by meeting the applicable requirements of the applicable New Source Performance Standard in 40 CFR 60 (Subpart IIII for compression ignition engines and Subpart JJJJ for spark ignition engines). No further requirements apply to such engines under NESHAP Subpart ZZZZ.

The two (2) proposed CAT G3616 compressor engines at the Redhook Compressor Station will comply with Subpart ZZZZ by complying with 40 CFR 63, Subpart JJJJ as described in the following section.

NESHAP Subpart DDDDD – Industrial, Commercial, and Institutional Boilers (Major Source Boiler MACT)

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types at major sources of HAP. The proposed facility is an area source of HAP; therefore, the requirements of this subpart will not apply.

NESHAP Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers (Area Source Boiler MACT)

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types. The proposed units are natural gas-fired and are therefore exempt from this subpart. Therefore, the requirements of this subpart will not apply.

New Source Performance Standards (NSPS)

Pennsylvania has received delegation from EPA to regulate facilities subject to NSPS. Regulatory requirements for facilities subject to NSPS are contained in Pennsylvania SIP in 25 Pa Code §122 and 40 CFR Part 60. The potential applicability of NSPS standards to the proposed operations at the Redhook Compressor Station are:

- 40 CFR Part 60 Subpart Dc – Steam Generating Units
- 40 CFR Part 60 Subpart GG – Stationary Gas Turbines

- 40 CFR Part 60 Subpart K/Ka/Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids
- 40 CFR Part 60 Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engine
- 40 CFR Part 60 Subpart KKKK – Stationary Combustion Turbines
- 40 CFR Part 60 Subpart OOOO – Crude Oil and Natural Gas Production, Transmission, and Distribution

NSPS Subpart Dc

Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, applies to all steam generating units with a heat input greater than or equal to 10 MMBtu/hr and less than 100 MMBtu/hr. No units at the proposed facility meet the definition of a steam generating unit and have a heat input greater than 10 MMBtu/hr; therefore, the requirements of this subpart will not apply.

NSPS Subpart GG – Stationary Gas Turbines

Subpart GG, Standards of Performance for Stationary Gas Turbines, applies to all gas turbines with a heat input at peak load greater than or equal to 10 MMBtu/hr based on the lower heating value of the fuel fired. This standard was promulgated in 1979. The applicability of Subpart KKKK, promulgated in 2006, is similar to that of Subpart GG and applies to stationary combustion turbines that commence construction after February 18, 2005. Turbines subject to Subpart KKKK are specifically exempt from the requirements of Subpart GG. As such, this subpart does not apply to the proposed Solar turbines at the Redhook Compressor station. The proposed microturbines are not subject to the requirements of Subpart GG based on having a heat input less than or equal to 10 MMBtu/hr.

NSPS Subparts K, Ka, and Kb - Storage Vessels for Petroleum Liquids/Volatile Organic Liquids

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka to those constructed, reconstructed, or modified prior to 1984. All storage tanks to be located at the Redhook Compressor Station will be constructed after these dates; therefore, the requirements of Subparts K and Ka do not apply. Subpart Kb applies to volatile organic liquid storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 cubic meters (m^3) (~19,813 gallons). All storage tanks at the Redhook Compressor Station were constructed after this date and do not have a capacity greater than 75 m^3. Therefore, Subpart Kb does not apply to the storage tanks at the Redhook Compressor Station.

NSPS Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, applies to manufacturers, owners, and operators of stationary spark (SI) engines. The requirements for SI engines with a maximum power rating greater than or equal to 500 hp (except lean burn engines 500 hp $\leq$ hp < 1,350) apply to owner/operators of such engines ordered on or after July 1, 2007. The proposed two (2) CAT G3616 compressor engines will be new 4-stroke, lean burn spark ignition RICE rated at 5,350 hp each. As such, the compressor engines will be subject to the following emissions standards per Table 1 to NSPS Subpart JJJJ applicable to non-emergency use engines. The compressor engines will be equipped with oxidation catalysts. All catalysts are guaranteed by the manufacturer to have emissions less than those cited in Table 9.1-6 below.

Table 9.1-6

NSPS Subpart JJJJ Emission Standards for Non-Emergency Natural Gas Engines ≥ 500 HP Manufactured On or After 7/1/2010

Pollutant	Emission Standards (g/hp-hr)	CAT G3616 Specifications - with Oxidation Catalyst (g/hp-hr)
NO_X	1.0	0.4
CO	2.0	0.17
VOC a/	0.7	0.13

a/ VOC as defined in NSPS JJJJ does not include formaldehyde.

The proposed compressor engines at the Redhook Compressor Station will be in compliance with NSPS JJJJ emissions standards as indicated in Table 9.1-6.

It should be noted that 40 CFR §60.4243(b)(1) allows for compliance with this subpart to be demonstrated by purchasing an engine certified by the manufacturer according to specified procedures and then operating the engine in accordance with the manufacturer's emission-related written instructions. However, while the proposed engines at Redhook Compressor Station will be equipped with control technology to achieve the emissions limits shown in Table 9.1-6, certification is not available from the engine manufacturer. Therefore, Equitrans will demonstrate compliance with this subpart for all non-certified engines at the Redhook Compressor Station in accordance with 40 CFR 60.4243(b)(2)(ii), which requires Equitrans to keep a maintenance plan and records of conducted maintenance and to maintain and operate the engines, to the extent practicable, in a manner consistent with good air pollution control practices for minimizing emissions. Additionally, Equitrans will be required to conduct an initial performance test and subsequent compliance testing every 8,760 hours of operation or three (3) years, whichever comes first, to demonstrate continued compliance. Testing will be conducted in accordance with 40 CFR §60.4244.

Records of all notifications submitted to comply with this subpart, maintenance conducted on the engines, and performance testing will be maintained in accordance with 40 CFR §60.4245(a). Initial notification of construction commencement will be submitted as required in 40 CFR §60.7(a)(1) and §60.4245(c), and performance testing results will be reported as required in 40 CFR §60.4245(d).

NSPS Subpart KKKK – Stationary Combustion Turbines

Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, applies to stationary combustion units with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the higher heating value of the fuel, commencing construction after February 18, 2005. The microturbines at the Redhook Compressor Station will each have a heat input less than 10 MMBtu/hr. Therefore, they are not subject to this standard.

The proposed Solar Taurus 70 turbines for the Redhook Compressor Station will be subject to the NO_X emissions limitations in 40 CFR 60.4320(a). Turbines with a rated capacity of 50 < MMBtu/hr ≤ 850 MMBtu/hr at peak load are limited to NO_X emissions of 25 ppm at 15% O_2 when firing natural gas. The Solar turbines that will be installed at the Redhook Compressor Station are equipped with lean pre-mix combustion technology and are guaranteed by the manufacturer to emit a maximum of 15 ppm of NO_X at

15% O_2 under variable turbine load conditions when firing natural gas. This vendor guarantee is well below the NSPS KKKK standard.

Equitrans will perform annual performance tests in accordance with 40 CFR 60.4340(a) and 60.4400 to demonstrate compliance with the NO_X emission limitations, or, as an alternative, will continuously monitor the appropriate parameters to determine whether the turbine is operating in low-NO_X mode in accordance with §60.4340(b)(2)(ii) and §60.4355(a). The Solar turbines must also comply with the SO_2 emission limits in 40 CFR 60.4330. Equitrans will comply with the SO_2 requirements by the exclusive use of natural gas which contains total potential sulfur emissions less than 0.060 pound. SO_2/MMBtu heat input will be in accordance with 40 CFR 60.4330(a)(2).

NSPS Subpart OOOO – Oil & Natural Gas Sector

Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011. This NSPS was published in the Federal Register on August 16, 2012 and subsequently amended. The list of potentially affected facilities includes:

- Gas wellheads;
- Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
- Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
- Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 standard cubic feet per hour located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment (excluding natural gas processing plants);
- Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- Storage vessels in the production, processing, or transmission and storage segments; and
- Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

Since the proposed Redhook Compressor Station will be a transmission facility located after the point of custody transfer, the only potentially applicable requirements for the proposed equipment are those for new storage vessels where construction commenced after August 23, 2011.

The standards applicable to storage vessels are detailed in 40 CFR 60.5395. The only tank that falls under the Subpart's definition of a 'storage vessel' is the produced fluid storage tank, however, this tank will have potential VOC emissions below 6 tpy. As such, per 60.5365(e), the tank is not a storage vessel affected facility under the rule.

It is important to note that updates to NSPS Subpart OOOO have been proposed. However, as the changes are not finalized, applicability will be reviewed once the rules have been finalized.

Greenhouse Gas Reporting Rule

As set forth in 40 CFR 98.2(a)(2), facilities which contain a source category listed in Table A-4 of the code and emit 25,000 metric tons per year of CO_2e in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all applicable source categories in Tables A-3 and A-4 of the code are subject to reporting under the Greenhouse Gas Mandatory Reporting Rule (MRR). Table A-4 of 40 CFR 98 Subpart A includes Petroleum and Natural Gas Systems. GHG emissions from the Redhook compressor station will be calculated and compared with the 25,000 metric tons per year of CO_2e when the design is final to address the applicability of the rule. Equitrans currently reports GHG emissions under Subpart W for similar facilities, and will meet all requirements of the MRR for the new compressor station, if applicable. No other subparts under the MRR are applicable to the facilities.

9.1.5.2 Pennsylvania Air Quality Regulations

The Pennsylvania Code contains regulations that fall under two (2) main categories: the regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., sulfur compound emissions from combustion units). The generally applicable requirements are straightforward (e.g., filing of emission statements) and, as such, are not discussed in further detail. The specific requirements associated with the Redhook Compressor Station are discussed in the following section.

25 Pa Code §§123.1 and 123.2: Prohibition of Certain Fugitive Emissions and Fugitive Particulate Matter

25 Pa Code §§123.1 and 123.2 state exceptions to fugitive emissions sources and methods for controlling fugitive emissions. Due to the nature of the activities at the Redhook Compressor Station, it is unlikely that fugitive particulate matter emissions will be emitted under normal operating conditions. However, Equitrans will take measures to ensure any fugitive particulate matter emissions will not cross the property boundary should any such emissions occur. Particulate emissions from the pipeline will result from its construction, but will be temporary in nature. Equitrans will take all measures necessary to ensure compliance with this requirement and will follow its fugitive dust control plan.

25 Pa Code §§123.11 and 123.13: Particulate Emissions: Combustion Units

25 Pa Code §123.11 *Particulate Emissions: Combustion Units* defines particulate matter emissions for combustion units. Combustion units are defined in §121.1 as stationary equipment used to burn fuel primarily for the purpose of producing power or heat by indirect heat transfer such as boilers. This definition does not apply to the proposed engines, fuel gas heaters, Solar turbines, and microturbines at the Redhook Compressor Station. As such, the particulate matter emissions limitations for processes in 25 Pa Code §123.13 *Particulate Emissions: Processes* apply to these units instead.

25 Pa Code §123.13 defines particulate matter emissions limitations for processes. For processes excluded from Table 1 of §123.13(b), particulate emissions are limited to 0.04 grains per dry standard cubic foot (gr/dscf) and 0.02 gr/dscf for exhaust flowrates less than 150,000 dry standard cubic feet per minute (dscfm) and greater than 300,000 dscfm, respectively. Particulates from equipment with exhaust flowrates between 150,000 dscfm and 300,000 dscfm are limited to the allowable emission rate calculated using the formula in §123.13(c)(1)(ii). As all proposed combustion sources at the facility will be fueled exclusively with pipeline quality natural gas, potential particulate emissions from all sources are expected to comply with these requirements.

25 Pa Code §123.21: Sulfur Compound Emissions: General

25 Pa Code §123.21 *Sulfur Compound Emissions*: General states that the concentration of sulfur oxides in the effluent gas may not exceed 500 parts per million (ppmvd). The proposed combustion equipment at the

Redhook Compressor Station will combust pipeline quality natural gas exclusively, and the sulfur oxide emissions are expected to be well below this concentration level in the combustion exhaust.

25 Pa Code §123.31: Odor Emissions

25 Pa Code §123.31 *Odor Emissions* prohibits the emission of malodorous air contaminants from any source that are detectable outside the facility fence line. This regulation applies to the facility in general. Equitrans will take measures to minimize odor from the Redhook Compressor Station operations by combusting pipeline quality natural gas fuel only, by installing a flare on the TEG dehydration unit, and by using pressure/vacuum reliefs on the produced fluid storage tank to minimize atmospheric venting under normal operations.

25 Pa Code §123.41 and §123.43: Visible Emissions: Limitations

25 Pa Code §123.41 *Visible Emissions: Limitations* states that a facility may not emit visible emissions equal to or greater than 20 percent for a period or periods aggregating more than 3 minutes in any 1 hour, or equal to or greater than 60 percent at any time. This standard applies to the proposed combustion units at the Redhook Compressor Station. The use of pipeline quality natural gas as fuel will ensure compliance with this requirement.

25 Pa Code §127.11

25 Pa Code §127.11 outlines requirements for Plan Approvals required to authorize construction or modification of air contamination sources. Construction, installation, modification, or reactivation of air contaminant sources or air pollution control devices is prohibited unless otherwise approved by the Department. The construction of new equipment at the proposed Redhook Compressor Station is subject to Plan Approval permitting requirements under this requirement.

25 Pa Code §129.57

25 Pa Code §129.57 contains requirements for storage vessels less than 40,000 gallons in capacity that contain VOCs. Under this section, above-ground storage tanks with a capacity greater than or equal to 2,000 gallons which contain VOCs with a vapor pressure greater than 1.5 pounds per square inch atmosphere (psia) must be equipped with pressure relief valves which are maintained in good operating condition and which are set to release at no less than 0.7 pounds per square inch gage (psig) of pressure or 0.3 psig of vacuum (or the highest possible pressure and vacuum in accordance with state or local fire codes or the National Fire Prevention Association guidelines). The proposed produced fluid storage tank, oil storage tanks, and TEG and ethylene glycol (MEG) tanks for the Redhook Compressor Station are greater than 2,000 gallons in capacity, but will not contain VOCs with a vapor pressure greater than 1.5 psia (see EPA TANKS output for vapor pressure data). As such, these tanks are not subject to these requirements. Note that the pressure settings of the produced fluids tank meet the pressure and vacuum settings of this rule.

25 Pa Code §129.91

25 Pa Code §129.91 establishes control standards for major stationary sources of NO_X and VOC under the Reasonably Available Control Technology (RACT) program. Major stationary sources of NO_X and VOC are defined in 25 Pa Code §121.1. The Redhook Compressor Station is located in the OTR, and therefore the applicable major source thresholds are 100 tons per year of NO_X and 50 tons per year of VOC.

This regulation will not apply because the Redhook Compressor Station will not have estimated potential emissions of NO_X in excess of 100 tpy or VOC in excess of 50 tpy.

25 Pa Code §131

25 Pa Code §131 references NAAQS for criteria pollutants and establishes State Ambient Air Quality Standards (SAAQS) for settled particulate, beryllium, fluorides, and hydrogen sulfide. As discussed in Section 9.1.5.1.1, the Project will not trigger NSR and the associated emissions of criteria pollutants would not reasonably be anticipated to exceed the corresponding NAAQS. The Project will not emit any quantifiable amount of beryllium, fluorides, or hydrogen sulfide, and as such the corresponding SAAQS would not apply.

25 Pa Code §135

25 Pa Code §135 includes requirements for submittal of emissions data to the Department for the purposes of evaluating the effectiveness of regulations, identifying available or potential emission offsets, and maintaining an accurate inventory of air contaminant emissions for air quality assessment and planning activities. As the proposed Redhook Compressor Station is considered part of an oil and natural gas system, emissions from the sources at the site will be subject to reporting and recordkeeping requirements under this section. As such, Equitrans will submit annual emissions inventory data by March 1 each year per the Department's requirements.

25 Pa Code §137

25 Pa Code §137 contains requirements intended to prevent the excessive buildup of air pollutants during air pollution episodes, thereby preventing the occurrence of an emergency due to the effects of the pollutants on the health of persons. This chapter specifically addresses air pollution episodes and the Department's response to such episodes. §137.4 specifies certain industrial sources that must have standby plans, which includes coal- and oil-fired electric and steam generating facilities and other specific manufacturing industries (e.g., metals, refining, paper, etc.). The proposed Redhook Compressor Station will be a natural gas transmission facility, which is not an industry impacted by these regulations.

25 Pa Code §139

25 Pa Code §139 establishes requirements for source operators to provide adequate sampling ports, safe sampling platforms and adequate utilities, and establishes testing procedures to be followed, for performance testing when required by the Department. The proposed Redhook Compressor Station will be designed and constructed to accommodate performance testing as required by applicable federal regulations (e.g., NSPS Subpart JJJJ) and any permit conditions set forth by the Department in the ensuing Plan Approval.

9.1.5.3 West Virginia Air Quality Regulations

Certain segments of the proposed pipeline are potentially subject to regulations contained in the West Virginia Code of State Rules, Chapter 45 (Code of State Rules, or CSR). The specific requirements associated with this Project are discussed in the following sections. Since the design is in preliminary phases, the requirements that generally apply to the Project are discussed in this section.

45 CSR 4: To Prevent and Control the Discharge of Air Pollutants into the Air Which Causes or Contributes to an Objectionable Odor

According to 45 CSR 4-3:

> *No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.*

The pipeline will be generally subject to this requirement. However, emissions from the pipeline which may result from its construction will be temporary in nature, and the production of objectionable odor from these operations is unlikely.

45 CSR 17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

According to 45 CSR 17-3.1:

> *No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.*

Particulate emissions from the pipeline may result from its construction, but any such emissions will be temporary in nature. Equitrans will take all measures necessary to ensure compliance with this requirement and will follow its fugitive dust control plan.

9.1.6 General Conformity

General conformity regulations implement the Section 176(c) of the Clean Air Act, which prohibits federal agencies from taking actions that may cause or contribute to violations of the NAAQS in an area working to attain or maintain the standards. In order to meet this Clean Air Act requirement, a federal agency must demonstrate that every action that it undertakes, approves, permits or supports will conform to the appropriate state, tribal, or federal implementation plan.

Because the FERC is a federal agency, and is the authority from which Equitrans must obtain a certificate authorizing the construction and operation of the pipeline and compressor station, as well as the demolition of the existing compressor station, it is necessary to undertake a conformity evaluation for the various aspects of the project.

The first step of the conformity evaluation is an analysis of applicability of the general conformity rule to the project. The applicability analysis starts with the determination of whether or not each of the areas in which the project will be conducted in is currently designated as nonattainment or maintenance for one or more pollutants for which a NAAQS exists.[3] West Virginia is currently classified as attainment/unclassifiable for all NAAQS. Hence the general conformity rule does not apply to work on components of the current project that will be located in that state. However, review of the attainment status of Greene, Allegheny, and Washington Counties in Pennsylvania indicates that each of those counties are currently classified as nonattainment and/or maintenance for one or more pollutants. Hence, the applicability of the general conformity rule must be analyzed for project emissions occurring in those counties. The current attainment status of the three counties in Pennsylvania with NAAQS is listed in Table

[3] 40 CFR 93.102(b)

9.1-7 for pollutants for which one or more counties is currently classified as other than attainment/unclassifiable.

The assessment of conformity must include emissions of air pollutants associated with the project that will be released during construction, demolition, and operation. Emissions that will occur during operation of the compressor station and pipeline will be subject to the air permitting programs and air quality rules and standards administered by the State of Pennsylvania. Equitrans has applied for and will obtain a valid air quality construction permit for the Redhook Compressor Station, and will operate the station pursuant to an air quality operating permit issued by Pennsylvania. Because the air quality programs under which the Redhook Compressor Station will be constructed and operated will have been administered in accordance with Pennsylvania's approved SIP, the emissions from operation of the station may be presumed to conform to Pennsylvania's SIP and are therefore exempted from the general conformity rule.[4]

Emissions from construction of the pipeline in Pennsylvania, decommissioning and demolition of the Pratt Compressor Station, and construction of the Redhook Compressor Station are not subject to state air quality permitting, and must therefore be assessed against the applicability criteria in the general conformity rule to determine what, if any, requirements of the rule may be applicable. An exception to the applicability of the general conformity rule is for actions that result in emissions below "de minimis" thresholds prescribed in the rule.[5] The de minimis thresholds for pollutants which Greene, Allegheny, and Washington Counties, Pennsylvania, are currently classified as nonattainment or maintenance are listed in Table 9.1-7. Listed underneath the de minimis thresholds for each pollutant for which any one of the three counties has been classified as nonattainment or maintenance are the estimated total annual emissions of that pollutant from construction of the section of the project occurring in that county. Detailed calculations of emissions from construction of the pipeline, interconnect and Redhook Compressor Station, and demolition of the Pratt Compressor Station are provided in Appendix 9-B. The total annual emissions are listed in Table 9.1-7 according to the calendar year in which they are expected to occur. It can be seen in the table that the estimated emissions are under the de minimis thresholds for each of the years in which the project is constructed. Therefore, the construction of the pipeline, the demolition of the Pratt Compressor Station, and the construction of the Redhook Compressor Station are exempt from the requirements of the general conformity rule.

[4] 40 CFR 93.153(d)(1)
[5] 40 CFR 93.153(b)

Table 9.1-5

Summary of General Conformity Applicability Analysis

Project Element	NO_2 Standards		Ozone 8-hr Standards				PM $_{2.5}$ Standards			PM_{10} Standards	SO_2 Standards	CO Standards
	2010	**1971**	**2008 NO_X**	**2008 VOC**	**1997 NO_X**	**1997 VOC**	**2012**	**2006**	**1997**	**1987**	**1971**	**1971**
Greene County, PA												
Redhook Compressor Station												
Estimated 2017 emissions (tpy)	10.30	10.30	10.30	1.60	10.30	1.60	1.51	1.51	1.51	2.63	0.50	18.64
Estimated 2018 emissions (tpy)	2.01	2.01	2.01	0.39	2.01	0.39	0.38	0.38	0.38	1.14	0.11	4.38
Pratt Decomission												
Estimated 2018 emissions (tpy)	6.90	6.90	6.90	1.18	6.90	1.18	1.14	1.14	1.14	1.98	0.41	14.76
H-316 Pipeline Construction												
Estimated 2017 emissions (tpy)	7.90	7.90	7.90	0.89	7.90	0.89	1.54	1.54	1.54	4.62	0.34	7.01
Estimated 2018 emissions (tpy)	0.38	0.38	0.38	0.051	0.38	0.051	0.12	0.12	0.12	0.74	0.0057	0.14
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass.**		**Maintenance**		**Attain/Unclass**	**Nonattainment (P)[2]**	**Nonattainment (P)[2]**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**N/A**	**N/A**	**100**	**50**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**18.20**	**18.20**	**18.20**	**2.49**	**18.20**	**2.49**	**3.05**	**3.05**	**3.05**	**7.25**	**0.84**	**25.65**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Allegheny County, PA												
H-318 Pipeline Construction												
Estimated 2017 emissions (tpy)	5.63	5.63	5.63	0.65	5.63	0.65	1.11	1.11	1.11	3.38	0.24	5.08
Estimated 2018 emissions (tpy)	0.27	0.27	0.27	0.037	0.27	0.037	0.087	0.087	0.087	0.53	0.0041	0.10
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Nonattainment**	**Nonattainment**	**Nonattainment**	**Maintenance (P)[2]**	**Maintenance (P)[2]**	**Maintenance (P)[2]**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**100**	**50**	**100**	**50**	**100**	**100**	**100**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**5.73**	**5.73**	**5.73**	**0.65**	**5.73**	**0.65**	**1.11**	**1.11**	**1.11**	**3.38**	**0.24**	**5.08**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Washington County, PA												
H-318 Pipeline Construction												
Estimated 2017 emissions (tpy)	2.31	2.31	2.31	0.26	2.31	0.26	0.45	0.45	0.45	1.36	0.10	2.05
Estimated 2018 emissions (tpy)	0.11	0.11	0.11	**0.000**	0.11	0.015	0.035	0.035	0.035	0.21	0.0016	0.041
Attainment Status[1]	**Attain/Unclass**	**Attain/Unclass**	**Marginal**		**Moderate**		**Attain/Unclass**	**Nonattainment**	**Nonattainment**	**Attain/Unclass**	**Attain/Unclass**	**Attain/Unclass**
Conformity De Minimis (tpy)	**N/A**	**N/A**	**100**	**50**	**100**	**50**	**N/A**	**100**	**100**	**N/A**	**N/A**	**N/A**
Max. Annual County-Wide Emissions (tpy)	**2.31**	**2.31**	**2.31**	**0.26**	**2.31**	**0.26**	**0.45**	**0.45**	**0.45**	**1.36**	**0.10**	**2.05**
Exceeds De Minimis? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Construction Project Triggers General Conformity Requirements? (Yes/No)	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

1. County is inside the Ozone Transport Region (OTR).
2. County is designated as nonattainment for portions of the county. This project will not be in the nonattainment portion(s) of this county.

9.1.7 Mitigation Measures

Under PADEP air permitting regulations in 25 Pa Code §127.1, new sources of air emissions must implement BAT. The Redhook Compressor Station will be installing new equipment, thus this section addresses the proposed BAT for the various emission sources proposed as part of this project. This information is outlined in detail in the Plan Approval application, and excerpts from the application are included in the following sections.

9.1.7.1 BAT for Natural Gas-Fired Engines

The proposed natural gas-fired compressor engines are 5,350 brake horsepower (bhp) four stroke-lean burn CAT G3616 engines. The engines are equipped with air/fuel ratio control to reduce NO_X emissions. Caterpillar's specifications for this engine indicate an emission rate of 0.5 g/bhp-hr, which is much lower than the current applicable limit of 1.0 g/bhp-hr required by NSPS Subpart JJJJ for engines of this size, type, and use. Furthermore, this emission rate is compliant with PADEP's BAT limit for compressor engines in the production/gathering segment of the industry authorized under General Permit No. 5 (GP-5) as finalized in February 2013. As such, Equitrans believes that the potential NO_X emissions rate of 0.5 g/bhp-hr complies with the BAT requirement in 25 Pa Code § 127.1. Equitrans is proposing a limit of 0.4 g/bhp-hr. This lower limit reflects a major source avoidance limit and is based on expected, but not guaranteed, performance. As such, Equitrans considers 0.4 g/bhp-hr an NSR-avoidance limit, not BAT.

A potential option to further reduce NO_X emissions is through the use of Selective Catalytic Reduction (SCR) control technology. SCR is not a widely used technology for natural gas-fired combustion engines like those proposed for this project. Although potentially technically feasible, SCR is very costly. Capital costs are significantly higher than other types of NO_X controls due to the volume of catalyst that is required. At an estimated NO_X control efficiency of 90 percent, the cost effectiveness of SCR on the engines at the proposed Redhook Compressor Station is estimated to be greater than $15,000 per ton. Therefore, SCR is determined to be economically infeasible for this application. As such, Equitrans believes that the proposed NO_X emission rate of 0.5 g/bhp-hr complies with the BAT requirement in 25 Pa Code § 127.1 and the major source avoidance limit of 0.4 g/bhp-hr exceeds BAT.

Equitrans is proposing the use of an oxidation catalyst as BAT for controlling emissions of CO and VOC from the compressor engines. The oxidation catalyst vendor has guaranteed a CO removal efficiency of 93% at this temperature, resulting in an emission rate of 0.17 g/bhp-hr. This emission rate is well below the current limit of 2.0 g/bhp-hr required by NSPS Subpart JJJJ for non-emergency lean burn natural gas engines ≥ 1,350 hp manufactured after July 1, 2010 and is equivalent to PADEP's BAT level for compressor engines under GP-5. As such, Equitrans believes that the potential CO emissions rate complies with the BAT requirement in 25 Pa Code § 127.1.

Potential BAT options for both PM/PM_{10} and SO_2 emissions, based on a search in the EPA's RACT/Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC) database, indicate that the only technologies used to reduce these pollutants from natural gas–burning engines are good combustion practices and low-sulfur fuels. The sulfur content of the pipeline quality natural gas, which will be used in the engines, is very low. Equitrans will also operate the engines in accordance with the manufacturer's recommended practice to minimize emissions of particulate matter and SO_2. Both technologies are considered base-case and are equally effective. Equitrans proposes that the combination of good combustion practices and the firing of pipeline quality natural gas be considered BAT for the proposed compressor engines.

9.1.7.2 BAT for Solar Turbines

The operation of the proposed combustion turbines for the Redhook Compressor Station will generate emissions of NO_X, CO, VOC, and HAPs. Small amounts of PM, and SO_2 will also be generated, but are insignificant and add-on emission controls have therefore not been evaluated for the purposes of determining BAT. Table 9.1-8**Error! Reference source not found.** summarizes the proposed control strategy and emission limits for the turbines at the Redhook Compressor Station as compared to PADEP's GP-5 BAT levels for turbines and RACT/BACT/LAER emission limits for similar simple-cycle gas-fired turbines.

Table 9.1-8

Summary of BAT for Turbines

Pollutant*	PADEP GP-5 BAT Levels	RBLC and Similar Sources		Proposed BAT for Turbines (Case-Specific)	
	Turbines 5000 < HP < 15,000	Maximum	Minimum	Controls	Emission Rate a/
CO	25 ppm	25 ppm	2 ppm	SoLoNOx	25 ppm
NO_X	15 ppm	120 ppm	15 ppm	SoLoNOx	15 ppm
VOC	9 ppm	25 ppm	2 ppm	SoLoNOx	5 ppm

a/ All emissions shown are in ppmvd and are corrected to 15% O_2

The proposed BAT for CO, NO_X, and VOC emissions from the combustion turbines is the lean pre-mix technology (i.e., SoLoNO$_X$ system). The CO emissions level of 25 ppmvd at 15% O_2 will be demonstrated through performance testing. The NO_X emissions level of 15 ppmvd at 15% O_2 will be demonstrated in accordance with the requirements of NSPS KKKK. The VOC emissions level of 5 ppmvd at 15% O_2 will be demonstrated through performance testing. All concentration limits are proposed for the maximum operating capacity of the unit. Compliance with the proposed CO and VOC limitations should also assure compliance with BAT for HAPs and therefore a separate HAP compliance demonstration is unnecessary.

9.1.7.3 BAT for TEG Dehydration Unit

The pollutants of interest emitted from TEG dehydration unit are VOC and HAP. Equitrans is proposing an enclosed flare with a minimum control efficiency of 98 percent to control emissions of these pollutants from the dehydration unit, which is more stringent as the established BAT levels for dehydration units (95% VOC control) in PADEP's recently finalized new GP-5.

9.1.7.4 Construction and Operational Emissions

The construction emissions associated with the compressor station and pipeline are expected to have minimal impact on the air quality in the surrounding area. However, Equitrans will implement various mitigation measures to minimize construction emissions. These include:

- Unnecessary construction activities leading to increased emissions will be avoided, where possible;
- Equitrans will follow manufacturer's operating recommendations regarding good combustion practices to ensure that fuel efficiency is maximized and engines are operated such that emissions are minimized;
- Equitrans will require contractors to follow all local, state, and federal emission standards and air quality regulations applicable to their fleet and equipment; and

- Equitrans will implement a fugitive dust control plan and will utilize certain dust control measures such as water suppression, enclosures, or other techniques.

Emissions from operating the equipment at the new Redhook Compressor Station result from combustion of natural gas in the turbines and other combustion equipment at the station. While the design is not yet final, similar to other Equitrans compressor stations, Equitrans will purchase turbines and other equipment that meet the emission limitations found in the applicable NSPS sections. Further, Equitrans will perform a BAT analysis in the Plan Approval application and will install units compatible with the BAT emission limits agreed to by PADEP. Equitrans will mitigate these emissions through the development and implementation of an operation and maintenance plan that is in line with the manufacturer's recommendations for good combustion practices. Proper operation and preventative maintenance activities will ensure that emissions from the turbines and other equipment will be minimized and continue to meet the emission standards. Refer to the operational emissions calculations provided in Appendix 9-C.

Fugitive GHG (and to a lesser extent, VOC) leaks will be minimized by adhering to good operating and maintenance practices. Despite the lack of federal or PADEP guidance on conducting control technology reviews for GHGs, Equitrans believes the Project is designed to reduce GHG emissions where technically and economically feasible.

Equitrans has also performed a complete air dispersion modeling analysis as presented in Appendix 9-E to ensure that the concentration levels from the emission sources at the compressor stations will not exceed the NAAQS levels. Per a data request from FERC, Equitrans also reviewed information to determine a list of reasonable foreseeable air emissions sources. Table 9.1-9 provides a list of these projects. Given the margin between existing ambient background concentrations and the NAAQS, the maximum expected project-related model output concentrations are predicted to occur at the fenceline (per Appendix 9-E), and the nearest source (proposed or existing) is being decommissioned as part of this project, no adverse cumulative impacts are expected from other emissions sources.

Table 9.1-9

Projects in the Vicinity of the Equitrans Expansion Project

Project	Description	County/State	Shared Watershed (Fifth Level)	Shared Air Quality Control Region	Distance from the Project	Direction	Status
Energy Projects							
Mountain Valley Pipeline (MVP)	The Mountain Valley Pipeline Project consists of the installation of approximately 301 miles of 42-inch-diameter pipeline in 17 counties in WV and VA. Installation of approximately 171,600 horsepower of compression at three compressor station sites along the route will also be required.	Wetzel County, WV Harrison County, WV Doddridge County, WV Lewis County, WV Braxton County, WV Webster County, WV Nicholas County, WV Greenbrier County, WV Fayette County, WV Summers County, WV Monroe County, WV Giles County, VA Craig County, VA Montgomery County, VA Roanoke County, VA Franklin County, VA Pittsylvania County, VA	Fishing Creek	Southwest Pennsylvania Intrastate, Parkersburg (West Virginia)-Marietta (Ohio)	Connects to EEP	S	In the pre-filing stage.
Leach Xpress	The Leach Xpress project, proposed by Columbia Pipeline Group, would involve construction of about 160 miles of natural gas pipeline and compression facilities in West Virginia's northern panhandle.	Marshall County, WV	N/A	Steubenville-Weirton-Wheeling Interstate	23 Miles	W	The application has been filed with FERC.
Ohio Valley Connector Project	Natural gas pipeline system of approximately 36 miles of pipeline and two compressor stations to transport natural gas from northwestern West Virginia to southeastern Ohio for subsequent delivery to mid-continent and Gulf Coast markets.	Marshall and Wetzel Counties, WV	N/A	Steubenville-Weirton-Wheeling Interstate, Southwest Pennsylvania Intrastate	Less than 1 mile	W	Construction expected to be complete third quarter 2016.

Table 9.1-9

Projects in the Vicinity of the Equitrans Expansion Project

Project	Description	County/State	Shared Watershed (Fifth Level)	Shared Air Quality Control Region	Distance from the Project	Direction	Status
Appalachian Connector Pipeline	Williams has proposed the Appalachian Connector pipeline project that would connect Western Marcellus and Utica natural gas supply areas in northern West Virginia with Williams' existing Transco natural gas pipeline, which stretches about 850 miles in Virginia.	N/A	N/A	N/A	N/A	N/A	The project is in the preliminary planning stages.
Supply Header Project	This proposed project would include about 39 miles of new 36-inch natural gas pipeline and would modify existing compression facilities in West Virginia. The compressor station in Mockingbird Hill is approximately 7 miles west of MVP mile marker 1.	Wetzel and Harrison Counties, WV	Fishing Creek, South Fork Tenmile Creek	North Central West Virginia Intrastate, Parkersburg (West Virginia)-Marietta (Ohio)	5 miles	SW	The application has been filed with FERC.
Rover Pipeline Project	Rover Pipeline LLC, a subsidiary of Energy Transfer, has proposed to construct the Rover Pipeline Project, which would carry 3.25 billion cubic feet of natural gas per day through 710 miles of pipeline. The last few miles of the proposed pipeline cuts southeast through Marshall County, West Virginia (24-inch pipe) and Wetzel and Tyler counties (36-inch pipe) before terminating in Doddridge County.	Marshall, Wetzel, Tyler, and Doddridge Counties, WV	South Fork Tenmile Creek, Fishing Creek	81.231 Central West Virginia, 81.70 - Parkersburg (West Virginia)-Marietta (Ohio)	20 miles	W	The application has been filed with FERC.
Sunrise Pipeline Project and Jefferson Expansion	The new facilities consist of 44.4 miles of natural gas pipeline varying from 16 to 24-inch diameter, replacement of 2.6 miles of pipeline, and retesting and uprating 4.8 miles of pipeline; one new compressor station; and ancillary facilities.	Wetzel County, WV; Greene County, PA	South Fork Tenmile Creek; Fishing Creek	Southwest Pennsylvania Intrastate AQCR and West Virginia 2	5 to 10 miles	SE	Operational.
Applegate Gathering System	EQT Gathering, LLC is in the planning stages for an expansion of its Applegate Gathering System, which could include construction of gathering pipelines and compression.	Allegheny County, PA	Lower Monongahela River	Southwest Pennsylvania Intrastate AQCR	Connects to EEP	E	The project is in the preliminary planning stages.

Table 9.1-9

Projects in the Vicinity of the Equitrans Expansion Project

Project	Description	County/State	Shared Watershed (Fifth Level)	Shared Air Quality Control Region	Distance from the Project	Direction	Status
Mariner East Pipeline	Sunoco Mariner East is constructing this project to deliver natural gas from Western Pennsylvania to the Marcus Hook facility, where it will be processed, stored, and distributed to various domestic and waterborne markets. The project is anticipated to have an initial capacity to transport approximately 70,000 barrels per.	Allegheny County, PA	Lower Monongahela River	Southwest Pennsylvania Intrastate AQCR	Less than 1 mile	N	Operational.
Mariner East 2 Pipeline	Sunoco is planning to expand the existing Mariner East pipeline to increase its capacity to 345,000 barrels per day natural gas.	Allegheny County, PA	Lower Monongahela River	Southwest Pennsylvania Intrastate AQCR	0-3 miles (route not finalized)	N	Operation expected in late 2016.
Transportation Projects							
Pennsylvania Turnpike, Southern Beltway Project	Construction of a 13-mile, 4-lane highway from Route 22 to I-79.	Allegheny and Washington Counties, PA	N/A	Southwest Pennsylvania Intrastate AQCR	10 miles	W	Under construction.
Murtland Ave/I-70 Interchange Improvements	PennDOT construction of a double divergent interchange at I-70 and Murtland Avenue.	Washington County, PA	N/A	Southwest Pennsylvania Intrastate AQCR	15 miles	NW	Under construction.
Commercial/Residential Development							
Cool Valley Mixed-use Development	911-acre mixed-use development in Cecil Township with up to 2.25 million square feet of office space, retail space, and 1,400 new homes.	Washington County, PA	N/A	Southwest Pennsylvania Intrastate AQCR	20 miles	N	Permitting in process.
Park Place at the Meadowlands, Phase II	Implementation of Phase II of Park Place at the Meadowlands, a mixed-use property on 44 acres in North and South Strabane townships.	Washington County, PA	N/A	Southwest Pennsylvania Intrastate AQCR	13 miles	W	Under construction.
Residential Development	Planned residential community associated with The Preserves and the Courtyard at the Preserves.	Allegheny County, PA	N/A	Southwest Pennsylvania Intrastate AQCR	16 miles	NW	Development approved in 2014.

9.2 NOISE

Sound is caused by vibrations that generate waves of minute pressure fluctuations in the surrounding air. Sound levels are typically measured using a logarithmic decibel (dB) scale. Sound that causes disturbance or annoyance, or unwanted sound, is often called "noise." The terms sound and noise are used interchangeably in this analysis.

Human hearing varies in sensitivity for different sound frequencies. The ear is most sensitive to sound frequencies between 800 and 8,000 hertz (Hz) and is least sensitive to sound frequencies below 400 Hz or above 12,500 Hz. Consequently, several different frequency weighting schemes have been used to approximate the way the human ear responds to noise levels. The "A-weighted" decibel scale (dBA) is the most widely used for this purpose. A list of typical sound levels for example sound sources is presented in Figure 9.2-1.

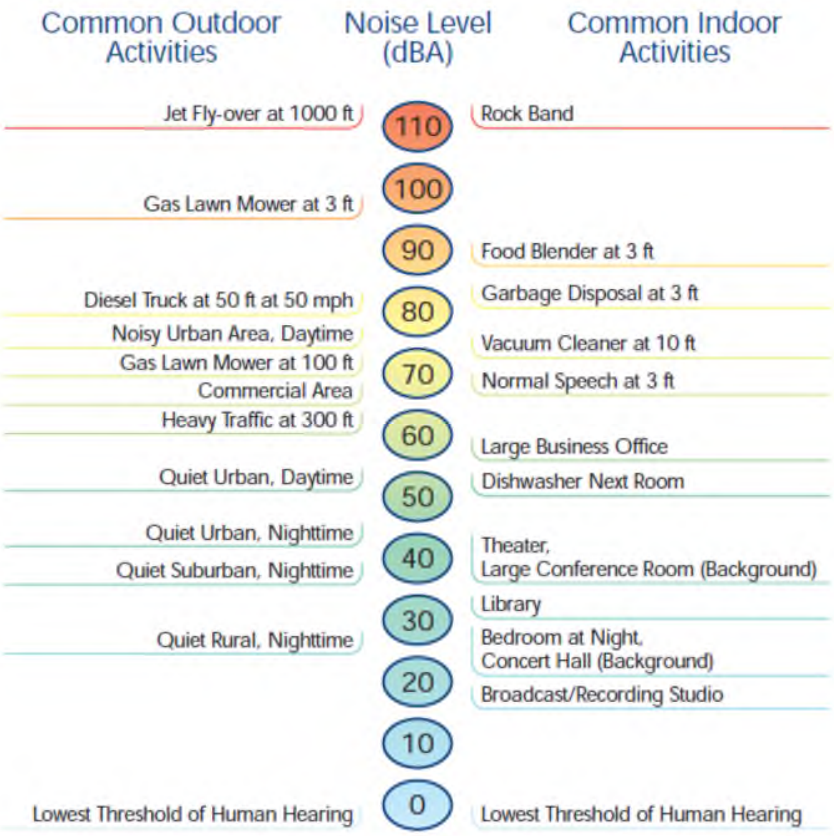

Figure 9.2-1. Sound Levels of Typical Noise Sources

Source: Caltrans 2014

Varying sound levels often are described in terms of an equivalent constant decibel level. Equivalent sound levels (L_{eq}) are not a simple averaging of decibel values but are based on the cumulative acoustical energy associated with the variable sound levels. L_{eq} values sometimes are referred to as energy-averaged sound levels. As a consequence of the calculation procedure, high dB events contribute more to the L_{eq} value than do low dB events. L_{eq} values are used to develop single-value descriptions of average sound exposure over various periods of time. Such average sound exposure ratings often include additional weighting factors for potential annoyance due to time of day or other considerations. The L_{eq} data used for average sound exposure descriptors are generally based on A-weighted sound level measurements (expressed as dBA), which include adjustments to the unweighted values to account for the variation in human hearing sensitivity across the audible frequencies.

Average sound exposure over a 24-hour period is often presented as a day-night average, or time-weighted, sound level (L_{dn}). L_{dn} values are calculated in the units of dBA from hourly L_{eq} values, with the L_{eq} values for the nighttime period (10 p.m. to 7 a.m.) increased by 10 dBA to reflect the greater disturbance potential from nighttime sounds.

L_{dn} is calculated from the daytime and nighttime L_{eq} values according to the following formula:

$$L_{dn} = 10 \times Log_{10}\left({}^{15}\!/_{24} \times 10^{(L_{eq(day)}/10)} + {}^{9}\!/_{24} \times 10^{((L_{eq(night)}+10)/10)} \right)$$

Certain statistical noise values are sometimes used to describe the allowable sound levels, or limits, at noise sensitive areas (NSAs). The L_1, L_{10}, and L_{50} statistical noise level descriptors are the noise levels that equaled or exceeded a stated percentage of the time during a given hour. For example, an L_{10} = 60 dBA implies that in any hour of the day, a noise level of 60 dBA is equaled or exceeded 10 percent of the time, or for 6 minutes. The L_{50}, the noise level exceeded 50 percent of the time, is commonly known as the "median noise level."

Sound intensity attenuates with distance as it propagates over a larger area, generally in a spherical spreading pattern, away from a point source where the sound waves were generated. Generally speaking, the sound pressure level emitted from a point source decreases by approximately 6 dBA for each doubling of distance. Sound emitted from a line of point sources attenuates in a cylindrical spreading pattern and decreases approximately 3 dBA for each doubling of distance.

9.2.1 Applicable Noise Regulations

FERC noise analysis guidelines require that any applicable federal, state or local noise regulations or standards be identified and compared with the anticipated noise levels from the Project. It is further required to specify how the addition of the Redhook Compressor Station will meet the applicable regulations.

The FERC standard for noise quality can be found at 18 CFR 380.12 (k)(4)(v)(A):

> *The noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day- night sound level (L_{dn}) of 55 dBA at any preexisting noise-sensitive area (such as schools, hospitals, or residences).*

Because the Project includes a new compressor station, the FERC noise standard applicable to the Project is to demonstrate that the noise level at any preexisting NSA attributable only to the Redhook Compressor Station does not exceed 55 dBA L_{dn}. An L_{dn} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA L_{eq} for facilities that operate at a constant level of noise.

Equitrans reviewed state and local rules and ordinances for noise standards potentially applicable to the Redhook Compressor Station and the horizontal directional drilling (HDD) operations. The results of the review are summarized in Table 9.2-1.

<table>
<tr><th colspan="4">Table 9.2-1

Summary of Applicable Noise Standards</th></tr>
<tr><th>Noise Source</th><th>Regulatory Agency</th><th>Noise Standard</th><th>Comments</th></tr>
<tr><td rowspan="4">Redhook Compressor Station</td><td>FERC</td><td>L_{dn}, 55 dBA</td><td>Maximum allowable impact from the Redhook Compressor Station as predicted at the nearest NSA</td></tr>
<tr><td>PADEP</td><td>None</td><td>No applicable noise policy or regulations identified</td></tr>
<tr><td>Greene County</td><td>None</td><td>No applicable noise policy or regulations identified</td></tr>
<tr><td>Franklin Township</td><td>60 decibels (dB) at 20 – 300 Hertz (Hz);
40 dB at 300 – 2,400 Hz;
30 dB at 2,400 Hz and above.</td><td>Five decibels can be deducted from the measurements for noises of periodic character. Standards apply at all time and are applicable at the property line and from the station alone. Per the ordinance: “the determination of the existence of the nuisance elements of noise, vibration, glare, and dust shall be made at the property lines of the use creating same”</td></tr>
<tr><td rowspan="3">HDD Operations</td><td>FERC</td><td>55 dBA for nighttime operations</td><td>–</td></tr>
<tr><td>Jefferson Township</td><td>80 dBA at the property line;
60 dBA in any district between 7:00 PM – 7:00 AM</td><td>–</td></tr>
<tr><td>Union Township</td><td>60 dBA in the “residential” district category beyond the property line</td><td>Construction or maintenance activities between 7:00 AM – 9:00 PM are exempt from the noise standard</td></tr>
</table>

9.2.2 Existing Noise Sensitive Areas

Aerial and field surveys of the area surrounding the Redhook Compressor Station were conducted to identify residences, schools, churches, hospitals and other potential NSAs. The noise survey was conducted on July 8, 2015 at the four identified NSAs that were closest to the Redhook Compressor Station. Detailed information on the existing NSAs and baseline noise levels are presented in the noise monitoring survey report which is included in Attachment 9-A of this report.

9.2.3 Existing Sound Environment

FERC rules at 18 CFR 380.12(k)(2)(ii) state that environmental reports for Natural Gas Act applications require the applicant to quantitatively describe existing noise levels at existing NSAs. Equitrans has quantified the existing noise levels at NSAs near the Redhook Compressor Station and also near the sites where pipeline installation is proposed using the HDD technique.

9.2.3.1 Redhook Compressor Station

With respect to the Redhook Compressor Station, the ambient sound levels at four existing NSAs were determined during the sound monitoring survey performed on July 8, 2015. The results of the ambient sound measurements are described in the sound monitoring survey included as Appendix 9-A of this report. A summary of the measurements is included in Table 9.2-2 below. Figure 9.2-2 shows the locations of the NSAs in comparison with the Redhook Compressor Station.

Table 9.2-2

Summary of Sound Measurement at the Pre-Existing NSAs

Location	Direction and Distance	Background (July 2015)	
		Daytime/Nighttime Measurements (L_{eq}, dBA)	L_{dn} (dBA)
NSA-1 (residence)	SW – 3,300 ft	45.3	50.5
		43.9	
NSA-2 (residence)	SW – 2,300 ft	52.6	56.1
		48.9	
NSA-3 (animal hospital)	NW – 1,900 ft	47.9	47.3
		36.1	
NSA-4 (residence)	E – 850 ft	65.3	66.6
		58.1	

Figure 9.2-2. Locations of the NSAs in Comparison with the Redhook Compressor Station

9.2.3.2 HDD Locations

Equitrans is planning to perform HDD at two locations, and the existing sound level was surveyed close to the entry and exit of each HDD location.

H-316 HDD

The results of the ambient sound measurements are described in the sound monitoring survey included as Appendix 9-A of this report. A summary of the measurements is included in Tables 9.2-3 and 9.2-4 below. Figures 9.2-3 and 9.2-4 show the locations of the NSAs in comparison with the H-316 HDD entry and exit points.

Table 9.2-3

Summary of Sound Measurement at the Pre-Existing NSAs (H-316 HDD Entry)

Location	Direction and Distance	Background (July 2015)
		Nighttime Measurements (L_{eq}, dBA)
NSA-W (residence)	W – 1,100 ft	41.2
NSA-N (residence)	NE – 800 ft	37.5
NSA-E (residence)	E – 1,100 ft	35.9
Entry Point	0 ft	46.2 (day time)
		34.9 (night time)

Table 9.2-4

Summary of Sound Measurement at the Pre-Existing NSAs (H-316 HDD Exit)

Location	Direction and Distance	Background (July 2015)
		Nighttime Measurements (L_{eq}, dBA)
NSA-N (residence)	N – 800 ft	34.3
NSA-SW (residence)	SW – 1,400 ft	44.4

Figure 9.2-3. Locations of the NSAs in Comparison with the H-316 HDD Entry Point

Figure 9.2-4. Locations of the NSAs in Comparison with the H-316 HDD Exit Point

H-318 HDD

The results of the ambient sound measurements are described in the sound monitoring survey included as Appendix 9-A of this report. A summary of the measurements is included in Tables 9.2-5 and 9.2-6 below. Figures 9.2-5 and 9.2-6 show the locations of the NSAs in comparison with the H-318 HDD entry and exit points.

Table 9.2-5

Summary of Sound Measurement at the Pre-Existing NSAs (H-318 HDD Entry)

Location	Direction and Distance	Background (July 2015) Nighttime Measurements (L_{eq}, dBA)
NSA-W (residence)	W - 200 ft	44.6
Entry Point	0 ft	45.6

Table 9.2-6 Summary of Sound Measurement at the Pre-Existing NSAs (H-318 HDD Exit)		
Location	Direction and Distance	Background (July 2015) Nighttime Measurements (L_{eq}, dBA)
NSA-N (residence)	N – 900 ft	37.5
NSA-N2 (residence)	N - 500 ft	42.4
NSA-S (residence)	S – 200 ft	45.4

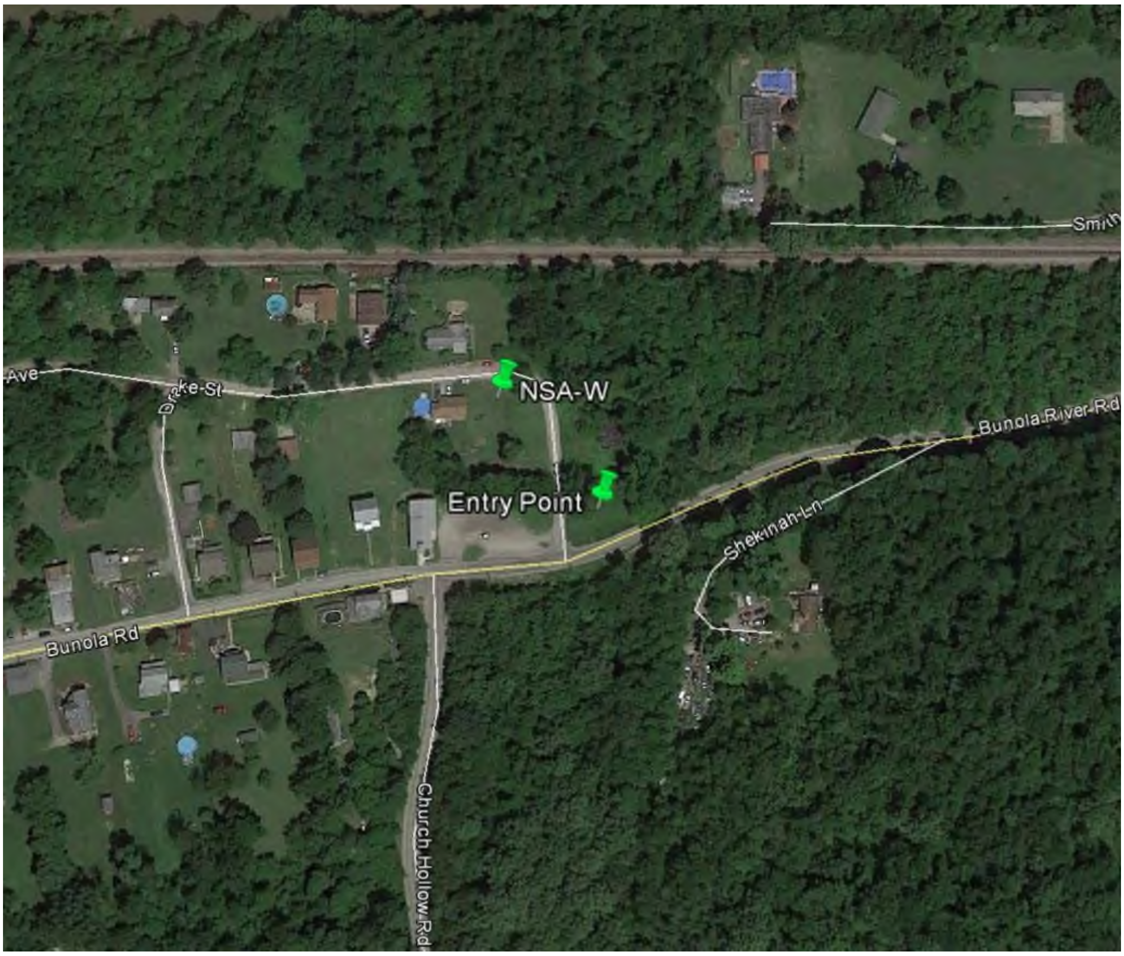

Figure 9.2-5. Locations of the NSAs in Comparison with the H-318 HDD Entry Point

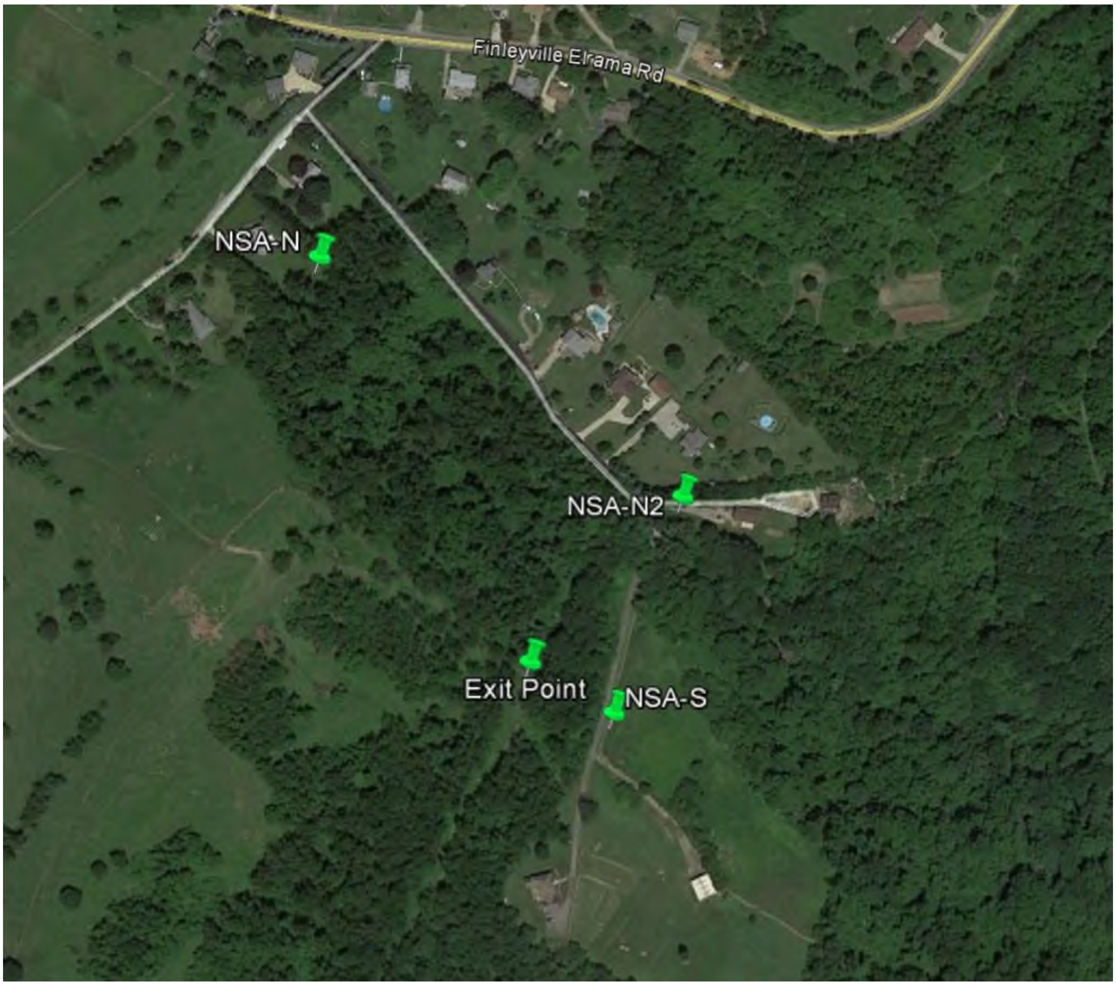

Figure 9.2-6. Locations of the NSAs in Comparison with the H-318 HDD Exit Point

9.2.4 Noise Sources

Noise will be generated at the site of the Redhook Compressor Station during its construction and operation and along the pipeline rights-of-way and the interconnect, tap, and ancillary facilities during construction. The anticipated primary sources of noise at those locations during construction and operation are discussed below.

9.2.4.1 Construction Noise Sources

This section reviews the noise sources associated with the construction of the pipeline and interconnect, construction of the Redhook Compressor Station, and demolition of the Pratt Compressor Station.

Pipeline and Interconnect

Equitrans is proposing to install 7.87 miles of pipeline as part of this project. While most of the pipeline will be installed using a trench-and-cover method, HDD techniques will be utilized for installing segments of pipeline at two locations along the pipeline.

Trench-and-Cover

The trench-and-cover method of pipeline installation involves digging a trench, lowering the pipelines, and backfilling. The predominant source of noise associated with trench-and-cover pipeline installation are associated with the internal combustion engines of the construction equipment.

Trench-and-cover pipeline installation typically occurs for a few days at any given location. Noise impacts at NSAs from the trench-and-cover pipeline installation is, therefore, expected to be short-term and temporary, and is not expected to adversely affect any NSAs along this route. No further impact assessment of the trench-and-cover pipeline installation have been made in this report.

Horizontal Directional Drilling (HDD)

Pipeline will be installed using HDD at two separate locations. General operational phases associated with HDD include:

- *Pilot Hole Drilling* which involves drilling a small diameter pilot hole along the pre-set pipeline pathway from the HDD Entry Point to the HDD Exit Point
- *Reaming* which involves enlarging the pilot hole to a diameter larger than pipeline from the Exit Point to the Entry Point
- *Pipeline Installation* which involves pulling the pipeline through the enlarged hole from the Exit Point to the Entry Point

Table 9.2-7 identifies the anticipated equipment associated with maximum operating scenario for HDD entry and exit points. HDD operations can occur up to 24 hours per day.

Table 9.2-7

Construction Equipment Associated with HDD

Construction Equipment	Quantity
Entry Point	
HDD Drill Rig & engine-driven hydraulic power unit	1
Mud Unit with engine-driven pump and engine-driven generator set	1
Generator	1
Air Compressor	1
Crane, Wheeled	1
Pump	1
Excavator	2
Exit Point	
Mud Unit with engine-driven pump and engine-driven generator set	1
Generator	1
Pump	1
Excavator / Sideboom	2

Redhook Compressor Station

Construction activities associated with the Redhook Compressor Station can be categorized into the following five phases based on schedule of operations and the type of construction equipment used:

- **Site Preparation** which includes removal of existing residential dwellings and vegetation
- **Earthmoving** which includes excavation, grading and filling
- **Concrete Pouring**
- **Structural Erection**, which involves steel erection, construction of building framework, and welding
- **Equipment Installation and Building Finishing**, which involves installation of mechanical and electrical equipment, and completion of buildings

Table 9.2-8 identifies the type, quantity and operating hours of construction equipment that can be expected over the course of the construction of the Redhook Compressor Station.

Based on a review of the quantity and sound power level of the equipment that is likely to be used at the site, it was determined that the earthmoving phase had the potential to cause the highest noise impact at the NSAs. The predominant source of noise from the earthmoving activities are the internal combustion engines of the construction equipment.

Table 9.2-8

Construction Equipment and On-Site Vehicles During Earthmoving Phase

Description	Typical Daily Operating Hours	Quantity
Air Compressor	12	2
Backhoe	12	2
Bobcat	12	3
Compactor, vibratory	12	1
Dozer	12	3
Dump Truck	12	3
Excavator	12	2
Front-end Loader	12	1
Generator	12	4
Roller	12	2
Trackhoe	12	2

Construction of the Redhook Compressor Station will consist of earth work (e.g., site grading), construction of the buildings, and installation of the equipment. The noise impact at the NSAs from construction activities will be dependent on the type of equipment used, the duration of use for each piece of equipment, and the quantity of construction equipment operating simultaneously. Construction equipment will be conventional in type (e.g., front end loaders, backhoes, dump trucks) and will be primarily operated during daytime hours on an as-needed basis. The construction activities will be of limited duration (i.e., that necessary to complete the Project components).

Pratt Compressor Station Demolition

Demolition of the existing Pratt Compressor Station will commence subsequent to the construction and operation of the Redhook Compressor Station. Demolition activities are anticipated to occur only during daytime hours, and will involve construction equipment similar to that used in the construction of the Redhook Compressor station. The noise impact at NSAs due to the demolition activities will be temporary and intermittent, and therefore is not expected to have an adverse impact at the NSAs and has not been assessed further in this report.

9.2.4.2 Operational Noise Sources

Redhook Compressor Station

The primary sources of noise during operation of the Project will consist of two RICE and two turbine-driven compressors and ancillary equipment. An approximate total of 33,200 hp of compression will be installed. Table 9.2-9 lists the primary sources of noise expected during the operation of the Redhook Compressor Station. Each pair of compressors will be housed in a sound attenuated building. The site will also consist of a valve/metering station yard, and other ancillary equipment such as generators and blowdown vents.

Table 9.2-9

Primary Sources of Operational Noise at the Redhook Compressor Station

Source ID	Description	Quantity	Manufacturer	Model
1	Turbine Driven Compressors	2	Solar	Taurus 70 (unenclosed package)
2	Turbine Compressor Building - Sidewall Exhaust	4	--	--
3	Turbine Intake	2	--	--
4	Turbine Exhaust	2	Solar	--
5	Turbine Lube Oil Cooler	2	Moore Fans	Class 10000 EC Series 24
6	Turbine Compressor Gas Cooler (2 fans each)	4	Moore Fans	1060/M94-W0-A/60R-AM-9-13.00-4
7	RICE-Driven Compressors	1	Caterpillar	G3616 (Unenclosed package)
8	RICE Compressor Building - Sidewall Intake	4	--	--
9	RICE Intake	4	--	--
10	RICE Exhaust	2	--	--
11	RICE Utility Coolers	2	Moore Fans	1036/M94-W0-A/36R-AM-9-11.00-4
12	RICE Compressor Gas Coolers (2 fans each)	4	Moore Fans	1072/M94-W0-A/72R-AM-9-14.00-4
13	Microturbine Generator	2	Capstone	C1000 (Attenuated Enclosures)
14	Above-Ground Piping and Valves	Multiple	--	--
15	Blowdown Vent – Normal Unit Shutdown	4	--	--

Lesser sources of noise installed at the Redhook Compressor Station will include a glycol dehydrator and an air compressor, both of which are considered to be relatively minor sources of noise. Blowdown vents for emergency shutdown (ESD) of the compressors and turbines are not equipped with a silencer. However, ESD events occur once per year as a scheduled test, with a duration of 10 minutes, and are considered to have insignificant impacts due to infrequent use and the short duration of each event.

Pipeline and Interconnect

Pipeline noise would be limited to construction and could include short-term increases in sound. However, the sound will be sporadic and temporary in any given location. In addition, most operations will generally occur during the daytime.

Any source of noise at the interconnects would be temporary during construction and intermittent thereafter (PRVs).

9.2.5 Noise Impact Analysis

9.2.5.1 Methodology

Noise impacts at the NSAs were determined using computer model CadnaA (Computer-Aided Noise Abatement, Version 4.4.145), a noise modeling software developed by DataKustik GmbH. The model is based on International Standards Organization (ISO) Standard 9613-2 “Acoustics – Attenuation of Sound During Propagation Outdoors.” The model evaluates the A-weighted sound pressure levels of each noise source at each identified receptor. The ISO-based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures, topography and brush. The model is considered conservative since it represents atmospheric conditions that promote propagation of sound from source to receiver.

The absorption of sound by the ground as the sound propagates from the emitting source is influenced by vegetation type, ground cover and the density and height of foliage. Attenuation by ground absorption is input into the model based on a numerical value between 0 and 1, where “0” indicates acoustically hard, reflective surfaces, and “1” indicates soft, absorptive ground. A ground absorption coefficient of 0.7 was used in the model for the intervening land between the Redhook Compressor Station property line and the NSAs; these intervening areas consist of deciduous forests and open fields. A ground absorption of 0 was conservatively used for the entire Redhook Compressor Station property.

9.2.5.2 Redhook Compressor Station Construction Noise

As previously indicated, it was considered that the earthworking phase had the potential to cause the highest noise impact at the NSAs. The predominant source of noise from the construction activities would be the internal combustion engines of the construction equipment.

The noise from construction equipment was modeled in CadnaA as an area source covering the impacted area within which all of the construction equipment identified in Table 9.2-10 would potentially operate simultaneously. The movement of on-site vehicles were modeled as a moving point source around the footprint of the Redhook Compressor Station.

The estimated noise impacts at the NSAs from construction activities are listed in Table 9.2-11. Based on the acoustic modeling, it was predicted that construction noise would only exceed 55 dBA L_{dn} at NSA-4. The predicted L_{dn} at NSA 4 due to construction activities, 59.6 dBA, is considerably lower than the measured ambient sound level at NSA-4 of 66.6 dBA L_{dn}. The predicted increase at NSA-4 over the existing ambient L_{dn} due to construction activities is only 0.8 dBA. Hence, the construction noise is not considered to have an adverse impact at NSA 4.

Table 9.2-10

Estimated SPLs of Construction Activities Potentially Used During Earthmoving Phase

Equipment	Quantity	Typical Daily Operating Hours a/ (Hours per Day)	Sound Pressure Level (SPL) b/ (dBA)	Distance of SPL b/ (ft)	PWL c/ (dBA)
CONSTRUCTION EQUIPMENT					
Air Compressor	2	12	78	50	109.5
Backhoe	2	12	78	50	109.5
Bobcat d/	3	12	70.7	23	95.4
Compactor, vibratory	1	12	82	50	113.5
Dozer	3	12	82	50	113.5
Excavator	2	12	81	50	112.5
Front-end Loader	1	12	79	50	110.5
Generator	4	12	81	50	112.5
Roller	2	12	80	50	111.5
Trackhoe	2	12	81	50	112.5
TOTAL	-	-	-	-	121.5
ON-SITE VEHICLES					
Dump Truck	3	12	76	50	107.5

a/ Anticipated construction hours of 7 AM to 7 PM
b/ Sound pressure levels obtained from FHWA Construction Noise Handbook (https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm)
c/ Construction equipment considered to operate continuously for the 12-hour operating period. Usage factor was not applied.
d/ Measured sound pressure level from a previous Trinity project.

Table 9.2-11

Estimated Impact at NSAs Due to Construction Activities

NSA	Distance to NSA from Compressor Building (ft)	Direction	Existing Ambient Background L_{dn} (dBA)	Estimated Maximum L_{dn} From Construction Activities (dBA)	Estimated Total L_{dn} (dBA)	Predicted Change from Existing Ambient L_{dn} (dBA)
NSA-1	3300	SW	50.5	44.1	51.4	+0.9
NSA-2	2300	SW	56.1	47.4	56.6	+0.5
NSA-3	1900	NW	47.3	52.6	53.7	+6.4
NSA-4	850	E	66.6	59.6	67.4	+0.8

9.2.5.3 HDD Activities

Each HDD entry and exit point was modeled as a point source having an A-weighted sound power level equal to that of the combined noise from all construction equipment identified in Tables 9.2-12 and 9.2-13. It was conservatively assumed that all equipment operate continuously and simultaneously for the period assessed. Assessment was conducted based on a 12-hour daytime operation and a 24-hour operation to provide the drilling contractor with flexibility.

Tables 9.2-14 and 9.2-15 provide L_{dn} at NSAs near the H-316 HDD Entry and Exit points, respectively. Tables 9.2-16 and 9.2-17 provide the L_{dn} at NSAs near H-318 HDD Entry and Exit points, respectively. For each of the two HDD locations, and for both entry and exit points, a 12-hour daytime only and a 24-hour operating scenario were assessed. The following two noise mitigation options were assessed for each HDD location, and for both the HDD Entry and Exit points:

- **Noise Mitigation 1**: All combustion engines will be fitted with a residential-grade exhaust muffler. This is expected to reduce the impact at the NSAs by approximately 10 dB.
- **Noise Mitigation 2:** A temporary acoustical sound wall (acoustical barrier blanket), or equivalent, will be installed along the perimeter of the HDD entry and/or exit points to a height of 16 feet and be located as close as possible to the construction equipment, particularly the drill rig. This acoustical blanket is typically rated for STC-25, but has been conservatively considered to have a reduction of 20 dB in this assessment.

Where necessary, HDD operations can meet the FERC criteria of 55 dBA by implementing one or both of the two mitigation measures identified above.

Table 9.2-12

Estimated Unattenuated SPLs of Equipment at HDD Entry

Construction Equipment	Sound Pressure Level (SPL) (dBA)	Distance of SPL (ft)	Sound Power Level (PWL) (dBA)
HDD Drill Rig & engine-driven hydraulic power unit	85	50	116.5
Mud Unit with engine-driven pump and engine-driven generator set	82	50	113.5
Generator	81	50	112.5
Air Compressor	80	50	111.5
Crane, Wheeled	83	50	114.5
Pump	77	50	108.5
Excavator	85	50	116.5
Excavator	85	50	116.5
TOTAL PWL			**123.5**

Table 9.2-13

Estimated Unattenuated SPLs of Equipment at HDD Exit

Construction Equipment	Sound Pressure Level (SPL) (dBA)	Distance of SPL (ft)	Sound Power Level (PWL) (dBA)
Mud Unit with engine-driven pump and engine-driven generator set	82	50	113.5
Generator	81	50	112.5
Pump	77	50	108.5
Excavator/Sideboom	85	50	116.5
Excavator/Sideboom	85	50	116.5
TOTAL PWL	–	–	**121.3**

Table 9.2-14

Estimated Impact from HDD Activities at H-316 HDD Entry

Construction Equipment	L_{dn} at NSA		
	NSA-W (dBA)	NSA-N (dBA)	NSA-E (dBA)
Daytime Operation Only a/			
Unmitigated Impact	58.6	61.5	58.6
Noise Mitigation Option 1	48.6	51.5	48.6
24-Hour Operation			
Unmitigated Impact	68	70.9	68
Noise Mitigation Option 1	58	60.9	58
Noise Mitigation Option 2	48	50.9	48
a/ Daytime operation from 7 AM to 7 PM			

Table 9.2-15

Estimated Impact from HDD Activities at H-316 HDD Exit

Construction Equipment	L_{dn} at NSA	
	NSA-N (dBA)	NSA-SW (dBA)
Daytime Operation Only a/		
Unmitigated Impact	56.5	51.4
Noise Mitigation Option 1	46.5	41.4
24-Hour Operation		
Unmitigated Impact	65.9	60.8
Noise Mitigation Option 1	55.9	50.8
Noise Mitigation Option 2	45.9	40.8
a/ Daytime operation from 7 AM to 7 PM		

Table 9.2-16 Estimated Impact at NSAs Due to HDD Activities at H-318 HDD Entry	
Construction Equipment	L_{dn} at NSA NSA-W (dBA)
Daytime Operation Only a/	
Unmitigated Impact	73.2
Noise Mitigation Option 1	63.2
Noise Mitigation Option 2	53.2
24-Hour Operation	
Unmitigated Impact	82.6
Noise Mitigation Option 1	72.6
Noise Mitigation Option 2	62.6
Noise Mitigation Option 1 & 2	52.6
a/ Daytime operation from 7 AM to 7 PM	

Table 9.2-17 Estimated Impact at NSAs Due to HDD Activities at H-318 HDD Exit			
	L_{dn} at NSA		
Construction Equipment	NSA-N1 (dBA)	NSA-N2 (dBA)	NSA-S (dBA)
Daytime Operation Only a/			
Unmitigated Impact	55.4	60.6	68.9
Noise Mitigation Option 1	45.4	50.6	58.9
Noise Mitigation Option 2	35.4	40.6	48.9
24-Hour Operation			
Unmitigated Impact	64.8	70	78.3
Noise Mitigation Option 1	54.8	60	68.3
Noise Mitigation Option 2	44.8	50	58.3
Noise Mitigation Option 1 & 2	34.8	40	48.3
a/ Daytime operation from 7 AM to 7 PM			

9.2.6 Redhook Compressor Station Operation

A three-dimensional noise model was constructed in CadnaA based on the site plans for the Redhook Compressor Station.

The A-weighted, unattenuated sound power levels were input in the model and were based on manufacturer or estimated data. The various types of noise sources at the Redhook Compressor Station were modeled as follows:

- stacks as point sources
- sidewall intakes (compressor building) and sidewall exhausts (turbine building) as point sources with the applicable directivity

- roof and roof-top ventilator as area sources
- walls as vertical area sources
- noise radiating from pipelines as line sources

The A-weighted sound power levels of each significant noise source associated with the Redhook Compressor Station were input in the model. With the exception of the G3616 engine intakes, the acoustical analyses were performed using acoustical data provided by the manufacturer or equipment supplier. Unattenuated sound power levels for the G3616 intakes were obtained from Caterpillar's technical data sheet for the G3616 compressor engine.

Insertion loss specifications for noise control measures (e.g., silencers) selected were used to calculate the attenuated sound power levels for input to the model. Table 9.2-18 summarizes the sound power level for each of the significant noise sources.

Based on the sound power levels identified in Table 9.2-18 with the attenuation as described in Section 9.2.7, the modeled noise impact at the NSAs from the Redhook Compressor Station is well below the FERC L_{dn} of 55 dBA, as shown in Table 9.2-19. Table 9.2-19 also identifies the predicted change in ambient L_{dn} due to the Redhook Compressor Station over the existing ambient L_{dn} to be imperceptible at three NSAs (NSAs 1, 2, and 4) and minimal at NSA 3.

Refer to Appendix 9-G for an isopleth showing the L_{dn} associated with the operation of the Redhook Compressor Station.

The Franklin Township Zoning Ordinance identifies the maximum sound pressure levels in each standard octave band that are required to be met at the property line of the industrial use that is the origin of the noise. The Township noise criteria and the maximum sound pressure levels at the compressor station's property line are summarized in Table 9.2-20.

The Redhook Compressor Station is located in close proximity to its property line. Sound pressure levels higher than the Township's criteria are predicted to occur along the compressor station's property line for some of the standard octave bands. The land uses of the properties in immediate proximity of the station are as follows:

- To the north are properties used for a communications tower and a compressor station.
- To the southwest are forest cover extending more than 600 feet from the property line.
- To the southeast is Jefferson Road and some open grass fields.

Although the station is predicted to have sound levels higher than the Township's noise criteria at the station's property line, adverse impact to the community is not expected based on the non-sensitive land use of the surrounding properties. Therefore, noise mitigation measures to meet the Township's noise criteria have not been proposed.

Table 9.2-18

Sound Pressure Level (SPL) Sound Power Level (PWL) of Significant Noise Sources at the Redhook Compressor Station

Description	Sound Pressure Levels (dBA)										SPL Distance (ft)	Sound Power Levels (dBA)									
	31.5	63	125	250	500	1000	2000	4000	8000	Overall		31.5	63	125	250	500	1000	2000	4000	8000	Overall
Turbine Unenclosed Package a/	91.0	91.0	100.0	100.0	104.0	102.0	110.0	104.0	101.0	113.0	3.3	98.8	98.8	107.8	107.8	111.8	109.8	117.8	111.8	108.8	120.8
Turbine-Driven Compressor Building – Sidewall Exhausts	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
Turbine Intake – Attenuated b/	-	-	-	-	-	-	-	-	-	45.0	800.0	-	-	-	-	-	-	-	-	-	100.5
Turbine Exhaust - Attenuated c/	27.6	39.0	34.0	36.0	33.0	33.0	35.0	32.0	33.0	44.1	200.0	71.1	82.5	77.5	79.5	76.5	76.5	78.5	75.5	76.5	87.6
Turbine Lube Oil Cooler	-	30.5	39.5	43.5	44.5	45.5	40.5	34.5	26.5	50.4	50.0	-	61.9	70.9	74.9	75.9	76.9	71.9	65.9	57.9	81.9
Turbine Driven Compressor Gas Cooler Fans	-	40.0	49.0	53.0	54.0	55.0	50.0	44.0	36.0	59.9	16	-	61.6	70.6	74.6	75.6	76.6	71.6	65.6	57.6	81.5
RICE-Driven Compressor Unenclosed Package d/	-	-	-	-	-	-	-	-	-	-	-	-	-	104.7	111.2	116.3	122.6	125.8	127.7	117.9	131.0
RICE-Driven Compressor Building – Sidewall Air Intakes	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
RICE Intake – Unattenuated e/	-	-	-	-	-	-	-	-	-	-	-	61.0	74.0	83.9	93.9	99.9	108.0	113.8	125.2	124.5	128.1
RICE Intake – Attenuated	-	-	-	-	-	-	-	-	-	-	-	37.0	46.0	43.9	89.9	60.9	71.0	77.8	91.2	91.5	95.8
RICE Exhaust - Unattenuated	-	-	-	-	-	-	-	-	-	-	-	81.0	102.2	114.6	117.1	123.7	130.0	136.0	140.9	138.1	143.8
RICE Exhaust – Attenuated	-	-	-	-	-	-	-	-	-	-	-	64.0	72.2	67.6	67.1	78.7	84.0	89.0	93.9	91.1	96.9
RICE-Driven Compressor Utility Coolers	-	34.7	43.7	47.7	48.7	49.7	44.7	38.7	30.7	54.6	50.0	-	66.2	75.2	79.2	80.2	81.2	76.2	70.2	62.2	86.1
RICE-Driven Compressor Gas Coolers	-	38.4	47.4	51.4	52.4	53.4	48.4	42.4	34.4	58.3	50.0	-	69.9	78.9	82.9	83.9	84.9	79.9	73.9	65.9	89.8
Microturbine Generator - Unattenuated	-	-	-	-	-	-	-	-	-	65.0	32.8	-	-	-	-	-	-	-	-	-	92.8
Microturbine Generator – Attenuated f/	-	-	-	-	-	-	-	-	-	55.5	32.8	-	-	-	-	-	-	-	-	-	82.8
Above-Ground Piping and Valves - Unattenuated	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
Blowdown Vents with Silencer – Normal Unit Shutdown	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0

a/ Unenclosed turbine packages will be located in an acoustically insulated turbine building.
b/ Unsilenced noise data for the T70 Turbine Intake was not provided.
c/ Unsilenced noise data for the T70 Turbine Exhaust was not provided.
d/ Unenclosed compressor packages will be located in an acoustically insulated compressor building.
e/ Unattenuated intake sound power levels for G3616 compressor intake were obtained from Caterpillar technical data sheet.
f/ Unsilenced noise data for the C-1000 generator was not provided.

Table 9.2-19

Compressor Station Sound Level Predictions – FERC Criteria

NSA	Distance to NSA from Compressor Building (ft)	Direction of NSA from Compressor Building	Existing Ambient Background L_{dn} (dBA)	Estimated L_{dn} from Station (dBA)	Estimated Total L_{dn} (dBA)	Predicted Change from Existing Ambient L_{dn} (dB)
1	3300	SW	50.5	37.3	50.7	+0.2
2	2300	SW	56.1	40.4	56.2	+0.1
3	1900	NW	47.3	46.2	49.8	+2.5
4	850	E	66.6	51.2	66.7	+0.1

Table 9.2-20

Compressor Station Sound Level Predictions – Franklin Township Ordinance

	Octave Bands (Hz)								
	31.5	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Township Ordinance – Noise Performance Standards									
Property Line Standard, dB	60	60	60	60	40	40	40	30	30
Property Line Standard, dBA	20.6	34.0	44.0	51.0	37.0	40.0	41.0	31.0	29.0
Sound Levels at Property Line									
North Property Line, dBA	--	--	41.4	42.0	43.9	47.3	45.9	44.9	28.3
Southwest Property Line, dBA	--	--	49.5	50.3	52.1	55.4	58.2	63.5	59.2
Southeast Property Line, dBA	--	--	37.7	37.8	39.8	43.6	42.4	40.8	19.7

9.2.7 Noise Mitigation Measures

9.2.7.1 Construction

The noise impact assessment predicted an L_{dn} only slightly in excess of 55 dBA at one NSA. Because construction noise is expected to be temporary and intermittent, Equitrans is not proposing any noise mitigation measures for construction at this time.

9.2.7.2 HDD Activities

The following two noise mitigation options were assessed for each HDD location and for both the HDD entry and exit points:

- **Noise Mitigation 1**: All combustion engines will be fitted with a residential-grade exhaust muffler. This is expected to reduce the impact at the NSAs by approximately 10 dB.
- **Noise Mitigation 2:** A temporary acoustical sound wall (acoustical barrier blanket), or equivalent, will be installed along the perimeter of the HDD entry and/or exit points to a height of 16 feet, and be located as close as possible to the construction equipment, particularly the drill rig. This acoustical blanket is typically rated for STC-25, but has been conservatively considered to have a reduction of 20 dB in this assessment.

The noise impact assessment indicates that, where necessary, HDD operations are expected to be able to meet the FERC criteria of 55 dBA by implementing one or both of the two mitigation measures identified above.

9.2.7.3 Operation

The noise impact analysis predicts that the Redhook Compressor Station will remain well under the FERC L_{dn} criteria of 55 dBA at the NSAs through the implementation of the noise mitigation measures outlined in this section.

Compressor Building Design

Two buildings are proposed for the site: one to enclose the two RICE-driven compressors and one to enclose the two turbine-driven compressors.

The roof and walls of both buildings will be acoustically insulated to reduce the transmission of mechanical noise from the engines, turbines and compressors to the environment. The noise impact analysis presumes that the buildings will be constructed to achieve a minimum Sound Transmission Class (STC) of 40, with the interior surface of the building having a minimum Noise Reduction Coefficient (NRC) of 0.65. Similarly, the noise impact analysis presumes that the roof-mounted ventilators will be a minimum of STC-30, and all personnel doors will be a minimum of STC-20 with tight perimeter seals.

Compressor Building Ventilation

The building enclosing the two RICE-driven compressors is proposed to include four general ventilation air intake fans located in the walls and five roof-top vents. The noise impact analysis presumes that sound levels of the sidewall exhausts will not exceed 85 dBA at 3 feet.

The building enclosing the two turbine-driven compressors is proposed to include four general ventilation exhausts located in the walls and three roof-top vents. The noise impact analysis presumes that sound levels of the sidewall exhausts will not exceed 85 dBA at 3 feet.

Turbine Intakes

The turbine air intake systems are proposed to be equipped with silencers having the following minimum insertion losses:

Estimated IL Values (dB) for Turbine Air Intake System

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	4	11	25	38	47	55	68	90	80

With this silencer, the attenuated sound pressure level of the turbine air intake system was provided to be 45 dBA at 800 feet, and is expected to require a splitter, a 48” duct and inlet silencer such as a Donasonic unit.

Turbine Exhausts

The turbine exhaust system is proposed to be equipped with a silencer that will have an attenuated sound pressure level of no more than 45 dBA at 200 feet and have the following attenuated acoustic performance:

Acoustic Performance of Attenuated Turbine Exhaust System at 200 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	67	65	50	45	36	33	34	31	34

This information is based on a silencer designed by Mueller Environmental Designs Inc. for an identical turbine (Taurus 70) at another Equitrans compressor station. Insertion losses were not made available at the preparation of this report. Based on the acoustic analyses for the Redhook Compressor Station, this proposed silencer performance was determined to be sufficient for the station.

Turbine Lube Oil Coolers

The proposed lube oil cooler has the following sound pressure levels provided by the manufacturer, with an overall SPL of 50.5 dBA at 50 feet.

Sound Pressure Levels of Lube Oil Cooler at 50 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	56.5	55.5	52.5	47.5	45.5	39.5	33.5	27.5

Based on the acoustic analyses for the Redhook Compressor Station, this proposed lube oil cooler acoustic performance was determined to be sufficient for the station.

Turbine-Driven Compressor Gas Coolers

The proposed gas cooler has the following sound pressure levels provided by the manufacturer for two fans, with an overall SPL of 60 dBA at 16 feet.

Sound Pressure Levels of Gas Cooler (2 fans) at 16 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	66.0	65.0	62.0	57.0	55.0	49.0	43.0	37.0

Based on the acoustic analyses for the Redhook Compressor Station, this proposed gas cooler acoustic performance was determined to be sufficient for the station.

RICE Intakes

Each air intake for the compressor is proposed to be equipped with a silencer having the following insertion losses:

Estimated IL Values (dB) for Each Compressor Air Intake

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	5.0	10.0	20.0	30.0	40.0	45.0	37.0	35.0

Attenuated sound power levels for the compressor air intakes were calculated by applying the silencer insertion losses to the unsilenced noise data obtained from Caterpillar.

Sound Power Levels for Each Compressor Intake

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	<100	<100	99.9	102.9	102.9	108.0	114.8	126.2	125.5

RICE Exhausts

The compressor exhaust system is proposed to be equipped with a hospital-enhanced silencer that will have the following insertion losses:

Estimated IL Values (dB) for Compressor Air Exhaust System

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	17.0	30.0	47.0	50.0	45.0	46.0	47.0	47.0	47.0

Based on the acoustic analyses for the Redhook Compressor Station, this proposed silencer was determined to be sufficient for the station.

RICE Utility Coolers

The proposed utility cooler has the following sound pressure levels provided by the manufacturer for two fans, with an overall SPL of 54.7 dBA at 50 feet.

Sound Pressure Levels of Gas Cooler (2 fans) at 50 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	60.7	59.7	56.7	51.7	49.7	43.7	37.7	31.7

Based on the acoustic analyses for the Redhook Compressor Station, this proposed utility cooler was determined to be sufficient for the station.

RICE-Driven Compressor Gas Coolers

The proposed gas cooler has the following sound pressure levels provided by the manufacturer for two fans, with an overall SPL of 58.4 dBA at 50 feet.

Sound Pressure Levels of Process Cooler (2 fans) at 50 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	64.4	63.4	60.4	55.4	53.4	47.4	41.4	35.4

Based on the acoustic analyses for the Redhook Compressor Station, this proposed gas cooler acoustic performance was determined to be sufficient for the station.

Microturbine Generators

The Capstone C-1000 generator enclosure, consisting of five C-200 generator units, were noted to have an overall attenuated sound pressure level of 65 dBA at 10 meters. Each C-200 microturbine exhaust will be equipped with a silencer having the following insertion losses:

Estimated IL Values (dB) for Each C-200 Microturbine Exhaust

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	0.0	10.0	15.0	30.0	35.0	35.0	35.0	30.0

Aboveground Piping and Valves

Assessment of the aboveground piping and valves were based on an expected sound pressure level of 85 dBA at 3 feet provided by Equitrans. Acoustic insulation meeting the specifications of ISO 15665:2003 Class 3 is required on the aboveground suction and discharge piping from the filter-separator to the intake of the gas aftercoolers. All outdoor valves should be covered with removable acoustical lagging.

Blowdown Vents – Normal Unit Shutdown

The blowdown vents for normal unit shutdown were proposed to be equipped with silencers having the following insertion loss values:

Estimated IL Values (dB) for Blowdown Silencer

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	2.0	5.0	7.0	15.0	20.0	20.0	15.0	13.0

Pneumatic Starting System

The pneumatic starting systems are proposed to be equipped with silencers having the following insertion loss values:

Estimated IL Values (dB) for Pneumatic Starting System

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	2.0	5.0	7.0	15.0	20.0	20.0	15.0	13.0

The pneumatic starting systems for the turbine units will be equipped with silencers having minimum insertion losses similar to the silencer for the compressor starting system. The pneumatic starting systems with silencers are proposed to be located inside the acoustically insulated buildings. Based on the combination of the pneumatic starting system being equipped with a silencer and it being located inside an acoustically insulated building, the attenuated noise levels from the pneumatic starting system was considered to be insignificant.

9.3 REFERENCES

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Equitrans Expansion Project

Docket No. CP16- -000

Resource Report 9

Appendix 9-A
Noise Survey Report

AMBIENT SOUND MONITORING REPORT
Equitrans, LP > Redhook Compressor Station

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July 2015

Project 152101.0029

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1. INTRODUCTION

Equitrans, LP (Equitrans) is planning to construct a new natural gas transmission facility in Franklin Township, Greene County, Pennsylvania (Redhook Compressor Station). It is anticipated that the Redhook Compressor Station will be comprised of two (2) natural gas-fired compressor engines, two (2) natural gas-fired turbines, five (5) microturbines, and other miscellaneous units. In addition to the construction related to the compressor station, two (2) nearby locations have been selected for horizontal directional drilling (HDD) related to pipelines. These locations are referred to as the H316 HDD site and the Monongahela ("Mon" or H318) HDD site.

Equitrans contacted Trinity Consultants (Trinity) to measure the ambient sound levels at noise sensitive areas (NSAs, such as schools, hospitals, or residences) near the station and the HDD sites. This sound level measurement was performed in July 2015. The goal of this activity was to characterize the existing ambient sound quality at NSAs near the proposed location of the Redhook Compressor Station. The ambient sound quality characterization is required by Title 18, Part 380, Section 12(k)(2) of the Code of Federal Regulations [18 CFR 380.12(k)(2)], and is a mandatory component of Resource Report 9, part of the application to the Federal Energy Regulatory Commission (FERC) for certification of the Redhook Compressor Station. This activity also characterized the existing ambient sound quality at NSAs near the two (2) proposed HDD locations. This report summarizes the results of this monitoring effort.

1.1. COMPRESSOR STATION APPLICABLE REGULATORY STANDARDS

The ambient sound measurements at NSAs near the Redhook Compressor Station were conducted to establish the preconstruction baseline per 18 CFR 380.12(k)(2). The federal and local standards that will apply to the Redhook Compressor Station upon start of operation are identified below.

1.1.1. FERC Standards

The FERC requirement at 18 CFR 157.206(b)(5)(i) states that the noise attributable to a new compressor station must not exceed a day-night level (L_{dn}) of 55 decibels A-weighting (dBA) at any pre-existing NSA.

1.1.2. Local Regulations

The Redhook Compressor Station is located in Franklin Township that has a noise ordinance as part of its zoning ordinance. The Franklin Township noise ordinance is dependent upon the frequency at which the noise was measured, as follows:

- 60 decibels (dB) at 20 – 300 Hertz (Hz);
- 40 dB at 300 – 2,400 Hz; and,
- 30 dB at 2,400 Hz and above.

Per the standard, for noises of periodic character, 5 dB can be deducted from the measurement. The standards in the Franklin Township noise ordinance are based on the noise impact from the facility alone at the property line (i.e., baseline sound levels are not relevant to the standard).

There are no county- or state-level noise ordinance or regulations that apply to the Redhook Compressor Station.

1.2. H316 HDD APPLICABLE REGULATORY STANDARDS

The ambient sound measurements at NSAs near the H316 HDD entry and exit were conducted to establish a baseline. The federal and local standards that will apply to the H316 HDD site are identified below.

1.2.1. FERC Standards

The FERC requirement at 18 CFR 157.206(b)(5)(iii) states that the sound emitted from any horizontal directional drilling or drilling of wells must not exceed a night level (L_n) of 55 dBA at any pre-existing NSA. Equitrans is not currently planning to perform drilling during the nighttime hours. However, measurements were conservatively taken at a few points around the HDD entry and exit points.

1.2.2. Local Regulations

Horizontal drilling operations located in Jefferson Township are also subject to the noise regulations in the Jefferson Morgan Multi-Municipal Zoning Ordinance, Section 5.27(c). This regulation states that it is unlawful to cause noise to the extent that the one-hour average sound level exceeds 60 dB in any district between the hours of 7:00 pm and 7:00 am. It also states that the noise measured must not exceed 80 dBA at any property line of the property from which the noise source is located.[1] The multi-municipality ordinance also requires that the noise be measured at an elevation of not less than four (4) feet above ground level and measurements be made at the property line.

Equitrans is not currently planning any nighttime drilling and the "property line" standard would not apply to horizontal directional drilling. However, to gather baseline measurements related to future compliance with these regulations, in a conservative manner, measurements were taken at and near the H316 HDD entry and exit.

There are no county- or state-level noise ordinance or regulations that apply to the H316 HDD sites.

1.3. MON HDD APPLICABLE REGULATORY STANDARDS

The ambient sound measurements at NSAs near the Mon HDD were conducted to demonstrate compliance with the requirements of the FERC and local regulations, as described below.

1.3.1. FERC Standards

The FERC requirement at 18 CFR 157.206(b)(5)(iii) states that the sound emitted from any horizontal directional drilling or drilling of wells must not exceed an L_n of 55 dBA at any pre-existing NSA. Equitrans is not currently planning to perform drilling during the nighttime hours. However, measurements were conservatively taken at a few points around the HDD entry and exit points.

1.3.2. Local Regulations

It has been determined that there are no local regulations that apply to HDD activities at the township-, county-, or state-level for the Mon HDD entry point (Forward Township, Allegheny County, PA).[2] The related activities therefore must only comply with the FERC standards.

[1] http://www.jeff-morgcog.org/Jefferson_Morgan_Multi_Municipal_Zoning_Ordinance_updated_5-08-13.pdf

[2] Forward Township has a general noise ordinance for objectionable noise but has established no numerical standards (Page 18 of Forward Township ordinance: http://elibrary.pacounties.org/Documents/Allegheny_County/77;%20Forward%20Township/4200326896mzo.pdf)

There are potentially local noise regulations which may apply to HDD activities related to the Mon HDD exit point (Union Township, Washington County, PA). The Union Township Zoning Ordinance includes provisions regulating noise in the form of numerical sound level limits which vary by 'district'. As it is believed that most NSAs in the area around the exit point would fall into the 'residential' district category (the most restrictive), the ordinance would dictate that "At no point beyond the boundary of any lot within these districts shall the exterior noise level resulting from any use or activity located on such lot exceed a maximum of sixty (60) dBA" (pg. 116 of the ordinance). However, there is an exemption from these regulations regarding "Noises emanating from construction or maintenance activities between 7:00 A.M. and 9:00 P.M." (pg. 117 of the ordinance), which would include HDD activities. There are no county- or state-level noise ordinance or regulations that apply to the exit point.

Equitrans is not currently planning any nighttime drilling and as such, there are no applicable standards. However, to gather baseline measurements related to future compliance with these regulations, in a conservative manner, measurements were taken at and near the Mon HDD entry and exit.

2.1. COMPRESSOR STATION MONITORING METHODOLOGY

Ambient sound level measurements were performed using a Larson Davis Model 831 Sound Level Meter (SLM). In accordance with the FERC regulations, the four (4) NSAs nearest to the Redhook Compressor Station were identified for background ambient sound monitoring. Figure 2-1 shows these locations. The list of these NSAs and their respective distances from the station is provided in Table 2-1.

Table 2-1. Noise Sensitive Areas in the Vicinity of the Station

NSA #	Description	Distance from the Station	Measurement Status
NSA-1	Residence	3,300 feet	Daytime and nighttime measurements
NSA-2	Residence	2,300 feet	Daytime and nighttime measurements
NSA-3	Animal Hospital	1,900 feet	Daytime and nighttime measurements
NSA-4	Residence	850 feet	Daytime and nighttime measurements

At least one (1) 30-minute daytime (7AM-10PM) and one (1) 30-minute nighttime (10PM-7AM) measurement was performed at each NSA. The Equivalent Continuous A-Weighted Sound Pressure Level (L_{Aeq}) was measured at the NSAs using the SLM. Intermittent and continuous sources of sound were carefully noted during each measurement and were correlated with the time-history sound data obtained during the test.

An additional monitoring point was originally included in the list of NSAs. This point was located near the structures in the wooded area to the east of NSA-4. However, landowner permission was not obtained for this point. ;

Figure 2-1 Map of NSAs Near the Redhook Compressor Station

2.2. H316 HDD MONITORING METHODOLOGY

Ambient sound level measurements were performed using a Larson Davis Model 831 SLM. Three (3) NSAs nearest to the proposed H316 HDD entry and two (2) NSAs nearest to the proposed H316 HDD exit were identified for background ambient sound monitoring. In addition, measurements were taken at the proposed H316 HDD entry site. Figures 2-2 and 2-3 show the NSAs and the 316 HDD entry and exit locations. The lists of these NSAs and their respective distances are provided in Table 2-2 and Table 2-3.

Table 2-2. Noise Sensitive Areas in the Vicinity of the H316 HDD Entry

NSA #	Description	Distance from the Entry Point	Measurement Status
NSA-W	Residence	1,100 feet	Nighttime measurements
NSA-N	Residence	800 feet	Nighttime measurements
NSA-E	Residence	1,100 feet	Nighttime measurements
Entry	H316 HDD Entry Point	N/A	Daytime and nighttime measurements

Table 2-3. Noise Sensitive Areas in the Vicinity of the H316 HDD Exit

NSA #	Description	Distance from the Exit Point	Measurement Status
NSA-N	Residence	800 feet	Nighttime measurements
NSA-SW	Residence	1,400 feet	Nighttime measurements

At least one (1) 15-minute nighttime (10PM-7AM) measurement was performed at each NSA. An additional 15-minute daytime (7AM-10PM) measurement was performed at the entry point. The L_{Aeq} was measured at the NSAs using the SLM. Intermittent and continuous sources of noise were carefully noted during each measurement and were correlated with the time-history noise data obtained during the test.

Figure 2-2. Map of NSAs Near the H316 HDD Entry

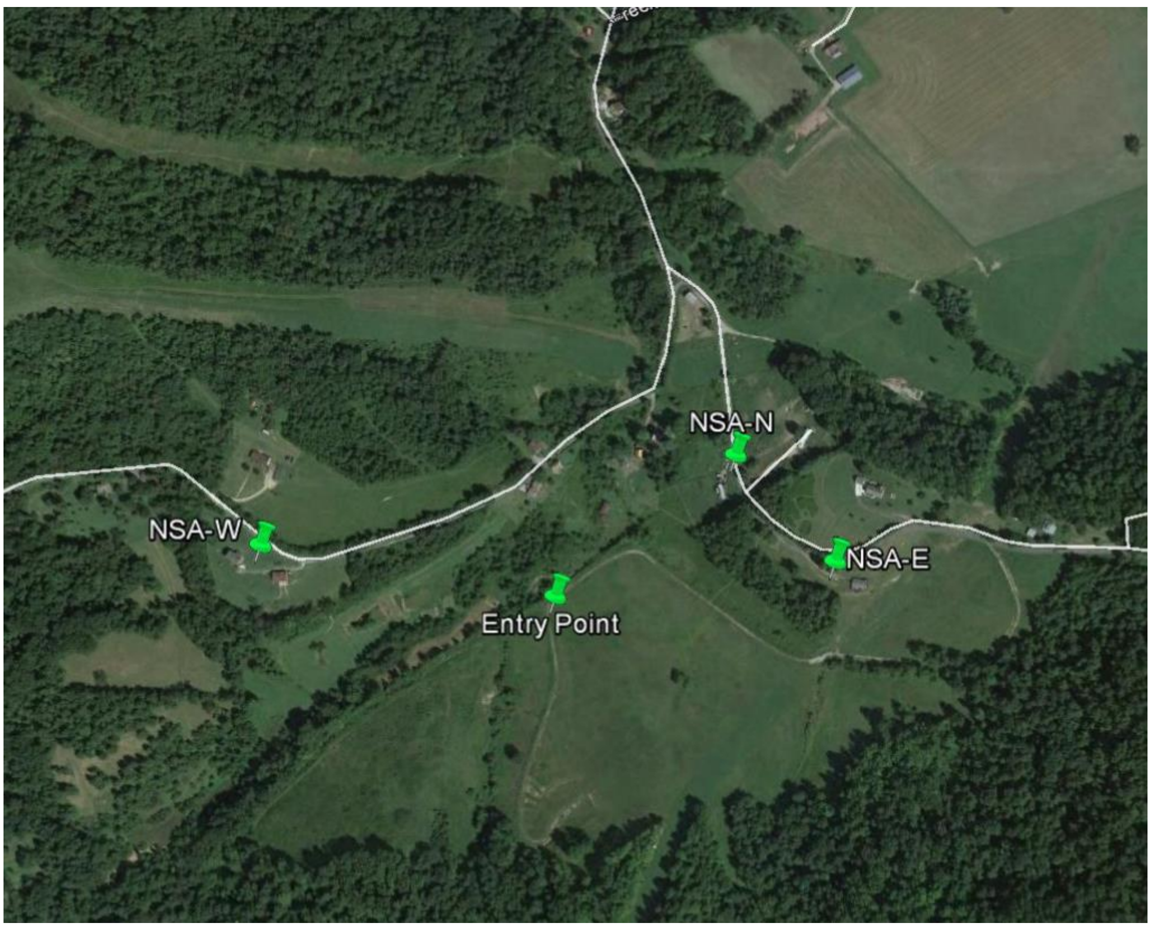


Figure 2-3. Map of NSAs Near the H316 HDD Exit

2.3. MON HDD MONITORING METHODOLOGY

Ambient sound level measurements were performed using a Larson Davis Model 831 SLM. One (1) NSA nearest to the proposed Mon HDD entry and three (3) NSAs nearest to the Mon HDD exit were identified for background ambient noise monitoring. In addition, measurements were taken at the proposed Mon HDD entry site. Figures 2-4 and 2-5 show the NSAs and the Mon HDD entry and exit locations. The list of these NSAs and their respective distances is provided in Table 2-4 and Table 2-5.

Table 2-4. Noise Sensitive Areas in the Vicinity of the Mon HDD Entry

NSA #	Description	Distance from the Entry Point	Measurement Status
NSA-W (entry)	Residence	200 feet	Nighttime measurements
Entry	Mon HDD Entry Point	N/A	Nighttime measurements

Table 2-5. Noise Sensitive Areas in the Vicinity of the Mon HDD Exit

NSA #	Description	Distance from the Exit Point	Measurement Status
NSA-N (exit)	Residence	900 feet	Nighttime measurements
NSA-N2 (exit)	Residence	500 feet	Nighttime measurements
NSA-S (exit)	Residence	200 feet	Nighttime measurements

At least one (1) 30-minute nighttime (10PM-7AM) measurement was performed at each NSA. L_{Aeq} was measured at the NSAs using the SLM. Intermittent and continuous sources of noise were carefully noted during each measurement and were correlated with the time-history noise data obtained during the test.

Figure 2-4. Map of NSAs Near the Mon HDD Entry

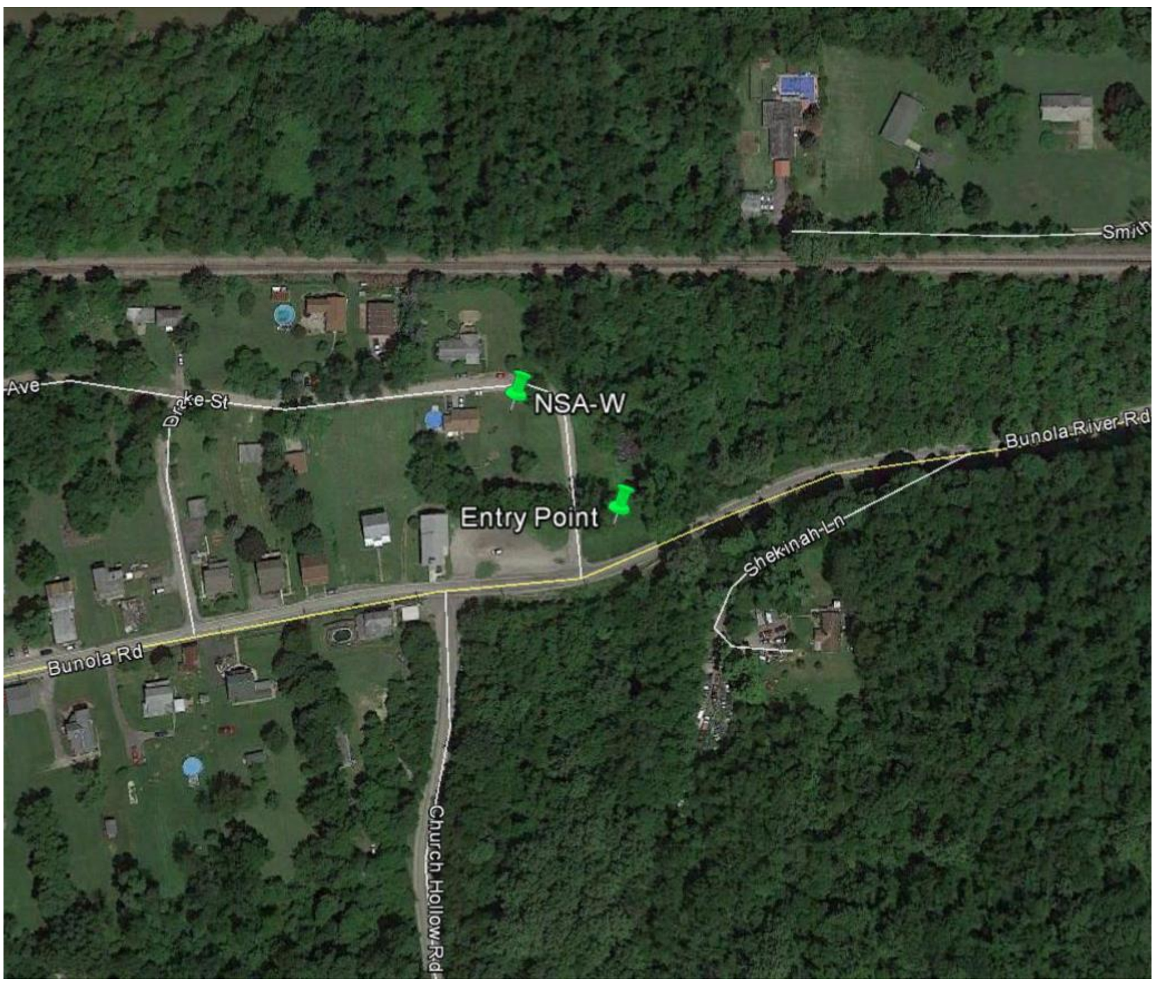
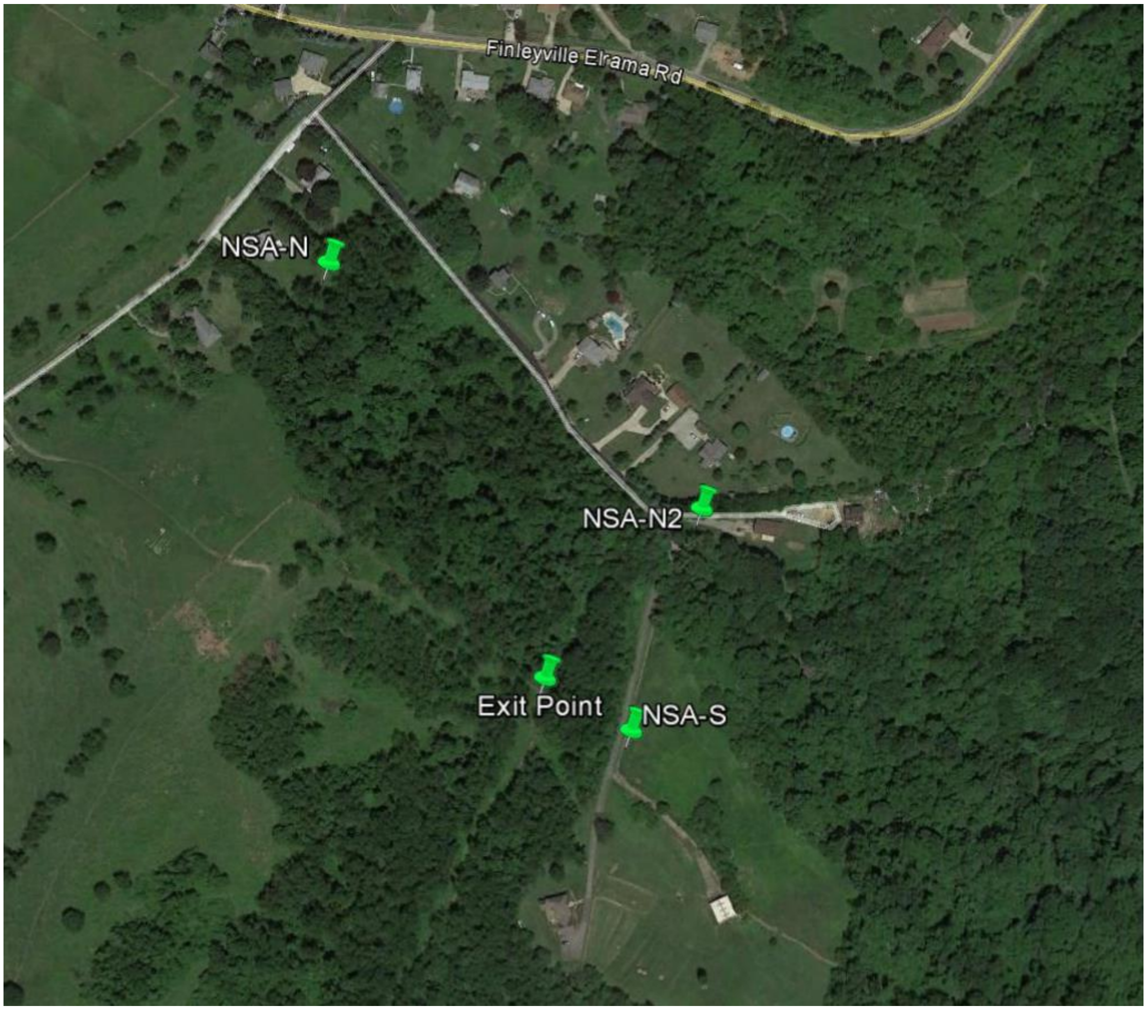


Figure 2-5. Map of NSAs Near the Mon HDD Exit



3. AMBIENT SOUND LEVEL MONITORING RESULTS

Measurements at the four (4) NSAs near the compressor station were performed for a period of at least 30 minutes during the daytime hours (7 AM – 10 PM) and 30 minutes during the nighttime hours (10 PM – 7 AM). The results of the measurements at the four (4) NSAs are presented in Table 3-1. Measurements at each NSA near the HDD entries and exits were performed for a period of at least 15 minutes during nighttime hours. The results of the measurements at the HDD NSAs are presented in Table 3-2 through Table 3-5. The time-history sound pressure level data is included in the charts attached in Appendix A.

As described in Table 3-1 through 3-5, there were often loud sources of noise that were not considered ambient noise, such as road traffic, dogs barking and airplanes passing in the sky. Noise originating from these intermittent sources can clearly be seen in the time-history data in Appendix A as sharp peaks in the measured sound pressure level. During the measurements, surveyors entered into their field notes (attached in Appendix B) the apparent source of noise that were not ambient noise.

The pre-existing NSAs nearby the proposed Redhook Compressor Station are significantly impacted by the road traffic. This impact is particularly clear at NSA-4, where there were numerous cars passing every minute and the road traffic is the major source of noise. While the other NSAs were not as substantially impacted by road traffic, the impact of road traffic was present during all measurements, as noted in the field sheets. Trinity did not exclude these additional sources of noise from the dataset, due to the continuous presence of the noise source. Other than road traffic, the noise from compressor stations to the northeast of the location of the proposed Redhook Compressor Station that was mostly unrecognizable from the road noise, and humming of pumps and engines (unrelated to the compressor stations) nearby may have impacted the ambient sound levels. A well pad was also observed nearby NSA-2 and the activities related to the well pad are noted in the field sheets. Other stations with gas equipment and piping were also observed around the H316 HDD.

Table 3-1. Results of Sound Level Measurements at Compressor Station NSAs

Point ID	Start Time	Duration	Meteorological Conditions	LA_{eq} (dBA)	Sources of Noise
NSA-1	12:18	32 min	68 deg F Winds NNW at 0 mph No measurable rain	45.3	Background included cars/trucks and chirping birds. Vehicle traffic and bird chirping sounds were constant.
	22:38	32 min	68.9 deg F Winds NNW at 0 mph No measurable rain	43.9	Traffic from nearby road was predominant noise source; Background included cars/trucks and insects. Vehicle traffic and insect sounds were constant.
NSA-2	11:18	37 min	68.2 deg F Winds W at 1 mph No measurable rain	52.6	Traffic from nearby road was predominant sound source; Background included cars/trucks, 4-wheelers, and birds. Vehicle traffic and bird chirping sounds were constant.
	22:02	31 min	69.1 deg F Winds NNW at 0 mph No measurable rain	48.9	Traffic from nearby road and engine by nearby creek was predominant sound source; Background included cars/trucks and an engine. Vehicle traffic and engine sounds were constant.
NSA-3	11:03	32 min	68.2 deg F Winds NW at 0 mph No measurable rain	47.9	Birds chirping were the predominant sound source; Background included cars/trucks, insects, planes, hammering, wind and trains. Bird and insect chirping noise was constant.
	22:44	33 min	68.9 deg F Winds NNW at 0 mph No measurable rain	36.1	Dogs barking were the predominant sound source; Background included cars/trucks, insects, dripping water, planes, AC unit, leaves and horses. Cricket chirping and dripping water was constant.

Point ID	Start Time	Duration	Meteorological Conditions	LA$_{eq}$ (dBA)	Sources of Noise
NSA-4	11:51	31 min	68.3 deg F Winds W at 1 mph No measurable rain	65.3	Traffic from nearby road was predominant sound source; Background included cars/trucks, planes, construction and birds. Heavy truck traffic and the hum of an industrial engine was constant.
	22:01	32 min	69.1 deg F Winds NNW at 0 mph No measurable rain	58.1	Traffic from nearby road was predominant sound source; Background included cars/trucks, insects, industry and dogs. Hum from industry motors and chirping insect sounds were constant.

Table 3-2. Results of Sound Level Measurements at H316 HDD Entry NSAs

Point ID	Start Time	Duration	Meteorological Conditions	LA$_{eq}$ (dBA)	Sources of Noise
NSA-W	02:08	17 min	69.9 deg F Winds SE at 0 mph No measurable rain	41.2	Background included cars/trucks, rain, AC unit, wind, and owls. Vehicle traffic and rain sounds were constant.
NSA-N	00:57	18 min	70.6 deg F Winds SE at 0 mph No measurable rain	37.5	Background included cars/trucks, doors opening and closing, horses, insects and nearby highway (or compressor station, could not be confirmed). Nearby highway (or compressor station) and insect noise was constant.
NSA-E	01:31	16 min	69.9 deg F Winds SE at 0 mph No measurable rain	35.9	Background included cars/trucks, birds chirping and nearby highway (or compressor station, could not be confirmed). Nearby highway (or compressor station) noise was constant.

Point ID	Start Time	Duration	Meteorological Conditions	LA_{eq} (dBA)	Sources of Noise
Entry	13:12	18 min	69.7 deg F Winds NNW at 1 mph No measurable rain	46.2	Traffic from nearby road was predominant sound source; Background included birds. Bird chirping was constant.
	02:17	16 min	70 deg F Winds SE at 1 mph No measurable rain	34.9	Background included trains, highway (or compressor station, could not be confirmed) and wind knocking water off leaves. Nearby highway (or compressor station) noise was constant.

Table 3-3. Results of Sound Level Measurements at H316 HDD Exit NSAs

Point ID	Start Time	Duration	Meteorological Conditions	LA_{eq} (dBA)	Sources of Noise
NSA-N	00:51	17 min	70.6 deg F Winds SE at 0 mph No measurable rain	34.3	Background included cars/trucks, planes, crickets, rain and chirping birds. Distant traffic and cricket sounds were constant.
NSA-SW	01:31	15 min	69.9 deg F Winds SE at 0 mph No measurable rain	44.4*	Background included cars/trucks, rain, motor, train, dripping and crickets. Rain, cricket and distant traffic sounds were constant.

*This LA_{eq} value is corrected due to the run being restarted after the windscreen was added. Some of the data were also excluded because the landowner vehicle approached.

Table 3-4. Results of Sound Level Measurements at Mon HDD Entry NSAs

Point ID	Start Time	Duration	Meteorological Conditions	LA_{eq} (dBA)	Sources of Noise
NSA-W	22:07	18 min	71.1 deg F Winds S at 8.1 mph No measurable rain	44.6	Traffic from nearby road was predominant sound source; Background included residents talking and coughing, dog barking, water dripping, and industrial equipment. Sounds from industrial equipment, traffic, and water dripping of leaves were constant.
Entry	22:41	20 min	71.1 deg F Winds S at 6.9 mph No measurable rain	45.6	Traffic from nearby road was predominant sound source; Background included planes, water dripping, water flow in nearby creek and industrial equipment. Sounds from industrial equipment, traffic, the creek and water dripping of leaves were constant.

Table 3-5. Results of Sound Level Measurements at Mon HDD Exit NSAs

Point ID	Start Time	Duration	Meteorological Conditions	LA_{eq} (dBA)	Sources of Noise
NSA-N	22:45	17 min	71.1 deg F Winds S at 6.9 mph No measurable rain	37.5	Traffic from nearby road was predominant sound source; Background included cars/trucks, planes and chirping insects.
NSA-N2	22:20	17 min	71.1 deg F Winds S at 8.1 mph No measurable rain	42.4	Background included cars/trucks, insects chirping, water dripping from leaves, motor, trains, and a distant boom.

Point ID	Start Time	Duration	Meteorological Conditions	LA_{eq} (dBA)	Sources of Noise
NSA-S	21:56	20 min	71.1 deg F Winds SSW at 8.1 mph No measurable rain	45.4	Background included cars/trucks, insects chirping, water dripping from leaves, trains, planes, a falling branch, and a distant boom. Rain patter and insect noise were constant.

4.1. LDN CALCULATIONS FOR THE REDHOOK COMPRESSOR STATION

In order to determine the baseline ambient sound levels at the NSAs, the L_{dn} were calculated from the sound measurements made at the NSAs. L_{dn} values are calculated from the daytime and nighttime L_{Aeq} values, with the L_{Aeq} values for the nighttime period (10 PM to 7 AM) increased by 10 dB to reflect the greater disturbance potential from nighttime sounds. The L_{dn} was calculated for each of the four (4) NSA nearest to the compressor station from the daytime and nighttime L_{Aeq} values according to the formula below. The results of this calculation are shown in Table 4-1.

$$L_{dn} = 10\log_{10}\left(\frac{15}{24} * 10^{\frac{L_{Aeq(day)}}{10}} + \frac{9}{24} * 10^{\frac{L_{Aeq(night)}+10}{10}}\right)$$

Table 4-1. L_{dn} at Each Noise Sensitive Area

Location	Background (July 2015)	
	Daytime/Nighttime Measurements (L_{eq}, dBA)	L_{dn} (dBA)
NSA-1	45.3	50.5
	43.9	
NSA-2	52.6	56.1
	48.9	
NSA-3	47.9	47.3
	36.1	
NSA-4	65.3	66.6
	58.1	

Once the Redhook Compressor Station is constructed and commences operation, a second noise measurement assessment will occur within 60 days, per 18 CFR 157.206(b)(5)(ii). Measurements from the second assessment will be compared to the baseline measurements to determine if the presence of the compressor station resulted in a change in ambient sound at the NSAs. However, at least two of the NSAs are already above the 55 dBA standard, mostly due to the road traffic.

4.2. HDD MEASUREMENTS

The federal noise standards related to HDD are all based on L_n measurements. The results of the measurements performed at the HDD entry and exit points are presented in Tables 3-2 through 3-5.

4.3. CONCLUSIONS

As discussed in Section 3, vehicular traffic was the predominant source of noise measured at all NSAs. Equitrans has no control over the road traffic. Other frequent sounds included planes, nearby industrial activities, dogs barking, trains, birds chirping, and insects.

Equitrans has characterized the ambient noise that is related to the NSAs surrounding the Redhook Compressor Station, as well as the two (2) HDD sites. Several locations receive significant impact from road traffic. In particular, it has been found that the L_{dn} at two (2) of the NSAs associated with the compressor station are already above the FERC standard of 55 dBA.

The results of the HDD measurements were also presented in this report. However, Equitrans is not planning to perform nighttime drilling and the baseline data were only taken as a conservative measure

APPENDIX A: COMPRESSOR STATION NSA TIME HISTORY DATA

Figure A- 1. NSA-1 – 2015 Daytime Measurement

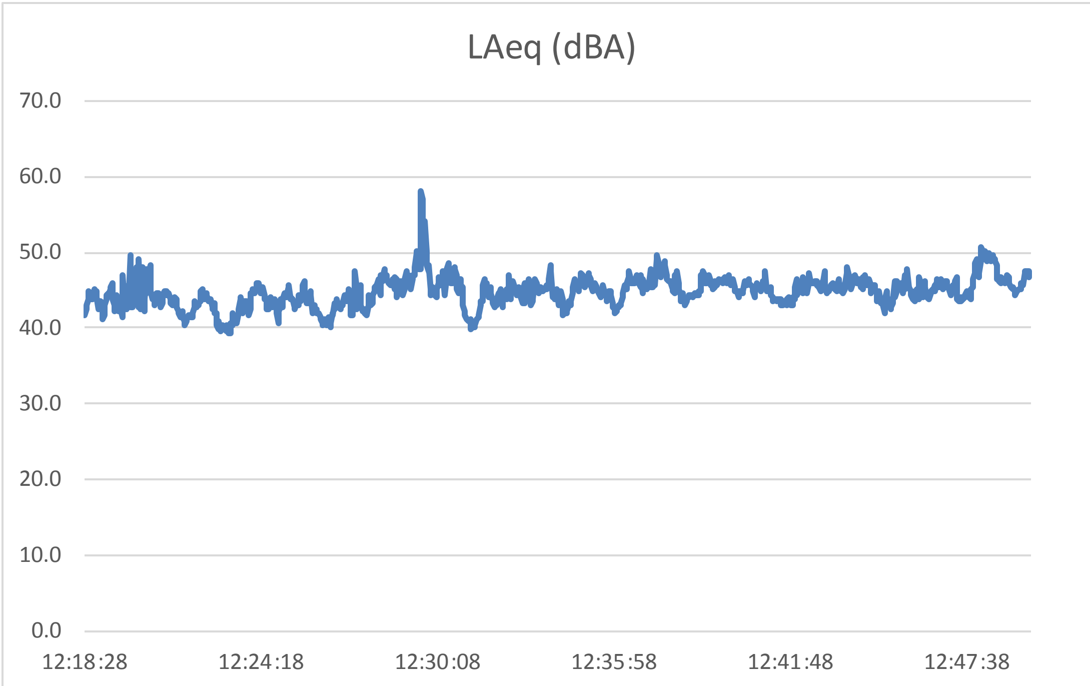


Figure A- 2 . NSA-1 – 2015 Nighttime Measurement

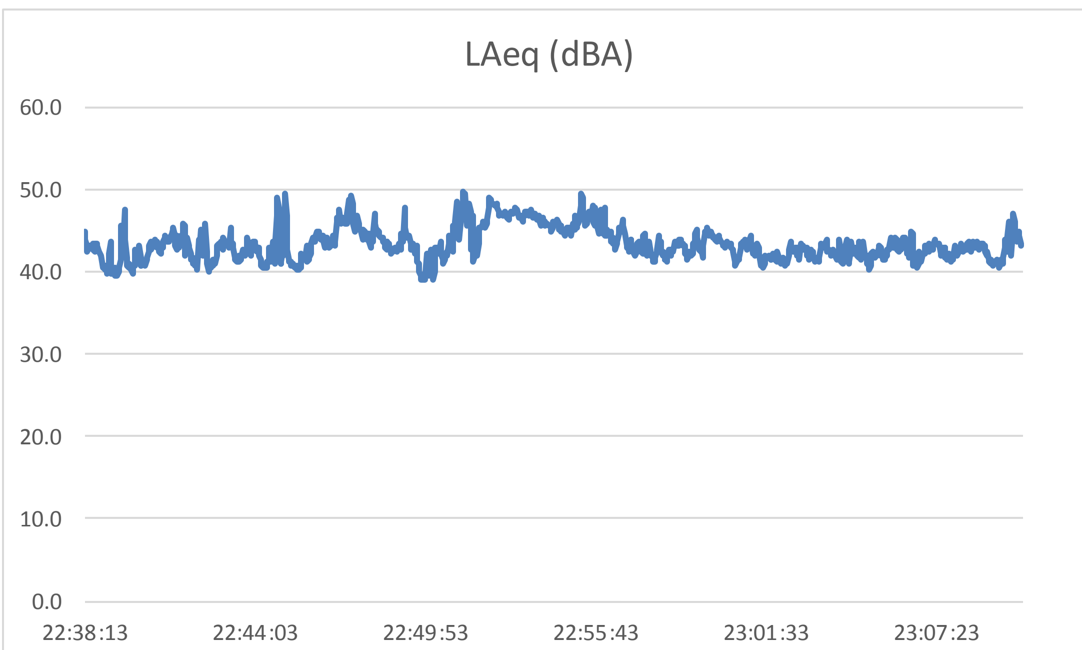


Figure A- 3. NSA-2 – 2015 Daytime Measurement

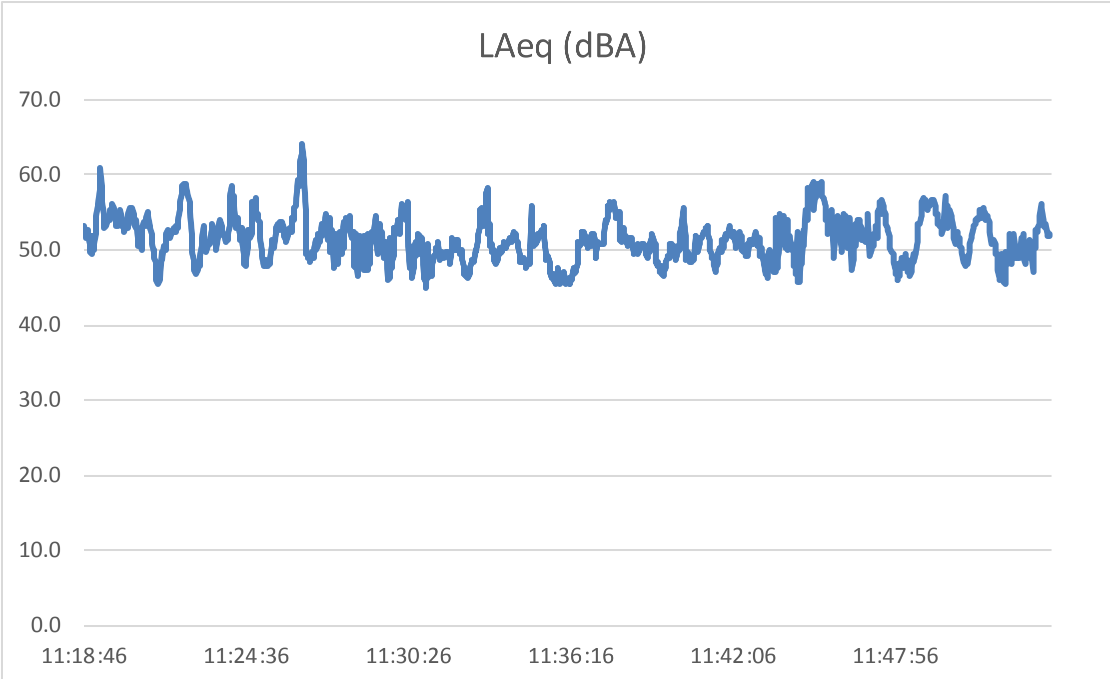


Figure A- 4. NSA-2 – 2015 Nighttime Measurement

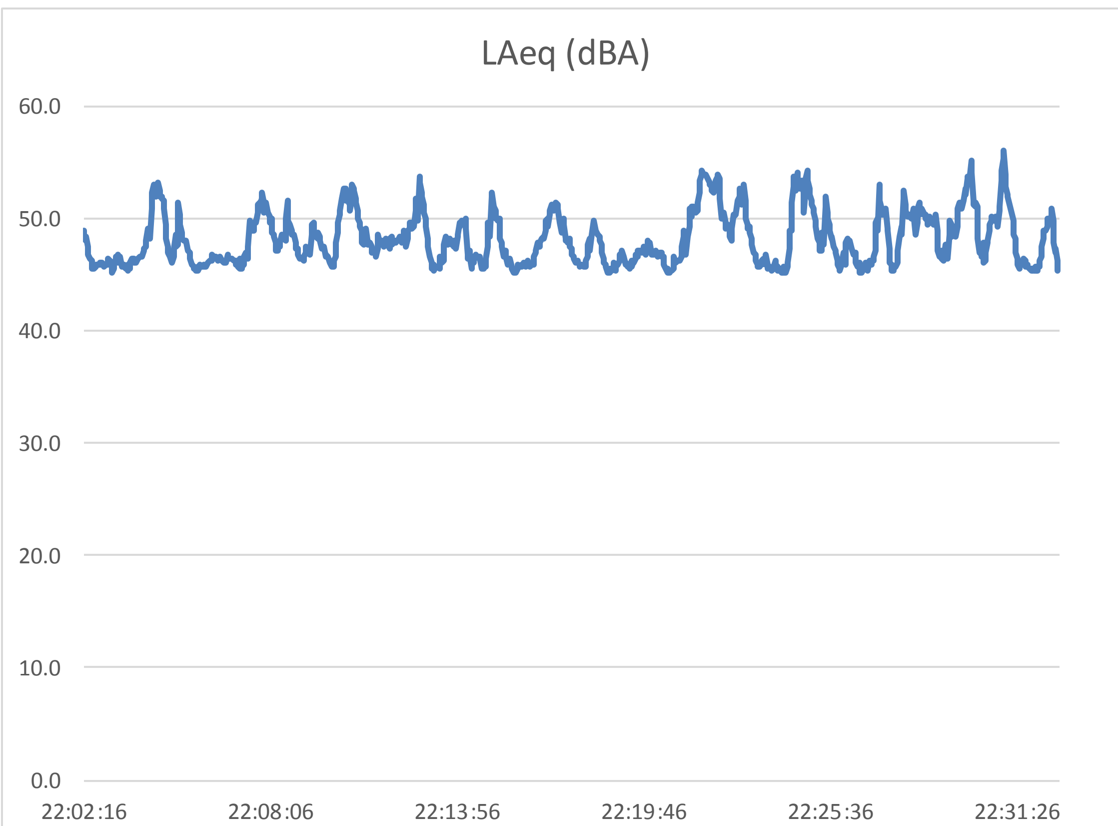


Figure A- 5. NSA-3 – 2015 Daytime Measurement

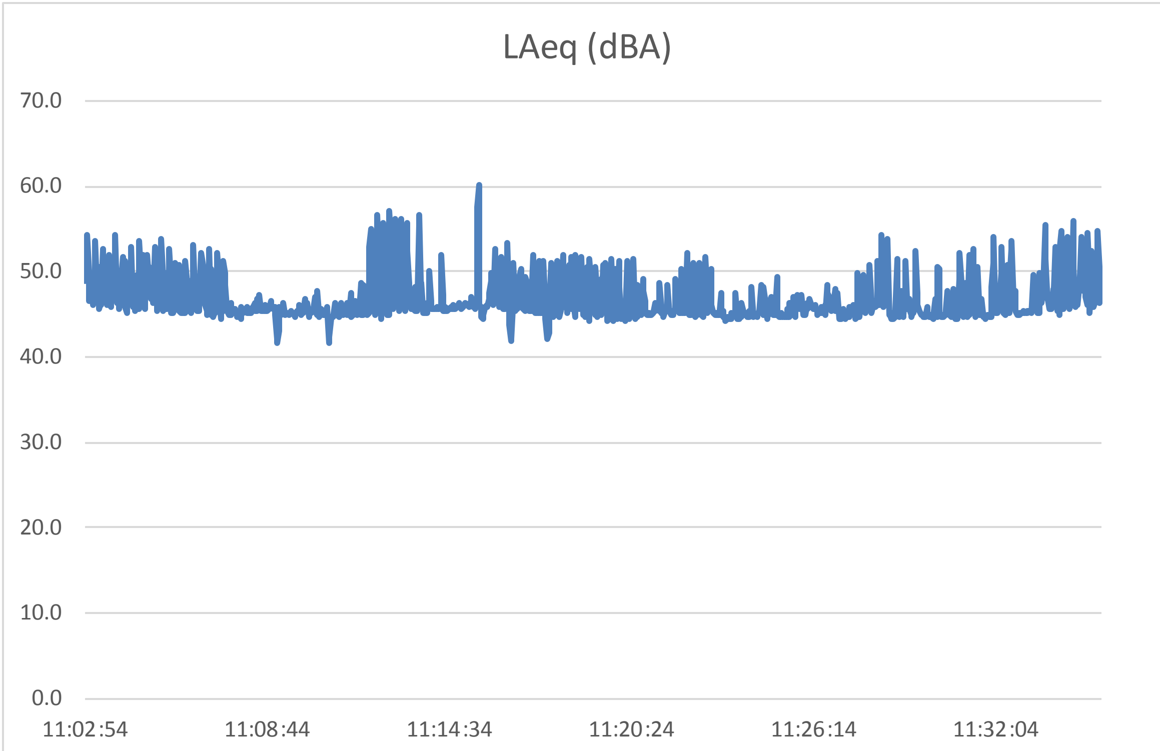


Figure A- 6. NSA-3 – 2015 Nighttime Measurement

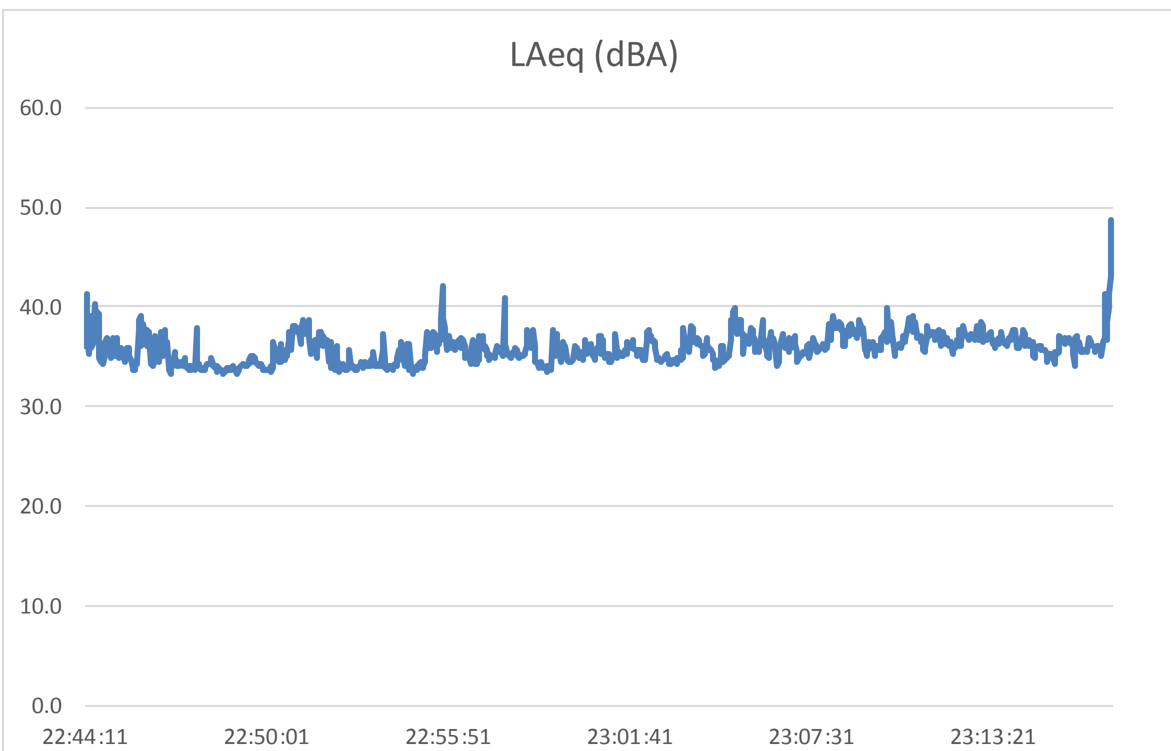


Figure A- 7. NSA-4 – 2015 Daytime Measurement

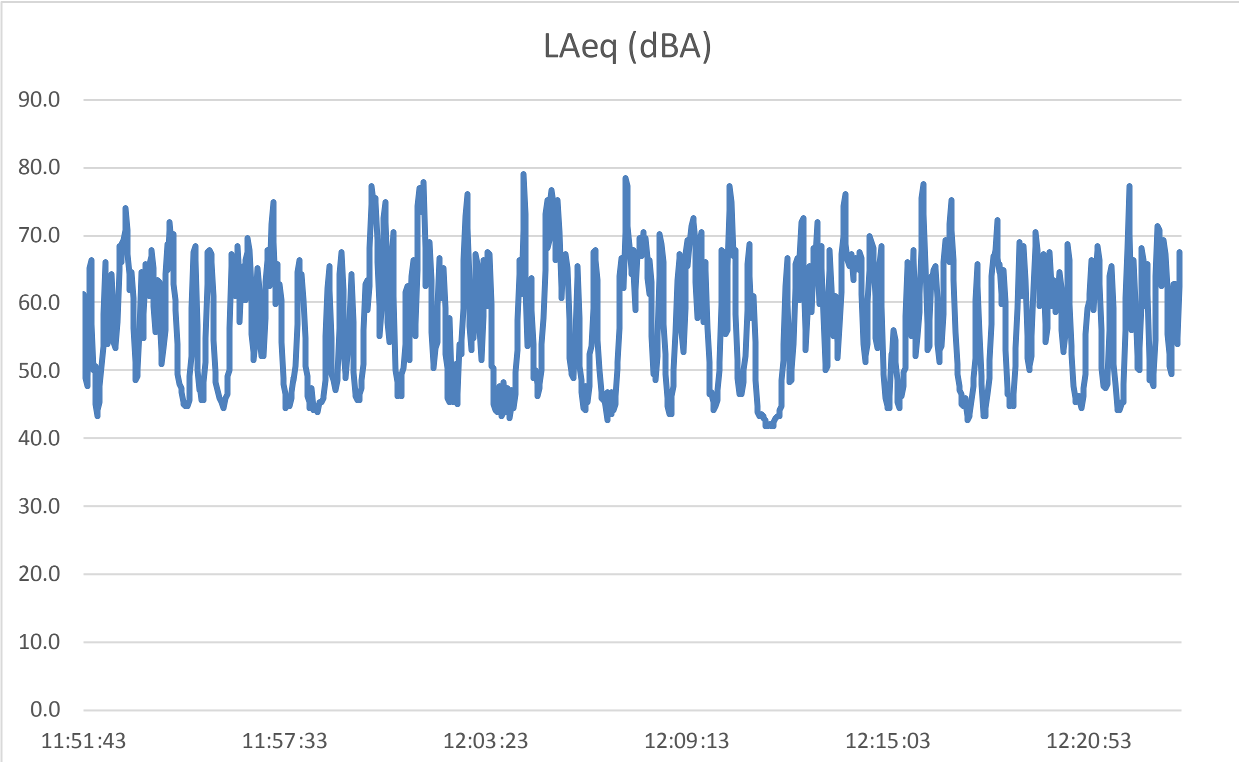
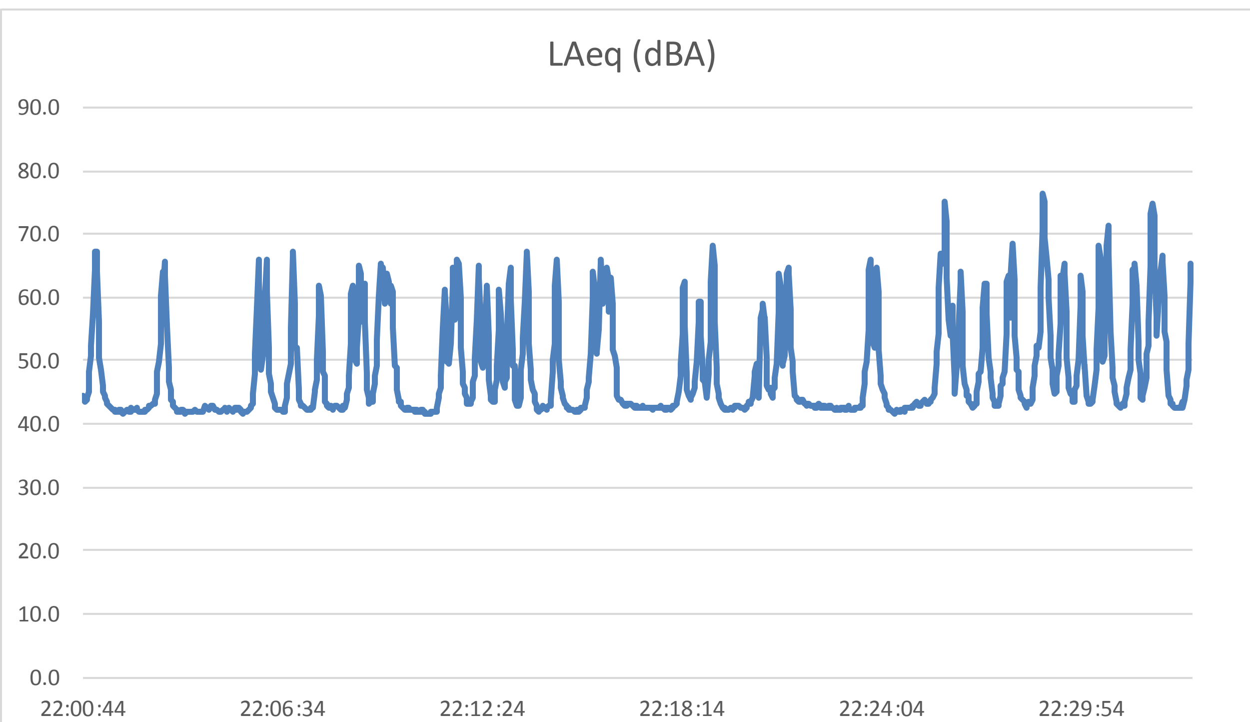


Figure A- 8. NSA-4 – 2015 Nighttime Measurement



APPENDIX B: FIELD NOTES

Redhook Compressor Station

Noise Study Field Sheet
Trinity Consultants

Location	Mon HDD Entry
NSA #	Entry Point
Description of Location (incl. vegetation/ground surface)	woods & tall grass
Latitude/Longitude	
Date	7/7/2015
Start Time	10:41 PM
End Time	11:01 PM
Duration	~15 min
Approximate distance(s) to nearby structures	~50 ft to road that NSA-W is on
Was NSA occupied?	N/A ~~YES / NO~~
Types of activities taking place in nearby area	cars driving by
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip
Engine Load Conditions or N/A	N/A File 831-data.010
Background noise	rain dripping off trees, nearby roads, hum of industrial equipment, planes overhead
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
10:46 PM	plane overhead	Constant (but temp.)	moderate
duration	hum of industrial equipment	constant	faint
duration	Cars on distant highway	constant	faint
10:47 PM	Car on nearby road	rare	faint
10:49 PM	animal in woods by meter	rare	mod.
10:49 PM	car driving by on road	rare	loud
10:50 PM	car on nearby road	~~faint~~ rare	~~[illegible]~~ faint
10:53 PM	plane overhead	constant (but temp.)	faint
Duration	rain dripping off trees	Constant	faint
Duration	water flow in nearby creek	constant	faint
10:57 PM	car driving by on road	rare	loud
10:58 PM	car driving by on road	rare	loud
11:00 PM	car on nearby road	rare	loud

Noise Study Field Sheet
Trinity Consultants

Location	Mon HDD Entry
NSA #	West (W)
Description of Location (incl. vegetation/ground surface)	lawn
Latitude/Longitude	
Date	7/7/2015
Start Time	10:07 PM
End Time	10:25 PM
Duration	~15 min
Approximate distance(s) to nearby structures	~50 ft to NSA residence
Was NSA occupied?	YES / NO (cars in driveway)
Types of activities taking place in nearby area	nearby residents talking, cars driving by
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip
Engine Load Conditions or N/A	n/a file 831-data, 009
Background noise	rain dripping off trees, ~~roads~~ nearby roads, hum of industrial equipment, planes overhead
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
10:08 PM	nearby residents walk outside	rare	moderate
10:09 PM	Car on nearby road	intermittent	faint - moderate
10:12 PM	nearby resident coughing	intermittent	faint - mod
10:13 PM	nearby resident talking/coughing	rare	faint - mod
10:15 PM	nearby residents coughing	interm.	faint
10:16 PM	car on nearby road, res. coughing	rare - int.	faint - mod
10:16 PM	dog barking	rare	mod.
10:17 PM	nearby resident talking/coughing	intermit.	faint - mod
10:18 PM	car on nearby road	~~[illegible]~~ rare	mod.
duration	hum of industrial equipment	constant	faint
duration	cars on distant highway	constant	faint
10:20 PM	car on nearby road	rare	mod.
10:21 PM	truck on nearby road	rare	mod - loud
10:23 PM	nearby residents talking	intermit	faint - mod
10:23 PM	car on nearby road	rare	mod.
10:24 PM	nearby resident coughing	intermit	faint - mod
10:25 PM	nearby res. talking/coughing	interm.	faint - mod
duration	rain dripping off trees	constant	faint

Noise Study Field Sheet
Trinity Consultants

Location	B1 – Data. 006 Mon HDD Exit -NSA-N
NSA #	NSAN
Description of Location (incl. vegetation/ground surface)	Field across street grass yard with shrubs; some tall trees interspersed
Latitude/Longitude	~ 40° 14' 56" N 79° 57' 20" W Close to Google Earth Coordinates
Date	7/7/15
Start Time	22:45
End Time	23:02
Duration	17:04
Approximate distance(s) to nearby structures	~30 ft from house
Was NSA occupied?	YES / NO
Types of activities taking place in nearby area	Traffic from nearby road/highway (both) Rustling leaves in field nearby
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	No precip humid light breeze, if any
Engine Load Conditions or N/A	NA
Background noise	Cars from nearby freeway Patter of rain on leaves
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
22:46	Plane overhead	Rare	moderate
22:48	Nearby car	Intermittent	moderate
22:49	Nearby Car	Rare	moderate
22:50	Car accelerating	Rare	low
22:53	Plane overhead	Rare	low
22:55	Nearby car	Rare	low
22:56	Nearby car	Rare	moderate
22:58	Nearby car	Intermittent	moderate
22:59	Nearby car	Rare	moderate
23:01	Insect chirping	Rare	low

Noise Study Field Sheet
Trinity Consultants

Location	831-Data.005 33 Saw Mill Rd
NSA #	Mon HDD Exit-NSA-N2
Description of Location (incl. vegetation/ground surface)	Grassy yard with surrounding forest
Latitude/Longitude	40° 14' 51" N 79° 57' 09" W
Date	7/7/15 Closer to 40°14'51"N, 79°57'24"W per Google Earth
Start Time	22:20
End Time	23:37
Duration	17:11
Approximate distance(s) to nearby structures	~ 100 feet from house
Was NSA occupied?	YES / NO
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	Not raining; leaves are dripping humid, no wind
Engine Load Conditions or N/A	NA
Background noise	Distant engine humming (AC unit?) Patter of water on leaves Insects chirping
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
22:22	Car door shuts	Rare	moderate
22:22	Siren in distance	Rare	low
22:22	Constant Patter of rain on leaves	constant	moderate
22:23	insects chirping	Constant	~~low~~ mod.
22:23	Plane overhead	rare/intermittent	low
22:23	low hum of motor	constant	moderate
22:27	Distant train whistle	Rare	low
22:28	Car accelerating in distance	Rare	low
22:28	Distant boom (firework?)	Rare	low
22:29	plane overhead	~~Ra~~ Rare	moderate
22:35	Train whistle	Intermittent	moderate

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Noise Study Field Sheet
Trinity Consultants

Location	Last house on Saw Mill Rd (S side) 831-Data.004
NSA #	Mon HDD Exit - PB Note that this is now being referred to as NSA-S
Description of Location (incl. vegetation/ground surface)	driveway; tall trees on either
Latitude/Longitude	~40° 14' 51" N 79 57' 11" W Google Earth shows these coords at end of driveway. Actual sample loc. was ~40° 14' 47" N, 79° 57' 12" W per Google Earth.
Date	7/7/15
Start Time	21:56:22
End Time	22:16
Duration	20 minutes
Approximate distance(s) to nearby structures	
Was NSA occupied?	Unable to tell YES / NO
Types of activities taking place in nearby area	None
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	Light rain
Engine Load Conditions or N/A	N/A
Background noise	Consistent patter of light rain on trees insects chirping Starting at 12:13 low distant motor (constant)
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
22:01	Plane overhead	Rare	low
22:01	Police siren (distant)	Rare	low
22:02	Rain drops on car roof	Intermittent	Moderate
22:02	Rain patter on leaves	constant	moderate
22:02	Insects chirping	Constant	low - moderate
22:09	Car in distance	Rare	faint
22:09	vehicle rumbling in distance	Rare	faint
22:11	Plane overhead	rare	faint
22:12	Branch falling in woods	rare	loud
22:12	Distant boom	Rare	moderate
22:13	Plane overhead or dist. motor?	Rare / Intermittent	low ~~moderate~~

Noise Study Field Sheet
Trinity Consultants

Location	316 HDD Entry
NSA #	Entry Point
Description of Location (incl. vegetation/ground surface)	field w/ woods on edges
Latitude/Longitude	
Date	7/8/2015
Start Time	1:12 PM
End Time	1:30 PM
Duration	~15 min
Approximate distance(s) to nearby structures	meter at entry point
Was NSA occupied?	N/A ~~YES~~ / NO
Types of activities taking place in nearby area	none
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip
Engine Load Conditions or N/A	N/A File 831-data.018
Background noise	birds chiping
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
1:16 PM	car on nearby road	rare	moderate
duration	birds chirping	constant	faint - moderate
1:20 PM	car on nearby road	rare	faint - mod.
1:22 PM	Car on nearby road	rare	faint
1:23 PM	Car on nearby road	rare	moderate
1:24 PM	car on nearby road	rare	faint - mod.
1:26 PM	Car on nearby road	rare	faint

Noise Study Field Sheet
Trinity Consultants

Location	316 HDD Entry
NSA #	Entry Point
Description of Location (incl. vegetation/ground surface)	field ~~[illegible]~~ w/ woods on edges
Latitude/Longitude	
Date	7/8/2015
Start Time	2:17 AM
End Time	2:33 AM
Duration	~15 min
Approximate distance(s) to nearby structures	meter at entry point
Was NSA occupied?	N/A ~~YES / NO~~
Types of activities taking place in nearby area	none
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip (very very light drizzle)
Engine Load Conditions or N/A	N/A File 831-data.015
Background noise	~~[illegible]~~ water dripping off nearby trees, insects, train in distance (whistle), noise in distance: either highway OR compressor station operating to west of NSA
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
2:17 AM	train whistle in distance	Intermittent	faint
duration	highway or compressor station	constant	faint - moderate
2:23 AM	wind knocks water off leaves	rare	faint - mod.
2:26 AM	wind knocks water off leaves	rare	faint

Noise Study Field Sheet
Trinity Consultants

Location	316 HDD entry
NSA #	E (East)
Description of Location (incl. vegetation/ground surface)	yard
Latitude/Longitude	
Date	7/8/2015
Start Time	~~[illegible] AM~~ 1:31 AM
End Time	1:47 AM
Duration	~15 min
Approximate distance(s) to nearby structures	~ 100 feet to residence, on driveway
Was NSA occupied?	YES / NO (~~[illegible]~~) (landowner arrived home prior to start of test)
Types of activities taking place in nearby area	none
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip (very very light drizzle)
Engine Load Conditions or N/A	N/A file 831-data.013
Background noise	noise in distance: either highway OR Compressor station operating to west of NSA
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
~~[illegible]~~	~~[illegible]~~		
1:34 AM	birds chirping	rare	faint
duration	nearby compressor station or highway	constant	faint to slightly moderate
1:41 AM	car in distance	rare	fain - mod.

Noise Study Field Sheet
Trinity Consultants

Location	316 HDD Entry
NSA #	N2 (North 2) — Note that this is now being referred to as NSA-N.
Description of Location (incl. vegetation/ground surface)	yard
Latitude/Longitude	
Date	7/8/2015
Start Time	12:57 AM
End Time	1:15 AM
Duration	~15 min
Approximate distance(s) to nearby structures	~50 ft to residence
Was NSA occupied?	YES / NO (cars in driveway, landowner came out)
Types of activities taking place in nearby area	none
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip (very very light drizzle)
Engine Load Conditions or N/A	N/A — file 831-data.011
Background noise	insects, ~~[illegible]~~ noise in distance, ~~[illegible]~~ → either highway OR potentially a nearby compressor station operating to west/SW of NSA
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
12:58 AM	Landowner opens door	rare	faint
duration	insects chirping	constant	faint
1:02 AM	landowner closes door	rare	faint
1:03 AM	horse snorts	rare	faint - moderate
1:05 AM	horse trotting in nearby field	intermit	faint
duration	nearby compressor station or highway	constant	slightly more than faint, sometimes moderate
1:14 AM	car in distance	rare	faint

Noise Study Field Sheet
Trinity Consultants

Location	831-Data.009 280 Ankram Rd
NSA #	316 HDD Entry - NSA-W
Description of Location (incl. vegetation/ground surface)	Sloped grassy area w/tree line above road
Latitude/Longitude	39° 54' 10" N, 80° 5' 34" W Approximate - No GPS signal during reading
Date	7/8/15
Start Time	2:08
End Time	2:25
Duration	~~8~~ 17
Approximate distance(s) to nearby structures	~20 ft to house
Was NSA occupied?	Unknown YES / NO
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	Light rain (drizzle) Light wind
Engine Load Conditions or N/A	NA
Background noise	Rain patter, rain hitting structures light wind Distant traffic
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
2:10	Wind blows		
Duration	Rain patter	constant	low / mod.
Duration	Rain on car roof	intermittent / constant	moderate
2:12	Owl hoot	Rare	low
Duration	Distant freeway traffic	constant	low
2:13	Distant passing car	rare	low
2:14	AC unit turned on	constant	moderate
2:15	Wind blows	intermittent	moderate
2:19	Wind blows	intermittent	low
2:21	Rustle in bushes	rare	low
2:22	Plane overhead	rare	low
2:23	Wind Blows	rare	moderate
2:23	Rain patter	intermittent	moderate
2:25	Distant car	rare	low

Noise Study Field Sheet
Trinity Consultants

Location	296 Homeville Rd 831-Data.007
NSA #	316 HDD Exit - NSA N2 Note that this is now being referred to as NSA-N.
Description of Location (incl. vegetation/ground surface)	grassy lawn w/ some tall trees
Latitude/Longitude	39° 54' 52" N 80° 05' 33" W (Note: Google Earth shows these coords. to be on S side of driveway, but measurement was taken ~~[illegible]~~ ~SE of driveway)
Date	7/8/15
Start Time	00:57
End Time	1:08
Duration	10:41
Approximate distance(s) to nearby structures	~30 ft to house ~50 ft to barn
Was NSA occupied?	Unknown YES / NO
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	~~No rain~~ Light rain began around 1:02
Engine Load Conditions or N/A	NA
Background noise	Distant freeway sounds Crickets
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
Duration	Distant traffic noise	constant	low
0:59	Plane Overhead	rare	low
Duration	Crickets Chirping	intermittent	moderate
Duration	Rain drops on leaves	intermittent	low
1:02	bird Chirping	rare	low
1:02 on	light patter of rain	Constant	moderate
1:07	plane overhead	rare	low
1:07	Distant car	rare	low

Noise Study Field Sheet
Trinity Consultants

Location	831 - Data. 008 174-210 Creek Rd
NSA #	316 HDD Exit - NSA - SW
Description of Location (incl. vegetation/ground surface)	Grassy lawn w/ nearby tree cover
Latitude/Longitude	39°54'35" N, 80° 5' 49" Approximate - No GPS signal during reading
Date	7/8/15
Start Time	~~1:25~~ Restarted 1:31 (Forgot wind screen)
End Time	[illegible] 1:46
Duration	[illegible] 23:05 - Note: exclude first 6 minutes & last 1 ~~[illegible]~~ minute
Approximate distance(s) to nearby structures	~50 ft to house
Was NSA occupied?	Spoke to landowner **YES** / **NO**
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	Light rain Crickets
Engine Load Conditions or N/A	NA
Background noise	Patter of light rain on leaves Crickets chirping Animals walking through woods Distant cars on freeway
Pictures Taken?	**YES** / **NO**

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
Duration	Rain patter	constant	moderate
Duration	Crickets	constant	low
Duration	distant traffic	constant	low
1:31	Distant whine of motor	~~rare~~ constant	low
1:33	Train whistle	rare	low
1:36	Rustle of branches	rare	low
1:40	Loud drip	~~rare~~ intermittent	moderate
1:42	Loud distant motor	rare/intermittent	moderate
1:44	Loud drip		moderate
1:46	Car drove up - Convo w/ landowner	rare	loud

Noise Study Field Sheet
Trinity Consultants

Location	Red Hook Compressor Station
NSA #	NSA-1 ~~N/A~~ (Address: 185 Shope Rd)
Description of Location (incl. vegetation/ground surface)	yard, surrounded by fields/woods
Latitude/Longitude	
Date	7/8/2015
Start Time	12:18 PM
End Time	12:50 PM
Duration	~30 min
Approximate distance(s) to nearby structures	~30 ft from NSA
Was NSA occupied?	YES / NO (witnessed kids on 4-wheelers pulling into driveway)
Types of activities taking place in nearby area	vehicles on Highway 188
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip (very very light drizzle)
Engine Load Conditions or N/A	N/A File 831data.017
Background noise	highway 188
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
duration	highway 188 vehicles (esp. trucks)	constant	faint - moderate
duration	birds chirping	constant	faint - moderate

Noise Study Field Sheet
Trinity Consultants

Location	Red Hook Compressor Station
NSA #	NSA-1 (185 Strope Road)
Description of Location (incl. vegetation/ground surface)	yard, surrounded by fields/woods
Latitude/Longitude	
Date	7/8/2015
Start Time	10:38 PM
End Time	11:10 PM
Duration	~30 min
Approximate distance(s) to nearby structures	~30 ft from NSA
Was NSA occupied?	YES / NO (some lights on, appeared to be)
Types of activities taking place in nearby area	Vehicles on highway 188
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip (very very light drizzle)
Engine Load Conditions or N/A	N/A filename: 831-data.020
Background noise	highway 188
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
duration	Highway 188 (esp. large trucks)	constant	moderate
duration	insects	constant	faint
10:51 PM	truck backing up in distance	constant (but temporary)	moderate
11:05 PM	truck backing up in distance	constant (but temporary)	moderate

Noise Study Field Sheet
Trinity Consultants

Location	Red Hook Compressor Station
NSA #	NSA-2 (Address: 215 Strope Rd)
Description of Location (incl. vegetation/ground surface)	yard, woods nearby
Latitude/Longitude	
Date	7/8/2015
Start Time	11:18 AM
End Time	11:55 AM
Duration	~30 min
Approximate distance(s) to nearby structures	~30 ft from NSA
Was NSA occupied?	YES / NO (talked to resident)
Types of activities taking place in nearby area	vehicles on highway 188, potentially [illegible] activities related to nearby wellpad (witnessed vehicles driving on wellpad roads, and a machine ~~construction vehicle~~ operating in nearby creek) possibly a large water pump
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip
Engine Load Conditions or N/A	N/A File 831-data, 016
Background noise	highway 188, ~~[illegible]~~ distant rumbling of equipment
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
11:19 AM	4-wheeler on road	rare	loud
duration	highway 188 vehicles (esp. large trucks)	constant	moderate – loud
~~[illegible]~~ duration	birds chirping (incl. crows cawing)	constant	moderate
11:23 AM	4-wheeler in nearby field	rare	moderate
11:24 AM	4-wheeler on road	rare	moderate
11:26 AM	4-wheeler goes up NSA driveway	rare	loud

Noise Study Field Sheet
Trinity Consultants

Location	Red Hook Compressor Station
NSA #	NSA-2 (215 Strope Road)
Description of Location (incl. vegetation/ground surface)	yard, woods nearby
Latitude/Longitude	
Date	7/8/2015
Start Time	10:02 PM
End Time	10:33 PM
Duration	~30 min
Approximate distance(s) to nearby structures	~30 feet from NSA
Was NSA occupied?	YES / NO
Types of activities taking place in nearby area	Vehicles on highway 88, potentially activities related to nearby wellpad (sounds like same machine as daytime test)
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	no precip
Engine Load Conditions or N/A	N/A filename 831_data.019
Background noise	highway 88, distant rumbling of equipment
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
duration	Highway 188 (esp. large trucks)	constant	faint - moderate
duration	engine in nearby creek (pump?)	constant	moderate

Noise Study Field Sheet
Trinity Consultants

Location	831 - Data.016 Braden Run Animal Hospital
NSA #	Red Hook NSA -3
Description of Location (incl. vegetation/ground surface)	Gravel lot close to road w/ surrounding trees 39° 55' 12" N ; 80° 08' 05" W
Latitude/Longitude	↑ Google Earth shows coords. in field but measurement was taken on border of field + parking lot (~39° 55' 11.84" N 80° 8' 4.68" W per Google Earth)
Date	7/8/15
Start Time	11:03
End Time	11:35
Duration	32:34
Approximate distance(s) to nearby structures	~20 feet to hospital building; 100 ft to house
Was NSA occupied?	Spoke to Megan + Tim YES / NO
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	light drizzle
Engine Load Conditions or N/A	NA
Background noise	Birds chirping light breeze insects
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
Duration	birds chirping	constant	moderate
Duration	insects chirping (crickets)	constant	low
11:06	Crow cawing &	intermittent	moderate
11:07	Plane overhead	rare	low
11:09	Bird chirping	intermittent	moderate
11:12	Bird	intermittent	mod.
11:12	Car in distance	rare	low
11:12	Train whistle	rare	low
11:13	Wind through trees	int.	low-mod.
11:14	Car in distance	rare	low
11:14	Train whistle	rare	low
11:14	Wind through trees	intermittent	low
11:16	Bird Chirping	intermittent	mod.
11:17	~~Ed~~ Hammering in distance	int.	low
11:18	Wind	int.	low
11:21	Crows cawing	int.	moderate
11:22	Distant car	rare	low
11:23	Birds chirping	int.	mod.
11:24	Bird chirping	int	mod.
11:25	Crow Cawing	rare	mod
11:27	Distant siren	rare	low
11:29	Bird	int.	mod.
11:31	Birds	int.	low
11:34	Bird/crow	int	moderate

Noise Study Field Sheet
Trinity Consultants

Location	Braden Run Animal Hospital
NSA #	Red Hook NSA-3
Description of Location (incl. vegetation/ground surface)	Gravel lot close to road w/ surrounding trees
Latitude/Longitude	39° 55' 11.84" N, 80° 8' 4.68" W per Google Earth
Date	7/8/15
Start Time	22:44
End Time	23:17
Duration	33:03
Approximate distance(s) to nearby structures	~20ft to hospital; ~100 ft to house
Was NSA occupied?	~~Weas~~ YES / NO
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	No rain none to low wind
Engine Load Conditions or N/A	NA
Background noise	Dripping sound (constant) low volume distant traffic Dog barking in distance intermittently for duration of run
Pictures Taken?	(Day time) YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
22:45	Dog barking in distance	intermittent	low-moderate
~~22:4~~			
Duration	drip of water	intermittent	low-moderate
22:46	plane overhead	rare	low
22:46	AC unit running at nearby house	constant	low to mod
22:47	Dog barking inside hospital	int.	low
Duration	Crickets chirping	constant	low
22:47	horse neighing	rare	moderate
Duration	Distant traffic	intermittent	low
22:50	Dog barking in distance	int.	moderate
22:51	plane overhead	rare	low
22:51	Dog barking in distance	int.	mod.
22:53	Distant traffic	rare	low
22:54	Dog barking in distance	int	moderate
22:55	plane overhead	rare	low
22:55	horse neighing	rare	mod.
22:56	Dog barking in distance	int	low-mod
22:57	horse neigh	rare	low-mod.
22:58	Dog bark in distance	int.	mod
22:59	Dog barking in distance	int.	mod
23:01	horse neigh	rare	moderate
23:02/03	Dog barking in distance	int.	mod
23:03	Rustle in bushes	rare	low
23:04	Dog barking in distance	int	low
23:05	plane overhead	rare	low
23:06	Dog barking in distance	int	rare
23:07	Rumble of distant traffic	int.	low
23:08	Rustle of leaves	rare	low
23:09	Horse neighing	rare	mod.
23:10	Horse neighing	rare	mod.

Noise Study Field Sheet
Trinity Consultants

Location	
NSA #	Red Hook NSA-3
Description of Location (incl. vegetation/ground surface)	
Latitude/Longitude	
Date	
Start Time	
End Time	
Duration	
Approximate distance(s) to nearby structures	
Was NSA occupied?	**YES / NO**
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	
Engine Load Conditions or N/A	
Background noise	
Pictures Taken?	**YES / NO**

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
23:10/11	Dog barking in distance	intermittent	low
23:15	Dog barking in distance	int	mod.

Noise Study Field Sheet
Trinity Consultants

Location	831-Data.011 End of Brain Run Road
NSA #	Red Hook NSA-4
Description of Location (incl. vegetation/ground surface)	Small grassy yard near road w/ trees around perimeter
Latitude/Longitude	39° 54' 58" N, 80° 07' 36" W
Date	7/8/15 Closer to Google Earth coordinates of: 39° 54' 57.77" N, 80° 7' 36.90" W
Start Time	11:51
End Time	12:23
Duration	31:53
Approximate distance(s) to nearby structures	~50 ft to road way ~30 ft to garage
Was NSA occupied?	YES / NO (?)
Types of activities taking place in nearby area	Busy road w/ lots of heavy truck traffic Nearby industrial equipment across street
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	No rain Light mist ~ 12:11
Engine Load Conditions or N/A	NA
Background noise	Loud traffic from nearby road; lots of heavy trucks Birds chirping Insects
Pictures Taken?	YES / NO

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
Duration	Heavy truck traffic		
11:55	Construction sound indist.	int.	low
11:55	Passing cars	constant/int.	loud
Duration	birds chirping	intermittent	moderate
11:57	cars passing	int.	loud
11:57	truck passing	int.	loud
11:58	cars passing	int.	loud
11:59	cars passing	int.	loud
12:00	heavy trucks passing	int	loud
12:01	car/truck passing	int.	loud
12:02	birds chirping	int.	mod.
12:02	truck passing, cars passing	int.	loud
12:04	Passing cars	int.	loud
12:05	trucks passing, motorcycle	int	loud
12:06	cars passing	int	loud
12:07	Birds chirping	int	moderate
12:07	trucks	int	loud
12:08	cars passing	int	loud
12:09	cars, heavy trucks	int.	loud
12:10	crow cawing;	int.	moderate
12:10	heavy truck; car	int	loud
12:11	cars passing	int	loud
12:12	trucks passing	int	loud
12:13	car; heavy truck	int	loud
12:14	heavy truck	int.	loud
12:14	Rustle in bushes	rare	mod
12:15	car pulling out of nearby road	rare	mod.
12:15	cars passing, heavy truck	int.	loud
12:16	cars passing	int	loud
12:17	car passing	int	mod

Noise Study Field Sheet
Trinity Consultants

Location	
NSA #	Red Hook NSA-4 pg 2of 2
Description of Location (incl. vegetation/ground surface)	
Latitude/Longitude	
Date	
Start Time	
End Time	
Duration	
Approximate distance(s) to nearby structures	
Was NSA occupied?	**YES / NO**
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	
Engine Load Conditions or N/A	
Background noise	
Pictures Taken?	**YES / NO**

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
12:18	heavy truck passing	int.	loud
12:19	cars passing	int.	mod
12:20	cars passing	int.	mod
12:20	birds chirping	int	mod.
12:21	cars passing	int.	mod.
12:22	trucks passing	int.	loud
Duration	industrial engine hum	constant	mod.

Noise Study Field Sheet
Trinity Consultants

Location	592 Jefferson Rd 831-Data.012
NSA #	Red Hook NSA-4
Description of Location (incl. vegetation/ground surface)	Grassy area near road w/ the surrounding trees
Latitude/Longitude	39°54'57.77"N, 80°7'36.90"W (per Google Earth)
Date	7/8/15
Start Time	22:01
End Time	22:33
Duration	32:27
Approximate distance(s) to nearby structures	~50 ft to roadway
Was NSA occupied?	YES / NO
Types of activities taking place in nearby area	Industry across street Traffic from adjacent roadway
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	No rain; none to low wind
Engine Load Conditions or N/A	NA
Background noise	Industry across street - hum of engines Crickets
Pictures Taken?	YES / NO Daytime

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
22:03	Cars passing	intermittent	moderate
22:04	Distant motor	rare	low
22:05	cars passing	int	moderate
22:06	Cars passing	int.	mod.
22:07	car passing	int.	mod.
22:08	cars passing	int.	mod.
22:09	cars passing	int	mod
22:11	car passing	int.	mod.
Duration	crickets/ insects chirping	constant	low
Duration	motor/hum from industry across st.	constant	low-mod
22:12	cars passing	int.	mod
22:13	cars passing	int.	mod
22:14	car passing	int.	mod
22:15	car passing	int.	mod
22:16	car passing	int.	mod.
22:18	car passing	int.	mod.
22:19	car passing	int.	mod.
22:20	car passing	int.	mod.
22:21	cars passing	int.	mod
22:22	insect chirping loudly	rare	mod./low
22:23	car passing	int.	mod.
22:25	distant clanging	rare	low
22:25	trucks passing	int.	loud
22:26	car passing	int.	mod.
22:27	truck passing	int.	loud
22:27/28	Cars passing	int.	mod.
22:28	dog barking in distance	rare	low
22:29	truck passing	int	loud
22:29	cars passing	int	mod.

Noise Study Field Sheet
Trinity Consultants

Location	
NSA #	
Description of Location (incl. vegetation/ground surface)	Red Hook NSA-4
Latitude/Longitude	
Date	
Start Time	
End Time	
Duration	
Approximate distance(s) to nearby structures	
Was NSA occupied?	**YES / NO**
Types of activities taking place in nearby area	
Weather Notes: • Precipitation • Temperature • Wind Direction • Wind Speed	
Engine Load Conditions or N/A	
Background noise	
Pictures Taken?	**YES / NO**

Noise Study Field Sheet
Trinity Consultants

Time	Noise Type	Frequency: Rare / Intermittent / Constant	Noise Volume
22:30	car passing	int.	mod.
22:30	truck passing	~~loud~~. int.	loud
22:31	~~truck~~ cars passing	int.	mod-loud
22:31	tree branch snap	rare	mod

Equitrans Expansion Project

Docket No. CP16- -000

Resource Report 9

Appendix 9-B
Construction Emissions Calculations

Equitrans Redhook

Table 9-B-1. Criteria Pollutant Emissions Summary, H-318 Pipeline Allegheny Washington Construction

Total Emissions from H-318 Pipeline Construction

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	7.73	5.33	0.34	0.82	0.73	0.73	1,880.01	0.10	0.055	0.0044	0.011	0.0094	0.0094	24.64
On-Road Vehicle Travel	0.32	1.80	0.0021	0.090	0.013	0.008	208.06	0.28	0.089	0.0013	0.041	0.010	0.0065	193.06
Off-Road Vehicle Travel	--	--	--	--	2.31	0.23	--	--	--	--	--	0.14	0.014	--
Earthmoving Fugitives	--	--	--	--	1.01	0.48	--	--	--	--	--	0.013	0.0066	--
Pile Erosion	--	--	--	--	0.68	0.10	--	--	--	--	--	0.57	0.085	--
TOTAL:	**8.04**	**7.13**	**0.34**	**0.91**	**4.75**	**1.55**	**2,088.07**	**0.38**	**0.14**	**0.0057**	**0.051**	**0.74**	**0.12**	**217.70**

Emissions from H-318 Pipeline Construction in Washington County

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	2.22	1.53	0.10	0.23	0.21	0.21	540.33	0.028	0.016	0.0013	0.0031	0.0027	0.0027	7.08
On-Road Vehicle Travel	0.091	0.52	0.0006	0.026	0.0037	0.0022	59.80	0.081	0.026	0.00038	0.012	0.0030	0.0019	55.49
Off-Road Vehicle Travel	--	--	--	--	0.66	0.066	--	--	--	--	--	0.040	0.0040	--
Earthmoving Fugitives	--	--	--	--	0.29	0.14	--	--	--	--	--	0.0037	0.0019	--
Pile Erosion	--	--	--	--	0.20	0.03	--	--	--	--	--	0.16	0.024	--
TOTAL:	**2.31**	**2.05**	**0.10**	**0.26**	**1.36**	**0.45**	**600.13**	**0.11**	**0.041**	**0.0016**	**0.015**	**0.21**	**0.035**	**62.57**

Emissions from H-318 Pipeline Construction in Allegheny County

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	5.51	3.80	0.24	0.58	0.52	0.52	1,339.67	0.071	0.039	0.0031	0.0077	0.0067	0.0067	17.56
On-Road Vehicle Travel	0.23	1.28	0.0015	0.064	0.0092	0.0055	148.26	0.20	0.064	0.00094	0.029	0.0075	0.0046	137.57
Off-Road Vehicle Travel	--	--	--	--	1.65	0.16	--	--	--	--	--	0.10	0.010	--
Earthmoving Fugitives	--	--	--	--	0.72	0.34	--	--	--	--	--	0.0092	0.0047	--
Pile Erosion	--	--	--	--	0.49	0.073	--	--	--	--	--	0.40	0.061	--
TOTAL:	**5.73**	**5.08**	**0.24**	**0.65**	**3.38**	**1.11**	**1,487.93**	**0.27**	**0.10**	**0.0041**	**0.037**	**0.53**	**0.087**	**155.13**

Emissions occurring in each county were estimated by multiplying total H-318 emissions by the ratio of the length og the pipeling installed in each county to the total H-318 pipeline length.

Pipeline distance per county

Allegheny County	3	mi
Washington County	1.21	mi
Total	4.21	mi

Equitrans Redhook

Table 9-B-2. HAP Emission Summary, H-318 Pipeline Allegheny Washington Construction

Source	2017 Construction Emissions (tpy)						2018 Construction Emissions (tpy)					
	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs
Construction Equipment Engines	4.33E-02	2.45E-03	1.63E-02	1.63E-03	9.64E-02	1.60E-01	5.72E-04	3.24E-05	2.16E-04	2.16E-05	1.27E-03	2.11E-03
On-Road Vehicle Travel	9.28E-04	1.42E-04	3.04E-03	5.30E-04	2.57E-03	7.21E-03	8.83E-04	1.45E-04	6.19E-04	3.09E-04	2.50E-03	4.45E-03
Off-Road Vehicle Travel	--	--	--	--	--	--	--	--	--	--	--	--
Earthmoving Fugitives	--	--	--	--	--	--	--	--	--	--	--	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL:	**4.42E-02**	**2.59E-03**	**1.94E-02**	**2.16E-03**	**9.90E-02**	**1.67E-01**	**1.45E-03**	**1.78E-04**	**8.35E-04**	**3.31E-04**	**3.77E-03**	**6.57E-03**

Equitrans Redhook

Table 9-B-3. Emissions from Construction Engines, H-318 Pipeline Allegheny Washington Construction

Equipment Type	SCC	Max. Engine Rating (hp)	Load Factor[3]	Average Engine Load (hp)	2017 Construction Year Operations Quantity	2017 Operations (hr/week)	2017 Operations (weeks/yr)	2017 Emissions (tpy) NO_X	2017 CO	2017 SO_2	2017 VOC	2017 PM_{10}	2017 $PM_{2.5}$	2017 CO_2	2018 Construction Year Operations Quantity	2018 Operations (hr/week)	2018 Operations (weeks/yr)	2018 Emissions (tpy) NO_X	2018 CO	2018 SO_2	2018 VOC	2018 PM_{10}	2018 $PM_{2.5}$	2018 CO_2
Air Compressor A	2270006015	310	0.43	133.3	2	15	18	1.63E-01	3.56E-02	7.68E-03	1.47E-02	1.27E-02	1.27E-02	4.21E+01	1	10	2	5.24E-03	1.16E-03	2.79E-04	5.13E-04	4.58E-04	4.58E-04	1.56E+00
Air Compressor B	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	2282005015	18	0.21	3.78	2	10	18	1.02E-02	2.41E-01	3.99E-04	2.14E-02	2.42E-04	2.42E-04	1.94E+00	1	10	2	5.56E-04	1.33E-02	2.21E-05	1.10E-03	1.04E-05	1.04E-05	1.07E-01
Asphalt Paver	2270002003	153	0.59	90.27	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Backhoe	2265002066	75	0.48	36	1	10	3	1.55E-03	1.57E-02	1.72E-04	4.68E-04	8.29E-05	8.29E-05	8.32E-01	1	10	1	4.98E-04	4.95E-03	5.72E-05	1.48E-04	2.76E-05	2.76E-05	2.77E-01
Bobcat[2]	2265003040	150	0.54	81	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Booster/Pumps	2270006010	370	0.43	159.1	2	10	1	6.42E-03	1.75E-03	1.81E-04	5.35E-04	4.33E-04	4.33E-04	9.30E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bucket Truck	2270002051	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chain Saw	2260004020	3	0.7	2.1	3	25	2	7.16E-04	8.16E-02	7.58E-05	1.44E-02	2.56E-03	2.56E-03	3.69E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	2270002081	160	0.59	94.4	1	12	2	6.37E-03	5.85E-03	2.78E-04	6.32E-04	9.46E-04	9.46E-04	1.49E+00	1	4	0	2.67E-04	2.50E-04	1.29E-05	2.75E-05	4.19E-05	4.19E-05	7.08E-02
Chipper/Shredder	2270004066	20	0.43	8.6	1	30	2	2.86E-03	7.28E-04	5.83E-05	2.02E-04	1.44E-04	1.44E-04	3.01E-01	1	10	1	2.28E-04	5.60E-05	4.80E-06	1.59E-05	1.15E-05	1.15E-05	2.51E-02
Compactor	2270002009	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor, Vibratory	2270002009	100	0.43	43	1	8	1	1.31E-03	6.93E-04	3.60E-05	1.40E-04	1.06E-04	1.06E-04	1.67E-01	1	10	1	1.08E-03	5.70E-04	3.00E-05	1.13E-04	8.69E-05	8.69E-05	1.40E-01
Concrete Mixer Truck (main pours)	2270002042	150	0.43	64.5	2	8	1	2.38E-03	1.25E-03	6.63E-05	2.54E-04	2.42E-04	2.42E-04	3.35E-01	1	3	1	4.18E-04	2.20E-04	1.23E-05	4.48E-05	4.32E-05	4.32E-05	6.28E-02
Concrete Mixer Truck (small pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	2270006010	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Crawler	2270002069	450	0.59	265.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (20 ton)	2270002045	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) B	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	2270002081	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	2270002033	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	2270002069	410	0.59	241.9	4	25	18	6.14E-01	2.02E-01	4.37E-02	7.36E-02	8.09E-02	8.09E-02	2.57E+02	1	25	1	6.91E-03	2.16E-03	5.89E-04	9.75E-04	1.04E-03	1.04E-03	3.58E+00
Drill Engine	2270002081	20	0.59	11.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	2270002033	950	0.43	408.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	2270002078	325	0.21	68.25	1	30	36	3.64E-01	2.10E-01	1.00E-02	5.50E-02	4.52E-02	4.52E-02	5.07E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavator	2270002036	138	0.59	81.42	4	35	18	3.22E-01	3.14E-01	2.30E-02	3.61E-02	6.14E-02	6.14E-02	1.35E+02	2	25	3	1.48E-02	1.40E-02	1.32E-03	2.01E-03	3.05E-03	3.05E-03	8.02E+00
Fork Lift	2270003020	120	0.59	70.8	1	30	15	2.56E-02	2.19E-02	3.30E-03	4.79E-03	6.13E-03	6.13E-03	2.09E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Front End Loaders	2270002066	196	0.21	41.16	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Generators	2270006005	430	0.43	184.9	2	10	15	2.23E-01	6.02E-02	6.30E-03	1.86E-02	1.47E-02	1.47E-02	3.24E+01	1	50	2	6.91E-02	1.82E-02	2.07E-03	5.84E-03	4.67E-03	4.67E-03	1.08E+01
Grader	2270002048	140	0.59	82.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	2270002033	600	0.43	258	1	168	15	2.79E+00	8.26E-01	7.42E-02	1.89E-01	1.61E-01	1.61E-01	3.80E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	2270002045	340	0.43	146.2	1	10	1	2.02E-03	4.48E-04	1.14E-04	2.00E-04	1.84E-04	1.84E-04	6.41E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	2270002051	100	0.59	59	1	48	1	4.23E-03	1.30E-03	1.38E-04	3.26E-04	3.01E-04	3.01E-04	8.37E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Jack Hammer	2270003040	405	0.43	174.15	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	2270002081	50	0.59	29.5	4	24	8	9.02E-02	1.99E-02	2.61E-03	4.65E-03	5.29E-03	5.29E-03	1.49E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift A	2270003010	50	0.21	10.5	1	10	2	1.22E-03	1.26E-03	3.21E-05	3.22E-04	1.96E-04	1.96E-04	1.60E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift B	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	2270002081	400	0.59	236	1	168	15	1.33E+00	4.47E-01	6.42E-02	1.24E-01	1.32E-01	1.32E-01	3.52E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	2270002051	250	0.59	147.5	8	10	15	1.32E-01	4.66E-02	1.66E-02	2.67E-02	2.95E-02	2.95E-02	1.05E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pile Driver	2270002081	350	0.59	206.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2270002081	20	0.59	11.8	4	30	25	1.74E-01	9.37E-02	4.99E-03	1.75E-02	1.42E-02	1.42E-02	2.32E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Tractor Trailer	2265002066	400	0.48	192	3	25	10	2.06E-01	2.09E+00	2.29E-02	6.23E-02	1.11E-02	1.11E-02	1.11E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Portable Pipe Bender	2270003040	75	0.43	32.25	2	30	12	9.17E-02	4.21E-02	2.87E-03	6.04E-03	6.89E-03	6.89E-03	1.51E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	2265003010	10	0.46	4.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	2270002015	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scissor Lift	2270003010	20	0.21	4.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
School Bus	2270002051	100	0.59	59	6	15	18	2.86E-01	8.79E-02	9.29E-03	2.20E-02	2.03E-02	2.03E-02	5.65E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scrapper	2270002018	488	0.59	287.92	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	2270002069	240	0.59	141.6	4	30	16	4.23E-01	1.83E-01	2.81E-02	4.87E-02	6.77E-02	6.77E-02	1.61E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	2270002072	75	0.21	15.75	1	15	15	2.01E-02	2.05E-02	5.43E-04	3.91E-03	3.26E-03	3.26E-03	2.71E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Stake Bed	2270002081	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	2270003030	12	0.43	5.16	2	10	18	9.14E-03	4.85E-03	2.59E-04	9.17E-04	7.52E-04	7.52E-04	1.21E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tamper	2260002006	4	0.55	2.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tandem Truck	2270002069	200	0.59	118	1	20	10	3.67E-02	1.59E-02	2.44E-03	4.23E-03	5.87E-03	5.87E-03	1.40E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trackhoe	2265002066	320	0.48	153.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trenching Machines	2270002030	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2270002081	8	0.59	4.72	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water / Fuel Truck	2270002051	250	0.59	147.5	1	30	18	5.92E-02	2.10E-02	7.45E-03	1.20E-02	1.33E-02	1.33E-02	4.71E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welder	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Machine	2270006025	35	0.21	7.35	10	40	12	2.07E-01	2.00E-01	5.79E-03	4.37E-02	2.82E-02	2.82E-02	2.69E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Rig	2270002051	10	0.59	5.9	2	40	12	1.69E-02	5.21E-03	5.51E-04	1.31E-03	1.20E-03	1.20E-03	3.35E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X-Ray Truck/Machine	2270002051	50	0.59	29.5	2	40	15	1.06E-01	3.26E-02	3.44E-03	8.16E-03	7.52E-03	7.52E-03	2.09E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[1]NONROAD2008a Model does not contain Emission Factors for All Terrain Vehicles (ATVs). Used Emission Factors for Personal Watercraft as a substitution.

[2]NONROAD2008a Model does not contain Emission Factors for Bobcat vehicle type. Used Emission Factors for Other Industrial Equipment vehicle type as a substitution.

[3] Load factors as recommended for estimation of emissions using NONROAD emission factors in EPA420-P-04-005 Revised April 2004

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Table 9-B-4. HAP Emissions from Construction Engines, H-318 Pipeline Allegheny Washington Construction

Pollutant	2017 Emissions (tpy)	2018 Emissions (tpy)
Acetaldehyde	4.33E-02	5.72E-04
Acrolein	2.45E-03	3.24E-05
Benzene	1.63E-02	2.16E-04
1,3-Butadiene	1.63E-03	2.16E-05
Formaldehyde	9.64E-02	1.27E-03

1. Emissions of HAPs are estimated based on total VOC emissions for the construction year and Table 3.1-3 Air Toxic Fractions of VOC in EPA's guidance document *Final Regulatory Analysis and Control of Emissions from Nonroad Diesel Engines* , EPA420-R-04-007, May 2004.

Pollutant	Fraction of VOC
Acetaldehyde	0.053
Acrolein	0.003
Benzene	0.020
1,3-Butadiene	0.002
Formaldehyde	0.118

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Table 9-B-5. On-Road Engine Emission Factors, H-318 Pipeline Allegheny Washington Construction

	2017 Emission Factors (grams/mile)					2018 Emission Factors (grams/mile)				
Pollutant	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**
NO_X	3.42E-01	3.83E-01	4.58E-01	6.99E+00	3.18E+00	3.19E-01	3.60E-01	4.06E-01	6.38E+00	2.71E+00
CO	1.21E+01	1.21E+01	5.13E-01	1.01E+00	5.88E-01	1.19E+01	1.17E+01	4.77E-01	8.85E-01	5.15E-01
SO_2	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02
VOC	3.89E-01	4.60E-01	2.37E-01	3.48E-01	2.43E-01	3.70E-01	4.38E-01	2.12E-01	3.28E-01	2.38E-01
PM_{10}	2.48E-02	2.48E-02	4.65E-02	3.71E-02	8.74E-02	2.47E-02	2.48E-02	4.02E-02	3.71E-02	7.62E-02
$PM_{2.5}$	1.12E-02	1.13E-02	3.12E-02	2.06E-02	5.69E-02	1.12E-02	1.13E-02	2.55E-02	2.06E-02	4.66E-02
CO_2	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.55E+03	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.54E+03
Acetaldehyde	1.37E-03	1.57E-03	2.92E-03	1.05E-02	7.33E-03	1.31E-03	1.49E-03	2.62E-03	9.90E-03	7.19E-03
Acrolein	1.70E-04	2.00E-04	8.30E-04	1.28E-03	8.95E-04	1.70E-04	1.90E-04	7.40E-04	1.21E-03	8.75E-04
Benzene	1.74E-02	1.99E-02	4.75E-03	3.84E-03	2.68E-03	1.67E-02	1.90E-02	4.26E-03	3.61E-03	2.62E-03
1,3-Butadiene	1.94E-03	2.21E-03	2.14E-03	2.23E-03	1.55E-03	1.86E-03	2.12E-03	1.92E-03	2.10E-03	1.52E-03
Formaldehyde	3.54E-03	4.05E-03	9.17E-03	2.85E-02	1.99E-02	3.40E-03	3.86E-03	8.21E-03	2.69E-02	1.95E-02

1. The emission factors were calculated using EPA's Mobile6.2 Vehicle Emission Modeling Software. Emission factors for each calendar year are based on average of Mobile6.2 generated factors for winter and summer of that year.

2. Temperatures for winter were based on average temperatures in January, and the temperatures for summer were based on average temperatures in July. The data was extracted from National Oceanic and Atmospheric Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/datatools/normals) based on data collected from 1981 to 2010 by the Morgantown Hart Field, WV Station (COOP ID 466202).

3. Fuel assumptions included conventional gasoline, with an average RVP limit of 9 psi, and diesel with average sulfur content of 11 ppm.

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Table 9-B-6. On-Road Vehicle Travel, H-318 Pipeline Allegheny Washington Construction

Vehicle Type	2017 Round Trip (miles)	2017 Trips per Day	2017 Days/Year	2017 Total Miles Per Year	2018 Round Trip (miles)	2018 Trips per Day	2018 Days/Year	2018 Total Miles Per Year
Commuter Bus	0	0	0	0	0	0	0	0
Light-Duty Diesel Truck	22	8	310	54,560	22	14.29	260	81,714
Light-Duty Gasoline Truck	22	4	310	27,280	0	0	0	0
Light-Duty Gasoline Vehicle	22	15	310	102,300	0	0	0	0
Heavy Duty Diesel Vehicle	22	8	310	54,560	22	14.29	260	81,714
Fuel Delivery	22	2	310	13,640	0	0	0	0

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Table 9-B-7. On-Road Engine Emissions, H-318 Pipeline Allegheny Washington Construction

Pollutant	2017 Annual Emissions (tpy)					2018 Annual Emissions (tpy)				
	LDGV	LDGT	LDDT	COM BUS	HDDV	LDGV	LDGT	LDDT	COM BUS	HDDV
NO_X	3.86E-02	1.15E-02	2.75E-02	0.00E+00	2.39E-01	0.00E+00	0.00E+00	3.65E-02	0.00E+00	2.44E-01
CO	1.36E+00	3.63E-01	3.09E-02	0.00E+00	4.42E-02	0.00E+00	0.00E+00	4.30E-02	0.00E+00	4.63E-02
SO_2	7.67E-04	2.65E-04	2.47E-04	0.00E+00	7.97E-04	0.00E+00	0.00E+00	3.69E-04	0.00E+00	9.55E-04
VOC	4.38E-02	1.38E-02	1.42E-02	0.00E+00	1.83E-02	0.00E+00	0.00E+00	1.91E-02	0.00E+00	2.14E-02
PM_{10}	2.80E-03	7.46E-04	2.79E-03	0.00E+00	6.57E-03	0.00E+00	0.00E+00	3.62E-03	0.00E+00	6.86E-03
$PM_{2.5}$	1.26E-03	3.40E-04	1.88E-03	0.00E+00	4.28E-03	0.00E+00	0.00E+00	2.29E-03	0.00E+00	4.20E-03
CO_2	4.15E+01	1.44E+01	3.60E+01	0.00E+00	1.16E+02	0.00E+00	0.00E+00	5.39E+01	0.00E+00	1.39E+02
Acetaldehyde	1.54E-04	4.71E-05	1.76E-04	0.00E+00	5.51E-04	0.00E+00	0.00E+00	2.36E-04	0.00E+00	6.47E-04
Acrolein	1.92E-05	6.01E-06	4.99E-05	0.00E+00	6.73E-05	0.00E+00	0.00E+00	6.67E-05	0.00E+00	7.88E-05
Benzene	1.96E-03	5.98E-04	2.85E-04	0.00E+00	2.01E-04	0.00E+00	0.00E+00	3.83E-04	0.00E+00	2.36E-04
1,3-Butadiene	2.18E-04	6.65E-05	1.29E-04	0.00E+00	1.17E-04	0.00E+00	0.00E+00	1.72E-04	0.00E+00	1.37E-04
Formaldehyde	3.99E-04	1.22E-04	5.51E-04	0.00E+00	1.50E-03	0.00E+00	0.00E+00	7.39E-04	0.00E+00	1.76E-03

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Table 9-B-8. On-Road Vehicle Travel, H-318 Pipeline Allegheny Washington Construction

Vehicle Type	2017 Round Trip (miles)	2017 Trips per Day	2017 Days/Year	2017 Total Miles Per Year	2018 Round Trip (miles)	2018 Trips per Day	2018 Days/Year	2018 Total Miles Per Year
All Terrain Vehicle (ATV)	1	4	310	1,240	1	4	260	1,040
Dump Trucks	0.5	1	310	155	0.5	4	260	520
Light Duty Trucks	0.75	30	310	6,975	0	0	0	0
Medium Duty Trucks	0.75	30	310	6,975	0	0	0	0
School Bus	0.75	12	310	2,790	0	0	0	0
Water / Fuel Truck	3	2	310	1,860	0	0	0	0

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Table 9-B-9. Emissions from Off-Road Vehicle Travel, H-318 Pipeline Allegheny Washington Construction

Vehicle Type	Mean Vehicle Weight (tons)	Emission Factor[1]		Control Efficiency[2] (%)	2017 Annual Emissions		2018 Annual Emissions	
		PM_{10} (lb/VMT)	$PM_{2.5}$ (lb/VMT)		PM_{10} (tpy)	$PM_{2.5}$ (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
All Terrain Vehicle (ATV)	0.25	0.23	0.02	75%	0.036	0.0036	0.03	0.00
Dump Trucks	20	1.66	0.17	75%	0.032	0.0032	0.11	0.01
Light Duty Trucks	2.5	0.65	0.07	75%	0.57	0.057	0.00	0.00
Medium Duty Trucks	5	0.89	0.09	75%	0.78	0.078	0.00	0.00
School Bus	15	1.46	0.15	75%	0.51	0.051	0.00	0.00
Water / Fuel Truck	20	1.66	0.17	75%	0.39	0.039	0.00	0.00

1. Emission factors calculated in accordance with AP-42 Section 13.2.2:

Unpaved Roads: $E = k(s/12)^a(W/3)^b*[(365-p)/365]$

k Factor (PM_{10}, $PM_{2.5}$) (lb/VMT)	1.5		0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	8.5	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	130			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM_{10}, $PM_{2.5}$)	0.9		0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM_{10}, $PM_{2.5}$)	0.45		0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

2. Assumed average dust control efficiency for road watering from AP-42 Section 13.2.2 and related background documents.

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Table 9-B-10. Fugitive Emissions from Earthmoving, H-318 Pipeline Allegheny Washington Construction

On-Site Activity	Emission Factors[1] PM_{10}	$PM_{2.5}$	Units of Measure	Operation[2] 2017	2018	Units of Measure	PM_{10} Emissions (tpy) 2017	2018	$PM_{2.5}$ Emissions (tpy) 2017	2018
Bulldozing	1.03E+00	5.31E-01	lb/hr	1,800	25	hr/yr	9.26E-01	1.29E-02	4.78E-01	6.64E-03
Grading	1.96E+00	2.24E-01	lb/VMT	0	0.0	VMT/yr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavating	4.25E-03	2.42E-04	lb/yd^3	38,231	0.0	yd^3	8.12E-02	0.00E+00	4.62E-03	0.00E+00
							1.01E+00	1.29E-02	4.83E-01	6.64E-03

1. Emissions were calculated using emission factor equations from Table 11.9-1, Compilation of Air Pollutant Emission Factors, USEPA AP-42, Fifth Edition, 10/98.

For bulldozing:

PM_{10} emissions factor (lb/hr) = 0.75 * [1.0 (s)^1.5 / (M)^1.4]

$PM_{2.5}$ emission factor (lb/hr) = 0.105 * [5.7(s)^1.2 / (M)^1.3]

For grading:

PM_{10} emission factor (lb/VMT) = 0.60 * [0.051 (S)^2.0]

$PM_{2.5}$ emission factor (lb/VMT) = 0.031 * [0.040 (S)^2.5]

For Excavating:

PM_{10} Emission factor (lb/yd^3) = 0.75 * [0.0021 (d)^0.7 / (M)^0.3]

$PM_{2.5}$ Emission factor (lb/yd^3) = 0.017 * [0.0021 (d)^1.1 / (M)^0.3]

Where:

s (Silt Content) =	8.5
M (Moisture Content) =	7.9
S (Vehicle Speed) =	8
d (Drop Height) =	10

2. Vehicle miles traveled for grading calculate based on amount of land disturbed during construction each year, as follows:

	2017	2018
Land Disturbed (acres):	0	0
Square Miles:	0.000	0.000
Miles in 1 Direction:	0.000	0.000
Feet in 1 Direction:	0	0
Clearance of Grader (ft):	5	5
Number of Trips for 1 Grade:	0	0
Miles to Clear 1 Direction:	0	0
Miles with 50% Safety Factor:	0.0	0.0
Number of Times to Go Over Surface:	2	2
Total Travel (VMT/yr):	0	0

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Table 9-B-11. Fugitive Emissions from Soil Pile Wind Erosion, H-318 Pipeline Allegheny Washington Construction

Material Pile Description	Size (acres)[3]	Emission Control Method	Control Efficiency[4]	Emission Factor[1]			Unit	2017 Emissions (tpy)[5]			2018 Emissions (tpy)[5]		
				PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Redhook Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.039	0.020	0.0030	0.036	0.018	0.0027
Pratt Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	--	--	--	0.032	0.016	0.0024
Compressor Station Total	0.184	Mulch/seeding	75%	--	--	--	--	0.039	0.020	0.0030	0.068	0.034	0.01
H-316 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.09
H-318 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.09
Pipeline Soil Piles in Allegheny, PA	2.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.97	0.49	0.07	0.81	0.40	0.06
Pipeline Soil Piles in Washington, PA	0.8	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.39	0.20	0.03	0.33	0.16	0.02
H-305 Pipeline Total	0.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.04	0.02	0.00	0.04	0.02	0.00
H-158 & M-80 Pipeline Total	0.3	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.14	0.07	0.01	0.13	0.06	0.01
H-319 Pipeline Total	0.1	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.002	0.001	0.000	--	--	--
Pipeline Soil Piles Total	6.29	Mulch/seeding	75%	--	--	--	--	2.92	1.46	0.22	2.43	1.22	0.18
Mobely Tap Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	--	--	--	0.0033	0.0016	0.000
Webster Interconnect Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.0033	0.0016	0.00025	--	--	--
Interconnect Total	0.147	Mulch/seeding	75%	--	--	--	--	0.0033	0.0016	0.00025	0.0033	0.0016	0.000
Total Stockpile Erosion Emissions								**2.96**	**1.48**	**0.22**	**2.51**	**1.25**	**0.19**

[1]USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles). USEPA, 2006 13.2.5 for k factors:

EF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)*(1-% Control Efficiency)

[2]Total PM assumed to be equal to PM < 30 μm

	Redhook	Wetzel, WV
Days of precipitation greater than or equal to 0.01 inch (p)	151	149.8
Time (%) that unobstructed wind speed exceeds 5.4 m/s at mean pile height (f)	17.6	1.8

Silt Content (%), (s)	8.5	
Particle Size multiplier (k)	1	(for PM < 30 μm)
	0.5	(for PM < 10 μm)
	0.075	(for PM < 2.5 μm)

[3]Soil Pile Areas:

	2	stockpiles
Compressor Stations Stockpile Area:	50	ft. wide
	40	ft. wide
	0.092	**acres**
	1	pile per spread

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Table 9-B-11. Fugitive Emissions from Soil Pile Wind Erosion, H-318 Pipeline Allegheny Washington Construction

	4	ft. wide (topsoil)	
	8	ft. wide (subsoil)	
	2	miles long	H-316 - Greene County, PA
	2.9	**acres**	
	2	miles long	H-318 - Allegheny & Washington Counties, PA
Pipeline Soil Pile Area:	**2.9**	**acres**	
	0.065	miles long	H-305 - Greene County, PA
	0.1	**acres**	
	0.222	miles long	H-158 & M-80 - Greene County, PA
	0.3	**acres**	
	0.035	miles long	H-319 - Wetzel County, WV
	0.1	**acres**	
Interconnects Stockpile Area:[6]	2	stockpiles	
	0.073	**acres**	

[4]Engineering estimate for control efficiency from use of mulch/seeding to control erosion.

[5]Emissions are based on the construction schedule below:

Start	End	2017 days	2018 days	Location
2/2/2017	10/30/2018	333	303	Redhook Compressor Station
2/2/2018	10/30/2018	--	270	Pratt Compressor Station
1/1/2017	10/30/2018	365	303	H-316 Pipeline
1/1/2017	10/30/2018	365	303	H-318 Pipeline
2/2/2017	10/30/2018	333	303	H-305 Pipeline
2/2/2017	10/30/2018	333	303	H-158 & M-80 Pipeline
2/2/2017	12/30/2017	331	--	H-319 Pipeline
2/2/2018	12/30/2018	--	331	Mobely Tap
2/2/2017	12/30/2017	331	--	Webster Interconnect

[6]Interconnects stockpiles are 20% smaller in size at interconnects than at compressor stations per conversation with Trever Leamon on 9/4/2015

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Table 9-B-12. Criteria Pollutant Emissions Summary, H-316 Pipeline Greene County Construction

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	7.59	5.26	0.34	0.80	0.72	0.72	1,861.44	0.10	0.05	0.00	0.01	0.01	0.01	24.64
On-Road Vehicle Travel	0.32	1.75	0.00	0.09	0.01	0.01	208.06	0.28	0.09	0.00	0.04	0.01	0.01	193.06
Off-Road Vehicle Travel	--	--	--	--	2.27	0.23	--	--	--	--	--	0.14	0.01	--
Earthmoving Fugitives	--	--	--	--	0.93	0.48	--	--	--	--	--	0.01	0.01	--
Pile Erosion	--	--	--	--	0.68	0.10	--	--	--	--	--	0.57	0.09	--
TOTAL:	**7.90**	**7.01**	**0.34**	**0.89**	**4.62**	**1.54**	**2,069.50**	**0.38**	**0.14**	**0.01**	**0.05**	**0.74**	**0.12**	**217.70**

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Table 9-B-13. HAP Emission Summary, H-316 Pipeline Greene County Construction

Source	2017 Construction Emissions (tpy)						2018 Construction Emissions (tpy)					
	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs
Construction Equipment Engines	4.25E-02	2.41E-03	1.61E-02	1.61E-03	9.47E-02	1.57E-01	5.72E-04	3.24E-05	2.16E-04	2.16E-05	1.27E-03	2.11E-03
On-Road Vehicle Travel	9.23E-04	1.42E-04	2.99E-03	5.25E-04	2.56E-03	7.14E-03	8.83E-04	1.45E-04	6.19E-04	3.09E-04	2.50E-03	4.45E-03
Off-Road Vehicle Travel	--	--	--	--	--	--	--	--	--	--	--	--
Earthmoving Fugitives	--	--	--	--	--	--	--	--	--	--	--	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL:	**4.35E-02**	**2.55E-03**	**1.90E-02**	**2.13E-03**	**9.73E-02**	**1.64E-01**	**1.45E-03**	**1.78E-04**	**8.35E-04**	**3.31E-04**	**3.77E-03**	**6.57E-03**

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Table 9-B-14. Emissions from Construction Engines, H-316 Pipeline Greene County Construction

Equipment Type	SCC	Max. Engine Rating (hp)	Load Factor[3]	Average Engine Load (hp)	2017 Construction Year										2018 Construction Year									
						Operations		Emissions (tpy)								Operations		Emissions (tpy)						
					Quantity	(hr/week)	(weeks/yr)	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	Quantity	(hr/week)	(weeks/yr)	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Air Compressor A	2270006015	310	0.43	133.3	2	15	18	1.63E-01	3.56E-02	7.68E-03	1.47E-02	1.27E-02	1.27E-02	4.21E+01	1	10	2	5.24E-03	1.16E-03	2.79E-04	5.13E-04	4.58E-04	4.58E-04	1.56E+00
Air Compressor B	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	2282005015	18	0.21	3.78	2	10	18	1.02E-02	2.41E-01	3.99E-04	2.14E-02	2.42E-04	2.42E-04	1.94E+00	1	10	2	5.56E-04	1.33E-02	2.21E-05	1.10E-03	1.04E-05	1.04E-05	1.07E-01
Asphalt Paver	2270002003	153	0.59	90.27	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Backhoe	2265002066	75	0.48	36	1	10	3	1.53E-03	1.57E-02	1.72E-04	4.66E-04	8.29E-05	8.29E-05	8.32E-01	1	10	1	4.91E-04	4.96E-03	5.72E-05	1.47E-04	2.76E-05	2.76E-05	2.77E-01
Bobcat[2]	2265003040	150	0.54	81	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Booster/Pumps	2270006010	370	0.43	159.1	2	10	1	6.42E-03	1.75E-03	1.81E-04	5.35E-04	4.33E-04	4.33E-04	9.30E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bucket Truck	2270002051	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chain Saw	2260004020	3	0.7	2.1	3	25	2	7.16E-04	8.16E-02	7.58E-05	1.44E-02	2.56E-03	2.56E-03	3.69E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	2270002081	160	0.59	94.4	1	12	2	6.37E-03	5.85E-03	2.78E-04	6.32E-04	9.46E-04	9.46E-04	1.49E+00	1	4	0	2.67E-04	2.50E-04	1.29E-05	2.75E-05	4.19E-05	4.19E-05	7.08E-02
Chipper/Shredder	2270004066	20	0.43	8.6	1	30	2	2.86E-03	7.28E-04	5.83E-05	2.02E-04	1.44E-04	1.44E-04	3.01E-01	1	10	1	2.28E-04	5.60E-05	4.80E-06	1.59E-05	1.15E-05	1.15E-05	2.51E-02
Compactor	2270002009	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor, Vibratory	2270002009	100	0.43	43	1	8	1	1.31E-03	6.93E-04	3.60E-05	1.40E-04	1.06E-04	1.06E-04	1.67E-01	1	10	1	1.08E-03	5.70E-04	3.00E-05	1.13E-04	8.69E-05	8.69E-05	1.40E-01
Concrete Mixer Truck (main pours)	2270002042	150	0.43	64.5	2	8	1	2.38E-03	1.25E-03	6.63E-05	2.54E-04	2.42E-04	2.42E-04	3.35E-01	1	3	1	4.18E-04	2.20E-04	1.23E-05	4.48E-05	4.32E-05	4.32E-05	6.28E-02
Concrete Mixer Truck (small pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	2270006010	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Crawler	2270002069	450	0.59	265.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (20 ton)	2270002045	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) B	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	2270002081	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	2270002033	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	2270002069	410	0.59	241.9	4	25	18	6.14E-01	2.02E-01	4.37E-02	7.36E-02	8.09E-02	8.09E-02	2.57E+02	1	25	1	6.91E-03	2.16E-03	5.89E-04	9.75E-04	1.04E-03	1.04E-03	3.58E+00
Drill Engine	2270002081	20	0.59	11.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	2270002033	950	0.43	408.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	2270002078	325	0.21	68.25	1	30	36	3.64E-01	2.10E-01	1.00E-02	5.50E-02	4.52E-02	4.52E-02	5.07E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavator	2270002036	138	0.59	81.42	4	35	18	3.22E-01	3.14E-01	2.30E-02	3.61E-02	6.14E-02	6.14E-02	1.35E+02	2	25	3	1.48E-02	1.40E-02	1.32E-03	2.01E-03	3.05E-03	3.05E-03	8.02E+00
Fork Lift	2270003020	120	0.59	70.8	1	30	15	2.56E-02	2.19E-02	3.30E-03	4.79E-03	6.13E-03	6.13E-03	2.09E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Front End Loaders	2270002066	196	0.21	41.16	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Generators	2270006005	430	0.43	184.9	2	10	15	2.23E-01	6.02E-02	6.30E-03	1.86E-02	1.47E-02	1.47E-02	3.24E+01	1	50	2	6.91E-02	1.82E-02	2.07E-03	5.84E-03	4.67E-03	4.67E-03	1.08E+01
Grader	2270002048	140	0.59	82.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	2270002033	600	0.43	258	1	168	15	2.79E+00	8.26E-01	7.42E-02	1.89E-01	1.61E-01	1.61E-01	3.80E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	2270002045	340	0.43	146.2	1	10	1	2.02E-03	4.48E-04	1.14E-04	2.00E-04	1.84E-04	1.84E-04	6.41E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	2270002051	100	0.59	59	1	48	1	4.23E-03	1.30E-03	1.38E-04	3.26E-04	3.01E-04	3.01E-04	8.37E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Jack Hammer	2270003040	405	0.43	174.15	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	2270002081	50	0.59	29.5	4	24	8	9.02E-02	1.99E-02	2.61E-03	4.65E-03	5.29E-03	5.29E-03	1.49E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift A	2270003010	50	0.21	10.5	1	10	2	1.22E-03	1.26E-03	3.21E-05	3.22E-04	1.96E-04	1.96E-04	1.60E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift B	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	2270002081	400	0.59	236	1	168	15	1.33E+00	4.47E-01	6.42E-02	1.24E-01	1.32E-01	1.32E-01	3.52E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	2270002051	250	0.59	147.5	8	10	15	1.32E-01	4.66E-02	1.66E-02	2.67E-02	2.95E-02	2.95E-02	1.05E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pile Driver	2270002081	350	0.59	206.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2270002081	20	0.59	11.8	4	10	15	3.48E-02	1.87E-02	9.98E-04	3.51E-03	2.83E-03	2.83E-03	4.64E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Tractor Trailer	2265002066	400	0.48	192	3	25	10	2.04E-01	2.10E+00	2.29E-02	6.21E-02	1.11E-02	1.11E-02	1.11E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Portable Pipe Bender	2270003040	75	0.43	32.25	2	30	12	9.17E-02	4.21E-02	2.87E-03	6.04E-03	6.89E-03	6.89E-03	1.51E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	2265003010	10	0.46	4.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	2270002015	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scissor Lift	2270003010	20	0.21	4.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
School Bus	2270002051	100	0.59	59	6	15	18	2.86E-01	8.79E-02	9.29E-03	2.20E-02	2.03E-02	2.03E-02	5.65E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scrapper	2270002018	488	0.59	287.92	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	2270002069	240	0.59	141.6	4	30	16	4.23E-01	1.83E-01	2.81E-02	4.87E-02	6.77E-02	6.77E-02	1.61E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	2270002072	75	0.21	15.75	1	15	15	2.01E-02	2.05E-02	5.43E-04	3.91E-03	3.26E-03	3.26E-03	2.71E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Stake Bed	2270002081	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	2270003030	12	0.43	5.16	2	10	18	9.14E-03	4.85E-03	2.59E-04	9.17E-04	7.52E-04	7.52E-04	1.21E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tamper	2260002006	4	0.55	2.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tandem Truck	2270002069	200	0.59	118	1	20	10	3.67E-02	1.59E-02	2.44E-03	4.23E-03	5.87E-03	5.87E-03	1.40E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trackhoe	2265002066	320	0.48	153.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trenching Machines	2270002030	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2270002081	8	0.59	4.72	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water / Fuel Truck	2270002051	250	0.59	147.5	1	30	18	5.92E-02	2.10E-02	7.45E-03	1.20E-02	1.33E-02	1.33E-02	4.71E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welder	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Machine	2270006025	35	0.21	7.35	10	40	12	2.07E-01	2.00E-01	5.79E-03	4.37E-02	2.82E-02	2.82E-02	2.69E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Rig	2270002051	10	0.59	5.9	2	40	12	1.69E-02	5.21E-03	5.51E-04	1.31E-03	1.20E-03	1.20E-03	3.35E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X-Ray Truck/Machine	2270002051	50	0.59	29.5	2	40	15	1.06E-01	3.26E-02	3.44E-03	8.16E-03	7.52E-03	7.52E-03	2.09E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[1] NONROAD2008a Model does not contain Emission Factors for All Terrain Vehicles (ATVs). Used Emission Factors for Personal Watercraft as a substitution.

[2] NONROAD2008a Model does not contain Emission Factors for Bobcat vehicle type. Used Emission Factors for Other Industrial Equipment vehicle type as a substitution.

[3] Load factors as recommended for estimation of emissions using NONROAD emission factors in EPA420-P-04-005 Revised April 2004

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Table 9-B-15. HAP Emissions from Construction Engines, H-316 Pipeline Greene County Construction

Pollutant	2017 Emissions (tpy)	2018 Emissions (tpy)
Acetaldehyde	4.25E-02	5.72E-04
Acrolein	2.41E-03	3.24E-05
Benzene	1.61E-02	2.16E-04
1,3-Butadiene	1.61E-03	2.16E-05
Formaldehyde	9.47E-02	1.27E-03

1. Emissions of HAPs are estimated based on total VOC emissions for the construction year and Table 3.1-3 Air Toxic Fractions of VOC in EPA's guidance document *Final Regulatory Analysis and Control of Emissions from Nonroad Diesel Engines* , EPA420-R-04-007, May 2004.

Pollutant	Fraction of VOC
Acetaldehyde	0.053
Acrolein	0.003
Benzene	0.020
1,3-Butadiene	0.002
Formaldehyde	0.118

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Table 9-B-16. On-Road Engine Emission Factors, H-316 Pipeline Greene County Construction

Pollutant	2017 Emission Factors (grams/mile) LDGV	LDGT	LDDT	COM BUS	HDDV	2018 Emission Factors (grams/mile) LDGV	LDGT	LDDT	COM BUS	HDDV
NO_X	3.41E-01	3.80E-01	4.58E-01	6.99E+00	3.18E+00	3.18E-01	3.57E-01	4.06E-01	6.38E+00	2.71E+00
CO	1.17E+01	1.17E+01	5.13E-01	1.01E+00	5.88E-01	1.16E+01	1.14E+01	4.77E-01	8.85E-01	5.15E-01
SO_2	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02
VOC	3.86E-01	4.56E-01	2.37E-01	3.48E-01	2.43E-01	3.67E-01	4.35E-01	2.12E-01	3.28E-01	2.38E-01
PM_{10}	2.48E-02	2.48E-02	4.65E-02	3.71E-02	8.74E-02	2.47E-02	2.48E-02	4.02E-02	3.71E-02	7.62E-02
$PM_{2.5}$	1.12E-02	1.13E-02	3.12E-02	2.06E-02	5.69E-02	1.12E-02	1.13E-02	2.55E-02	2.06E-02	4.66E-02
CO_2	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.55E+03	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.54E+03
Acetaldehyde	1.34E-03	1.54E-03	2.92E-03	1.05E-02	7.33E-03	1.29E-03	1.47E-03	2.62E-03	9.90E-03	7.19E-03
Acrolein	1.70E-04	2.00E-04	8.30E-04	1.28E-03	8.95E-04	1.65E-04	1.85E-04	7.40E-04	1.21E-03	8.75E-04
Benzene	1.70E-02	1.95E-02	4.75E-03	3.84E-03	2.68E-03	1.63E-02	1.86E-02	4.26E-03	3.61E-03	2.62E-03
1,3-Butadiene	1.90E-03	2.17E-03	2.14E-03	2.23E-03	1.55E-03	1.82E-03	2.07E-03	1.92E-03	2.10E-03	1.52E-03
Formaldehyde	3.48E-03	3.97E-03	9.17E-03	2.85E-02	1.99E-02	3.34E-03	3.79E-03	8.21E-03	2.69E-02	1.95E-02

1. The emission factors were calculated using EPA's Mobile6.2 Vehicle Emission Modeling Software. Emission factors for each calendar year are based on average of Mobile6.2 generated factors for winter and summer of that year.

2. Temperatures for winter were based on average temperatures in January, and the temperatures for summer were based on average temperatures in July. The data was extracted from National Oceanic and Atmospheric Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/datatools/normals) based on data collected from 1981 to 2010 by the Morgantown Hart Field, WV Station (COOP ID 466202).

3. Fuel assumptions included conventional gasoline, with an average RVP limit of 9 psi, and diesel with average sulfur content of 11 ppm.

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Table 9-B-17. On-Road Vehicle Travel, H-316 Pipeline Greene County Construction

	2017				2018			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
Commuter Bus	0	0	0	0	0	0	0	0
Light-Duty Diesel Truck	22	8	310	54,560	22	14.29	260	81,714
Light-Duty Gasoline Truck	22	4	310	27,280	0	0	0	0
Light-Duty Gasoline Vehicle	22	15	310	102,300	0	0	0	0
Heavy Duty Diesel Vehicle	22	8	310	54,560	22	14.3	260	81,714
Fuel Delivery	22	2	310	13,640	0	0	0	0

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Table 9-B-18. On-Road Engine Emissions, H-316 Pipeline Greene County Construction

	2017 Annual Emissions (tpy)					2018 Annual Emissions (tpy)				
Pollutant	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**
NO_X	3.84E-02	1.14E-02	2.75E-02	0.00E+00	2.39E-01	0.00E+00	0.00E+00	3.65E-02	0.00E+00	2.44E-01
CO	1.32E+00	3.53E-01	3.09E-02	0.00E+00	4.42E-02	0.00E+00	0.00E+00	4.30E-02	0.00E+00	4.63E-02
SO_2	7.67E-04	2.65E-04	2.47E-04	0.00E+00	7.97E-04	0.00E+00	0.00E+00	3.69E-04	0.00E+00	9.55E-04
VOC	4.35E-02	1.37E-02	1.42E-02	0.00E+00	1.83E-02	0.00E+00	0.00E+00	1.91E-02	0.00E+00	2.14E-02
PM_{10}	2.80E-03	7.46E-04	2.79E-03	0.00E+00	6.57E-03	0.00E+00	0.00E+00	3.62E-03	0.00E+00	6.86E-03
$PM_{2.5}$	1.26E-03	3.40E-04	1.88E-03	0.00E+00	4.28E-03	0.00E+00	0.00E+00	2.29E-03	0.00E+00	4.20E-03
CO_2	4.15E+01	1.44E+01	3.60E+01	0.00E+00	1.16E+02	0.00E+00	0.00E+00	5.39E+01	0.00E+00	1.39E+02
Acetaldehyde	1.51E-04	4.62E-05	1.76E-04	0.00E+00	5.51E-04	0.00E+00	0.00E+00	2.36E-04	0.00E+00	6.47E-04
Acrolein	1.92E-05	6.01E-06	4.99E-05	0.00E+00	6.73E-05	0.00E+00	0.00E+00	6.67E-05	0.00E+00	7.88E-05
Benzene	1.92E-03	5.86E-04	2.85E-04	0.00E+00	2.01E-04	0.00E+00	0.00E+00	3.83E-04	0.00E+00	2.36E-04
1,3-Butadiene	2.14E-04	6.51E-05	1.29E-04	0.00E+00	1.17E-04	0.00E+00	0.00E+00	1.72E-04	0.00E+00	1.37E-04
Formaldehyde	3.92E-04	1.19E-04	5.51E-04	0.00E+00	1.50E-03	0.00E+00	0.00E+00	7.39E-04	0.00E+00	1.76E-03

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Table 9-B-19. On-Road Vehicle Travel, H-316 Pipeline Greene County Construction

	2017				2018			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
All Terrain Vehicle (ATV)	1	4	310	4	1	4	260	1,040
Dump Trucks	0.5	1	310	155	0.5	4	260	520
Light Duty Trucks	0.75	30	310	6,975	0	0	0	0
Medium Duty Trucks	0.75	30	310	6,975	0	0	0	0
School Bus	0.75	12	310	2,790	0	0	0	0
Water / Fuel Truck	3	2	310	1,860	0	0	0	0

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Table 9-B-20. Emissions from Off-Road Vehicle Travel, H-316 Pipeline Greene County Construction

Vehicle Type	Mean Vehicle Weight (tons)	Emission Factor[1] PM_{10} (lb/VMT)	Emission Factor[1] $PM_{2.5}$ (lb/VMT)	Control Efficiency[2] (%)	2017 Annual Emissions PM_{10} (tpy)	2017 Annual Emissions $PM_{2.5}$ (tpy)	2018 Annual Emissions PM_{10} (tpy)	2018 Annual Emissions $PM_{2.5}$ (tpy)
All Terrain Vehicle (ATV)	0.25	0.23	0.02	75%	0.00012	0.000012	0.03	0.0030
Dump Trucks	20	1.66	0.17	75%	0.032	0.0032	0.11	0.011
Light Duty Trucks	2.5	0.65	0.065	75%	0.57	0.06	0.00	0.000
Medium Duty Trucks	5	0.89	0.089	75%	0.78	0.078	0.00	0.00
School Bus	15	1.46	0.15	75%	0.51	0.051	0.00	0.00
Water / Fuel Truck	20	1.66	0.17	75%	0.39	0.039	0.00	0.00

1. Emission factors calculated in accordance with AP-42 Section 13.2.2:

Unpaved Roads: $E = k(s/12)^a(W/3)^b*[(365-p)/365]$

k Factor (PM_{10}, $PM_{2.5}$) (lb/VMT)	1.5		0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	8.5	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	130			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM_{10}, $PM_{2.5}$)	0.9		0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM_{10}, $PM_{2.5}$)	0.45		0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

2. Assumed average dust control efficiency for road watering from AP-42 Section 13.2.2 and related background documents.

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Table 9-B-21. Fugitive Emissions from Earthmoving, H-316 Pipeline Greene County Construction

On-Site Activity	Emission Factors[1] PM_{10}	$PM_{2.5}$	Units of Measure	Operation[2] 2017	2018	Units of Measure	PM_{10} Emissions (tpy) 2017	2018	$PM_{2.5}$ Emissions (tpy) 2017	2018
Bulldozing	1.03E+00	5.31E-01	lb/hr	1,800	25	hr/yr	9.26E-01	1.29E-02	4.78E-01	6.64E-03
Grading	1.96E+00	2.24E-01	lb/VMT	0.0	0.0	VMT/yr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavating	4.25E-03	2.42E-04	lb/yd^3	32,413	0.0	yd^3	6.88E-02	0.00E+00	3.92E-03	0.00E+00

1. Emissions were calculated using emission factor equations from Table 11.9-1, Compilation of Air Pollutant Emission Factors, USEPA AP-42, Fifth Edition, 10/98.

For bulldozing:

PM_{10} emissions factor (lb/hr) = 0.75 * [1.0 (s)^1.5 / (M)^1.4]

$PM_{2.5}$ emission factor (lb/hr) = 0.105 * [5.7(s)^1.2 / (M)^1.3]

For grading:

PM_{10} emission factor (lb/VMT) = 0.60 * [0.051 (S)^2.0]

$PM_{2.5}$ emission factor (lb/VMT) = 0.031 * [0.040 (S)^2.5]

For Excavating:

PM_{10} Emission factor (lb/yd^3) = 0.75 * [0.0021 (d)^0.7 / (M)^0.3]

$PM_{2.5}$ Emission factor (lb/yd^3) = 0.017 * [0.0021 (d)^1.1 / (M)^0.3]

Where:

s (Silt Content) =	8.5
M (Moisture Content) =	7.9
S (Vehicle Speed) =	8
d (Drop Height) =	10

2. Vehicle miles traveled for grading calculate based on amount of land disturbed during construction each year, as follows:

	2017	2018
Land Disturbed (acres):	0	0
Square Miles:	0.000	0.000
Miles in 1 Direction:	0.000	0.000
Feet in 1 Direction:	0	0
Clearance of Grader (ft):	5	5
Number of Trips for 1 Grade:	0	0
Miles to Clear 1 Direction:	0	0
Miles with 50% Safety Factor:	0.0	0.0
Number of Times to Go Over Surface:	2	2
Total Travel (VMT/yr):	0	0

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Table 9-B-22. Fugitive Emissions from Soil Pile Wind Erosion, H-316 Pipeline Greene County Construction

Material Pile Description	Size (acres)[3]	Emission Control Method	Control Efficiency[4]	Emission Factor[1]			Unit	2017 Emissions (tpy)[5]			2018 Emissions (tpy)[5]		
				PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Redhook Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.039	0.020	0.0030	0.036	0.018	0.0027
Pratt Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	--	--	--	0.032	0.016	0.0024
Compressor Station Total	0.184	Mulch/seeding	75%	--	--	--	--	0.039	0.020	0.0030	0.068	0.034	0.0051
H-316 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.085
H-318 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.085
Pipeline Soil Piles in Allegheny, PA	2.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.97	0.49	0.073	0.81	0.40	0.061
Pipeline Soil Piles in Washington, PA	0.8	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.39	0.20	0.029	0.33	0.16	0.024
H-305 Pipeline Total	0.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.041	0.020	0.0030	0.037	0.018	0.0028
H-158 & M-80 Pipeline Total	0.3	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.14	0.069	0.010	0.13	0.063	0.0095
H-319 Pipeline Total	0.1	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.0023	0.0011	0.000	--	--	--
Pipeline Soil Piles Total	6.29	Mulch/seeding	75%	--	--	--	--	2.92	1.46	0.22	2.43	1.22	0.18
Mobely Tap Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	--	--	--	0.003	0.002	0.000
Webster Interconnect Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.003	0.002	0.000	--	--	--
Interconnect Total	0.147	Mulch/seeding	75%	--	--	--	--	0.003	0.002	0.000	0.003	0.002	0.000
							Total Stockpile Erosion Emissions	**2.96**	**1.48**	**0.22**	**2.51**	**1.25**	**0.19**

[1]USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles). USEPA, 2006 13.2.5 for k factors:

EF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)*(1-% Control Efficiency)

[2]Total PM assumed to be equal to PM < 30 μm

	Redhook	Wetzel, WV
Days of precipitation greater than or equal to 0.01 inch (p)	151	149.8
Time (%) that unobstructed wind speed exceeds 5.4 m/s at mean pile height (f)	17.6	1.8

Silt Content (%), (s)	8.5	
Particle Size multiplier (k)	1	(for PM < 30 μm)
	0.5	(for PM < 10 μm)
	0.075	(for PM < 2.5 μm)

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Table 9-B-22. Fugitive Emissions from Soil Pile Wind Erosion, H-316 Pipeline Greene County Construction

[3]Soil Pile Areas:

Compressor Stations Stockpile Area:	2	stockpiles	
	50	ft. wide	
	40	ft. wide	
	0.092	**acres**	
Pipeline Soil Pile Area:	1	pile per spread	
	4	ft. wide (topsoil)	
	8	ft. wide (subsoil)	
	2	miles long	H-316 - Greene County, PA
	2.9	**acres**	
	2	miles long	H-318 - Allegheny & Washington Counties, PA
	2.9	**acres**	
	0.065	miles long	H-305 - Greene County, PA
	0.1	**acres**	
	0.222	miles long	H-158 & M-80 - Greene County, PA
	0.3	**acres**	
	0.035	miles long	H-319 - Wetzel County, WV
	0.1	**acres**	
Interconnects Stockpile Area:[6]	2	stockpiles	
	0.073	**acres**	

[4]Engineering estimate for control efficiency from use of mulch/seeding to control erosion.

[5]Emissions are based on the construction schedule below:

Start	End	2017 days	2018 days	Location
2/2/2017	10/30/2018	333	303	Redhook Compressor Station
2/2/2018	10/30/2018	--	270	Pratt Compressor Station
1/1/2017	10/30/2018	365	303	H-316 Pipeline
1/1/2017	10/30/2018	365	303	H-318 Pipeline
2/2/2017	10/30/2018	333	303	H-305 Pipeline
2/2/2017	10/30/2018	333	303	H-158 & M-80 Pipeline
2/2/2017	12/30/2017	331	--	H-319 Pipeline
2/2/2018	12/30/2018	--	331	Mobely Tap
2/2/2017	12/30/2017	331	--	Webster Interconnect

[6]Interconnects stockpiles are 20% smaller in size at interconnects than at compressor stations per conversation with Trever Leamon on 9/4/2015

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Table 9-B-23. Criteria Pollutant Emissions Summary, Webster Interconnect Construction

Source	2017 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	4.49	8.07	0.28	0.78	0.57	0.57	1,602.91
On-Road Vehicle Travel	0.023	0.16	0.00016	0.0073	0.0010	0.00058	15.62
Off-Road Vehicle Travel	--	--	--	--	0.87	0.087	--
Earthmoving Fugitives	--	--	--	--	1.08	0.56	--
Pile Erosion	--	--	--	--	0.0028	0.00042	--
TOTAL:	**4.52**	**8.22**	**0.28**	**0.79**	**2.53**	**1.22**	**1,618.53**

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Table 9-B-24. HAP Emission Summary, Webster Interconnect Construction

Source	2017 Construction Emissions (tpy)					
	Acetaldehyde	**Acrolein**	**Benzene**	**1,3-Butadiene**	**Formaldehyde**	**Total HAPs**
Construction Equipment Engines	4.14E-02	2.34E-03	1.56E-02	1.56E-03	9.21E-02	1.53E-01
On-Road Vehicle Travel	6.86E-05	1.05E-05	2.57E-04	4.21E-05	1.90E-04	5.67E-04
Off-Road Vehicle Travel	--	--	--	--	--	--
Earthmoving Fugitives	--	--	--	--	--	--
Pile Erosion	--	--	--	--	--	--
TOTAL:	**4.14E-02**	**2.35E-03**	**1.59E-02**	**1.60E-03**	**9.23E-02**	**1.54E-01**

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Table 9-B-25. Emissions from Construction Engines, Webster Interconnect Construction

					2017 Construction Year										2018 Construction Year									
		Max. Engine Rating		Average Engine Load		Operations		Emissions (tpy)								Operations		Emissions (tpy)						
Equipment Type	SCC	(hp)	Load Factor[3]	(hp)	Quantity	(hr/week)	(weeks/yr)	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	Quantity	(hr/week)	(weeks/yr)	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Air Compressor A	2270006015	310	0.43	133.3	2	15	10	9.04E-02	1.98E-02	4.27E-03	8.18E-03	7.08E-03	7.08E-03	2.34E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Air Compressor B	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	2282005015	18	0.21	3.78	1	5	35	4.97E-03	1.17E-01	1.94E-04	1.04E-02	1.18E-04	1.18E-04	9.42E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Asphalt Paver	2270002003	153	0.59	90.27	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Backhoe	2265002066	75	0.48	36	2	25	40	1.02E-01	1.05E+00	1.14E-02	3.11E-02	5.53E-03	5.53E-03	5.55E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bobcat[2]	2265003040	150	0.54	81	2	25	40	3.01E-01	3.38E+00	2.58E-02	1.03E-01	1.27E-02	1.27E-02	1.25E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Booster/Pumps	2270006010	370	0.43	159.1	1	4	1	2.57E-03	6.99E-04	7.23E-05	2.14E-04	1.73E-04	1.73E-04	3.72E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bucket Truck	2270002051	300	0.59	177	1	12	2	2.97E-03	7.64E-04	3.92E-04	6.30E-04	6.37E-04	6.37E-04	2.51E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chain Saw	2260004020	3	0.7	2.1	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	2270002081	160	0.59	94.4	1	20	2	1.06E-02	9.76E-03	4.63E-04	1.05E-03	1.58E-03	1.58E-03	2.48E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chipper/Shredder	2270004066	20	0.43	8.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor	2270002009	300	0.43	129	1	10	2	1.31E-02	6.93E-03	3.60E-04	1.40E-03	1.06E-03	1.06E-03	1.67E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor, Vibratory	2270002009	100	0.43	43	1	10	4	8.73E-03	4.62E-03	2.40E-04	9.32E-04	7.07E-04	7.07E-04	1.12E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Mixer Truck (main pours)	2270002042	150	0.43	64.5	3	35	6	1.88E-01	9.85E-02	5.22E-03	2.00E-02	1.91E-02	1.91E-02	2.64E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Mixer Truck (small pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	2270006010	300	0.43	129	1	4	1	1.04E-03	2.83E-04	2.93E-05	8.68E-05	7.03E-05	7.03E-05	1.51E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Crawler	2270002069	450	0.59	265.5	1	10	1	1.87E-03	6.15E-04	1.33E-04	2.24E-04	2.47E-04	2.47E-04	7.85E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (20 ton)	2270002045	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	2270002045	715	0.43	307.45	1	10	1	4.38E-03	1.13E-03	1.69E-04	2.99E-04	2.81E-04	2.81E-04	8.99E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) B	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	2270002081	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	2270002033	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	2270002069	410	0.59	241.9	2	35	30	7.16E-01	2.35E-01	5.09E-02	8.58E-02	9.44E-02	9.44E-02	3.00E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drill Engine	2270002081	25	0.59	14.75	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	2270002033	950	0.43	408.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	2270002078	325	0.21	68.25	2	15	15	1.52E-01	8.75E-02	4.18E-03	2.29E-02	1.88E-02	1.88E-02	2.11E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavator	2270002036	138	0.59	81.42	3	30	40	4.59E-01	4.49E-01	3.28E-02	5.16E-02	8.78E-02	8.78E-02	1.92E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fork Lift	2270003020	120	0.59	70.8	1	25	40	5.70E-02	4.87E-02	7.33E-03	1.06E-02	1.36E-02	1.36E-02	4.65E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Front End Loaders	2270002066	196	0.21	41.16	1	25	20	8.30E-02	4.84E-02	2.75E-03	1.27E-02	1.11E-02	1.11E-02	1.42E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Generators	2270006005	430	0.43	184.9	2	8	40	4.76E-01	1.28E-01	1.34E-02	3.97E-02	3.13E-02	3.13E-02	6.91E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Grader	2270002048	140	0.59	82.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	2270002033	600	0.43	258	1	50	4	2.22E-01	6.55E-02	5.89E-03	1.50E-02	1.28E-02	1.28E-02	3.02E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	2270002045	340	0.43	146.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	2270002051	100	0.59	59	1	10	1	1.76E-03	5.43E-04	5.74E-05	1.36E-04	1.25E-04	1.25E-04	3.49E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Jack Hammer	2270003040	405	0.43	174.15	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	2270002081	50	0.59	29.5	4	10	20	9.39E-02	2.07E-02	2.71E-03	4.85E-03	5.51E-03	5.51E-03	1.55E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift A	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift B	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	2270002081	400	0.59	236	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	2270002051	250	0.59	147.5	10	12	40	5.27E-01	1.86E-01	6.62E-02	1.07E-01	1.18E-01	1.18E-01	4.19E+02	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pile Driver	2270002081	350	0.59	206.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2270002081	25	0.59	14.75	2	8	40	4.64E-02	2.50E-02	1.33E-03	4.67E-03	3.78E-03	3.78E-03	6.19E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Tractor Trailer	2265002066	400	0.48	192	2	20	10	1.09E-01	1.12E+00	1.22E-02	3.32E-02	5.90E-03	5.90E-03	5.92E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Portable Pipe Bender	2270003040	75	0.43	32.25	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	2265003010	10	0.46	4.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	2270002015	300	0.59	177	2	10	10	6.25E-02	2.12E-02	3.69E-03	6.49E-03	7.21E-03	7.21E-03	2.09E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scissor Lift	2270003010	20	0.21	4.2	1	15	4	1.68E-03	1.88E-03	4.13E-05	4.54E-04	2.67E-04	2.67E-04	1.92E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
School Bus	2270002051	100	0.59	59	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scrapper	2270002018	488	0.59	287.92	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	2270002069	240	0.59	141.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	2270002072	75	0.21	15.75	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Stake Bed	2270002081	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	2270003030	12	0.43	5.16	1	6	40	6.09E-03	3.23E-03	1.73E-04	6.11E-04	5.02E-04	5.02E-04	8.04E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tamper	2260002006	4	0.55	2.2	2	20	15	1.93E-03	4.08E-01	2.07E-04	8.28E-02	1.35E-02	1.35E-02	1.01E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tandem Truck	2270002069	200	0.59	118	2	15	20	1.10E-01	4.78E-02	7.33E-03	1.27E-02	1.76E-02	1.76E-02	4.19E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trackhoe	2265002066	320	0.48	153.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trenching Machines	2270002030	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2270002081	8	0.59	4.72	2	15	6	4.23E-03	1.53E-03	9.60E-05	2.94E-04	2.63E-04	2.63E-04	5.02E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water / Fuel Truck	2270002051	250	0.59	147.5	1	10	40	4.39E-02	1.55E-02	5.52E-03	8.88E-03	9.84E-03	9.84E-03	3.49E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welder	2270006025	35	0.21	7.35	4	50	25	2.16E-01	2.09E-01	6.03E-03	4.55E-02	2.94E-02	2.94E-02	2.80E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Machine	2270006025	35	0.21	7.35	4	50	25	2.16E-01	2.09E-01	6.03E-03	4.55E-02	2.94E-02	2.94E-02	2.80E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Rig	2270002051	10	0.59	5.9	4	50	25	8.82E-02	2.71E-02	2.87E-03	6.80E-03	6.26E-03	6.26E-03	1.74E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X-Ray Truck/Machine	2270002051	50	0.59	29.5	2	20	20	7.06E-02	2.17E-02	2.29E-03	5.44E-03	5.01E-03	5.01E-03	1.39E+01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[1]NONROAD2008a Model does not contain Emission Factors for All Terrain Vehicles (ATVs). Used Emission Factors for Personal Watercraft as a substitution.
[2]NONROAD2008a Model does not contain Emission Factors for Bobcat vehicle type. Used Emission Factors for Other Industrial Equipment vehicle type as a substitution.
[3] Load factors as recommended for estimation of emissions using NONROAD emission factors in EPA420-P-04-005 Revised April 2004

Equitrans Redhook
Table 9-B-26. HAP Emissions from Construction Engines, Webster Interconnect Construction

Pollutant	2017 Emissions (tpy)
Acetaldehyde	4.14E-02
Acrolein	2.34E-03
Benzene	1.56E-02
1,3-Butadiene	1.56E-03
Formaldehyde	9.21E-02

1. Emissions of HAPs are estimated based on total VOC emissions for the construction year and Table 3.1-3 Air Toxic Fractions of VOC in EPA's guidance document *Final Regulatory Analysis and Control of Emissions from Nonroad Diesel Engines* , EPA420-R-04-007, May 2004.

Pollutant	Fraction of VOC
Acetaldehyde	0.053
Acrolein	0.003
Benzene	0.020
1,3-Butadiene	0.002
Formaldehyde	0.118

Equitrans Redhook
Table 9-B-27. On-Road Engine Emission Factors, Webster Interconnect Construction

	2017 Emission Factors (grams/mile)				
Pollutant	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**
NO_X	3.41E-01	3.81E-01	4.58E-01	6.99E+00	3.18E+00
CO	1.18E+01	1.18E+01	5.13E-01	1.01E+00	5.88E-01
SO_2	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02
VOC	3.86E-01	4.57E-01	2.37E-01	3.48E-01	2.43E-01
PM_{10}	2.48E-02	2.48E-02	4.65E-02	3.71E-02	8.74E-02
$PM_{2.5}$	1.12E-02	1.13E-02	3.12E-02	2.06E-02	5.69E-02
CO_2	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.55E+03
Acetaldehyde	1.34E-03	1.54E-03	2.92E-03	1.05E-02	7.33E-03
Acrolein	1.70E-04	2.00E-04	8.30E-04	1.28E-03	8.95E-04
Benzene	1.71E-02	1.96E-02	4.75E-03	3.84E-03	2.68E-03
1,3-Butadiene	1.91E-03	2.18E-03	2.14E-03	2.23E-03	1.55E-03
Formaldehyde	3.50E-03	3.99E-03	9.17E-03	2.85E-02	1.99E-02

1. The emission factors were calculated using EPA's Mobile6.2 Vehicle Emission Modeling Software. Emission factors for each calendar year are based on average of Mobile6.2 generated factors for winter and summer of that year.

2. Temperatures for winter were based on average temperatures in January, and the temperatures for summer were based on average temperatures in July. The data was extracted from National Oceanic and Atmospheric Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/datatools/normals) based on data collected from 1981 to 2010 by the Morgantown Hart Field, WV Station (COOP ID 466202).
3. Fuel assumptions included conventional gasoline, with an average RVP limit of 9 psi, and diesel with average sulfur content of 11 ppm.

Equitrans Redhook
Table 9-B-28. On-Road Vehicle Travel, Webster Interconnect Construction

	2017			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
Commuter Bus	0	0	0	0
Light-Duty Diesel Truck	2	8	240	3,840
Light-Duty Gasoline Truck	2	4	240	1,920
Light-Duty Gasoline Vehicle	2	20	240	9,600
Heavy Duty Diesel Vehicle	2	8	240	3,840
Fuel Delivery	2	2	240	960

Equitrans Redhook

Table 9-B-29. On-Road Engine Emissions, Webster Interconnect Construction

	2017 Annual Emissions (tpy)				
Pollutant	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**
NO_X	3.61E-03	8.05E-04	1.94E-03	0.00E+00	1.68E-02
CO	1.25E-01	2.50E-02	2.17E-03	0.00E+00	3.11E-03
SO_2	7.20E-05	1.86E-05	1.74E-05	0.00E+00	5.61E-05
VOC	4.08E-03	9.66E-04	1.00E-03	0.00E+00	1.29E-03
PM_{10}	2.62E-04	5.25E-05	1.97E-04	0.00E+00	4.62E-04
$PM_{2.5}$	1.19E-04	2.39E-05	1.32E-04	0.00E+00	3.01E-04
CO_2	3.89E+00	1.01E+00	2.53E+00	0.00E+00	8.18E+00
Acetaldehyde	1.42E-05	3.26E-06	1.24E-05	0.00E+00	3.88E-05
Acrolein	1.80E-06	4.23E-07	3.51E-06	0.00E+00	4.74E-06
Benzene	1.81E-04	4.14E-05	2.01E-05	0.00E+00	1.42E-05
1,3-Butadiene	2.02E-05	4.61E-06	9.06E-06	0.00E+00	8.20E-06
Formaldehyde	3.70E-05	8.43E-06	3.88E-05	0.00E+00	1.05E-04

Equitrans Redhook

Table 9-B-30. On-Road Vehicle Travel, Webster Interconnect Construction

	2017			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
All Terrain Vehicle (ATV)	0.75	2	240	360
Dump Trucks	2	2	240	960
Light Duty Trucks	0.5	20	240	2,400
Medium Duty Trucks	0.5	20	240	2,400
School Bus	0	0	0	0
Water / Fuel Truck	2	2	240	960

Equitrans Redhook

Table 9-B-31. Emissions from Off-Road Vehicle Travel, Webster Interconnect Construction

Vehicle Type	Mean Vehicle Weight (tons)	Emission Factor[1] PM_{10} (lb/VMT)	Emission Factor[1] $PM_{2.5}$ (lb/VMT)	Control Efficiency[2] (%)	2017 Annual Emissions PM_{10} (tpy)	2017 Annual Emissions $PM_{2.5}$ (tpy)
All Terrain Vehicle (ATV)	0.25	0.23	0.02	75%	0.01	0.00
Dump Trucks	20	1.66	0.17	75%	0.20	0.02
Light Duty Trucks	2.5	0.65	0.07	75%	0.20	0.02
Medium Duty Trucks	5	0.89	0.09	75%	0.27	0.03
School Bus	15	1.46	0.15	75%	0.00	0.00
Water / Fuel Truck	20	1.66	0.17	75%	0.20	0.02

1. Emission factors calculated in accordance with AP-42 Section 13.2.2:

Unpaved Roads: $E = k(s/12)^a(W/3)^b*[(365-p)/365]$

k Factor (PM_{10}, $PM_{2.5}$) (lb/VMT)	1.5		0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	8.5	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	130			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM_{10}, $PM_{2.5}$)	0.9		0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM_{10}, $PM_{2.5}$)	0.45		0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

2. Assumed average dust control efficiency for road watering from AP-42 Section 13.2.2 and related background documents.

Equitrans Redhook
Table 9-B-32. Fugitive Emissions from Earthmoving, Webster Interconnect Construction

On-Site Activity	Emission Factors[1] PM_{10}	$PM_{2.5}$	Units of Measure	Operation[2] 2017	2018	Units of Measure	PM_{10} Emissions (tpy) 2017	2018	$PM_{2.5}$ Emissions (tpy) 2017	2018
Bulldozing	1.03E+00	5.31E-01	lb/hr	2100	0	hr/yr	1.08E+00	0.00E+00	5.58E-01	0.00E+00
Grading	1.96E+00	2.24E-01	lb/VMT	0.0	0.0	VMT/yr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavating	4.25E-03	2.42E-04	lb/yd^3	382.4	0.0	yd^3	8.12E-04	0.00E+00	4.62E-05	0.00E+00

1. Emissions were calculated using emission factor equations from Table 11.9-1, Compilation of Air Pollutant Emission Factors, USEPA AP-42, Fifth Edition, 10/98.

For bulldozing:

PM_{10} emissions factor (lb/hr) = 0.75 * [1.0 (s)^1.5 / (M)^1.4]

$PM_{2.5}$ emission factor (lb/hr) = 0.105 * [5.7(s)^1.2 / (M)^1.3]

For grading:

PM_{10} emission factor (lb/VMT) = 0.60 * [0.051 (S)^2.0]

$PM_{2.5}$ emission factor (lb/VMT) = 0.031 * [0.040 (S)^2.5]

For Excavating:

PM_{10} Emission factor (lb/yd^3) = 0.75 * [0.0021 (d)^0.7 / (M)^0.3]

$PM_{2.5}$ Emission factor (lb/yd^3) = 0.017 * [0.0021 (d)^1.1 / (M)^0.3]

Where:

s (Silt Content) =	8.5
M (Moisture Content) =	7.9
S (Vehicle Speed) =	8
d (Drop Height) =	10

2. Vehicle miles traveled for grading calculate based on amount of land disturbed during construction each year, as follows:

	2017	2018
Land Disturbed (acres):	0	0
Square Miles:	0.000	0.000
Miles in 1 Direction:	0.000	0.000
Feet in 1 Direction:	0	0
Clearance of Grader (ft):	5	5
Number of Trips for 1 Grade:	0	0
Miles to Clear 1 Direction:	0	0
Miles with 50% Safety Factor:	0.0	0.0
Number of Times to Go Over Surface:	2	2
Total Travel (VMT/yr):	0	0

Equitrans Redhook

Table 9-B-33. Fugitive Emissions from Soil Pile Wind Erosion, Webster Interconnect Construction

Material Pile Description	Size (acres)[3]	Emission Control Method	Control Efficiency[4]	Emission Factor[1]			Unit	2017 Emissions (tpy)[5]			2018 Emissions (tpy)[5]		
				PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Redhook Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.039	0.020	0.0030	0.036	0.018	0.0027
Pratt Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	--	--	--	0.032	0.016	0.0024
Compressor Station Total	0.184	Mulch/seeding	75%	--	--	--	--	0.039	0.020	0.0030	0.068	0.034	0.0051
H-316 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.085
H-318 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.085
Pipeline Soil Piles in Allegheny, PA	2.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.97	0.49	0.073	0.81	0.40	0.061
Pipeline Soil Piles in Washington, PA	0.8	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.39	0.20	0.029	0.33	0.16	0.024
H-305 Pipeline Total		Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.00	0.000	0.0000	0.000	0.000	0.0000
H-158 & M-80 Pipeline Total	0.3	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.14	0.069	0.010	0.13	0.063	0.0095
H-319 Pipeline Total	0.1	Mulch/seeding	75%	0.27	0.14	0.020	lb/day/acre	0.0023	0.0011	0.0002	--	--	--
Pipeline Soil Piles Total	6.19	Mulch/seeding	75%	--	--	--	--	2.88	1.44	0.22	2.40	1.20	0.18
Mobely Tap Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.020	lb/day/acre	--	--	--	0.0033	0.0016	0.0002
Webster Interconnect Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.020	lb/day/acre	0.0033	0.0016	0.000	--	--	--
Interconnect Total	0.147	Mulch/seeding	75%	--	--	--	--	0.0033	0.0016	0.000	0.0033	0.0016	0.0002
							Total Stockpile Erosion Emissions	**2.92**	**1.46**	**0.22**	**2.47**	**1.23**	**0.19**

[1]USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles). USEPA, 2006 13.2.5 for k factors:

EF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)*(1-% Control Efficiency)

[2]Total PM assumed to be equal to PM < 30 µm

	Redhook	Wetzel, WV
Days of precipitation greater than or equal to 0.01 inch (p)	151	149.8
Time (%) that unobstructed wind speed exceeds 5.4 m/s at mean pile height (f)	17.6	1.8

Silt Content (%), (s)	8.5	
Particle Size multiplier (k)	1	(for PM < 30 µm)
	0.5	(for PM < 10 µm)
	0.075	(for PM < 2.5 µm)

Equitrans Redhook
Table 9-B-33. Fugitive Emissions from Soil Pile Wind Erosion, Webster Interconnect Construction

[3]Soil Pile Areas:

	2	stockpiles	
Compressor Stations Stockpile Area:	50	ft. wide	
	40	ft. wide	
	0.092	**acres**	
	1	pile per spread	
	4	ft. wide (topsoil)	
	8	ft. wide (subsoil)	
	2	miles long	H-316 - Greene County, PA
	2.9	**acres**	
	2	miles long	H-318 - Allegheny & Washington Counties, PA
Pipeline Soil Pile Area:	**2.9**	**acres**	
	0.065	miles long	H-305 - Greene County, PA
	0.1	**acres**	
	0.222	miles long	H-158 & M-80 - Greene County, PA
	0.3	**acres**	
	0.035	miles long	H-319 - Wetzel County, WV
	0.1	**acres**	
Interconnects Stockpile Area:[6]	2	stockpiles	
	0.073	**acres**	

[4]Engineering estimate for control efficiency from use of mulch/seeding to control erosion.

[5]Emissions are based on the construction schedule below:

Start	End	2017 days	2018 days	Location
2/2/2017	10/30/2018	333	303	Redhook Compressor Station
2/2/2018	10/30/2018	--	270	Pratt Compressor Station
1/1/2017	10/30/2018	365	303	H-316 Pipeline
1/1/2017	10/30/2018	365	303	H-318 Pipeline
2/2/2017	10/30/2018	333	303	H-305 Pipeline
2/2/2017	10/30/2018	333	303	H-158 & M-80 Pipeline
2/2/2017	12/30/2017	331	--	H-319 Pipeline
2/2/2018	12/30/2018	--	331	Mobely Tap
2/2/2017	12/30/2017	331	--	Webster Interconnect

[6]Interconnects stockpiles are 20% smaller in size at interconnects than at compressor stations per conversation with Trever Leamon on 9/4/2015

Equitrans Redhook
Table 9-B-34. Criteria Pollutant Emissions Summary, Mobley Tap Construction

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.87	12.12	0.76	1.74	1.48	1.48	4,450.29
On-Road Vehicle Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.00	0.01	0.00	0.00	16.39
Off-Road Vehicle Travel	--	--	--	--	0.00	0.00	--	--	--	--	--	3.91	0.39	--
Earthmoving Fugitives	--	--	--	--	0.00	0.00	--	--	--	--	--	2.47	1.28	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00	--
TOTAL:	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.89**	**12.31**	**0.76**	**1.75**	**7.86**	**3.15**	**4,466.68**

Equitrans Redhook
Table 9-B-35. HAP Emission Summary, Mobley Tap Construction

Source	2017 Construction Emissions (tpy)						2018 Construction Emissions (tpy)					
	Acetaldehyde	**Acrolein**	**Benzene**	**1,3-Butadiene**	**Formaldehyde**	**Total HAPs**	**Acetaldehyde**	**Acrolein**	**Benzene**	**1,3-Butadiene**	**Formaldehyde**	**Total HAPs**
Construction Equipment Engines	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.21E-02	5.21E-03	3.48E-02	3.48E-03	2.05E-01	3.41E-01
On-Road Vehicle Travel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.83E-05	9.42E-06	2.93E-04	4.30E-05	1.85E-04	6.00E-04
Off-Road Vehicle Travel	--	--	--	--	--	--	--	--	--	--	--	--
Earthmoving Fugitives	--	--	--	--	--	--	--	--	--	--	--	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL:	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**9.22E-02**	**5.22E-03**	**3.50E-02**	**3.52E-03**	**2.05E-01**	**3.41E-01**

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Table 9-B-36. Emissions from Construction Engines, Mobely Tap Construction

Equipment Type	SCC	Max. Engine Rating (hp)	Load Factor[3]	Average Engine Load (hp)	2017 Construction Year Operations Quantity	(hr/week)	(weeks/yr)	2017 Emissions (tpy) NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Air Compressor A	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Air Compressor B	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	2282005015	18	0.21	3.78	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Asphalt Paver	2270002003	153	0.59	90.27	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Backhoe	2265002066	75	0.48	36	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bobcat[2]	2265003040	150	0.54	81	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Booster/Pumps	2270006010	370	0.43	159.1	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bucket Truck	2270002051	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chain Saw	2260004020	3	0.7	2.1	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	2270002081	160	0.59	94.4	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chipper/Shredder	2270004066	20	0.43	8.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor	2270002009	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor, Vibratory	2270002009	100	0.43	43	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Mixer Truck (main pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Mixer Truck (small pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	2270006010	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Crawler	2270002069	450	0.59	265.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (20 ton)	2270002045	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) B	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	2270002081	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	2270002033	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	2270002069	410	0.59	241.9	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drill Engine	2270002081	25	0.59	14.75	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	2270002033	950	0.43	408.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	2270002078	325	0.21	68.25	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavator	2270002036	138	0.59	81.42	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fork Lift	2270003020	120	0.59	70.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Front End Loaders	2270002066	196	0.21	41.16	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Generators	2270006005	430	0.43	184.9	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Grader	2270002048	140	0.59	82.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	2270002033	600	0.43	258	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	2270002045	340	0.43	146.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	2270002051	100	0.59	59	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Jack Hammer	2270003040	405	0.43	174.15	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	2270002081	50	0.59	29.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift A	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift B	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	2270002081	400	0.59	236	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	2270002051	250	0.59	147.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pile Driver	2270002081	350	0.59	206.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2270002081	25	0.59	14.75	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Tractor Trailer	2265002066	400	0.48	192	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Portable Pipe Bender	2270003040	75	0.43	32.25	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	2265003010	10	0.46	4.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	2270002015	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scissor Lift	2270003010	20	0.21	4.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
School Bus	2270002051	100	0.59	59	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scrapper	2270002018	488	0.59	287.92	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	2270002069	240	0.59	141.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	2270002072	75	0.21	15.75	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Stake Bed	2270002081	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	2270003030	12	0.43	5.16	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tamper	2260002006	4	0.55	2.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tandem Truck	2270002069	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trackhoe	2265002066	320	0.48	153.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trenching Machines	2270002030	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2270002081	8	0.59	4.72	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water / Fuel Truck	2270002051	250	0.59	147.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welder	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Machine	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Rig	2270002051	10	0.59	5.9	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X-Ray Truck/Machine	2270002051	50	0.59	29.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Equipment Type	2018 Construction Year Operations Quantity	(hr/week)	(weeks/yr)	2018 Emissions (tpy) NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Air Compressor A	2	15	15	1.18E-01	2.61E-02	6.27E-03	1.15E-02	1.03E-02	1.03E-02	3.51E+01
Air Compressor B	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	1	5	30	4.17E-03	9.95E-02	1.66E-04	8.26E-03	7.82E-05	7.82E-05	8.05E-01
Asphalt Paver	1	20	1	3.18E-03	3.15E-03	2.06E-04	3.49E-04	5.87E-04	5.87E-04	1.19E+00
Backhoe	2	50	40	1.97E-01	1.98E+00	2.29E-02	5.90E-02	1.11E-02	1.11E-02	1.11E+02
Bobcat[2]	3	25	40	3.94E-01	4.30E+00	3.86E-02	1.29E-01	1.91E-02	1.91E-02	1.87E+02
Booster/Pumps	1	5	12	3.57E-02	9.51E-03	1.07E-03	3.02E-03	2.48E-03	2.48E-03	5.58E+00
Bucket Truck	1	15	2	2.61E-03	8.11E-04	4.86E-04	7.80E-04	7.78E-04	7.78E-04	3.14E+00
Chain Saw	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	1	20	40	1.87E-01	1.75E-01	9.05E-03	1.92E-02	2.93E-02	2.93E-02	4.96E+01
Chipper/Shredder	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor	3	25	25	1.22E+00	6.42E-01	3.38E-02	1.28E-01	9.78E-02	9.78E-02	1.57E+02
Compactor, Vibratory	1	25	10	5.41E-02	2.85E-02	1.50E-03	5.67E-03	4.35E-03	4.35E-03	6.98E+00
Concrete Mixer Truck (main pours)	5	40	6	3.35E-01	1.76E-01	9.81E-03	3.58E-02	3.45E-02	3.45E-02	5.03E+01
Concrete Mixer Truck (small pours)	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	1	30	3	4.34E-02	1.16E-02	1.30E-03	3.68E-03	3.02E-03	3.02E-03	6.78E+00
Crane, Crawler	1	30	15	1.37E-01	4.27E-02	1.16E-02	1.93E-02	2.06E-02	2.06E-02	7.06E+01
Crane, Wheeled (20 ton)	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	1	30	15	3.53E-01	9.19E-02	1.49E-02	2.59E-02	2.45E-02	2.45E-02	8.09E+01
Crane, Wheeled (250 ton) B	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	3	40	40	1.33E+00	4.15E-01	1.13E-01	1.87E-01	2.00E-01	2.00E-01	6.87E+02
Drill Engine	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	3	40	15	5.64E-01	3.23E-01	1.65E-02	8.55E-02	7.14E-02	7.14E-02	8.46E+01
Excavator	3	50	40	5.91E-01	5.59E-01	5.28E-02	8.05E-02	1.22E-01	1.22E-01	3.21E+02
Fork Lift	2	50	40	1.52E-01	1.59E-01	2.90E-02	4.19E-02	4.97E-02	4.97E-02	1.86E+02
Front End Loaders	2	50	20	3.04E-01	1.78E-01	1.08E-02	4.71E-02	4.21E-02	4.21E-02	5.67E+01
Generators	4	20	40	2.21E+00	5.83E-01	6.64E-02	1.87E-01	1.49E-01	1.49E-01	3.46E+02
Grader	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	1	10	3	5.02E-03	1.37E-03	1.67E-04	3.87E-04	3.60E-04	3.60E-04	1.05E+00
Jack Hammer	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	4	10	20	8.91E-02	1.62E-02	2.61E-03	4.40E-03	5.04E-03	5.04E-03	1.55E+01
Man Lift A	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Man Lift B	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	10	50	40	1.53E+00	6.25E-01	2.72E-01	4.37E-01	4.60E-01	4.60E-01	1.74E+03
Pile Driver	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2	40	40	2.32E-01	1.24E-01	6.66E-03	2.33E-02	1.89E-02	1.89E-02	3.09E+01
Pipe Tractor Trailer	2	15	10	7.88E-02	7.94E-01	9.15E-03	2.36E-02	4.42E-03	4.42E-03	4.44E+01
Portable Pipe Bender	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	1	20	4	2.12E-02	7.15E-03	1.44E-03	2.48E-03	2.72E-03	2.72E-03	8.37E+00
Scissor Lift	1	15	4	1.64E-03	1.77E-03	4.13E-05	4.25E-04	2.52E-04	2.52E-04	1.92E-01
School Bus	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Scrapper	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Stake Bed	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	1	6	38	5.79E-03	3.07E-03	1.64E-04	5.80E-04	4.78E-04	4.78E-04	7.64E-01
Tamper	2	20	10	1.28E-03	2.72E-01	1.38E-04	5.52E-02	8.99E-03	8.99E-03	6.75E-01
Tandem Truck	2	10	25	7.51E-02	3.20E-02	5.92E-03	1.00E-02	1.32E-02	1.32E-02	3.49E+01
Trackhoe	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trenching Machines	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2	15	3	2.01E-03	6.82E-04	4.72E-05	1.37E-04	1.24E-04	1.24E-04	2.51E-01
Water / Fuel Truck	1	10	40	3.07E-02	1.25E-02	5.45E-03	8.74E-03	9.19E-03	9.19E-03	3.49E+01
Welder	4	50	25	2.09E-01	1.91E-01	6.04E-03	4.09E-02	2.68E-02	2.68E-02	2.81E+01
Welding Machine	4	50	25	2.09E-01	1.91E-01	6.04E-03	4.09E-02	2.68E-02	2.68E-02	2.81E+01
Welding Rig	4	50	25	8.36E-02	2.29E-02	2.78E-03	6.45E-03	6.01E-03	6.01E-03	1.74E+01
X-Ray Truck/Machine	2	20	20	6.69E-02	1.83E-02	2.23E-03	5.16E-03	4.81E-03	4.81E-03	1.39E+01

[1] NONROAD2008a Model does not contain Emission Factors for All Terrain Vehicles (ATVs). Used Emission Factors for Personal Watercraft as a substitution.
[2] NONROAD2008a Model does not contain Emission Factors for Bobcat vehicle type. Used Emission Factors for Other Industrial Equipment vehicle type as a substitution.
[3] Load factors as recommended for estimation of emissions using NONROAD emission factors in EPA420-P-04-005 Revised April 2004

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Table 9-B-37. HAP Emissions from Construction Engines, Mobley Tap Construction

Pollutant	2017 Emissions (tpy)	2018 Emissions (tpy)
Acetaldehyde	0.00E+00	9.21E-02
Acrolein	0.00E+00	5.21E-03
Benzene	0.00E+00	3.48E-02
1,3-Butadiene	0.00E+00	3.48E-03
Formaldehyde	0.00E+00	2.05E-01

1. Emissions of HAPs are estimated based on total VOC emissions for the construction year and Table 3.1-3 Air Toxic Fractions of VOC in EPA's guidance document *Final Regulatory Analysis and Control of Emissions from Nonroad Diesel Engines* , EPA420-R-04-007, May 2004.

Pollutant	Fraction of VOC
Acetaldehyde	0.053
Acrolein	0.003
Benzene	0.020
1,3-Butadiene	0.002
Formaldehyde	0.118

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Table 9-B-38. On-Road Engine Emission Factors, Mobley Tap Construction

Pollutant	2017 Emission Factors (grams/mile) LDGV	LDGT	LDDT	COM BUS	HDDV	2018 Emission Factors (grams/mile) LDGV	LDGT	LDDT	COM BUS	HDDV
NO_X	3.41E-01	3.81E-01	4.58E-01	6.99E+00	3.18E+00	3.18E-01	3.58E-01	4.06E-01	6.38E+00	2.71E+00
CO	1.18E+01	1.18E+01	5.13E-01	1.01E+00	5.88E-01	1.16E+01	1.14E+01	4.77E-01	8.85E-01	5.15E-01
SO_2	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02
VOC	3.86E-01	4.57E-01	2.37E-01	3.48E-01	2.43E-01	3.68E-01	4.35E-01	2.12E-01	3.28E-01	2.38E-01
PM_{10}	2.48E-02	2.48E-02	4.65E-02	3.71E-02	8.74E-02	2.47E-02	2.48E-02	4.02E-02	3.71E-02	7.62E-02
$PM_{2.5}$	1.12E-02	1.13E-02	3.12E-02	2.06E-02	5.69E-02	1.12E-02	1.13E-02	2.55E-02	2.06E-02	4.66E-02
CO_2	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.55E+03	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.54E+03
Acetaldehyde	1.34E-03	1.54E-03	2.92E-03	1.05E-02	7.33E-03	1.29E-03	1.47E-03	2.62E-03	9.90E-03	7.19E-03
Acrolein	1.70E-04	2.00E-04	8.30E-04	1.28E-03	8.95E-04	1.65E-04	1.90E-04	7.40E-04	1.21E-03	8.75E-04
Benzene	1.71E-02	1.96E-02	4.75E-03	3.84E-03	2.68E-03	1.64E-02	1.87E-02	4.26E-03	3.61E-03	2.62E-03
1,3-Butadiene	1.91E-03	2.18E-03	2.14E-03	2.23E-03	1.55E-03	1.83E-03	2.08E-03	1.92E-03	2.10E-03	1.52E-03
Formaldehyde	3.50E-03	3.99E-03	9.17E-03	2.85E-02	1.99E-02	3.35E-03	3.81E-03	8.21E-03	2.69E-02	1.95E-02

1. The emission factors were calculated using EPA's Mobile6.2 Vehicle Emission Modeling Software. Emission factors for each calendar year are based on average of Mobile6.2 generated factors for winter and summer of that year.

2. Temperatures for winter were based on average temperatures in January, and the temperatures for summer were based on average temperatures in July. The data was extracted from National Oceanic and Atmospheric Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/datatools/normals) based on data collected from 1981 to 2010 by the Morgantown Hart Field, WV Station (COOP ID 466202).

3. Fuel assumptions included conventional gasoline, with an average RVP limit of 9 psi, and diesel with average sulfur content of 11 ppm.

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Table 9-B-39. On-Road Vehicle Travel, Mobley Tap Construction

	2017				2018			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
Commuter Bus	0	0	0	0	0	0	0	0
Light-Duty Diesel Truck	0	0	0	0	2	4	260	2,080
Light-Duty Gasoline Truck	0	0	0	0	2	4	260	2,080
Light-Duty Gasoline Vehicle	0	0	0	0	2	24	260	12,480
Heavy Duty Diesel Vehicle	0	0	0	0	2	8	260	4,160
Fuel Delivery	0	0	0	0	2	2	260	1,040

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Table 9-B-40. On-Road Engine Emissions, Mobley Tap Construction

Pollutant	2017 Annual Emissions (tpy) LDGV	LDGT	LDDT	COM BUS	HDDV	2018 Annual Emissions (tpy) LDGV	LDGT	LDDT	COM BUS	HDDV
NO_X	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.37E-03	8.20E-04	9.30E-04	0.00E+00	1.55E-02
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-01	2.62E-02	1.09E-03	0.00E+00	2.95E-03
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.35E-05	2.02E-05	9.40E-06	0.00E+00	6.08E-05
VOC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.06E-03	9.97E-04	4.86E-04	0.00E+00	1.36E-03
PM_{10}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.40E-04	5.69E-05	9.22E-05	0.00E+00	4.37E-04
$PM_{2.5}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.54E-04	2.59E-05	5.84E-05	0.00E+00	2.67E-04
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.06E+00	1.10E+00	1.37E+00	0.00E+00	8.85E+00
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-05	3.37E-06	6.00E-06	0.00E+00	4.12E-05
Acrolein	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-06	4.36E-07	1.70E-06	0.00E+00	5.02E-06
Benzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-04	4.28E-05	9.76E-06	0.00E+00	1.50E-05
1,3-Butadiene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-05	4.77E-06	4.39E-06	0.00E+00	8.71E-06
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.61E-05	8.72E-06	1.88E-05	0.00E+00	1.12E-04

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Table 9-B-41. On-Road Vehicle Travel, Mobley Tap Construction

	2017				2018			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
All Terrain Vehicle (ATV)	0	0	0	0	2	5	260	2,600
Dump Trucks	0	0	0	0	2	30	260	15,600
Light Duty Trucks	0	0	0	0	0.75	10	260	1,950
Medium Duty Trucks	0	0	0	0	0.75	10	260	1,950
School Bus	0	0	0	0	0	0	0	0
Water / Fuel Truck	0	0	0	0	2	2	260	1,040

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Table 9-B-42. Emissions from Off-Road Vehicle Travel, Mobley Tap Construction

Vehicle Type	Mean Vehicle Weight (tons)	Emission Factor[1] PM_{10} (lb/VMT)	Emission Factor[1] $PM_{2.5}$ (lb/VMT)	Control Efficiency[2] (%)	2017 Annual Emissions PM_{10} (tpy)	2017 Annual Emissions $PM_{2.5}$ (tpy)	2018 Annual Emissions PM_{10} (tpy)	2018 Annual Emissions $PM_{2.5}$ (tpy)
All Terrain Vehicle (ATV)	0.25	0.23	0.02	75%	0.00	0.00	0.08	0.01
Dump Trucks	20	1.66	0.17	75%	0.00	0.00	3.24	0.32
Light Duty Trucks	2.5	0.65	0.07	75%	0.00	0.00	0.16	0.02
Medium Duty Trucks	5	0.89	0.09	75%	0.00	0.00	0.22	0.02
School Bus	15	1.46	0.15	75%	0.00	0.00	0.00	0.00
Water / Fuel Truck	20	1.66	0.17	75%	0.00	0.00	0.22	0.02

1. Emission factors calculated in accordance with AP-42 Section 13.2.2:

Unpaved Roads: $E = k(s/12)^a(W/3)^b*[(365-p)/365]$

k Factor (PM_{10}, $PM_{2.5}$) (lb/VMT)	1.5		0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	8.5	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	130			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM_{10}, $PM_{2.5}$)	0.9		0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM_{10}, $PM_{2.5}$)	0.45		0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

2. Assumed average dust control efficiency for road watering from AP-42 Section 13.2.2 and related background documents.

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Table 9-B-43. Fugitive Emissions from Earthmoving, Mobley Tap Construction

On-Site Activity	Emission Factors[1] PM_{10}	$PM_{2.5}$	Units of Measure	Operation[2] 2017	2018	Units of Measure	PM_{10} Emissions (tpy) 2017	2018	$PM_{2.5}$ Emissions (tpy) 2017	2018
Bulldozing	1.03E+00	5.31E-01	lb/hr	0	4800	hr/yr	0.00E+00	2.47E+00	0.00E+00	1.28E+00
Grading	1.96E+00	2.24E-01	lb/VMT	0.0	0.0	VMT/yr	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Excavating	4.25E-03	2.42E-04	lb/yd^3	0.0	246.4	yd^3	0.00E+00	5.23E-04	0.00E+00	2.98E-05

1. Emissions were calculated using emission factor equations from Table 11.9-1, Compilation of Air Pollutant Emission Factors, USEPA AP-42, Fifth Edition, 10/98.

For bulldozing:

PM_{10} emissions factor (lb/hr) = 0.75 * [1.0 (s)^1.5 / (M)^1.4]

$PM_{2.5}$ emission factor (lb/hr) = 0.105 * [5.7(s)^1.2 / (M)^1.3]

For grading:

PM_{10} emission factor (lb/VMT) = 0.60 * [0.051 (S)^2.0]

$PM_{2.5}$ emission factor (lb/VMT) = 0.031 * [0.040 (S)^2.5]

For Excavating:

PM_{10} Emission factor (lb/yd^3) = 0.75 * [0.0021 (d)^0.7 / (M)^0.3]

$PM_{2.5}$ Emission factor (lb/yd^3) = 0.017 * [0.0021 (d)^1.1 / (M)^0.3]

Where:

s (Silt Content) =	8.5
M (Moisture Content) =	7.9
S (Vehicle Speed) =	8
d (Drop Height) =	10

2. Vehicle miles traveled for grading calculate based on amount of land disturbed during construction each year, as follows:

	2017	2018
Land Disturbed (acres):	0	0
Square Miles:	0.000	0.000
Miles in 1 Direction:	0.000	0.000
Feet in 1 Direction:	0	0
Clearance of Grader (ft):	5	5
Number of Trips for 1 Grade:	0	0
Miles to Clear 1 Direction:	0	0
Miles with 50% Safety Factor:	0.0	0.0
Number of Times to Go Over Surface:	2	2
Total Travel (VMT/yr):	0	0

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Table 9-B-44. Fugitive Emissions from Soil Pile Wind Erosion, Mobley Tap Construction

Material Pile Description	Size (acres)[3]	Emission Control Method	Control Efficiency[4]	Emission Factor[1]			Unit	2017 Emissions (tpy)[5]			2018 Emissions (tpy)[5]		
				PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Redhook Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.04	0.02	0.00	0.04	0.02	0.00
Pratt Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	--	--	--	0.03	0.02	0.00
Compressor Station Total	0.184	Mulch/seeding	75%	--	--	--	--	0.04	0.02	0.00	0.07	0.03	0.01
H-316 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.09
H-318 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.09
Pipeline Soil Piles in Allegheny, PA	2.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.97	0.49	0.07	0.81	0.40	0.06
Pipeline Soil Piles in Washington, PA	0.8	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.39	0.20	0.03	0.33	0.16	0.02
H-305 Pipeline Total	0.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.04	0.02	0.00	0.04	0.02	0.00
H-158 & M-80 Pipeline Total	0.3	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.14	0.07	0.01	0.13	0.06	0.01
H-319 Pipeline Total	0.1	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.002	0.001	0.000	--	--	--
Pipeline Soil Piles Total	6.29	Mulch/seeding	75%	--	--	--	--	2.92	1.46	0.22	2.43	1.22	0.18
Mobely Tap Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	--	--	--	0.003	0.002	0.000
Webster Interconnect Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.003	0.002	0.000	--	--	--
Interconnect Total	0.147	Mulch/seeding	75%	--	--	--	--	0.003	0.002	0.000	0.003	0.002	0.000
Total Stockpile Erosion Emissions								**2.96**	**1.48**	**0.22**	**2.51**	**1.25**	**0.19**

[1]USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles). USEPA, 2006 13.2.5 for k factors:

EF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)*(1-% Control Efficiency)

[2]Total PM assumed to be equal to PM < 30 μm

	Redhook	Wetzel, WV
Days of precipitation greater than or equal to 0.01 inch (p)	151	149.8
Time (%) that unobstructed wind speed exceeds 5.4 m/s at mean pile height (f)	17.6	1.8

Silt Content (%), (s)	8.5	
Particle Size multiplier (k)	1	(for PM < 30 μm)
	0.5	(for PM < 10 μm)
	0.075	(for PM < 2.5 μm)

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Table 9-B-44. Fugitive Emissions from Soil Pile Wind Erosion, Mobley Tap Construction

[3]Soil Pile Areas:

Compressor Stations Stockpile Area:	2	stockpiles	
	50	ft. wide	
	40	ft. wide	
	0.092	**acres**	
Pipeline Soil Pile Area:	1	pile per spread	
	4	ft. wide (topsoil)	
	8	ft. wide (subsoil)	
	2	miles long	H-316 - Greene County, PA
	2.9	**acres**	
	2	miles long	H-318 - Allegheny & Washington Counties, PA
	2.9	**acres**	
	0.065	miles long	H-305 - Greene County, PA
	0.1	**acres**	
	0.222	miles long	H-158 & M-80 - Greene County, PA
	0.3	**acres**	
	0.035	miles long	H-319 - Wetzel County, WV
	0.1	**acres**	
Interconnects Stockpile Area:[6]	2	stockpiles	
	0.073	**acres**	

[4]Engineering estimate for control efficiency from use of mulch/seeding to control erosion.

[5]Emissions are based on the construction schedule below:

Start	End	2017 days	2018 days	Location
2/2/2017	10/30/2018	333	303	Redhook Compressor Station
2/2/2018	10/30/2018	--	270	Pratt Compressor Station
1/1/2017	10/30/2018	365	303	H-316 Pipeline
1/1/2017	10/30/2018	365	303	H-318 Pipeline
2/2/2017	10/30/2018	333	303	H-305 Pipeline
2/2/2017	10/30/2018	333	303	H-158 & M-80 Pipeline
2/2/2017	12/30/2017	331	--	H-319 Pipeline
2/2/2018	12/30/2018	--	331	Mobely Tap
2/2/2017	12/30/2017	331	--	Webster Interconnect

[6]Interconnects stockpiles are 20% smaller in size at interconnects than at compressor stations per conversation with Trever Leamon on 9/4/2015

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Table 9-B-45. Criteria Pollutant Emissions Summary, Redhook Station Construction

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	10.14	17.38	0.50	1.54	1.04	1.04	2,708.70	1.89	3.28	0.11	0.34	0.21	0.21	587.33
On-Road Vehicle Travel	0.15	1.25	0.00	0.06	0.01	0.00	113.61	0.12	1.10	0.00	0.05	0.01	0.00	101.85
Off-Road Vehicle Travel	--	--	--	--	0.73	0.07	--	--	--	--	--	0.66	0.07	--
Earthmoving Fugitives	--	--	--	--	0.74	0.38	--	--	--	--	--	0.16	0.09	--
Pile Erosion	--	--	--	--	0.11	0.02	--	--	--	--	--	0.10	0.01	--
TOTAL:	**10.30**	**18.64**	**0.50**	**1.60**	**2.63**	**1.51**	**2,822.31**	**2.01**	**4.38**	**0.11**	**0.39**	**1.14**	**0.38**	**689.18**

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Table 9-B-46. HAP Emission Summary, Redhook Station Construction

Source	2017 Construction Emissions (tpy)						2018 Construction Emissions (tpy)					
	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs
Construction Equipment Engines	8.14E-02	4.61E-03	3.07E-02	3.07E-03	1.81E-01	3.01E-01	1.79E-02	1.01E-03	6.75E-03	6.75E-04	3.99E-02	6.62E-02
On-Road Vehicle Travel	4.84E-04	7.83E-05	2.14E-03	3.39E-04	1.35E-03	4.39E-03	4.14E-04	6.57E-05	1.83E-03	2.87E-04	1.15E-03	3.74E-03
Off-Road Vehicle Travel	--	--	--	--	--	--	--	--	--	--	--	--
Earthmoving Fugitives	--	--	--	--	--	--	--	--	--	--	--	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL:	**8.19E-02**	**4.69E-03**	**3.29E-02**	**3.41E-03**	**1.83E-01**	**3.05E-01**	**1.83E-02**	**1.08E-03**	**8.58E-03**	**9.63E-04**	**4.10E-02**	**6.99E-02**

Table 9-B-47. Emissions from Construction Engines, Redhook Station Construction

					2017 Construction Year										2018 Construction Year									
					Operations			Emissions (tpy)							Operations			Emissions (tpy)						
Equipment Type	SCC	Max. Engine Rating (hp)	Load Factor[3]	Average Engine Load (hp)	Quantity	(hr/week)	(weeks/yr)	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	Quantity	(hr/week)	(weeks/yr)	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Air Compressor A	2270006015	310	0.43	133.3	2	20	20	2.41E-01	5.27E-02	1.14E-02	2.18E-02	1.89E-02	1.89E-02	6.24E+01	2	15	5	3.93E-02	8.71E-03	2.09E-03	3.85E-03	3.44E-03	3.44E-03	1.17E+01
Air Compressor B	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	2282005015	18	0.21	3.78	2	4	35	7.95E-03	1.87E-01	3.10E-04	1.67E-02	1.88E-04	1.88E-04	1.51E+00	2	4	10	2.23E-03	5.31E-02	8.84E-05	4.40E-03	4.17E-05	4.17E-05	4.29E-01
Asphalt Paver	2270002003	153	0.59	90.27	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Backhoe	2265002066	75	0.48	36	2	25	40	1.02E-01	1.05E+00	1.14E-02	3.11E-02	5.53E-03	5.53E-03	5.55E+01	2	30	7	2.06E-02	2.09E-01	2.40E-03	6.19E-03	1.16E-03	1.16E-03	1.17E+01
Bobcat[2]	2265003040	150	0.54	81	3	28	40	5.04E-01	5.69E+00	4.34E-02	1.73E-01	2.14E-02	2.14E-02	2.11E+02	3	30	7	8.24E-02	9.02E-01	8.11E-03	2.70E-02	4.01E-03	4.01E-03	3.94E+01
Booster/Pumps	2270006010	370	0.43	159.1	1	4	10	2.57E-02	6.99E-03	7.23E-04	2.14E-03	1.73E-03	1.73E-03	3.72E+00	1	5	2	5.95E-03	1.59E-03	1.78E-04	5.04E-04	4.13E-04	4.13E-04	9.30E-01
Bucket Truck	2270002051	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chain Saw	2260004020	3	0.7	2.1	4	40	3	2.29E-03	2.61E-01	2.42E-04	4.61E-02	8.18E-03	8.18E-03	1.18E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	2270002081	160	0.59	94.4	1	20	30	1.59E-01	1.46E-01	6.94E-03	1.58E-02	2.37E-02	2.37E-02	3.72E+01	1	20	4	1.87E-02	1.75E-02	9.05E-04	1.92E-03	2.93E-03	2.93E-03	4.96E+00
Chipper/Shredder	2270004066	20	0.43	8.6	1	20	3	2.86E-03	7.28E-04	5.83E-05	2.02E-04	1.44E-04	1.44E-04	3.01E-01	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor	2270002009	300	0.43	129	3	25	28	1.38E+00	7.28E-01	3.78E-02	1.47E-01	1.11E-01	1.11E-01	1.76E+02	3	25	4	1.95E-01	1.03E-01	5.40E-03	2.04E-02	1.56E-02	1.56E-02	2.51E+01
Compactor, Vibratory	2270002009	100	0.43	43	1	28	10	6.11E-02	3.23E-02	1.68E-03	6.53E-03	4.95E-03	4.95E-03	7.81E+00	1	28	5	3.03E-02	1.60E-02	8.41E-04	3.17E-03	2.43E-03	2.43E-03	3.91E+00
Concrete Mixer Truck (main pours)	2270002042	150	0.43	64.5	10	40	12	1.43E+00	7.51E-01	3.98E-02	1.53E-01	1.45E-01	1.45E-01	2.01E+02	2	30	3	5.02E-02	2.65E-02	1.47E-03	5.38E-03	5.18E-03	5.18E-03	7.54E+00
Concrete Mixer Truck (small pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	2270006010	300	0.43	129	1	40	8	1.67E-01	4.53E-02	4.69E-03	1.39E-02	1.12E-02	1.12E-02	2.41E+01	1	10	1	4.83E-03	1.29E-03	1.45E-04	4.09E-04	3.35E-04	3.35E-04	7.54E-01
Crane, Crawler	2270002069	450	0.59	265.5	1	25	17	1.59E-01	5.22E-02	1.13E-02	1.91E-02	2.10E-02	2.10E-02	6.67E+01	1	30	5	4.55E-02	1.42E-02	3.88E-03	6.42E-03	6.87E-03	6.87E-03	2.35E+01
Crane, Wheeled (20 ton)	2270002045	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	2270002045	715	0.43	307.45	1	25	25	5.47E-01	1.41E-01	2.11E-02	3.74E-02	3.51E-02	3.51E-02	1.12E+02	1	30	5	1.18E-01	3.06E-02	4.98E-03	8.63E-03	8.18E-03	8.18E-03	2.70E+01
Crane, Wheeled (250 ton) B	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	2270002081	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	2270002033	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	2270002069	410	0.59	241.9	3	40	12	4.91E-01	1.61E-01	3.49E-02	5.89E-02	6.47E-02	6.47E-02	2.06E+02	2	40	4	8.85E-02	2.77E-02	7.53E-03	1.25E-02	1.33E-02	1.33E-02	4.58E+01
Drill Engine	2270002081	20	0.59	11.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	2270002033	950	0.43	408.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	2270002078	325	0.21	68.25	3	20	22	4.45E-01	2.57E-01	1.23E-02	6.72E-02	5.52E-02	5.52E-02	6.20E+01	4	30	5	1.88E-01	1.08E-01	5.50E-03	2.85E-02	2.38E-02	2.38E-02	2.82E+01
Excavator	2270002036	138	0.59	81.42	2	30	40	3.06E-01	2.99E-01	2.19E-02	3.44E-02	5.85E-02	5.85E-02	1.28E+02	2	30	7	4.14E-02	3.91E-02	3.70E-03	5.63E-03	8.54E-03	8.54E-03	2.25E+01
Fork Lift	2270003020	120	0.59	70.8	4	30	40	2.73E-01	2.34E-01	3.52E-02	5.11E-02	6.54E-02	6.54E-02	2.23E+02	4	30	10	4.55E-02	4.77E-02	8.70E-03	1.26E-02	1.49E-02	1.49E-02	5.58E+01
Front End Loaders	2270002066	196	0.21	41.16	1	25	30	1.24E-01	7.26E-02	4.13E-03	1.91E-02	1.67E-02	1.67E-02	2.13E+01	1	20	10	3.04E-02	1.78E-02	1.08E-03	4.71E-03	4.21E-03	4.21E-03	5.67E+00
Generators	2270006005	430	0.43	184.9	4	15	40	1.79E+00	4.81E-01	5.04E-02	1.49E-01	1.17E-01	1.17E-01	2.59E+02	4	15	10	4.14E-01	1.09E-01	1.24E-02	3.50E-02	2.80E-02	2.80E-02	6.48E+01
Grader	2270002048	140	0.59	82.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	2270002033	600	0.43	258	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	2270002045	340	0.43	146.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	2270002051	100	0.59	59	1	10	5	8.82E-03	2.71E-03	2.87E-04	6.80E-04	6.26E-04	6.26E-04	1.74E+00	1	10	3	5.02E-03	1.37E-03	1.67E-04	3.87E-04	3.60E-04	3.60E-04	1.05E+00
Jack Hammer	2270003040	405	0.43	174.15	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	2270002081	50	0.59	29.5	4	10	20	9.39E-02	2.07E-02	2.71E-03	4.85E-03	5.51E-03	5.51E-03	1.55E+01	4	10	10	4.46E-02	8.11E-03	1.31E-03	2.20E-03	2.52E-03	2.52E-03	7.75E+00
Man Lift A	2270003010	50	0.21	10.5	5	30	28	2.56E-01	2.64E-01	6.73E-03	6.77E-02	4.11E-02	4.11E-02	3.36E+01	5	30	10	8.85E-02	8.72E-02	2.37E-03	2.21E-02	1.38E-02	1.38E-02	1.20E+01
Man Lift B	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	2270002081	400	0.59	236	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	2270002051	250	0.59	147.5	6	15	40	3.95E-01	1.40E-01	4.97E-02	8.00E-02	8.85E-02	8.85E-02	3.14E+02	6	15	10	6.90E-02	2.81E-02	1.23E-02	1.97E-02	2.07E-02	2.07E-02	7.85E+01
Pile Driver	2270002081	350	0.59	206.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2270002081	20	0.59	11.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Tractor Trailer	2265002066	400	0.48	192	1	10	10	2.72E-02	2.79E-01	3.05E-03	8.28E-03	1.47E-03	1.47E-03	1.48E+01	1	15	5	1.97E-02	1.99E-01	2.29E-03	5.90E-03	1.11E-03	1.11E-03	1.11E+01
Portable Pipe Bender	2270003040	75	0.43	32.25	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	2265003010	10	0.46	4.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	2270002015	300	0.59	177	2	20	10	1.25E-01	4.23E-02	7.38E-03	1.30E-02	1.44E-02	1.44E-02	4.19E+01	1	20	4	2.12E-02	7.15E-03	1.44E-03	2.48E-03	2.72E-03	2.72E-03	8.37E+00
Scissor Lift	2270003010	20	0.21	4.2	1	15	4	1.68E-03	1.88E-03	4.13E-05	4.54E-04	2.67E-04	2.67E-04	1.92E-01	1	15	4	1.64E-03	1.77E-03	4.13E-05	4.25E-04	2.52E-04	2.52E-04	1.92E-01
School Bus	2270002051	100	0.59	59	1	6	40	4.23E-02	1.30E-02	1.38E-03	3.26E-03	3.01E-03	3.01E-03	8.37E+00	1	6	25	2.51E-02	6.87E-03	8.35E-04	1.93E-03	1.80E-03	1.80E-03	5.23E+00
Scrapper	2270002018	488	0.59	287.92	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	2270002069	240	0.59	141.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	2270002072	75	0.21	15.75	2	15	26	6.97E-02	7.09E-02	1.88E-03	1.36E-02	1.13E-02	1.13E-02	9.38E+00	2	15	10	2.59E-02	2.55E-02	7.14E-04	4.82E-03	4.08E-03	4.08E-03	3.61E+00
Stake Bed	2270002081	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	2270003030	12	0.43	5.16	1	6	40	6.09E-03	3.23E-03	1.73E-04	6.11E-04	5.02E-04	5.02E-04	8.04E-01	1	6	10	1.52E-03	8.08E-04	4.32E-05	1.53E-04	1.26E-04	1.26E-04	2.01E-01
Tamper	2260002006	4	0.55	2.2	2	20	15	1.93E-03	4.08E-01	2.07E-04	8.28E-02	1.35E-02	1.35E-02	1.01E+00	2	20	10	1.28E-03	2.72E-01	1.38E-04	5.52E-02	8.99E-03	8.99E-03	6.75E-01
Tandem Truck	2270002069	200	0.59	118	2	12	20	8.81E-02	3.82E-02	5.86E-03	1.01E-02	1.41E-02	1.41E-02	3.35E+01	2	10	7	2.10E-02	8.96E-03	1.66E-03	2.81E-03	3.69E-03	3.69E-03	9.77E+00
Trackhoe	2265002066	320	0.48	153.6	2	30	40	5.22E-01	5.36E+00	5.86E-02	1.59E-01	2.83E-02	2.83E-02	2.84E+02	2	30	7	8.81E-02	8.90E-01	1.02E-02	2.64E-02	4.95E-03	4.95E-03	4.97E+01
Trenching Machines	2270002030	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2270002081	8	0.59	4.72	2	15	6	4.23E-03	1.53E-03	9.60E-05	2.94E-04	2.63E-04	2.63E-04	5.02E-01	2	15	1	6.68E-04	2.27E-04	1.57E-05	4.55E-05	4.12E-05	4.12E-05	8.36E-02
Water / Fuel Truck	2270002051	250	0.59	147.5	1	12	40	5.27E-02	1.86E-02	6.62E-03	1.07E-02	1.18E-02	1.18E-02	4.19E+01	1	12	10	9.20E-03	3.75E-03	1.63E-03	2.62E-03	2.76E-03	2.76E-03	1.05E+01
Welder	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Machine	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Rig	2270002051	10	0.59	5.9	8	40	30	1.69E-01	5.21E-02	5.51E-03	1.31E-02	1.20E-02	1.20E-02	3.35E+01	4	40	10	2.68E-02	7.33E-03	8.91E-04	2.06E-03	1.92E-03	1.92E-03	5.58E+00
X-Ray Truck/Machine	2270002051	50	0.59	29.5	2	20	20	7.06E-02	2.17E-02	2.29E-03	5.44E-03	5.01E-03	5.01E-03	1.39E+01	1	20	10	1.67E-02	4.58E-03	5.57E-04	1.29E-03	1.20E-03	1.20E-03	3.49E+00

[1]NONROAD2008a Model does not contain Emission Factors for All Terrain Vehicles (ATVs). Used Emission Factors for Personal Watercraft as a substitution.

[2]NONROAD2008a Model does not contain Emission Factors for Bobcat vehicle type. Used Emission Factors for Other Industrial Equipment vehicle type as a substitution.

[3] Load factors as recommended for estimation of emissions using NONROAD emission factors in EPA420-P-04-005 Revised April 2004

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Table 9-B-48. HAP Emissions from Construction Engines, Redhook Station Construction

Pollutant	2017 Emissions (tpy)	2018 Emissions (tpy)
Acetaldehyde	8.14E-02	1.79E-02
Acrolein	4.61E-03	1.01E-03
Benzene	3.07E-02	6.75E-03
1,3-Butadiene	3.07E-03	6.75E-04
Formaldehyde	1.81E-01	3.99E-02

1. Emissions of HAPs are estimated based on total VOC emissions for the construction year and Table 3.1-3 Air Toxic Fractions of VOC in EPA's guidance document *Final Regulatory Analysis and Control of Emissions from Nonroad Diesel Engines* , EPA420-R-04-007, May 2004.

Pollutant	Fraction of VOC
Acetaldehyde	0.053
Acrolein	0.003
Benzene	0.020
1,3-Butadiene	0.002
Formaldehyde	0.118

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Table 9-B-49. On-Road Engine Emission Factors, Redhook Station Construction

	2017 Emission Factors (grams/mile)					2018 Emission Factors (grams/mile)				
Pollutant	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**
NO_X	3.41E-01	3.80E-01	4.58E-01	6.99E+00	3.18E+00	3.18E-01	3.57E-01	4.06E-01	6.38E+00	2.71E+00
CO	1.17E+01	1.17E+01	5.13E-01	1.01E+00	5.88E-01	1.16E+01	1.14E+01	4.77E-01	8.85E-01	5.15E-01
SO_2	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02
VOC	3.86E-01	4.56E-01	2.37E-01	3.48E-01	2.43E-01	3.67E-01	4.35E-01	2.12E-01	3.28E-01	2.38E-01
PM_{10}	2.48E-02	2.48E-02	4.65E-02	3.71E-02	8.74E-02	2.47E-02	2.48E-02	4.02E-02	3.71E-02	7.62E-02
$PM_{2.5}$	1.12E-02	1.13E-02	3.12E-02	2.06E-02	5.69E-02	1.12E-02	1.13E-02	2.55E-02	2.06E-02	4.66E-02
CO_2	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.55E+03	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.54E+03
Acetaldehyde	1.34E-03	1.54E-03	2.92E-03	1.05E-02	7.33E-03	1.29E-03	1.47E-03	2.62E-03	9.90E-03	7.19E-03
Acrolein	1.70E-04	2.00E-04	8.30E-04	1.28E-03	8.95E-04	1.65E-04	1.85E-04	7.40E-04	1.21E-03	8.75E-04
Benzene	1.70E-02	1.95E-02	4.75E-03	3.84E-03	2.68E-03	1.63E-02	1.86E-02	4.26E-03	3.61E-03	2.62E-03
1,3-Butadiene	1.90E-03	2.17E-03	2.14E-03	2.23E-03	1.55E-03	1.82E-03	2.07E-03	1.92E-03	2.10E-03	1.52E-03
Formaldehyde	3.48E-03	3.97E-03	9.17E-03	2.85E-02	1.99E-02	3.34E-03	3.79E-03	8.21E-03	2.69E-02	1.95E-02

1. The emission factors were calculated using EPA's Mobile6.2 Vehicle Emission Modeling Software. Emission factors for each calendar year are based on average of Mobile6.2 generated factors for winter and summer of that year.

2. Temperatures for winter were based on average temperatures in January, and the temperatures for summer were based on average temperatures in July. The data was extracted from National Oceanic and Atmospheric Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/datatools/normals) based on data collected from 1981 to 2010 by the Morgantown Hart Field, WV Station (COOP ID 466202).

3. Fuel assumptions included conventional gasoline, with an average RVP limit of 9 psi, and diesel with average sulfur content of 11 ppm.

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Table 9-B-50. On-Road Vehicle Travel, Redhook Station Construction

	2017				2018			
Vehicle Type	**Round Trip (miles)**	**Trips per Day**	**Days/Year**	**Total Miles Per Year**	**Round Trip (miles)**	**Trips per Day**	**Days/Year**	**Total Miles Per Year**
Commuter Bus	0	0	0	0	0	0	0	0
Light-Duty Diesel Truck	14	8.571428571	290	34,800	14	8.571428571	260	31,200
Light-Duty Gasoline Truck	14	10.28571429	290	41,760	14	10.28571429	260	37,440
Light-Duty Gasoline Vehicle	14	12.85714286	290	52,200	14	12.85714286	260	46,800
Heavy Duty Diesel Vehicle	14	6.857142857	290	27,840	14	6.857142857	260	24,960
Fuel Delivery	0	0	0	0	0	0	0	0

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Table 9-B-51. On-Road Engine Emissions, Redhook Station Construction

	2017 Annual Emissions (tpy)					2018 Annual Emissions (tpy)				
Pollutant	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**	**LDGV**	**LDGT**	**LDDT**	**COM BUS**	**HDDV**
NO_X	1.96E-02	1.75E-02	1.76E-02	0.00E+00	9.75E-02	1.64E-02	1.47E-02	1.39E-02	0.00E+00	7.46E-02
CO	6.76E-01	5.41E-01	1.97E-02	0.00E+00	1.80E-02	5.96E-01	4.70E-01	1.64E-02	0.00E+00	1.42E-02
SO_2	3.91E-04	4.05E-04	1.57E-04	0.00E+00	3.25E-04	3.51E-04	3.63E-04	1.41E-04	0.00E+00	2.92E-04
VOC	2.22E-02	2.10E-02	9.07E-03	0.00E+00	7.46E-03	1.89E-02	1.79E-02	7.29E-03	0.00E+00	6.55E-03
PM_{10}	1.43E-03	1.14E-03	1.78E-03	0.00E+00	2.68E-03	1.27E-03	1.02E-03	1.38E-03	0.00E+00	2.10E-03
$PM_{2.5}$	6.44E-04	5.20E-04	1.20E-03	0.00E+00	1.75E-03	5.78E-04	4.66E-04	8.75E-04	0.00E+00	1.28E-03
CO_2	2.12E+01	2.21E+01	2.30E+01	0.00E+00	4.74E+01	1.90E+01	1.98E+01	2.06E+01	0.00E+00	4.25E+01
Acetaldehyde	7.68E-05	7.07E-05	1.12E-04	0.00E+00	2.25E-04	6.63E-05	6.05E-05	8.99E-05	0.00E+00	1.98E-04
Acrolein	9.78E-06	9.21E-06	3.18E-05	0.00E+00	2.75E-05	8.51E-06	7.64E-06	2.55E-05	0.00E+00	2.41E-05
Benzene	9.80E-04	8.97E-04	1.82E-04	0.00E+00	8.21E-05	8.43E-04	7.67E-04	1.46E-04	0.00E+00	7.21E-05
1,3-Butadiene	1.09E-04	9.97E-05	8.21E-05	0.00E+00	4.76E-05	9.39E-05	8.54E-05	6.59E-05	0.00E+00	4.18E-05
Formaldehyde	2.00E-04	1.83E-04	3.52E-04	0.00E+00	6.11E-04	1.72E-04	1.56E-04	2.82E-04	0.00E+00	5.37E-04

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Table 9-B-52. On-Road Vehicle Travel, Redhook Station Construction

Vehicle Type	2017 Round Trip (miles)	2017 Trips per Day	2017 Days/Year	2017 Total Miles Per Year	2018 Round Trip (miles)	2018 Trips per Day	2018 Days/Year	2018 Total Miles Per Year
All Terrain Vehicle (ATV)	0.5	8	290	1,160	0.5	8	260	1,040
Dump Trucks	0.5	10	290	1,450	0.5	10	260	1,300
Light Duty Trucks	0.5	5	290	725	0.5	5	260	650
Medium Duty Trucks	0.5	4	290	580	0.5	4	260	520
School Bus	2	2	290	1,160	2	2	260	1,040
Water / Fuel Truck	1	1	290	290	1	1	260	260

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Table 9-B-53. Emissions from Off-Road Vehicle Travel, Redhook Station Construction

Vehicle Type	Mean Vehicle Weight (tons)	Emission Factor[1] PM_{10} (lb/VMT)	Emission Factor[1] $PM_{2.5}$ (lb/VMT)	Control Efficiency[2] (%)	2017 Annual Emissions PM_{10} (tpy)	2017 Annual Emissions $PM_{2.5}$ (tpy)	2018 Annual Emissions PM_{10} (tpy)	2018 Annual Emissions $PM_{2.5}$ (tpy)
All Terrain Vehicle (ATV)	0.25	0.23	0.02	75%	0.03	0.00	0.03	0.00
Dump Trucks	20	1.66	0.17	75%	0.30	0.03	0.27	0.03
Light Duty Trucks	2.5	0.65	0.07	75%	0.06	0.01	0.05	0.01
Medium Duty Trucks	5	0.89	0.09	75%	0.06	0.01	0.06	0.01
School Bus	15	1.46	0.15	75%	0.21	0.02	0.19	0.02
Water / Fuel Truck	20	1.66	0.17	75%	0.06	0.01	0.05	0.01

1. Emission factors calculated in accordance with AP-42 Section 13.2.2:

Unpaved Roads: $E = k(s/12)^a(W/3)^b*[(365-p)/365]$

k Factor (PM_{10}, $PM_{2.5}$) (lb/VMT)	1.5		0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	8.5	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	130			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM_{10}, $PM_{2.5}$)	0.9		0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM_{10}, $PM_{2.5}$)	0.45		0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

2. Assumed average dust control efficiency for road watering from AP-42 Section 13.2.2 and related background documents.

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Table 9-B-54. Fugitive Emissions from Earthmoving, Redhook Station Construction

On-Site Activity	Emission Factors[1] PM_{10}	Emission Factors[1] $PM_{2.5}$	Units of Measure	Operation[2] 2017	Operation[2] 2018	Units of Measure	PM_{10} Emissions (tpy) 2017	PM_{10} Emissions (tpy) 2018	$PM_{2.5}$ Emissions (tpy) 2017	$PM_{2.5}$ Emissions (tpy) 2018
Bulldozing	1.03E+00	5.31E-01	lb/hr	1440	320	hr/yr	7.41E-01	1.65E-01	3.83E-01	8.50E-02
Grading	1.96E+00	2.24E-01	lb/VMT	0.0	0.0	VMT/yr	0.00E+00	0.00E+00	0.00E+00	0.00E+00

1. Emissions were calculated using emission factor equations from Table 11.9-1, Compilation of Air Pollutant Emission Factors, USEPA AP-42, Fifth Edition, 10/98.

For bulldozing:

PM_{10} emissions factor (lb/hr) = 0.75 * [1.0 (s)^1.5 / (M)^1.4]

$PM_{2.5}$ emission factor (lb/hr) = 0.105 * [5.7(s)^1.2 / (M)^1.3]

For grading:

PM_{10} emission factor (lb/VMT) = 0.60 * [0.051 (S)^2.0]

$PM_{2.5}$ emission factor (lb/VMT) = 0.031 * [0.040 (S)^2.5]

Where:

s (Silt Content) = 8.5

M (Moisture Content) = 7.9

S (Vehicle Speed) = 8

2. Vehicle miles traveled for grading calculate based on amount of land disturbed during construction each year, as follows:

	2017	2018
Land Disturbed (acres):	0	0
Square Miles:	0.000	0.000
Miles in 1 Direction:	0.000	0.000
Feet in 1 Direction:	0	0
Clearance of Grader (ft):	5	5
Number of Trips for 1 Grade:	0	0
Miles to Clear 1 Direction:	0	0
Miles with 50% Safety Factor:	0.0	0.0
Number of Times to Go Over Surface:	2	2
Total Travel (VMT/yr):	0	0

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Table 9-B-55. Fugitive Emissions from Soil Pile Wind Erosion, Redhook Station Construction

Material Pile Description	Size (acres)[3]	Emission Control Method	Control Efficiency[4]	Emission Factor[1]			Unit	2017 Emissions (tpy)[5]			2018 Emissions (tpy)[5]		
				PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Redhook Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.04	0.02	0.00	0.04	0.02	0.00
Pratt Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	--	--	--	0.03	0.02	0.00
Compressor Station Total	0.184	Mulch/seeding	75%	--	--	--	--	0.04	0.02	0.00	0.07	0.03	0.01
H-316 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.09
H-318 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.09
Pipeline Soil Piles in Allegheny, PA	2.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.97	0.49	0.07	0.81	0.40	0.06
Pipeline Soil Piles in Washington, PA	0.8	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.39	0.20	0.03	0.33	0.16	0.02
H-305 Pipeline Total	0.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.04	0.02	0.00	0.04	0.02	0.00
H-158 & M-80 Pipeline Total	0.3	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.14	0.07	0.01	0.13	0.06	0.01
H-319 Pipeline Total	0.1	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.002	0.001	0.000	--	--	--
Pipeline Soil Piles Total	6.29	Mulch/seeding	75%	--	--	--	--	2.92	1.46	0.22	2.43	1.22	0.18
Mobely Tap Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	--	--	--	0.003	0.002	0.000
Webster Interconnect Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.003	0.002	0.000	--	--	--
Interconnect Total	0.147	Mulch/seeding	75%	--	--	--	--	0.003	0.002	0.000	0.003	0.002	0.000
							Total Stockpile Erosion Emissions	**2.96**	**1.48**	**0.22**	**2.51**	**1.25**	**0.19**

[1]USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles). USEPA, 2006 13.2.5 for k factors:

EF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)*(1-% Control Efficiency)

[2]Total PM assumed to be equal to PM < 30 µm

	Redhook	Wetzel, WV
Days of precipitation greater than or equal to 0.01 inch (p)	151	149.8
Time (%) that unobstructed wind speed exceeds 5.4 m/s at mean pile height (f)	17.6	1.8

Silt Content (%), (s)	8.5	
Particle Size multiplier (k)	1	(for PM < 30 µm)
	0.5	(for PM < 10 µm)
	0.075	(for PM < 2.5 µm)

Equitrans Redhook
Table 9-B-55. Fugitive Emissions from Soil Pile Wind Erosion, Redhook Station Construction

[3]Soil Pile Areas:

Compressor Stations Stockpile Area:	2	stockpiles	
	50	ft. wide	
	40	ft. wide	
	0.092	**acres**	
Pipeline Soil Pile Area:	1	pile per spread	
	4	ft. wide (topsoil)	
	8	ft. wide (subsoil)	
	2	miles long	H-316 - Greene County, PA
	2.9	**acres**	
	2	miles long	H-318 - Allegheny & Washington Counties, PA
	2.9	**acres**	
	0.065	miles long	H-305 - Greene County, PA
	0.1	**acres**	
	0.222	miles long	H-158 & M-80 - Greene County, PA
	0.3	**acres**	
	0.035	miles long	H-319 - Wetzel County, WV
	0.1	**acres**	
Interconnects Stockpile Area:[6]	2	stockpiles	
	0.073	**acres**	

[4]Engineering estimate for control efficiency from use of mulch/seeding to control erosion.

[5]Emissions are based on the construction schedule below:

Start	End	2017 days	2018 days	Location
2/2/2017	10/30/2018	333	303	Redhook Compressor Station
2/2/2018	10/30/2018	--	270	Pratt Compressor Station
1/1/2017	10/30/2018	365	303	H-316 Pipeline
1/1/2017	10/30/2018	365	303	H-318 Pipeline
2/2/2017	10/30/2018	333	303	H-305 Pipeline
2/2/2017	10/30/2018	333	303	H-158 & M-80 Pipeline
2/2/2017	12/30/2017	331	--	H-319 Pipeline
2/2/2018	12/30/2018	--	331	Mobely Tap
2/2/2017	12/30/2017	331	--	Webster Interconnect

[6]Interconnects stockpiles are 20% smaller in size at interconnects than at compressor stations per conversation with Trever Leamon on 9/4/2015

Equitrans Redhook

Table 9-B-56. Criteria Pollutant Emissions Summary, Pratt Station Decommissioning

Source	2017 Construction Emissions (tpy)							2018 Construction Emissions (tpy)						
	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Construction Equipment Engines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.80	13.79	0.41	1.14	0.76	0.76	2,229.43
On-Road Vehicle Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.97	0.00	0.04	0.01	0.00	90.10
Off-Road Vehicle Travel	--	--	--	--	0.00	0.00	--	--	--	--	--	0.58	0.06	--
Earthmoving Fugitives	--	--	--	--	0.00	0.00	--	--	--	--	--	0.62	0.32	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	0.02	0.00	--
TOTAL:	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**6.90**	**14.76**	**0.41**	**1.18**	**1.98**	**1.14**	**2,319.53**

Equitrans Redhook

Table 9-B-57. HAP Emission Summary, Pratt Station Decommissioning

Source	2017 Construction Emissions (tpy)						2018 Construction Emissions (tpy)					
	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Formaldehyde	Total HAPs
Construction Equipment Engines	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.03E-02	3.41E-03	2.27E-02	2.27E-03	1.34E-01	2.23E-01
On-Road Vehicle Travel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-04	5.81E-05	1.62E-03	2.54E-04	1.01E-03	3.31E-03
Off-Road Vehicle Travel	--	--	--	--	--	--	--	--	--	--	--	--
Earthmoving Fugitives	--	--	--	--	--	--	--	--	--	--	--	--
Pile Erosion	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL:	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**6.07E-02**	**3.47E-03**	**2.44E-02**	**2.53E-03**	**1.35E-01**	**2.26E-01**

Equitrans Redhook

Table 9-B-58. Emissions from Construction Engines, Pratt Station Decommissioning

Equipment Type	SCC	Max. Engine Rating (hp)	Load Factor[3]	Average Engine Load (hp)	2017 Construction Year Operations Quantity	(hr/week)	(weeks/yr)	Emissions (tpy) NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2	2018 Construction Year Operations Quantity	(hr/week)	(weeks/yr)	Emissions (tpy) NO_X	CO	SO_2	VOC	PM_{10}	$PM_{2.5}$	CO_2
Air Compressor A	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	15	15	1.18E-01	2.61E-02	6.27E-03	1.15E-02	1.03E-02	1.03E-02	3.51E+01
Air Compressor B	2270006015	310	0.43	133.3	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
All Terrain Vehicle (ATV)[1]	2282005015	18	0.21	3.78	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	4	30	6.68E-03	1.59E-01	2.65E-04	1.32E-02	1.25E-04	1.25E-04	1.29E+00
Asphalt Paver	2270002003	153	0.59	90.27	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Backhoe	2265002066	75	0.48	36	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	30	38	1.12E-01	1.13E+00	1.30E-02	3.36E-02	6.30E-03	6.30E-03	6.33E+01
Bobcat[2]	2265003040	150	0.54	81	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	30	38	4.47E-01	4.90E+00	4.40E-02	1.47E-01	2.18E-02	2.18E-02	2.14E+02
Booster/Pumps	2270006010	370	0.43	159.1	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	5	12	3.57E-02	9.51E-03	1.07E-03	3.02E-03	2.48E-03	2.48E-03	5.58E+00
Bucket Truck	2270002051	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chain Saw	2260004020	3	0.7	2.1	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cherry Picker	2270002081	160	0.59	94.4	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	20	38	1.78E-01	1.66E-01	8.60E-03	1.83E-02	2.79E-02	2.79E-02	4.71E+01
Chipper/Shredder	2270004066	20	0.43	8.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Compactor	2270002009	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3	25	15	7.30E-01	3.85E-01	2.03E-02	7.65E-02	5.87E-02	5.87E-02	9.42E+01
Compactor, Vibratory	2270002009	100	0.43	43	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	28	5	3.03E-02	1.60E-02	8.41E-04	3.17E-03	2.43E-03	2.43E-03	3.91E+00
Concrete Mixer Truck (main pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	30	3	5.02E-02	2.65E-02	1.47E-03	5.38E-03	5.18E-03	5.18E-03	7.54E+00
Concrete Mixer Truck (small pours)	2270002042	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Concrete Pumps	2270006010	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	10	1	4.83E-03	1.29E-03	1.45E-04	4.09E-04	3.35E-04	3.35E-04	7.54E-01
Crane, Crawler	2270002069	450	0.59	265.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	30	25	2.28E-01	7.11E-02	1.94E-02	3.21E-02	3.43E-02	3.43E-02	1.18E+02
Crane, Wheeled (20 ton)	2270002045	150	0.43	64.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crane, Wheeled (250 ton) A	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	30	25	5.88E-01	1.53E-01	2.49E-02	4.31E-02	4.09E-02	4.09E-02	1.35E+02
Crane, Wheeled (250 ton) B	2270002045	715	0.43	307.45	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cuttings Cleaner System	2270002081	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Digger Derrick	2270002033	300	0.43	129	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	2270002069	410	0.59	241.9	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	40	15	3.32E-01	1.04E-01	2.82E-02	4.68E-02	5.01E-02	5.01E-02	1.72E+02
Drill Engine	2270002081	20	0.59	11.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Drilling Rig	2270002033	950	0.43	408.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	2270002078	325	0.21	68.25	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	30	25	9.39E-01	5.38E-01	2.75E-02	1.43E-01	1.19E-01	1.19E-01	1.41E+02
Excavator	2270002036	138	0.59	81.42	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	30	30	1.77E-01	1.68E-01	1.58E-02	2.41E-02	3.66E-02	3.66E-02	9.62E+01
Fork Lift	2270003020	120	0.59	70.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	30	30	1.36E-01	1.43E-01	2.61E-02	3.77E-02	4.47E-02	4.47E-02	1.67E+02
Front End Loaders	2270002066	196	0.21	41.16	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	20	25	7.59E-02	4.45E-02	2.71E-03	1.18E-02	1.05E-02	1.05E-02	1.42E+01
Generators	2270006005	430	0.43	184.9	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	15	30	1.24E+00	3.28E-01	3.73E-02	1.05E-01	8.40E-02	8.40E-02	1.94E+02
Grader	2270002048	140	0.59	82.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDD Rig	2270002033	600	0.43	258	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Heavy Lift Crane	2270002045	340	0.43	146.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hydrotest Truck	2270002051	100	0.59	59	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	10	3	5.02E-03	1.37E-03	1.67E-04	3.87E-04	3.60E-04	3.60E-04	1.05E+00
Jack Hammer	2270003040	405	0.43	174.15	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Light Tower	2270002081	50	0.59	29.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	10	10	4.46E-02	8.11E-03	1.31E-03	2.20E-03	2.52E-03	2.52E-03	7.75E+00
Man Lift A	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5	30	30	2.65E-01	2.61E-01	7.12E-03	6.63E-02	4.14E-02	4.14E-02	3.60E+01
Man Lift B	2270003010	50	0.21	10.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mudd Unit	2270002081	400	0.59	236	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Trucks	2270002051	250	0.59	147.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6	15	38	2.62E-01	1.07E-01	4.66E-02	7.48E-02	7.86E-02	7.86E-02	2.98E+02
Pile Driver	2270002081	350	0.59	206.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Beveling Machine	2270002081	20	0.59	11.8	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pipe Tractor Trailer	2265002066	400	0.48	192	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	15	20	7.86E-02	7.94E-01	9.15E-03	2.36E-02	4.42E-03	4.42E-03	4.44E+01
Portable Pipe Bender	2270003040	75	0.43	32.25	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rigging Loft	2265003010	10	0.46	4.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Roller	2270002015	300	0.59	177	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	20	4	2.12E-02	7.15E-03	1.44E-03	2.48E-03	2.72E-03	2.72E-03	8.37E+00
Scissor Lift	2270003010	20	0.21	4.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	15	4	1.64E-03	1.77E-03	4.13E-05	4.25E-04	2.52E-04	2.52E-04	1.92E-01
School Bus	2270002051	100	0.59	59	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	6	25	2.51E-02	6.87E-03	8.35E-04	1.93E-03	1.80E-03	1.80E-03	5.23E+00
Scrapper	2270002018	488	0.59	287.92	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SideBoom	2270002069	240	0.59	141.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Skid Steer Loader	2270002072	75	0.21	15.75	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	15	30	7.78E-02	7.66E-02	2.14E-03	1.45E-02	1.22E-02	1.22E-02	1.08E+01
Stake Bed	2270002081	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sweeper	2270003030	12	0.43	5.16	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	6	38	5.79E-03	3.07E-03	1.64E-04	5.80E-04	4.78E-04	4.78E-04	7.64E-01
Tamper	2260002006	4	0.55	2.2	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	20	10	1.28E-03	2.72E-01	1.38E-04	5.52E-02	8.99E-03	8.99E-03	6.75E-01
Tandem Truck	2270002069	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	10	25	7.51E-02	3.20E-02	5.92E-03	1.00E-02	1.32E-02	1.32E-02	3.49E+01
Trackhoe	2265002066	320	0.48	153.6	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	30	30	3.77E-01	3.81E+00	4.39E-02	1.13E-01	2.12E-02	2.12E-02	2.13E+02
Trenching Machines	2270002030	200	0.59	118	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trowel	2270002081	8	0.59	4.72	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	15	3	2.01E-03	6.82E-04	4.72E-05	1.37E-04	1.24E-04	1.24E-04	2.51E-01
Water / Fuel Truck	2270002051	250	0.59	147.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	12	38	3.50E-02	1.43E-02	6.21E-03	9.97E-03	1.05E-02	1.05E-02	3.98E+01
Welder	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Machine	2270006025	35	0.21	7.35	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Welding Rig	2270002051	10	0.59	5.9	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4	40	20	5.35E-02	1.47E-02	1.78E-03	4.13E-03	3.85E-03	3.85E-03	1.12E+01
X-Ray Truck/Machine	2270002051	50	0.59	29.5	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1	20	20	3.34E-02	9.16E-03	1.11E-03	2.58E-03	2.40E-03	2.40E-03	6.97E+00

[1]NONROAD2008a Model does not contain Emission Factors for All Terrain Vehicles (ATVs). Used Emission Factors for Personal Watercraft as a substitution.
[2]NONROAD2008a Model does not contain Emission Factors for Bobcat vehicle type. Used Emission Factors for Other Industrial Equipment vehicle type as a substitution.
[3] Load factors as recommended for estimation of emissions using NONROAD emission factors in EPA420-P-04-005 Revised April 2004

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Table 9-B-59. HAP Emissions from Construction Engines, Pratt Station Decommissioning

Pollutant	2017 Emissions (tpy)	2018 Emissions (tpy)
Acetaldehyde	0.00E+00	6.03E-02
Acrolein	0.00E+00	3.41E-03
Benzene	0.00E+00	2.27E-02
1,3-Butadiene	0.00E+00	2.27E-03
Formaldehyde	0.00E+00	1.34E-01

1. Emissions of HAPs are estimated based on total VOC emissions for the construction year and Table 3.1-3 Air Toxic Fractions of VOC in EPA's guidance document *Final Regulatory Analysis and Control of Emissions from Nonroad Diesel Engines* , EPA420-R-04-007, May 2004.

Pollutant	**Fraction of VOC**
Acetaldehyde	0.053
Acrolein	0.003
Benzene	0.020
1,3-Butadiene	0.002
Formaldehyde	0.118

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Table 9-B-60. On-Road Engine Emission Factors, Pratt Station Decommissioning

Pollutant	2017 Emission Factors (grams/mile) LDGV	LDGT	LDDT	COM BUS	HDDV	2018 Emission Factors (grams/mile) LDGV	LDGT	LDDT	COM BUS	HDDV
NO_X	3.41E-01	3.80E-01	4.58E-01	6.99E+00	3.18E+00	3.18E-01	3.57E-01	4.06E-01	6.38E+00	2.71E+00
CO	1.17E+01	1.17E+01	5.13E-01	1.01E+00	5.88E-01	1.16E+01	1.14E+01	4.77E-01	8.85E-01	5.15E-01
SO_2	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02	6.80E-03	8.80E-03	4.10E-03	1.12E-02	1.06E-02
VOC	3.86E-01	4.56E-01	2.37E-01	3.48E-01	2.43E-01	3.67E-01	4.35E-01	2.12E-01	3.28E-01	2.38E-01
PM_{10}	2.48E-02	2.48E-02	4.65E-02	3.71E-02	8.74E-02	2.47E-02	2.48E-02	4.02E-02	3.71E-02	7.62E-02
$PM_{2.5}$	1.12E-02	1.13E-02	3.12E-02	2.06E-02	5.69E-02	1.12E-02	1.13E-02	2.55E-02	2.06E-02	4.66E-02
CO_2	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.55E+03	3.68E+02	4.79E+02	5.99E+02	1.65E+03	1.54E+03
Acetaldehyde	1.34E-03	1.54E-03	2.92E-03	1.05E-02	7.33E-03	1.29E-03	1.47E-03	2.62E-03	9.90E-03	7.19E-03
Acrolein	1.70E-04	2.00E-04	8.30E-04	1.28E-03	8.95E-04	1.65E-04	1.85E-04	7.40E-04	1.21E-03	8.75E-04
Benzene	1.70E-02	1.95E-02	4.75E-03	3.84E-03	2.68E-03	1.63E-02	1.86E-02	4.26E-03	3.61E-03	2.62E-03
1,3-Butadiene	1.90E-03	2.17E-03	2.14E-03	2.23E-03	1.55E-03	1.82E-03	2.07E-03	1.92E-03	2.10E-03	1.52E-03
Formaldehyde	3.48E-03	3.97E-03	9.17E-03	2.85E-02	1.99E-02	3.34E-03	3.79E-03	8.21E-03	2.69E-02	1.95E-02

1. The emission factors were calculated using EPA's Mobile6.2 Vehicle Emission Modeling Software. Emission factors for each calendar year are based on average of Mobile6.2 generated factors for winter and summer of that year.

2. Temperatures for winter were based on average temperatures in January, and the temperatures for summer were based on average temperatures in July. The data was extracted from National Oceanic and Atmospheric Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/datatools/normals) based on data collected from 1981 to 2010 by the Morgantown Hart Field, WV Station (COOP ID 466202).

3. Fuel assumptions included conventional gasoline, with an average RVP limit of 9 psi, and diesel with average sulfur content of 11 ppm.

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Table 9-B-61. On-Road Vehicle Travel, Pratt Station Decommissioning

	2017				2018			
Vehicle Type	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year	Round Trip (miles)	Trips per Day	Days/Year	Total Miles Per Year
Commuter Bus	0	0	0	0	0	0	0	0
Light-Duty Diesel Truck	0	0	0	0	14	8.571428571	230	27,600
Light-Duty Gasoline Truck	0	0	0	0	14	10.28571429	230	33,120
Light-Duty Gasoline Vehicle	0	0	0	0	14	12.85714286	230	41,400
Heavy Duty Diesel Vehicle	0	0	0	0	14	6.857142857	230	22,080
Fuel Delivery	0	0	0	0	0	0	0	0

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Table 9-B-62. On-Road Engine Emissions, Pratt Station Decommissioning

Pollutant	2017 Annual Emissions (tpy) LDGV	LDGT	LDDT	COM BUS	HDDV	2018 Annual Emissions (tpy) LDGV	LDGT	LDDT	COM BUS	HDDV
NO_X	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-02	1.30E-02	1.23E-02	0.00E+00	6.60E-02
CO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.28E-01	4.16E-01	1.45E-02	0.00E+00	1.25E-02
SO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-04	3.21E-04	1.25E-04	0.00E+00	2.58E-04
VOC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-02	1.59E-02	6.45E-03	0.00E+00	5.79E-03
PM_{10}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-03	9.05E-04	1.22E-03	0.00E+00	1.85E-03
$PM_{2.5}$	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.11E-04	4.13E-04	7.74E-04	0.00E+00	1.13E-03
CO_2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E+01	1.75E+01	1.82E+01	0.00E+00	3.76E+01
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.86E-05	5.35E-05	7.96E-05	0.00E+00	1.75E-04
Acrolein	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.53E-06	6.75E-06	2.25E-05	0.00E+00	2.13E-05
Benzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.46E-04	6.78E-04	1.29E-04	0.00E+00	6.38E-05
1,3-Butadiene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.31E-05	7.56E-05	5.83E-05	0.00E+00	3.70E-05
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E-04	1.38E-04	2.50E-04	0.00E+00	4.75E-04

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Table 9-B-63. On-Road Vehicle Travel, Pratt Station Decommissioning

	2017				2018			
Vehicle Type	**Round Trip (miles)**	**Trips per Day**	**Days/Year**	**Total Miles Per Year**	**Round Trip (miles)**	**Trips per Day**	**Days/Year**	**Total Miles Per Year**
All Terrain Vehicle (ATV)	0	0	0	0	0.5	8	230	920
Dump Trucks	0	0	0	0	0.5	10	230	1,150
Light Duty Trucks	0	0	0	0	0.5	5	230	575
Medium Duty Trucks	0	0	0	0	0.5	4	230	460
School Bus	0	0	0	0	2	2	230	920
Water / Fuel Truck	0	0	0	0	1	1	230	230

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Table 9-B-64. Emissions from Off-Road Vehicle Travel, Pratt Station Decommissioning

Vehicle Type	Mean Vehicle Weight (tons)	Emission Factor[1] PM_{10} (lb/VMT)	Emission Factor[1] $PM_{2.5}$ (lb/VMT)	Control Efficiency[2] (%)	2017 Annual Emissions PM_{10} (tpy)	2017 Annual Emissions $PM_{2.5}$ (tpy)	2018 Annual Emissions PM_{10} (tpy)	2018 Annual Emissions $PM_{2.5}$ (tpy)
All Terrain Vehicle (ATV)	0.25	0.23	0.02	75%	0.00	0.00	0.03	0.00
Dump Trucks	20	1.66	0.17	75%	0.00	0.00	0.24	0.02
Light Duty Trucks	2.5	0.65	0.07	75%	0.00	0.00	0.05	0.00
Medium Duty Trucks	5	0.89	0.09	75%	0.00	0.00	0.05	0.01
School Bus	15	1.46	0.15	75%	0.00	0.00	0.17	0.02
Water / Fuel Truck	20	1.66	0.17	75%	0.00	0.00	0.05	0.00

1. Emission factors calculated in accordance with AP-42 Section 13.2.2:

Unpaved Roads: $E = k(s/12)^a(W/3)^b*[(365-p)/365]$

k Factor (PM_{10}, $PM_{2.5}$) (lb/VMT)	1.5		0.15	AP-42 Table 13.2.2-2 (Final, 11/06)
Silt content, s	8.5	%		AP-42 Table 13.2.2-1 (Final, 11/06)
Number of Rain Days, p	130			AP-42 Figure 13.2.2-1 (Final, 11/06)
a (PM_{10}, $PM_{2.5}$)	0.9		0.9	AP-42 Table 13.2.2-2 (Final, 11/06)
b (PM_{10}, $PM_{2.5}$)	0.45		0.45	AP-42 Table 13.2.2-2 (Final, 11/06)

2. Assumed average dust control efficiency for road watering from AP-42 Section 13.2.2 and related background documents.

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Table 9-B-65. Fugitive Emissions from Earthmoving, Pratt Station Decommissioning

On-Site Activity	Emission Factors[1]			Operation[2]			PM_{10} Emissions (tpy)		$PM_{2.5}$ Emissions (tpy)	
	PM_{10}	$PM_{2.5}$	Units of Measure	2017	2018	Units of Measure	2017	2018	2017	2018
Bulldozing	1.03E+00	5.31E-01	lb/hr	0	1200	hr/yr	0.00E+00	6.18E-01	0.00E+00	3.19E-01
Grading	1.96E+00	2.24E-01	lb/VMT	0.0	0.0	VMT/yr	0.00E+00	0.00E+00	0.00E+00	0.00E+00

1. Emissions were calculated using emission factor equations from Table 11.9-1, Compilation of Air Pollutant Emission Factors, USEPA AP-42, Fifth Edition, 10/98.

For bulldozing:

PM_{10} emissions factor (lb/hr) = 0.75 * [1.0 (s)^1.5 / (M)^1.4]

$PM_{2.5}$ emission factor (lb/hr) = 0.105 * [5.7(s)^1.2 / (M)^1.3]

For grading:

PM_{10} emission factor (lb/VMT) = 0.60 * [0.051 (S)^2.0]

$PM_{2.5}$ emission factor (lb/VMT) = 0.031 * [0.040 (S)^2.5]

Where:

s (Silt Content) =	8.5
M (Moisture Content) =	7.9
S (Vehicle Speed) =	8

2. Vehicle miles traveled for grading calculate based on amount of land disturbed during construction each year, as follows:

	2017	2018
Land Disturbed (acres):	0	0
Square Miles:	0.000	0.000
Miles in 1 Direction:	0.000	0.000
Feet in 1 Direction:	0	0
Clearance of Grader (ft):	5	5
Number of Trips for 1 Grade:	0	0
Miles to Clear 1 Direction:	0	0
Miles with 50% Safety Factor:	0.0	0.0
Number of Times to Go Over Surface:	2	2
Total Travel (VMT/yr):	0	0

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Table 9-B-66. Fugitive Emissions from Soil Pile Wind Erosion, Pratt Station Decommissioning

Material Pile Description	Size (acres)[3]	Emission Control Method	Control Efficiency[4]	Emission Factor[1]			Unit	2017 Emissions (tpy)[5]			2018 Emissions (tpy)[5]		
				PM	PM_{10}	$PM_{2.5}$		PM	PM_{10}	$PM_{2.5}$	PM	PM_{10}	$PM_{2.5}$
Redhook Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.039	0.020	0.003	0.036	0.018	0.003
Pratt Compressor Station Stockpiles	0.092	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	--	--	--	0.032	0.016	0.002
Compressor Station Total	0.184	Mulch/seeding	75%	--	--	--	--	0.039	0.020	0.003	0.068	0.034	0.005
H-316 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.085
H-318 Pipeline Total	2.9	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	1.37	0.68	0.10	1.14	0.57	0.085
Pipeline Soil Piles in Allegheny, PA	2.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.97	0.49	0.07	0.81	0.40	0.061
Pipeline Soil Piles in Washington, PA	0.8	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.39	0.20	0.03	0.33	0.16	0.024
H-305 Pipeline Total	0.1	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.041	0.020	0.003	0.04	0.02	0.003
H-158 & M-80 Pipeline Total	0.3	Mulch/seeding	75%	2.58	1.29	0.19	lb/day/acre	0.14	0.069	0.010	0.13	0.06	0.009
H-319 Pipeline Total	0.1	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.0023	0.0011	0.000	--	--	--
Pipeline Soil Piles Total	6.29	Mulch/seeding	75%	--	--	--	--	2.92	1.46	0.22	2.43	1.22	0.18
Mobely Tap Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	--	--	--	0.003	0.002	0.000
Webster Interconnect Stockpiles	0.073	Mulch/seeding	75%	0.27	0.14	0.02	lb/day/acre	0.003	0.002	0.000	--	--	--
Interconnect Total	0.147	Mulch/seeding	75%	--	--	--	--	0.003	0.002	0.000	0.003	0.002	0.000
Total Stockpile Erosion Emissions								**2.96**	**1.48**	**0.22**	**2.51**	**1.25**	**0.19**

[1]USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles). USEPA, 2006 13.2.5 for k factors:

EF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)*(1-% Control Efficiency)

[2]Total PM assumed to be equal to PM < 30 μm

	Redhook	Wetzel, WV
Days of precipitation greater than or equal to 0.01 inch (p)	151	149.8
Time (%) that unobstructed wind speed exceeds 5.4 m/s at mean pile height (f)	17.6	1.8

Silt Content (%), (s)	8.5	
Particle Size multiplier (k)	1	(for PM < 30 μm)
	0.5	(for PM < 10 μm)
	0.075	(for PM < 2.5 μm)

Equitrans Redhook
Table 9-B-66. Fugitive Emissions from Soil Pile Wind Erosion, Pratt Station Decommissioning

[3]Soil Pile Areas:

Compressor Stations Stockpile Area:	2 stockpiles	
	50 ft. wide	
	40 ft. wide	
	0.092 acres	
Pipeline Soil Pile Area:	1 pile per spread	
	4 ft. wide (topsoil)	
	8 ft. wide (subsoil)	
	2 miles long	H-316 - Greene County, PA
	2.9 acres	
	2 miles long	H-318 - Allegheny & Washington Counties, PA
	2.9 acres	
	0.065 miles long	H-305 - Greene County, PA
	0.1 acres	
	0.222 miles long	H-158 & M-80 - Greene County, PA
	0.3 acres	
	0.035 miles long	H-319 - Wetzel County, WV
	0.1 acres	
Interconnects Stockpile Area:[6]	2 stockpiles	
	0.073 acres	

[4]Engineering estimate for control efficiency from use of mulch/seeding to control erosion.

[5]Emissions are based on the construction schedule below:

Start	End	2017 days	2018 days	Location
2/2/2017	10/30/2018	333	303	Redhook Compressor Station
2/2/2018	10/30/2018	--	270	Pratt Compressor Station
1/1/2017	10/30/2018	365	303	H-316 Pipeline
1/1/2017	10/30/2018	365	303	H-318 Pipeline
2/2/2017	10/30/2018	333	303	H-305 Pipeline
2/2/2017	10/30/2018	333	303	H-158 & M-80 Pipeline
2/2/2017	12/30/2017	331	--	H-319 Pipeline
2/2/2018	12/30/2018	--	331	Mobely Tap
2/2/2017	12/30/2017	331	--	Webster Interconnect

[6]Interconnects stockpiles are 20% smaller in size at interconnects than at compressor stations per conversation with Trever Leamon on 9/4/2015

Equitrans Expansion Project

Docket No. CP16-   -000

Resource Report 9

Appendix 9-C
Operational Emissions Calculations

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 1. Internal Combustion (IC) Engine Emissions Calculations

Engine Information:

Source ID:	S001-S002
Manufacturer:	Caterpillar
Model No.:	G3616
Stroke Cycle:	4-stroke
Type of Burn:	Lean
Rated Horsepower (bhp) each:	5,350
Control Device:	Oxidation Catalyst
Stack Designation:	P001-P002
Number of Units:	2

Engine Fuel Information:

	Per Unit
Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,058
Specific Fuel Consumption (Btu/bhp-hr):	7,411
Maximum Fuel Consumption at 100% Load (scf/hr):	37,260
Engine Exhaust flow rate (cfm)	31,808
Heat Input (MMBtu/hr):	39.65
Potential Fuel Consumption (MMBtu/yr):	347,324
Max. Fuel Consumption (MMscf/yr):	326.4
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant	Emission Factor	Units	Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	0.40	g/bhp-hr	4.72	20.66	Manufacturer's Specifications
NMNEHC (Excludes HCHO)	0.13	g/bhp-hr	1.53	6.72	Vendor Guarantee
VOC (NMNEHC + Formaldehyde)	---	---	2.12	9.30	Vendor Guarantee (NMNEHC + HCHO)
CO	0.17	g/bhp-hr	1.95	8.53	Vendor Guarantee (93% control)
SO_X	0.001	lb/MMBtu	0.02	0.10	AP-42, Table 3.2-2 (Aug-2000)
PM_{10}	0.01	lb/MMBtu	0.40	1.73	AP-42, Table 3.2-2 (Aug-2000)
$PM_{2.5}$	0.01	lb/MMBtu	0.40	1.73	AP-42, Table 3.2-2 (Aug-2000)
Formaldehyde (HCHO)	0.05	g/bhp-hr	0.59	2.58	Vendor Guarantee
GHG (CO_2e)	See Table Below		6,030	26,409.70	Man. Specs. And 40 CFR 98, Table C-2
Other (Total HAP)	See Table Below		1.36	5.95	AP-42, Table 3.2-2 (Aug-2000)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 1. Internal Combustion (IC) Engine Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	421	g/bhp-hr	4965.50	21748.88	Manufacturer's Specifications
CH_4	3.60	g/bhp-hr	42.46	185.98	Manufacturer's Specifications (THC-NMHC)
N_2O	0.0001	kg/MMBtu	0.01	0.04	40 CFR 98, Table C-2
GHG (CO_2e)			**6,030**	**26,410**	
Organic HAPs:					
1,1,2,2-Tetrachloroethane	4.00E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
1,1,2-Trichloroethane	3.18E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
1,3-Butadiene	2.67E-04	lb/MMBtu	0.01	0.05	AP-42, Table 3.2-2 (Aug-2000)
1,3-Dichloropropene	2.64E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
2-Methylnaphthalene	3.32E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
2,2,4-Trimethlpentane	2.50E-04	lb/MMBtu	0.01	0.04	AP-42, Table 3.2-2 (Aug-2000)
Acenaphthene	1.25E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Acenaphthylene	5.53E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Acetaldehyde	8.36E-03	lb/MMBtu	0.33	1.45	AP-42, Table 3.2-2 (Aug-2000)
Acrolein	5.14E-03	lb/MMBtu	0.20	0.89	AP-42, Table 3.2-2 (Aug-2000)
Benzene	4.40E-04	lb/MMBtu	0.02	0.08	AP-42, Table 3.2-2 (Aug-2000)
Benzo(b)fluoranthene	1.66E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Benzo(e)pyrene	4.15E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Benzo(g,h,i)perylene	4.14E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Biphenyl	2.12E-04	lb/MMBtu	0.01	0.04	AP-42, Table 3.2-2 (Aug-2000)
Carbon Tetrachloride	3.67E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Chlorobenzene	3.04E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Chloroform	2.85E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Chrysene	6.93E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Ethylbenzene	3.97E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Ethylene Dibromide	4.43E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Fluoranthene	1.11E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Fluorene	5.67E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Methanol	2.50E-03	lb/MMBtu	0.10	0.43	AP-42, Table 3.2-2 (Aug-2000)
Methylene Chloride	2.00E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
n-Hexane	1.11E-03	lb/MMBtu	0.04	0.19	AP-42, Table 3.2-2 (Aug-2000)
Naphthalene	7.44E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
PAH	2.69E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Phenanthrene	1.04E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Phenol	2.40E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Pyrene	1.36E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Styrene	2.36E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Tetrachloroethane	2.48E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Toluene	4.08E-04	lb/MMBtu	0.02	0.07	AP-42, Table 3.2-2 (Aug-2000)
Vinyl Chloride	1.49E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Xylene	1.84E-04	lb/MMBtu	0.01	0.03	AP-42, Table 3.2-2 (Aug-2000)
Total HAP			**1.36**	**5.95**	

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 2. Internal Combustion Turbine Emissions Calculations

Turbine Information:

Source ID:	S003-S004
Manufacturer:	Solar
Model No.:	Taurus-70
Year Installed:	TBD
Fuel Used:	Natural Gas
Fuel Lower Heating Value (Btu/scf):	951.5
Rated Horsepower (bhp):	11,311
Maximum Fuel Consumption at 100% Load (scf/hr):	88,019
Heat Input (MMBtu/hr)	83.75
Control Device:	None
Stack Designation:	P003-P004

Operational Details:

Potential Annual Hours of Operation (hr/yr):	8,760
Potential Fuel Consumption (MMscf/yr):	771.05
Potential Startup/Shutdown Events (per year):	12

Manufacturer Specific Pollutant Emission Factors:

Pollutant	Emission Factors	Units	Emission Factor Source
NO_X	0.060	lb/MMBtu	Manufacturer
CO	0.061	lb/MMBtu	Manufacturer
SO_2	0.004	lb/MMBtu	Manufacturer
PM_{10}	0.019	lb/MMBtu	Manufacturer
$PM_{2.5}$	0.019	lb/MMBtu	Manufacturer
VOC	0.007	lb/MMBtu	20% of UHC per Manufacturer
Formaldehyde	0.003	lb/MMBtu	Manufacturer
CO_2	126.40	lb/MMBtu	40 CFR 98, Subpart C, Table C-1
CH_4	0.028	lb/MMBtu	80% of UHC per Manufacturer
N_2O	2.4E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2

*Emission factors from AP-42 and Subpart C are based on HHV. To calculate a LHV emission factor, emissions are multiplied by (HHV/LHV). For AP-42 HHV is 1020 Btu/scf, for Subpart C HHV is 1028 Btu/scf. PM and HCHO emission factors are provided in HHV in the specifications and were converted to LHV using a HHV value of 1020 Btu/scf.

Pollutant Emission Rates:

Pollutant	Potential Emissions (lb/hr)[a]	(tpy)[b]
NO_X	5.03	22.02
CO	5.11	23.38
SO_2	0.31	1.34
PM_{10}	1.62	7.08
$PM_{2.5}$	1.62	7.08
VOC	0.59	2.58
Formaldehyde	0.26	1.13
CO_2	10,586	46,375
CH_4	2.35	15.12
N_2O	0.02	0.09
GHG (CO_2e)	10,650.89	46,778.78

*Annual emissions shown above include startup/shutdown events.

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 2. Internal Combustion Turbine Emissions Calculations

Hazardous Air Pollutant (HAP) Emission Rates:

Pollutant	Emission Factor (lb/MMBtu)[c]	Potential Emissions (lb/hr)[a]	Potential Emissions (tpy)[b]
HAPs:			
Acetaldehyde	4.29E-05	3.59E-03	1.57E-02
Acrolein	6.86E-06	5.75E-04	2.52E-03
Benzene	1.29E-05	1.08E-03	4.72E-03
1,3-Butadiene	4.61E-07	3.86E-05	1.69E-04
Propylene Oxide	2.90E-05	2.43E-03	1.06E-02
Ethylbenzene	3.43E-05	2.87E-03	1.26E-02
Toluene	1.39E-04	1.17E-02	5.11E-02
Xylene	6.86E-05	5.75E-03	2.52E-02
Polycyclic Organic Matter:			
Naphthalene	1.39E-06	1.17E-04	5.11E-04
PAH	2.36E-06	1.98E-04	8.65E-04
Total HAP (Including HCHO)		**0.29**	**1.26**

Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr) × Emission Factor (lb/MMBtu)
Emission Rate (tpy) = Emission Rate (lb/hr) × Hours of Operation (hr/yr) / 2000 (tons/lb) + SU/SD emissions, as applicable
Emission factors from AP-42 Section 3.1, Table 3.1-3 "Emission Factors for HAPs from Natural Gas Fired Stationary Gas Turbines", April 2000. Factors are based on HHV. Therefore, they were converted to LHV by multiplying by (HHV/LHV).

Startup/Shutdown Combustion Emission Factors:

Pollutant	Startup Emissions[a] (lbs/event)	Shutdown Emissions[a] (lbs/event)	Emission Factor Source
NO_X	0.8	1.1	Manufacturer
CO	73.1	93.4	Manufacturer
VOC	0.8	1.06	20% of UHC per Manufacturer
CO_2	519	575	Manufacturer

Each startup and shutdown event is estimated to last approximately 10 minutes, per manufacturer.

Pneumatic Start Venting Emissions		
Natural Gas Purged During Startup	4,500	scfm
Duration of Normal Purge	4.0	min
Total Gas Purged (Per Startup)	18,000	scf
VOC Purged (Per Startup)	25	lbs/startup
CO_2 Purged (Per Startup)	2	lbs/startup
CH_4 Purged (Per Startup)	809	lbs/startup

Density of natural gas: 0.05 lb/ft^3 @ STP (www.engineeringtoolbox.com)

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 3. Microturbine Emissions Calculations

Microturbine Unit Information:

Engine ID:	S005-S014
Manufacturer:	Capstone
Model No.:	C200
Number of Units:	10

Microturbine Fuel Information:

	Per Unit	As Combined
Fuel Type:	Natural Gas	Natural Gas
Rated Electrical Power Output (kW):	200	2,000
Rated Electrical Power Output (MW):	0.2	2
Rated Horsepower (bhp):	268.2	2,682
Heat Input (MMBtu/hr)	2.28	22.8
Maximum Fuel Consumption at 100% Load (scf/hr):	2,156	21,559
Maximum Fuel Consumption at 100% Load (mmscf/yr	18.89	188.86
Potential Fuel Consumption (MMBtu/yr):	19,973	199,728
Max. Annual Hours of Operation (hr/yr):	8,760	8,760

Microturbine Emissions Data:

Pollutant	Emission Factors	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	0.40	lb/MWhe	0.08	0.35	Manufacturer's Specifications
VOC	0.10	lb/MWhe	0.02	0.09	Manufacturer's Specifications
CO	1.10	lb/MWhe	0.22	0.96	Manufacturer's Specifications
SO_X	0.003	lb/MMBtu	0.01	0.03	AP-42, Table 3.1-2a (Apr-2000)
PM_{10}	0.007	lb/MMBtu	0.02	0.07	AP-42, Table 3.1-2a (Apr-2000)
$PM_{2.5}$	0.007	lb/MMBtu	0.02	0.07	AP-42, Table 3.1-2a (Apr-2000)
GHG (CO_2e)	See Table Below		266	1,166	Manufacturer's Specifications / 40 CFR 98, Table C-2
Other (Total HAP)	See Table Below		0.00	0.01	AP-42, Table 3.1-3 (Apr-2000)

Notes:
1. NMNEHC is non-methane, non-ethane hydrocarbon excluding formaldehyde (HCHO).
2. VOC is NMNEHC + HCHO.
3. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
5. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this engine type, including HCHO

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 3. Microturbine Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	1,330	lb/MWhe	266	1,165	Manufacturer's Specifications
CH_4	0.001	kg/MMBtu	0.01	0.02	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**266**	**1,166**	
HAPs:					
1,3-Butadiene	4.3E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Acetaldehyde	4.0E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Acrolein	6.4E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Benzene	1.2E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Ethylbenzene	3.2E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Formaldehyde	7.1E-04	lb/MMBtu	0.00	0.01	AP-42, Table 3.1-3 (Apr-2000)
Naphthalene	1.3E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
PAH	2.2E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Propylene oxide	2.9E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Toluene	1.3E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Xylene	6.4E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Total HAP			**0.002**	**0.010**	

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 4. Dehydration Unit Regenerator Vent Emissions Calculations

Dehydration Unit Information:

Source ID:	S015
Control Type:	Enclosed Flare
Control Efficiency:	98%
Dehy Throughput (MMscfd):	50
Glycol Circulation Rate (gpm):	5.90
Max. Annual Hours of Operation (hr/yr):	8,760

Dehydration Unit Regenerator Vent Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	4.45	19.47	0.09	0.39	GRI GLYCalc (See Output Below)
HAPs	2.96	12.97	0.06	0.26	GRI GLYCalc (See Output Below)
NO_X	N/A	N/A	N/A	N/A	See Flare Calculations
SO_X	N/A	N/A	N/A	N/A	See Flare Calculations
CO	N/A	N/A	N/A	N/A	See Flare Calculations
PM_{10}	N/A	N/A	N/A	N/A	See Flare Calculations
$PM_{2.5}$	N/A	N/A	N/A	N/A	See Flare Calculations
GHG (CO_2e)	13	56	0.26	1.13	GRI GLYCalc (See Output Below)
Other (Benzene)	0.32	1.39	0.01	0.03	GRI GLYCalc (See Output Below)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

GRI GLYCalc Emissions Data - Regenerator Vent:

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lbs/hr	lbs/day	tpy	lbs/hr	lbs/day	tpy
Methane	0.5143	12.343	2.2525	0.0103	0.247	0.0451
Ethane	0.4313	10.351	1.8891	0.0086	0.207	0.0378
Propane	0.2644	6.346	1.1582	0.0053	0.127	0.0232
Isobutane	0.0959	2.302	0.4201	0.0019	0.046	0.0084
n-Butane	0.2634	6.322	1.1537	0.0053	0.126	0.0231
Isopentane	0.1041	2.4980	0.4560	0.0021	0.0500	0.0091
n-Pentane	0.1293	3.1040	0.5665	0.0026	0.0620	0.0113
Cyclopentane	0.0127	0.3040	0.0555	0.0003	0.0060	0.0011
n-Hexane	0.2368	5.6830	1.0371	0.0047	0.1140	0.0207
Cyclohexane	0.0299	0.7170	0.1308	0.0006	0.0140	0.0026
Other Hexanes	0.0033	0.0800	0.0146	0.0001	0.0020	0.0003
Heptanes	0.5149	12.3580	2.2554	0.0103	0.2470	0.0451
Methylcyclohexane	0.0385	0.9240	0.1686	0.0008	0.0180	0.0034
2,2,4-Trimethylpentane	0.0048	0.1150	0.0210	0.0001	0.0020	0.0004
Benzene	0.3173	7.6150	1.3897	0.0063	0.1520	0.0278
Toluene	0.5606	13.4550	2.4556	0.0112	0.2690	0.0491
Ethylbenzene	0.7888	18.9310	3.4549	0.0158	0.3790	0.0691
Xylenes	1.0527	25.2650	4.6108	0.0211	0.5050	0.0922
C8 + Heavier Hydrocarbons	0.0275	0.6600	0.1204	0.0005	0.0130	0.0024
Total Emissions	**5.3905**	**129.373**	**23.6105**	**0.1078**	**2.587**	**0.4722**
Total Hydrocarbon Emissions	**5.3905**	**129.373**	**23.6105**	**0.1078**	**2.587**	**0.4722**
Total VOC Emissions	**4.4450**	**106.679**	**19.4689**	**0.0889**	**2.134**	**0.3894**
Total HAP Emissions	**2.961**	**71.064**	**12.969**	**0.059**	**1.421**	**0.2594**
Total BTEX Emissions	**2.719**	**65.266**	**11.911**	**0.054**	**1.305**	**0.2383**

Notes:
1. Based on GRI GLYCalc 4.0 run at maximum design conditions of dry gas flow rate at 50 MMscfd, temperature at 60°F, and pressure at 1000 psig.

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 5. Dehydration Unit Flash Tank Emissions Calculations

Dehydration Unit Information:

Source ID:	S015
Control Type:	Route to Reboiler/Enclosed Flare
Control Efficiency:	98%
Flash Tank Inlet Pressure (psig):	35
Flash Tank Inlet Temperature (^oF)	125
Max. Annual Hours of Operation (hr/yr):	8,760

Dehydration Unit Flash Tank Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	1.62	7.08	0.03	0.14	GRI GLYCalc (See Output Below)
HAPs	0.13	0.57	0.00	0.01	GRI GLYCalc (See Output Below)
NO_X	N/A	N/A	N/A	N/A	See Flare Calculations
SO_X	N/A	N/A	N/A	N/A	See Flare Calculations
CO	N/A	N/A	N/A	N/A	See Flare Calculations
PM_{10}	N/A	N/A	N/A	N/A	See Flare Calculations
$PM_{2.5}$	N/A	N/A	N/A	N/A	See Flare Calculations
GHG (CO_2e)	250	1,093	5	22	GRI GLYCalc (See Output Below)
Other (Benzene)	0.00	0.02	0.00	0.00	GRI GLYCalc (See Output Below)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

GRI GLYCalc Emissions Data - Flash Tank:

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lbs/hr	lbs/day	tpy	lbs/hr	lbs/day	tpy
Methane	9.9803	239.528	43.7139	0.1996	4.791	0.8743
Ethane	2.2915	54.996	10.0368	0.0458	1.100	0.2007
Propane	0.6637	15.928	2.9068	0.0133	0.319	0.0581
Isobutane	0.1559	3.743	0.6830	0.0031	0.075	0.0137
n-Butane	0.3256	7.815	1.4262	0.0065	0.156	0.0285
Isopentane	0.1107	2.6560	0.4847	0.0022	0.053	0.0097
n-Pentane	0.1092	2.6210	0.4784	0.0022	0.0520	0.0096
Cyclopentane	0.0026	0.0630	0.0116	0.0001	0.0010	0.0002
n-Hexane	0.1081	2.5940	0.4735	0.0022	0.0520	0.0095
Cyclohexane	0.0033	0.0800	0.0146	0.0001	0.0020	0.0003
Other Hexanes	0.0020	0.0490	0.0089	0.0001	0.0010	0.0002
Heptanes	0.1115	2.6750	0.4882	0.0022	0.0540	0.0098
Methylcyclohexane	0.0033	0.0790	0.0144	0.0001	0.0020	0.0003
2,2,4-Trimethylpentane	0.0021	0.0500	0.0091	0.0001	0.0010	0.0002
Benzene	0.0050	0.1200	0.0219	0.0001	0.0020	0.0004
Toluene	0.0055	0.1330	0.0243	0.0001	0.0030	0.0005
Ethylbenzene	0.0044	0.1060	0.0193	0.0001	0.0020	0.0004
Xylenes	0.0041	0.0980	0.0179	0.0001	0.0020	0.0004
C8 + Heavier Hydrocarbons	0.0005	0.0120	0.0022	0.0001	0.0010	0.0001
Total Emissions	**13.8894**	**333.346**	**60.8356**	**0.2778**	**6.667**	**1.2167**
Total Hydrocarbon Emissions	**13.8894**	**333.346**	**60.8356**	**0.2778**	**6.667**	**1.2167**
Total VOC Emissions	**1.6176**	**38.821**	**7.0849**	**0.0324**	**0.776**	**0.1417**
Total HAP Emissions	**0.1292**	**3.101**	**0.566**	**0.003**	**0.062**	**0.011**
Total BTEX Emissions	**0.0191**	**0.457**	**0.084**	**0.000**	**0.009**	**0.002**

Notes:
1. Based on GRI GLYCalc 4.0 run at maximum design conditions of dry gas flow rate at 50 MMscfd, temperature at 60°F, and pressure at 1000 psig.
2. The proposed control system consists of a reboiler with flare backup which is expected to achieve 98% removal of VOC/HAP.

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 8. Fuel Gas Heater Emissions Calculations

Fuel Gas Heater Information:

Source ID:	S017-S018
Number of Units:	2

Fuel Gas Heater Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,058
Heat Input (MMBtu/hr)	0.77
Potential Fuel Consumption (MMBtu/yr):	6,745
Max. Fuel Consumption (MMscf/hr):	0.0007
Max. Fuel Consumption (MMscf/yr):	6.4
Max. Annual Hours of Operation (hr/yr):	8,760

Fuel Gas Heater Information:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	100	lb/MMScf	0.07	0.32	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.00	0.02	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.06	0.27	AP-42, Table 1.4-1 (Jul-1998)
SO_X	0.6	lb/MMScf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM_{10}	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
$PM_{2.5}$	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO_2e)	See Table Below		90	395	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.00	0.01	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 8. Fuel Gas Heater Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	53.06	kg/MMBtu	90.09	395	40 CFR 98, Tables C-1 & C-2
CH_4	0.001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**90**	**395**	
Organic HAPs:					
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthylene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Anthracene	2.40E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benz(a)anthracene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dichlorobenzene	1.20E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.00	0.01	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:					
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP			**0.001**	**0.01**	

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 6. Control Device Emissions Calculations - Enclosed Flare on Dehydration Unit

Control Device Information:

Source ID:	CD-001
Control Type:	Enclosed Flare
Control Efficiency:	98%
Maximum Flow (ACFM)	7,222
Flare Rating (MMBtu/hr):	7.0
Pilot Rating (MMBtu/hr):	2.0
Rated Gas Combustion (MMsf/yr):	58.0
Max. Annual Hours of Operation (hr/yr):	8,760

Emissions from Combustion of Gas in Flare:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	0.09	lb/MMBtu	0.66	2.90	AP-42, Table 1.4-1 (Jul-1998)
CO	0.08	lb/MMBtu	0.56	2.44	AP-42, Table 1.4-1 (Jul-1998)
SO_X	0.001	lb/MMBtu	0.004	0.02	AP-42, Table 1.4-2 (Jul-1998)
PM_{10}	0.007	lb/MMBtu	0.05	0.22	AP-42, Table 1.4-2 (Jul-1998)
$PM_{2.5}$	0.007	lb/MMBtu	0.05	0.22	AP-42, Table 1.4-2 (Jul-1998)
GHG (CO_2e)	See Table Below		820	3,591	40 CFR 98, Tables C-1 & C-2

Greenhouse Gas (GHG) Emissions Calculations:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	53.06	kg/MMBtu	818.98	3587.14	40 CFR 98, Tables C-1 & C-2
CH_4	0.001	kg/MMBtu	0.02	0.07	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**820**	**3,591**	

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Emissions of NO_X, SO_X. CO, PM, and GHG pollutants are the result of combustion of the regenerator and flash tank vent streams in the combustor

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 7. Dehydration Unit Reboiler Emissions Calculations

Reboiler Information:

Source ID:	S016
Number of Units:	1

Reboiler Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,058
Heat Input (MMBtu/hr)	0.77
Potential Fuel Consumption (MMBtu/yr):	6,745
Max. Fuel Consumption (MMscf/hr):	0.0007
Max. Fuel Consumption (MMscf/yr):	6.4
Max. Annual Hours of Operation (hr/yr):	8,760

Reboiler Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	100	lb/MMScf	0.07	0.32	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.004	0.02	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.06	0.27	AP-42, Table 1.4-1 (Jul-1998)
SO_X	0.6	lb/MMScf	0.0004	0.002	AP-42, Table 1.4-2 (Jul-1998)
PM_{10}	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
$PM_{2.5}$	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	0.0001	0.0002	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO_2e)	See Table Below		90	395	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.001	0.01	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 7. Dehydration Unit Reboiler Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	53.06	kg/MMBtu	90.09	395	40 CFR 98, Tables C-1 & C-2
CH_4	0.001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**90**	**395**	
Organic HAPs:					
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthylene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Anthracene	2.40E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benz(a)anthracene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dichlorobenzene	1.20E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.00	0.01	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:					
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP			**0.001**	**0.01**	

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 9. Storage Tank Emissions Calculations - Produced Fluids Tank

Storage Tank Information:

Source ID:	S019
Tank Capacity (gallons):	8,820
Tank Contents:	Produced Fluids
Annual Throughput (gallons/year):	91,350
Daily Throughput (bbl/day)	6
Percent Condensate	1%
Condensate Throughput (bbl/day)	0.1
Control Type:	None
Control Efficiency:	N/A
Max. Annual Hours of Operation (hr/yr):	8,760

Tank Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	0.05	0.21	0.05	0.21	E&P TANK 2.0
HAPs	0.00	0.00	0.00	0.00	E&P TANK 2.0
GHG (CO2e)	0.48	2.10	0.48	2.10	E&P TANK 2.0

E & P Tanks Emissions Data:

Pollutant	Total Emissions (Working + Breathing + Flashing)			Total Emissions		
	lbs/hr	lbs/yr	tpy	lbs/hr	lbs/yr	tpy
VOC	0.05	429.24	0.21	0.05	429.24	0.21
HAPs	0.00	0.00	0.00	0.00	0.00	0.00
GHG (CO_2e)	0.48	4,161.00	2.10	0.48	4,161.00	2.10

Notes:
1. E & P TANK software estimates working, breathing, and flashing losses and reports as one total. Emissions are based on a conservative estimate of 99 % water and
2. This tank does contain hydrocarbons that could be flashed off at tank operating conditions.

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 10. Miscellaneous Storage Tank Emissions Calculations

Storage Tank Information:

Source ID:	S020	S021	S022	S023	S024	S025	S026
Tank Capacity (gallons):	4,200	2,100	2,100	2,100	2,100	2,100	2,100
Tank Contents:	Used Oil	TEG	Used TEG	MEG	Used MEG	Engine Oil	Compressor Oil
Annual Throughput (gallons/year):	2,100	2,100	1,050	1,050	1,050	2,100	4,200
Control Type:	None	None	None	None	None	None	None
Control Efficiency:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max. Annual Hours of Operation (hr/yr):	8,760	8,760	8,760	8,760	8760	8,760	8,760

Emissions Data:

Pollutant	Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)	
	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAPs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:
1. EPA TANKS software run for engine/compressor oil and used oil tanks are using properties of distillate fuel oil #2.
2. EPA TANKS software run for TEG and Used MEG are using properties of propylene glycol.
3. These tanks do not contain hydrocarbons that would be expected to be flashed off at tank operating conditions

Tank Emissions Data:

Pollutant	Working and Breathing		Flashing		Emissions Estimation Method	Total Uncontrolled	
	lbs/hr	tpy	lbs/hr	tpy		lbs/hr	tpy
VOC	0.00	0.00	0.00	0.00	N/A	0.00	0.00
HAPs	0.00	0.00	0.00	0.00	N/A	0.00	0.00
Methane	0.00	0.00	0.00	0.00	N/A	0.00	0.00

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 11. Fugitive Emissions Calculations

Fugitive Component Information:

Component Type	Estimated Component Count	Gas Leak Emission Factor (lb/hr/component)	Factor Source	Average Gas Leak Rate (lb/hr)	Max Gas Leak Rate (tpy)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
Connectors	1,970	0.0004	EPA Protocol, Table 2-4	0.87	4.18	0.12	0.01
Flanges	985	0.001	EPA Protocol, Table 2-4	0.85	4.08	0.11	0.00
Open-Ended Lines	55	0.004	EPA Protocol, Table 2-4	0.24	1.17	0.03	0.00
Pump Seals	0	0.005	EPA Protocol, Table 2-4	0.00	0.00	0.00	0.00
Valves	355	0.010	EPA Protocol, Table 2-4	3.52	16.97	0.47	0.02
Other	32	0.019	EPA Protocol, Table 2-4	0.62	2.99	0.08	0.00
Total				**6.10**	**29.39**	**0.82**	**0.04**

Notes:
1. "Other" equipment types include compressor seals, relief valves, diaphragms, drains, meters, etc
2. The component count is a preliminary estimate based on the proposed design of the station
3. Conservatively assumed that maximum leak rate is 10% greater than measured average leak rate for the purposes of establishing PTE
4. VOC and HAP emissions are based on fractions of these pollutants in the site-specific gas analysis

Dry Seal Emissions

Number of Compressors	Number of seals Per Compressor	Leak Rate (scf/hr/seal)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
2	2	6	210,240	0.11	0.00	0.01	4.22	105.62
Total				**0.11**	**0.00**	**0.01**	**4.22**	**105.62**

1. Leak rate and seal information from EPA Natural Gas Star Program (http://www.epa.gov/gasstar/documents/ll_wetseals.pdf

Rod Packing Emissions

Number of Compressors	Number of Rods Per Compressor	Leak Rate (scf/hr/rod)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
2	6	15	1,576,800	0.83	0.02	0.08	31.68	792.12
Total				**0.83**	**0.02**	**0.08**	**31.68**	**792.12**

1. Caterpillar does not publish specific crankcase and rodpacking emission leak rates. The leak rates are based on engineering estimates on the operation of the engines

Engine Crankcase Emissions

Number of Engines	Engine Rating (hp)	Leak Rate (scf/bhp-hr)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HCHO Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
2	5,350	0.5	46,866,000	0.06	0.03	0.04	60.21	0.51	73.08
Total				**0.06**	**0.03**	**0.04**	**60.21**	**0.51**	**73.08**

Flow Rate of Engine[1] 32,209 ft^3/min
1. From Vendor data sheet

Engine Crankcase Exhaust Composition

Constituent	Engine Exhaust Emissions (tpy)	Composition of Exhaust Gas (lb/MMscf)
VOC	23	2.75
HCHO	10	1.22
Total HAP	14	1.62
CO_2	21,749	2,569
CH_4	186	21.97

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Operational Emissions

TABLE 11. Fugitive Emissions Calculations

VOC and HAP Vented Blowdown Emissions

Blowdown Emissions Sources	Vented Gas Volume Per Blowdown Event (scf)	Number of Blowdown Events per year	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
Station ESD Vent	1,500,000	1	1,500,000	0.79	0.02
Pigging and Pipeline Blowdowns			2,000,000	1.05	0.03
Reciprocating Compressors	50,000	24	1,200,000	0.63	0.02
Centrifugal Compressors	200,000	8	1,600,000	0.84	0.02
Total				**3.30**	**0.09**

Density of natural gas: 0.05 lb/ft^3 @ STP (www.engineeringtoolbox.com)

GHG Vented Blowdown Emissions

Blowdown Emissions Sources	Vented Gas Volume Per Blowdown Event (scf)	Number of Blowdown Events per year	Total Volume NG Emitted (scf/yr)	Potential CH_4 Emissions[1] (tpy)	Potential CO_2 Emissions[1] (tpy)	Potential CO_2e Emissions (tpy)
Station ESD Vent	1,500,000	1	1,500,000	30.14	0.08	754
Pigging and Pipeline Blowdowns			2,000,000	40.18	0.10	1,005
Reciprocating Compressors	50,000	24	1,200,000	24.11	0.06	603
Centrifugal Compressors	200,000	8	1,600,000	32.15	0.08	804
Total				**126.6**	**0.32**	**3,165**

1. Calculated in accordance with Equations W-14 and W-35, and W-36 in Subpart W of 40 CFR 98

GHG Fugitive Emissions from Component Leaks:

Component Type	Estimated Component Count	GHG Emission Factor		CH_4 Emissions	CO_2 Emissions	CO_2e Emissions
		(scf/hr/component)	Factor Source	(tpy)	(tpy)	(tpy)
Connectors	1,970	0.004	40 CFR 98, Table W-1A	1.39	0.004	34.68
Flanges	985	0.004	40 CFR 98, Table W-1A	0.69	0.002	17.34
Open-Ended Lines	55	0.061	40 CFR 98, Table W-1A	0.59	0.001	14.76
Pump Seals	0	13.3	40 CFR 98, Table W-1A	0.00	0.000	0.00
Valves	355	0.03	40 CFR 98, Table W-1A	1.69	0.004	42.18
Other	32	0.04	40 CFR 98, Table W-1A	0.23	0.001	5.63
Total				**4.58**	**0.01**	**114.59**

Notes:
1. The component count is a preliminary estimate based on the proposed design of the station
2. CH_4 and CO_2 emissions are based on fractions of these pollutants in the site-specific gas analysis
3. Emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CC_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

Fugitive Component Emissions Data:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	1.17	5.13	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
HCHO	0.01	0.03	Concentration and Vented Volume
HAPs	0.04	0.19	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
GHG (CO_2e)	970	4,250	40 CFR 98, Table W-1A and Site-Specific Gas Analysis

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 12. Liquid Loading Emissions Calculations

Liquid Loading Information:

Parameter	Value	Description
S	1.45	saturation factor for splash loading (AP-42 Table 5.2-1)
Collection Efficiency	0%	
Control Efficiency	0%	
P	0.21	true vapor pressure of liquid loaded (psia) - assume octane
M	114.23	molecular weight of vapors (lb/lb-mol) - assume octane
T	516.4	temperature of liquids loaded (deg R) - TANKS Data

Description	Loading Losses	Maximum Throughput[2]	VOC Emissions	
	($lb/10^3$ gal)[1]	(gal)	(lb/hr)	(tpy)
Liquids Hauling	0.8	91,350	0.01	0.04

Notes:
1. Uncontrolled Loading Losses: L_L ($lb/10^3$ gal) = 12.46 (SPM)/T
2. Produced fluids throughput.

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 13. Site-Specific Gas Analysis

Sample Location: Pratt Station
Sample Date: 4/21/2015
HHV (Btu/scf): 1,058

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)
N2	0.1358	0.224
METHANE	94.9365	89.860
CO2	0.0877	0.228
ETHANE	3.8895	6.902
PROPANE	0.566	1.473
I-BUTANE	0.0805	0.276
N-BUTANE	0.1393	0.478
I-PENTANE	0.0413	0.176
N-PENTANE	0.0339	0.144
N-HEXANE	0.0239	0.122
HEPTANES	0.0198	0.117
Totals	99.954	100.000

*Gas Analysis showed no detectable compounds above heptanes.

TOC (Total)	99.73	99.55
VOC (Total)	0.90	2.79
HAP (Total)	0.02	0.12

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 14. Atmospheric Emissions from Each Source at the Facility

Source	Pollutants																	
	VOC		NO_X		CO		HCHO		Total HAPs		PM_{10}		$PM_{2.5}$		SO_X		GHG (CO_2e)	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Engine 1 (S001)	2.12	9.30	4.72	20.66	1.95	8.53	0.59	2.58	1.36	5.95	0.40	1.73	0.40	1.73	0.02	0.10	6,030	26,410
Engine 2 (S002)	2.12	9.30	4.72	20.66	1.95	8.53	0.59	2.58	1.36	5.95	0.40	1.73	0.40	1.73	0.02	0.10	6,030	26,410
Turbine 1 (S003)	0.59	2.58	5.03	22.02	5.11	23.38	0.26	1.13	0.29	1.26	1.62	7.08	1.62	7.08	0.31	1.34	10,651	46,779
Turbine 2 (S004)	0.59	2.58	5.03	22.02	5.11	23.38	0.26	1.13	0.29	1.26	1.62	7.08	1.62	7.08	0.31	1.34	10,651	46,779
Microturbine 1 (S005)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 2 (S006)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 3 (S007)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 4 (S008)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 5 (S009)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 6 (S010)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 7 (S011)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 8 (S012)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 9 (S013)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 10 (S014)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Dehy Regenerator (S015)	0.09	0.39	N/A	N/A	N/A	N/A	--	--	0.06	0.26	N/A	N/A	N/A	N/A	N/A	N/A	0.26	1.13
Dehy Flash Tank (S015)	0.03	0.14	N/A	N/A	N/A	N/A	--	--	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	5	22
Dehy Reboiler (S016)	0.00	0.02	0.07	0.32	0.06	0.27	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	90	395
Dehy Enclosed Flare (CD-001)	--	--	0.66	2.90	0.56	2.44	--	--	--	--	0.05	0.22	0.05	0.22	0.00	0.02	820	3,591
Fuel Gas Heater 1 (S017)	0.00	0.02	0.07	0.32	0.06	0.27	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	90	395
Fuel Gas Heater 2 (S018)	0.00	0.02	0.07	0.32	0.06	0.27	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	90	395
Produced Fluids Tank (S019)	0.05	0.21	--	--	--	--	--	--	0.00	0.00	--	--	--	--	--	--	0	2
Misc Tanks Tank (S020-S026)	0.00	0.00	--	--	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--
Fugitive Leaks	1.17	5.13	--	--	--	--	0.01	0.03	0.04	0.19	--	--	--	--	--	--	970	4,250
Liquid Loading	0.01	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Facility-Wide	**6.98**	**30.59**	**21.17**	**92.73**	**17.05**	**76.69**	**1.72**	**7.53**	**3.42**	**14.99**	**4.24**	**18.58**	**4.24**	**18.58**	**0.74**	**3.24**	**38,090**	**167,091**

Notes:
1. PM_{10} and $PM_{2.5}$ emissions are filterable + condensable.
2. VOC emissions for the engines are conservatively estimated as: VOC=NMNEHC+HCHO (Formaldehyde)

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Operational Emissions**

TABLE 15. Total Emissions from All Sources at the Facility

Pollutants	Estimated Site-Wide Emissions	
	lb/hr	tpy
VOC	6.98	30.59
NO_X	21.17	92.73
CO	17.05	76.69
Formaldehyde (HCHO)	1.72	7.53
Total HAPs	3.42	14.99
SO_X	0.74	3.24
PM_{10}	4.24	18.58
$PM_{2.5}$	4.24	18.58
GHG (CO_2e)	38,090	167,091

Notes:
1. PM_{10} and $PM_{2.5}$ emissions are filterable + condensable.
2. Emissions from all sources at the facility are included above.

Equitrans Expansion Project

Docket No. CP16- -000

Resource Report 9

Appendix 9-D
Pennsylvania State Plan Approval Applications

EQT Plaza
625 Liberty Avenue, Suite 1700
Pittsburgh PA 15222
www.eqt.com

TEL: (412) 395-3654

Mark Sowa
Sr. Environmental Coordinator

CERTIFIED MAIL # 7015 0640 0000 9694 3482

October 21, 2015

Mark Gorog
Air Quality Permitting
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

**Subject: Plan Approval Application
Equitrans, LP – Redhook Compressor Station**

Dear Mr. Gorog:

Equitrans, LP (Equitrans) is submitting this application to obtain a plan approval permit for the construction and operation of a new natural gas compressor station located in Franklin Township, Greene County, PA (Redhook Compressor Station). Upon completion and commissioning of the proposed Redhook station, the existing Pratt Station will be abandoned and decommissioned, and the existing gas contracts from the Pratt Station will be re-routed to the Redhook Compressor Station.

The main proposed sources of air emissions at the Redhook Station will be:

- Two (2) 5,350 hp CAT G3616 engines equipped with oxidation catalysts for emissions control;
- Two (2) 11,311 hp Solar Taurus -70 turbines equipped with SoLoNO$_x$™ technology for emissions control;
- One (1) triethylene glycol (TEG) dehydration unit (50 MMscfd) with associated flash tank, natural gas fired reboiler (0.77 MMbtu/hr heat input) and enclosed ground flare (7.0 MMbtu/hr);
- Ten (10) microturbine generators (200 kW, each);
- Two (2) natural gas fired fuel heaters (0.77 MMBtu/hr heat input, each);
- One (1) produced fluids storage tanks (8,820 gallons); and
- Seven (7) miscellaneous storage tanks (each 4,200 gallons or less).

Included in the Plan Approval Application are local municipal and county notifications describing the proposed sources. Proof of these notifications shall be submitted to PADEP upon receipt of the Certified Mail Return Receipts.

The enclosed application contains the required application forms and support material and is filed in triplicate. The required documents and associated application fee of $1,700 in the form of a check made payable to the Commonwealth of Pennsylvania, Clean Air Fund is provided in the attachments to this letter as outlined below:

- Section 1: Executive Summary
- Section 2: Project Description
- Section 3: Applicable Regulations Review (Includes Aggregation Analysis)
- Section 4: Best Available Technology (BAT) Review
- Section 5: Potential Emissions Calculations
- Appendix A : Area Maps and Process Flow Diagram
- Appendix B : Detailed Emission Calculations and BAT Analysis
- Appendix C : Manufacturer's Specifications
- Appendix D: Plan Approval Application Forms
- Appendix E: General Information Form (GIF)
- Appendix F: Compliance Review Form
- Appendix G: County & Municipal Notifications
- Appendix H: Application Fee

Equitrans, LP appreciates your review of this application. Should you have any questions pertaining to this matter, please contact me at (412)-395-3654 or msowa@eqt.com.

Sincerely,

Mark A. Sowa

Mark A. Sowa
Sr. Environmental Coordinator

PROJECT REPORT
Equitrans LP > Redhook Compressor Station

Plan Approval Application

Prepared By:

TRINITY CONSULTANTS
4500 Brooktree Road
Suite 103
Wexford, PA 15090
(724) 935-2611

October 2015

Project Report 153901.0086

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

Equitrans, LP (Equitrans) is planning to construct a new natural gas compressor station in Franklin Township, Greene County, PA (the Redhook Compressor Station). EQT is submitting this Plan Approval application seeking authorization for the installation of the equipment associated with the construction of the compressor station.

The Redhook Station will be located on Braden Run Road in Waynesburg, PA, and will be a minor source of air emissions with respect to New Source Review. Emissions from the equipment associated with the proposed compressor station is reflected in site-wide total emissions shown in this Plan Approval application.

The following sections of this application report address the following topics:

- Section 2: Project Description
- Section 3: Applicable Regulations Review (Includes Aggregation Analysis)
- Section 4: Best Available Technology (BAT) Review
- Section 5: Potential Emissions Calculations
- Appendix A : Area Maps and Process Flow Diagram
- Appendix B : Detailed Emission Calculations and BAT Analysis
- Appendix C : Manufacturer's Specifications
- Appendix D: Plan Approval Application Forms
- Appendix E: General Information Form (GIF)
- Appendix F: Compliance Review Form
- Appendix G: County & Municipal Notifications
- Appendix H: Application Fee

2. PROJECT DESCRIPTION

The proposed Redhook Compressor Station will be a natural gas transmission facility covered under Standard Industrial Classification (SIC) Code 4922 and regulated by the Federal Energy Regulatory Commission (FERC). The station will compress and dehydrate natural gas from the Equitrans interstate transmission pipeline system to be transported downstream along the transmission system. The Redhook Station will have the potential to operate 24 hours per day, 7 days per week and 365 days per year.

The proposed equipment to be installed at the Redhook Compressor Station is as follows: two (2) Caterpillar (CAT) G3616 natural gas compressor engines (rated at 5,350 hp each) equipped with oxidation catalysts, two (2) Solar Taurus-70 natural gas fired turbines (rated at 11,311 HP each), one (1) tri-ethylene glycol (TEG) dehydration unit (rated at 50 million standard cubic feet per day [MMSCFD]) equipped with associated reboiler (heat input rated at 0.77 MMBtu/hr) and enclosed flare (rated at 7.00 MMBtu/hr), two (2) natural gas fired fuel gas heaters (rated at 0.77 MMBtu/hr heat input each), ten (10) Capstone microturbine generators (each rated at 200 Kilowatts of electricity (kWe) for power generation), one (1) 8,820 gallon produced fluid tank, seven (7) miscellaneous storage tanks and associated piping and components. All proposed operations are described in detail below and depicted on a process flow diagram included in Appendix A.

2.1 COMPRESSOR ENGINES

Equitrans is proposing to install two (2) natural gas-fired reciprocating engines (each rated at 5,350 hp) for the compression and transmission of natural gas. The engines will be 4-stroke, lean burn, spark ignition engines each rated at 5,350 hp and equipped with oxidation catalyst for control of carbon monoxide (CO), non-methane/non-ethane hydrocarbon (NMNEHC), and formaldehyde emissions. The compressor engines are expected to operate on a full-time basis and as such are being permitted for 8,760 hours per year. Manufacturer's specifications for the engines and oxidation catalysts are included in Appendix C.

The function of these reciprocating compressors is to raise the pressure of the gas to overcome the higher operating pressure in the transmission pipeline downstream of the proposed station.

2.2 SOLAR TURBINES

Equitrans is proposing to install two (2) natural gas fired compression turbines for the compression and transmission of natural gas. The turbines are rated at 11,311 hp and are equipped with Solar's SoLoNO$_X$™ combustion technology. The SoLoNO$_X$™ technology limits the formation of NO$_X$, CO, and VOC by pre-mixing air and fuel prior to combustion. Manufacturer's specifications for the turbines are included in Appendix C.

2.3 TEG DEHYDRATION UNIT AND ASSOCIATED REBOILER

Equitrans is proposing to install one (1) TEG dehydration unit (rated at 50 MMSCFD of gas throughput) with associated reboiler and enclosed flare. The dehydration unit introduces TEG to the natural gas stream in packed contact towers to absorb water vapor from the gas to a level not exceeding 7 pounds per million cubic feet (lb/MMcf). The rich glycol is then sent to flash tank which removes trace organic compounds present in moisture rich glycol and then is sent to the associated reboiler where the water is evaporated from the glycol. The natural gas stream from the contact tower flows into the pipeline to be transported downstream to the transmission pipeline system. Emissions from dehydration unit are generated at three distinct points: the flash tank vent, the regenerator overheads emissions, and fuel combustion in the reboiler.

The flash gas generated is used to fuel the associated reboiler burner, while the excess flash gas and the regenerator overhead stream are be routed to the enclosed flare for emission control. The reboiler burner is used to maintain glycol temperature, and the combustion emissions from the burner are vented though a separate stack. The dehydration unit will operate continuously (i.e. 8,760 hours per year).

2.4 FUEL GAS HEATERS

Equitrans is proposing to install two (2) natural gas-fired fuel gas heaters each rated at 0.77 MMBtu/hr of heat input at the Redhook Compressor Station. The heater will operate continuously (i.e. 8,760 hours per year) and preheat natural gas to maintain temperature above dewpoint prior to combustion.

2.5 STORAGE TANKS

Equitrans is proposing to install one (1) 8,820 gallon produced fluids storage tank, one (1) 4,200 gallon used oil tank, one (1) 2,100 gallon TEG tank, one (1) 2,100 gallon used TEG tank, one (1) 2,100 gallon mono-ethylene glycol (MEG) tank, one (1) 2,100 gallon used MEG tank, one (1) 2,100 gallon engine oil tank, and one (1) 2,100 gallon compressor oil tank. The true vapor pressure of the contents of these tanks will be less than 1.5 psia.

2.6 MICROTURBINE GENERATORS

Equitrans is proposing to install ten (10) natural gas-fired microturbine generators, each rated at 200 kW of electricity, as part of this project. The generators will operate continuously (i.e. 8,760 hours per year) and will serve as the primary source of power at this facility.

3. APPLICABLE REGULATIONS REVIEW

Authorization to begin construction and initially operate a new or modified source must be obtained by complying with key regulatory elements:

- Title V of the 1990 Clean Air Act Amendments (as incorporated and implemented in the Pennsylvania SIP under 25 PA Code §127.501 – 127.543);
- Prevention of Significant Deterioration (PSD) and/or Nonattainment New Source Review programs (NNSR) [both parts of the federal New Source Review (NSR) as incorporated by reference under 25 PA Code §127.81 – 127.83 for PSD and implemented in the Pennsylvania SIP under 25 PA Code §127.201 – 127.218 for NNSR];
- Applicable federal and state emission standards and control programs contained in the Pennsylvania State Implementation Plan (SIP).

This section of the report addresses the conformity of the proposed project to these permitting programs and requirements. The proposed project is subject to 25 PA Code §127.11 – 127.51 plan approval requirements, as reflected by the application for a plan approval contained herein.

3.1 SOURCE AGGREGATION ANALYSIS

To determine applicability of various permitting programs to the proposed Redhook Compressor Station, a single source determination must be performed for the site. According to the Department's Guidance for Performing Single Stationary Source Determinations for Oil and Gas Industries (Docket 270-0810-006), the following three factors must all be met in order for emission sources to be aggregated and considered a single facility: (1) the sources all belong to the same industrial grouping; (2) the activities are located on one or more contiguous or adjacent properties; and (3) the activities are under common control.

The proposed Redhook Station will move gas from the northern portion of the Equitrans system south to a future interconnection with Mountain Valley Pipeline LLC's (Mountain Valley) proposed pipeline, as well as to existing interconnects with Texas Eastern Transmission, LP (Texas Eastern) and Dominion Transmission, Inc. (Dominion) on the southern portion of the Equitrans system.

The nearest facilities owned or operated by Equitrans to the proposed Redhook Compressor Station in Greene County are the Jefferson Compressor Station, the Pratt Compressor Station, and the Waynesburg Compressor Station. Upon completion and commissioning of the proposed Redhook station, the existing Pratt Station will be abandoned and decommissioned, and the existing gas contracts from the Pratt Station will be re-routed to the Redhook Compressor Station.

The Jefferson Station receives gas from third-party producers located in West Virginia and is strategically located close to the Texas Eastern (and Dominion) gas transmission line to facilitate transport of gas production to market on the East Coast via high-pressure interstate transmission lines. This station is not currently planned to have any direct tie-ins with the proposed Redhook Station that would require coordinated operation. The Jefferson Station is located approximately 2.8 miles from the location of the proposed Redhook Station.

The Waynesburg Station handles gas to market or storage, again primarily in Western Pennsylvania, which does not come from the sources which provide gas to the Redhook Station. This station is not currently planned to have any direct tie-ins with the proposed Redhook Station, nor swap or exchange gas between stations. The Waynesburg Station is located approximately 1.6 miles from the location of the proposed Redhook Station.

The area within a 50-mile radius of the proposed Redhook Station currently contains hundreds of well sites owned/operated by numerous different companies. EQT Production (a sister subsidiary of Equitrans) currently owns and operates wells in this area that currently send gas to the Pratt Station. While some of these wells may be located near the proposed Redhook Station, none have a unique or dedicated interdependent relationship with the site, and therefore should not be considered contiguous with the site. Furthermore, the proposed Redhook Station is a transmission compressor station, not a production facility or gas processing plant. Well sites are classified under Standard Industrial Code (SIC) Industry Group 1311 - *Crude Petroleum and Natural Gas*, whereas the proposed Redhook Station will be classified under SIC Industry Group 4922 - *Natural Gas Transmission*

As a result of the above-described analysis, Equitrans has determined that the proposed Redhook Compressor Station is a single source and should not be aggregated with any other source.

3.2 TITLE V AND STATE PERMITTING REQUIREMENTS

The Title V Operating Permit program applies to stationary sources with the potential to emit over 100 tons per year (tpy), or a lower major source threshold defined by nonattainment status, of any individual criteria air pollutant, 10 tpy of any individual Hazardous Air Pollutant (HAP), or 25 tpy of combined HAPs. Since this site is in Greene County, PA which is in the ozone transport region, a major source threshold of 50 tpy is applicable for VOC. Maximum potential emissions for NO_X, VOC, and total HAP from the Redhook Compressor Station will not exceed the major source thresholds for Title V. Therefore, the Redhook Compressor Station will be a minor source with respect to the Title V Program after the construction of the proposed project.

With respect to greenhouse gases (GHGs), EPA had previously incorporated provisions into the existing Title V rules via the Greenhouse Gas Tailoring Rule. These included the specification of a major source threshold and subject to regulation/significant emission rate of 100,000 tpy and 75,000 tpy of carbon dioxide equivalent (CO_2e), respectively[1], for current projects. On June 23, 2014, the U.S Supreme Court decision in the case of *Utility Air Regulatory Group v. EPA* effectively changed the permitting procedures for greenhouse gases (GHGs) under the PSD and Title V programs[2]. In essence, GHGs remain "subject to regulation" but only for sources which otherwise trigger Title V requirements. As such, the Redhook Compressor Station is not subject to the regulation of GHG emissions, as it does not trigger Title V requirements.

3.3 MAJOR NEW SOURCE REVIEW (25 PA CODE §127)

The federal New Source Review (NSR) program applies to major stationary sources. The NSR permitting regulations are comprised of two programs: 1) Prevention of Significant Deterioration (PSD) for projects located in areas where specified pollutant levels have met National Ambient Air Quality Standards (NAAQS); and 2) Nonattainment New Source Review (NNSR) for projects located in areas where pollutant levels have not attained the corresponding NAAQS. The NSR program regulates the installation of new major sources or major modifications to existing major sources. The Redhook Compressor Station is located in Greene County which is classified as attainment with all NAAQS except for ozone and $PM_{2.5}$ (certain areas, but not the proposed location). The state of Pennsylvania is in the Ozone Transport Region (OTR) and therefore the entire state is classified as moderate nonattainment for ozone. The Redhook Compressor Station will be a minor source of all regulated pollutants, therefore NSR will not be triggered by this project.

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[1] CO_2e is carbon dioxide equivalents calculated as the sum of the six well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) with applicable global warming potentials per 40 CFR 98 applied.
[2] http://www.supremecourt.gov/opinions/13pdf/12-1146_4g18.pdf

Table 3-1: NSR Major Source Thresholds

Pollutant	Potential Site-Wide PTE (TPY)[1]	Major Source Threshold (TPY)	NSR Program	Subject to Major NSR?
PM_{10}	18.58	250	PSD	No
$PM_{2.5}$	18.58	250	PSD	No
SO_2	3.24	250	PSD	No
CO	76.69	250	PSD	No
NO_X	92.73	100	NNSR[2]	No
VOC	30.59	50	NNSR	No
CO_2e	167,091	NA[3]	PSD	No

[1] PTE includes site-wide emissions from all sources, including storage tanks, fugitive leaks, and blowdowns.
[2] NO_2 is also a regulated PSD pollutant with a major source threshold of 250 tpy.
[3] Only applicable if another pollutant exceeds major source threshold for PSD.

The estimated emissions as a result of the proposed project, as shown in Table 3-1, are below major source thresholds for NSR under 25 Pa Code Section 127, Subchapter E and PSD permitting under 25 Pa Code Section 127, Subchapter D. As such, NSR is not applicable to this plan approval application.

3.4 POTENTIALLY APPLICABLE FEDERAL EMISSIONS STANDARDS

Two types of federal emission standards could apply to certain operations being permitted as part of this project. These emission standards are: New Source Performance Standards (NSPS) codified in 40 CFR 60 and National Emission Standards for Hazardous Air Pollutants (NESHAP) standards codified in 40 CFR 63.

3.4.1. National Emission Standards for Hazardous Air Pollutants (NESHAP or MACT)

Regulatory requirements for facilities subject to NESHAP standards, otherwise known Maximum Available Control Technology (MACT) Standards for source categories, are contained in 40 CFR Part 63. 40 CFR Part 61 NESHAP standards are defined for specific pollutants while Part 63 NESHAPs are defined for source categories where allowable emission limits are established on the basis of a MACT determination for a particular major source. A major source of HAP is defined as having potential emissions in excess of 25 tpy for total HAP and/or potential emissions in excess of 10 tpy for any individual HAP. Part 63 NESHAPs apply to sources in specifically regulated industrial source categories (CAA Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

Historically NESHAPs have only been applicable to major sources of HAP. However, recently the U.S. EPA has been promulgating area source NESHAP standards to address area (or minor) source categories that represent ninety percent of the emissions of a specific list of urban air toxics under Section 112(c) of the Clean Air Act. Potential HAP emissions from the proposed Redhook Compressor Station will be below the major source thresholds and therefore the facility will be an area source of HAP. The potential applicability of specific MACT standards to the Redhook Compressor Station is discussed below.

3.4.1.1. NESHAP Subpart HH - Natural Gas Production Facilities

Glycol dehydration units are potentially subject to Subpart HH. This standard applies to such units at natural gas production facilities that are major or area sources of HAP emissions. The proposed Redhook Station is a transmission facility; therefore, this facility will not be subject to Subpart HH.

3.4.1.2. NESHAP Subpart HHH - Natural Gas Transmission and Storage Facilities

Glycol dehydration units are potentially subject to Subpart HHH, *NESHAP from Natural Gas Transmission and Storage Facilities.* This standard applies to such units at natural gas transmission and storage facilities that are major sources of HAP emissions located downstream of the point of custody transfer (after processing and/or treatment in the production sector), but upstream of the distribution sector. The proposed Redhook Compressor Station is a transmission facility and is an area source of HAP emissions. Therefore, this facility will not be subject to Subpart HHH.

3.4.1.3. NESHAP Subpart YYYY - Stationary Combustion Turbines.

Stationary combustion turbines located at facilities that are major sources of HAPs are potentially subject to Subpart YYYY, NESHAP for Stationary Combustion Turbines. Subpart YYYY establishes emissions and operating limitations for lean premix gas-fired, lean premix oil-fired, diffusion flame gas-fired and diffusion flame oil-fired stationary combustion turbines. The proposed Redhook Station is a minor source of HAP and therefore is not subject to the requirements of this subpart.

3.4.1.4. NESHAP Subpart ZZZZ - Stationary Reciprocating Internal Combustion Engines

Stationary reciprocating internal combustion engines (RICE) at both area and major sources of HAP emissions are potentially subject to Subpart ZZZZ – *NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE).* Stationary RICE at facilities that are major sources of HAP are considered new if they are ordered after June 12, 2006. Per 40 CFR §63.6590(c), new area source stationary RICE are required to meet the requirements of this MACT standard by meeting the applicable requirements of the applicable New Source Performance Standard in 40 CFR 60 (Subpart IIII for compression ignition engines and Subpart JJJJ for spark ignition engines). No further requirements apply to such engines under NESHAP Subpart ZZZZ.

The two (2) proposed CAT 3616 compressor engines at the proposed Redhook Compressor Station will comply with Subpart ZZZZ by complying with 40 CFR 63, Subpart JJJJ as described in the following section.

3.4.1.5. *NESHAP Subpart DDDDD* - Industrial, Commercial, and Institutional Boilers and Process Heaters (Major Source Boiler MACT)

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types at major sources of HAP. The proposed facility is an area source of HAP; therefore, the requirements of this subpart will not apply.

3.4.1.6. NESHAP Subpart JJJJJJ - Industrial, Commercial, and Institutional Boilers (Area Source Boiler MACT)

This MACT standard applies to industrial, commercial, and institutional boilers of various sizes and fuel types. The proposed units are natural gas-fired and are specifically exempt from this subpart. Therefore, the requirements of this subpart will not apply.

3.4.2. New Source Performance Standards (NSPS)

Pennsylvania has received delegation from EPA to regulate facilities subject to NSPS. Regulatory requirements for facilities subject to NSPS are contained in Pennsylvania SIP in 25 Pa Code §122 and 40 CFR Part 60. The potential applicability of NSPS standards to the proposed operations at the Redhook Compressor Station are:

- 40 CFR Part 60 Subpart Dc – Steam Generating Units
- 40 CFR Part 60 Subpart GG – Stationary Gas Turbines
- 40 CFR Part 60 Subpart K/Ka/Kb – Storage Vessels for Petroleum Liquids/Volatile Organic Liquids
- 40 CFR Part 60 Subpart JJJJ – Stationary Spark Ignition Internal Combustion Engine
- 40 CFR Part 60 Subpart KKKK – Stationary Combustion Turbines
- 40 CFR Part 60 Subpart OOOO – Crude Oil and Natural Gas Production, Transmission, and Distribution

3.4.2.1. NSPS Subpart Dc - Steam Generating Units

Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, applies to all steam generating units with a heat input greater than or equal to 10 MMBtu/hr and less than 100 MMBtu/hr. No units at the proposed facility meet the definition of a steam generating unit and have a heat input greater than 10 MMBtu/hr; therefore, the requirements of this subpart will not apply.

3.4.2.2. NSPS Subpart GG - Stationary Gas Turbines

Subpart GG, Standards of Performance for Stationary Gas Turbines, applies to all gas turbines with a heat input at peak load greater than or equal to 10 MMBtu/hr based on the lower heating value of the fuel fired. This standard was promulgated in 1979. The applicability of Subpart KKKK, promulgated in 2006, is similar to that of Subpart GG and applies to stationary combustion turbines that commence construction after February 18, 2005. Turbines subject to Subpart KKKK are specifically exempt from the requirements of Subpart GG. As such, this subpart does not apply to the proposed Solar turbines at the Redhook Compressor station. The proposed microturbines are not subject to the requirements of Subpart GG based on heat input.

3.4.2.3. NSPS Subparts K, Ka, and Kb - Storage Vessels for Petroleum Liquids/Volatile Organic Liquids

These subparts apply to storage tanks of certain sizes constructed, reconstructed, or modified during various time periods. Subpart K applies to storage tanks constructed, reconstructed, or modified prior to 1978, and Subpart Ka to those constructed, reconstructed, or modified prior to 1984. All storage tanks located at the Redhook Compressor Station were constructed after these dates; therefore, the requirements of Subparts K and Ka do not apply. Subpart Kb applies to volatile organic liquid (VOL) storage tanks constructed, reconstructed, or modified after July 23, 1984 with a capacity equal to or greater than 75 m^3 (~19,813 gallons). All storage tanks at the Redhook Compressor Station were constructed after this date, but do not have a capacity greater than 75 m^3. Therefore, Subpart Kb does not apply to the storage tanks at the Redhook Compressor Station.

3.4.2.4. NSPS Subpart JJJJ - Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, applies to manufacturers, owners and operators of stationary spark (SI) engines. The requirements for SI engines with a maximum power rating greater than or equal to 500 hp (except lean burn engines 500 hp ≤ hp < 1,350) apply to owner/operators of such engines ordered on or after July 1, 2007. The proposed two (2) CAT G3616 compressor engines will be new 4-stroke, lean burn spark ignition RICE rated at 5,350 hp each. As such, the compressor engines will be subject to the following emissions standards per Table 1 to NSPS Subpart JJJJ applicable to non-emergency use engines. The compressor engines will be equipped with oxidation catalysts. All catalysts are guaranteed by the manufacturer to have emissions less than those cited in Table 3-2 below.

Table 3-2: NSPS Subpart JJJJ Emission Standards for Non-Emergency Natural Gas Engines ≥ 500 HP Manufactured On or After 7/1/2010

Pollutant	Emission Standards (g/hp-hr)	CAT G3616 Specifications - with Oxidation Catalyst (g/hp-hr)
NO_X	1.0	0.4
CO	2.0	0.17
VOC*	0.7	0.13

*VOC as defined in NSPS JJJJ does not include formaldehyde.

The proposed compressor engines at the Redhook Compressor Station will be in compliance with NSPS JJJJ emissions standards as indicated in Table 3-2.

It should be noted that 40 CFR §60.4243(b)(1) allows for compliance with this subpart to be demonstrated by purchasing an engine certified by the manufacturer according to specified procedures and then operating the engine in accordance with the manufacturer's emission-related written instructions. However, while the proposed engines at Redhook Compressor Station will be equipped with control technology to achieve the emissions limits shown in Table 3-2, certification is not available from the engine manufacturer. Therefore, Equitrans will demonstrate compliance with this subpart for all non-certified engines at the Redhook Compressor Station in accordance with 40 CFR 60.4243(b)(2)(ii), which requires Equitrans to keep a maintenance plan and records of conducted maintenance and to maintain and operate the engines, to the extent practicable, in a manner consistent with good air pollution control practices for minimizing emissions. Additionally, Equitrans will be required to conduct an initial performance test and subsequent compliance testing every 8,760 hours of operation or three (3) years, whichever comes first, to demonstrate continued compliance. Testing will be conducted in accordance with 40 CFR §60.4244.

Records of all notifications submitted to comply with this subpart, maintenance conducted on the engines, and performance testing will be maintained in accordance with 40 CFR §60.4245(a). Initial notification of construction commencement will be submitted as required in 40 CFR §60.7(a)(1) and §60.4245(c), and performance testing results will be reported as required in 40 CFR §60.4245(d).

3.4.2.5. NSPS Subpart KKKK - Stationary Combustion Turbines

Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, applies to stationary combustion units with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the higher heating value of the fuel, commencing construction after February 18, 2005. The microturbines at the Redhook Compressor station will each have a heat input less than 10 MMbtu/hr. Therefore, they are not subject to this standard.

The proposed Solar turbines for the Redhook Compressor Station will be subject to the NO_X emissions limitations in 40 CFR 60.4320(a). Turbines with a rated capacity of 50 < MMBtu/hr ≤ 850 MMBtu/hr at peak load are limited to NO_X emissions of 25 ppm at 15% O_2 when firing natural gas. The Solar turbines that will be installed at the Redhook Compressor Station are equipped with lean pre-mix combustion technology and are guaranteed by the manufacturer to emit a maximum of 15 ppm of NO_X at 15% O_2 under variable turbine load conditions when firing natural gas. This vendor guarantee is well below the NSPS KKKK standard.

Equitrans will perform annual performance tests in accordance with 40 CFR 60.4340(a) and 60.4400 to demonstrate compliance with the NO_X emission limitations, or as an alternative, will continuously monitor the appropriate parameters to determine whether the turbine is operating in low-NO_X mode in accordance with §60.4340(b)(2)(ii) and §60.4355(a). The Solar turbines must also comply with the SO_2 emission limits in 40

CFR 60.4330. Equitrans will comply with the SO_2 requirements by the exclusive use of natural gas which contains total potential sulfur emissions less than 0.060 lb SO_2/MMBtu heat input in accordance with 40 CFR 60.4330(a)(2).

3.4.2.6. NSPS Subpart OOOO - Natural Gas Production, Transmission, and Storage

Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, applies to affected facilities that commenced construction, reconstruction, or modification after August 23, 2011. This NSPS was published in the Federal Register on August 16, 2012, and subsequently amended. The list of potentially affected facilities includes:

- Gas wellheads ;
- Centrifugal compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
- Reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
- Continuous bleed natural gas-driven pneumatic controllers with a bleed rate of > 6 scfh located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment (excluding natural gas processing plants);
- Continuous bleed natural gas-driven pneumatic controllers located at natural gas processing plants;
- Storage vessels in the production, processing, or transmission and storage segments; and
- Sweetening units located onshore that process natural gas produced from either onshore or offshore wells.

Since the proposed Redhook Compressor Station will be a transmission facility located after the point of custody transfer, the only potentially applicable requirements for the proposed equipment are those for new storage vessels where construction commenced after August 23, 2011.

The standards applicable to storage vessels are detailed in 40 CFR §60.5395. The only tank that falls under the Subpart's definition of a 'storage vessel' is the produced fluid storage tank, however, this tank will have potential VOC emissions below 6 tpy. As such, per 60.5365(e), the tank is not a storage vessel affected facility under the rule.

3.5 POTENTIALLY APPLICABLE STATE STANDARDS

The Pennsylvania Code contains regulations that fall under two (2) main categories: the regulations that are generally applicable (e.g., permitting requirements), and those that have specific applicability (e.g., sulfur compound emissions from combustion units). The generally applicable requirements are straightforward (e.g., filing of emission statements) and, as such, are not discussed in further detail. The specific requirements associated with the proposed Redhook Compressor Station are discussed in the following section.

3.5.1. 25 Pa Code §123.1 and 123.2

25 Pa Code §123.1 and 123.2 *Prohibition of Certain Fugitive Emissions* and *Fugitive Particulate Matter*, both state exceptions to fugitive emissions sources and methods for controlling fugitive emissions. This regulation applies to the facility in general.

3.5.2. 25 Pa Code §123.11 and 123.13

25 Pa Code §123.11 *Particulate Emissions: Combustion Units* defines particulate matter emissions for combustion units. Combustion units are defined in §121.1 as stationary equipment used to burn fuel primarily for the

purpose of producing power or heat by indirect heat transfer such as boilers. This definition does not apply to the proposed engines, fuel gas heaters, Solar turbines, and microturbines at the Redhook Compressor Station. As such, the particulate matter emissions limitations for processes in 25 Pa Code §123.13 *Particulate Emissions: Processes* apply to these units instead.

25 Pa Code §123.13 defines particulate matter emissions limitations for processes. For processes excluded from Table 1 of §123.13(b), particulate emissions are limited to 0.04 gr/dscf and 0.02 gr/dscf for exhaust flowrates less than 150,000 dscfm and greater than 300,000 dscfm, respectively. Particulates from equipment with exhaust flowrates between 150,000 dscfm and 300,000 dscfm are limited to the allowable emission rate calculated using the formula in §123.13(c)(1)(ii). As all proposed combustion sources at the facility will be fueled exclusively with pipeline quality natural gas, potential particulate emissions from all sources are expected to comply with these requirements.

3.5.3. 25 Pa Code §123.21

25 Pa Code §123.21 *Sulfur Compound Emissions: General* states that the concentration of sulfur oxides in the effluent gas may not exceed 500 ppmvd. The proposed equipment at Redhook Compressor Station will combust pipeline quality natural gas and the sulfur oxide emissions are expected to be well below this concentration level in the combustion exhaust.

3.5.4. 25 Pa Code §123.31

25 Pa Code §123.31 *Odor Emissions* prohibits the emission of malodorous air contaminants from any source that are detectable outside the facility fence line. This regulation applies to the facility in general. Equitrans will take measures to minimize odor from the Redhook Compressor Station operations by combusting pipeline quality natural gas fuel only, by installing a flare on the TEG dehydration unit, and by use of pressure/vacuum reliefs on the produced fluid storage tank to minimize atmospheric venting under normal operations.

3.5.5. 25 Pa Code §123.41 and 123.43

25 Pa Code §123.41 *Visible Emissions: Limitations* states that a facility may not emit visible emissions equal to or greater than 20% for a period or periods aggregating more than 3 minutes in any 1 hour, or equal to or greater than 60% at any time. This standard applies to the proposed combustion units at the Redhook Compressor Station. The use of pipeline quality natural gas as fuel will ensure compliance with this requirement.

3.5.6. 25 Pa Code §127.11

25 Pa Code §127.11 outlines requirements for Plan Approvals required to authorize construction or modification of air contamination sources. Construction, installation, modification, or reactivation of air contaminant sources or air pollution control devices is prohibited unless otherwise approved by the Department. The construction of new equipment at the proposed Redhook Compressor Station is subject to Plan Approval permitting requirements under this requirement.

3.5.7. 25 Pa Code §129.57

25 Pa Code §129.57 contains requirements for storage vessels less than 40,000 gallons in capacity that contain VOCs. Under this section, above-ground storage tanks with a capacity greater than or equal to 2,000 gallons which contain VOCs with a vapor pressure greater than 1.5 psia must be equipped with pressure relief valves which are maintained in good operating condition and which are set to release at no less than 0.7 psig of pressure or 0.3 psig of vacuum (or the highest possible pressure and vacuum in accordance with state or local fire codes or the National Fire Prevention Association (NFPA) guidelines). The proposed produced fluid storage

tank, oil storage tanks, TEG and MEG tanks for the Redhook Compressor Station are greater than 2,000 gallons in capacity, but will not contain VOCs with a vapor pressure greater than 1.5 psia (see EPA TANKS output for vapor pressure data). As such, these tanks are not subject to these requirements. Note that the pressure settings of the produced fluids tank meet the pressure and vacuum settings of this rule.

3.5.8. 25 Pa Code §129.91

25 Pa Code §129.91 establishes control standards for major stationary sources of NO_X and VOC under the Reasonably Available Control Technology (RACT) program. Major stationary sources of NO_X and VOC are defined in 25 PA Code §121.1. The proposed Redhook Compressor Station is located in the Ozone Transport Region (OTR), and therefore the applicable major source thresholds are 100 tons per year of NO_X and 50 tons per year of VOC.

This regulation will not apply because the Redhook Compressor Station will not have estimated potential emissions of NO_X in excess of 100 tpy or VOC in excess of 50 tpy.

3.5.9. 25 Pa Code §131

25 Pa Code §131 references National Ambient Air Quality Standards (NAAQS) for criteria pollutants and establishes State Ambient Air Quality Standards (SAAQS) for settled particulate, beryllium, fluorides, and hydrogen sulfide. As discussed in Section 3.3, the proposed project will not trigger NSR and the associated emissions of criteria pollutants would not reasonably be anticipated to exceed the corresponding NAAQS. The proposed project will not emit any quantifiable amount of beryllium, fluorides, or hydrogen sulfide, and as such the corresponding SAAQS would not apply.

3.5.10. 25 Pa Code §135

25 Pa Code §135 includes requirements for submittal of emissions data to the Department for the purposes of evaluating the effectiveness of regulations, identifying available or potential emission offsets, and maintaining an accurate inventory of air contaminant emissions for air quality assessment and planning activities. As the proposed Redhook Compressor Station is considered part of an oil and natural gas system, emissions from the sources at the site will be subject to reporting and recordkeeping requirements under this section. As such, Equitrans will submit annual emissions inventory data by March 1 of year per the Department's requirements.

3.5.11. 25 Pa Code §137

25 Pa Code §137 contains requirements intended to prevent the excessive buildup of air pollutants during air pollution episodes, thereby preventing the occurrence of an emergency due to the effects of the pollutants on the health of persons. This chapter specifically addresses air pollution episodes and the Department's response to such episodes. §137.4 specifies certain industrial sources that must have standby plans, which includes coal- and oil-fired electric and steam generating facilities and other specific manufacturing industries (e.g., metals, refining, paper, etc.). The proposed Redhook Compressor Station will be a natural gas transmission facility, which is not an industry specified by these regulations.

3.5.12. 25 Pa Code §139

25 Pa Code §139 establishes requirements for source operators to provide adequate sampling ports, safe sampling platforms and adequate utilities, and establishes testing procedures to be followed, for performance testing when required by the Department. The proposed Redhook Compressor Station will be designed and constructed to accommodate performance testing as required by applicable federal regulations (e.g., NSPS Subpart JJJJ) and any permit conditions set forth by the Department in the ensuing Plan Approval.

4. BEST AVAILABLE TECHNOLOGY (BAT) ANALYSIS

Under PADEP air permitting regulations in 25 Pa Code §127.1, new sources of air emissions must implement Best Available Technology (BAT). The Redhook Compressor Station will be installing new equipment, sources applicable to this requirement that must be deemed by PADEP to satisfy this requirement before a Plan Approval can be issued. The section addresses the proposed BAT for the various emission sources proposed as part of this project.

4.1 BAT FOR NATURAL GAS-FIRED ENGINES

The proposed natural gas-fired compressor engines are 5,350 bhp four stroke-lean burn Caterpillar G3616 engines. The engines are equipped with air/fuel ratio control to reduce NO_X emissions. Caterpillar's specifications for this engine indicate an emission rate of 0.5 g/bhp-hr, which is much lower than the current applicable limit of 1.0 g/bhp-hr required by NSPS Subpart JJJJ for engines of this size, type, and use. Furthermore, this emission rate is compliant with PADEP's BAT limit for compressor engines in the production/gathering segment of the industry authorized under GP-5 as finalized in February 2013. As such, Equitrans believes that the potential NO_X emissions rate of 0.5 g/bhp-hr complies with the BAT requirement in 25 Pa Code § 127.1. Equitrans is proposing a limit of 0.4 g/bhp-hr. This lower limit reflects a major source avoidance limit and is based on expected, but not guaranteed, performance. As such, Equitrans considers 0.4 g/bhp-hr a NSR-avoidance limit, not BAT.

A potential option to further reduce NO_X emissions is through the use of Selective Catalytic Reduction (SCR) control technology. The SCR process chemically reduces the NO_X molecule into molecular nitrogen and water vapor. A nitrogen-based reagent such as ammonia or urea is injected into the engine exhaust upstream of a catalyst bed. The exhaust gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst. The reagent reacts selectively with the NO_X within a specific temperature range and in the presence of the catalyst and oxygen. The rate of reaction will depend on the type of catalyst, reagent, and the temperature. The reaction requires an optimum temperature range of 480 to 800 °F and fairly constant exhaust temperatures for best performance. [3]

SCR is not a widely used technology for natural gas-fired combustion engines like those proposed for this project. Although potentially technically feasible, SCR is very costly. Capital costs are significantly higher than other types of NO_X controls due to the volume of catalyst that is required. The Operating & Maintenance (O & M) costs of using SCR are driven by the reagent usage, catalyst replacement, and increased electrical power usage. The following shows budgetary cost estimates for installation of SCR for each of the compressor engines proposed for this project:

Capital Cost	~ $900,000
O & M Cost	~ $200,000
Annual Cost	~ $300,000

The compressor engines being proposed for the Redhook Compressor Station are estimated with potential emissions at approximately 20.66 tpy each. At an estimated NO_X control efficiency of 90%, the cost effectiveness of SCR on the engines at the proposed Redhook Compressor Station is estimated to be greater than $15,000 per ton (see Appendix B for detailed cost-effectiveness calculations). Therefore, SCR is determined to be **economically infeasible** for this application. As such, Equitrans believes that the proposed NO_X emission rate

[3] http://www.epa.gov/ttn/catc/dir1/fscr.pdf

of 0.5 g/bhp-hr complies with the BAT requirement in 25 Pa Code § 127.1 and the major source avoidance limit of 0.4 g/bhp-hr exceeds BAT.

Equitrans is proposing the use of an oxidation catalyst as BAT for controlling emissions of Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) from the compressor engines. The rate of formation of CO during natural gas combustion depends primarily on the efficiency of combustion. The formation of CO occurs in small, localized areas inside the combustion chamber (engine cylinder) where oxygen levels cannot support the complete oxidation of carbon to CO_2. CO emissions resulting from natural gas combustion can be decreased via catalytic oxidation.

This reaction is promoted by several noble metal-enriched catalysts at high temperatures. The oxidation catalyst vendor has guaranteed a CO removal efficiency of 93% at this temperature, resulting in an emission rate of 0.17 g/bhp-hr. This emission rate is well below the current limit of 2.0 g/bhp-hr required by NSPS Subpart JJJJ for non-emergency lean burn natural gas engines ≥ 1,350 HP manufactured after July 1, 2010, and is equivalent to PADEP's BAT level for compressor engines under GP-5. As such, Equitrans believes that the potential CO emissions rate complies with the BAT requirement in 25 Pa Code § 127.1.

Catalytic oxidation also promotes the conversion of non-methane/non-ethane hydrocarbon (NMNEHC) and formaldehyde to carbon dioxide and water, over the face of the catalyst, thereby reducing emissions of these pollutants. The efficiency of the oxidation catalyst proposed for the Redhook compressor engines is guaranteed by the vendor to be at least 48% for NMNEHC emissions resulting in an emission rate of 0.13 g/bhp-hr, and at least 75% for formaldehyde emissions resulting in an emission rate of 0.05 g/bhp-hr. The engines' NMNEHC emission rate is well below the current limit of 0.7 g/bhp-hr required by NSPS Subpart JJJJ for non-emergency lean burn natural gas engines ≥ 1,350 HP manufactured after July 1, 2010, and the proposed NMNEHC and formaldehyde emission limits are compliant with PADEP's BAT limits in the recently finalized GP-5. Similar to CO and NO_X, Equitrans believes that the potential NMNEHC and formaldehyde emission rates comply with the BAT requirement in 25 Pa Code § 127.1.

Potential BAT options for both PM/PM_{10} and SO_2 emissions, based on a search in the EPA's Reasonably Available Control Technology (RACT)/Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC) database, indicate that the only technologies used to reduce these pollutants from natural gas burning engines are good combustion practices and low-sulfur fuels. The sulfur content of the pipeline quality natural gas, which will be used in the engines, is very low. Equitrans will also operate the engines in accordance with the manufacturer's recommended practice to minimize emissions of particulate matter and SO_2. Both technologies are considered base-case and are equally effective. Equitrans proposes that the combination of good combustion practices and the firing of pipeline quality natural gas be considered BAT for the proposed compressor engines.

The proposed BAT levels for the new engines at the Redhook Compressor Station are summarized below. These levels are at least as stringent as the presumptive BAT levels that PADEP established in the GP-5 permit conditions.

Table 4-1. Summary of Proposed BAT for Compressor Engines

Pollutant	Proposed BAT for Compressor Engines		
	Controls	Removal Efficiency	Emission Rate
NO_X	Lean-Burn, Air-to-Fuel Ratio Control	Inherent Design	0.5 g/bhp-hr[1]
CO	Catalytic Oxidation	93 %	0.17 g/bhp-hr
NMNEHC	Catalytic Oxidation	48 %	0.13 g/bhp-hr
HCHO	Catalytic Oxidation	75 %	0.05 g/bhp-hr

[1] An NSR avoidance limit of 0.4 g/bhp-hr is being proposed for annual emissions.

4.2 BAT FOR SOLAR TURBINES

The operation of the proposed combustion turbines for the Redhook Compressor Station will generate emissions of nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), and hazardous air pollutants (HAPs). Small amounts of particulate matter (PM), and sulfur dioxide (SO_2) will also be generated, but are insignificant and add-on emission controls have therefore not been evaluated for the purposes of determining BAT. Table 4-2 summarizes the proposed control strategy and emission limits for the turbines at the Redhook Compressor Station as compared to PADEP's GP-5 BAT levels for turbines and RACT/BACT/LAER emission limits for similar simple-cycle gas-fired turbines

Table 4-2. Summary of Proposed BAT for Turbines

Pollutant*	PADEP GP-5 BAT Levels	RBLC and Similar Sources		Proposed BAT for Turbines (Case-Specific)	
	Turbines 5000 < HP < 15,000	Maximum	Minimum	Controls	Emission Rate[1]
CO	25 ppm	25 ppm	2 ppm	SoLoNOx	25 ppm
NO_X	15 ppm	120 ppm	15 ppm	SoLoNOx	15 ppm
VOC	9 ppm	25 ppm	2 ppm	SoLoNOx	5 ppm

[1] All emissions shown are in ppmvd and are corrected to 15% O_2

4.2.2. TURBINE - NO_X BAT ANALYSIS

The NO_X control technologies identified for the gas-fired gas turbines are presented in Table 4-3.

Table 4-3: Potential NO_x Control Technologies for Turbine

Pollutant	Control Technology	Potential Control Efficiency
NO_X	1. Selective Catalytic Reduction	70-90[a]
	2. Dry Low-NO_X/Lean Pre-Mix Combustors	85[b]
	3. Steam/Water Injection	68[c]
	4. Good Combustion Practices	Base Case
	5. Selective Non-catalytic Reduction (SNCR)	Technically Infeasible
	6. Multi-Pollutant Catalytic System	Technically Infeasible

[a] U.S. EPA. "Air Pollution Control Technology Fact Sheet.", EPA-452/F-03-032, http://www.epa.gov/ttn/catc/dir1/fscr.pdf
[b] Estimated based on uncontrolled NO_X emission factors from U.S. EPA. "Alternative Control Techniques Document-NO_X Emissions from Stationary Gas Turbines," EPA-453/R-93-007. Research Triangle Park, NC. January 1993, Table 4-1 (for Solar Mars ™ turbine model) as compared to Solar controlled emissions guarantee for same model.
[c] U.S. EPA. "Alternative Control Techniques Document-NO_X Emissions from Stationary Gas Turbines," EPA-453/R-93-007. Research Triangle Park, NC. January 1993. http://www.epa.gov/ttn/catc/dir1/gasturb.pdf.

Control technologies listed in Table 4-3 were obtained from U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC), EPA's Clean Air Technology Center (CATC) website, and other turbine applications and permits obtained by Trinity. These technologies and their respective control efficiencies have been briefly described in the following sections. This discussion includes technical and economic feasibility considerations for the specific turbines proposed as part of this project.

Selective Catalytic Reduction (SCR)

The SCR process chemically reduces the NO_X molecule into molecular nitrogen and water vapor. A nitrogen based reagent such as ammonia or urea is injected into the turbine exhaust upstream of a catalyst bed. The exhaust gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst. The reagent reacts selectively with the NO_X within a specific temperature range and in the presence of the catalyst and oxygen. The rate of reaction will depend on the type of catalyst, reagent, and the temperature. The reaction requires an optimum temperature range of 480 to 800 °F and fairly constant exhaust temperatures for best performance.[4]

SCR is a widely used technology for large gas turbines. As noted, the NO_X reduction reaction is effective only within a given temperature range under fairly constant levels, and can tolerate temperature fluctuations of ± 200°F. SCR can achieve high reduction efficiencies (70 - 90%) on NO_X concentrations as low as 20 ppm. The turbines proposed for the Redhook Compressor Station is a variable load unit that is expected to have exhaust gas temperatures that fluctuate between 700 and 1000°F. Nevertheless, SCR technology is generally determined to be **technically feasible** for the turbines proposed as part of this project.

While technically feasible and potentially very effective, SCR is also very costly, and is accompanied by environmental hazards that may be presented by high levels of ammonia slip, especially for units under variable loads. Capital costs are significantly higher than other types of NO_X controls due to the large volume of catalyst that is required. The Operating & Maintenance (O & M) costs of using SCR are driven by the reagent usage, catalyst replacement, and increased electrical power usage. The following shows budgetary cost estimates for SCR on the natural gas-fired Solar Taurus-70 turbines proposed for this project:

[4] http://www.epa.gov/ttn/catc/dir1/fscr.pdf

Capital Cost	~ \$2,800,000
O & M Cost	~ \$240,000
Annual Cost	~ \$550,000

NO_X potential emissions from normal operations as well as startup and shutdown for each turbine at the Redhook Compressor Station is estimated at 22.02 tpy. At an estimated NO_X control efficiency of 90%, the cost effectiveness of SCR on the turbine at the Redhook Compressor Station is estimated at approximately \$27,774 per ton (in 2013 dollars). Therefore, SCR is determined to be **economically infeasible** for this application.

Lean Pre-Mix Technology

The second most effective control technology from the ranking on Table 4-3 is the dry low-NO_x or lean pre-mix combustion technology. Dry low-NO_x combustion technology controls NO_x by reducing the conversion of atmospheric nitrogen to NO_x in the turbine combustor. This reduction in conversion is achieved by operating at relatively low fuel-to-air ratios, thereby lowering the combustion temperature in the turbine. At high temperatures, thermal NO_x is formed by the thermal fixation of atmospheric nitrogen in the combustion air.

The turbines being proposed for this project utilizes the dry low-NO_X method - Solar's patented lean pre-mix technology SoLoNO$_X$™ system. This technology is considered **technically feasible** for the turbine being proposed for this project because it does not have the cost implications of the SCR technology and it is substantially more efficient when compared to Good Combustion practices. Therefore, due to its effectiveness and suitability for use with natural gas, **the SoLoNO$_X$ technology is proposed as BAT for NO_X.**

Steam/Water Injection

Both steam and water injection technologies use the same principle which includes lowering the combustion temperature by injecting water or steam into the combustion chamber. The NO_X emission levels are then controlled by varying the amount of steam/water. One major concern with this technology is the tradeoff between NO_X and CO/hydrocarbon emission rates. By decreasing the combustion temperature, the concentration of pollutants that are generated as a result of incomplete combustion will increase. Therefore, there will be a limit to the amount of steam/water that can be injected into the combustion chamber and the resulting removal efficiency of this technology.[5]

Given the relatively low levels of NO_X emissions expected from the inherent design of the proposed turbines (15 ppmv) relative to the considerably higher uncontrolled rates of CO (25 ppmv), the disadvantages of this technology appear to outweigh the advantages. Nevertheless, this technology is **technically feasible** for the proposed application. However, as it is ranked lower than the proposed BAT of SoLoNO$_X$™, steam/water injection is not considered BAT for the proposed turbines.

Good Combustion Practices

Good combustion practices essentially imply that the turbine is operated within parameters that, without add-on control technology, allow the equipment to operate as efficiently as possible. The turbines proposed as part of this project is equipped with the SoLoNO$_X$ technology, which inherently promotes good combustion practices by optimizing the air-to-fuel ratio. Therefore, this technology is **technically feasible** for the proposed application. However, since it is ranked lower than the proposed BAT of SoLoNO$_X$™, good combustion practices is not considered BAT for the proposed turbines.

[5] http://www.tytlabs.co.jp/english/review/rev411epdf/e411_012ohkubo.pdf

Selective Non-Catalytic Reduction (SNCR)

SNCR is an exhaust gas chemical treatment process in which a reducing reagent, typically ammonia (NH_3) or urea, is injected into the exhaust gas upstream. The injection of ammonia selectively reduces the oxides of nitrogen into diatomic nitrogen and water. The window of operation for SNCR technology is fairly narrow and is in the range of 1500 to 1900 °F. Applying the SNCR method when the turbine exhaust is not in the optimum temperature range will result in excessive ammonia or NO_X emissions. SNCR is also best suited for applications with higher levels of uncontrolled NO_X (200 – 400 ppm).

As noted above, the SNCR technology has an optimum temperature range of 1500 to 1900 °F and operating the system outside this temperature can result in a significant reduction in emission control efficiency. The exhaust gas temperature of the turbine proposed for the Redhook Compressor Station is expected to be in the range of 700 - 1000 °F, which is significantly below the optimum SNCR operating temperature range. Furthermore, SNCR is best suited for uncontrolled NO_X emission rates in the range of 200 – 400 ppm. The NO_X emissions from the combustion turbines proposed for the Redhook Compressor Station are expected to be much lower, in the range of approximately 15 ppm. Given the expected exhaust gas temperature and NO_X emissions levels from the proposed turbine, SNCR technology is determined to be **technically infeasible** for the turbines proposed as part of this project.

Multi-Pollutant Catalytic System

The SCONO$_X$ and XONON™ systems are comparable multi-pollutant catalyst control technologies. The SCONO$_x$ catalyst system controls NO_x emissions by oxidizing NO to NO_2, and then absorbing NO_2 onto a potassium carbonate surface. These reactions are shown below, and are referred to as the "Oxidation/Absorption Cycle".

Equations:

$$2\,NO + O_2 \rightarrow 2\,NO_2$$
$$2\,NO_2 + K_2CO_3 \rightarrow CO_2 + KNO_2 + KNO_3$$

Intrinsic to absorbing systems is a regeneration cycle, such that when all of the carbonate on the surface of the catalyst has reacted to form nitrogen compounds, the catalyst must be regenerated. The catalyst surface is regenerated by converting potassium nitrite and potassium nitrate to potassium carbonate. The process of regeneration is accomplished by passing a dilute gaseous hydrogen stream across the surface of the catalyst in the absence of oxygen. The hydrogen in this gas reacts with nitrites and nitrates to form water and elemental nitrogen. Carbon dioxide in the regeneration gas reacts with potassium nitrites and nitrates to form potassium carbonate, which is the reactivated catalyst.

XONON™ combustion technology replaces the typical turbine combustor with a catalytic combustor, limiting the temperature of combustion to reduce NO_X formation. This technology is generally applied to small turbines and the design of each XONON™ combustor is customized to the particular turbine model and operating conditions of the application. The combustor specifications would typically be defined through a collaborative effort with the manufacturer of the turbine to integrate the hardware into the design.

As of this date, the SCONO$_X$ and XONON™ systems are not commercially available for small simple cycle turbines, and Equitrans is not aware of any plans to make these systems commercially available for the size range of turbines typically used for compressor service. In addition, the SCONO$_x$ system includes a potassium catalyst which operates optimally at temperatures between 280 °F and 650 °F. This range is well below the exhaust gas temperature expected from the proposed turbines. The XONON™ technology is generally applied to very small turbines and the design of each XONON™ combustor is customized to the particular turbine model and operating conditions of the application. The combustor specifications would typically be defined through a collaborative effort with the manufacturer of the turbine to integrate the hardware into the design. Given the expected exhaust gas temperatures and the fact that these technologies have not been demonstrated for small turbines, multi-pollutant catalytic systems are determined to be **technically infeasible** for the turbines proposed for this project.

Conclusion

The proposed BAT for NO_X from the combustion turbines is the lean pre-mix technology (i.e., $SoLoNO_x$) with an emission rate of 15 ppmvd at 15% O_2, which will be demonstrated in accordance with the requirements of NSPS KKKK. The concentration limit is proposed for the maximum operating capacity of the unit.

4.2.3. TURBINE - CO, VOC, AND HAP BAT ANALYSIS

Emissions of CO, VOC, and HAP from combustion turbines are generally aligned with one another as products of combustion, such that intended control of one may also collaterally control the others. The control technologies identified for the control of CO, VOC, and HAP from the gas-fired gas turbine is presented in Table 4-4.

Table 4-4: Potential CO/VOC/HAP Control Technologies For Turbine

Pollutant	Control Technology	Potential Control Efficiency
CO, VOC, HAP	1. Catalytic Oxidation 2. Lean Pre-Mix Combustors 3. Multi Pollutant Combustors 4. Good Combustion Practices	60-90+ (CO); 85-90 (HAP)[1] 82 (CO)[2] 97 (HAP)[3] Base Case

[1] AP-42, Chapter 3.1, Section 3.1.4, "Stationary Gas Turbines," April 2000.

[2] Estimated based on uncontrolled CO emission factors from AP-42, Chapter 3.1, Table 3.1-1, "Stationary Gas Turbines," April 2000 (for natural gas fired turbines) as compared to emission factors shown for lean-premix sources.

[3] Estimated based on uncontrolled formaldehyde emission factors from AP-42, Chapter 3.1, Table 3.1-2a, "Stationary Gas Turbines," April 2000 (for natural gas fired turbines) as compared to emission factors shown for $SCONO_X$ sources.

Control technologies listed in Table 4-4 were obtained from U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC), EPA's Clean Air Technology Center (CATC) website, and other turbine applications and permits. These technologies and their respective control efficiencies have been briefly described in the following sections. This discussion includes technical and economic feasibility considerations for the specific turbines proposed as part of this project.

Catalytic Oxidation

Catalytic oxidation is an enhanced thermal oxidation process that allows relatively low temperature combustion of VOC and CO. Since the vast majority of HAPs are volatile organic in nature, controlling VOC emissions would therefore control HAPs as well. This combustion is accomplished by employing a specialized catalyst. Oxidation catalyst systems have been installed typically on diffusion flame combustion turbines. In a diffusion flame combustor, the fuel and air are injected at the combustor and are mixed only by diffusion prior to ignition. The performance of these oxidation catalyst systems on diffusion flame combustion turbines results in 60 to 90-plus percent control of CO and about 85 to 90 percent control of formaldehyde (which is a HAP).

Typical installations of catalytic oxidizers on stationary gas turbines are for units used for electric generation purposes or older units not equipped with lean pre-mix combustors. The turbines being proposed for the Redhook Compressor Station will operate at variable loads to drive compression (resulting in variable exhaust gas temperatures), and will already be equipped with lean pre-mix staged combustion resulting in inherently low levels of CO and VOC/HAP (thus limiting the overall effectiveness of the control technology).

As to economic impacts, the catalysts used in this type of process have an operating life of less than 10 years. The need to frequently replace this catalyst imposes significant economic costs. The Operating & Maintenance (O & M) costs of using catalytic oxidation are driven largely by the catalyst replacement. The following are budgetary cost estimates for catalytic oxidation for the natural gas-fired Solar Taurs-70 turbines proposed for this project:

Capital Cost ~ $500,000
O & M Cost ~ $150,000
Annual Cost ~ $200,000

The potential CO emission from normal operations as well as startup, shutdown and low ambient temperature operation for the turbine at the Redhook Compressor Station is estimated at 23.38 tpy. At an estimated control efficiency of 80%, the cost effectiveness of oxidation catalyst for the control of CO emissions for the turbines proposed at the Redhook Compressor Station is estimated at approximately $10,955 per ton.
Therefore, oxidation catalyst is determined to be **economically infeasible** for this application

Lean Pre-Mix Technology

Lean pre-mix combustion technology controls NO_x as well as other pollutants by operating at relatively low fuel-to-air ratios, thereby lowering the combustion temperature in the turbine. In a staged lean pre-mix combustion system, the air and fuel are thoroughly mixed to form a lean mixture before delivery to the combustor. The pre-mixing of fuel and air and staged entry limits the flame temperature and the residence time at the peak flame temperature. Lean pre-mix combustors emit lower levels of NO_X, CO, formaldehyde, and other HAP than diffusion flame combustion turbines.

The turbines being proposed for this project utilizes the dry low-NO_x method - Solar's patented lean pre-mix technology SoLoNO$_X$™ system. This technology is considered **technically feasible** for this project because it does not have the cost considerations of the oxidation catalyst technology and it is substantially more efficient when compared to Good Combustion practice. Therefore, due to its effectiveness and suitability for use with natural gas, the **SoLoNO$_X$ technology is proposed as BAT for CO, VOC, and HAP.**

Multi-Pollutant Catalytic System

The SCONO$_X$ and XONON™ systems are comparable multi-pollutant catalyst control technologies as described previously. These systems utilize a flameless combustion technology where fuel and air reacts on a catalyst surface, preventing the formation of NO_X while achieving low CO and unburned hydrocarbon emission levels.

As of this date, the SCONO$_X$ and XONON™ systems are not commercially available for small simple cycle turbines, and Equitrans is not aware of any plans to make these systems commercially available for the size range of turbines typically used for compressor service. In addition, the SCONO$_X$ system includes a catalyst which operates optimally at temperatures between 280 °F and 650 °F. This range is well below the exhaust gas temperature expected from the proposed turbines. The XONON™ technology is generally applied to very small turbines and the design of each XONON™ combustor is customized to the particular turbine model and operating conditions of the application. The combustor specifications would typically be defined through a collaborative effort with the manufacturer of the turbine to integrate the hardware into the design. Given the expected exhaust gas temperatures and the fact that these technologies have not been demonstrated for small turbines, multi-pollutant catalytic systems are determined to be **technically infeasible** for the turbines proposed for this project.

Good Combustion Practices

Control technology for VOC, HAPs, and CO includes the employment of good combustion practices. The use of good combustion practices was the main control option listed in the RBLC database for the control of VOC and

CO from stationary gas turbines of similar size and fuel type as to the proposed turbines for the Redhook Compressor Station. Good combustion practices essentially imply that the turbine is operated within parameters that, without add-on control technology, allow the equipment to operate as efficiently as possible. The operating parameters that may affect CO, VOC, and HAP emissions include temperature, fuel-to-air feed ratio, and fuel specifications. The turbine proposed as part of this project is equipped with the $SoLoNO_X$ technology, which inherently promotes good combustion practices by optimizing the air-to-fuel ratio. Therefore, this technology is **technically feasible** for the proposed application. However, since it is ranked lower than the proposed BAT of $SoLoNO_X$™, good combustion practices is not considered BAT for the proposed project.

Conclusion

The proposed BAT for CO emissions from the combustion turbines is the lean pre-mix technology (i.e., $SoLoNO_X$ system) with an emission rate of 25 ppmvd at 15% O_2 demonstrated through performance testing. The proposed BAT emission rate for VOC from the turbines associated with this project is 5 ppmvd at 15% O_2 demonstrated through performance testing. The concentration limits are proposed for the maximum operating capacity of the unit. Compliance with the proposed CO and VOC limitations should also assure compliance with BAT for HAPs and therefore a separate HAP compliance demonstration is unnecessary.

4.3 BAT FOR TEG DEHYDRATION UNIT

The pollutants of interest emitted from TEG dehydration unit are VOC and HAP. EQT is proposing an enclosed flare with a minimum control efficiency of 98% to control emissions of these pollutants from the dehydration unit, which is more stringent as the established BAT levels for dehydration units in PADEP's recently finalized new General Permit No. 5 (GP-5).

4.4 BAT FOR MICROTURBINES

The proposed microturbine generators for power generation at the Redhook Compressor Station are 200 kW natural gas-fired Capstone C200 microturbines. These units are designed to provide primary power generation at the site and will operate continuously (i.e., 8,760 hr/yr). Microturbines are energy efficient units such that their operation will generate only small amounts of combustion byproducts (e.g., NO_X, CO, PM, SO_2, VOC, and HAPs) but are insignificant due to the size, function, fuel-type, and efficient combustion design. Emissions from each microturbine are estimated to be less than 1.0 ton per year for all pollutants at full-time unrestricted operation. Therefore, add-on emission controls have not been evaluated for the purposes of determining BAT.

4.5 BAT FOR PRODUCED FLUID TANK

NSPS OOOO regulates VOC emissions from storage tanks at oil and gas facilities. Emissions control is required for storage tanks with VOC emissions greater than 6.0 tpy, as EPA has deemed controls for such tanks to be cost effective. The proposed produced fluid tank for the Redhook Compressor Station is estimated to have potential VOC emissions from combined working, breathing, and flashing losses at 0.21 tpy. As such, the installation of add-on controls is believed to be economically infeasible for this tank.

4.6 BAT FOR GHG EMISSIONS SOURCES

While the proposed construction of the Redhook Compressor Station will not trigger PSD permitting for any regulated pollutant based on maximum potential emission rates, EQT is including this discussion of BAT for GHG pollutants as requested by PADEP for similar projects. EPA has published white papers for different industries to discuss available GHG control technologies. However, at this time, there is no white paper specifically for the natural gas sector. In the permitting guidance, EPA agrees that energy efficiency improvements will satisfy the BACT requirements for GHGs in most cases. As such, GHG BAT would be expected to be limited to the use of energy efficient design and the minimization of GHG releases through good work practices for the natural gas industry.

Fugitive GHG (and to a lesser extent, VOC) leaks will be minimized by adhering to good operating and maintenance practices. Despite the lack of federal or PADEP guidance on conducting control technology reviews for GHGs, Equitrans believes the proposed project is designed to reduce GHG emissions where technically and economically feasible and, therefore, to a level that would be consistent with BACT or BAT.

In addition, Equitrans has reviewed EPA's voluntary Natural Gas Star program for potential emission reduction measures.[6] Total site-wide VOC and GHG emissions from fugitive and blowdown sources are estimated to be low. Therefore, any additional emission reduction will not be cost effective due to the minimal emission reductions achieved. Table 4-5 summarizes the evaluation of the Natural Gas Star program practices for the proposed compressor station.

[6] http://www.epa.gov/gasstar/

Table 4-5. Summary of Natural Gas Star Program

Energy Star Project[7]	Feasibility Assessment
Replace Gas Starters with Air or Nitrogen	Feasible – Engine gas starters may be replaced with air.
Reduce Natural Gas Venting with Fewer Compressor Engine Startups and Improved Engine Ignition	Feasible – Engines are intended to operate at all times other than preventative maintenance shutdowns. EQT's preventative maintenance program will reduce engine starts related to unanticipated engine shutdown/repairs.
Reducing Methane Emissions from Compressor Rod Packing Systems	Not feasible – This reduction strategy is applicable to older compressors with potentially worn packing. Compressors are equipped with newly installed packing by design. EQT will follow the manufacturer's recommended procedures for proper maintenance and inspection of compressor rod packing systems.
Test and Repair Pressure Safety Valves	Feasible - Completed by EQT on periodic basis.
Eliminate Unnecessary Equipment and/or Systems	EQT will only be installing what is required for this application.
Install Automated Air/Fuel Ratio Controls	Feasible – Engines/turbines will be equipped with state-of-the art AFR (air-to-fuel-ratio) controllers/SoLoNOx technology.
Install Electric Motor Starters	Not feasible – these engines are intended to operate at all times therefore the number of starts is minimized and the potential methane reductions would be minimal.
Reducing Emissions When Taking Compressors Off-Line	Feasible - Blowdown gas may be injected into the fuel gas recovery system. However, the proposed facility is a gathering facility that is expected to operate at or near 100% capacity year round. Shutdown events are expected to be very infrequent, and the current design of the station does not allow for recycling of engine blowdowns.
Replace Compressor Cylinder Unloaders	Not Applicable.
Install Electric Compressors	Not Feasible - Electric compressors are cost prohibitive even if electric supply is available. As stated in the NG Star fact sheet "The capital costs and the electricity costs, however, are higher for an electric motor compared to those for a gas driven engine. The savings from maintenance costs relative to the cost of energy will not be justified unless the engine is at the end of its economic life."
Wet Seal Degassing Recovery System for Centrifugal Compressors	Not applicable to CAT engines - units are reciprocating compressors. Turbine centrifugal compressors will be dry seal.

[7] http://epa.gov/gasstar/tools/recommended.html#compressors

5. SAMPLE EMISSION SOURCE CALCULATIONS

The characteristics of air emissions from the Redhook Compressor Station, along with the methodology used for calculating emissions from the proposed sources, are described in narrative form below. Detailed supporting calculations are also provided in Appendix B.

Emissions from the Redhook Compressor Station will result from natural gas combustion in the compressor engines, turbines, fuel gas heaters, and dehydration reboiler. Emissions will also result from the operation of the TEG dehydration unit and enclosed flare, and from the produced fluid storage tank and other tanks. Finally, there will be fugitive emissions from process-related equipment. The methods by which emissions from each of these sources has been calculated are summarized below.

- **Compressor Engines:** Potential emissions of nitrogen oxides (NO_x), carbon monoxide (CO), non-methane/non-ethane hydrocarbon (NMNEHC), formaldehyde, and GHGs are calculated using factors provided by the engine manufacturer and the oxidation catalyst manufacturer where available. Potential emissions of other criteria pollutants and all other HAPs are calculated using U.S. EPA's AP-42 factors for natural gas-fired engines.[8] When needed to estimate emissions, calculations assume a site-specific heat content of natural gas.

- **Gas-Fired Turbines:** Potential emissions of NO_x, CO, VOC, SO_2, PM, PM_{10}, $PM_{2.5}$ and formaldehyde are calculated using factors provided by the turbine manufacturer as applicable. Potential emissions of all other HAPs are calculated using U.S. EPA's AP-42 factors for stationary gas-fired turbines.[9] Potential emissions of greenhouse gas pollutants (GHGs) are calculated using U.S. EPA's emission factors from 40 CFR Part 98, Subpart C and vendor supplied emissions (methane). Emission estimates include periods of startup and shutdown.

- **Dehydration Unit and Enclosed Flare:** Potential VOC and HAP emissions are estimated using the GRI-GLYCalc program, version 4.0. The output report from this program is included in Appendix B. A 98% emission reduction efficiency has been assumed for the control of dehy unit emissions with the proposed enclosed flare. Emissions resulting from the combustion of the dehydration unit off-gases in the flare have been calculated using AP-42 factors.

- **Process Fugitives:** Potential emissions of VOC and HAPs from process fugitives are calculated using estimated component counts of valves, connectors, flanges, open-ended lines, pump seals, etc. along with U.S. EPA's equipment leak emission factors.[10] In addition, potential VOC and HAP emissions from vented blowdown emissions have been estimated using the expected number of blowdown events and the volume of gas to be vented. Similarly, potential GHG emissions from process fugitives and blowdown events have been calculated using the relevant equations from 40 CFR 98, Subpart W.

- **Microturbines:** Potential emissions of NO_X, VOC, CO, and CO_2 are calculated using factors provided by the manufacturer. Potential emissions of all other criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas-fired stationary combustion turbines.

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[8] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 3.2, *Natural Gas-Fired Reciprocating Engine*, July 2000.
[9] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 3.1, *Stationary Gas Turbines*, April 2000.
[10] *Table 2-4 :Oil & Gas Production Operations Average Emission Factors, Protocol for Equipment Leak Emission Estimates*, EPA 453/R-95-017, November 1995. Emission factors based on average measured TOC from component types indicated in gas service at O&G Production Operations.

- **Fuel Gas Heaters and Reboilers:** Potential emissions of all criteria pollutants and HAPs are calculated using U.S. EPA's AP-42 factors for natural gas combustion equipment.[11] Potential GHG emissions from the heaters have been calculated using the relevant emission factors for natural gas combustion from 40 CFR 98, Subpart C.

- **Storage Tanks:** Potential emissions of VOC and HAP from the storage tanks have been estimated, although they are expected to be insignificant. Emissions from the TEG, MEG and oil tanks have been estimated using EPA's TANKS 4.0.9d software to evaluate working and breathing losses from the tanks. Emissions from the produced fluids tank have been estimated using E & P TANK software which includes flashing, working, and breathing losses.

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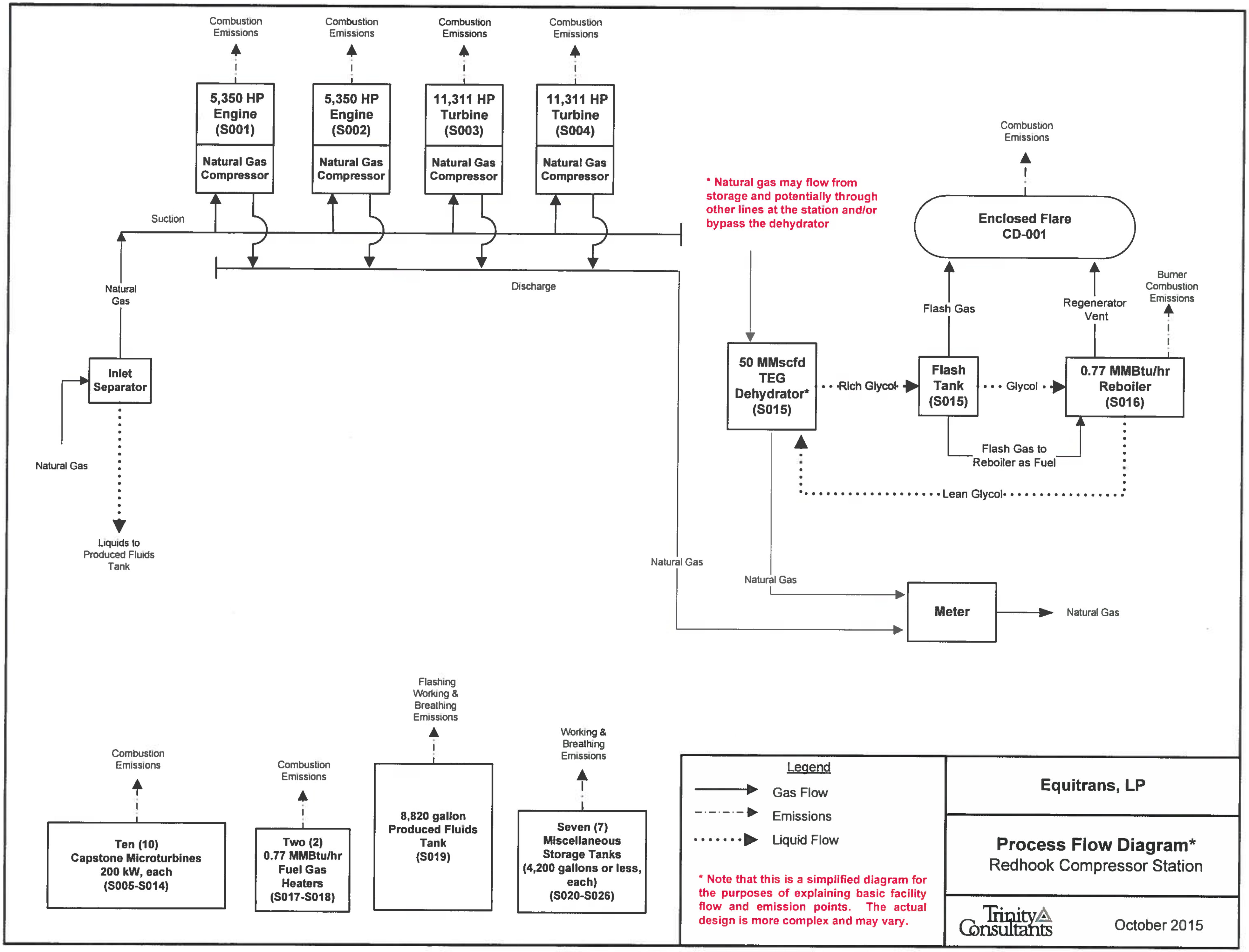
[11] U.S. EPA, AP 42, Fifth Edition, Volume I, Chapter 1.4, *Natural Gas Combustion*, Supplement D, July 1998.

APPENDIX A: AREA MAP AND PROCESS FLOW DIAGRAM


Combustion Emissions
5,350 HP Engine (S001)
Natural Gas Compressor
Combustion Emissions
5,350 HP Engine (S002)
Natural Gas Compressor
Combustion Emissions
11,311 HP Turbine (S003)
Natural Gas Compressor
Combustion Emissions
11,311 HP Turbine (S004)
Natural Gas Compressor
Suction
Discharge
Natural Gas
Inlet Separator
Natural Gas
Liquids to Produced Fluids Tank
* Natural gas may flow from storage and potentially through other lines at the station and/or bypass the dehydrator
Combustion Emissions
Enclosed Flare CD-001
Flash Gas
Regenerator Vent
Burner Combustion Emissions
50 MMscfd TEG Dehydrator* (S015)
Rich Glycol
Flash Tank (S015)
Glycol
0.77 MMBtu/hr Reboiler (S016)
Flash Gas to Reboiler as Fuel
Lean Glycol
Natural Gas
Natural Gas
Meter
Natural Gas
Combustion Emissions
Ten (10) Capstone Microturbines 200 kW, each (S005-S014)
Combustion Emissions
Two (2) 0.77 MMBtu/hr Fuel Gas Heaters (S017-S018)
Flashing Working & Breathing Emissions
8,820 gallon Produced Fluids Tank (S019)
Working & Breathing Emissions
Seven (7) Miscellaneous Storage Tanks (4,200 gallons or less, each) (S020-S026)
Legend
Gas Flow
Emissions
Liquid Flow
* Note that this is a simplified diagram for the purposes of explaining basic facility flow and emission points. The actual design is more complex and may vary.
Equitrans, LP
Process Flow Diagram*
Redhook Compressor Station
Trinity Consultants
October 2015

Redhook Compressor Station Area Map

APPENDIX B: EMISSION CALCULATIONS & BAT CALCULATIONS

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 1. Internal Combustion (IC) Engine Emissions Calculations

Engine Information:

Source ID:	S001-S002
Manufacturer:	Caterpillar
Model No.:	G3616
Stroke Cycle:	4-stroke
Type of Burn:	Lean
Rated Horsepower (bhp) each:	5,350
Control Device:	Oxidation Catalyst
Stack Designation:	P001-P002
Number of Units:	2

Engine Fuel Information:

	Per Unit
Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,058
Specific Fuel Consumption (Btu/bhp-hr):	7,411
Maximum Fuel Consumption at 100% Load (scf/hr):	37,260
Engine Exhaust flow rate (cfm)	31,808
Heat Input (MMBtu/hr):	39.65
Potential Fuel Consumption (MMBtu/yr):	347,324
Max. Fuel Consumption (MMscf/yr):	326.4
Max. Annual Hours of Operation (hr/yr):	8,760

Engine Emissions Data:

Pollutant	Emission Factor	Units	Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	0.40	g/bhp-hr	4.72	20.66	Manufacturer's Specifications
NMNEHC (Excludes HCHO)	0.13	g/bhp-hr	1.53	6.72	Vendor Guarantee
VOC (NMNEHC + Formaldehyde)	---	---	2.12	9.30	Vendor Guarantee (NMNEHC + HCHO)
CO	0.17	g/bhp-hr	1.95	8.53	Vendor Guarantee (93% control)
SO_X	0.001	lb/MMBtu	0.02	0.10	AP-42, Table 3.2-2 (Aug-2000)
PM_{10}	0.01	lb/MMBtu	0.40	1.73	AP-42, Table 3.2-2 (Aug-2000)
$PM_{2.5}$	0.01	lb/MMBtu	0.40	1.73	AP-42, Table 3.2-2 (Aug-2000)
Formaldehyde (HCHO)	0.05	g/bhp-hr	0.59	2.58	Vendor Guarantee
GHG (CO_2e)	See Table Below		6,030	26,409.70	Man. Specs. And 40 CFR 98, Table C-2
Other (Total HAP)	See Table Below		1.36	5.95	AP-42, Table 3.2-2 (Aug-2000)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Plan Approval Application**

TABLE 1. Internal Combustion (IC) Engine Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	421	g/bhp-hr	4965.50	21748.88	Manufacturer's Specifications
CH_4	3.60	g/bhp-hr	42.46	185.98	Manufacturer's Specifications (THC-NMHC)
N_2O	0.0001	kg/MMBtu	0.01	0.04	40 CFR 98, Table C-2
GHG (CO_2e)			**6,030**	**26,410**	
Organic HAPs:					
1,1,2,2-Tetrachloroethane	4.00E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
1,1,2-Trichloroethane	3.18E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
1,3-Butadiene	2.67E-04	lb/MMBtu	0.01	0.05	AP-42, Table 3.2-2 (Aug-2000)
1,3-Dichloropropene	2.64E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
2-Methylnaphthalene	3.32E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
2,2,4-Trimethlpentane	2.50E-04	lb/MMBtu	0.01	0.04	AP-42, Table 3.2-2 (Aug-2000)
Acenaphthene	1.25E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Acenaphthylene	5.53E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Acetaldehyde	8.36E-03	lb/MMBtu	0.33	1.45	AP-42, Table 3.2-2 (Aug-2000)
Acrolein	5.14E-03	lb/MMBtu	0.20	0.89	AP-42, Table 3.2-2 (Aug-2000)
Benzene	4.40E-04	lb/MMBtu	0.02	0.08	AP-42, Table 3.2-2 (Aug-2000)
Benzo(b)fluoranthene	1.66E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Benzo(e)pyrene	4.15E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Benzo(g,h,i)perylene	4.14E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Biphenyl	2.12E-04	lb/MMBtu	0.01	0.04	AP-42, Table 3.2-2 (Aug-2000)
Carbon Tetrachloride	3.67E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Chlorobenzene	3.04E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Chloroform	2.85E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Chrysene	6.93E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Ethylbenzene	3.97E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Ethylene Dibromide	4.43E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
Fluoranthene	1.11E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Fluorene	5.67E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Methanol	2.50E-03	lb/MMBtu	0.10	0.43	AP-42, Table 3.2-2 (Aug-2000)
Methylene Chloride	2.00E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
n-Hexane	1.11E-03	lb/MMBtu	0.04	0.19	AP-42, Table 3.2-2 (Aug-2000)
Naphthalene	7.44E-05	lb/MMBtu	0.00	0.01	AP-42, Table 3.2-2 (Aug-2000)
PAH	2.69E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Phenanthrene	1.04E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Phenol	2.40E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Pyrene	1.36E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Styrene	2.36E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Tetrachloroethane	2.48E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Toluene	4.08E-04	lb/MMBtu	0.02	0.07	AP-42, Table 3.2-2 (Aug-2000)
Vinyl Chloride	1.49E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.2-2 (Aug-2000)
Xylene	1.84E-04	lb/MMBtu	0.01	0.03	AP-42, Table 3.2-2 (Aug-2000)
Total HAP			**1.36**	**5.95**	

Company Name:	**Equitrans, L.P.**
Facility Name:	**Redhook Compressor Station**
Project Description:	**Plan Approval Application**

TABLE 2. Internal Combustion Turbine Emissions Calculations

Turbine Information:

Source ID:	S003-S004
Manufacturer:	Solar
Model No.:	Taurus-70
Year Installed:	TBD
Fuel Used:	Natural Gas
Fuel Lower Heating Value (Btu/scf):	951.5
Rated Horsepower (bhp):	11,311
Maximum Fuel Consumption at 100% Load (scf/hr):	88,019
Heat Input (MMBtu/hr)	83.75
Control Device:	None
Stack Designation:	P003-P004

Operational Details:

Potential Annual Hours of Operation (hr/yr):	8,760
Potential Fuel Consumption (MMscf/yr):	771.05
Potential Startup/Shutdown Events (per year):	12

Manufacturer Specific Pollutant Emission Factors:

Pollutant	Emission Factors	Units	Emission Factor Source
NO_x	0.060	lb/MMBtu	Manufacturer
CO	0.061	lb/MMBtu	Manufacturer
SO_2	0.004	lb/MMBtu	Manufacturer
PM_{10}	0.019	lb/MMBtu	Manufacturer
$PM_{2.5}$	0.019	lb/MMBtu	Manufacturer
VOC	0.007	lb/MMBtu	20% of UHC per Manufacturer
Formaldehyde	0.003	lb/MMBtu	Manufacturer
CO_2	126.40	lb/MMBtu	40 CFR 98, Subpart C, Table C-1
CH_4	0.028	lb/MMBtu	80% of UHC per Manufacturer
N_2O	2.4E-04	lb/MMBtu	40 CFR 98, Subpart C, Table C-2

[a]Emission factors from AP-42 and Subpart C are based on HHV. To calculate a LHV emission factor, emissions are multiplied by (HHV/LHV). For AP-42 HHV is 1020 Btu/scf, for Subpart C HHV is 1028 Btu/scf. PM and HCHO emission factors are provided in HHV in the specifications and were converted to LHV using a HHV value of 1020 Btu/scf.

Pollutant Emission Rates:

Pollutant	Potential Emissions (lb/hr)[a]	Potential Emissions (tpy)[b]
NO_x	5.03	22.02
CO	5.11	23.38
SO_2	0.31	1.34
PM_{10}	1.62	7.08
$PM_{2.5}$	1.62	7.08
VOC	0.59	2.58
Formaldehyde	0.26	1.13
CO_2	10,586	46,375
CH_4	2.35	15.12
N_2O	0.02	0.09
GHG (CO_2e)	10,650.89	46,778.78

[a]Annual emissions shown above include startup/shutdown events.

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Plan Approval Application**

TABLE 2. Internal Combustion Turbine Emissions Calculations

Hazardous Air Pollutant (HAP) Emission Rates:

Pollutant	Emission Factor (lb/MMBtu)[c]	Potential Emissions (lb/hr)[a]	Potential Emissions (tpy)[b]
HAPs:			
Acetaldehyde	4.29E-05	3.59E-03	1.57E-02
Acrolein	6.86E-06	5.75E-04	2.52E-03
Benzene	1.29E-05	1.08E-03	4.72E-03
1,3-Butadiene	4.61E-07	3.86E-05	1.69E-04
Propylene Oxide	2.90E-05	2.43E-03	1.06E-02
Ethylbenzene	3.43E-05	2.87E-03	1.26E-02
Toluene	1.39E-04	1.17E-02	5.11E-02
Xylene	6.86E-05	5.75E-03	2.52E-02
Polycyclic Organic Matter:			
Naphthalene	1.39E-06	1.17E-04	5.11E-04
PAH	2.36E-06	1.98E-04	8.65E-04
Total HAP (Including HCHO)		**0.29**	**1.26**

Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr) × Emission Factor (lb/MMBtu)
Emission Rate (tpy) = Emission Rate (lb/hr) × Hours of Operation (hr/yr) / 2000 (tons/lb) + SU/SD emissions, as applicable
Emission factors from AP-42 Section 3.1, Table 3.1-3 "Emission Factors for HAPs from Natural Gas Fired Stationary Gas Turbines", April 2000. Factors are based on HHV. Therefore, they were converted to LHV by multiplying by (HHV/LHV).

Startup/Shutdown Combustion Emission Factors:

Pollutant	Startup Emissions[a] (lbs/event)	Shutdown Emissions[a] (lbs/event)	Emission Factor Source
NO_X	0.8	1.1	Manufacturer
CO	73.1	93.4	Manufacturer
VOC	0.8	1.06	20% of UHC per Manufacturer
CO_2	519	575	Manufacturer

Each startup and shutdown event is estimated to last approximately 10 minutes, per manufacturer.

Pneumatic Start Venting Emissions		
Natural Gas Purged During Startup	4,500	scfm
Duration of Normal Purge	4.0	min
Total Gas Purged (Per Startup)	18,000	scf
VOC Purged (Per Startup)	25	lbs/startup
CO_2 Purged (Per Startup)	2	lbs/startup
CH_4 Purged (Per Startup)	809	lbs/startup

Density of natural gas: 0.05 lb/ft^3 @ STP (www.engineeringtoolbox.com)

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 3. Microturbine Emissions Calculations

Microturbine Unit Information:

Engine ID:	S005-S014
Manufacturer:	Capstone
Model No.:	C200
Number of Units:	10

Microturbine Fuel Information:

	Per Unit	As Combined
Fuel Type:	Natural Gas	Natural Gas
Rated Electrical Power Output (kW):	200	2,000
Rated Electrical Power Output (MW):	0.2	2
Rated Horsepower (bhp):	268.2	2,682
Heat Input (MMBtu/hr)	2.28	22.8
Maximum Fuel Consumption at 100% Load (scf/hr):	2,156	21,559
Maximum Fuel Consumption at 100% Load (mmscf/yr	18.89	188.86
Potential Fuel Consumption (MMBtu/yr):	19,973	199,728
Max. Annual Hours of Operation (hr/yr):	8,760	8,760

Microturbine Emissions Data:

Pollutant	Emission Factors	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	0.40	lb/MWhe	0.08	0.35	Manufacturer's Specifications
VOC	0.10	lb/MWhe	0.02	0.09	Manufacturer's Specifications
CO	1.10	lb/MWhe	0.22	0.96	Manufacturer's Specifications
SO_X	0.003	lb/MMBtu	0.01	0.03	AP-42, Table 3.1-2a (Apr-2000)
PM_{10}	0.007	lb/MMBtu	0.02	0.07	AP-42, Table 3.1-2a (Apr-2000)
$PM_{2.5}$	0.007	lb/MMBtu	0.02	0.07	AP-42, Table 3.1-2a (Apr-2000)
GHG (CO_2e)	See Table Below		266	1,166	Manufacturer's Specifications / 40 CFR 98, Table C-2
Other (Total HAP)	See Table Below		0.00	0.01	AP-42, Table 3.1-3 (Apr-2000)

Notes:
1. NMNEHC is non-methane, non-ethane hydrocarbon excluding formaldehyde (HCHO).
2. VOC is NMNEHC + HCHO.
3. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
5. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this engine type, including HCHO

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 3. Microturbine Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	1,330	lb/MWhe	266	1,165	Manufacturer's Specifications
CH_4	0.001	kg/MMBtu	0.01	0.02	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**266**	**1,166**	
HAPs:					
1,3-Butadiene	4.3E-07	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Acetaldehyde	4.0E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Acrolein	6.4E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Benzene	1.2E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Ethylbenzene	3.2E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Formaldehyde	7.1E-04	lb/MMBtu	0.00	0.01	AP-42, Table 3.1-3 (Apr-2000)
Naphthalene	1.3E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
PAH	2.2E-06	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Propylene oxide	2.9E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Toluene	1.3E-04	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Xylene	6.4E-05	lb/MMBtu	0.00	0.00	AP-42, Table 3.1-3 (Apr-2000)
Total HAP			**0.002**	**0.010**	

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 4. Dehydration Unit Regenerator Vent Emissions Calculations

Dehydration Unit Information:

Source ID:	S015
Control Type:	Enclosed Flare
Control Efficiency:	98%
Dehy Throughput (MMscfd):	50
Glycol Circulation Rate (gpm):	5.90
Max. Annual Hours of Operation (hr/yr):	8,760

Dehydration Unit Regenerator Vent Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	4.45	19.47	0.09	0.39	GRI GLYCalc (See Output Below)
HAPs	2.96	12.97	0.06	0.26	GRI GLYCalc (See Output Below)
NO_x	N/A	N/A	N/A	N/A	See Flare Calculations
SO_x	N/A	N/A	N/A	N/A	See Flare Calculations
CO	N/A	N/A	N/A	N/A	See Flare Calculations
PM_{10}	N/A	N/A	N/A	N/A	See Flare Calculations
$PM_{2.5}$	N/A	N/A	N/A	N/A	See Flare Calculations
GHG (CO_2e)	13	56	0.26	1.13	GRI GLYCalc (See Output Below)
Other (Benzene)	0.32	1.39	0.01	0.03	GRI GLYCalc (See Output Below)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

GRI GLYCalc Emissions Data - Regenerator Vent:

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lbs/hr	lbs/day	tpy	lbs/hr	lbs/day	tpy
Methane	0.5143	12.343	2.2525	0.0103	0.247	0.0451
Ethane	0.4313	10.351	1.8891	0.0086	0.207	0.0378
Propane	0.2644	6.346	1.1582	0.0053	0.127	0.0232
Isobutane	0.0959	2.302	0.4201	0.0019	0.046	0.0084
n-Butane	0.2634	6.322	1.1537	0.0053	0.126	0.0231
Isopentane	0.1041	2.4980	0.4560	0.0021	0.0500	0.0091
n-Pentane	0.1293	3.1040	0.5665	0.0026	0.0620	0.0113
Cyclopentane	0.0127	0.3040	0.0555	0.0003	0.0060	0.0011
n-Hexane	0.2368	5.6830	1.0371	0.0047	0.1140	0.0207
Cyclohexane	0.0299	0.7170	0.1308	0.0006	0.0140	0.0026
Other Hexanes	0.0033	0.0800	0.0146	0.0001	0.0020	0.0003
Heptanes	0.5149	12.3580	2.2554	0.0103	0.2470	0.0451
Methylcyclohexane	0.0385	0.9240	0.1686	0.0008	0.0180	0.0034
2,2,4-Trimethylpentane	0.0048	0.1150	0.0210	0.0001	0.0020	0.0004
Benzene	0.3173	7.6150	1.3897	0.0063	0.1520	0.0278
Toluene	0.5606	13.4550	2.4556	0.0112	0.2690	0.0491
Ethylbenzene	0.7888	18.9310	3.4549	0.0158	0.3790	0.0691
Xylenes	1.0527	25.2650	4.6108	0.0211	0.5050	0.0922
C8 + Heavier Hydrocarbons	0.0275	0.6600	0.1204	0.0005	0.0130	0.0024
Total Emissions	**5.3905**	**129.373**	**23.6105**	**0.1078**	**2.587**	**0.4722**
Total Hydrocarbon Emissions	**5.3905**	**129.373**	**23.6105**	**0.1078**	**2.587**	**0.4722**
Total VOC Emissions	**4.4450**	**106.679**	**19.4689**	**0.0889**	**2.134**	**0.3894**
Total HAP Emissions	**2.961**	**71.064**	**12.969**	**0.059**	**1.421**	**0.2594**
Total BTEX Emissions	**2.719**	**65.266**	**11.911**	**0.054**	**1.305**	**0.2383**

Notes:
1. Based on GRI GLYCalc 4.0 run at maximum design conditions of dry gas flow rate at 50 MMscfd, temperature at 60 °F, and pressure at 1000 psig.

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 5. Dehydration Unit Flash Tank Emissions Calculations

Dehydration Unit Information:

Source ID:	S015
Control Type:	Route to Reboiler/Enclosed Flare
Control Efficiency:	98%
Flash Tank Inlet Pressure (psig):	35
Flash Tank Inlet Temperature (°F)	125
Max. Annual Hours of Operation (hr/yr):	8,760

Dehydration Unit Flash Tank Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	1.62	7.08	0.03	0.14	GRI GLYCalc (See Output Below)
HAPs	0.13	0.57	0.00	0.01	GRI GLYCalc (See Output Below)
NO_x	N/A	N/A	N/A	N/A	See Flare Calculations
SO_x	N/A	N/A	N/A	N/A	See Flare Calculations
CO	N/A	N/A	N/A	N/A	See Flare Calculations
PM_{10}	N/A	N/A	N/A	N/A	See Flare Calculations
$PM_{2.5}$	N/A	N/A	N/A	N/A	See Flare Calculations
GHG (CO_2e)	250	1,093	5	22	GRI GLYCalc (See Output Below)
Other (Benzene)	0.00	0.02	0.00	0.00	GRI GLYCalc (See Output Below)

Notes:
1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

GRI GLYCalc Emissions Data - Flash Tank:

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lbs/hr	lbs/day	tpy	lbs/hr	lbs/day	tpy
Methane	9.9803	239.528	43.7139	0.1996	4.791	0.8743
Ethane	2.2915	54.996	10.0368	0.0458	1.100	0.2007
Propane	0.6637	15.928	2.9068	0.0133	0.319	0.0581
Isobutane	0.1559	3.743	0.6830	0.0031	0.075	0.0137
n-Butane	0.3256	7.815	1.4262	0.0065	0.156	0.0285
Isopentane	0.1107	2.6560	0.4847	0.0022	0.053	0.0097
n-Pentane	0.1092	2.6210	0.4784	0.0022	0.0520	0.0096
Cyclopentane	0.0026	0.0630	0.0116	0.0001	0.0010	0.0002
n-Hexane	0.1081	2.5940	0.4735	0.0022	0.0520	0.0095
Cyclohexane	0.0033	0.0800	0.0146	0.0001	0.0020	0.0003
Other Hexanes	0.0020	0.0490	0.0089	0.0001	0.0010	0.0002
Heptanes	0.1115	2.6750	0.4882	0.0022	0.0540	0.0098
Methylcyclohexane	0.0033	0.0790	0.0144	0.0001	0.0020	0.0003
2,2,4-Trimethylpentane	0.0021	0.0500	0.0091	0.0001	0.0010	0.0002
Benzene	0.0050	0.1200	0.0219	0.0001	0.0020	0.0004
Toluene	0.0055	0.1330	0.0243	0.0001	0.0030	0.0005
Ethylbenzene	0.0044	0.1060	0.0193	0.0001	0.0020	0.0004
Xylenes	0.0041	0.0980	0.0179	0.0001	0.0020	0.0004
C8 + Heavier Hydrocarbons	0.0005	0.0120	0.0022	0.0001	0.0010	0.0001
Total Emissions	**13.8894**	**333.346**	**60.8356**	**0.2778**	**6.667**	**1.2167**
Total Hydrocarbon Emissions	**13.8894**	**333.346**	**60.8356**	**0.2778**	**6.667**	**1.2167**
Total VOC Emissions	**1.6176**	**38.821**	**7.0849**	**0.0324**	**0.776**	**0.1417**
Total HAP Emissions	**0.1292**	**3.101**	**0.566**	**0.003**	**0.062**	**0.011**
Total BTEX Emissions	**0.0191**	**0.457**	**0.084**	**0.000**	**0.009**	**0.002**

Notes:
1. Based on GRI GLYCalc 4.0 run at maximum design conditions of dry gas flow rate at 50 MMscfd, temperature at 60 °F, and pressure at 1000 psig.
2. The proposed control system consists of a reboiler with flare backup which is expected to achieve 98% removal of VOC/HAP.

Company Name:	**Equitrans, L.P.**
Facility Name:	**Redhook Compressor Station**
Project Description:	**Plan Approval Application**

TABLE 6. Control Device Emissions Calculations - Enclosed Flare on Dehydration Unit

Control Device Information:

Source ID:	CD-001
Control Type:	Enclosed Flare
Control Efficiency:	98%
Maximum Flow (ACFM)	7,222
Flare Rating (MMBtu/hr):	7.0
Pilot Rating (MMBtu/hr):	2.0
Rated Gas Combustion (MMsf/yr):	58.0
Max. Annual Hours of Operation (hr/yr):	8,760

Emissions from Combustion of Gas in Flare:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_X	0.09	lb/MMBtu	0.66	2.90	AP-42, Table 1.4-1 (Jul-1998)
CO	0.08	lb/MMBtu	0.56	2.44	AP-42, Table 1.4-1 (Jul-1998)
SO_X	0.001	lb/MMBtu	0.004	0.02	AP-42, Table 1.4-2 (Jul-1998)
PM_{10}	0.007	lb/MMBtu	0.05	0.22	AP-42, Table 1.4-2 (Jul-1998)
$PM_{2.5}$	0.007	lb/MMBtu	0.05	0.22	AP-42, Table 1.4-2 (Jul-1998)
GHG (CO_2e)	See Table Below		820	3,591	40 CFR 98, Tables C-1 & C-2

Greenhouse Gas (GHG) Emissions Calculations:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	53.06	kg/MMBtu	818.98	3587.14	40 CFR 98, Tables C-1 & C-2
CH_4	0.001	kg/MMBtu	0.02	0.07	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**820**	**3,591**	

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Emissions of NO_X, SO_X, CO, PM, and GHG pollutants are the result of combustion of the regenerator and flash tank vent streams in the combustor

Company Name:	Equitrans, L.P.
Facility Name:	Redhook Compressor Station
Project Description:	Plan Approval Application

TABLE 7. Dehydration Unit Reboiler Emissions Calculations

Reboiler Information:

Source ID:	S016
Number of Units:	1

Reboiler Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,058
Heat Input (MMBtu/hr)	0.77
Potential Fuel Consumption (MMBtu/yr):	6,745
Max. Fuel Consumption (MMscf/hr):	0.0007
Max. Fuel Consumption (MMscf/yr):	6.4
Max. Annual Hours of Operation (hr/yr):	8,760

Reboiler Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_x	100	lb/MMScf	0.07	0.32	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.004	0.02	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.06	0.27	AP-42, Table 1.4-1 (Jul-1998)
SO_x	0.6	lb/MMScf	0.0004	0.002	AP-42, Table 1.4-2 (Jul-1998)
PM_{10}	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
$PM_{2.5}$	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	0.0001	0.0002	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO_2e)	See Table Below		90	395	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.001	0.01	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 7. Dehydration Unit Reboiler Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	53.06	kg/MMBtu	90.09	395	40 CFR 98, Tables C-1 & C-2
CH_4	0.001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**90**	**395**	
Organic HAPs:					
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthylene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Anthracene	2.40E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benz(a)anthracene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dichlorobenzene	1.20E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.00	0.01	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:					
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP			**0.001**	**0.01**	

Company Name:	**Equitrans, L.P.**
Facility Name:	**Redhook Compressor Station**
Project Description:	**Plan Approval Application**

TABLE 8. Fuel Gas Heater Emissions Calculations

Fuel Gas Heater Information:

Source ID:	S017-S018
Number of Units:	2

Fuel Gas Heater Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,058
Heat Input (MMBtu/hr)	0.77
Potential Fuel Consumption (MMBtu/yr):	6,745
Max. Fuel Consumption (MMscf/hr):	0.0007
Max. Fuel Consumption (MMscf/yr):	6.4
Max. Annual Hours of Operation (hr/yr):	8,760

Fuel Gas Heater Information:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO_x	100	lb/MMScf	0.07	0.32	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.00	0.02	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.06	0.27	AP-42, Table 1.4-1 (Jul-1998)
SO_x	0.6	lb/MMScf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM_{10}	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
$PM_{2.5}$	7.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO_2e)	See Table Below		90	395	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.00	0.01	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:

1. PM_{10} and $PM_{2.5}$ are total values (filterable + condensable).
2. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CC_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 8. Fuel Gas Heater Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO_2	53.06	kg/MMBtu	90.09	395	40 CFR 98, Tables C-1 & C-2
CH_4	0.001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
N_2O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO_2e)			**90**	**395**	
Organic HAPs:					
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Acenapthylene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Anthracene	2.40E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benz(a)anthracene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dichlorobenzene	1.20E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.00	0.01	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:					
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP			**0.001**	**0.01**	

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 9. Storage Tank Emissions Calculations - Produced Fluids Tank

Storage Tank Information:

Source ID:	S019
Tank Capacity (gallons):	8,820
Tank Contents:	Produced Fluids
Annual Throughput (gallons/year):	91,350
Daily Throughput (bbl/day)	6
Percent Condensate	1%
Condensate Throughput (bbl/day)	0.1
Control Type:	None
Control Efficiency:	N/A
Max. Annual Hours of Operation (hr/yr):	8,760

Tank Emissions Data:

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	0.05	0.21	0.05	0.21	E&P TANK 2.0
HAPs	0.00	0.00	0.00	0.00	E&P TANK 2.0
GHG (CO2e)	0.48	2.10	0.48	2.10	E&P TANK 2.0

E & P Tanks Emissions Data:

Pollutant	Total Emissions (Working + Breathing + Flashing)			Total Emissions		
	lbs/hr	lbs/yr	tpy	lbs/hr	lbs/yr	tpy
VOC	0.05	429.24	0.21	0.05	429.24	0.21
HAPs	0.00	0.00	0.00	0.00	0.00	0.00
GHG (CO_2e)	0.48	4,161.00	2.10	0.48	4,161.00	2.10

Notes:
1. E & P TANK software estimates working, breathing, and flashing losses and reports as one total. Emissions are based on a conservative estimate of 99 % water and
2. This tank does contain hydrocarbons that could be flashed off at tank operating conditions.

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 10. Miscellaneous Storage Tank Emissions Calculations

Storage Tank Information:

Source ID:	S020	S021	S022	S023	S024	S025	S026
Tank Capacity (gallons):	4,200	2,100	2,100	2,100	2,100	2,100	2,100
Tank Contents:	Used Oil	TEG	Used TEG	MEG	Used MEG	Engine Oil	Compressor Oil
Annual Throughput (gallons/year):	2,100	2,100	1,050	1,050	1,050	2,100	4,200
Control Type:	None	None	None	None	None	None	None
Control Efficiency:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max. Annual Hours of Operation (hr/yr):	8,760	8,760	8,760	8,760	8760	8,760	8,760

Emissions Data:

Pollutant	Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)		Total Emissions (Working + Breathing)	
	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
VOC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HAPs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:
1. EPA TANKS software run for engine/compressor oil and used oil tanks are using properties of distillate fuel oil #2.
2. EPA TANKS software run for TEG and Used MEG are using properties of propylene glycol.
3. These tanks do not contain hydrocarbons that would be expected to be flashed off at tank operating conditions

Tank Emissions Data:

Pollutant	Working and Breathing		Flashing		Emissions Estimation Method	Total Uncontrolled	
	lbs/hr	tpy	lbs/hr	tpy		lbs/hr	tpy
VOC	0.00	0.00	0.00	0.00	N/A	0.00	0.00
HAPs	0.00	0.00	0.00	0.00	N/A	0.00	0.00
Methane	0.00	0.00	0.00	0.00	N/A	0.00	0.00

Company Name: **Equitrans, L.P.**
Facility Name: **Redhook Compressor Station**
Project Description: **Plan Approval Application**

TABLE 11. Fugitive Emissions Calculations

Fugitive Component Information:

Component Type	Estimated Component Count	Gas Leak Emission Factor (lb/hr/component)	Factor Source	Average Gas Leak Rate (lb/hr)	Max Gas Leak Rate (tpy)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
Connectors	1,970	0.0004	EPA Protocol, Table 2-4	0.87	4.18	0.12	0.01
Flanges	985	0.001	EPA Protocol, Table 2-4	0.85	4.08	0.11	0.00
Open-Ended Lines	55	0.004	EPA Protocol, Table 2-4	0.24	1.17	0.03	0.00
Pump Seals	0	0.005	EPA Protocol, Table 2-4	0.00	0.00	0.00	0.00
Valves	355	0.010	EPA Protocol, Table 2-4	3.52	16.97	0.47	0.02
Other	32	0.019	EPA Protocol, Table 2-4	0.62	2.99	0.08	0.00
Total				6.10	29.39	0.82	0.04

Notes:
1. "Other" equipment types include compressor seals, relief valves, diaphragms, drains, meters, etc
2. The component count is a preliminary estimate based on the proposed design of the station
3. Conservatively assumed that maximum leak rate is 10% greater than measured average leak rate for the purposes of establishing PTE
4. VOC and HAP emissions are based on fractions of these pollutants in the site-specific gas analysis

Dry Seal Emissions

Number of Compressors	Number of seals Per Compressor	Leak Rate (scf/hr/seal)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
2	2	6	210,240	0.11	0.00	0.01	4.22	105.62
Total				0.11	0.00	0.01	4.22	105.62

1. Leak rate and seal information from EPA Natural Gas Star Program (http://www.epa.gov/gasstar/documents/ll_wetseals.pdf

Rod Packing Emissions

Number of Compressors	Number of Rods Per Compressor	Leak Rate (scf/hr/rod)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
2	6	15	1,576,800	0.83	0.02	0.08	31.68	792.12
Total				0.83	0.02	0.08	31.68	792.12

1. Caterpillar does not publish specific crankcase and rodpacking emission leak rates. The leak rates are based on engineering estimates on the operation of the engines

Engine Crankcase Emissions

Number of Engines	Engine Rating (hp)	Leak Rate (scf/bhp-hr)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HCHO Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO_2 Emissions (tpy)	Potential CH_4 Emissions (tpy)	Potential CO_2e Emissions (tpy)
2	5,350	0.5	46,866,000	0.06	0.03	0.04	60.21	0.51	73.08
Total				0.06	0.03	0.04	60.21	0.51	73.08

Flow Rate of Engine[1] 32,209 ft^3/min
1. From Vendor data sheet

Engine Crankcase Exhaust Composition

Constituent	Engine Exhaust Emissions (tpy)	Composition of Exhaust Gas (lb/MMscf)
VOC	23	2.75
HCHO	10	1.22
Total HAP	14	1.62
CO_2	21,749	2,569
CH_4	186	21.97

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 11. Fugitive Emissions Calculations

VOC and HAP Vented Blowdown Emissions

Blowdown Emissions Sources	Vented Gas Volume Per Blowdown Event (scf)	Number of Blowdown Events per year	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)
Station ESD Vent	1,500,000	1	1,500,000	0.79	0.02
Pigging and Pipeline Blowdowns			2,000,000	1.05	0.03
Reciprocating Compressors	50,000	24	1,200,000	0.63	0.02
Centrifugal Compressors	200,000	8	1,600,000	0.84	0.02
Total				**3.30**	**0.09**

Density of natural gas: 0.05 lb/ft^3 @ STP (www.engineeringtoolbox.com)

GHG Vented Blowdown Emissions

Blowdown Emissions Sources	Vented Gas Volume Per Blowdown Event (scf)	Number of Blowdown Events per year	Total Volume NG Emitted (scf/yr)	Potential CH_4 Emissions[1] (tpy)	Potential CO_2 Emissions[1] (tpy)	Potential CO_2e Emissions (tpy)
Station ESD Vent	1,500,000	1	1,500,000	30.14	0.08	754
Pigging and Pipeline Blowdowns			2,000,000	40.18	0.10	1,005
Reciprocating Compressors	50,000	24	1,200,000	24.11	0.06	603
Centrifugal Compressors	200,000	8	1,600,000	32.15	0.08	804
Total				**126.6**	**0.32**	**3,165**

1. Calculated in accordance with Equations W-14 and W-35, and W-36 in Subpart W of 40 CFR 98

GHG Fugitive Emissions from Component Leaks:

Component Type	Estimated Component Count	GHG Emission Factor		CH_4 Emissions	CO_2 Emissions	CO_2e Emissions
		scf/hr/component	Factor Source	(tpy)	(tpy)	(tpy)
Connectors	1,970	0.004	40 CFR 98, Table W-1A	1.39	0.004	34.68
Flanges	985	0.004	40 CFR 98, Table W-1A	0.69	0.002	17.34
Open-Ended Lines	55	0.061	40 CFR 98, Table W-1A	0.59	0.001	14.76
Pump Seals	0	13.3	40 CFR 98, Table W-1A	0.00	0.000	0.00
Valves	355	0.03	40 CFR 98, Table W-1A	1.69	0.004	42.18
Other	32	0.04	40 CFR 98, Table W-1A	0.23	0.001	5.63
Total				**4.58**	**0.01**	**114.59**

Notes:
1. The component count is a preliminary estimate based on the proposed design of the station
2. CH_4 and CO_2 emissions are based on fractions of these pollutants in the site-specific gas analysis
3. Emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98
4. GHG (CO_2e) is carbon dioxide equivalent, which is the summation of CO_2 (GWP = 1) + CH_4 (GWP = 25) + N_2O (GWP = 298).

Fugitive Component Emissions Data:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	1.17	5.13	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
HCHO	0.01	0.03	Concentration and Vented Volume
HAPs	0.04	0.19	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
GHG (CO_2e)	970	4,250	40 CFR 98, Table W-1A and Site-Specific Gas Analysis

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 12. Liquid Loading Emissions Calculations

Liquid Loading Information:

Parameter	Value	Description
S	1.45	saturation factor for splash loading (AP-42 Table 5.2-1)
Collection Efficiency	0%	
Control Efficiency	0%	
P	0.21	true vapor pressure of liquid loaded (psia) - assume octane
M	114.23	molecular weight of vapors (lb/lb-mol) - assume octane
T	516.4	temperature of liquids loaded (deg R) - TANKS Data

Description	Loading Losses	Maximum Throughput[2]	VOC Emissions	
	($lb/10^3$ gal)[1]	(gal)	(lb/hr)	(tpy)
Liquids Hauling	0.8	91,350	0.01	0.04

Notes:

1. Uncontrolled Loading Losses: L_L ($lb/10^3$ gal) = 12.46 (SPM)/T
2. Produced fluids throughput.

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 13. Site-Specific Gas Analysis

Sample Location: Pratt Station
Sample Date: 4/21/2015
HHV (Btu/scf): 1,058

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)
N2	0.1358	0.224
METHANE	94.9365	89.860
CO2	0.0877	0.228
ETHANE	3.8895	6.902
PROPANE	0.566	1.473
I-BUTANE	0.0805	0.276
N-BUTANE	0.1393	0.478
I-PENTANE	0.0413	0.176
N-PENTANE	0.0339	0.144
N-HEXANE	0.0239	0.122
HEPTANES	0.0198	0.117
Totals	99.954	100.000

*Gas Analysis showed no detectable compounds above heptanes.

TOC (Total)	99.73	99.55
VOC (Total)	0.90	2.79
HAP (Total)	0.02	0.12

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 14. Atmospheric Emissions from Each Source at the Facility

Source	Pollutants																	
	VOC		NO_x		CO		HCHO		Total HAPs		PM_{10}		$PM_{2.5}$		SO_x		GHG (CO_2e)	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Engine 1 (S001)	2.12	9.30	4.72	20.66	1.95	8.53	0.59	2.58	1.36	5.95	0.40	1.73	0.40	1.73	0.02	0.10	6,030	26,410
Engine 2 (S002)	2.12	9.30	4.72	20.66	1.95	8.53	0.59	2.58	1.36	5.95	0.40	1.73	0.40	1.73	0.02	0.10	6,030	26,410
Turbine 1 (S003)	0.59	2.58	5.03	22.02	5.11	23.38	0.26	1.13	0.29	1.26	1.62	7.08	1.62	7.08	0.31	1.34	10,651	46,779
Turbine 2 (S004)	0.59	2.58	5.03	22.02	5.11	23.38	0.26	1.13	0.29	1.26	1.62	7.08	1.62	7.08	0.31	1.34	10,651	46,779
Microturbine 1 (S005)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 2 (S006)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 3 (S007)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 4 (S008)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 5 (S009)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 6 (S010)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 7 (S011)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 8 (S012)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 9 (S013)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Microturbine 10 (S014)	0.02	0.09	0.08	0.35	0.22	0.96	0.00	0.01	0.00	0.01	0.02	0.07	0.02	0.07	0.01	0.03	266	1,166
Dehy Regenerator (S015)	0.09	0.39	N/A	N/A	N/A	N/A	--	--	0.06	0.26	N/A	N/A	N/A	N/A	N/A	N/A	0.26	1.13
Dehy Flash Tank (S015)	0.03	0.14	N/A	N/A	N/A	N/A	--	--	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	5	22
Dehy Reboiler (S016)	0.00	0.02	0.07	0.32	0.06	0.27	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	90	395
Dehy Enclosed Flare (CD-001)	--	--	0.66	2.90	0.56	2.44	--	--	--	--	0.05	0.22	0.05	0.22	0.00	0.02	820	3,591
Fuel Gas Heater 1 (S017)	0.00	0.02	0.07	0.32	0.06	0.27	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	90	395
Fuel Gas Heater 2 (S018)	0.00	0.02	0.07	0.32	0.06	0.27	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	90	395
Produced Fluids Tank (S019)	0.05	0.21	--	--	--	--	--	--	0.00	0.00	--	--	--	--	--	--	0	2
Misc Tanks Tank (S020-S026)	0.00	0.00	--	--	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--
Fugitive Leaks	1.17	5.13	--	--	--	--	0.01	0.03	0.04	0.19	--	--	--	--	--	--	970	4,250
Liquid Loading	0.01	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Facility-Wide	**6.98**	**30.59**	**21.17**	**92.73**	**17.05**	**76.69**	**1.72**	**7.53**	**3.42**	**14.99**	**4.24**	**18.58**	**4.24**	**18.58**	**0.74**	**3.24**	**38,090**	**167,091**

Notes:
1. PM_{10} and $PM_{2.5}$ emissions are filterable + condensable.
2. VOC emissions for the engines are conservatively estimated as: VOC=NMNEHC+HCHO (Formaldehyde)

Company Name: Equitrans, L.P.
Facility Name: Redhook Compressor Station
Project Description: Plan Approval Application

TABLE 15. Total Emissions from All Sources at the Facility

Pollutants	Estimated Site-Wide Emissions	
	lb/hr	tpy
VOC	6.98	30.59
NO_x	21.17	92.73
CO	17.05	76.69
Formaldehyde (HCHO)	1.72	7.53
Total HAPs	3.42	14.99
SO_x	0.74	3.24
PM_{10}	4.24	18.58
$PM_{2.5}$	4.24	18.58
GHG (CO_2e)	38,090	167,091

Notes:
1. PM_{10} and $PM_{2.5}$ emissions are filterable + condensable.
2. Emissions from all sources at the facility are included above.

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: EQT -Red Hook CS
File Name: Z:\Client\EQT Corporation\Pennsylvania\Red Hook\Projects\153901.0086 Plan Approval\04 Draft\2015-0708 Red Hook 50MMSCFD.ddf
Date: July 08, 2015

DESCRIPTION:

Description: 50 MMscfd 60F, 1000 PSIG. Pratt gas analysis from 4/21/2015.

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0103	0.247	0.0451
Ethane	0.0086	0.207	0.0378
Propane	0.0053	0.127	0.0232
Isobutane	0.0019	0.046	0.0084
n-Butane	0.0053	0.126	0.0231
Isopentane	0.0021	0.050	0.0091
n-Pentane	0.0026	0.062	0.0113
Cyclopentane	0.0003	0.006	0.0011
n-Hexane	0.0047	0.114	0.0207
Cyclohexane	0.0006	0.014	0.0026
Other Hexanes	0.0001	0.002	0.0003
Heptanes	0.0103	0.247	0.0451
Methylcyclohexane	0.0008	0.018	0.0034
2,2,4-Trimethylpentane	0.0001	0.002	0.0004
Benzene	0.0063	0.152	0.0278
Toluene	0.0112	0.269	0.0491
Ethylbenzene	0.0158	0.379	0.0691
Xylenes	0.0211	0.505	0.0922
C8+ Heavies	0.0005	0.013	0.0024
Total Emissions	0.1078	2.587	0.4722
Total Hydrocarbon Emissions	0.1078	2.587	0.4722
Total VOC Emissions	0.0889	2.134	0.3894
Total HAP Emissions	0.0592	1.421	0.2594
Total BTEX Emissions	0.0544	1.305	0.2382

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5143	12.343	2.2525
Ethane	0.4313	10.351	1.8891
Propane	0.2644	6.346	1.1582
Isobutane	0.0959	2.302	0.4201
n-Butane	0.2634	6.322	1.1537
Isopentane	0.1041	2.498	0.4560
n-Pentane	0.1293	3.104	0.5665
Cyclopentane	0.0127	0.304	0.0555

n-Hexane	0.2368	5.683	1.0371
Cyclohexane	0.0299	0.717	0.1308
Other Hexanes	0.0033	0.080	0.0146
Heptanes	0.5149	12.358	2.2554
Methylcyclohexane	0.0385	0.924	0.1686
2,2,4-Trimethylpentane	0.0048	0.115	0.0210
Benzene	0.3173	7.615	1.3897
Toluene	0.5606	13.455	2.4556
Ethylbenzene	0.7888	18.931	3.4549
Xylenes	1.0527	25.265	4.6108
C8+ Heavies	0.0275	0.660	0.1204
Total Emissions	5.3905	129.373	23.6105
Total Hydrocarbon Emissions	5.3905	129.373	23.6105
Total VOC Emissions	4.4450	106.679	19.4689
Total HAP Emissions	2.9610	71.064	12.9691
Total BTEX Emissions	2.7194	65.266	11.9110

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.1996	4.791	0.8743
Ethane	0.0458	1.100	0.2007
Propane	0.0133	0.319	0.0581
Isobutane	0.0031	0.075	0.0137
n-Butane	0.0065	0.156	0.0285
Isopentane	0.0022	0.053	0.0097
n-Pentane	0.0022	0.052	0.0096
Cyclopentane	0.0001	0.001	0.0002
n-Hexane	0.0022	0.052	0.0095
Cyclohexane	0.0001	0.002	0.0003
Other Hexanes	<0.0001	0.001	0.0002
Heptanes	0.0022	0.054	0.0098
Methylcyclohexane	0.0001	0.002	0.0003
2,2,4-Trimethylpentane	<0.0001	0.001	0.0002
Benzene	0.0001	0.002	0.0004
Toluene	0.0001	0.003	0.0005
Ethylbenzene	0.0001	0.002	0.0004
Xylenes	0.0001	0.002	0.0004
C8+ Heavies	<0.0001	<0.001	<0.0001
Total Emissions	0.2778	6.667	1.2167
Total Hydrocarbon Emissions	0.2778	6.667	1.2167
Total VOC Emissions	0.0324	0.776	0.1417
Total HAP Emissions	0.0026	0.062	0.0113
Total BTEX Emissions	0.0004	0.009	0.0017

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	9.9803	239.528	43.7139
Ethane	2.2915	54.996	10.0368
Propane	0.6637	15.928	2.9068
Isobutane	0.1559	3.743	0.6830
n-Butane	0.3256	7.815	1.4262
Isopentane	0.1107	2.656	0.4847

n-Pentane	0.1092	2.621	0.4784
Cyclopentane	0.0026	0.063	0.0116
n-Hexane	0.1081	2.594	0.4735
Cyclohexane	0.0033	0.080	0.0146
Other Hexanes	0.0020	0.049	0.0089
Heptanes	0.1115	2.675	0.4882
Methylcyclohexane	0.0033	0.079	0.0144
2,2,4-Trimethylpentane	0.0021	0.050	0.0091
Benzene	0.0050	0.120	0.0219
Toluene	0.0055	0.133	0.0243
Ethylbenzene	0.0044	0.106	0.0193
Xylenes	0.0041	0.098	0.0179
C8+ Heavies	0.0005	0.012	0.0022
Total Emissions	13.8894	333.346	60.8356
Total Hydrocarbon Emissions	13.8894	333.346	60.8356
Total VOC Emissions	1.6176	38.821	7.0849
Total HAP Emissions	0.1292	3.101	0.5660
Total BTEX Emissions	0.0191	0.457	0.0835

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.2099	5.037	0.9193
Ethane	0.0545	1.307	0.2385
Propane	0.0186	0.445	0.0813
Isobutane	0.0050	0.121	0.0221
n-Butane	0.0118	0.283	0.0516
Isopentane	0.0043	0.103	0.0188
n-Pentane	0.0048	0.115	0.0209
Cyclopentane	0.0003	0.007	0.0013
n-Hexane	0.0069	0.166	0.0302
Cyclohexane	0.0007	0.016	0.0029
Other Hexanes	0.0001	0.003	0.0005
Heptanes	0.0125	0.301	0.0549
Methylcyclohexane	0.0008	0.020	0.0037
2,2,4-Trimethylpentane	0.0001	0.003	0.0006
Benzene	0.0064	0.155	0.0282
Toluene	0.0113	0.272	0.0496
Ethylbenzene	0.0159	0.381	0.0695
Xylenes	0.0211	0.507	0.0926
C8+ Heavies	0.0006	0.013	0.0025
Total Emissions	0.3856	9.254	1.6889
Total Hydrocarbon Emissions	0.3856	9.254	1.6889
Total VOC Emissions	0.1213	2.910	0.5311
Total HAP Emissions	0.0618	1.483	0.2707
Total BTEX Emissions	0.0548	1.314	0.2399

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	45.9665	0.9193	98.00
Ethane	11.9259	0.2385	98.00

Propane	4.0650	0.0813	98.00
Isobutane	1.1031	0.0221	98.00
n-Butane	2.5799	0.0516	98.00
Isopentane	0.9407	0.0188	98.00
n-Pentane	1.0448	0.0209	98.00
Cyclopentane	0.0671	0.0013	98.00
n-Hexane	1.5106	0.0302	98.00
Cyclohexane	0.1454	0.0029	98.00
Other Hexanes	0.0235	0.0005	98.00
Heptanes	2.7436	0.0549	98.00
Methylcyclohexane	0.1830	0.0037	98.00
2,2,4-Trimethylpentane	0.0300	0.0006	98.00
Benzene	1.4117	0.0282	98.00
Toluene	2.4799	0.0496	98.00
Ethylbenzene	3.4742	0.0695	98.00
Xylenes	4.6287	0.0926	98.00
C8+ Heavies	0.1226	0.0025	98.00
Total Emissions	84.4461	1.6889	98.00
Total Hydrocarbon Emissions	84.4461	1.6889	98.00
Total VOC Emissions	26.5538	0.5311	98.00
Total HAP Emissions	13.5351	0.2707	98.00
Total BTEX Emissions	11.9945	0.2399	98.00

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 60.00 deg. F
Excess Oxygen: 5.00 %
Combustion Efficiency: 98.00 %
Supplemental Fuel Requirement: 3.44e-002 MM BTU/hr

Component	Emitted	Destroyed
Methane	2.00%	98.00%
Ethane	2.00%	98.00%
Propane	2.00%	98.00%
Isobutane	2.00%	98.00%
n-Butane	2.00%	98.00%
Isopentane	2.00%	98.00%
n-Pentane	2.00%	98.00%
Cyclopentane	2.00%	98.00%
n-Hexane	2.00%	98.00%
Cyclohexane	2.00%	98.00%
Other Hexanes	2.00%	98.00%
Heptanes	2.00%	98.00%
Methylcyclohexane	2.00%	98.00%
2,2,4-Trimethylpentane	2.00%	98.00%
Benzene	2.00%	98.00%
Toluene	2.00%	98.00%
Ethylbenzene	2.00%	98.00%
Xylenes	2.00%	98.00%
C8+ Heavies	2.00%	98.00%

ABSORBER

NOTE: Because the Calculated Absorber Stages was below the minimum allowed, GRI-GLYCalc has set the number of Absorber Stages to 1.25 and has calculated a revised Dry Gas Dew Point.

Calculated Absorber Stages:	1.25
Calculated Dry Gas Dew Point:	0.62 lbs. H2O/MMSCF
Temperature:	60.0 deg. F
Pressure:	1000.0 psig
Dry Gas Flow Rate:	50.0000 MMSCF/day
Glycol Losses with Dry Gas:	0.1283 lb/hr
Wet Gas Water Content:	Saturated
Calculated Wet Gas Water Content:	16.74 lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	10.54 gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	3.72%	96.28%
Carbon Dioxide	99.78%	0.22%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.96%	0.04%
Propane	99.93%	0.07%
Isobutane	99.90%	0.10%
n-Butane	99.87%	0.13%
Isopentane	99.87%	0.13%
n-Pentane	99.82%	0.18%
Cyclopentane	99.21%	0.79%
n-Hexane	99.70%	0.30%
Cyclohexane	98.56%	1.44%
Other Hexanes	99.77%	0.23%
Heptanes	99.43%	0.57%
Methylcyclohexane	98.45%	1.55%
2,2,4-Trimethylpentane	99.78%	0.22%
Benzene	84.98%	15.02%
Toluene	77.63%	22.37%
Ethylbenzene	72.80%	27.20%
Xylenes	63.76%	36.24%
C8+ Heavies	99.40%	0.60%

FLASH TANK

Flash Control:	Combustion device
Flash Control Efficiency:	98.00 %
Flash Temperature:	125.0 deg. F
Flash Pressure:	35.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.96%	0.04%
Carbon Dioxide	38.41%	61.59%
Nitrogen	4.79%	95.21%
Methane	4.90%	95.10%
Ethane	15.84%	84.16%
Propane	28.49%	71.51%

Isobutane	38.08%	61.92%
n-Butane	44.72%	55.28%
Isopentane	48.73%	51.27%
n-Pentane	54.44%	45.56%
Cyclopentane	82.84%	17.16%
n-Hexane	68.81%	31.19%
Cyclohexane	90.30%	9.70%
Other Hexanes	62.68%	37.32%
Heptanes	82.30%	17.70%
Methylcyclohexane	92.45%	7.55%
2,2,4-Trimethylpentane	70.23%	29.77%
Benzene	98.52%	1.48%
Toluene	99.10%	0.90%
Ethylbenzene	99.50%	0.50%
Xylenes	99.66%	0.34%
C8+ Heavies	98.41%	1.59%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	59.75%	40.25%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	1.03%	98.97%
n-Pentane	0.92%	99.08%
Cyclopentane	0.60%	99.40%
n-Hexane	0.73%	99.27%
Cyclohexane	3.54%	96.46%
Other Hexanes	1.60%	98.40%
Heptanes	0.61%	99.39%
Methylcyclohexane	4.33%	95.67%
2,2,4-Trimethylpentane	2.14%	97.86%
Benzene	5.08%	94.92%
Toluene	7.98%	92.02%
Ethylbenzene	10.46%	89.54%
Xylenes	12.96%	87.04%
C8+ Heavies	12.23%	87.77%

STREAM REPORTS:

WET GAS STREAM

Temperature: 60.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.08e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	3.53e-002	3.49e+001
Carbon Dioxide	8.77e-002	2.12e+002
Nitrogen	1.36e-001	2.09e+002
Methane	9.49e+001	8.37e+004
Ethane	3.89e+000	6.43e+003
Propane	5.66e-001	1.37e+003
Isobutane	8.05e-002	2.57e+002
n-Butane	1.39e-001	4.45e+002
Isopentane	4.13e-002	1.64e+002
n-Pentane	3.39e-002	1.34e+002
Cyclopentane	5.00e-004	1.93e+000
n-Hexane	2.39e-002	1.13e+002
Cyclohexane	5.00e-004	2.31e+000
Other Hexanes	5.00e-004	2.37e+000
Heptanes	1.98e-002	1.09e+002
Methylcyclohexane	5.00e-004	2.70e+000
2,2,4-Trimethylpentane	5.00e-004	3.14e+000
Benzene	5.00e-004	2.15e+000
Toluene	5.00e-004	2.53e+000
Ethylbenzene	5.00e-004	2.92e+000
Xylenes	5.00e-004	2.92e+000
C8+ Heavies	5.00e-004	4.68e+000
Total Components	100.00	9.32e+004

DRY GAS STREAM

Temperature: 60.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 2.08e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.31e-003	1.30e+000
Carbon Dioxide	8.76e-002	2.12e+002
Nitrogen	1.36e-001	2.09e+002
Methane	9.50e+001	8.36e+004
Ethane	3.89e+000	6.42e+003
Propane	5.66e-001	1.37e+003
Isobutane	8.05e-002	2.57e+002
n-Butane	1.39e-001	4.44e+002
Isopentane	4.13e-002	1.63e+002
n-Pentane	3.39e-002	1.34e+002
Cyclopentane	4.96e-004	1.91e+000
n-Hexane	2.38e-002	1.13e+002
Cyclohexane	4.93e-004	2.28e+000
Other Hexanes	4.99e-004	2.36e+000
Heptanes	1.97e-002	1.08e+002
Methylcyclohexane	4.93e-004	2.66e+000
2,2,4-Trimethylpentane	4.99e-004	3.13e+000
Benzene	4.25e-004	1.82e+000
Toluene	3.88e-004	1.96e+000
Ethylbenzene	3.64e-004	2.12e+000
Xylenes	3.19e-004	1.86e+000
C8+ Heavies	4.97e-004	4.65e+000

Component	Conc. (wt%)	Loading (lb/hr)
Total Components	100.00	9.31e+004

LEAN GLYCOL STREAM

Temperature: 60.00 deg. F
Flow Rate: 5.90e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	3.27e+003
Water	1.50e+000	4.98e+001
Carbon Dioxide	1.43e-012	4.75e-011
Nitrogen	9.28e-014	3.08e-012
Methane	1.06e-017	3.53e-016
Ethane	3.87e-008	1.29e-006
Propane	1.14e-009	3.78e-008
Isobutane	2.27e-010	7.56e-009
n-Butane	4.40e-010	1.46e-008
Isopentane	3.25e-005	1.08e-003
n-Pentane	3.61e-005	1.20e-003
Cyclopentane	2.32e-006	7.69e-005
n-Hexane	5.22e-005	1.73e-003
Cyclohexane	3.30e-005	1.10e-003
Other Hexanes	1.63e-006	5.42e-005
Heptanes	9.48e-005	3.15e-003
Methylcyclohexane	5.24e-005	1.74e-003
2,2,4-Trimethylpentane	3.14e-006	1.04e-004
Benzene	5.11e-004	1.70e-002
Toluene	1.46e-003	4.86e-002
Ethylbenzene	2.77e-003	9.22e-002
Xylenes	4.72e-003	1.57e-001
C8+ Heavies	1.15e-004	3.83e-003
Total Components	100.00	3.32e+003

RICH GLYCOL STREAM

Temperature: 60.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 6.01e+000 gpm
NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.69e+001	3.27e+003
Water	2.47e+000	8.34e+001
Carbon Dioxide	1.41e-002	4.75e-001
Nitrogen	9.14e-004	3.08e-002
Methane	3.11e-001	1.05e+001
Ethane	8.07e-002	2.72e+000
Propane	2.75e-002	9.28e-001
Isobutane	7.46e-003	2.52e-001
n-Butane	1.75e-002	5.89e-001
Isopentane	6.40e-003	2.16e-001
n-Pentane	7.10e-003	2.40e-001
Cyclopentane	4.56e-004	1.54e-002
n-Hexane	1.03e-002	3.47e-001

Cyclohexane	1.02e-003	3.43e-002
Other Hexanes	1.61e-004	5.42e-003
Heptanes	1.87e-002	6.30e-001
Methylcyclohexane	1.29e-003	4.35e-002
2,2,4-Trimethylpentane	2.06e-004	6.96e-003
Benzene	1.01e-002	3.39e-001
Toluene	1.82e-002	6.15e-001
Ethylbenzene	2.62e-002	8.85e-001
Xylenes	3.60e-002	1.21e+000
C8+ Heavies	9.43e-004	3.18e-002
Total Components	100.00	3.38e+003

FLASH TANK OFF GAS STREAM

Temperature: 125.00 deg. F
Pressure: 49.70 psia
Flow Rate: 2.80e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.28e-001	3.02e-002
Carbon Dioxide	9.01e-001	2.92e-001
Nitrogen	1.42e-001	2.94e-002
Methane	8.44e+001	9.98e+000
Ethane	1.03e+001	2.29e+000
Propane	2.04e+000	6.64e-001
Isobutane	3.64e-001	1.56e-001
n-Butane	7.60e-001	3.26e-001
Isopentane	2.08e-001	1.11e-001
n-Pentane	2.05e-001	1.09e-001
Cyclopentane	5.11e-003	2.64e-003
n-Hexane	1.70e-001	1.08e-001
Cyclohexane	5.36e-003	3.33e-003
Other Hexanes	3.19e-003	2.02e-003
Heptanes	1.51e-001	1.11e-001
Methylcyclohexane	4.54e-003	3.29e-003
2,2,4-Trimethylpentane	2.46e-003	2.07e-003
Benzene	8.70e-003	5.01e-003
Toluene	8.17e-003	5.55e-003
Ethylbenzene	5.63e-003	4.41e-003
Xylenes	5.23e-003	4.09e-003
C8+ Heavies	4.02e-004	5.04e-004
Total Components	100.00	1.42e+001

FLASH TANK GLYCOL STREAM

Temperature: 125.00 deg. F
Flow Rate: 5.98e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.73e+001	3.27e+003
Water	2.48e+000	8.34e+001
Carbon Dioxide	5.42e-003	1.82e-001
Nitrogen	4.39e-005	1.48e-003
Methane	1.53e-002	5.14e-001

Ethane	1.28e-002	4.31e-001
Propane	7.87e-003	2.64e-001
Isobutane	2.85e-003	9.59e-002
n-Butane	7.84e-003	2.63e-001
Isopentane	3.13e-003	1.05e-001
n-Pentane	3.88e-003	1.31e-001
Cyclopentane	3.79e-004	1.27e-002
n-Hexane	7.10e-003	2.39e-001
Cyclohexane	9.21e-004	3.10e-002
Other Hexanes	1.01e-004	3.40e-003
Heptanes	1.54e-002	5.18e-001
Methylcyclohexane	1.20e-003	4.02e-002
2,2,4-Trimethylpentane	1.46e-004	4.89e-003
Benzene	9.95e-003	3.34e-001
Toluene	1.81e-002	6.09e-001
Ethylbenzene	2.62e-002	8.81e-001
Xylenes	3.60e-002	1.21e+000
C8+ Heavies	9.32e-004	3.13e-002
Total Components	100.00	3.36e+003

FLASH GAS EMISSIONS

Flow Rate: 9.38e+002 scfh
Control Method: Combustion Device
Control Efficiency: 98.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.40e+001	2.85e+001
Carbon Dioxide	3.54e+001	3.85e+001
Nitrogen	4.24e-002	2.94e-002
Methane	5.03e-001	2.00e-001
Ethane	6.16e-002	4.58e-002
Propane	1.22e-002	1.33e-002
Isobutane	2.17e-003	3.12e-003
n-Butane	4.53e-003	6.51e-003
Isopentane	1.24e-003	2.21e-003
n-Pentane	1.22e-003	2.18e-003
Cyclopentane	3.05e-005	5.28e-005
n-Hexane	1.01e-003	2.16e-003
Cyclohexane	3.20e-005	6.65e-005
Other Hexanes	1.90e-005	4.05e-005
Heptanes	9.00e-004	2.23e-003
Methylcyclohexane	2.71e-005	6.57e-005
2,2,4-Trimethylpentane	1.47e-005	4.15e-005
Benzene	5.19e-005	1.00e-004
Toluene	4.87e-005	1.11e-004
Ethylbenzene	3.36e-005	8.82e-005
Xylenes	3.12e-005	8.19e-005
C8+ Heavies	2.40e-006	1.01e-005
Total Components	100.00	6.73e+001

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F

Pressure: 14.70 psia
Flow Rate: 7.46e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.48e+001	3.36e+001
Carbon Dioxide	2.11e-001	1.82e-001
Nitrogen	2.68e-003	1.48e-003
Methane	1.63e+000	5.14e-001
Ethane	7.29e-001	4.31e-001
Propane	3.05e-001	2.64e-001
Isobutane	8.39e-002	9.59e-002
n-Butane	2.30e-001	2.63e-001
Isopentane	7.34e-002	1.04e-001
n-Pentane	9.12e-002	1.29e-001
Cyclopentane	9.19e-003	1.27e-002
n-Hexane	1.40e-001	2.37e-001
Cyclohexane	1.80e-002	2.99e-002
Other Hexanes	1.97e-003	3.34e-003
Heptanes	2.61e-001	5.15e-001
Methylcyclohexane	1.99e-002	3.85e-002
2,2,4-Trimethylpentane	2.13e-003	4.79e-003
Benzene	2.07e-001	3.17e-001
Toluene	3.09e-001	5.61e-001
Ethylbenzene	3.78e-001	7.89e-001
Xylenes	5.04e-001	1.05e+000
C8+ Heavies	8.20e-003	2.75e-002
Total Components	100.00	3.91e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 7.46e-001 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Methane	3.26e+001	1.03e-002
Ethane	1.46e+001	8.63e-003
Propane	6.10e+000	5.29e-003
Isobutane	1.68e+000	1.92e-003
n-Butane	4.61e+000	5.27e-003
Isopentane	1.47e+000	2.08e-003
n-Pentane	1.82e+000	2.59e-003
Cyclopentane	1.84e-001	2.53e-004
n-Hexane	2.79e+000	4.74e-003
Cyclohexane	3.61e-001	5.97e-004
Other Hexanes	3.95e-002	6.69e-005
Heptanes	5.22e+000	1.03e-002
Methylcyclohexane	3.99e-001	7.70e-004
2,2,4-Trimethylpentane	4.26e-002	9.57e-005
Benzene	4.13e+000	6.35e-003
Toluene	6.19e+000	1.12e-002
Ethylbenzene	7.55e+000	1.58e-002
Xylenes	1.01e+001	2.11e-002
C8+ Heavies	1.64e-001	5.50e-004
Total Components	100.00	1.08e-001

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*   Project Setup Information
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Project File : Z:\Client\EQT Corporation\Pennsylvania\Red Hook\Projects\153901.0086 Plan Approval\04 Draft\Emission Calculations\2015-0722 Redhook PF Tank.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 0.0%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No

Filed Name : EQT - Redhook Produced Fluid Tank
Date : 2015.07.22

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*   Data Input
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Separator Pressure : 414.00[psig]
Separator Temperature : 60.00[F]
Ambient Pressure : 14.70[psia]
Ambient Temperature : 55.00[F]
C10+ SG : 0.8024
C10+ MW : 163.342

-- Low Pressure Oil

No.	Component	mol %
1	H2S	0.0000
2	O2	0.0000
3	CO2	0.0840
4	N2	0.0000
5	C1	9.9570
6	C2	8.1140
7	C3	6.8240
8	i-C4	1.8640
9	n-C4	4.8700
10	i-C5	2.9440
11	n-C5	3.3610
12	C6	2.2410
13	C7	9.7080
14	C8	11.4500
15	C9	8.4380
16	C10+	25.3730
17	Benzene	0.0910
18	Toluene	0.7580
19	E-Benzene	0.1130
20	Xylenes	1.3570
21	n-C6	2.4330
22	224Trimethylp	0.0200

-- Sales Oil

Production Rate : 0.1[bbl/day]

20150722_Redhook_Produced Fluids Tank

Days of Annual Operation : 365 [days/year]
API Gravity : 59.11
Reid Vapor Pressure : 10.60[psia]

****
* Calculation Results *
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-- Emission Summary

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
Total HAPs	0.000	0.000	0.000	0.000
Total HC	0.423	0.097	0.423	0.097

Item	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
VOCs, C2+	0.339	0.077	0.339	0.077
VOCs, C3+	0.213	0.049	0.213	0.049

Uncontrolled Recovery Info.

Vapor	28.1600 x1E-3	[MSCFD]
HC Vapor	28.0700 x1E-3	[MSCFD]
GOR	281.60	[SCF/bbl]

-- Emission Composition

No	Component	Uncontrolled [ton/yr]	Uncontrolled [lb/hr]	Controlled [ton/yr]	Controlled [lb/hr]
1	H2S	0.000	0.000	0.000	0.000
2	O2	0.000	0.000	0.000	0.000
3	CO2	0.002	0.000	0.002	0.000
4	N2	0.000	0.000	0.000	0.000
5	C1	0.084	0.019	0.084	0.019
6	C2	0.125	0.029	0.125	0.029
7	C3	0.109	0.025	0.109	0.025
8	i-C4	0.023	0.005	0.023	0.005
9	n-C4	0.045	0.010	0.045	0.010
10	i-C5	0.014	0.003	0.014	0.003
11	n-C5	0.012	0.003	0.012	0.003
12	C6	0.003	0.001	0.003	0.001
13	C7	0.004	0.001	0.004	0.001
14	C8	0.001	0.000	0.001	0.000
15	C9	0.000	0.000	0.000	0.000
16	C10+	0.000	0.000	0.000	0.000
17	Benzene	0.000	0.000	0.000	0.000
18	Toluene	0.000	0.000	0.000	0.000
19	E-Benzene	0.000	0.000	0.000	0.000
20	Xylenes	0.000	0.000	0.000	0.000
21	n-C6	0.002	0.000	0.002	0.000
22	224Trimethylp	0.000	0.000	0.000	0.000
	Total	0.424	0.097	0.424	0.097

-- Stream Data

No. Component	MW	LP Oil	Flash Oil	Sale Oil	Flash Gas	W&S Gas	Total Emissions
		mol %	mol %	mol %	mol %	mol %	mol %

1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0840	0.0069	0.0001	0.3251	0.3289	0.3254
4 N2	28.01	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
5 C1	16.04	9.9570	0.2491	0.0001	40.3145	12.0792	38.6045
6 C2	30.07	8.1140	1.3061	0.2375	29.4027	52.0759	30.7759
7 C3	44.10	6.8240	3.2946	2.8877	17.8607	22.6275	18.1494
8 i-C4	58.12	1.8640	1.5368	1.5034	2.8873	3.1206	2.9014
9 n-C4	58.12	4.8700	4.6049	4.5743	5.6989	6.0623	5.7209
10 i-C5	72.15	2.9440	3.4237	3.4639	1.4439	1.5163	1.4483
11 n-C5	72.15	3.3610	4.0550	4.1140	1.1907	1.2521	1.1944
12 C6	86.16	2.2410	2.8819	2.9372	0.2370	0.2510	0.2378
13 C7	100.20	9.7080	12.7165	12.9774	0.3002	0.3211	0.3015
14 C8	114.23	11.4500	15.0807	15.3960	0.0965	0.1043	0.0969
15 C9	128.28	8.4380	11.1296	11.3633	0.0212	0.0250	0.0215
16 C10+	163.34	25.3730	33.4860	34.1908	0.0030	0.0034	0.0030
17 Benzene	78.11	0.0910	0.1181	0.1204	0.0064	0.0068	0.0064
18 Toluene	92.13	0.7580	0.9963	1.0170	0.0128	0.0138	0.0128
19 E-Benzene	106.17	0.1130	0.1490	0.1521	0.0005	0.0006	0.0005
20 Xylenes	106.17	1.3570	1.7892	1.8267	0.0056	0.0061	0.0056
21 n-C6	86.18	2.4330	3.1494	3.2114	0.1926	0.2046	0.1933
22 224Trimethylp	114.24	0.0200	0.0262	0.0268	0.0005	0.0005	0.0005
MW		95.74	116.43	118.13	31.04	35.93	31.33
Stream Mole Ratio		1.0000	0.7577	0.7421	0.2423	0.0156	0.2579
Heating Value	[BTU/SCF]				1808.07	2072.28	1824.07
Gas Gravity	[Gas/Air]				1.07	1.24	1.08
Bubble Pt. @ 100F	[psia]	406.75	28.61	13.23			
RVP @ 100F	[psia]	101.88	15.92	10.81			
Spec. Gravity @ 100F		0.685	0.715	0.717			

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	S020
City:	
State:	Pennsylvania
Company:	Equitrans, LP
Type of Tank:	Horizontal Tank
Description:	Used Oil Tank

Tank Dimensions

Shell Length (ft):		11.50
Diameter (ft):		7.70
Volume (gallons):		4,200.00
Turnovers:		0.50
Net Throughput(gal/yr):		2,100.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S015 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.69	48.70	64.69	52.55	0.0064	0.0043	0.0082	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0074

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S015 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	1.1687
Vapor Space Volume (cu ft):	341.0904
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0622
Vented Vapor Saturation Factor:	0.9987
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	341.0904
Tank Diameter (ft):	7.7000
Effective Diameter (ft):	10.6209
Vapor Space Outage (ft):	3.8500
Tank Shell Length (ft):	11.5000
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0622
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0038
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0043
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0082
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9987
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0064
Vapor Space Outage (ft):	3.8500
Working Losses (lb):	0.0419
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Annual Net Throughput (gal/yr.):	2,100.0000
Annual Turnovers:	0.5000
Turnover Factor:	1.0000
Tank Diameter (ft):	7.7000
Working Loss Product Factor:	1.0000
Total Losses (lb):	1.2106

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S015 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.04	1.17	1.21

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	S021	
City:		
State:	Pennsylvania	
Company:	Equitrans LP	
Type of Tank:	Horizontal Tank	
Description:	TEG	
Tank Dimensions		
Shell Length (ft):		12.00
Diameter (ft):		5.30
Volume (gallons):		2,100.00
Turnovers:		1.00
Net Throughput(gal/yr):		2,100.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S016 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Propylene glycol	All	56.69	48.70	64.69	52.55	0.0008	0.0005	0.0012	76.1100			76.11	Option 2: A=8.2082, B=2085.9, C=203.54

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S016 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.0382
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0577
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0577
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0007
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0005
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0012
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.0030
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Annual Net Throughput (gal/yr.):	2,100.0000
Annual Turnovers:	1.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0412

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S016 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.00	0.04	0.04

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	S022	
City:		
State:	Pennsylvania	
Company:	Equitrans LP	
Type of Tank:	Horizontal Tank	
Description:	Used TEG	
Tank Dimensions		
Shell Length (ft):		12.00
Diameter (ft):		5.30
Volume (gallons):		2,100.00
Turnovers:		0.50
Net Throughput(gal/yr):		1,050.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S017 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Propylene glycol	All	56.69	48.70	64.69	52.55	0.0008	0.0005	0.0012	76.1100			76.11	Option 2: A=8.2082, B=2085.9, C=203.54

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S017 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.0382
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0577
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0577
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0007
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0005
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0012
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.0015
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Annual Net Throughput (gal/yr.):	1,050.0000
Annual Turnovers:	0.5000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0397

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S017 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.00	0.04	0.04

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	S023	
City:		
State:	Pennsylvania	
Company:	Equitrans LP	
Type of Tank:	Horizontal Tank	
Description:	MEG	
Tank Dimensions		
Shell Length (ft):		12.00
Diameter (ft):		5.30
Volume (gallons):		2,100.00
Turnovers:		0.50
Net Throughput(gal/yr):		1,050.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S018 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Propylene glycol	All	56.69	48.70	64.69	52.55	0.0008	0.0005	0.0012	76.1100			76.11	Option 2: A=8.2082, B=2085.9, C=203.54

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S018 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.0382
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0577
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0577
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0007
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0005
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0012
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.0015
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Annual Net Throughput (gal/yr.):	1,050.0000
Annual Turnovers:	0.5000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0397

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S018 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.00	0.04	0.04

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	S024	
City:		
State:	Pennsylvania	
Company:	Equitrans LP	
Type of Tank:	Horizontal Tank	
Description:	Used MEG	
Tank Dimensions		
Shell Length (ft):		12.00
Diameter (ft):		5.30
Volume (gallons):		2,100.00
Turnovers:		0.50
Net Throughput(gal/yr):		1,050.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S020 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Propylene glycol	All	56.69	48.70	64.69	52.55	0.0008	0.0005	0.0012	76.1100			76.11	Option 2: A=8.2082, B=2085.9, C=203.54

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S020 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.0382
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0000
Vapor Space Expansion Factor:	0.0577
Vented Vapor Saturation Factor:	0.9999
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0000
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0577
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0007
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0005
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0012
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9999
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.0015
Vapor Molecular Weight (lb/lb-mole):	76.1100
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0008
Annual Net Throughput (gal/yr.):	1,050.0000
Annual Turnovers:	0.5000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.0397

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S020 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Propylene glycol	0.00	0.04	0.04

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	S025	
City:		
State:	Pennsylvania	
Company:	Equitrans LP	
Type of Tank:	Horizontal Tank	
Description:	Engine Oil Tank	
Tank Dimensions		
Shell Length (ft):		12.00
Diameter (ft):		5.30
Volume (gallons):		2,100.00
Turnovers:		1.00
Net Throughput(gal/yr):		2,100.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S020 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.69	48.70	64.69	52.55	0.0064	0.0043	0.0082	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0074

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S020 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.5385
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0579
Vented Vapor Saturation Factor:	0.9991
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0579
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0038
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0043
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0082
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0064
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.0419
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Annual Net Throughput (gal/yr.):	2,100.0000
Annual Turnovers:	1.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.5803

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S020 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.04	0.54	0.58

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification		
User Identification:	S026	
City:		
State:	Pennsylvania	
Company:	Equitrans LP	
Type of Tank:	Horizontal Tank	
Description:	Compressor Oil Tank	
Tank Dimensions		
Shell Length (ft):		12.00
Diameter (ft):		5.30
Volume (gallons):		2,100.00
Turnovers:		2.00
Net Throughput(gal/yr):		4,200.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Pittsburgh, Pennsylvania (Avg Atmospheric Pressure = 14.11 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

S021 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.69	48.70	64.69	52.55	0.0064	0.0043	0.0082	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0074

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

S021 - Horizontal Tank

Annual Emission Calcaulations	
Standing Losses (lb):	0.5385
Vapor Space Volume (cu ft):	168.6255
Vapor Density (lb/cu ft):	0.0002
Vapor Space Expansion Factor:	0.0579
Vented Vapor Saturation Factor:	0.9991
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	168.6255
Tank Diameter (ft):	5.3000
Effective Diameter (ft):	9.0011
Vapor Space Outage (ft):	2.6500
Tank Shell Length (ft):	12.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Daily Avg. Liquid Surface Temp. (deg. R):	516.3645
Daily Average Ambient Temp. (deg. F):	50.3083
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	512.2183
Tank Paint Solar Absorptance (Shell):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,202.9556

Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0579
Daily Vapor Temperature Range (deg. R):	31.9767
Daily Vapor Pressure Range (psia):	0.0038
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0043
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0082
Daily Avg. Liquid Surface Temp. (deg R):	516.3645
Daily Min. Liquid Surface Temp. (deg R):	508.3704
Daily Max. Liquid Surface Temp. (deg R):	524.3587
Daily Ambient Temp. Range (deg. R):	19.1500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9991
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Vapor Space Outage (ft):	2.6500
Working Losses (lb):	0.0837
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0064
Annual Net Throughput (gal/yr.):	4,200.0000
Annual Turnovers:	2.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	5.3000
Working Loss Product Factor:	1.0000
Total Losses (lb):	0.6222

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

S021 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.08	0.54	0.62

Cost Evaluation of Selective Catalytic Reduction (SCR) for NOx Control of One Turbine

Based on Preliminary/Budgetary Estimates

CAPITAL COSTS		
Direct & Indirect Capital Costs		
Purchased Equipment & Installation, Engineering, Construction	***$***	***2,800,000***
TOTAL CAPITAL COST	**$**	**2,800,000**
Fractional Interest Rate for Capital		7.00%
Equipment Lifetime (yrs)		15
Capital Recovery Factor		0.1098
ANNUAL OPERATING COSTS		
Total Direct & Indirect Operating Costs	**$**	**243,000**
CAPITAL RECOVERY COSTS	**$**	**307,425**
TOTAL ANNUAL CONTROL COST	**$**	**550,425**
Pre-controlled emission rate of NOx (tons/yr)		22.02
SCR control efficiency		90%
Pollutant Removed - NOx (tons/yr)		**19.82**
AVERAGE ANNUAL CONTROL COST PER TON NOx REMOVED		**27,774**

Cost Evaluation of Oxidation Catalyst for CO Control of One Turbine

Based on Preliminary/Budgetary Estimates

CAPITAL COSTS		
Direct & Indirect Capital Costs		
Purchased Equipment & Installation, Engineering, Construction	***$***	***500,000***
TOTAL CAPITAL COST	**$**	**500,000**
Fractional Interest Rate for Capital		7.00%
Equipment Lifetime (yrs)		15
Capital Recovery Factor		0.1098
ANNUAL OPERATING COSTS		
Total Direct & Indirect Operating Costs	**$**	**150,000**
CAPITAL RECOVERY COSTS	**$**	**54,897**
TOTAL ANNUAL CONTROL COST	**$**	**204,897**
Pre-controlled emission rate of CO (tons/yr)		23.38
Oxidation Catalyst control efficiency		80%
Pollutant Removed - CO (tons/yr)		**18.70**
AVERAGE ANNUAL CONTROL COST PER TON CO REMOVED		**10,955**

Cost Evaluation of Selective Catalytic Reduction (SCR) for NOx Control of One Compressor Engine

Pollutant: NO_X
Technology: SCR
Source: RICE - CAT3616

CAPITAL COSTS		*2010 Dollars*	*Footnote Reference*
Direct & Indirect Capital Costs			
Purchased Equipment			
Delivered vendor equipment cost	$	350,000	1
Freight (5% of control device cost)	$	17,500	2
Instrumentation (10% of control device cost)	$	35,000	2
Total Direct Capital Costs	$	402,500	
Installation			
Installation Costs	$	315,000	3
Commissioning Labor (SCR Vendor)	$	50,000	1
Engineering and Home Office Fees (10% of purchased equipment costs)	$	40,250	4
Process Contingency (5% of purchased equipment costs)	$	20,125	4
Total Indirect Capital Costs	$	425,375	
Project Contingency (15% of purchased equipment costs plus process contingency)	$	63,394	4
Preproduction Cost (2% of direct & indirect capitol cost plus project contingencies)	$	17,825	4
Inventory Capital (cost of initial reactant tank fill - 550 gallons)	$	1,375	4
TOTAL CAPITAL INVESTMENT (TCI)	$	910,469	
ANNUAL OPERATING COSTS			
Direct Annual Costs			
Annual Operating and Supervisory Labor ($)	$	65,000	
Annual Maintenance Costs (1% of TCI)	$	9,105	4
Annual Cost of Reactant Solution ($2.50/gal at a rate of 1 gal/hr)	$	21,900	3
Annual Electricity Costs ($)	$	5,000	
Annual Water Costs ($)	$	-	
Annual Catalyst Costs	$	90,000	
Total Direct Annual Operating Costs	$	191,005	
Indirect Annual Costs			
Fractional Interest Rate for Capital		7.00%	
Equipment Lifetime (yrs)		15	
Capital Recovery Factor		0.1098	
Total Indirect Annual Operating Costs	$	99,965	
TOTAL ANNUAL COST (TAC)	$	290,969	
Pre-controlled emission rate of (tons/yr)		20.66	6
Control Efficiency		90%	7
Pollutant Removed - (tons/yr)		18.59	
AVERAGE ANNUAL CONTROL COST EFFECTIVENESS ($/ton removed)	$	15,649	NOx

Footnotes:

1. Purchased equipment costs based on historical quotes and engineering knowledge. Includes reactant storage tank and recommended spare parts.
2. Based on data in EPA's Pollution Control Cost Manual, Section 2, Table 2.4. http://www.epa.gov/ttn/catc/dir1/cs1ch2.pdf
3. Installation costs are estimates.
4. Based on data in EPA's Pollution Control Cost Manual, Section 4, Table 2.5. http://www.epa.gov/ttn/catc/dir1/cs4-2ch2.pdf
5. Based on data from EPA Air Pollution Control Technology Fact Sheet (EPA -452/F-03-032)
6. Emissions based on a pre-controlled emission rate of 0.4 g/bhp-hr for an engine rated at 5,350 hp operated at 8760 hrs/yr.
7. Control efficiency based on experience with vendor estimates. Note that is the high range for this technology.

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Fractional Analysis

EQT

Analysis No:	1
Analysis Date:	04/27/2015
MSES Project No.:	15-049

SAMPLE COLLECTION INFORMATION

Client:	EQT	Sample Date:	4/21/2015
Sample Location:	Pratt Station	Sample Time:	2:45 PM
Sample Collection Source:	Discharge befrore DehY-Valve # 33	Collected By:	JSF/BRS
MSES Sample Number:	N/A	Sample Pressure:	436.2
Date Received at Lab:	4/22/2015	Sample Temp. (°F):	N/A
Unique Identifier:	Pratt CS-GS1-AE	Sample Container Type:	Cylinder
		MSES/CPD ID#	011
		Client ID #:	N/A

ANALYSIS REPORT

FRACTIONAL ANALYSIS

COMPONENTS	MOLE PERCENT	GPM
METHANE	94.9365	
ETHANE	3.8895	1.04
PROPANE	0.5660	0.16
I-BUTANE	0.0805	0.03
N-BUTANE	0.1393	0.04
I-PENTANE	0.0413	0.02
N-PENTANE	0.0339	0.01
NITROGEN	0.1358	
CARBON DIOXIDE	0.0877	
OXYGEN	0.0298	
HEXANES (PLUS)	0.0597	0.03
TOTAL	100.0000	

ANALYTICAL RESULTS AT BASE CONDITIONS (CALCULATED VALUES)

BTU/SCF (DRY):	1057.54
BTU/SCF (SATURATED):	1039.46
PRESSURE (PSIA):	14.696
TEMPERATURE (°F)	60.00
Z FACTOR (DRY):	0.9978
Z FACTOR (SATURATED):	0.9974
ETHANE + GPM	1.3194

SPECIFIC GRAVITIES (CALCULATED VALUES)

IDEAL GRAVITY	0.5860
REAL GRAVITY	0.5871

COMMENTS

ANALYTICAL METHODS AND VALUES

(1) Extended analysis and reporting performed following procedures outlined in GPA 2286-95: Tentative Method of Extended Analysis for Natural Gas and Similar Mxitures by Temperature Programmed Gas Chromatography

(2) Physical properties and values used in calculations were acquired from GPA 2145-09: Table of Physical properties for Hydrocarbons and Other Compounds of Interest to the Natural Gas Industry

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Extended Gas Analysis

EQT

Analysis No:	1
Analysis Date:	EQT
MSES Project No.:	15-049

SAMPLE COLLECTION INFORMATION

Client:	EQT	Sample Date:	4/21/2015
Sample Location:	Pratt Station	Sample Time:	2:45 PM
Sample Collection Source:	Discharge befrore DehY-Valve # 33	Collected By:	JSF/BRS
MSES Sample Number:	N/A	Sample Pressure:	436
Date Received at Lab:	4/22/2015	Sample Temp. (°F):	N/A
Unique Identifier:	Pratt CS-GS1-AE	Sample Container Type:	Cylinder
		MSES/CPD ID#	011
		Client ID #:	N/A

ANALYSIS REPORT

COMPONENTS	UNITS	ANALYTICAL METHODS	RESULTS
C_5H_{10} CYCLOPENTANE	Mole %	GPA 2186	<0.0001
C_6H_{12} CYCLOHEXANE	Mole %	GPA 2186	<0.0001
C_6H_{14} n-HEXANE	Mole %	GPA 2186	0.0239
C_6H_{14} 2 METHYLPENTANE (isohexane)	Mole %	GPA 2186	<0.0001
C_6H_{14} 3 METHYLPENTANE	Mole %	GPA 2186	<0.0001
C_6H_{14} 2,2 DIMETHYLBUTANE (neohexane)	Mole %	GPA 2186	<0.0001
C_6H_{14} 2,3 DIMETHYLBUTANE	Mole %	GPA 2186	<0.0001
C_7H_{14} METHYLCYCLOHEXANE	Mole %	GPA 2186	<0.0001
C_7H_{16} n-HEPTANE	Mole %	GPA 2186	0.0198
C_8H_{18} n-OCTANE	Mole %	GPA 2186	<0.0001
C_8H_{18} 2,2,4 TRIMETHYLPENTANE (isooctane)	Mole %	GPA 2186	<0.0001
C_9H_{20} n-NONANE	Mole %	GPA 2186	<0.0001
$C_{10}H_{22}$ n-DECANE	Mole %	GPA 2186	<0.0001
$C_{11}H_{24}$ UNDECANE	Mole %	GPA 2186	<0.0001
$C_{12}H_{26}$ DODECANE	Mole %	GPA 2186	<0.0001
$C_{13}H_{28}$ TRIDECANE	Mole %	GPA 2186	<0.0001
$C_{14}H_{30}$ TETRADECANE	Mole %	GPA 2186	<0.0001

ANALYTICAL METHODS AND VALUES

(1) Extended analysis and reporting performed following procedures outlined in GPA 2286-95: Tentative Method of Extended Analysis for Natural Gas and Similar Mxitures by Temperature Programmed Gas Chromatography

(2) Limit of Detection= 0.0001 Mole Percent

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Aromatic Hydrocarbon Analysis

EQT

Analysis No:	1
Analysis Date:	04/27/2015
MSES Project No.:	15-049

SAMPLE COLLECTION INFORMATION

Client:	EQT	Sample Date:	4/21/2015
Sample Location:	Pratt Station	Sample Time:	2:45 PM
Sample Collection Source:	Discharge befrore DehY-Valve # 33	Collected By:	JSF/BRS
MSES Sample Number:	N/A	Sample Pressure:	436
Date Received at Lab:	4/22/2015	Sample Temp. (°F):	N/A
Unique Identifier:	Pratt CS-GS1-AE	Sample Container Type:	Cylinder
		MSES/CPD ID#	011
		Client ID #:	N/A

ANALYSIS REPORT

COMPONENTS	UNITS	ANALYTICAL METHODS	RESULTS
C_6H_6 BENZENE	ppmV	GPA 2286-95	<0.1
C_7H_8 TOLUENE	ppmV	GPA 2286-95	<0.1
C_8H_{10} ETHYLBENZENE	ppmV	GPA 2286-95	<0.1
C_8H_{10} XYLENE	ppmV	GPA 2286-95	<0.1

ANALYTICAL METHODS AND VALUES

(1) Extended analysis and reporting performed following procedures outlined in GPA 2286-95: Tentative Method of Extended Analysis for Natural Gas and Similar Mxitures by Temperature Programmed Gas Chromatography

(2) Limit of Detection = 0.1 ppmV

APPENDIX C: MANUFACTURER'S SPECIFICATIONS

G3616

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

G15-3600-068-00

CATERPILLAR®

ENGINE SPEED (rpm):	1000
COMPRESSION RATIO:	7.6
AFTERCOOLER TYPE:	SCAC
AFTERCOOLER - STAGE 1 INLET (°F)	174
JACKET WATER OUTLET (°F):	190
ASPIRATION:	TA
COOLING SYSTEM:	JW+1AC, OC+2AC
CONTROL SYSTEM:	ADEM4
EXHAUST MANIFOLD:	DRY
COMBUSTION:	LOW EMISSION
NOx EMISSION LEVEL(g/bhp-hr NOx):	0.4
SET POINT TIMING:	18

RATING STRATEGY:	STANDARD
RATING LEVEL:	CONTINUOUS
FUEL SYSTEM:	GAV WITH AIR FUEL RATIO CONTROL

SITE CONDITIONS

FUEL:	G15-3600-068 (00)
FUEL PRESSURE RANGE(psig):	58.0-70
FUEL METHANE NUMBER:	83
FUEL LHV (Btu/scf):	954
ALTITUDE (ft):	1050
MAXIMUM INLET AIR TEMPERATURE(°F):	100
NAMEPLATE RATING:	5350 bhp@1000rpm

RATING		NOTES	LOAD	MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
				100%	100%	75%	50%
ENGINE POWER	(WITHOUT FAN)	(1)	bhp	5350	5000	3750	2500
INLET AIR TEMPERATURE			°F	60	100	100	100
AFTERCOOLER - STAGE 2 INLET (°F):		(2)	°F	90	130	130	130
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	6686	6726	6914	7387
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	7411	7456	7664	8189
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4) (5)	ft3/min	12342	12639	9529	6520
AIR FLOW	(WET)	(4) (5)	lb/hr	56527	53700	40488	27702
FUEL FLOW (60°F, 14.7 psia)			scfm	625	587	453	323
INLET MAN. PRESSURE		(6)	in HG(abs)	105.4	102.0	76.6	53.9
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	812	831	890	957
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(8) (5)	ft3/min	32209	31042	24506	17638
EXHAUST GAS MASS FLOW	(WET)	(8) (5)	lb/hr	58199	55271	41700	28565
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9) (10)	g/bhp-hr	0.40	0.40	0.40	0.40
CO		(9) (10)	g/bhp-hr	2.36	2.36	2.36	2.36
THC (mol. wt. of 15.84)		(9) (10)	g/bhp-hr	4.02	4.28	4.65	4.87
NMHC (mol. wt. of 15.84)		(9) (10)	g/bhp-hr	0.42	0.45	0.49	0.51
NMNEHC (VOCs)(mol. wt. of 15.84)		(9) (10) (11)	g/bhp-hr	0.25	0.27	0.29	0.30
HCHO (Formaldehyde)		(9) (10)	g/bhp-hr	0.20	0.20	0.21	0.23
CO2		(9) (10)	g/bhp-hr	421	423	435	463
EXHAUST OXYGEN		(9) (12)	% DRY	11.0	11.3	11.0	10.6
HEAT REJECTION							
HEAT REJECTION TO JACKET WATER (JW)		(13)	Btu/min	52493	52144	42341	35905
HEAT REJECTION TO ATMOSPHERE		(13)	Btu/min	18956	18602	16663	15034
HEAT REJECTION TO LUBE OIL (OC)		(13)	Btu/min	32505	30562	26990	23496
HEAT REJECTION TO A/C - STAGE 1 (1AC)		(13) (14)	Btu/min	46230	49937	24934	5890
HEAT REJECTION TO A/C - STAGE 2 (2AC)		(13) (14)	Btu/min	19864	11891	8167	4982
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+1AC)		(14) (15)	Btu/min	109792			
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)		(14) (15)	Btu/min	59863			
A COOLING SYSTEM SAFETY FACTOR OF 0% HAS BEEN ADDED TO THE COOLING SYSTEM SIZING CRITERIA.							

PRELIMINARY

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page 3

The engine technical performance data listed above is preliminary in nature and can change as the development program for this new product progresses. This data represents Caterpillar's best knowledge to date on this product but carries no guarantees or warranty, either expressed or implied. This data will be superseded by the final production data when the product completes the development program and the production data is published in TMI. This data should not be used for final designs, sizing, purchase of equipment or financial calculations as it is subject to change.

PREPARED BY:

Data generated by Gas Engine Data Master Version 5.01.00

Special Rating Request G15-3600-068-00, Printed 7/20/2015

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

G15-3600-068-00

NOTES:

1. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.
2. Aftercooler temperature is based on site specified cooling system ambient capability. Refer to the table below.

SCAC Temp.	Ambient Cap.
90 °F	60 °F
110 °F	80 °F
130 °F	100 °F
140 °F	129 °F

3. Fuel consumption tolerance is ± 2.5% of full load data.
4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.
5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.
6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.
7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.
8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.
9. Emissions data is at engine exhaust flange prior to any after treatment.
10. Emission values are based on engine operating at steady state conditions. Fuel methane number cannot vary more than ± 3. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate "Not to Exceed" values. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.
11. VOCs - Volatile organic compounds as defined in US EPA 40 CFR 60, subpart JJJJ
12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.
13. Heat rejection values are nominal. Tolerances, based on treated water, are ± 10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.
14. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.
15. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

PRELIMINARY

PREPARED BY:
Data generated by Gas Engine Data Master Version 5.01.00
Special Rating Request G15-3600-068-00, Printed 7/20/2015

G3616

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
G15-3600-068-00

CATERPILLAR®

CONSTITUENT	ABBREV	MOLE %	NORM
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	94.9365	94.9365
Ethane	C2H6	3.8895	3.8895
Propane	C3H8	0.5660	0.5660
Isobutane	iso-C4H10	0.0805	0.0805
Norbutane	nor-C4H10	0.1393	0.1393
Isopentane	iso-C5H12	0.0413	0.0413
Norpentane	nor-C5H12	0.0339	0.0339
Hexane	C6H14	0.0597	0.0597
Heptane	C7H16	0.0000	0.0000
Nitrogen	N2	0.1358	0.1358
Carbon Dioxide	CO2	0.0000	0.0000
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0877	0.0877
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0298	0.0298
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
Total (Volume %)		100.0000	100.0000

Fuel Makeup:	G15-3600-068 (00)
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	83
Lower Heating Value (Btu/scf):	954
Higher Heating Value (Btu/scf):	1058
WOBBE Index (Btu/scf):	1247
THC: Free Inert Ratio	4220.69
Total % Inerts(%N2, CO2, He)	0.14%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.998
Stoich A/F Ratio (Vol/Vol):	9.95
Stoich A/F Ratio (Mass/Mass):	17
Specific Gravity (Relative to Air):	0.585
Specific Heat Constant:	1.308

PRELIMINARY

CONDITIONS AND DEFINITIONS

Caterpillar methane number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar fuel usage guide for the engine and rating to determine the rating for the fuel specified. A fuel usage guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to the naturally aspirated (NA) engines, and the turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the gas engine data master program take the Caterpillar methane number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60ºF and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and releated material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid seperator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

PREPARED BY:
Data generated by Gas Engine Data Master Version 5.01.00
Special Rating Request G15-3600-068-00, Printed 7/20/2015

10497 Town & Country Way, Ste. 94(
Houston, TX 77024
Office: 307.673.0883 | Direct: 307.675.5073
cparisi@emittechnologies.com

Prepared For:
Doug Mace
EQT MIDSTREAM

QUOTE: QUO-16276-G0V4
Expires: September 11, 2015

INFORMATION PROVIDED BY CATERPILLAR

Engine:	G3616
Horsepower:	5350
RPM:	1000
Compression Ratio:	9.0
Exhaust Flow Rate:	32209 CFM
Exhaust Temperature:	812 °F
Reference:	G15-3600-068-00
Fuel:	Natural Gas
Annual Operating Hours:	8760

Uncontrolled Emissions

	g/bhp-hr	Lb/Hr	Tons/Year
NOx:	0.40	4.72	20.66
CO:	2.36	27.84	121.92
THC:	4.02	47.41	207.68
NMHC	0.42	4.95	21.70
NMNEHC:	0.25	2.95	12.92
HCHO:	0.20	2.36	10.33
O2:	10.80 %		

POST CATALYST EMISSIONS

	% Reduction	g/bhp-hr	Lb/Hr	Tons/Year
NOx:	Unaffected by Oxidation Catalyst			
CO:	>93 %	<0.17	<1.95	<8.53
VOC:	>48 %	<0.13	<1.54	<6.74
HCHO:	>75 %	<0.05	<0.59	<2.58

CONTROL EQUIPMENT

Catalyst Housing

Model:	EBX-9000-3036F-8C4E-48C
Manufacturer:	EMIT Technologies, Inc
Element Size:	Rectangle 48" x 15" x 3.5"
Housing Type:	8 Element Capacity
Catalyst Installation:	Ground Level Accessible Housing
Construction:	3/16" Carbon Steel
Sample Ports:	9 (0.5" NPT)
Inlet Connections:	30" Flat Face Flange
Outlet Connections:	36" Flat Face Flange
Configuration:	Side In / End Out
Silencer:	Integrated
Silencer Grade:	Hospital Enhanced
Insertion Loss:	35-50 dBA
Estimated Lead Time:	2 Weeks to Ship

Catalyst Element

Model:	RT-4815-H
Catalyst Type:	Oxidation, Premium Precious Group Metals
Substrate Type:	BRAZED
Manufacturer:	EMIT Technologies, Inc
Element Quantity:	5
Element Size:	Rectangle 48" x 15" x 3.5"
Estimated Lead Time:	7-10 Business Days to Ship

The information in this quotation, and any files transmitted with it, is confidential and may be legally privileged. It is intended only for the use of individual(s) within the company named above. If you are the intended recipient, be aware that your use of any confidential or personal information may be restricted by state and federal privacy laws

10497 Town & Country Way, Ste. 94(
Houston, TX 77024
Office: 307.673.0883 | Direct: 307.675.5073
cparisi@emittechnologies.com

WARRANTY

EMIT Technologies, Inc. warrants that the goods supplied will be free from defects in workmanship by EMIT Technologies, Inc. for a period of two (2) years from date of shipment. EMIT Technologies, Inc. will not be responsible for any defects which result from imprope use, neglect, failure to properly maintain or which are attributable to defects, errors or omissions in any drawings, specifications, plans or descriptions, whether written or oral, supplied to EMIT Technologies, Inc. by Buyer.

Catalyst performance using an EMIT Air/Fuel ratio controller is dependent upon properly defined set-points, variable with engine and fuel gas composition. Air/fuel ratio controller performance is guaranteed, but not limited, to fuel gas with a HHV content of 1400 BTU/SCF.

Catalyst performance will be guaranteed for a period of 1 year from installation, or 8760 operating hours, whichever comes first. The catalyst shall be operated with an automatic air/fuel ratio controller. The performance guarantee shall not cover the effects of excessive ash masking due to operation at low load, improper engine maintenance, or inappropriate lubrication oil. The performance guarantee shall not cover the effects of continuous engine misfires (cylinder or ignition) exposing the catalyst to excessive exothermic reaction temperatures. In most cases, excluding thermal deactivation, catalyst performance is redeemable by means of proper washing (refer to EMIT Catalyst/Silencer Housing Manual for element wash information, or contact a local EMIT Sales representative).

The exhaust temperature operating range at the converter inlet is a minimum of 600°F for oxidation catalyst and 750 °F for NSCR catalyst, and a maximum of 1250°F.

If a properly functioning, high temperature shut down switch is not installed, thermal deactivation of catalyst at sustained temperatures above 1250°F is not covered. If excessive exposure to over oxygenation of NSCR catalyst occurs due to improperly functioning or non-existent Air/Fuel ratio control, then deactivation of catalyst is not warranted.

The catalyst conversion efficiencies (% reduction) will be guaranteed for engine loads of 50 to 100 percent. Standard Oxidation Catalyst conversion efficiencies (% reduction) will be guaranteed for fuel gas containing less than 1.5% mole fraction of non-methane, non-ethane hydrocarbons. Applications where fuel gas exceeds this level will require a Premium Oxidation Catalyst to maintain guaranteed VOC conversion efficiencies.

Engine lubrication oil shall contain less than 0.5 wt% Sulfated Ash with a maximum allowable specific oil consumption of 0.7 g/bhp-hr. The catalyst shall be limited to a maximum ash loading of 0.022 lb/ft3. Phosphorous and zinc additives are limited to 0.03 wt%. New or Reconstructed engines must operate for a minimum of 50 hours prior to catalyst installation, otherwise the warranty is void.

The catalyst must not be exposed to the following know poisoning agents, including: antimony, arsenic, chromium, copper, iron, lead, lithium, magnesium, mercury, nickel, phosphorous, potassium, silicon, sodium, sulfur, tin, and zinc. Total poison concentrations in the fuel gas must be limited to 0.25 ppm or less for catalyst to function properly.

Shipment - Promised shipping dates are approximate lead times from the point of manufacture and are not guaranteed. EMIT Technologies, Inc. will not be liable for any loss, damage or delay in manufacture or delivery resulting from any cause beyond its control including, but not limited to a period equal to the time lost by reason of that delay. All products will be crated as per best practice to prevent any damage during shipment. Unless otherwise specified, Buyer will pay for any special packing and shipping requirements. Acceptance of goods by common carrier constitutes delivery to Buyer. EMIT Technologies, Inc. shall not be responsible for goods damaged or lost in transit.

Terms: Credit is extended to purchaser for net 30 time period. If payment is not received in the net 30 timeframe, interest on the unpaid balance will accrue at a rate of 1.5% per month from the invoice date.

Order Cancellation Terms: Upon cancellation of an order once submittal of a Purchase Order has occurred, the customer will pay a 25% restocking fee for Catalyst Housings, Catalyst Elements, and Air/Fuel Ratio Controllers; 50% restocking fee for Cooler Top Solutions Exhaust System Accessories, and other Custom Built Products; 100% of all associated shipping costs incurred by EMIT; 100% of all project expenses incurred by EMIT for Field Services.

The information in this quotation, and any files transmitted with it, is confidential and may be legally privileged. It is intended only for the use of individual(s) within the company named above. If you are the intended recipient, be aware that your use of any confidential or personal information may be restricted by state and federal privacy laws

CATERPILLAR®

Gas Engine Special Rating Request Form

Project Name	Redhook Compressor Station	**Date In**	7/20/2015
Dealer Contact	Diana Hopkins		
Dealer	Cat Oil & Gas		
Subsidiary	PSNA		
Site Location	Pennsylvania		

- [x] SRR - Special Rating Request
- [ ] ELR - Emissions Lette
- [x] TDR - Technical Data Request

Appl. Engineer: Brenna K Geswein
Phone # (765) 448-2400
Fax # (765) 448-2300

Project Description: Need rating at 0.4g NOx utilizing ambient based rating
Appl: Pet./Ind.
Existing Unit? ☐
Unit SN

Engine Info

Eng. Model	G3616	Reqested Rating	5350 BHP (w/o fan)	Eng. Speed	1000 RPM	JW Temp Out	190 Deg F
Feature Code	616GI06		EKW*	Comp. Ratio	7.6:1	AC Temp In	90 Deg F

Fuel Information

Fuel Type	Field Gas	Lower Heating Value	954.00 Btu/ft3
Fuel Pressure	65.0 PSIG	Caterpillar Methane Number	83.0

Site/Application

Number of Units	1	Site Altitude	1050	Inlet Air Temp.** max	100 Deg F
Operation Hrs/Year	8760			min	0 Deg F

Emissions Requirements

NOx	0.4 g/bhp-hr	Not to Exceed? ☐	NMHC	0 g/bhp-hr
CO	0 g/bhp-hr		NMNEHC	0 g/bhp-hr
THC	0 g/bhp-hr		Formaldehyde	0 g/bhp-hr

Other Emiss Requirements:

Catalyst after treatment ☐

Additional Performance Requirements

Trans Response?	☐
Gen Paralleling?	
Gen. Efficiency	% (Assumed)
Fan Power	BKW (Assumed)
Gear Box Power:	0.0 BKW (Assumed)

Other Perf Req.

SRR Approval / Project Notes

Approved Rating: 5001 BHP (w/o fan) @ 1000 RPM

Conditions:

Approved rating includes TWO engine driven water pumps. Engine rating plate shall be stamped 5300 bhp (3990 bkW) @ 1000 rpm w/ TWO driven water pumps; derate must be applied by customer per attached curve.

Please Specify RATSPEC w/SPLRAT2 on the order.

Data is Preliminary; SRR is only valid upon successful completion of the NPI program.

Perf Engineer : Sean A Osborne
Date Out 7/20/2015
SRR# **G15-3600-068**

Perf Supervisor : Ryan A Maple

Single Unit SRR - The SRR is valid for an engine order placed on or before 1/20/2016 for 1 unit, for this customer and application only.

Additional Approvals:

Engineering : Craig W Asbill

Customer Service : Doug D Erdman

*Electric Power = (Brake Power - Fan Power) x Gen. Efficiency

**Inlet Air Temp. :Measured at the air cleaner inlet for NA engines and the Turbo inlet for TA engines during normal engine operation.

PWR #: 0000054897
Thursday, July 23, 2015

Solar Turbines
A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

Customer: EQT		Engine Model: TAURUS 70-10802S CS/MD STANDARD	
Job ID: PI15-0012			
Inquiry Number:		Fuel Type: CHOICE GAS	Water Injection: NO
Run By: James Belmont	Date Run: 6-Jul-15	Engine Emissions Data: REV. 0.1	

	NOx EMISSIONS	CO EMISSIONS	UHC EMISSIONS
1 — 11311 HP, 100.0% Load, Elev. 1050 ft, Rel. Humidity 60.0%, Temperature 0 Deg. F			
PPMvd at 15% O2	15.00	25.00	25.00
ton/yr	22.01	22.33	12.79
lbm/MMBtu (Fuel LHV)	0.060	0.061	0.035
lbm/(MW-hr) (gas turbine shaft pwr)	0.60	0.60	0.35
lbm/hr	5.02	5.10	2.92
2 — 11256 HP, 100.0% Load, Elev. 1050 ft, Rel. Humidity 60.0%, Temperature 20.0 Deg. F			
PPMvd at 15% O2	15.00	25.00	25.00
ton/yr	21.41	21.73	12.44
lbm/MMBtu (Fuel LHV)	0.060	0.061	0.035
lbm/(MW-hr) (gas turbine shaft pwr)	0.58	0.59	0.34
lbm/hr	4.89	4.96	2.84
3 — 11091 HP, 100.0% Load, Elev. 1050 ft, Rel. Humidity 60.0%, Temperature 40.0 Deg. F			
PPMvd at 15% O2	15.00	25.00	25.00
ton/yr	21.00	21.30	12.20
lbm/MMBtu (Fuel LHV)	0.060	0.061	0.035
lbm/(MW-hr) (gas turbine shaft pwr)	0.58	0.59	0.34
lbm/hr	4.79	4.86	2.79

Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
2. Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F or -20 deg C, and between 50% and 100% load for gas, fuel, and between 65% and 100% load for liquid fuel (except f or the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F or -20 deg C and betwee
3. Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
6. Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines
A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

Customer: EQT	Engine Model: TAURUS 70-10802S CS/MD STANDARD
Job ID: PI15-0012	Fuel Type: CHOICE GAS; Water Injection: NO
Inquiry Number:	Engine Emissions Data: REV. 0.1
Run By: James Belmont; Date Run: 6-Jul-15	

4	10268 HP 100.0% Load	Elev. 1050 ft	Rel. Humidity 60.0%	Temperature 60.0 Deg. F
		NOx EMISSIONS	CO EMISSIONS	UHC EMISSIONS
PPMvd at 15% O2		15.00	25.00	25.00
ton/yr		19.78	20.08	11.50
lbm/MMBtu (Fuel LHV)		0.060	0.061	0.035
lbm/(MW-hr) (gas turbine shaft pwr)		0.59	0.60	0.34
lbm/hr		4.52	4.58	2.63

5	9316 HP 100.0% Load	Elev. 1050 ft	Rel. Humidity 60.0%	Temperature 80.0 Deg. F
		NOx EMISSIONS	CO EMISSIONS	UHC EMISSIONS
PPMvd at 15% O2		15.00	25.00	25.00
ton/yr		18.39	18.66	10.69
lbm/MMBtu (Fuel LHV)		0.059	0.060	0.034
lbm/(MW-hr) (gas turbine shaft pwr)		0.60	0.61	0.35
lbm/hr		4.20	4.26	2.44

6	8238 HP 100.0% Load	Elev. 1050 ft	Rel. Humidity 60.0%	Temperature 100.0 Deg. F
		NOx EMISSIONS	CO EMISSIONS	UHC EMISSIONS
PPMvd at 15% O2		15.00	25.00	25.00
ton/yr		16.82	17.06	9.77
lbm/MMBtu (Fuel LHV)		0.059	0.059	0.034
lbm/(MW-hr) (gas turbine shaft pwr)		0.63	0.63	0.36
lbm/hr		3.84	3.90	2.23

Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another.
2. Solar's typical SoLoNOx warranty, for ppm values, is available for greater than 0 deg F or -20 deg C, and between 50% and 100% load for gas, fuel, and between 65% and 100% load for liquid fuel (except f or the Centaur 40). An emission warranty for non-SoLoNOx equipment is available for greater than 0 deg F or -20 deg C and betwee
3. Fuel must meet Solar standard fuel specification ES 9-98. Emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide Product Information Letters to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.
6. Any emissions warranty is applicable only for steady-state conditions and does not apply during start-up, shut-down, malfunction, or transient event.

Solar Turbines
A Caterpillar Company

PREDICTED ENGINE PERFORMANCE

Customer: EQT	Model: TAURUS 70-10802S
	Package Type: CS/MD
Job ID: PI15-0012	Match: STANDARD
Run By: James Belmont — Date Run: 6-Jul-15	Fuel System: GAS
Engine Performance Code: REV. 4.15.1.17.10 — Engine Performance Data: REV. 2.0	Fuel Type: CHOICE GAS

DATA FOR NOMINAL PERFORMANCE

Elevation	feet	1050
Inlet Loss	in H2O	5.0
Exhaust Loss	in H2O	8.0
Accessory on GP Shaft	HP	23.8

		1	2	3	4	5	6
Engine Inlet Temperature	deg F	0	20.0	40.0	60.0	80.0	100.0
Relative Humidity	%	60.0	60.0	60.0	60.0	60.0	60.0
Driven Equipment Speed	RPM	11896	11823	11727	11463	11157	10766
Specified Load	HP	FULL	FULL	FULL	FULL	FULL	FULL
Net Output Power	HP	11311	11256	11091	10268	9316	8238
Fuel Flow	mmBtu/hr	83.75	81.55	80.10	75.75	70.90	65.61
Heat Rate	Btu/HP-hr	7404	7244	7222	7377	7610	7964
Therm Eff	%	34.364	35.123	35.234	34.491	33.435	31.950
Engine Exhaust Flow	lbm/hr	227889	221508	215089	203870	191318	176186
PT Exit Temperature	deg F	896	900	922	946	970	1003
Exhaust Temperature	deg F	891	899	922	946	970	1003

Fuel Gas Composition (Volume Percent)

Methane (CH4)	94.94
Ethane (C2H6)	3.89
Propane (C3H8)	0.57
I-Butane (C4H10)	0.08
N-Butane (C4H10)	0.14
I-Pentane (C5H12)	0.04
N-Pentane (C5H12)	0.03
Hexane (C6H14)	0.04
Heptane (C7H16)	0.02
Carbon Dioxide (CO2)	0.09
Nitrogen (N2)	0.14
Oxygen (O2)	0.03
Sulfur Dioxide (SO2)	0.0001

Fuel Gas Properties

LHV (Btu/Scf)	951.5	Specific Gravity	0.5859	Wobbe Index at 60F	1243.0

This performance was calculated with a basic inlet and exhaust system. Special equipment such as low noise silencers, special filters, heat recovery systems or cooling devices will affect engine performance. Performance shown is "Expected" performance at the pressure drops stated, not guaranteed.

Notes
Red Hook

Capstone

Capstone Turbine Corporation • 21211 Nordhoff Street • Chatsworth • CA 91311 • USA
Phone: (818) 734-5300 • Fax: (818) 734-5320 • Web: www.microturbine.com

Technical Reference

Capstone MicroTurbine™ Systems Emissions

Summary

Capstone MicroTurbine™ systems are inherently clean and can meet some of the strictest emissions standards in the world. This technical reference is to provide customers with information that may be requested by local air permitting organizations or to compare air quality impacts of different technologies for a specific project. The preferred units of measure are "output based"; meaning that the quantity of a particular exhaust emission is reported relative to the useable output of the microturbine – typically in pounds per megawatt hour for electrical generating equipment. This technical reference also provides volumetric measurements in parts per million and milligrams per normal cubic meter. A conversion between several common units is also provided.

Maximum Exhaust Emissions at ISO Conditions

Table 1 below summarizes the exhaust emissions at full power and ISO conditions for different Capstone microturbine models. Note that the fuel can have a significant impact on certain emissions. For example landfill and digester gas can be made up of a wide variety of fuel elements and impurities, and typically contains some percentage of carbon dioxide (CO_2). This CO_2 dilutes the fuel, makes complete combustion more difficult, and results in higher carbon monoxide emissions (CO) than for pipeline-quality natural gas.

Table 1. Emission for Different Capstone Microturbine Models in [lb/MWhe]

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	0.64	1.8	0.23
CR30 MBTU	Landfill Gas (2)	0.64	22.0	1.00
CR30 MBTU	Digester Gas (3)	0.64	11.0	1.00
C30 Liquid	Diesel #2 (4)	2.60	0.41	0.23
C65 NG Standard	Natural Gas (1)	0.46	1.25	0.10
C65 NG Low NOx	Natural Gas (1)	0.17	1.30	0.10
C65 NG CARB	Natural Gas (1)	0.17	0.24	0.05
CR65 Landfill	Landfill Gas (2)	0.46	4.0	0.10
CR65 Digester	Digester Gas (3)	0.46	4.0	0.10
C200 NG	Natural Gas (1)	0.40	1.10	0.10
C200 NG CARB	Natural Gas (1)	0.14	0.20	0.04
CR200 Digester	Digester Gas (3)	0.40	3.6	0.10

Notes:

(1) Emissions for standard natural gas at 1,000 BTU/scf (HHV) or 39.4 MJ/m3 (HHV)

(2) Emissions for surrogate gas containing 42% natural gas, 39% CO2, and 19% Nitrogen

(3) Emissions for surrogate gas containing 63% natural gas and 37% CO2

(4) Emissions for Diesel #2 according to ASTM D975-07b

(5) Expressed as Methane

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Table 2 provides the same output-based information shown in Table 1, but expressed in grams per horsepower hour (g/hp-hr).

Table 2. Emission for Different Capstone Microturbine Models in [g/hp-hr]

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	0.22	0.60	0.078
CR30 MBTU	Landfill Gas (2)	0.22	7.4	0.340
CR30 MBTU	Digester Gas (3)	0.22	3.7	0.340
C30 Liquid	Diesel #2 (4)	0.90	0.14	0.078
C65 NG Standard	Natural Gas (1)	0.16	0.42	0.034
C65 NG Low NOx	Natural Gas (1)	0.06	0.44	0.034
C65 NG CARB	Natural Gas (1)	0.06	0.08	0.017
CR65 Landfill	Landfill Gas (2)	0.16	1.4	0.034
CR65 Digester	Digester Gas (3)	0.16	1.4	0.034
C200 NG	Natural Gas (1)	0.14	0.37	0.034
C200 NG CARB	Natural Gas (1)	0.05	0.07	0.014
CR200 Digester	Digester Gas (3)	0.14	1.3	0.034

Notes: - same as for Table 1

Emissions may also be reported on a volumetric basis, with the most common unit of measurement being parts per million. This is typically a measurement that is corrected to specific oxygen content in the exhaust and without considering moisture content. The abbreviation for this unit of measurement is "ppmvd" (parts per million by volume, dry) and is corrected to 15% oxygen for electrical generating equipment such as microturbines. The relationship between an output based measurement like pounds per MWh and a volumetric measurement like ppmvd depends on the characteristics of the generating equipment and the molecular weight of the criteria pollutant being measured. Table 3 expresses the emissions in ppmvd at 15% oxygen for the Capstone microturbine models shown in Table 1. Note that raw measurements expressed in ppmv will typically be lower than the corrected values shown in Table 3 because the microturbine exhaust has greater than 15% oxygen.

Another volumetric unit of measurement expresses the mass of a specific criteria pollutant per standard unit of volume. Table 4 expresses the emissions in milligrams per normal cubic meter at 15% oxygen. Normal conditions for this purpose are expresses as one atmosphere of pressure and zero degrees Celsius. Note that both the ppmvd and mg/m3 measurements are for specific oxygen content. A conversion can be made to adjust either unit of measurement to other reference oxygen contents, if required. Use the equation below to convert from one reference oxygen content to another:

$$\text{Emissions at New } O_2 = \frac{(20.9 - \text{New } O_2 \text{ Percent})}{(20.9 - \text{Current } O_2 \text{ Percent})} \times \text{Emissions at Current } O_2$$

For example, to express 9 ppmvd of NOx at 15% oxygen to ppmvd at 3% oxygen:

$$\text{Emissions at 3\% } O_2 = \frac{(20.9 - 3.0)}{(20.9 - 15.0)} \times 9 = 27 \text{ ppmvd}$$

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Table 3. Emission for Different Capstone Microturbine Models in [ppmvd] at 15% O_2

Model	Fuel	NOx	CO	VOC
C30 NG	Natural Gas (1)	9	40	9
CR30 MBTU	Landfill Gas (2)	9	500	40
CR30 MBTU	Digester Gas (3)	9	250	40
C30 Liquid	Diesel #2 (4)	35	9	9
C65 NG Standard	Natural Gas (1)	9	40	7
C65 NG Low NOx	Natural Gas (1)	4	40	7
C65 NG CARB	Natural Gas (1)	4	8	3
CR65 Landfill	Landfill Gas (2)	9	130	7
CR65 Digester	Digester Gas (3)	9	130	7
C200 NG	Natural Gas (1)	9	40	7
C200 NG CARB	Natural Gas (1)	4	8	3
CR200 Digester	Digester Gas (3)	9	130	7

Notes: same as Table 1

Table 4. Emission for Different Capstone Microturbine Models in [mg/m3] at 15% O_2

Model	Fuel	NOx	CO	VOC (5)
C30 NG	Natural Gas (1)	18	50	6
CR30 MBTU	Landfill Gas (2)	18	620	30
CR30 MBTU	Digester Gas (3)	18	310	30
C30 Liquid	Diesel #2 (4)	72	11	6
C65 NG Standard	Natural Gas (1)	19	50	5
C65 NG Low NOx	Natural Gas (1)	8	50	5
C65 NG CARB	Natural Gas (1)	8	9	2
CR65 Landfill	Landfill Gas (2)	18	160	5
CR65 Digester	Digester Gas (3)	18	160	5
C200 NG	Natural Gas (1)	18	50	5
C200 NG CARB	Natural Gas (1)	8	9	2
CR200 Digester	Digester Gas (3)	18	160	5

Notes: same as Table 1

The emissions stated in Tables 1, 2, 3 and 4 are guaranteed by Capstone for new microturbines during the standard warranty period. They are also the expected emissions for a properly maintained microturbine according to manufacturer's published maintenance schedule for the useful life of the equipment.

Emissions at Full Power but Not at ISO Conditions

The maximum emissions in Tables 1, 2, 3 and 4 are at full power under ISO conditions. These levels are also the expected values at full power operation over the published allowable ambient temperature and elevation ranges.

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Emissions at Part Power

Capstone microturbines are designed to maintain combustion stability and low emissions over a wide operating range. Capstone microturbines utilize multiple fuel injectors, which are switched on or off depending on the power output of the turbine. All injectors are typically on when maximum power is demanded, regardless of the ambient temperature or elevation. As the load requirements of the microturbine are decreased, injectors will be switched off to maintain stability and low emissions. However, the emissions relative to the lower power output may increase. This effect differs for each microturbine model.

Emissions Calculations for Permitting

Air Permitting agencies are normally concerned with the maximum amount of a given pollutant being emitted per unit of time (for example pounds per day of NOx). The simplest way to make this calculation is to use the maximum microturbine full electrical power output (expressed in MW) multiplied by the emissions rate in pounds per MWhe times the number of hours per day. For example, the C65 CARB microturbine operating on natural gas would have a NOx emissions rate of:

NOx = .17 X (65/1000) X 24 = .27 pounds per day

This would be representative of operating the equipment full time, 24 hours per day, at full power output of 65 kWe.

As a general rule, if local permitting is required, use the published agency levels as the stated emissions for the permit and make sure that this permitted level is above the calculated values in this technical reference.

Consideration of Useful Thermal Output

Capstone microturbines are often deployed where their clean exhaust can be used to provide heating or cooling, either directly or using hot water or other heat transfer fluids. In this case, the local permitting or standards agencies will usually consider the emissions from traditional heating sources as being displaced by the useful thermal output of the microturbine exhaust energy. This increases the useful output of the microturbine, and decreases the relative emissions of the combined heat and power system. For example, the CARB version C65 ICHP system with integral heat recovery can achieve a total system efficiency of 70% or more, depending on inlet water temperatures and other installation-specific characteristics. The electric efficiency of the CARB version C65 microturbine is 28% at ISO conditions. This means that the total NOx output based emissions, including the captured thermal value, is the electric-only emissions times the ratio of electric efficiency divided by total system efficiency:

NOx = .17 X 28/70 = .068 pounds per MWh (based on total system output)

This is typically much less than the emissions that would result from providing electric power using traditional central power plants, plus the emissions from a local hot water heater or boiler. In fact microturbine emissions are so low compared with traditional hot water heaters that installing a Capstone microturbine with heat recovery can actually decrease the local emissions of NOx and other criteria pollutants, without even considering the elimination of emissions from a remote power plant.

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Greenhouse Gas Emissions

Many gasses are considered "greenhouse gasses", and agencies have ranked them based on their global warming potential (GWP) in the atmosphere compared with carbon dioxide (CO_2), as well as their ability to maintain this effect over time. For example, methane is a greenhouse gas with a GWP of 21. Criteria pollutants like NOx and organic compounds like methane are monitored by local air permitting authorities, and are subject to strong emissions controls. Even though some of these criteria pollutants can be more troublesome for global warming than CO_2, they are released in small quantities – especially from Capstone microturbines. So the major contributor of concern is carbon dioxide, or CO_2. Emission of CO_2 depends on two things:

1. Carbon content in the fuel
2. Efficiency of converting fuel to useful energy

It is for these reasons that many local authorities are focused on using clean fuels (for example natural gas compared with diesel fuel), achieving high efficiency using combined heat and power systems, and displacing emissions from traditional power plants using renewable fuels like waste landfill and digester gasses.

Table 5 shows the typical CO_2 emissions due to combustion for different Capstone microturbine models at full power and ISO conditions. The values do not include CO_2 that may already exist in the fuel itself, which is typical for renewable fuels like landfill and digester gas. These values are expressed on an output basis, as is done for criteria pollutants in Table 1. The table shows the pounds per megawatt hour based on electric power output only, as well as considering total useful output in a CHP system with total 70% efficiency (LHV). As for criteria pollutants, the relative quantity of CO_2 released is substantially less when useful thermal output is also considered in the measurement.

Table 5. CO_2 Emission for Capstone Microturbine Models in [lb/MWh]

Model	Fuel	CO_2	
		Electric Only	70% Total CHP
C30 NG	Natural Gas (1)	1,690	625
CR30 MBTU	Landfill Gas (1)	1,690	625
CR30 MBTU	Digester Gas (1)	1,690	625
C30 Liquid	Diesel #2 (2)	2,400	855
C65 NG Standard	Natural Gas (1)	1,520	625
C65 NG Low NOx	Natural Gas (1)	1,570	625
C65 NG CARB	Natural Gas (1)	1,570	625
CR65 Landfill	Landfill Gas (1)	1,520	625
CR65 Digester	Digester Gas (1)	1,520	625
C200 NG	Natural Gas (1)	1,330	625
C200 NG CARB	Natural Gas (1)	1,330	625
CR200 Digester	Digester Gas (1)	1,330	625

Notes:

(1) Emissions due to combustion, assuming natural gas with CO_2 content of 117 lb/MMBTU (HHV)

(2) Emissions due to combustion, assuming diesel fuel with CO_2 content of 160 lb/MMBTU (HHV)

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Useful Conversions

The conversions shown in Table 6 can be used to obtain other units of emissions outputs. These are approximate conversions.

Table 6. Useful Unit Conversions

From	Multiply By	To Get
lb/MWh	0.338	g/bhp-hr
g/bhp-hr	2.96	lb/MWh
lb	0.454	kg
kg	2.20	lb
kg	1,000	g
hp (electric)	.746	kW
kW	1.34	hp (electric)
MW	1,000	kW
kW	0.001	MW

Definitions

- ISO conditions are defined as: 15 °C (59 °F), 60% relative humidity, and sea level pressure of 101.3 kPa (14.696 psia).
- HHV: Higher Heating Value
- LHV: Lower Heating Value
- kW_{th}: Kilowatt (thermal)
- kW_e : Kilowatt (electric)
- MWh: Megawatt-hour
- hp-hr: horsepower-hour (sometimes referred to as "electric horsepower-hour")
- Scf: Standard cubic foot (standard references ISO temperature and pressure)
- m3: Normal cubic meter (normal references 0 °C and one atmosphere pressure)

Capstone Contact Information

If questions arise regarding this technical reference, please contact Capstone Turbine Corporation for assistance and information:

Capstone Applications

Toll Free Telephone: (866) 4-CAPSTONE or (866) 422-7786

Fax: (818) 734-5385

E-mail: applications@capstoneturbine.com

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ENVIROTHERM INTERNATIONAL™

Flare Stacks – Thermal Oxidizers – Burners & Controls

TVO-36
SPECIFICATION SHEET

36" TVO SPECIFICATION		OPERATIONAL INFORMATION						
Maximum Heat Release From Inlet Stream	MMBTU/HR	1.0	2.0	3.0	4.0	5.0	6.0	7.0
Mass Flow at 1450°F	ACFH	66,098	127,299	188,498	249,698	310,899	372,097	433,298
Exit Velocity	FT/SEC	4.30	8.27	12.25	16.23	20.21	24.18	28.16
Residence Time	SEC	4.66	2.42	1.63	1.23	0.99	0.83	0.71
Rating of the Assist Heat Burner		2.0 MMBTU/HR						
Gas Service Required for Burner		≤400 SCFH – Natural Gas intermittent use, only on when temperature <1450°F						
Gas Consumption at Start-up		400,00 BTU/HR						
Gas Consumption Under Load		≤400 SCFH, dependant on BTU						
Combustion Chamber Temperature		1450°F - 1600°F						
Flame Cell Air Inlet Diameter		24 IN						
Destruction Efficiency		≥ 98.0%						
Stack Inner Diameter		28 IN						
Stack Height		20 FT						
Ceramic Lining Thickness		4 IN						
Electrical Service Required		24 VDC, 5 Amps						

APPENDIX D: PLAN APPROVAL APPLICATION FORMS

2700-PM-AQ0007 Rev. 7/2004

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Submit in Triplicate

PROCESSES

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: Equitrans, LP - Redhook Compressor Station

DEP Client ID# (if known): ______

Type of Review required and Fees:

- ☐ Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD: .... $______
- ☒ Source requiring approval under NSPS or NESHAPS or both: $1,700
- ☐ Source requiring approval under NSR regulations: .... $______
- ☐ Source requiring the establishment of a MACT limitation: .... $______
- ☐ Source requiring approval under PSD: .... $______

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

- ☒ **General Information Form (GIF)**
- ☒ **Processes Plan Approval Application**
- ☒ **Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: ______
- ☒ **Copy and Proof of County and Municipal Notifications**
- ☒ **Permit Fees**
- ☐ **Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility)

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, **Diana Charletta**, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): Diana M. Charletta   Date: 10/21/15

Name (Print): Diana Charletta   Title: Sr. Vice President – Midstream Operations

OFFICIAL USE ONLY

Application No. ______ Unit ID ______ Site ID ______

DEP Client ID #: ______ APS. ID ______ AUTH. ID ______

Date Received ______ Date Assigned ______ Reviewed By ______

Date of 1st Technical Deficiency ______ Date of 2nd Technical Deficiency ______

Comments: ______

Section B - Processes Information

1. Source Information – Compressor Engines (S001 and S002)

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

Two (2) Caterpillar G3616 spark ignition 4-stroke lean burn engines (5,350 HP each) that combust pipeline quality natural gas. The engines are used to boost the pressure for the pipeline transmission of natural gas.

Manufacturer Caterpillar	Model No. G3616	Number of Sources 2
Source Designation S001 and S002	Maximum Capacity 5,350 HP (each)	Rated Capacity 5,350 HP (each)
Type of Material Processed Natural Gas		

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel – Compressor Engines (S001 and S002) - Each

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number ________	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number ________	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	37,260 SCFH	326 X 10^6 SCF	NA grain/100 SCF	NA	1,058 Btu/SCF
Gas (other) ________	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal ________	TPH	Tons	% by wt		Btu/lb
Other * ________					
________					
________					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information

1. Source Information – Solar Turbines (S003 and S004)

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

Two (2) Solar Taurus 70 turbines that combust pipeline quality natural gas. The turbines are used to drive compressors that boost pressure for the pipeline transmission of natural gas.

Manufacturer Solar	Model No. Taurus-70	Number of Sources 2
Source Designation S003 and S004	Maximum Capacity 11,311 HP (each)	Rated Capacity 11,311 HP (each)
Type of Material Processed Natural Gas		

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel – Solar Turbines (S003 and S004) - Each

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number ______	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number ______	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	88,019 SCFH	771 X 10^6 SCF	NA grain/100 SCF	NA	1,058 Btu/SCF
Gas (other) ______	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal ______	TPH	Tons	% by wt		Btu/lb
Other * ______					
______					
______					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information

1. Source Information – Microturbines (S005 – S014)

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

Ten (10) natural gas fired microturbine generator engines. Each unit (five microturbines comprise one unit) will combust pipeline quality natural gas to power an electric generator.

Manufacturer Capstone	Model No. C200	Number of Sources 10
Source Designation S005 through S014	Maximum Capacity 0.2 MW (each)	Rated Capacity 0.2 MW (each)
Type of Material Processed Natural Gas		

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel – Microturbines (S005 – S014) - Each

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number ____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number ____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	2,156 SCFH (each)	18.89 X 10^6 SCF (each)	NA grain/100 SCF	NA	1,058 Btu/SCF
Gas (other) ____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal ____	TPH	Tons	% by wt		Btu/lb
Other * ____					
____					
____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information

1. Source Information – Dehydration Unit Still Vent & Flash Tank (S015), and associated reboiler (S016)

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

One (1) 50 MMSCFD triethylene glycol (TEG) dehydration unit with associated reboiler and enclosed flare. The dehydration unit will remove moisture from the natural gas, and will be controlled by an enclosed flare (CD-001).

Manufacturer Exterran or equivalent	Model No.	Number of Sources 1
Source Designation S015	Maximum Capacity 50 MMSCFD	Rated Capacity 50 MMSCFD
Type of Material Processed Natural Gas		

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel – Dehydration Unit Reboiler (S016)

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number ____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number ____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	728 SCFH	6.4 X 10^6 SCF	NA grain/100 SCF	NA	1,058 Btu/SCF
Gas (other) ____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal ____	TPH	Tons	% by wt		Btu/lb
Other * ____					
____					
____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner – Fuel Gas Heaters (S017 and S018)

Manufacturer	Type and Model No.	Number of Burners
TBD	TBD	2 (one each)

Description:
Two (2) Fuel Gas Heaters, each rated 0.77 MMbtu/hr.

Rated Capacity	Maximum Capacity
0.77 MMBtu/hr heat input, each	0.77 MMBtu/hr heat input, each

4. Process Storage Vessels – Produced Fluids Tank (S019)

A. For Liquids:

Name of material stored
Produced Fluids (from the pipeline)

Tank I.D. No.	Manufacturer	Date Installed
TBD	TBD	TBD

Maximum Pressure	Capacity (gallons/Meter^3)
	8,820 gallons

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)
TBD

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)
0.75	< 1.5 psia

Type of Roof: Describe:
Vertical Fixed Roof

Total Throughput Per Year	
91,350 gallons	Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies

4. Process Storage Vessels – Used Oil Tank (S020)

A. For Liquids:

Name of material stored
Used Oil

Tank I.D. No.	Manufacturer	Date Installed
TBD	TBD	TBD

Maximum Pressure	Capacity (gallons/Meter^3)
	4,200 gallons

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)
TBD

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)
0.75	Negligible

Type of Roof: Describe:
Vertical Tank

Total Throughput Per Year	
2,100 gallons	Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies

4. Process Storage Vessels – TEG Tank (S021)			
A. For Liquids:			
Name of material stored Triethylene glycol (TEG)			
Tank I.D. No. TBD	Manufacturer TBD		Date Installed TBD
Maximum Pressure		Capacity (gallons/Meter^3) 2,100 gallons	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent) TBD			
Relief valve/vent set pressure (psig) 0.03125		Vapor press. of liquid at storage temp. (psia/kPa) Negligible	
Type of Roof: Describe: Horizontal Tank			
Total Throughput Per Year 2,100 gallons		Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies	

4. Process Storage Vessels – Used TEG Tank (S022)			
A. For Liquids:			
Name of material stored Used TEG			
Tank I.D. No. TBD	Manufacturer TBD		Date Installed TBD
Maximum Pressure		Capacity (gallons/Meter^3) 2,100 gallons	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent) TBD			
Relief valve/vent set pressure (psig) 0.03125		Vapor press. of liquid at storage temp. (psia/kPa) Negligible	
Type of Roof: Describe: Horizontal Tank			
Total Throughput Per Year 1,050 gallons		Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies	

4. Process Storage Vessels – MEG Tank (S023)			
A. For Liquids:			
Name of material stored Monoethylene Glycol (MEG)			
Tank I.D. No. TBD	Manufacturer TBD		Date Installed TBD
Maximum Pressure		Capacity (gallons/Meter^3) 2,100 gallons	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent) TBD			

Relief valve/vent set pressure (psig) 0.03125	Vapor press. of liquid at storage temp. (psia/kPa) Negligible
Type of Roof: Describe: Horizontal Tank	
Total Throughput Per Year 1,050 gallons	Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies

4. Process Storage Vessels – Used MEG Tank (S024)		
A. For Liquids:		
Name of material stored Used MEG		
Tank I.D. No. TBD	Manufacturer TBD	Date Installed TBD
Maximum Pressure	Capacity (gallons/Meter^3) 2,100 gallons	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent) TBD		
Relief valve/vent set pressure (psig) 0.03125	Vapor press. of liquid at storage temp. (psia/kPa) Negligible	
Type of Roof: Describe: Horizontal Tank		
Total Throughput Per Year 1,050 gallons	Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies	

4. Process Storage Vessels – Engine Oil Tank (S025)		
A. For Liquids:		
Name of material stored Used Oil		
Tank I.D. No. TBD	Manufacturer TBD	Date Installed TBD
Maximum Pressure	Capacity (gallons/Meter^3) 2,100 gallons	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent) TBD		
Relief valve/vent set pressure (psig) 0.03	Vapor press. of liquid at storage temp. (psia/kPa) Negligible	
Type of Roof: Describe: Horizontal Tank		
Total Throughput Per Year 2,100 gallons	Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies	

4. Process Storage Vessels – Compressor Oil Tank (S026)			
A. For Liquids:			
Name of material stored Compressor Oil			
Tank I.D. No. TBD	Manufacturer TBD		Date Installed TBD
Maximum Pressure		Capacity (gallons/Meter^3) 2,100 gallons	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent) TBD			
Relief valve/vent set pressure (psig) 0.03125		Vapor press. of liquid at storage temp. (psia/kPa) Negligible	
Type of Roof: Describe: Horizontal Tank			
Total Throughput Per Year 4,200 gallons		Number of fills per day (fill/day): varies Filling Rate (gal./min.): varies Duration of fill hr./fill): varies	

5. Request for Confidentiality	
Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.	

Section B - Processes Information (Continued)

6. Miscellaneous Information

Attach flow diagram of process giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.). Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored.

See process flow diagram

Describe fully the facilities provided to monitor and to record process operating conditions, which may affect the emission of air contaminants. Show that they are reasonable and adequate.

Hours of operation will be monitored for all engines and turbines. Engine and turbine operating parameters such as RPM, percent load and fuel usage may be monitored for normal operating ranges while the station is manned. The dehydration unit enclosed flare may be equipped with a thermocouple to monitor combustion temperature

Describe each proposed modification to an existing source.

NA

Identify and describe all fugitive emission points, all relief and emergency valves and any by-pass stacks.

Based on preliminary estimates, there will be a total of 355 valves, 1970 connectors, 985 flanges, 55 open ended lines and 32 other miscellaneous fugitive emission points in the entire facility following the completion of this proposed project. The emissions from these points have been estimated in the site-wide emissions calculations.

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

As the catalyst must be heated to a certain temperature before it reaches its rated reduction efficiency, emissions may be greater during startup of reciprocating engines. To ensure emissions will be minimized, the engines will be operated in accordance with manufacturer's specifications or recommendations.

There is no reason to anticipate excess emissions during shutdown of engines. The only reasonably anticipated upset condition would be malfunction of the catalyst. If such an upset were to occur, the engine would be shutdown until the catalyst was repaired or replaced.

Equitrans will limit startup and shutdown emissions from the turbines by adhering to startup and shutdown practices which are recommended by the manufacturer.

In addition, all sources at the station will be operated in accordance with good engineering practices, according to manufacturer's specifications and in a manner which minimizes air pollution.

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: Q4 2015
ii. Expected completion date of construction/reconstruction/installation: As soon as possible
iii. Anticipated date of start-up: As soon as possible

Section C - Air Cleaning Device

1. Precontrol Emissions* – Compressor Engine (S001 and S002)

Pollutant	Maximum Emission Rate - (each)				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	0.01 lb/MMBtu	0.40	8,760	1.73	AP-42
PM_{10}	0.01 lb/MMBtu	0.40	8,760	1.73	AP-42
SO_x	0.001 lb/MMBtu	0.02	8,760	0.10	AP-42
CO	2.36 g/bhp-hr	27.84	8,760	121.92	Manufacturer
NO_x	0.4 g/bhp-hr	4.72	8,760	20.66	Manufacturer
VOC (NMNEHC)	0.25 g/bhp-hr	2.95	8,760	12.92	Manufacturer
Others: (e.g., HAPs)	-----	-----	-----	-----	-----
Formaldehyde	0.20 g/bhp-hr	2.36	8,760	10.33	Manufacturer

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

Section C - Air Cleaning Device

1. Precontrol Emissions* - Solar Turbines (S003 and S004)

Pollutant	Maximum Emission Rate – (each)				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	0.019 lb/MMBtu	1.62	8760	7.08	Turbine Manufacturer
PM_{10}	0.019 lb/MMBtu	1.62	8760	7.08	Turbine Manufacturer
SO_x	0.004 lb/MMBtu	0.31	8760	1.34	Turbine Manufacturer
CO	0.061 lb/MMBtu	5.11	8760	23.38	Turbine Manufacturer
NO_x	0.060 lb/MMBtu	5.03	8760	22.02	Turbine Manufacturer
VOC (NMNEHC)	0.007 lb/MMBtu	0.59	8760	2.58	Turbine Manufacturer
Others: (e.g., HAPs)	-----	-----	8760	-----	-----
Formaldehyde	0.003 lb/MMBtu	0.26	8760	1.13	Turbine Manufacturer

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

Section C - Air Cleaning Device

1. Precontrol Emissions* Dehydration Unit Still Vent and Flash Tank (S015)

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	-----	-----	-----	-----	-----
PM_{10}	-----	-----	-----	-----	-----
SO_x	-----	-----	-----	-----	-----
CO	-----	-----	-----	-----	-----
NO_x	-----	-----	-----	-----	-----
VOC (NMNEHC)	-----	6.06	8760	26.55	GRI-GLY-Calc
Others: Total HAP	-----	3.09	8760	13.54	GRI-GLY-Calc
Benzene	-----	0.32	8760	1.41	GRI-GLY-Calc

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

Section C - Air Cleaning Device (Continued) – not applicable

10. ☐ Selective Catalytic Reduction (SCR)
☐ Selective Non-Catalytic Reduction (SNCR)
☐ Non-Selective Catalytic Reduction (NSCR)

Equipment Specifications

Manufacturer	Type	Model No.

Design Inlet Volume (SCFM)	Design operating temperature (°F)

Is the system equipped with process controls for proper mixing/control of the reducing agent in gas stream? If yes, give details.

Attach efficiency and other pertinent information (e.g., ammonia slip)

Operating Parameters

Volume of gases handled______________ (ACFM) @____________ °F

Operating temperature range for the SCR/SNCR/NSCR system (°F) From ____________°F To _____________°F

Reducing agent used, if any	Oxidation catalyst used, if any

State expected range of usage rate and concentration.

Service life of catalyst	Ammonia slip (ppm)

Describe fully with a sketch giving locations of equipment, controls systems, important parameters and method of operation.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

11. Oxidizer/Afterburners – Oxidation Catalysts for Compressor Engines (S001 and S002)

Equipment Specifications

Manufacturer Emit Technologies, Inc. (or equivalent)	Type ☐ Thermal ☒ Catalytic	Model No. RT-4815-H (or equivalent)
Design Inlet Volume (SCFM) ~32,209 CFM	Combustion chamber dimensions (length, cross-sectional area, effective chamber volume, etc.) NA	

Describe design features, which will ensure mixing in combustion chamber.

Describe method of preheating incoming gases (if applicable). NA	Describe heat exchanger system used for heat recovery (if applicable). NA

Catalyst used See above	Life of catalyst 1 year or 8,760 operating hours	Expected temperature rise across catalyst (°F) Unknown	Dimensions of bed (in inches). Height: 48" Diameter or Width: 15" Depth: 3.5"

Are temperature sensing devices being provided to measure the temperature rise across the catalyst? ☒ Yes ☐ No

If yes, describe.

As good practice, thermocouples may be installed to monitor pre-catalyst and post-catalyst exhaust gas temperatures.

Describe any temperature sensing and/or recording devices (including specific location of temperature probe in a drawing or sketch.

Burner Information

Burner Manufacturer NA	Model No.	Fuel Used
Number and capacity of burners	Rated capacity (each)	Maximum capacity (each)

Describe the operation of the burner	Attach dimensioned diagram of afterburner

Operating Parameters

Inlet flow rate (ACFM) 32,209 @ 812 °F	Outlet flow rate (ACFM) TBD @ TBD °F
State pressure drop range across catalytic bed (in. of water). TBD	Describe the method adopted for regeneration or disposal of the used catalyst. Catalyst may be cleaned periodically, or when performance declines.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

As good practice, a high-temperature shutdown control or alarm may be in place to shut the engine down or warn the operator should the inlet exhaust temperature to the oxidation catalyst(s) approach a critical temperature.

Emissions Data			
Pollutant	**Inlet**	**Outlet**	**Removal Efficiency (%)**
CO	2.36 g/bhp-hr	0.17 g/bhp-hr	$\geq$93%
NMNEHC (Non-methane non-ethane hydrocarbons excluding HCHO)	0.25 g/bhp-hr	0.13 g/bhp-hr	48%
HCHO	0.20 g/bhp-hr	0.05 g/bhp-hr	75%

Section C - Air Cleaning Device (Continued)

12. Flares – Enclosed Flare (CD-001)

Equipment Specifications

Manufacturer Envirotherm	Type ☐ Elevated flare ☐ Ground flare ☒ Other Enclosed Describe	Model No. TVO-36
Design Volume (SCFM)	Dimensions of stack (ft.) Diameter 28 inches Height 20 ft	
Residence time (sec.) and outlet temperature (°F) 1450-1600 F, Residence time - 0.71 sec (minimum)	Turn down ratio	Burner details

Describe the flare design (air/steam-assisted or nonassisted), essential auxiliaries including pilot flame monitor of proposed flare with a sketch. Flare will be a ground mounted, enclosed combustion type with forced combustion air, assist and electronic spark ignition. Assist gas is introduced at the rate needed to maintain desired combustion temperature.

Describe the operation of the flare's ignition system.

Electronic spark ignition.

Describe the provisions to introduce auxiliary fuel to the flare.

Assist gas is introduced at the rate needed to maintain desired combustion temperature.

Operation Parameters

Detailed composition of the waste gas	Heat content	Exit velocity
See GLY-Calc Output File for Regenerator and Flash Gas Composition	Varies	28.16 (maximum)

Maximum and average gas flow burned (ACFM)	Operating temperature (°F)
7,222 (maximum), average varies	1450-1600 F

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Flare will include an active flame monitor. The flare will be interlocked with the reboiler such that loss of flare will result in reboiler shutdown. The system would then go into alarm state.

Emissions Data

Pollutant	Inlet (tpy)	Outlet (tpy)	Removal Efficiency (%)
VOC	26.55	0.53	$\geq$98%
HAP	13.54	0.27	$\geq$98%

Section C - Air Cleaning Device (Continued)

13. Other Control Equipment - Solar Turbines (S003 and S004)

Equipment Specifications

Manufacturer	Type	Model No.
Solar	SoLoNOx Combustion System	NA

Design Volume (SCFM)	Capacity
NA	NA

Describe pH monitoring and pH adjustment, if any.
NA

Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. NA

Attach efficiency curve and/or other efficiency information.

Manufactured guaranteed emissions of 15 ppmvd NOx, 25 ppmvd UHC, and 25 ppmvd CO (all at 15% O2) based on inherent design of system.

Attach any additional date including auxiliary equipment and operation details to thoroughly evaluate the control equipment.
NA

Operation Parameters

Volume of gas handled

NA ____________ ACFM @ ______________ °F ____________ % Moisture

Describe fully giving important parameters and method of operation.

SoLoNOx technology is a lean-premixed combustion technology inherent to Solar turbine design to lower the maximum flame temperature and ensure uniform air/fuel mixture, which reduces the emissions of regulated pollutants.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
NOx		15 ppmvd - at all times other than startup, shutdown and low ambient temperatures (<0 F)	
CO		25 ppmvd- at all times other than startup, shutdown and low ambient temperatures (<0 F)	

Section C - Air Cleaning Device (Continued)

14. Costs

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost

15. Miscellaneous

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

N/A

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

See Attached Specifications and Guarantees

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

Varies by control equipment. EQT will conduct maintenance on all control equipment as recommended by the respective manufacturer.

Section D - Additional Information

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.

No - this is a greenfield construction project

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

a.	Prevention of Significant Deterioration permit (PSD), 40 CFR 52?	☐ YES	☒ NO
b.	New Source Review (NSR), 25 Pa. Code Chapter 127, Subchapter E?	☐ YES	☒ NO
c.	New Source Performance Standards (NSPS), 40 CFR Part 60? (If Yes, which subpart) JJJJ, KKKK	☒ YES	☐ NO
d.	National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61? (If Yes, which subpart) ________	☐ YES	☒ NO
e.	Maximum Achievable Control Technology (MACT) 40 CFR Part 63? (If Yes, which subpart) ZZZZ	☒ YES	☐ NO

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

Please see Section 4 of Application Report.

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last five (5) years for applicable PSD pollutant(s) if the facility is an existing major facility (PSD purposes).

N/A

Section D - Additional Information (Continued)

Indicate emission increases and decreases in tons per year (tpy), for volatile organic compounds (VOCs) and nitrogen oxides (NOx) for NSR applicability since January 1, 1991 or other applicable dates (see other applicable dates in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from exempted source(s), etc.

Permit number (if applicable)	Date issued	Indicate ***Yes*** or ***No*** if emission increases and decreases were used previously for netting	Source I. D. or Name	VOCs		NOx	
				Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)	Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)
N/A							

If the source is subject to 25 Pa. Code Chapter 127, Subchapter E, New Source Review requirements,

a. Identify Emission Reduction Credits (ERCs) for emission offsets or demonstrate ability to obtain suitable ERCs for emission offsets.

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable).

c. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs (if applicable).

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III and applicable requirements of the Clean Air Act adopted thereunder. The Department may request additional information to evaluate the application such as a standby plan, a plan for air pollution emergencies, air quality modeling, etc.

Section E - Compliance Demonstration (Compressor Engines - S001 and S002)

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

☐ Monitoring ☒ Testing ☒ Reporting

☒ Recordkeeping ☐ Work Practice Standard

Monitoring:

a. Monitoring device type (Parameter, CEM, etc):

b. Monitoring device location:

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Testing:

a. Reference Test Method: Citation	40 CFR 60.4243(b)(2)(ii) requires initial performance testing as well as subsequent compliance testing every 8,760 hours or three years, whichever comes first. Testing to be conducted in accordance with 40 CFR 60.4244.
b. Reference Test Method: Description	EPA approved test methods - 7E (NOx concentration), 10 (CO concentration), 25A/320 (NMHC concentration), and 19 (exhaust mass emissions rate)

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:

Records of all notifications submitted to comply with NSPS Subpart JJJJ, records of maintenance conducted on the engine and performance testing reports maintained in accordance with 40 CFR 60.4245(a).

Reporting:

a. Describe what is to be reported and frequency of reporting:

Initial Notification of the date construction commences no later than 30 days after such date in accordance with 40 CFR 60.7(a)(1) and 60.4245 (c) and performance testing results within 60 days of test completion in accordance with 40 CFR 60.4245(d).

b. Reporting start date: 60 days after first performance test

Work Practice Standard:

Describe each: Prepare and adhere to a maintenance plan to maintain and operate the engine, to the extent practicable, in a manner consistent with good air pollution control practices for minimizing emissions as required by 40 CFR 60.4243(b)(2)(ii).

Section E - Compliance Demonstration (Solar Turbines – S003 and S004)

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

☒ Monitoring ☒ Testing ☒ Reporting

☒ Recordkeeping ☒ Work Practice Standard

Monitoring:

a. Monitoring device type (Parameter, CEM, etc): Fuel Records

b. Monitoring device location: On Site

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:
Total sulfur content of the fuel per 40 CFR 60.4360

Testing:

a. Reference Test Method: Citation 40 CFR 60.4400: EPA method 7E or Method 20

b. Reference Test Method: Description Determination of NOx Emissions from Stationary Sources (Instrumental Analyzer Procedure) or NOx from Stationary Gas Turbines

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:
Records of the hours of operation, fuel consumption, total sulfur content of the fuel, and start up and shut down events. All records will be kept as required per 40 CFR 60.4365(a) or 40 CFR 60.4365(b)

Reporting:

a. Describe what is to be reported and frequency of reporting:
Report of initial compliance testing in accordance with 40 CFR 60.4375(b)

b. Reporting start date: Within 60 days of the performance test

Work Practice Standard:

Describe each: 60.4333: operate and maintain the stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.

Section E - Compliance Demonstration (Dehydration Unit – S015)

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

☐ Monitoring ☐ Testing ☐ Reporting

☒ Recordkeeping ☐ Work Practice Standard

Monitoring:

a. Monitoring device type (Parameter, CEM, etc):

b. Monitoring device location:

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Testing:

a. Reference Test Method: Citation

b. Reference Test Method: Description

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:

Maintain HAP emissions facility-wide below 10 tpy of individual HAP and 25 tpy for total HAP

Reporting:

a. Describe what is to be reported and frequency of reporting:

b. Reporting start date: ______________________

Work Practice Standard:

Describe each:

Section E - Compliance Demonstration (Microturbines – S005-S014)

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

- ☐ Monitoring
- ☐ Testing
- ☐ Reporting
- ☒ Recordkeeping
- ☒ Work Practice Standard

Monitoring:

a. Monitoring device type (Parameter, CEM, etc):

b. Monitoring device location:

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Testing:

a. Reference Test Method: Citation

b. Reference Test Method: Description

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:

Fuel throughput

Reporting:

a. Describe what is to be reported and frequency of reporting:

Record hours of operation will be recorded annually

b. Reporting start date: ____________________

Work Practice Standard:

Describe each: Burn Natural Gas

Section F - Flue and Air Contaminant Emissions – Compressor Engine (S001 and S002)

1. Estimated Atmospheric Emissions* Post-Control @ 8760 hrs/yr (Each Engine)

Pollutant	Maximum emission rate: specify units	lbs/hr	tons/yr.	Calculation/ Estimation Method
PM	0.01 lb/MMBtu	0.40	1.73	AP-42
PM_{10}	0.01 lb/MMBtu	0.40	1.73	AP-42
SO_x	0.001 lb/MMBtu	0.02	0.10	AP-42
CO	0.17 g/bhp-hr	1.95	8.53	Vendor Guarantee
NO_x	0.40 g/bhp-hr	4.72	20.66	Vendor Guarantee
VOC (NMNEHC)	0.13 g/bhp-hr	1.53	6.72	Vendor Guarantee
Others: (e.g., HAPs)	-----	-----	-----	-----
Formaldehyde	0.05 g/bhp-hr	0.59	2.58	Vendor Guarantee

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number TBD

List Source(s) or source ID exhausted to this stack: Two (2) CAT G3616 Compressor Engines (one stack per engine)

% of flow exhausted to stack: 100

Stack height above grade (ft.) TBD
Grade elevation (ft.) TBD

Stack diameter (ft) or Outlet duct area (sq. ft.) TBD

f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
TBD

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. NA

Location of stack** Latitude/Longitude Point of Origin	Latitude: Degrees	Latitude: Minutes	Latitude: Seconds	Longitude: Degrees	Longitude: Minutes	Longitude: Seconds

Stack exhaust
Volume 32,209 ACFM Temperature 812 °F Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
TBD

Exhauster (attach fan curves) ______________ in. of water ______________ HP @ ______________ RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section F - Flue and Air Contaminant Emissions – Solar Turbines (S003 and S004)

1. Estimated Atmospheric Emissions* Post-Control @ 8760 hrs/yr (Each Turbine)

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	0.019 lb/MMBtu	1.62	7.08	Turbine Manufacturer
PM_{10}	0.019 lb/MMBtu	1.62	7.08	Turbine Manufacturer
SO_x	0.004 lb/MMBtu	0.31	1.34	Turbine Manufacturer
CO	0.061 lb/MMBtu	5.11	23.38	Turbine Manufacturer
NO_x	0.060 lb/MMBtu	5.03	22.02	Turbine Manufacturer
VOC (NMNEHC)	0.007 lb/MMBtu	0.59	2.58	Turbine Manufacturer
Others: (e.g., HAPs)	-----	-----	-----	-----
Formaldehyde	0.003 lb/MMBtu	0.26	1.13	Turbine Manufacturer

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number TBD

List Source(s) or source ID exhausted to this stack:
Two (2) Solar Turbines (one stack per turbine)

% of flow exhausted to stack: 100

Stack height above grade (ft.) TBD
Grade elevation (ft.) TBD

Stack diameter (ft) or Outlet duct area (sq. ft.)
TBD

f. Weather Cap
☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
TBD

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. NA

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume TBD ACFM Temperature TBD °F Moisture ____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
TBD

Exhauster (attach fan curves) ____________ in. of water ____________ HP @ ____________RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section F - Flue and Air Contaminant Emissions – Microturbines (S005-S014)

1. Estimated Atmospheric Emissions* Microturbines @ 8,760 hrs/yr (each microturbine)

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	0.007 lb/MMBtu	0.02	0.07	AP-42
PM_{10}	0.007 lb/MMBtu	0.02	0.07	AP-42
SO_x	0.003 lb/MMBtu	0.01	0.03	AP-42
CO	1.10 lb/MWhe	0.22	0.96	Manufacturer's Spec
NO_x	0.40 lb/MWhe	0.08	0.35	Manufacturer's Spec
VOC	0.10 lb/MWhe	0.02	0.09	Manufacturer's Spec
Others: (e.g., HAPs)	-----	-----	-----	-----
Formaldehyde	7.1E-4 lb/MMBtu	0.002	0.01	AP-42

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number TBD

List Source(s) or source ID exhausted to this stack:
Ten (10) microturbines (one stack per microturbine)

% of flow exhausted to stack: 100

Stack height above grade (ft.) TBD
Grade elevation (ft.) TBD

Stack diameter (ft) or Outlet duct area (sq. ft.)
TBD

f. Weather Cap
☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
TBD

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. NA

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume TBD ACFM Temperature TBD °F Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
TBD

Exhauster (attach fan curves) ____________________ in. of water ______________ HP @ ______________RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section F - Flue and Air Contaminant Emissions – Dehydration Unit (Still Vent and Flash Tank) and Enclosed Flare (S015 and CD-001)

1. Estimated Atmospheric Emissions* **Dehydration unit and flare @ 8,760 hrs/yr (combined)**

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	0.007 lb/MMbtu	0.05	0.22	AP-42
PM_{10}	0.007 lb/MMbtu	0.05	0.22	AP-42
SO_x	0.001 lb/MMbtu	0.004	0.02	AP-42
CO	0.08 lb/MMbtu	0.56	2.44	AP-42
NO_x	0.09 lb/MMbtu	0.66	2.90	AP-42
VOC		0.12	0.53	GRI-GLY-Calc
Others: Total HAP		0.06	0.27	GRI-GLY-Calc
Benzene		0.01	0.03	AP-42

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

Estimated atmospheric emissions includes controlled VOC/HAP emissions from Dehydration Unit Flash Tank and Still Vent, as well as combustion related emissions from burning these streams in the flare.

2. Stack and Exhauster

Stack Designation/Number TBD

List Source(s) or source ID exhausted to this stack: Dehydration Unit Still Vent and Flash tank, Enclosed Flare	% of flow exhausted to stack: 100

Stack height above grade (ft.) TBD Grade elevation (ft.) TBD	Stack diameter (ft) or Outlet duct area (sq. ft.) TBD	f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

TBD

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. NA

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume TBD ACFM Temperature TBD °F Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
TBD

Exhauster (attach fan curves) ____________________ in. of water ______________ HP @ ______________RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section F - Flue and Air Contaminant Emissions – Dehydration Unit Reboiler (S016)

1. Estimated Atmospheric Emissions* **Dehydration Reboiler @ 8,760 hrs/yr**

Pollutant	**Maximum emission rate**			**Calculation/ Estimation Method**
	specify units	**lbs/hr**	**tons/yr.**	
PM	7.6 lb/MMscf	0.01	0.02	AP-42
PM_{10}	7.6 lb/MMscf	0.01	0.02	AP-42
SO_x	0.6 lb/MMscf	<0.001	0.002	AP-42
CO	84 lb/MMscf	0.06	0.27	AP-42
NO_x	100 lb/MMscf	0.07	0.32	AP-42
VOC	5.5 lb/MMscf	0.004	0.02	AP-42
Others: Total HAP	(varies)	0.001	0.01	AP-42

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number TBD

List Source(s) or source ID exhausted to this stack: Dehydration Unit Reboiler	% of flow exhausted to stack: 100

Stack height above grade (ft.) TBD Grade elevation (ft.) TBD	Stack diameter (ft) or Outlet duct area (sq. ft.) TBD	f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

TBD

Does stack height meet Good Engineering Practice (GEP)?

Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. NA

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust

Volume TBD ACFM Temperature TBD °F Moisture ____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.

TBD

Exhauster (attach fan curves) ____________ in. of water ____________ HP @ ____________RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section F - Flue and Air Contaminant Emissions – Fuel Gas Heaters (S017-S018)

1. Estimated Atmospheric Emissions* **Fuel Gas Heaters @ 8,760 hrs/yr (each heater)**

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	7.6 lb/MMscf	0.01	0.02	AP-42
PM_{10}	7.6 lb/MMscf	0.01	0.02	AP-42
SO_x	0.6 lb/MMscf	<0.001	0.002	AP-42
CO	84 lb/MMscf	0.06	0.27	AP-42
NO_x	100 lb/MMscf	0.07	0.32	AP-42
VOC	5.5 lb/MMscf	0.004	0.02	AP-42
Others: Total HAP	(varies)			AP-42

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number TBD

List Source(s) or source ID exhausted to this stack: Two (2) fuel gas heaters (one stack per heater)	% of flow exhausted to stack: 100

Stack height above grade (ft.) TBD Grade elevation (ft.) TBD	Stack diameter (ft) or Outlet duct area (sq. ft.) TBD	f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

TBD

Does stack height meet Good Engineering Practice (GEP)?
Yes

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions. NA

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume TBD ACFM Temperature TBD °F Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
TBD

Exhauster (attach fan curves) ____________________ in. of water ______________ HP @ ______________RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section G - Attachments

Number and list all attachments submitted with this application below:

Appendix B:

1. Detailed Emission Calculation Tables
2. GRI-GLYCalc Report
3. EPA TANKS Software Reports (S020-S026)
4. E&P TANK Software Report (S019)
5. Facility-wide gas analysis
6. BAT Cost Analyses

Appendix C:

7. CAT G3616 Engine GERP Sheet (S001 – S002)
8. Oxidation Catalyst Spec Sheet (S001 – S002)
9. Solar Taurus Turbines Spec Sheet and Vendor Product Information Letters (S003 – S004)
10. Capstone C200 Microturbine Vendor Spec Sheet (S005 – S014)
11. Enclosed Flare Spec Sheet (CD-001)

APPENDIX E: GENERAL INFORMATION FORM (GIF)

1300-PM-BIT0001 5/2012
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)

Client ID# ______ **APS ID#** ______
Site ID# ______ **Auth ID#** ______
Facility ID#

DEP USE ONLY
Date Received & General Notes

CLIENT INFORMATION

DEP Client ID#	**Client Type / Code** LLC			
Organization Name or Registered Fictitious Name Equitrans, LP		**Employer ID# (EIN)** 25-0724685	**Dun & Bradstreet ID#**	
Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**
Additional Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**
Mailing Address Line 1 EQT Plaza - 625 Liberty Avenue		**Mailing Address Line 2** Suite 1700		
Address Last Line – City Pittsburgh	**State** PA	**ZIP+4** 15222	**Country** USA	
Client Contact Last Name Sowa	**First Name** Mark	**MI**	**Suffix**	
Client Contact Title Sr. Environmental Coordinator		**Phone** (412) 395-3654	**Ext**	
Email Address msowa@eqt.com		**FAX**		

SITE INFORMATION

DEP Site ID#	**Site Name** Redhook Compressor Station				
EPA ID#	**Estimated Number of Employees to be Present at Site**	0 (unmanned)			
Description of Site A natural gas compression facility					
County Name Greene	**Municipality** Franklin	**City** ☐	**Boro** ☐	**Twp** ☒	**State** PA
Site Location Line 1 Braden Run Road		**Site Location Line 2**			
Site Location Last Line – City Waynesburg		**State** PA	**ZIP+4** 15370		
Detailed Written Directions to Site From Waterfront Drive, PA, use PA-28S to get to I-279 S and then I-376 W. Use Exit 64A to head south onto I-79 S. Take Exit 14 to travel west on US-21 W. Turn right onto Elm Drive (T796), and make another right onto Jefferson Road. Turn left onto Braden Run Road; the station will be on your right.					
Site Contact Last Name Sowa	**First Name** Mark	**MI**	**Suffix**		
Site Contact Title Sr. Environmental Coordinator		**Site Contact Firm** EQT			
Mailing Address Line 1 EQT Plaza - 625 Libery Avenue		**Mailing Address Line 2** Suite 1700			
Mailing Address Last Line – City Pittsburgh		**State** PA	**ZIP+4** 15222		

Phone	Ext	FAX	Email Address
(412) 395-3654			msowa@eqt.com

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
486210

Client to Site Relationship
Owner/Operator

FACILITY INFORMATION

Modification of Existing Facility

		Yes	No
1.	**Will this project modify an existing facility, system, or activity?**	☐	☒
2.	**Will this project involve an addition to an existing facility, system, or activity?**	☐	☒

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☐	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	MineDrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☐	Water Pollution Control Facility	
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	39	54	59.39	-80	7	44.40

Horizontal Accuracy Measure Feet *--or--* Meters

Horizontal Reference Datum Code
☐ North American Datum of 1927
☐ North American Datum of 1983
☒ World Geodetic System of 1984

Horizontal Collection Method Code

Reference Point Code

Altitude Feet 1054 *--or--* Meters

Altitude Datum Name
☐ The National Geodetic Vertical Datum of 1929
☐ The North American Vertical Datum of 1988 (NAVD88)

Altitude (Vertical) Location Datum Collection Method Code

Geometric Type Code

Data Collection Date

Source Map Scale Number Inch(es) = Feet
--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
Redhook Compressor Station

Project Description
Equitrans, LP plans to construct a new natural gas compression facility consisting of Two (2) 5,350 hp CAT G3616 engines equipped with oxidation catalysts; Two (2) 11,311 hp Solar Taurus 70 turbines, One (1) triethylene glycol (TEG) dehydration unit (50 MMscfd) with associated flash tank, natural gas fired reboiler (0.77 MMbtu/hr heat input) and enclosed flare (7.0 MMbtu/hr); Ten (10) microturbine generators (200 kW, each); Two (2) natural gas fired fuel heaters (0.77 MMBtu/hr heat input); One (1) produced fluid storage tank (8,820 gallons); Seven (7) miscellaneous storage tanks (each 4,200 gallons or less); and piping and associated fugitive components.

Project Consultant Last Name	First Name	MI	Suffix
Muscenti	Tom		

Project Consultant Title	Consulting Firm
Principal Consultant	Trinity Consultants

Mailing Address Line 1			Mailing Address Line 2	
4500 Brooktree Rd.			Suite 103	
Address Last Line – City			**State**	**ZIP+4**
Wexford			PA	15090
Phone	**Ext**	**FAX**	**Email Address**	
(724) 935-2611	1		tmuscenti@trinityconsultants.com	

Time Schedules	Project Milestone (Optional)
Upon Approval	Proposed start of construction

1. **Have you informed the surrounding community and addressed any concerns prior to submitting the application to the Department?** ☒ Yes ☐ No
2. **Is your project funded by state or federal grants?** ☐ Yes ☒ No

   Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.
   Aspect of Project Related to Grant
   Grant Source: __________
   Grant Contact Person: __________
   Grant Expiration Date: __________
3. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☒ Yes ☐ No

   Note: If "No" to Question 3, the application is not subject to the Land Use Policy.
   If "Yes" to Question 3, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☒ Yes ☐ No
2. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☒ Yes ☐ No
3. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☒ Yes ☐ No

   Note: If the Applicant answers "No" to either Questions 1, 2 or 3, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below.
   If the Applicant answers "Yes" to questions 1, 2 and 3, the Applicant should respond to questions 4 and 5 below.
4. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☒ Yes ☐ No

   Note: EQT will ensure that the proposed project meets all applicable zoning requirements.
5. **Have you attached Municipal and County Land Use Letters for the project?** ☐ Yes ☒ No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☐	Yes	☒	No

3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐	Yes	☐	No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐	Yes	☐	No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐	Yes	☐	No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage. **4.0.1 Total Disturbed Acreage** ~15 acres	☒	Yes	☐	No
5.0	**Does the project involve any of the following?** If "Yes", respond to 5.1-5.3. If "No", skip to Question 6.0.	☐	Yes	☒	No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☐	Yes	☐	No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☐	Yes	☐	No
5.3	**Floodplain Projects by the commonwealth, a Political Subdivision of the commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐	Yes	☐	No
6.0	**Will the project involve discharge of stormwater or wastewater from an industrial activity to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☐	Yes	☒	No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☐	Yes	☒	No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. **8.0.1 Estimated Proposed Flow (gal/day)**	☐	Yes	☒	No
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☐	Yes	☒	No
	9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐	Yes	☐	No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). **10.0.1 Gallons Per Year (residential septage)** **10.0.2 Dry Tons Per Year (biosolids)**	☐	Yes	☒	No
11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. **11.0.1 Dam Name**	☐	Yes	☒	No
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. **12.0.1 Dam Name**	☐	Yes	☒	No

13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** If "Yes", identify each type of emission followed by the amount of that emission. 13.0.1 **Enter all types & amounts of emissions; separate each set with semicolons.** See attached emission calculations	☒	Yes	☐	No
14.0	**Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes", check all proposed sub-facilities. 14.0.1 **Number of Persons Served** ____ 14.0.2 **Number of Employee/Guests** ____ 14.0.3 **Number of Connections** ____	☐	Yes	☒	No
	14.0.4 **Sub-Fac: Distribution System**	☐	Yes	☐	No
	14.0.5 **Sub-Fac: Water Treatment Plant**	☐	Yes	☐	No
	14.0.6 **Sub-Fac: Source**	☐	Yes	☐	No
	14.0.7 **Sub-Fac: Pump Station**	☐	Yes	☐	No
	14.0.8 **Sub Fac: Transmission Main**	☐	Yes	☐	No
	14.0.9 **Sub-Fac: Storage Facility**	☐	Yes	☐	No
15.0	**Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?**	☐	Yes	☒	No
16.0	**Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. 16.0.1 **Supplier's Name** ____	☐	Yes	☒	No
	16.0.2 **Letter of Approval from Supplier is Attached**	☐	Yes	☐	No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body?** If "Yes", should reference both Water Supply and Watershed Management. 17.0.1 **Stream Name**	☐	Yes	☒	No
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. 18.0.1 **Type & Amount**	☐	Yes	☒	No
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?**	☐	Yes	☒	No
20.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. 20.0.1 **Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. 21.0.1 **Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. 22.0.1 **Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No

23.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☒	Yes	☐	No
	23.0.1 Enter all substances & capacity of each; separate each set with semicolons. See Attached Emission Calculations for storage tank capacities and contents				
24.0	**Will the intended activity involve the use of a radiation source?**	☐	Yes	☒	No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name Diana Charletta

Diana M. Charletta
Signature

Sr. Vice President - Midstream Operations
Title

10/21/15
Date

APPENDIX F: COMPLIANCE REVIEW FORM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☐ Original Filing
☒ Amended Filing

Date of Last Compliance Review Form Filing:
October 2015

Type of Submittal

☒ New Plan Approval
☐ New Operating Permit
☐ Renewal of Operating Permit
☐ Extension of Plan Approval
☐ Change of Ownership
☐ Periodic Submission (@ 6 mos)
☐ Other: ______________________

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)
Equitrans, LP – Redhook Compressor Station

Address 625 Liberty Avenue, Suite 1700
Pittsburgh, PA 15222

Telephone 412-395-3000 **Taxpayer ID#** 25-1776875

Permit, Plan Approval or Application ID#

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual
☐ Syndicate
☐ Government Agency
☐ Municipality
☐ Municipal Authority
☐ Joint Venture
☐ Proprietorship
☐ Fictitious Name
☐ Association
☐ Public Corporation
☐ Partnership
☐ Other Type of Business, specify below:
☐ Private Corporation
☒ Limited Partnership

Describe below the type(s) of business activities performed.
The facility is a natural gas gathering facility.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
Equitrans, LP	PA	PA	25-1776875	Applicant
EQT Corporation	PA	PA	25-0464690	Parent
EQM Gathering Holdings, LLC	PA	DE	46-3895163	Subsidiary
EQM Gathering Opco, LLC	PA	DE	32-0422322	Subsidiary
EQT Gathering LLC	PA	DE	20-2752042	Subsidiary
EQT Production Co	PA	PA	25-0724685	Subsidiary
Allegheny Valley Connector, LLC	PA	DE	61-1707596	Subsidiary

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
EQT Corporation and all subsidiaries	625 Liberty Avenue Pittsburgh, PA 15222	Allegheny County, City of Pittsburgh	412-395-3000	Parent

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Jack Mackin, Director of PA Operations	EQT, 317 E Roy Furman Highway, Waynesburg PA 15370
Frank Blawas, Asst. Superintendent of Operations – Northern District	EQT, 13251 State Route 422, Kitanning, PA 16201
Jeff Spencer, Asst. Superintendent of Operations – Southern District	EQT, 317 E Roy Furman Highway, Waynesburg PA 15370
Zach Kinser, Asst. Superintendent of Operations – Eastern District	EQT, 317 E Roy Furman Highway, Waynesburg PA 15370
Bryan Cikowski, Asst Superintendent of Operations – Northern District	EQT, 13251 State Route 422, Kittanning, PA 16201

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
See Next Page				

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
12/2/2014	Pratt Compressor Station	TV-30-00110	Permit limit exceedance	Consent Assessment and Civil Penalty	1/17/2015	$20,000
2/5/2015	Rager Mtn/Laurel Ridge Station	11-00356	Permit exceedance	Consent Assessment and Civil Penalty	2/5/2015	$10,000
						$
						$
						$
						$
						$
						$
						$
						$

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
10/10/2011	Hartson CS	63-00642	VOC exceeded limit	Richer fuel is cause; planning to install fuel conditioner
9/6/2011	Hartson CS	63-00642	VOC exceeded limit	Richer fuel is cause; planning to install fuel conditioner
12/9/2010	Hartson CS	63-00642	VOC exceeded limit	Richer fuel is cause; planning to install fuel conditioner
9/29/2010	Hartson CS	63-00642	VOC exceeded limit	Richer fuel is cause; planning to install fuel conditioner
10/5/2011	Pratt CS	30-00110A	Unit #5 exceeded VOC limit	Richer fuel is cause; planning to install fuel conditioner
4/13/2011	Pratt CS	30-00110A	Unit #1 exceeded VOC limit	Richer fuel is cause; planning to install fuel conditioner
2/23/2011	Pratt CS	30-00110A	Unit #1 exceeded VOC limit	Repaired damaged air intake filter
2/2/2011	Pratt CS	30-00110A	Unit #5 exceeded VOC limit	Unit passed subsequent test; richer fuel is cause
12/8/2010	Pratt CS	30-00110A	Unit #5 exceeded VOC limit	Richer fuel is cause; planning to install fuel conditioner
11/2010 – 12/2010	Pratt CS	30-00110A	Unit #4 Hours of Operation Exceedance	Revision of operating limits
11/18/2011 – 12/15/2011	Jupiter CS	30-00183B	Section B, Condition #4	12/15/2011
11/18/2011 – 12/15/2011	Jupiter CS	30-00183B	Section B, Condition #13	12/15/2011
12/27/12	Pratt CS	30-00110	Engine #3 exceeded formaldehyde limit	11/10/2014
12/20/12	Pratt CS	30-00110	Engine #4 exceeded formaldehyde limit	11/10/2014
12/20/12	Pratt CS	30-00110	Engine #5 exceeded formaldehyde limit	11/10/2014
12/20/12	Pratt CS	30-00110	Engine #5 exceeded VOC limit	Revised emission inventory on 8/22/2013
5/2/13	Pratt CS	30-00110	Engines #1-#5 exceeded formaldehyde limit	11/10/2014

5/8/2013	Hartson		Stack testing not performed at full loading	The stack testing was not performed at full loading due to loading restrictions and design problems with the CleanBurn retrofits. Equitrans believes the issue has now been corrected and has subsequently scheduled a retest for 2/26/2014.
12/2013	Hartson		Second portable analyzer not performed	The second quarterly portable analyzer test was not performed due to loading restrictions in design problems with the CleanBurn retrofits. Equitrans believes the issue has now been corrected and has subsequently scheduled a stack retest for 2/26/2014. A portable analyzer test will be conducted later in the year.
11/26-12/4/14 12/8-12/10/14 12/12 12/16 12/24-12/30/14	Applegate	IP-0856-I001 (ACHD)	The minimum exhaust temperature was not maintained at 1400 degree F or greater	Instances occurred during these days where the flare exhaust temperature was recorded as being below 1400 F. The flare is equipped with a temperature probe that is electronically monitored. Should the temperature probe reading indicate a reading below 1450 F, an alarm is sent to gas control who immediately dispatches an operator to assess the situation. The lower readings are believed to be the result of a malfunctioning temperature probe. The supplier has been subsequently out to fix the probe and EQT believes this issue has been mitigated.
11-19-2014	Rager Mtn./Laurel Ridge	11-00356	Exceeded operational hours limitation (Section D, Condition 005).	2-5-2015
9-4-2014	Truitsburg	16-00124	Late Stack Test Report > 30 days after test	Test conducted 8/5/14 report submitted 10/6/14
12-31-2014	Truitsburg	16-00124	Semi-annual natural gas sampling	Only 1 sample collected in 2014 (3-19-14). None in 2nd half 2014

<u>CONTINUING OBLIGATION</u>. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT

Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.

Diana M Charletta | 10/21/15

Signature | Date

Diana Charletta

Name (Print or Type)

Senior Vice President Midstream Operations

Title

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date	Notes
Amity	GP5-63-00949	Washington County	8/13/2009	8/13/2014	Permit exemption determination 8/6/14
Applegate	IP-0856-I001	Allegheny County	3/28/2013		
Benezette	GP5-24-129B	Elk County	8/31/2010	8/31/2015	Renewal application submitted 7/30/15
Browns Creek	GP5-30-00172B	Greene County	2/24/2010	2/24/2015	Renewal application submitted 1/23/15, aggregated w/Calsito PA-30-00194B 3/24/15
Bass	GP5-10-384A	Butler County	10/1/2013	9/30/2018	
Callisto	PA-30-00194A	Greene County	3/29/2011		Extended to 1/14/2016
Callisto	PA-30-00194B	Greene County	3/24/2014	8/24/2015	Extended to 9/24/15. Modified 3/24/15 to aggregate Browns Creek.
Derry	GP5-65-01028	Westmoreland County	7/3/2013	7/3/2018	
Ginger Hill	GP1-63-00971	Washington County	6/14/2012	6/14/2017	
Gobbler	GP5-17-516	Clearfield County	4/26/2012	4/26/2017	
Halo	GP-5-30-00220	Greene County	7/31/2013	7/31/2018	
Hartson	TV-63-00642	Washington County	6/30/2014	6/30/2019	
Hartson	63-00642A	Washington County	5/2/2012	4/18/2014	
IO	GP5-30-00231	Greene County	1/16/2015	1/16/2020	
Jefferson	PA-30-00195	Greene County	10/17/2011	6/28/2014	Extended to 12/28/15 Operating permit application submitted 4/8/13.
Jefferson	PA-30-00195A	Greene County	2/26/2014	2/26/2015	Extended to 10/1/15
Jupiter	OP-30-00183	Greene County	7/30/2013	7/30/2018	
Jupiter	PA-30-000183C	Greene County	2/6/2014	8/6/2015	Plan Approval for station expansion. Extended to 11/30/15
Minnow	GP5-63-00991	Washington County	3/10/2015	3/10/2020	
Mt. Morris	OP-30-00112	Greene County	8/31/2005	8/31/2010	Renewal submitted 2/24/10
Penn View	OP-32-00316	Indiana County	2/10/2005	2/10/2010	Renewal submitted 8/12/09
Pipers Ridge	GP5-30-00203A	Greene County	2/4/2015	2/4/2020	
Pratt Station	PA-30-00110	Greene County	10/20/2011	10/20/2016	
Rogersville	OP-30-00109	Greene County	4/1/2008	4/1/2013	Renewal application submitted 9/27/12
Tepe Bunola	IP-0862-I001	Allegheny County	3/28/2013		
Terra	GP5-03-00255A	Armstrong County	9/13/2013	9/13/2018	
Tioga	59-00025A	Tioga County	8/5/2014	9/29/2014	
Tioga	59-00025B	Tioga County	3/22/2013	9/21/2014	
Tioga	NMOP 59-00025	Tioga County	8/5/2014	8/4/2019	
Tyler	GP5-17-18A	Clearfield County	9/3/2010	9/3/2015	Renewal application submitted 7/30/15
Whippoorwill	GP5-12-062	Cameron County	7/25/2013	7/25/2018	
Rager Mountain/Laurel Ridge	TVOP 11-00356	Cambria County	1/14/2003	1/14/2008	Renewal application submitted 5/10/06
Rager Mountain/Laurel Ridge	PA-11-00356C	Cambria County	4/22/2014	10/26/2014	Extended to 10/26/15
Truittsburg	TVOP 16-00124	Clarion County	1/31/2013	1/31/2018	Title V mod 2/27/14
Truittsburg	PA 16-00124B	Clarion County	12/22/2011	12/30/2013	
Waynesburg	OP-30-000106	Greene County	6/7/2006	6/7/2011	Renewal submitted 1/3/11.
West Fairfield	OP-65-00946	Westmoreland County	8/30/2007	8/30/2012	Renewal submitted 11/28/11

APPENDIX G: COUNTY & MUNICIPAL NOTIFICATIONS

EQT Plaza
625 Liberty Avenue, Suite 1700
Pittsburgh PA 15222
www.eqt.com

TEL: (412) 395-3654

Mark A. Sowa
Sr. Environmental Coordinator

CERTIFIED MAIL # 7015 0640 0000 9694 3499

October 21, 2015

Franklin Township Board of Supervisors
Franklin Township Municipal Building
568 Rolling Meadows Road
Waynesburg, PA 15370

Re: Notification of Plan Approval Permit Application – Redhook Compressor Station

Dear Township Supervisors:

Equitrans, LP (EQT) is providing this notification to the township regarding EQT's request to obtain a Plan Approval Permit from the Pennsylvania Department of Environmental Protection's (DEP) Air Quality Program to construct a new natural gas compressor station located in Franklin Township, Greene County, PA (Redhook Compressor Station).

The permit application is to allow the construction and temporary operation of the following equipment:

- Two (2) 5,350 hp CAT G3616 engines equipped with oxidation catalysts for emissions control;
- Two (2) 11,311 hp Solar Taurus -70 turbines equipped with SoLoNO$_x$™ technology for emissions control;
- One (1) triethylene glycol (TEG) dehydration unit (50 MMscfd) with associated flash tank, natural gas fired reboiler (0.77 MMbtu/hr heat input) and enclosed ground flare (7.0 MMbtu/hr);
- Ten (10) microturbine generators (200 kW, each);
- Two (2) natural gas fired fuel heaters (0.77 MMBtu/hr heat input, each);
- One (1) produced fluids storage tanks (8,820 gallons); and
- Seven (7) miscellaneous storage tanks (each 4,200 gallons or less).

Pennsylvania Code Title 25 (Environmental Protection – Air Resources) Section 127.413 requires municipal notification including a 30-day comment period regarding the permit application, which begins upon receipt of this formal notification. During this comment period, DEP will accept such comments. Comments are to be sent to:

Air Quality Program
PADEP – Southwest Regional Office
400 Waterfront Dr.
Pittsburgh, PA 15222

Should you have any questions pertaining to this matter, please contact me at (412) 395-3654 or msowa@eqt.com.

Sincerely,

Mark A. Sowa
Sr. Environmental Coordinator
EQT Corporation

EQT Plaza
625 Liberty Avenue, Suite 1700
Pittsburgh PA 15222
www.eqt.com

TEL: (412) 395-3654

Mark A. Sowa
Sr. Environmental Coordinator

EQT

CERTIFIED MAIL # 7015 0640 0000 9694 3505

October 21, 2015

Greene County Board of Commissioners
Greene County Office Building, 3rd Floor
93 E. High Street
Waynesburg, PA 15370

Re: Notification of Plan Approval Permit Application – Redhook Compressor Station

Dear County Commissioners:

Equitrans, LP (EQT) is providing this notification to the County regarding EQT's request to obtain a Plan Approval Permit from the Pennsylvania Department of Environmental Protection's (DEP) Air Quality Program to construct a new natural gas compressor station located in Franklin Township, Greene County, PA (Redhook Compressor Station).

The permit application is to allow the construction and temporary operation of the following equipment:

- Two (2) 5,350 hp CAT G3616 engines equipped with oxidation catalysts for emissions control;
- Two (2) 11,311 hp Solar Taurus-70 turbines equipped with SoLoNO$_x$™ technology for emissions control;
- One (1) triethylene glycol (TEG) dehydration unit (50 MMscfd) with associated flash tank, natural gas fired reboiler (0.77 MMbtu/hr heat input) and enclosed flare (7.0 MMbtu/hr);
- Ten (10) microturbine generators (200 kW, each);
- Two (2) natural gas fired fuel heaters (0.77 MMBtu/hr heat input, each);
- One (1) produced fluids storage tank (8,820 gallons); and
- Seven (7) miscellaneous storage tanks (each 4,200 gallons or less).

Pennsylvania Code Title 25 (Environmental Protection – Air Resources) Section 127.413 requires municipal notification including a 30-day comment period regarding the permit application, which begins upon receipt of this formal notification. During this comment period, DEP will accept such comments. Comments are to be sent to:

Air Quality Program
PADEP – Southwest Regional Office
400 Waterfront Dr.
Pittsburgh, PA 15222

Should you have any questions pertaining to this matter, please contact me at (412) 395-3654 or msowa@eqt.com.

Sincerely,

Mark A. Sowa

Mark A. Sowa
Sr. Environmental Coordinator
EQT Corporation

APPENDIX H: APPLICATION FEE

EQUITRANS
An EQUITABLE RESOURCES Company
P.O. Box 23365
Pittsburgh, PA 15212-6365

COMMONWEALTH OF PA - CLEAN AIR FUND
DEPARTMENT OF ENVIRONMENTAL PROTECT
AIR QUALITY PROGRAM
SOUTHWEST REGIONAL OFFICE
400 WATERFRONT DRIVE
PITTSBURGH, PA 15222-4739

3737 0176
PAGE: 1

PAYMENT SUMMARY

VENDOR NO: 154505
CHECK NO: 0000149947
CHECK DATE: 08/10/15

REF. DOC.	REFERENCE NUMBER	REF. DATE	DOCUMENT AMOUNT	DISCOUNT/ADJ AMOUNT	NET AMOUNT
SELLER INVCE	CKRQST080515EY94 04539612 M.SOWA - REDHOOK COMP STN	08/05/15	1,700.00	0.00	1,700.00
		TOTALS:	1,700.00	0.00	1,700.00

(Detach Here)

EQUITRANS
An EQUITABLE RESOURCES Company
P.O. Box 23365
Pittsburgh, PA 15212-6365

60-160/433

CHECK DATE: 08/10/2015
CHECK NUMBER: 0000149947

PAY...ONE THOUSAND SEVEN HUNDRED DOLLARS 00 CENTS

$*****1,700.00

TO THE ORDER OF:
COMMONWEALTH OF PA - CLEAN AIR FUND
DEPARTMENT OF ENVIRONMENTAL PROTECT
AIR QUALITY PROGRAM
SOUTHWEST REGIONAL OFFICE
400 WATERFRONT DRIVE
PITTSBURGH, PA 15222-4739

THE BANK OF NEW YORK MELLON
PITTSBURGH, PENNSYLVANIA

⑈0000149947⑈ ⑆043301601⑆ 199⑉8984⑈

Equitrans Expansion Project

Docket No. CP16- -000

Resource Report 9

Appendix 9-E
Redhook Compressor Station Air Quality Modeling Report

FEDERAL ENERGY REGULATORY COMMISSION AIR QUALITY MODELING REPORT

Redhook Compressor Station

Where energy meets innovation.

Prepared By:

TRINITY CONSULTANTS

October 2015

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

Equitrans, LP (Equitrans), a subsidiary of EQT Corporation (EQT), is seeking authorization from the Federal Energy Regulatory Commission (FERC) pursuant to Section 7(c) of the Natural Gas Act (NGA) to construct and operate a new natural gas compressor station in Greene County, Pennsylvania (the Redhook Compressor Station).

The Project will include the installation of the following combustion equipment at the Redhook Compressor Station:

- Two (2) Caterpillar G3616 natural gas compressor engines, each rated at 5,350 hp and equipped with oxidation catalysts;
- Two (2) Solar Taurus-70 natural gas-fired turbines, each rated at 11,311 horsepower (hp);
- One (1) triethylene glycol dehydration unit rated at 50 million standard cubic feet per day (MMSCFD) equipped with associated reboiler (heat input rated at 0.77 million British thermal units per hour [MMBtu/hr]) and enclosed flare (rated at 7.00 MMBtu/hr);
- Ten (10) Capstone C200 microturbines, each rated at 200 kW; and
- Two (2) natural gas-fired fuel gas heaters each rated at 0.77 MMBtu/hr. [1]

This modeling report outlines the methodologies used to conduct the air dispersion modeling analysis required by the FERC for the project. Air dispersion modeling is utilized as a tool to demonstrate that the project complies with the National Ambient Air Quality Standards (NAAQS).

The remainder of this modeling report is organized as follows:

- Section 2: Modeling Procedures;
- Section 3: Modeling Methodology ; and
- Section 4: Modeling Results.

Equitrans has included, as Attachment B to this modeling report, a CD containing all the files associated with the FERC air dispersion modeling analysis of the Project. This CD includes those files associated with importing terrain elevations, analyzing building downwash, meteorological data, and AERMOD.

1.1. FACILITY BACKGROUND

The Redhook Compressor Station will be located in Franklin Township, Greene County, Pennsylvania at approximately 574.4 kilometers (km) east and 4,418.8 km north, Universal Transverse Mercator (UTM) Zone 17. Figure 1-1 provides an area map which shows the location of the facility relative to surrounding terrain and other features, such as roads and rivers.

[1] The station will also include one (1) 210 barrel (bbl) storage tank for produced fluids and seven (7) miscellaneous storage tanks. The tanks are insignificant emissions sources and were not included in the model.

Figure 1-1. Area Map

2.1. NAAQS ANALYSIS

Air quality dispersion modeling was conducted to evaluate the cumulative impact with regard to the NAAQS at the Redhook Compressor Station. Modeling was conducted for particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead (Pb). The NAAQS evaluated in this modeling analysis are presented in Table 2-1.

Table 2-1. Primary and Secondary NAAQS

Pollutant	Averaging Period	Primary NAAQS (µg/m^3)	Secondary NAAQS (µg/m^3)	Form of Standard
PM_{10}	24-hour	150	150	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$	24-hour	35	35	3-year average of the 98th percentile 24-hour average concentrations
	Annual	12.0	15.0	3-year average of the annual arithmetic mean
SO_2	1-hour	196 (75 ppb)	--	3-year average of the 99th percentile of daily maximum 1-hour concentrations
	3-hour	--	1,300 (500 ppb)	Not to be exceeded more than once per year
	24-hour	365 (140 ppb)[A]	--	Not to be exceeded more than once per year
	Annual	80 (30 ppb)[A]	--	Annual arithmetic mean
NO_2	1-hour	188 (100 ppb)	--	3-year average of the 98th percentile of daily maximum 1-hour concentrations
	Annual	100 (53 ppb)	100 (53 ppb)	Annual arithmetic mean
CO	1-hour	40,000 (35 ppm)	--	Not to be exceeded more than once per year
	8-hour	10,000 (9 ppm)	--	Not to be exceeded more than once per year
Pb	3-month[B]	0.15	0.15	Maximum arithmetic mean

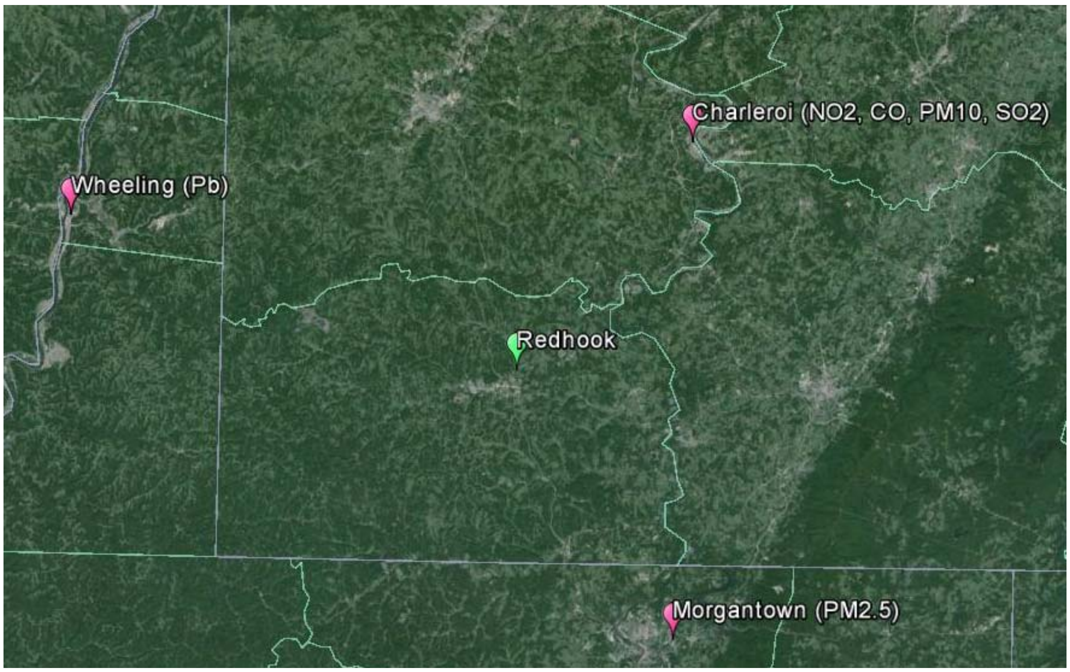
[A] The annual and 24-hour SO_2 standards will be revoked one year after the effective date in areas with a designated status of the revised SO_2 NAAQS, per 40 CFR §50.4(e).
[B] The lead NAAQS is evaluated as a rolling 3-month average concentration.

2.2. BACKGROUND AIR QUALITY

In evaluating cumulative impacts with respect to the NAAQS, maximum modeled impacts were added to representative ambient background concentrations and compared to the applicable NAAQS. Selection of the existing monitoring station data that is "representative" of the ambient air quality in the area surrounding the Redhook Compressor Station is determined based on the following three criteria: 1) monitor location, 2) data quality, and 3) data currentness. Key considerations based on the monitor location criteria include proximity to the significant impact area of the facility, similarity of emission sources impacting the monitor to the emission sources impacting the airshed surrounding the Redhook Compressor Station, and the similarity of the land use and land cover (LULC) surrounding the monitor and facility. The data quality criteria refers to the monitor being an approved state and local air monitoring station (SLAM) or similar monitor type subject to the quality assurance requirements in 40 CFR Part 58 Appendix A. Data currentness refers to the fact that the most recent three complete years of quality assured data are generally preferred.

Figure 2-1 presents the location of the closest, most representative monitor locations which are proposed for use in the NAAQS analysis.

Figure 2-1. Background Monitor Locations



As is discussed in more detail, Equitrans selected monitors with the most currently available data (2012-2014), that are within the region, and that have reasonably similar topographic settings. The selected monitors are generally in more populated or industrialized areas than the Redhook Compressor Station and thus represent conservative estimates of ambient background.

With regard to NO_2, CO, and PM_{10} monitoring data, Equitrans used a representative ambient monitor, AQS# 42-125-0005, located at the Charleroi Waste Treatment Plant in Washington County, Pennsylvania. The Charleroi Waste Treatment Plant is the closest monitoring site for these pollutants [approximately 32 km northeast of the facility] that has high data counts for the most recent three years (2012-2014). The Charleroi Waste Treatment Plant is also located in a much more populated, and industrial, area than the Redhook Compressor Station and thus provides conservative estimates of ambient background concentrations.

For SO_2, the Charleroi Waste Treatment Plant monitoring data was also used. While this monitoring site is not the closest SO_2 monitor to the station, the closest monitor, Holbrook, has incomplete SO_2 data for 2012. In addition, the Charleroi data provides a conservative estimate of background concentrations due to its more populated and industrial setting.

For $PM_{2.5}$, Equitrans used a representative ambient monitor, AQS# 54-061-0003, located at Morgantown Airport in Monongalia, West Virginia. The airport is approximately equidistant to other available monitoring sites from the Redhook Compressor Station (approximately 35 km southeast of the facility). However, it has more similar LULC to the station than the other monitoring sites. The airport is also located in a much more populated area than the Redhook Compressor Station, thus the monitor provides conservative estimates of ambient background concentrations.

For lead, Equitrans used a monitor located at the Warwood Water Plant in Wheeling, West Virginia. While the Morgantown US Airport monitor is closer than the Wheeling site, the Wheeling site has more current data. Furthermore, the monitor is located in a more populated area than the Redhook Compressor Station, thus providing a conservative estimate of background concentration.

Table 2-2 presents a list of the selected monitor locations and measured pollutants.

Table 2-2. Selected Background Monitors

Site ID	Address	County	State	Pollutant Monitored
42-125-0005	Charleroi Waste Treatment Plant, Charleroi, PA	Washington	PA	NO_2, CO, PM_{10}. SO_2
54-069-0010	Warwood Water Plant, Wheeling, WV	Ohio	WV	Pb
54-061-0003	Morgantown US Airport, Morgantown, WV	Monongalia	WV	$PM_{2.5}$

Based on available, validated data, Equitrans proposes to utilize the ambient background concentrations shown in Table 2-3 in the modeling analyses.

Table 2-3. Selected Background Concentrations

Pollutant	Averaging Period	2012-2014 Monitor Background Concentration (μg/m^3)	Metric	Monitor Location
PM_{10}	24-hour	34.0	3-year maximum Highest-second-high (H2H)	Charleroi Waste Treatment Plant
$PM_{2.5}$	24-hour	18.0	3-year average of 98th percentile	Morgantown US Airport
	Annual	8.8	3-year average	
SO_2	1-hour	67.2	3-year average of 99th percentile	Charleroi Waste Treatment Plant
	3-hour	69.7	H2H (2014)	
	24-hour	23.6	H2H (2013)	
	Annual	8.5	Annual Average (2013)	
NO_2	1-hour	68.4	3-year average of 98th percentile	Charleroi Waste Treatment Plant
	Annual	16.1	Annual Average (2014)	
CO	1-hour	2,864.0	H2H (2014)	Charleroi Waste Treatment Plant
	8-hour	1,718.4	H2H (2012)	
Pb	3-month	0.04	Highest Month (2012)	Wheeling Warwood Water Plant

This section of the modeling report describes the procedures and data resources utilized in the air dispersion modeling analyses.

3.1. DISPERSION MODEL SELECTION AND BUILDING DOWNWASH ANALYSIS

Dispersion models predict ambient pollutant concentrations by simulating the evolution of the pollutant plume over time and space given data inputs including the quantity of emissions, stack exhaust parameters (e.g., velocity, flowrate, and temperature) and weather data. Building structures that obstruct wind flow near emission points may cause stack discharges to become caught in the turbulent wakes of these structures leading to downwash of the plumes. Wind blowing around a building creates zones of turbulence that are greater than if the building were absent. These effects generally cause higher ground-level pollutant concentrations since building downwash inhibits dispersion from elevated stack discharges. For this reason, building downwash algorithms are considered an integral component of the selected air dispersion model.

Version 15181 of the AERMOD model was used to estimate maximum ground-level concentrations in the air pollutant analyses conducted. AERMOD is a refined, steady-state, multiple source dispersion model that was promulgated in December 2005 as the Environmental Protection Agency (EPA)-preferred model to use for industrial sources in this type of air dispersion modeling analysis.[2] The AERMOD modeling was performed using regulatory default options except as otherwise noted in this report. The AERMOD model has the Plume Rise Modeling Enhancements (PRIME) incorporated in the regulatory version, so the direction-specific building downwash dimensions used as input were determined by the Building Profile Input Program, PRIME version (BPIP PRIME), version 04274.[3] BPIP PRIME is designed to incorporate the concepts and procedures expressed in the Good Engineering Practice (GEP) Technical Support document, the Building Downwash Guidance document, and other related documents,[4] while incorporating the PRIME enhancements to improve prediction of ambient impacts in building cavities and wake regions. Table 3-1 summarizes the model control options that were utilized in this analysis.

[2] 40 CFR 51, Appendix W–*Guideline on Air Quality Models*, Appendix A.1– AMS/EPA Regulatory Model (AERMOD).
[3] Earth Tech, Inc., *Addendum to the ISC3 User's Guide, The PRIME Plume Rise and Building Downwash Model*, Concord, MA.
[4] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised)*, Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.

Table 3-1. Model Selection Options

Control Option	Option Selected	Justification
Pollutant ID	CO, NO_2, PM_{10}, $PM_{2.5}$, SO_2, Other (for lead)	--
Terrain	Elevated, Meters	The receptor grid covers varying terrain elevations; as such, the elevated option was selected.
Flagpole Receptors	N/A	--
Run or Not	Run	--
Averaging Times	1-hour, 3-hour, 8-hour, 24-hour, month, and annual	Equitrans selected the appropriate averaging periods for each pollutant.
Model	PRIME	The PRIME algorithms are default.
Dispersion	Concentration, Rural, Regulatory Default Option	This modeling analysis is assessing compliance with concentration standards. Redhook is located in a predominantly rural area. The regulatory default option was selected.
NO_2 Model Options	N/A	Equitrans utilized the Tier 2 model options for NO_2 modeling. ARM assumes 80% and 75% of modeled concentrations of NO_x are NO_2 for a 1-hour and an annual average basis, respectively.
Particulate Model Options	N/A	Equitrans did not utilize particle deposition or depletion options for particulate modeling.
Output Files	.aml	Model output file from Breeze User Interface (contained in zip files [.amz])

3.2. METEOROLOGICAL DATA

Site-specific dispersion models require a sequential hourly record of dispersion meteorology representative of the region within which the source is located. In the absence of site-specific measurements, readily available data from the closest and most representative National Weather Service (NWS) station are commonly used. Regulatory air dispersion modeling using AERMOD requires five years of quality-assured meteorological data that includes hourly records of the following parameters:

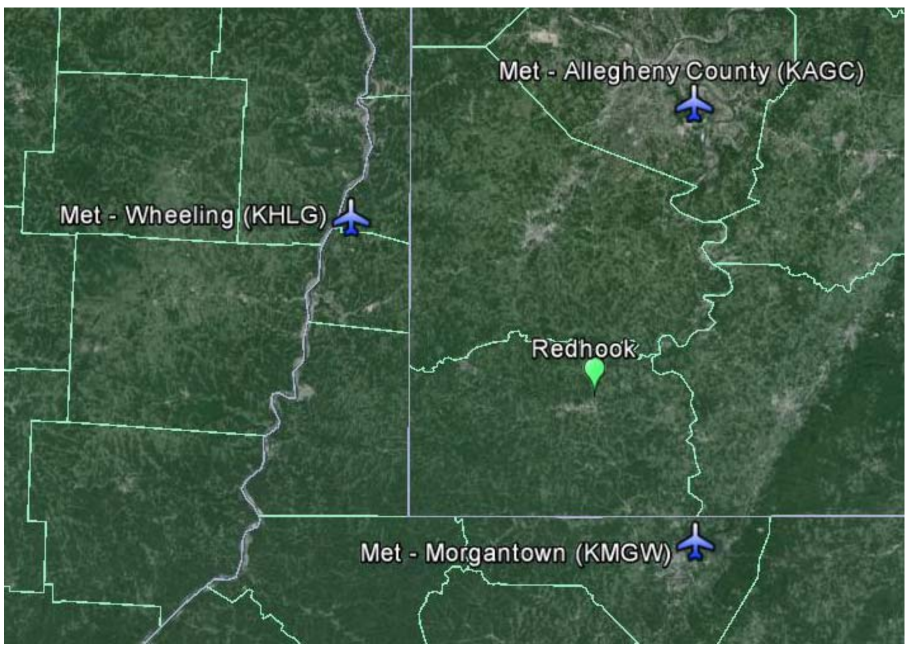
- Wind speed;
- Wind direction;
- Air temperature;
- Micrometeorological parameters (e.g., friction velocity, Monin-Obukhov length);
- Mechanical mixing height; and
- Convective mixing height.

The first three of these parameters are directly measured by monitoring equipment located at typical surface observation stations. The friction velocity, Monin-Obukhov length, and mixing heights are derived from characteristic micrometeorological parameters and from observed and correlated values of cloud cover, solar insulation, time of day and year, and latitude of the surface observation station. Surface observation stations form a relatively dense network, are almost always found at airports, and are typically operated by the NWS. Upper air stations are fewer in number than surface observing points since the upper atmosphere is less vulnerable to local effects caused by terrain or other land influences and is therefore less variable. The NWS operates virtually all available upper air measurement stations in the United States.

3.2.1. Site Location and Surface Characteristics

Equitrans utilized 2010 to 2014 meteorological data from the meteorological tower at Wheeling-Ohio County Airport (HLG), located roughly 52 km northwest of the Redhook Compressor Station. Figure 3-1 shows the relative location of Wheeling-Ohio County Airport to the Redhook Compressor Station.

Figure 3-1. Location of Wheeling-Ohio County Meteorological Tower



The meteorological tower at Wheeling-Ohio County Airport (KHLG) is not the closest tower to the Redhook Compressor Station. Morgantown Municipal Airport (KMGW) is located approximately 35 km from the station and Allegheny County Airport (KAGC) is approximately the same distance as KHLG. However, the surface roughness surrounding KAGC is significantly different that the Redhook Compressor Station and as such it was not considered in the analysis moving forward. Both KHLG and KMGW are similar to the Redhook Compressor Station with respect to base elevation and surrounding landuse, although KHLG is a slightly better fit with respect to landuse. However, unlike the Redhook Compressor Station location, there are some terrain features to the east of KMGW that are likely to cause some south-north channeling of winds. This is shown in a wind rose for KMGW that is included as Figure 3-3. Given these considerations, Wheeling-Ohio County Airport was determined to be the most representative meteorological station based on site location.

AERSURFACE (version 13016) was used as an objective method for evaluating land use characteristics and their associated micrometeorological parameters for a given location. The AERSURFACE program was used in the evaluation of potential NWS stations in the area. AERSURFACE was used to create seasonal values of albedo, Bowen ratio and surface roughness, across 12 directional sectors (e.g. 0-30 degrees). The seasonal parameters correspond to the calendar months in which they occur (i.e. winter values for December-February). The albedo and Bowen ratio values were determined from taking the geometric mean over a 10 km area out from the location of interest. The surface roughness values assigned by AERSURFACE were based on a 1 km radius out from the site.

The figures in Attachment A illustrate the magnitude of the micrometeorological differences between Wheeling-Ohio County airport and Redhook Compressor Station sites, as determined by AERSURFACE.

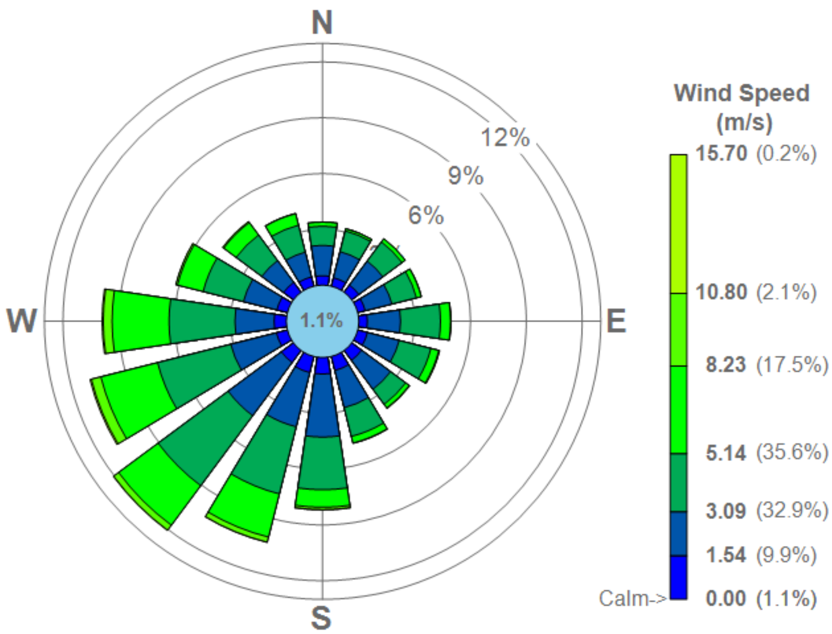
The albedo and Bowen ratio values show reasonable agreement across the directional sectors. However, there are variations in surface roughness across a couple of sectors. Accordingly, Equitrans performed a sensitivity analysis of the surface characteristics (most notably the surface roughness) to determine the impact of these differences. For this assessment a constant emission rate (1 lb/hr) was input for the turbine normal operating scenario (i.e., 100 percent load). The results of this analysis were compared for all receptors in the domain and for each metric used in this analysis (e.g., 1-hour H1H, H2H, H4H, and H8H, 3-hour H1H and H2H, etc.). AERMOD responded to the surface characteristics differences between the two sites with moderately varying output concentrations (17% on average).

3.2.2. Topographic Setting

The complexity of the terrain is another important consideration in determining data representativeness. In addition to the land use similarities shown above, Wheeling-Ohio County airport and the Redhook Compressor Station are at both at relatively high elevations (~320 meters for the station and ~360 for the tower) without significant terrain features between the sites or similar hills around the individual locations.

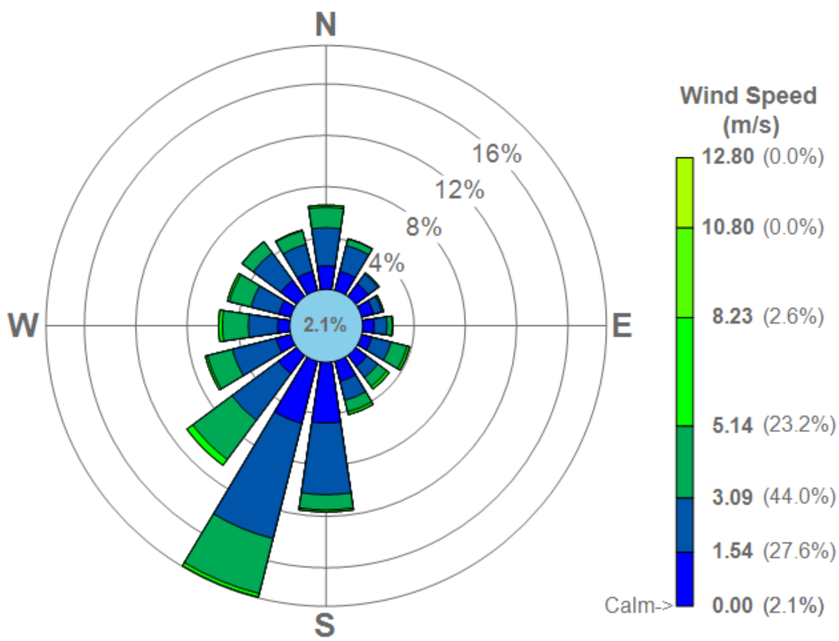
Figure 3-2 provides a wind rose for Wheeling-Ohio County airport for the data period of 2010 to 2014.

Figure 3-2. Wheeling-Ohio County Airport Wind Rose



As shown in Figure 3-2, wind is largely from the southwest at Wheeling-Ohio County airport. This is the general wind pattern in this area and is also expected to be the wind pattern at the Redhook Compressor Station site. To demonstrate this, a 5-year wind rose (2010 – 2014) for the Morgantown Airport which is located 35 km southeast of the Redhook Compressor Station is provided as Figure 3-3. All wind roses show the same predominant wind directions from the west and south, however the Morgantown wind rose is slightly biased with respect to winds from the south due to local terrain influences that are not present at the Redhook Compressor Station.

Figure 3-3. Morgantown Airport Wind Rose



3.2.3. Data Quality

The Wheeling-Ohio County Airport meteorological data was processed through the latest version of AERMET (version 15181) to include upper air measurements from the Pittsburgh upper air site (KPIT). Per EPA guidance, 1-minute Automated Surface Observing System (ASOS) wind data was also incorporated in the processing, using the latest version of AERMINUTE (version 14337).[5] A base elevation of 364 meters was used for the meteorological tower in the modeling analysis.

3.3. TREATMENT OF TERRAIN

Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.[6]

Receptor terrain elevations input to the model were those interpolated from 1/3 arc second National Elevation Dataset (NED) data obtained from the U.S. Geological Survey (USGS). The array elevations and elevations for emission sources and buildings at the Redhook Compressor Station were based on site grade elevations.

3.4. RECEPTOR GRIDS

For this air dispersion modeling analysis, ground-level concentrations were calculated along the facility boundary and also within a Cartesian receptor grid outside the fenceline. The boundary receptors were spaced

[5] Version 14237 of AERMINUTE was released after the modeling for this project was initiated. The results of this modeling analysis are not expected to change based on the version of AERMINUTE.
[6] EPA, *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, Research Triangle Park, NC, EPA-454/B-03-003, October 2004.

50 meters apart starting at an arbitrary point on the boundary. The Cartesian grid generally consists of the following receptor spacing:

- 50 meter-spaced receptors from the boundary out to 2 kilometers;
- 100 meter-spaced receptors from 2 to 5 kilometers;
- 500 meter-spaced receptors from 5 to 10 kilometers; and
- 1,000 meter-spaced receptors from 10 to 25 kilometers.

In general, the receptors covered a region extending from all edges of the Redhook Compressor Station boundary to the point where impacts from the project are no longer expected to be significant. For this modeling analysis, Equitrans considered all land outside of the facility's fenceline to be ambient air although Equitrans owns property beyond the fenceline.

As noted previously, receptor elevations required by AERMOD were determined using the AERMAP terrain preprocessor (version 11103). Figures 3-4 and 3-5 show the full receptor grid and a closer view of the receptors are the facility, respectively.

Figure 3-4. Receptor Grid

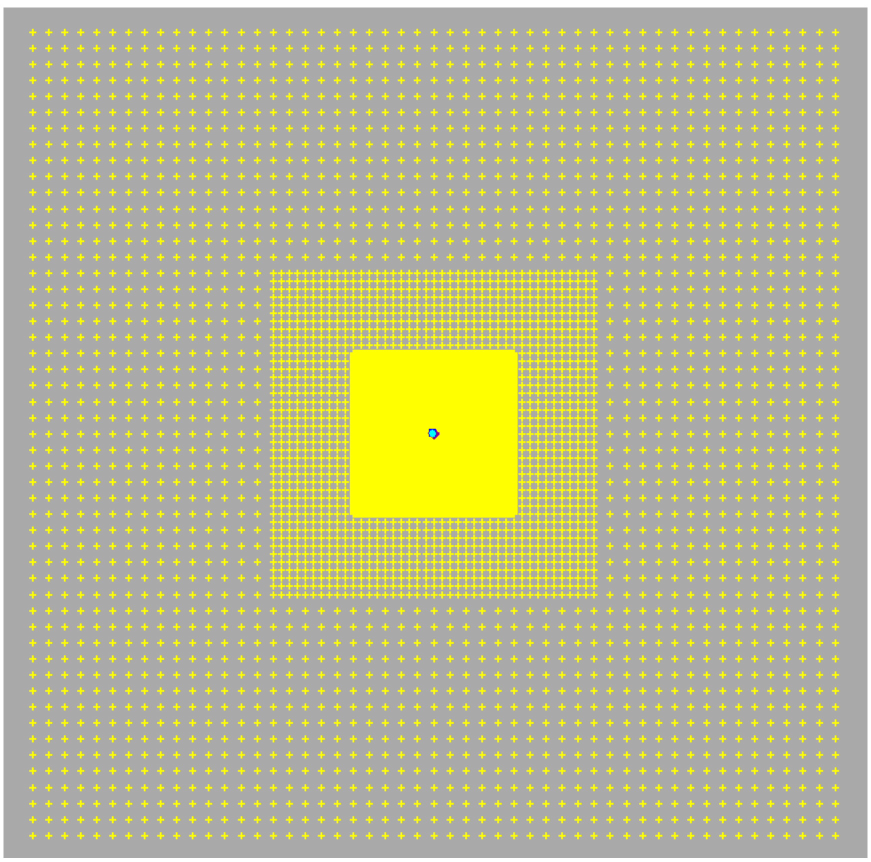
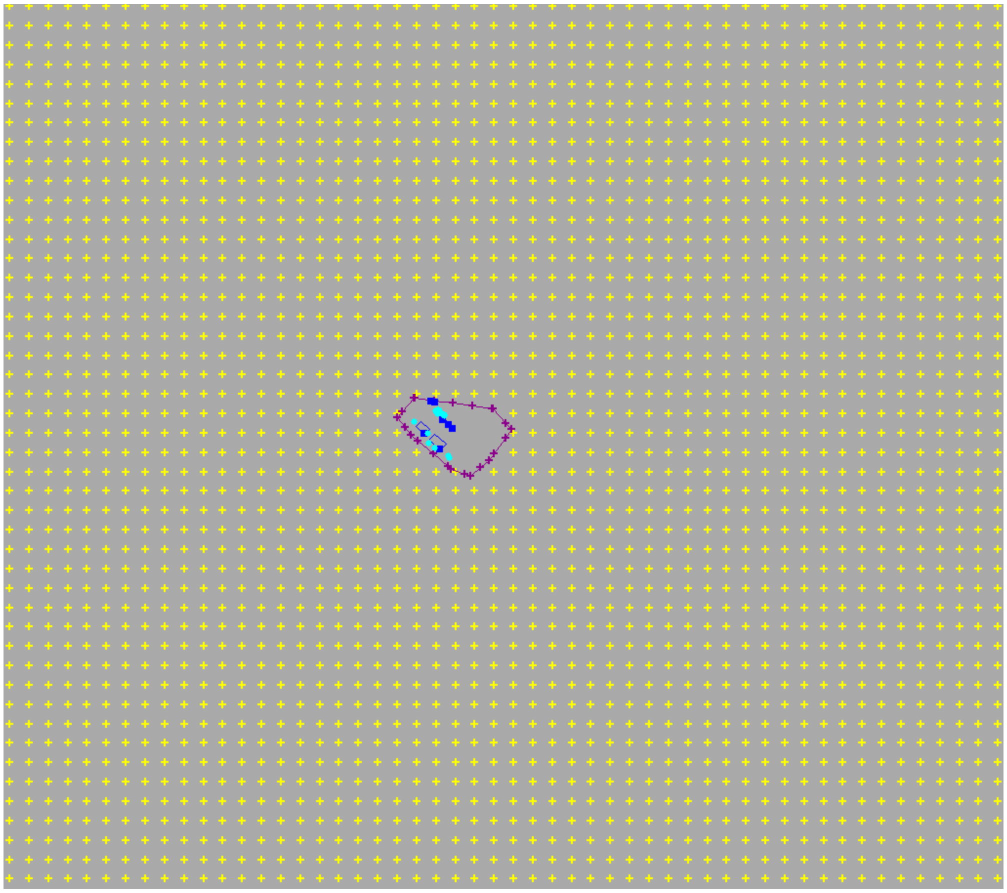


Figure 3-5. Receptor Grid (Zoomed In)



3.5. GEP STACK HEIGHT ANALYSIS

Stack height regulations restrict the use of stack heights in excess of GEP in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. The minimum stack height not subject to the effects of downwash, called the GEP stack height, is defined by the following formula:

H_{GEP} = H + 1.5L, where:

H_{GEP} = minimum GEP stack height,
H = structure height, and
L = lesser dimension of the structure (height or projected width).

The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP PRIME. In general, the lowest GEP stack height for any source is 65 meters by default.[7] A source may construct a stack that exceeds GEP, but is limited to the GEP stack height in the air quality

[7] 40 CFR §51.100(ii).

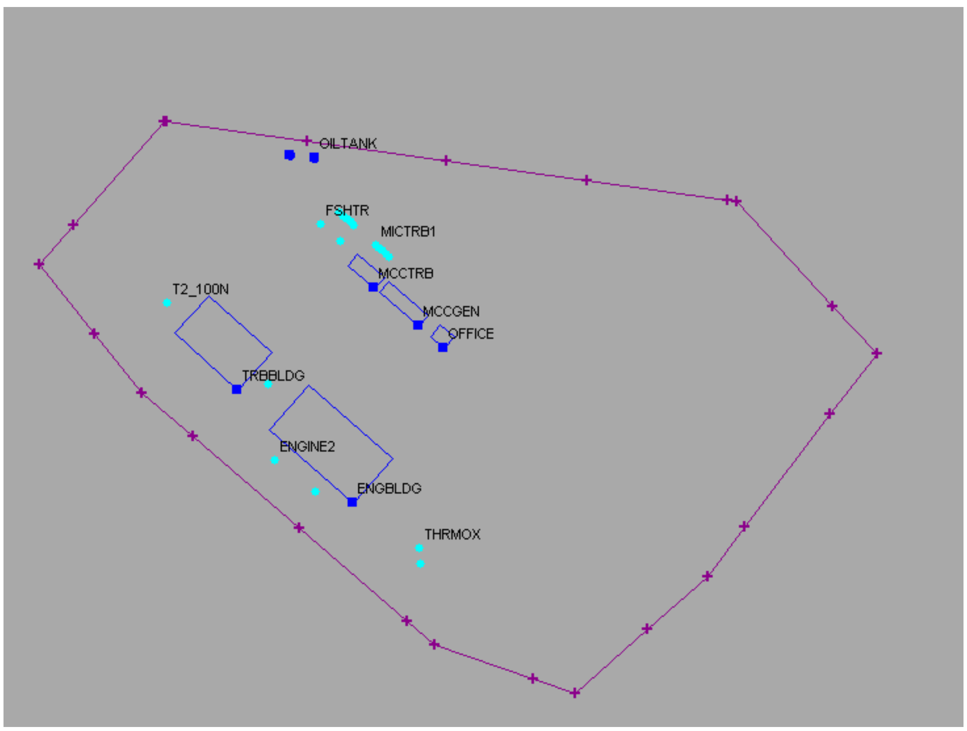
analysis demonstration. All proposed source stacks at the Redhook Compressor Station are less than 65 meters tall and therefore meet the requirements of GEP.[8]

3.6. REPRESENTATION OF EMISSION SOURCES

3.6.1. Coordinate System

In all modeling analysis data files, the location of emission sources, structures, and receptors, are represented in the UTM coordinate system. The UTM grid divides the world into coordinates that are measured in north meters (measured from the equator) and east meters (measured from the central meridian of a particular zone, which is set at 500 km). The datum for this modeling analysis is based on North American Datum 1983 (NAD 83). UTM coordinates for this analysis all reside within UTM Zone 17. The following figure shows the general layout of the station's buildings and stacks.

Figure 3-6. Station Layout



3.6.2. Source Types

The AERMOD dispersion model allows for emission units to be represented as point, area, or volume sources. In these air dispersions modeling analyses, Equitrans utilized point sources for all emission sources. There were no area or volumes sources used in this modeling analysis.

For point sources with unobstructed vertical releases, it is appropriate to use actual stack parameters (i.e., height, diameter, exhaust gas temperature, and gas exit velocity) in the modeling analyses. The proposed

[8] Note that all stacks are also below GEP formula height with the exception of Turbine 2, whose stack meets GEP via the 65 meter stack height allowance.

turbines and heaters at the Redhook Compressor Station have an unobstructed vertical release and were therefore modeled as point sources. Stack parameters (i.e., height, diameter, exhaust gas temperature, and gas exit velocity) used in the modeling analyses were based on design values for the turbine for each operating load considered in the analysis.

The proposed microturbines at the Redhook Compressor Station are equipped with hinged rain caps. These rain caps are necessary to avoid rainwater build up when the units are not operating. However, during operation the rain caps are forced open by the exhaust plume and remain open during operation thereby not obstructing the plume. As such, these sources were also modeled as point sources with their design values for height, diameter, exhaust gas temperature, and gas exit velocity.[9]

3.6.3. Source Parameters and Emission Rates

In general, a dispersion modeling analysis should contain sufficient detail to determine the maximum ambient concentration of the pollutant under consideration, and in many cases this involves modeling several operating loads or production rates. As such, this modeling analysis considered the proposed combustion turbine operating at various expected load scenarios (100 percent, 75 percent, and 50 percent loads). These scenarios encompass the variations in flow potentially resulting from reduced operational loads, thus determining the worst-case modeled concentrations. For this load analysis, a unit emission rate (one lb/hr) was input into the model and results were scaled based on the actual potential to emit (lb/hr) for each operating load. The worst-case load determined from this load analysis (as shown in Attachment D) and the 100 percent load scenario were utilized in the AERMOD modeling analyses.

Equitrans also evaluated the effect of startup and shutdown emissions from the proposed combustion turbines in this analysis. A startup or shutdown event of the turbine is expected to last 10 minutes. This is a much shorter time than the shortest NAAQS averaging period (i.e., 1-hour) and, as such, these intermittent emissions were not included in modeling. In addition, the only modeled pollutants for which startup and shutdown emissions are available are NO_2 and CO. For NO_2, the startup and shutdown emissions, in lb/event, are much less than the normal operation hourly emission rate. For CO, emissions per event are higher than the normal operation hourly emission rate, however, the modeling results for the 1-hour CO standard are well below the NAAQS.

The source parameters and emissions utilized in this analysis are included in Attachment C.

[9] The Vermont Department of Environmental Conservation and Northwest Clean Air Agency have both published guidance supporting the treatment of hinged rain caps as unobstructed, vertical releases (http://www.anr.state.vt.us/air/permitting/docs/Rain_Guard_Guidance.pdf and http://www.nwcleanair.org/pdf/forms/misc/Stack%20and%20Rain%20Guard%20Requirements1.pdf). The Pennsylvania Department of Environmental Protection does not have any published state-specific air dispersion modeling guidance.

4. MODELING RESULTS

Following the procedures and methods discussed in this report, the following tables summarize the results from the conducted modeling analyses. For each pollutant and averaging period, the maximum model output concentration occurs at the station's fenceline. The magnitude of the model output concentrations drop significantly in the first few hundred meters. As shown in the tables below, the results of the analyses indicate that the predicted ambient impacts resulting from the operation of the Redhook Compressor Station plus the existing ambient background concentration are lower than each of the NAAQS.

Electronic input and output files for all AERMOD model runs are included in Attachment B.

Table 4-1. Modeling Results - PM_{10} 24-Hour NAAQS

Scenario/ Load	H6H Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
100% Load/Worst-Case Load	9.2	34.0	43.2	150	Yes

Table 4-2. Modeling Results – $PM_{2.5}$ 24-Hour NAAQS

Scenario/ Load	5-year Average H1H Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
100% Load/Worst-Case Load	6.9	18.0	24.8	35	Yes

Table 4-3. Modeling Results – $PM_{2.5}$ Annual NAAQS

Scenario/ Load	5-year Average Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
100% Load	1.7	8.8	10.4	12	Yes
Worst-Case Load	1.7		10.4		Yes

Table 4-4. Modeling Results – SO_2 1-Hour NAAQS

Scenario/ Load	5-year Average H4H Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
100% Load/Worse-Case Load	5.9	67.2	73.2	196	Yes

Table 4-5. Modeling Results – SO_2 3-Hour NAAQS

Scenario/ Load	H2H Modeled Concentration (µg/m³)						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load/Worst-Case Load	5.1	4.9	4.7	5.0	4.9	5.1	69.7	74.8	1,300	Yes

Table 4-6. Modeling Results – SO_2 24-Hour NAAQS

Scenario/ Load	H2H Modeled Concentration (µg/m³)						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load/Worst-Case Load	2.4	2.8	3.3	3.0	2.8	3.3	23.6	26.9	365	Yes

Table 4-7. Modeling Results – SO_2 Annual NAAQS

Scenario/ Load	1st High Modeled Concentration (µg/m³)						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load	0.5	0.5	0.5	0.5	0.5	0.5	8.5	9.1	80	Yes
Worst-Case Load	0.5	0.5	0.5	0.5	0.5	0.5		9.1		Yes

Table 4-8. Modeling Results – NO_2 1-Hour NAAQS

Scenario/ Load	5-year Average H8H Modeled Concentration with ARM (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
100% Load/Worst-Case Load	106.2	68.4	174.5	188	Yes

1. Model output concentrations reflect the application of the Tier 2 Ambient Ratio Method (ARM). 80% of modeled concentrations of NO_x are assumed to be NO_2.

Table 4-9. Modeling Results – NO_2 Annual NAAQS

Scenario/ Load	1st High Modeled Concentration (µg/m³) with ARM						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load	9.0	10.7	10.2	10.2	10.7	10.7	16.1	26.8	100	Yes
Worst-Case Load	9.0	10.7	10.2	10.2	10.7	10.7		26.8		Yes

1. Model output concentrations reflect the application of the Tier 2 Ambient Ratio Method (ARM). 75% of modeled concentrations of NO_x are assumed to be NO_2.

Table 4-10. Modeling Results – CO 1-Hour NAAQS

Scenario/ Load	H2H Modeled Concentration (µg/m³)						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load/Worst-Case Load	192.8	189.0	188.3	185.3	188.3	192.8	2,864.0	3,056.8	40,000	Yes

Table 4-11. Modeling Results – CO 8-Hour NAAQS

Scenario/ Load	H2H Modeled Concentration (µg/m³)						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load	125.8	126.8	131.3	132.5	144.1	144.1	1,718.4	1,862.5	10,000	Yes
Worst-Case Load	125.8	126.8	131.3	132.5	144.1	144.1		1,862.5		Yes

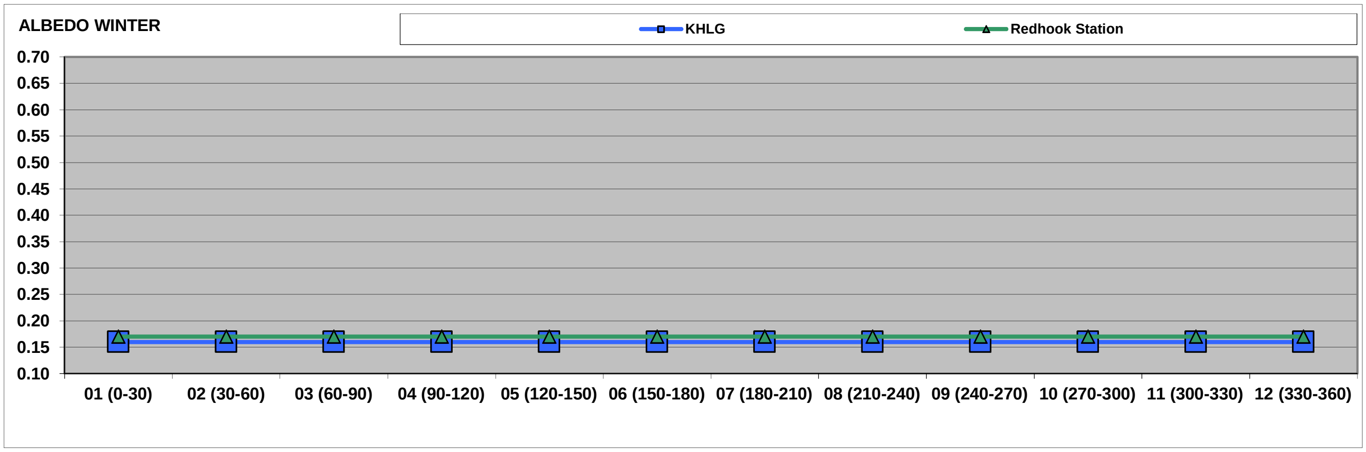
Table 4-12. Modeling Results – Lead 3-Month NAAQS

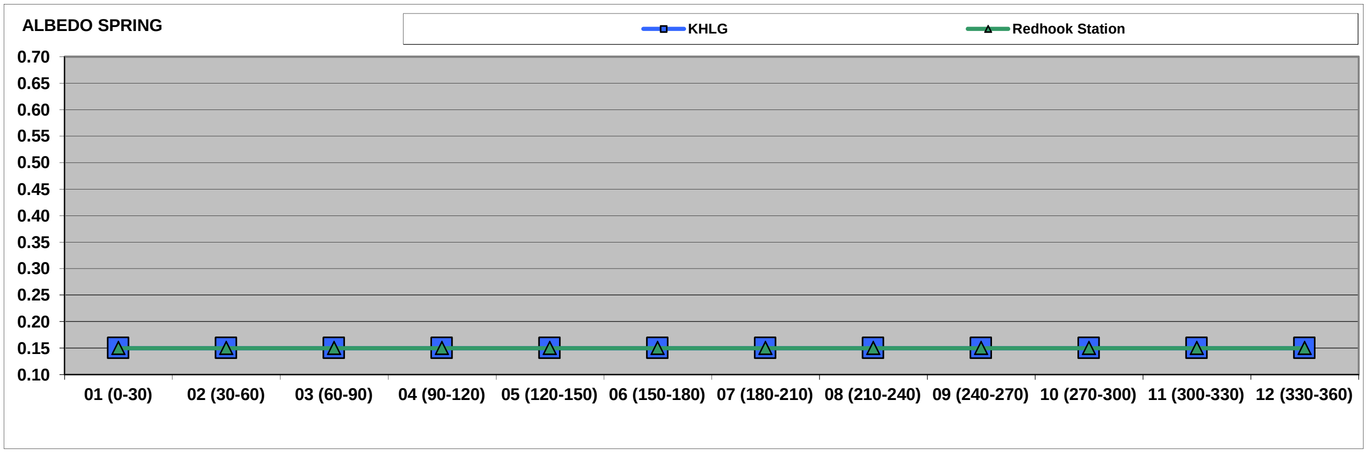
Scenario/ Load	H1H Modeled Concentration (µg/m³)[A]						Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
	2010	2011	2012	2013	2014	Maximum				
100% Load/Worst-Case Load	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.04	0.04	0.15	Yes

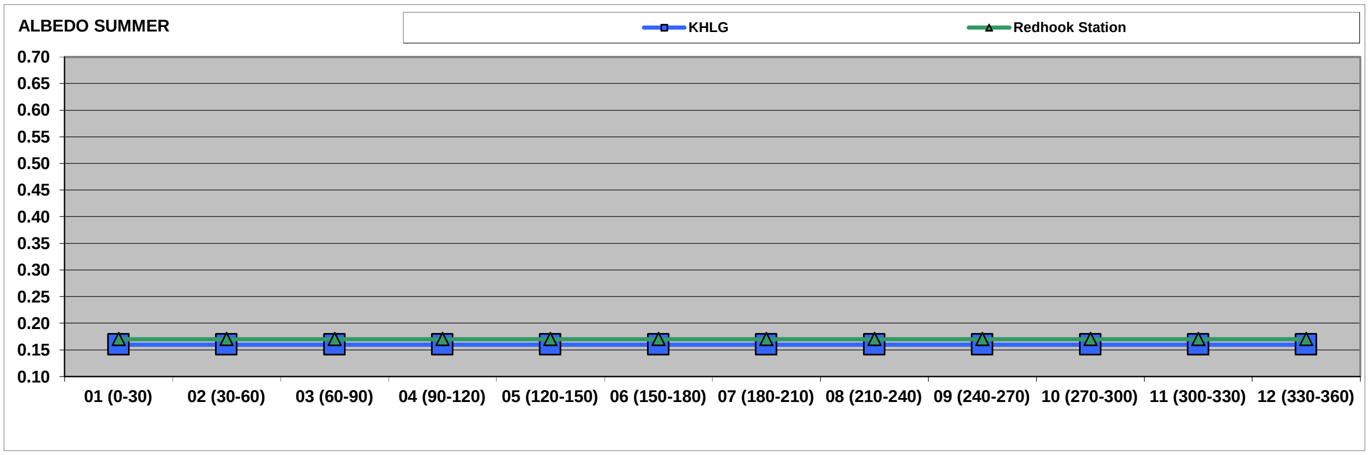
[A] Results shown are maximum monthly average concentration. This is a conservative assumption as the NAAQS is based on a rolling 3-month average.

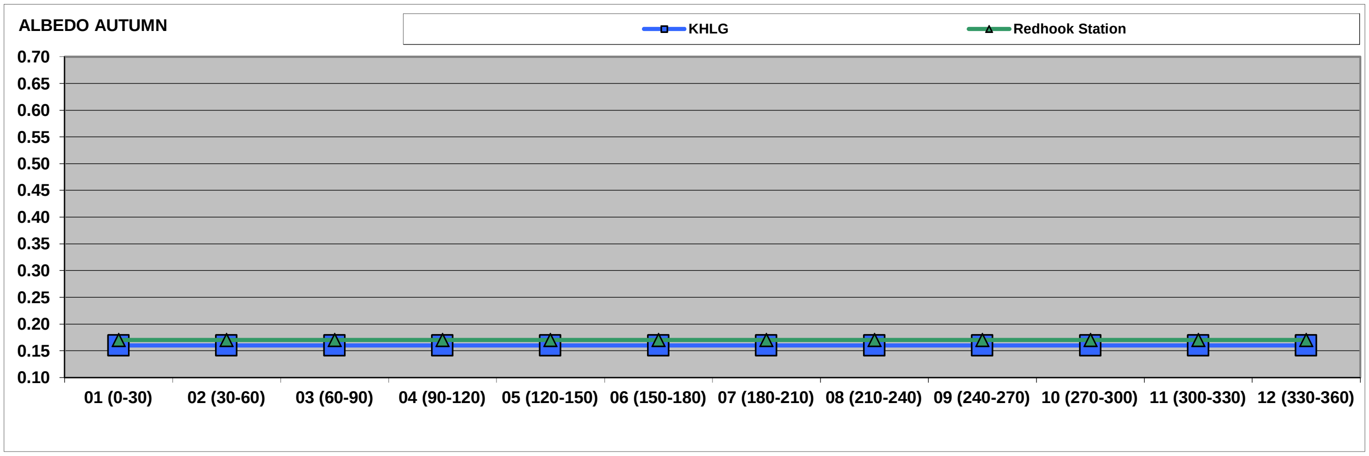
ATTACHMENT A. COMPARISON OF SURFACE CHARACTERISTICS

COMPARISON OF ALBEDO VALUES

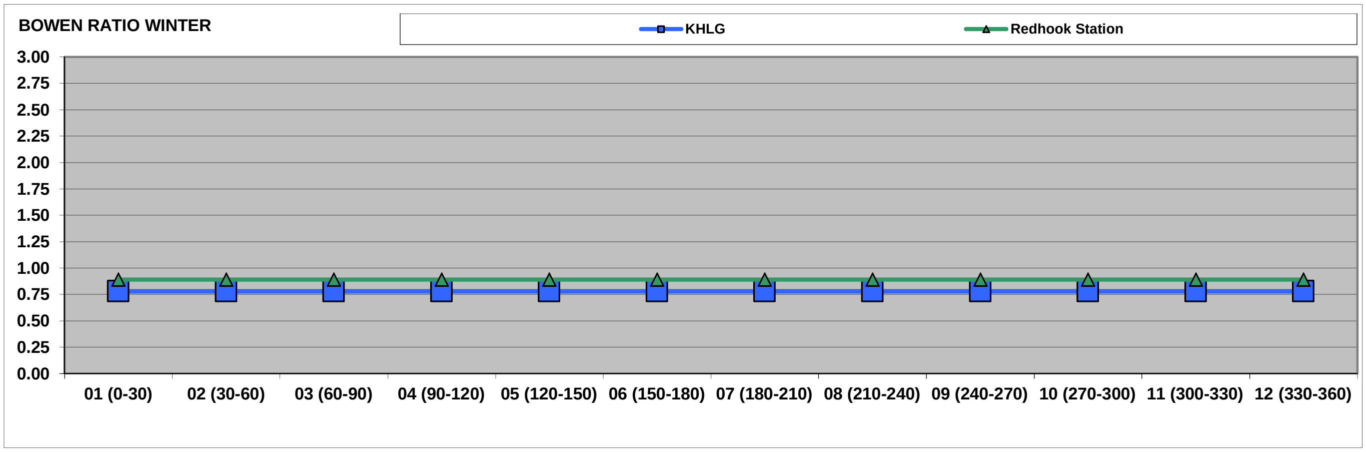


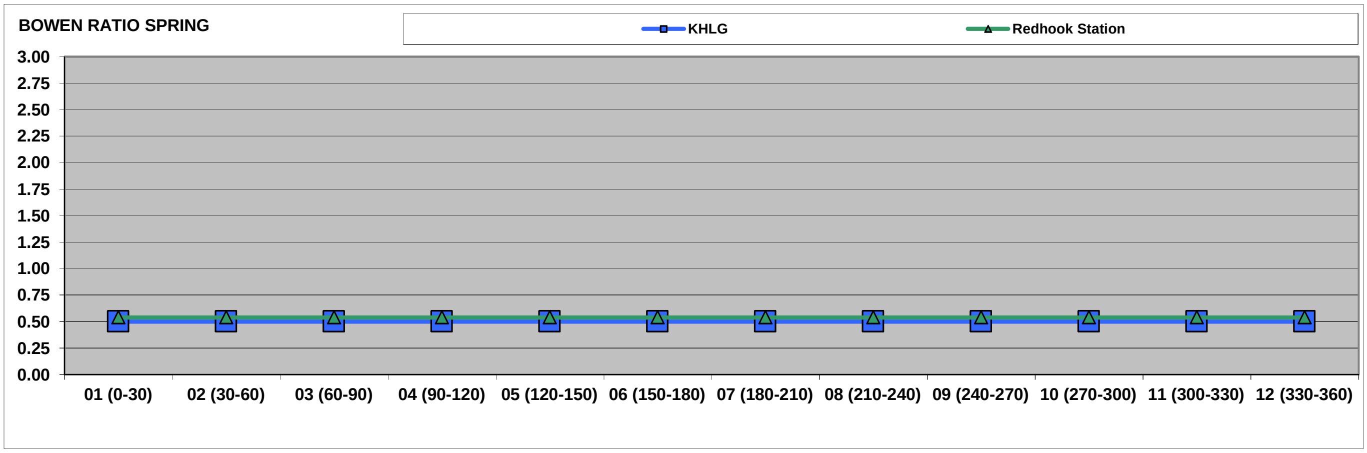


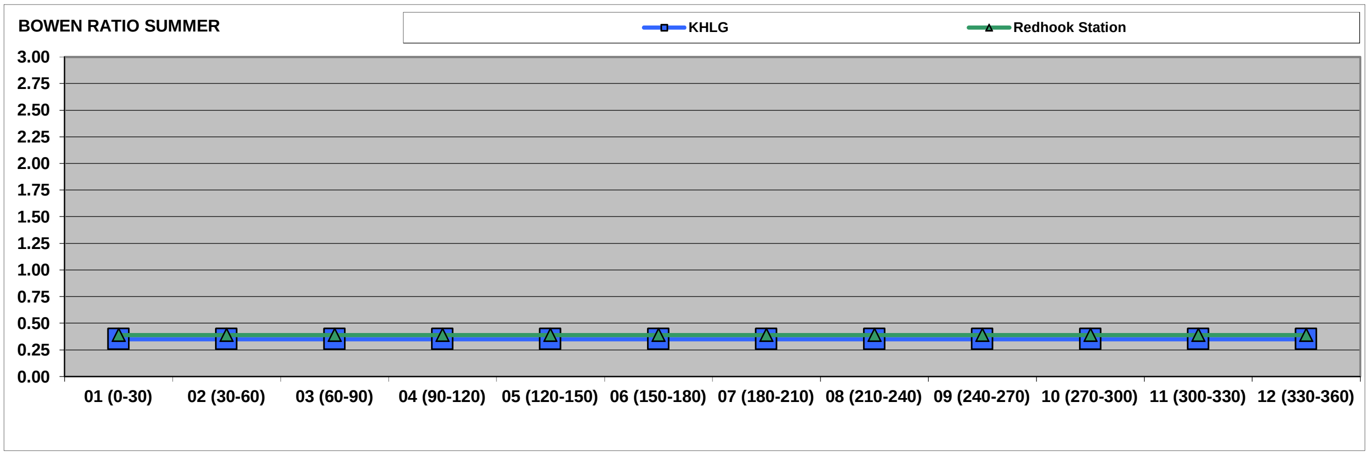


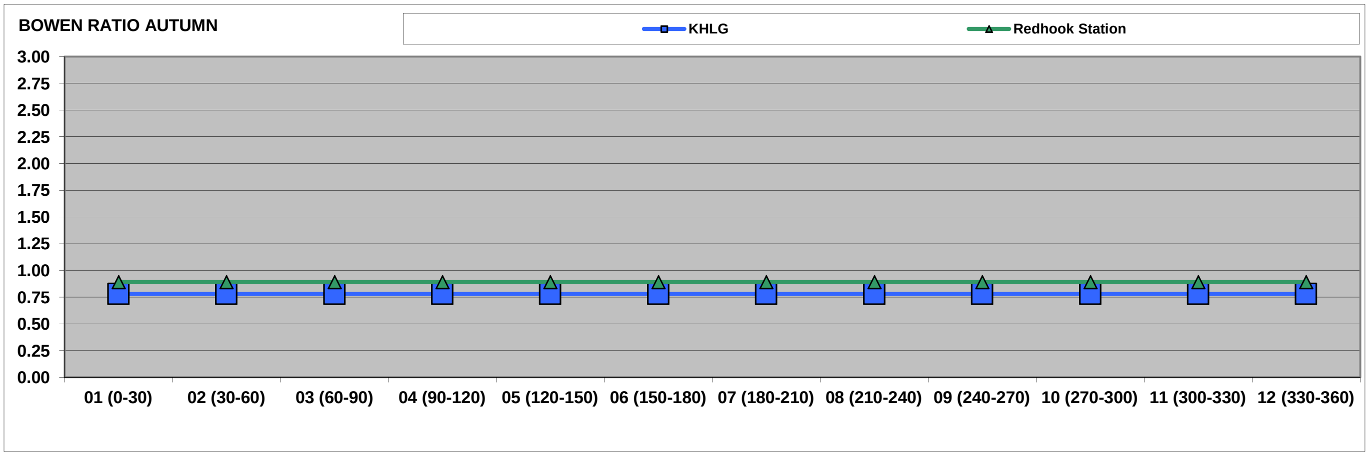


COMPARISON OF BOWEN RATIO VALUES

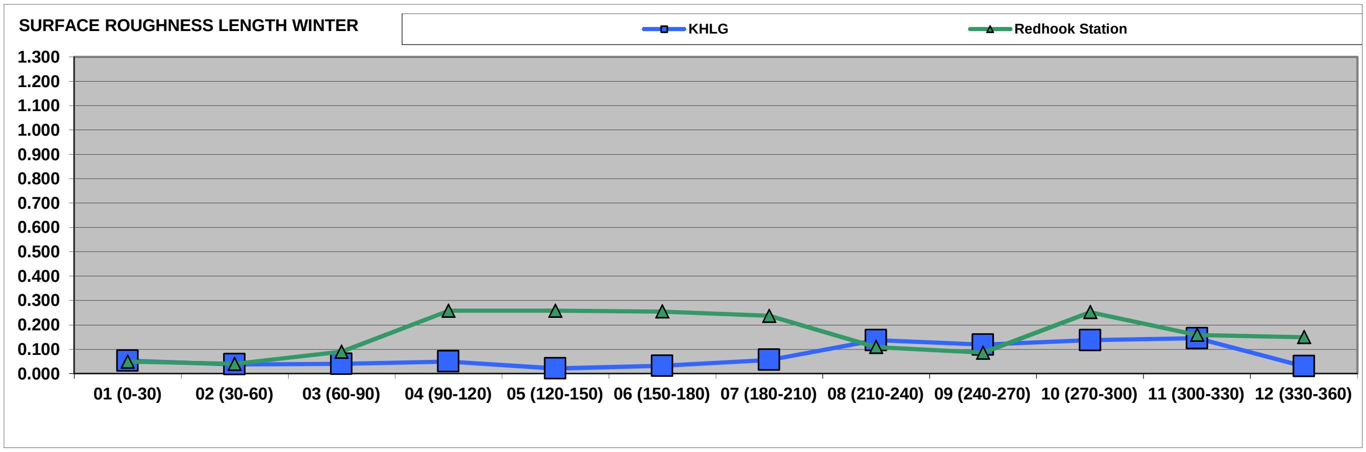


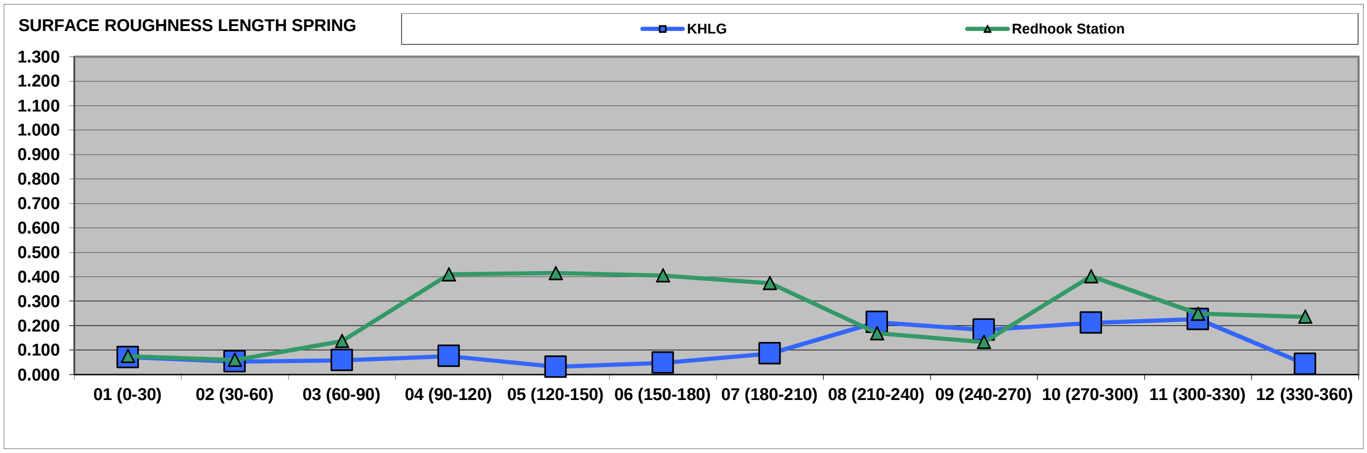


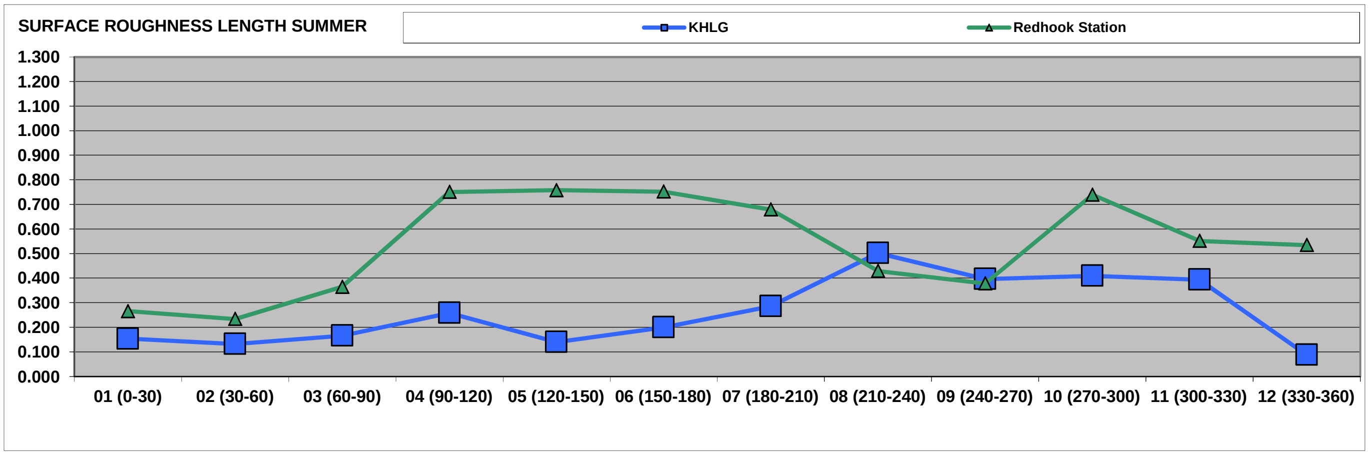


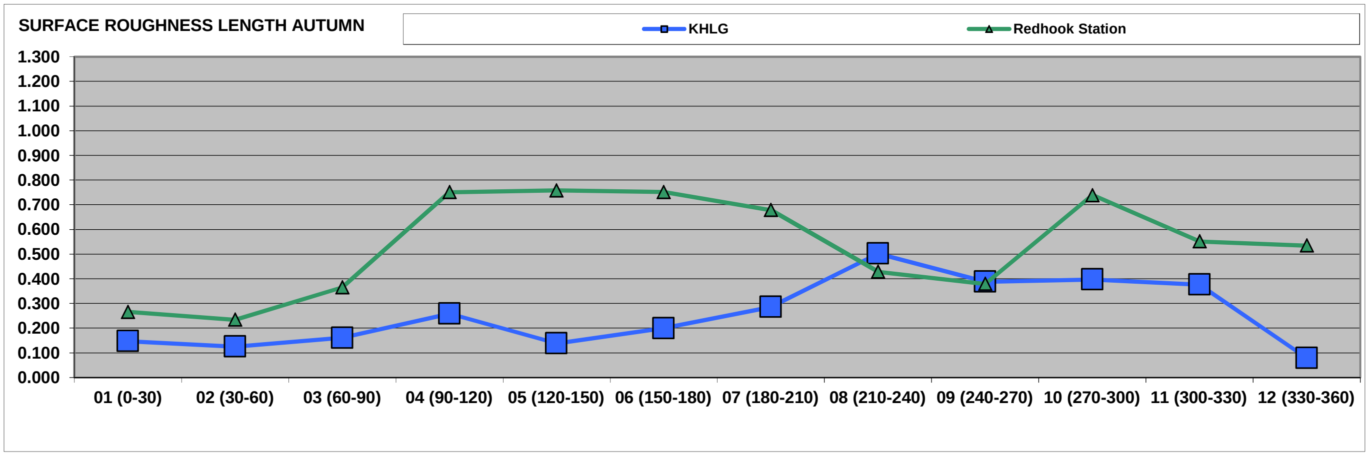


COMPARISON OF SURFACE ROUGHNESS LENGTH VALUES









ATTACHMENT B. MODEL FILES CD

ATTACHMENT C. MODELED SOURCE INVENTORY

Redhook Compressor Station - Modeled Source Inventory
1-Hour CO Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	CO Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	5.11
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	5.11
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	1.95
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	1.95
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.06
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.06
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.22
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.56
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.06
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.22

Redhook Compressor Station - Modeled Source Inventory
8-Hour CO Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	CO Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	5.11
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	5.11
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	1.95
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	1.95
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.06
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.06
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.22
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.56
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.06
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.22
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.22
T1_50L	TURBINE1 Load, 50 % Load	574371.6	4418845.4	320.0	14.02	762.6	21.22	1.52	3.73

Redhook Compressor Station - Modeled Source Inventory
Pb Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	Pb Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	0.00
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	0.00
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.00
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.00
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	3.64E-07
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	3.64E-07
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.00
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.00
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	3.64E-07
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.00
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.00

* No load scenario was run for the turbines as there are no lead emissions from the turbines with which to determine worst-case load.

Redhook Compressor Station - Modeled Source Inventory
1-Hour NO_2 Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	NO_2 Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	5.03
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	5.03
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	4.72
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	4.72
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.07
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.07
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.08
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.66
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.07
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.08

Redhook Compressor Station - Modeled Source Inventory
Annual NO_2 Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	NO_2 Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	5.03
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	5.03
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	4.72
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	4.72
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.07
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.07
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.08
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.66
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.07
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.08
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.08
T1_50L	TURBINE1 Load, 50 % Load	574371.6	4418845.4	320.0	14.02	762.6	21.22	1.52	3.66

Redhook Compressor Station - Modeled Source Inventory
24-Hour $PM_{2.5}$ Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	$PM_{2.5}$ Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	1.62
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	1.62
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.40
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.40
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.01
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.01
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.02
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.05
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.01
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.02

Redhook Compressor Station - Modeled Source Inventory
Annual $PM_{2.5}$ Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	$PM_{2.5}$ Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	1.62
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	1.62
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.40
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.40
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.01
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.01
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.02
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.05
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.01
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.02
T1_50L	TURBINE1 Load, 50 % Load	574371.6	4418845.4	320.0	14.02	762.6	21.22	1.52	1.18

Redhook Compressor Station - Modeled Source Inventory
24-Hour PM_{10} Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	PM_{10} Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	1.62
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	1.62
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.40
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.40
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.01
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.01
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.02
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.05
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.01
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.02
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.02

Redhook Compressor Station - Modeled Source Inventory
1-Hour SO_2 Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	SO_2 Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	0.31
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	0.31
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.02
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.02
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.00
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.00
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.01
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.00
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.00
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.01

Redhook Compressor Station - Modeled Source Inventory
3-Hour SO_2 Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	SO_2 Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	0.31
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	0.31
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.02
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.02
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.00
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.00
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.01
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.00
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.00
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.01

Redhook Compressor Station - Modeled Source Inventory
24-Hour SO_2 Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	SO_2 Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal and Load, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	0.31
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	0.31
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.02
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.02
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.00
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.00
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.01
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.00
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.00
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.01

Redhook Compressor Station - Modeled Source Inventory
Annual SO_2 Modeling Analysis

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	SO_2 Emission Rate (lb/hr)
T1_100N	TURBINE1 Normal, 100 % Load	574371.6	4418845.4	320.0	14.02	750.4	28.46	1.52	0.31
T2_100N	TURBINE2 Normal and Load, 100 % Load	574335.7	4418874.2	320.0	14.02	750.4	28.46	1.52	0.31
ENGINE1	ENGINE1	574388.3	4418807.3	320.0	11.87	722.0	22.66	0.90	0.02
ENGINE2	ENGINE2	574374.1	4418818.7	320.0	11.87	722.0	22.66	0.90	0.02
FSHTR	FUEL START HEATER	574390.0	4418901.9	320.0	5.18	699.8	2.00	0.31	0.00
FGHTR	FUEL GAS HEATER	574397.1	4418896.2	320.0	5.18	699.8	2.00	0.31	0.00
MICTRB1	CAPSTONE MICROTURBINE 1	574409.5	4418894.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB2	CAPSTONE MICROTURBINE 2	574410.8	4418893.7	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB3	CAPSTONE MICROTURBINE 3	574412.1	4418892.6	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB4	CAPSTONE MICROTURBINE 4	574413.3	4418891.5	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB5	CAPSTONE MICROTURBINE 5	574414.5	4418890.4	320.0	3.89	552.6	33.56	0.30	0.01
THRMOX	THERMAL OXIDIZER	574424.9	4418787.5	320.0	6.48	1088.7	8.58	0.31	0.00
RBHTR	REBOILER HEATER	574425.3	4418782.1	320.0	4.78	699.8	2.00	0.31	0.00
MICTRB6	CAPSTONE MICROTURBINE 6	574401.9	4418901.8	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB7	CAPSTONE MICROTURBINE 7	574400.7	4418902.9	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB8	CAPSTONE MICROTURBINE 8	574399.5	4418904.0	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB9	CAPSTONE MICROTURBINE 9	574398.2	4418905.1	320.0	3.89	552.6	33.56	0.30	0.01
MICTRB10	CAPSTONE MICROTURBINE 10	574396.8	4418906.2	320.0	3.89	552.6	33.56	0.30	0.01
T1_50L	TURBINE1 Load, 50 % Load	574371.6	4418845.4	320.0	14.02	762.6	21.22	1.52	0.22

Redhook Compressor Station - Modeled Source Inventory
Load Analysis for Turbines 1 and 2

Model ID	Description	X-Coordinate (m)	Y-Coordinate (m)	Elevation (m)	Stack Height (m)	Stack Temperature (K)	Stack Velocity (m/s)	Stack Diameter (m)	Emission Rate Used for Scaling Results from 1 lb/hr Modeling Analysis (lb/hr)											
									1-hr CO	8-hr CO	1-hr NO_2	Annual NO_2	24-hr $PM_{2.5}$	Annual $PM_{2.5}$	24-hr PM_{10}	1-hr SO_2	3-hr SO_2	24-hr SO_2	Annual SO_2
T1_100N	TURBINE 1 100% LOAD	574371.6	4418845.4	320.0	14.02	750.37	28.46	1.52	5.10	5.10	5.02	5.02	1.62	1.62	1.62	0.31	0.31	0.31	0.31
T2_100N	TURBINE 2 100% LOAD	574335.7	4418874.2	320.0	14.02	750.37	28.46	1.52	5.10	5.10	5.02	5.02	1.62	1.62	1.62	0.31	0.31	0.31	0.31
T1_75N	TURBINE 1 75% LOAD	574371.6	4418845.4	320.0	14.02	755.93	25.35	1.52	4.49	4.49	4.43	4.43	1.42	1.42	1.42	0.27	0.27	0.27	0.27
T2_75N	TURBINE 2 75% LOAD	574335.7	4418874.2	320.0	14.02	755.93	25.35	1.52	4.49	4.49	4.43	4.43	1.42	1.42	1.42	0.27	0.27	0.27	0.27
T1_50N	TURBINE 1 50% LOAD	574371.6	4418845.4	320.0	14.02	762.59	21.22	1.52	3.71	3.71	3.66	3.66	1.18	1.18	1.18	0.22	0.22	0.22	0.22
T2_50N	TURBINE 2 50% LOAD	574335.7	4418874.2	320.0	14.02	762.59	21.22	1.52	3.71	3.71	3.66	3.66	1.18	1.18	1.18	0.22	0.22	0.22	0.22

ATTACHMENT D. LOAD ANALYSIS

Load Analysis Results for Redhook Compressor Station - AERMOD Concentrations (ug/m3) Resulting from 1 lb/hr Emission Rate

Turbine 1

			2010			**2011**			**2012**			**2013**			**2014**		
Emission Unit	**Avg. Period**	**Metric**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**
T-130 Turbine 1	1-hr	H1H	10.30662	10.48439	9.60335	12.42441	11.23349	9.94493	12.25292	11.48943	10.1788	10.76116	10.44648	11.24519	10.14373	10.10618	9.61235
	3-hr	H1H	6.21881	5.16925	4.36421	7.76699	6.81997	6.17154	5.80281	4.85899	4.90302	6.54745	5.53908	4.91289	5.72458	4.88993	4.01706
	8-hr	H1H	5.45668	4.35932	3.23961	3.92971	3.33928	2.82558	3.59082	3.51931	3.08054	3.31574	2.8633	2.72284	5.28533	4.25513	3.34467
	24-hr	H1H	2.49796	2.27741	2.12889	2.61491	1.62772	1.47334	2.24012	2.05378	1.92182	2.39916	2.18868	2.02676	2.44698	2.23791	2.06392
	Monthly	H1H	0.48947	0.41648	0.36187	0.31114	0.26407	0.23834	0.35739	0.30736	0.27295	0.39095	0.32104	0.27956	0.37338	0.32419	0.28471
	Annual	1H	0.19326	0.15804	0.13418	0.13711	0.11875	0.10808	0.14659	0.12452	0.11351	0.17708	0.1441	0.12412	0.18532	0.15431	0.13417

			2010			**2011**			**2012**			**2013**			**2014**			**MAX**		
	Avg. Period	**Metric**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**
CO	1-hr	H1H	38.2376	47.0749	48.9771	46.0946	50.4384	50.7191	45.4583	51.5875	51.9119	39.9239	46.9047	57.3505	37.6332	45.3767	49.0230	*46.0946*	*51.5875*	***57.3505***
	8-hr	H1H	20.2443	19.5733	16.5220	14.5792	14.9934	14.4105	13.3219	15.8017	15.7108	12.3014	12.8562	13.8865	19.6086	19.1055	17.0578	***20.2443***	*19.5733*	*17.0578*
PM10	24-hr	H1H	2.9441	3.2453	3.4403	3.0819	2.3195	2.3810	2.6402	2.9266	3.1057	2.8276	3.1189	3.2753	2.8840	3.1890	3.3354	*3.0819*	*3.2453*	***3.4403***
PM2.5	24-hr	H1H	2.9441	3.2453	3.4403	3.0819	2.3195	2.3810	2.6402	2.9266	3.1057	2.8276	3.1189	3.2753	2.8840	3.1890	3.3354	*3.0819*	*3.2453*	***3.4403***
	Annual	1H	0.2278	0.2252	0.2168	0.1616	0.1692	0.1747	0.1728	0.1774	0.1834	0.2087	0.2053	0.2006	0.2184	0.2199	0.2168	***0.2278***	*0.2252*	*0.2168*
NO2	1-hr	H1H	37.7222	46.4458	48.2088	45.4733	49.7644	49.9235	44.8457	50.8982	51.0976	39.3858	46.2779	56.4509	37.1261	44.7704	48.2540	*45.4733*	*50.8982*	***56.4509***
	Annual	1H	0.7073	0.7001	0.6736	0.5018	0.5261	0.5426	0.5365	0.5516	0.5698	0.6481	0.6384	0.6231	0.6783	0.6836	0.6735	***0.7073***	*0.7001*	*0.6736*
SO2	1-hr	H1H	2.2945	2.8220	2.9314	2.7660	3.0237	3.0357	2.7278	3.0926	3.1071	2.3957	2.8118	3.4326	2.2582	2.7202	2.9342	*2.7660*	*3.0926*	***3.4326***
	3-hr	H1H	1.3844	1.3914	1.3322	1.7291	1.8357	1.8839	1.2918	1.3079	1.4966	1.4576	1.4909	1.4997	1.2744	1.3162	1.2262	*1.7291*	*1.8357*	***1.8839***
	24-hr	H1H	0.5561	0.6130	0.6498	0.5821	0.4381	0.4497	0.4987	0.5528	0.5866	0.5341	0.5891	0.6187	0.5448	0.6024	0.6300	*0.5821*	*0.6130*	***0.6498***
	Annual	1H	0.0430	0.0425	0.0410	0.0305	0.0320	0.0330	0.0326	0.0335	0.0346	0.0394	0.0388	0.0379	0.0413	0.0415	0.0410	***0.0430***	*0.0425*	*0.0410*
Pb	Monthly	H1H	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	***0.0000***	***0.0000***	***0.0000***

Load Analysis Results for Redhook Compressor Station - AERMOD Concentrations (ug/m3) Resulting from 1 lb/hr Emission Rate

Turbine 2

			2010			**2011**			**2012**			**2013**			**2014**		
Emission Unit	**Avg. Period**	**Metric**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**
T-130 Turbine 2	1-hr	H1H	7.87495	7.24293	6.80151	7.80773	7.19114	7.02448	8.38104	7.3276	6.82774	8.34405	7.18423	6.42047	8.04122	7.62832	7.20359
	3-hr	H1H	5.11151	4.851	4.59489	6.41934	5.79889	5.55771	5.53019	4.78245	4.39034	6.81117	5.8249	5.60338	4.88888	4.1914	3.75122
	8-hr	H1H	3.84375	3.63265	3.43103	2.9931	2.58823	2.48797	3.16108	2.9038	2.69709	3.42006	2.90658	2.78556	2.78133	2.32577	2.06374
	24-hr	H1H	1.29452	1.22322	1.15541	1.54826	1.4976	1.43401	0.99416	0.89531	0.83106	1.37659	1.16452	1.11719	1.19269	1.00938	0.91882
	Monthly	H1H	0.16054	0.142	0.13009	0.18262	0.16303	0.15292	0.15153	0.14021	0.13301	0.1625	0.14366	0.132	0.15161	0.13668	0.12899
	Annual	1H	0.10357	0.09272	0.08566	0.10852	0.09779	0.09071	0.11773	0.10676	0.10039	0.10205	0.09045	0.08401	0.09905	0.08913	0.08283

			2010			**2011**			**2012**			**2013**			**2014**			**MAX**		
	Avg. Period	**Metric**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**	**50N**	**75N**	**100N**
CO	1-hr	H1H	29.2161	32.5208	34.6877	28.9667	32.2882	35.8248	31.0937	32.9009	34.8215	30.9564	32.2572	32.7444	29.8329	34.2512	36.7383	*31.0937*	*34.2512*	***36.7383***
	8-hr	H1H	14.2603	16.3106	17.4983	11.1044	11.6212	12.6886	11.7276	13.0381	13.7552	12.6884	13.0505	14.2064	10.3187	10.4427	10.5251	*14.2603*	*16.3106*	***17.4983***
PM10	24-hr	H1H	1.5257	1.7431	1.8672	1.8248	2.1341	2.3174	1.1717	1.2758	1.3430	1.6224	1.6594	1.8054	1.4057	1.4384	1.4848	*1.8248*	*2.1341*	***2.3174***
PM2.5	24-hr	H1H	1.5257	1.7431	1.8672	1.8248	2.1341	2.3174	1.1717	1.2758	1.3430	1.6224	1.6594	1.8054	1.4057	1.4384	1.4848	*1.8248*	*2.1341*	***2.3174***
	Annual	1H	0.1221	0.1321	0.1384	0.1279	0.1394	0.1466	0.1388	0.1521	0.1622	0.1203	0.1289	0.1358	0.1167	0.1270	0.1339	*0.1388*	*0.1521*	***0.1622***
NO2	1-hr	H1H	28.8223	32.0862	34.1436	28.5763	31.8568	35.2629	30.6746	32.4613	34.2753	30.5392	31.8261	32.2308	29.4309	33.7935	36.1620	*30.6746*	*33.7935*	***36.1620***
	Annual	1H	0.3791	0.4107	0.4300	0.3972	0.4332	0.4554	0.4309	0.4729	0.5040	0.3735	0.4007	0.4217	0.3625	0.3948	0.4158	*0.4309*	*0.4729*	***0.5040***
SO2	1-hr	H1H	1.7531	1.9496	2.0762	1.7382	1.9356	2.1442	1.8658	1.9723	2.0842	1.8576	1.9338	1.9598	1.7902	2.0533	2.1989	*1.8658*	*2.0533*	***2.1989***
	3-hr	H1H	1.1379	1.3057	1.4026	1.4291	1.5609	1.6965	1.2311	1.2873	1.3401	1.5163	1.5679	1.7104	1.0884	1.1282	1.1451	*1.5163*	*1.5679*	***1.7104***
	24-hr	H1H	0.2882	0.3292	0.3527	0.3447	0.4031	0.4377	0.2213	0.2410	0.2537	0.3065	0.3134	0.3410	0.2655	0.2717	0.2805	*0.3447*	*0.4031*	***0.4377***
	Annual	1H	0.0231	0.0250	0.0261	0.0242	0.0263	0.0277	0.0262	0.0287	0.0306	0.0227	0.0243	0.0256	0.0221	0.0240	0.0253	*0.0262*	*0.0287*	***0.0306***
Pb	Monthly	H1H	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	***0.0000***	***0.0000***	***0.0000***

Equitrans Expansion Project

Docket No. CP16-   -000

Resource Report 9

Appendix 9-F
Correspondence to Federal Land Managers

Pellerin, Tricia

From:	O'Dea, Claire B -FS <cbodea@fs.fed.us>
Sent:	Wednesday, October 07, 2015 3:25 PM
To:	Frazier, Stephanie
Cc:	Pellerin, Tricia
Subject:	RE: Equitrans Expansion Project

Hi Stephanie,

My apologies for my delay in responding, but I have been away on leave. Thank you for keeping the USDA Forest Service informed about facilities that may potentially impact Forest Service Class I Areas. Based on the proposed emissions from this project as well as the distance to the closest Class I Area managed by the Forest Service, it is not anticipated that the modified facility would cause or contribute to an adverse impact on any air quality related values (AQRVs) at any Forest Service Class I Area. Therefore, we will not be requesting any additional information be included within your RR9. Should the nature of the project change such that emissions increase, please let me know so that we may reevaluate the application.

Thank you again for keeping us informed.
Best,

Claire O'Dea, PhD
Air Quality Specialist

Forest Service
Eastern Regional Office

p: 202-205-1686
c: 919-368-6879
cbodea@fs.fed.us

1400 Independence Ave, SW, #1121
Washington, DC 20250
www.fs.fed.us

Caring for the land and serving people

From: Frazier, Stephanie [mailto:SFrazier@eqt.com]
Sent: Monday, September 28, 2015 3:58 PM
To: O'Dea, Claire B -FS
Cc: 'Pellerin, Tricia'
Subject: Equitrans Expansion Project

Good afternoon Ms. O'Dea;

Equitrans, LP (Equitrans) is planning to construct one new greenfield natural gas compressor station, abandon an existing compressor station, and construct an interconnect with the proposed Mountain Valley Pipeline (MVP) via 7.4 miles of new gas pipeline as part of the proposed Redhook Project (Project). The compressor station will be located in Greene County, PA (the Redhook Compressor Station). New pipeline will traverse through the counties of Wetzel, WV, and Allegheny, Greene, Washington, PA. The proposed compressor station will involve the installation of the following equipment:

- Two (2) turbines for the compression and transmission of natural gas;
- Two (2) engines for the compression and transmission of natural gas;
- Ten (10) microturbines to provide power;
- One (1) tri-ethylene glycol dehydration unit equipped with an associated reboiler and enclosed flare;
- One (1) produced fluids tank and associated loadout;
- Two (2) fuel gas heaters;
- One (1) office building heater;
- Seven (7) miscellaneous storage tanks and associated loadout; and,
- Associated piping and components.

The compressor station will be located in Greene County, PA, which is designated as attainment/unclassifiable for all criteria pollutants except for ozone and PM2.5 (certain areas, but not the proposed location). Furthermore, the state of Pennsylvania is in the Ozone Transport Region (OTR) and therefore the entire state is classified as moderate nonattainment for ozone. Since emissions are expected to remain below the emissions thresholds, the proposed project did not trigger for the Nonattainment New Source Review (NNSR) permitting or Prevention of Significant Deterioration (PSD) permitting programs. The maximum projected potential to emit from the proposed project, with regards to Class I area pollutants of concern are as follows:

NOX – 92.73 tpy
SO2 – 3.24 tpy
PM10 – 18.58 tpy
H2SO4 – Negligible

The purpose of this email is to notify you of the proposed project and ascertain any specific interests you may have in addressing a Class I area review in our Resource Report 9 (RR9), which will be filed with the Federal Energy Regulatory Commission (FERC). The approximate distance to the Class I areas within 250 kilometers (km) to the project sites are as follows:

Otter Creek Wilderness Area: 110 km
Dolly Sods Wilderness Area: 122 km
Shenandoah National Park: 220 km

Based on Section 3.2 of the 2010 Federal Land Managers' Air Quality Related Values (AQRV) Work Group (FLAG) guidance document, the resulting Q (emissions) over D (distance) based on the nearest Class I area is approximately 1.04 for the Redhook Compressor Station. This value is less than the screening Q/D threshold value of 10. Based on the above, the emission levels from the project, and the location of the sites versus these Class I areas, it is estimated that impacts at these Class I areas will be negligible. As such, Equitrans requests confirmation that a Class I area AQRV analysis is not required for this project. Should you have questions on this project, do not hesitate to contact me.

Best,
Stephanie Frazier

Stephanie Frazier
Supervisor Permitting – Environmental
EQT Corporation
625 Liberty Avenue
Suite 1700
Pittsburgh, PA 15222
Office: 412.553.5798

Mobile: 412.925.1446
Fax: 412.395.2156
E-Mail: SFrazier@eqt.com

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Pellerin, Tricia

From:	Ian Donaldson <IDonaldson@trinityconsultants.com>
Sent:	Monday, October 26, 2015 11:02 AM
To:	Pellerin, Tricia
Subject:	FW: Equitrans Expansion Project

Email response from NPS.

From: Frazier, Stephanie [mailto:SFrazier@eqt.com]
Sent: Friday, October 09, 2015 1:49 PM
To: 'Pellerin, Tricia' <Tricia.Pellerin@tetratech.com>; Vince, Georgia (Georgia.Vince@tetratech.com) <Georgia.Vince@tetratech.com>
Cc: Ian Donaldson <IDonaldson@trinityconsultants.com>
Subject: FW: Equitrans Expansion Project

FYI - Steph

Stephanie Frazier
Supervisor Permitting – Environmental, EQT Corporation
T 412.553.5798 / C 412.925.1446

Think Green - Not every email needs to be printed.

From: Stacy, Andrea [mailto:andrea_stacy@nps.gov]
Sent: Monday, October 05, 2015 2:52 PM
To: Shepherd, Don; Frazier, Stephanie
Cc: Holly Salazer; Susan Johnson; Jalyn Cummings
Subject: Re: Equitrans Expansion Project

Hi Stephanie,

Thank you for notifying the NPS of the proposed greenfield compressor station to be located in Greene County, PA. Based on the proposed emissions, as described in your email, and the distance to Shenandoah NP, we do not anticipate the need for a Class I AQRV analysis for this park. Please feel free to contact me if you have any questions, or if the nature of the proposal changes such that a re-evaluation is necessary.

Regards,
Andrea Stacy

On Tue, Sep 29, 2015 at 6:40 AM, Shepherd, Don <don_shepherd@nps.gov> wrote:

---------- Forwarded message ----------
From: **Frazier, Stephanie** <SFrazier@eqt.com>
Date: Mon, Sep 28, 2015 at 1:50 PM
Subject: Equitrans Expansion Project
To: "Holly_Salazar@nps.gov" <Holly_Salazar@nps.gov>
Cc: "Don_Shepherd@nps.gov" <Don_Shepherd@nps.gov>, "Pellerin, Tricia" <Tricia.Pellerin@tetratech.com>

Good afternoon Ms. Salazar;

Equitrans, LP (Equitrans) is planning to construct one new greenfield natural gas compressor station, abandon an existing compressor station, and construct an interconnect with the proposed Mountain Valley Pipeline (MVP) via 7.4 miles of new gas pipeline as part of the proposed Redhook Project (Project). The compressor station will be located in Greene County, PA (the Redhook Compressor Station). New pipeline will traverse through the counties of Wetzel, WV, and Allegheny, Greene, Washington, PA. The proposed compressor station will involve the installation of the following equipment:

- Two (2) turbines for the compression and transmission of natural gas;
- Two (2) engines for the compression and transmission of natural gas;
- Ten (10) microturbines to provide power;
- One (1) tri-ethylene glycol dehydration unit equipped with an associated reboiler and enclosed flare;
- One (1) produced fluids tank and associated loadout;
- Two (2) fuel gas heaters;
- One (1) office building heater;
- Seven (7) miscellaneous storage tanks and associated loadout; and,
- Associated piping and components.

The compressor station will be located in Greene County, PA, which is designated as attainment/unclassifiable for all criteria pollutants except for ozone and PM2.5 (certain areas, but not the proposed location). Furthermore, the state of Pennsylvania is in the Ozone Transport Region (OTR) and therefore the entire state is classified as moderate nonattainment for ozone. Since emissions are expected to remain below the emissions thresholds, the proposed project did not trigger for the Nonattainment New Source Review (NNSR) permitting or Prevention of Significant Deterioration (PSD) permitting programs. The maximum projected potential to emit from the proposed project, with regards to Class I area pollutants of concern are as follows:

NOX – 92.73 tpy

SO2 – 3.24 tpy

PM10 – 18.58 tpy

H2SO4 – Negligible

The purpose of this email is to notify you of the proposed project and ascertain any specific interests you may have in addressing a Class I area review in our Resource Report 9 (RR9), which will be filed with the Federal Energy Regulatory Commission (FERC). The approximate distance to the Class I areas within 250 kilometers (km) to the project sites are as follows:

Otter Creek Wilderness Area: 110 km

Dolly Sods Wilderness Area: 122 km

Shenandoah National Park: 220 km

Based on Section 3.2 of the 2010 Federal Land Managers' Air Quality Related Values (AQRV) Work Group (FLAG) guidance document, the resulting Q (emissions) over D (distance) based on the nearest Class I area is approximately 1.04 for the Redhook Compressor Station. This value is less than the screening Q/D threshold value of 10. Based on the above, the emission levels from the project, and the location of the sites versus these Class I areas, it is estimated that impacts at these Class I areas will be negligible. As such, Equitrans requests confirmation that a Class I area AQRV analysis is not required for this project. Should you have questions on this project, do not hesitate to contact me.

Best,

Stephanie Frazier

Stephanie Frazier

Supervisor Permitting – Environmental

EQT Corporation

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E-Mail: SFrazier@eqt.com

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Don Shepherd
National Park Service
Air Resources Division
12795 W. Alameda Pkwy.
Lakewood, CO 80228
Phone: 303-969-2075
Fax: 303-969-2822
E-Mail: don_shepherd@nps.gov
"the man who really counts in the world is the doer, not the mere critic" TR 1891

--
Andrea Stacy
National Park Service
Air Resources Division
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Denver, CO 80225
andrea_stacy@nps.gov
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303-969-2822 (Fax)

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Pellerin, Tricia

From: Frazier, Stephanie <SFrazier@eqt.com>
Sent: Monday, September 28, 2015 3:51 PM
To: elhuffman@fs.fed.us
Cc: Pellerin, Tricia
Subject: Equitrans Expansion Project

Good afternoon Mr. Hoffman;

Equitrans, LP (Equitrans) is planning to construct one new greenfield natural gas compressor station, abandon an existing compressor station, and construct an interconnect with the proposed Mountain Valley Pipeline (MVP) via 7.4 miles of new gas pipeline as part of the proposed Redhook Project (Project). The compressor station will be located in Greene County, PA (the Redhook Compressor Station). New pipeline will traverse through the counties of Wetzel, WV, and Allegheny, Greene, Washington, PA. The proposed compressor station will involve the installation of the following equipment:

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Best,
Stephanie Frazier

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Supervisor Permitting – Environmental
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Equitrans Expansion Project

Docket No. CP16-   -000

Resource Report 9

Appendix 9-G
Noise Report Supplemental Data

NOISE IMPACT ANALYSES REPORT

Equitrans, LP > Redhook Compressor Station

Prepared By:

TRINITY CONSULTANTS
885 Don Mills Road, Suite 106
Toronto, Ontario
M3C 1V9
416-391-2527

October 16, 2015

Project 152101.0029

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TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

Equitrans, LP (Equitrans) is planning to construct a new natural gas transmission facility in Franklin Township, Greene County, Pennsylvania (Redhook Compressor Station). The proposed Redhook Compressor Station will be comprised of two (2) natural gas-fired compressor engines, two (2) natural gas-fired turbines, two (2) Microturbines assemblies, and other ancillary units. As part of this project, Equitrans is proposing to install 7.6 miles of pipeline. While most of the pipeline will be installed using a trench-and-cover method, horizontal directional drilling (HDD) operations are proposed to occur at two locations along the pipeline installation. These HDD locations are referred to as the H316 HDD site and the Monongahela ("Mon" or H318) HDD site.

Equitrans contacted Trinity Consultants (Trinity) to determine the impacts of noise at the noise sensitive areas (NSAs, such as schools, hospitals, or residences) resulting from:

- Construction of the compressor station
- HDD activities
- Operation of the compressor station

Noise impact analyses is required by Title 18, Part 380, Section 12(k)(2) of the Code of Federal Regulations [18 CFR 380.12(k)(2)], and is a mandatory component of Resource Report 9, part of the application to the Federal Energy Regulatory Commission (FERC) for certification of the Redhook Compressor Station.

This report has been prepared to detail the results of the following tasks conducted for the new Redhook compressor station:

- Estimate the noise impact at the NSAs from the operation of the Station, and determine the noise control measures so that the Station meets the applicable sound criteria
- Estimate the noise impacts at the NSAs during the construction and installation activities
- Estimate the noise impacts at the NSAs during HDD activities, and if necessary, identify noise control or mitigation measures

The noise impact analyses in this report are based on the regulatory standards and ambient sound level monitoring results in the "Ambient Sound Monitoring Report", July 2015, prepared by Trinity.

2. DESCRIPTION OF NOISE SOURCES

2.1. COMPRESSOR STATION

It is anticipated that the Redhook Compressor Station will consist of one building to house the two (2) natural gas-fired Caterpillar G3616 compressor engines, each rated for a power output of 5,350 hp, and one building to house the two (2) natural gas-fired Solar Taurus 70 turbines, each rated for a power output of 11,311 hp. The site will also consist of a valve/metering station yard, and other ancillary equipment such as generators, and blowdown vents.

Table 2-1 identifies the significant sources of noise expected during the operation of the compressor station and any proposed noise control measures. The dominant noise sources at the Station are anticipated to include:

- Mechanical noise from two (2) turbine units that are radiated through the walls, roof, and ventilation openings of the turbine building
- Intakes and exhausts for the turbine
- Mechanical noise from two (2) compressor units that are radiated through the walls, roof, and ventilation openings of the compressor building
- Intakes and exhausts for the compressor
- Blowdown noise from normal shutdown events of the compressors and turbines
- Aboveground piping and valves

Sources of noise considered to have insignificant impacts relative to the significant source identified in Table 2-1 were not assessed in this report, and include:

- Pneumatic starting systems for the turbines and compressors were considered to have insignificant impacts due to the starting systems being equipped with a silencer and being located inside an acoustically insulated building.
- Blowdown vents for emergency shutdown (ESD) of the compressors and turbines are not equipped with a silencer. However, ESD events occur once per year as a scheduled test, with a duration of 10 minutes. Blowdown vents for ESD events are considered to have insignificant impacts due to infrequent use and the short duration of each event.

2.2. CONSTRUCTION NOISE

Construction activities associated with the compressor station can be categorized into the following five phases based on schedule of operations and the type of construction equipment used:

- **Site Preparation** which includes removal of existing residential dwellings and vegetation
- **Earthmoving** which includes excavation, grading and filling
- **Concrete Pouring**
- **Structural Erection**, which involves steel erection, construction of building framework, and welding
- **Equipment Installation and Building Finishing**, which involves installation of mechanical and electrical equipment, and completion of buildings

Table 2-2 identifies the type, quantity and operating hours of construction equipment that can be expected over the course of the construction of the compressor station.

Based on a review of the quantity and sound power level of the equipment that is likely to be used at the site, it was determined that the earthmoving phase had the potential to cause the highest noise impact at the NSAs. The predominant source of noise from the earthmoving activities are the internal combustion engines of the construction equipment.

Table 2-1. Significant Operational Noise Sources From Compressor Station

Source ID	Description	Quantity	Data Source	Manufacturer	Model	Noise Control Measures [1]
1	T70 Turbine Unenclosed Package	1	Manufacturer Data	Solar	Taurus 70	Located Inside Acoustically Insulated Building
2	T70 Turbine Building - Sidewall Exhaust Fan	4	Equitrans	--	--	
3	T70 Turbine Intake	2	Manufacturer Data	--	--	Silencer
4	T70 Turbine Exhaust	2	Manufacturer Data	Solar Taurus	--	Silencer
5	T70 Turbine Lube Oil Cooler	2	Manufacturer Data	Moore Fans	Class 10000 EC Series 24	
6	T70 Turbine Gas Cooler Fan (2 fans)	4	Manufacturer Data	Moore Fans	1060/M94-W0-A/60R-AM-9-13.00-4	
7	G3616 Compressor Unenclosed Package	1	Manufacturer Data	Caterpillar	G3616	Located Inside Acoustically Insulated Building
8	G3616 Compressor Building - Sidewall Intake Fan	4	Estimated [2]	--	--	
9	G3616 Compressor Intake	4	Manufacturer Data [3]	--	--	Silencer
10	G3616 Compressor Exhaust	2	Manufacturer Data	--	--	Silencer
11	G3616 Compressor Utility Coolers	2	Manufacturer Data	Moore Fans	1036/M94-W0-A/36R-AM-9-11.00-4	
12	G3616 Compressor Process Coolers (2 fans)	4	Manufacturer Data	Moore Fans	1072/M94-W0-A/72R-AM-9-14.00-4	
14	MicroTurbine C1000 Generator	2	Manufacturer Data	MicroTurbine	Capstone C1000	Silencer
15	Above-Ground Piping and Valves	Multiple	Equitrans	--	--	Acoustical Lagging
16	Blowdown Vent – Normal Unit Shutdown	4	Equitrans	--	--	Silencer

[1] Noise control measures listed include controls as proposed by Equitrans and controls as required based on acoustic analyses.

Table 2-2. Construction Equipment & On-Site Vehicles During Earthmoving Phase

Description	Typical Hours of Operation	Quantity
Air Compressor	12	2
Backhoe	12	2
Bobcat	12	3
Compactor, vibratory	12	1
Dozer	12	3
Dump Truck	12	3
Excavator	12	2
Front-end Loader	12	1
Generator	12	4
Roller	12	2
Trackhoe	12	2

2.3. PIPELINE INSTALLATION

Equitrans is proposing to install 7.6 miles of pipeline as part of this project. While most of the pipeline will be installed using a trench-and-cover method, HDD operations are proposed to occur at two locations along the pipeline installation.

2.3.1. Trench-and-Cover

The trench-and-cover method of pipeline installation involves digging a trench, lowering the pipelines, and backfilling. The predominant source of noise associated with trench-and-cover pipeline installation are associated with the internal combustion engines of the construction equipment.

Trench-and-cover pipeline installation typically occurs for a few days at any given location. Noise impacts at NSAs from the trench-and-cover pipeline installation is, therefore, expected to be short-term and temporary, and is not expected to adversely affect any NSAs along this route. No further impact assessment of the trench-and-cover pipeline installation have been made in this report.

2.3.2. Horizontal Direction Drilling (HDD)

Pipeline will be installed using HDD at two separate sections. General operational phases associated with HDD drilling include:

- <u>Pilot Hole Drilling</u> which involves drilling a small diameter pilot hole along the pre-set pipeline pathway from the HDD Entry Point to the HDD Exit Point
- <u>Reaming</u> which involves enlarging the pilot hole to a diameter larger than pipeline from the Exit Point to the Entry Point
- <u>Pipeline Installation</u> which involves pulling the pipeline through the enlarged hole from the Exit Point to the Entry Point

Table 2-3 identifies the anticipated equipment associated with maximum operating scenario for HDD entry and exit points. HDD operations can occur up to 24 hours per day.

Table 2-3. Construction Equipment Associated with HDD

Construction Equipment	Quantity
Entry Point	
HDD Drill Rig & engine-driven hydraulic power unit	1
Mud Unit with engine-driven pump and engine-driven generator set	1
Generator	1
Air Compressor	1
Crane, Wheeled	1
Pump	1
Excavator	2
Exit Point	
Mud Unit with engine-driven pump and engine-driven generator set	1
Generator	1
Pump	1
Excavator / Sideboom	2

3.1. LDN CALCULATIONS

The U.S. Environmental Protection Agency ("EPA") established a day-night sound level (L_{dn}) of 55 dBA as the sound level that should not be exceeded to protect public health and welfare. The L_{dn} is defined as the equivalent sound level (L_{eq}) for a 24-hour period with a 10 dBA weighting applied to the L_{eq} for the nighttime hours (10 p.m. to 7 a.m.) to compensate for increased sensitivity during the nighttime period.

For a facility that emits constant sound levels over a 24-hour period, the L_{eq} at any NSA must not exceed 48.5 dBA in order for the facility to meet the L_{dn} of 55 dBA.

The L_{dn} can be calculated using the following equation:

$$L_{dn} = 10\log_{10}\left(\frac{15}{24}10^{\frac{L_{Aeq(day)}}{10}} + \frac{9}{24}10^{\frac{L_{Aeq(night)}+10}{10}}\right)$$

3.2. SOUND PROPOGATION MODEL

Noise impacts at the NSAs were determined using computer model Cadna-A (Computer Aided Noise Abatement, Version 4.4.145), a noise modeling software developed by DataKustik GmbH. The model is based on International Standards Organization (ISO) Standard 9613-2 "Acoustics – Attenuation of Sound During Propagation Outdoors". The model evaluates the A-weighted sound pressure levels of each noise source at each identified receptor. The ISO-based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures, topography and brush. The model is considered conservative since it represents atmospheric conditions that promote propagation of sound from source to receiver.

The absorption of sound by the ground as the sound propagates from the emitting source is influenced by vegetation type, ground cover and the density and height of foliage. Attenuation by ground absorption is inputted into the model based on a numerical value between 0 and 1, where "0" indicates acoustically hard, reflective surfaces, and "1" indicates soft, absorptive ground. A ground absorption coefficient of 0.7 was used in the model for the intervening land between the compressor station property line and the NSAs; these intervening areas consist of deciduous forests and open fields. A ground absorption of 0 was conservatively used for the entire compressor station property.

3.3. MODEL SET-UP

3.3.1. Compressor Station Operation

A three-dimensional noise model was constructed in Cadna-A based on the latest available site plans for the compressor station.

The A-weighted, unattenuated sound power levels were inputted in the model, and were based on manufacturer or estimated data. The noise sources were assigned in the model as follows:

- stacks as point sources
- sidewall exhausts (turbine building) and sidewall intakes (compressor building)as point sources with the applicable directivity
- roof and roof-top ventilator as area sources
- walls as vertical area sources
- noise radiating from pipelines as line sources

The model was used to assess the impact of the compressor station at the NSAs, and if applicable, determine the minimum noise mitigation scenario to meet the noise criteria.

3.3.2. Construction Noise

The noise from construction equipment was modeled in Cadna-A as an area source covering the impacted area within which all of the construction equipment identified in Table 2-2 would operate. The movement of on-site vehicles were modeled as a moving point source around the footprint of the compressor station.

3.3.3. HDD Activities

Each HDD entry and exit point was modeled as a point source having an A-weighted sound power level equal to that of the combined noise from all construction equipment identified in Table 2-3.

The model was used to assess the impact of the HDD activities, and as necessary, determine the mitigation measures to meet the FERC criteria.

4.1. COMPRESSOR STATION OPERATION

4.1.1. Noise Impact Analyses

The A-weighted sound power levels of each significant noise source associated with the compressor station were inputted in the model. The acoustical analyses were performed using manufacturer or supplier noise data provided by Equitrans for the significant noise sources.

Equitrans provided the specifications for noise controls (e.g. silencer) selected, or the post-control sound levels. Where noise controls specifications were provided, the attenuated sound power levels were calculated for input to the model. Table 4-1 summarizes the sound power level for each of the significant noise sources.

4.1.1.1. FERC Criteria

Based on the sound power levels identified in Table 4-1 with the attenuation as described in Section 4.1.2, the modeled noise impact at the NSAs from the compressor station is well below the FERC L_{dn} of 55 dBA, as shown in Table 4-2. Table 4-2 also identifies the predicted change in ambient L_{dn} due to the compressor station over the existing ambient L_{dn} to be imperceptible at three NSAs (NSAs 1, 2, and 4), and minimal at NSA 3.

Refer to Appendix B for an isopleth showing the L_{dn} associated with the operation of the compressor station.

4.1.1.2. Franklin Township Ordinance

Franklin Township Zoning Ordinance identifies the maximum sound pressure levels in each standard octave band that are required to be met at the property line of the industrial use that is the origin of the noise. The Township noise criteria and the maximum sound pressure levels at the compressor station's property line are summarized in Table 4-3.

Sound pressure levels higher than the Township's criteria are predicted to occur along the compressor station's property line for some of the standard octave bands. The land uses of the properties in immediate proximity of the station are as follows:

- To the north are properties used for a communications tower and a compressor station
- To the southwest are forest cover extending more than 600 feet from the property line
- To the southeast is Jefferson Road and some open grass fields

Although the station is predicted to have sound levels higher than the Township's noise criteria at the station's property line, adverse impact to the community is not expected based on the land use of the surrounding properties, and mitigation measures to meet the Township's noise criteria have not been proposed.

Table 4-1. Sound Pressure Level (SPL) Sound Power Level (PWL) of Significant Noise Sources at Compressor Station

Description	Sound Pressure Levels (dBA)										SPL Distance	Sound Power Levels (dBA)									
	31.5	63	125	250	500	1000	2000	4000	8000	Overall	(ft)	31.5	63	125	250	500	1000	2000	4000	8000	Overall
T70 Turbine Unenclosed Package [1]	91.0	91.0	100.0	100.0	104.0	102.0	110.0	104.0	101.0	113.0	3.3	98.8	98.8	107.8	107.8	111.8	109.8	117.8	111.8	108.8	120.8
T70 Turbine Building – Sidewall Exhaust	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
T70 Turbine Intake – Attenuated [2]	-	-	-	-	-	-	-	-	-	45.0	800.0	-	-	-	-	-	-	-	-	-	100.5
T70 Turbine Exhaust - Attenuated [3]	27.6	39.0	34.0	36.0	33.0	33.0	35.0	32.0	33.0	44.1	200.0	71.1	82.5	77.5	79.5	76.5	76.5	78.5	75.5	76.5	87.6
T70 Turbine Lube Oil Cooler	-	30.5	39.5	43.5	44.5	45.5	40.5	34.5	26.5	50.4	50.0	-	61.9	70.9	74.9	75.9	76.9	71.9	65.9	57.9	81.9
T70 Turbine Gas Cooler Fans	-	40.0	49.0	53.0	54.0	55.0	50.0	44.0	36.0	59.9	16	-	61.6	70.6	74.6	75.6	76.6	71.6	65.6	57.6	81.5
G3616 Compressor Unenclosed Package [4]	-	-	-	-	-	-	-	-	-	-	-	-	-	104.7	111.2	116.3	122.6	125.8	127.7	117.9	131.0
G3616 Compressor Building – Sidewall Intake	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
G3616 Compressor Intake – Unattenuated [5]	-	-	-	-	-	-	-	-	-	-	-	61.0	74.0	83.9	93.9	99.9	108.0	113.8	125.2	124.5	128.1
G3616 Compressor Intake – Attenuated	-	-	-	-	-	-	-	-	-	-	-	37.0	46.0	43.9	89.9	60.9	71.0	77.8	91.2	91.5	95.8
G3616 Compressor Exhaust - Unattenuated	-	-	-	-	-	-	-	-	-	-	-	81.0	102.2	114.6	117.1	123.7	130.0	136.0	140.9	138.1	143.8
G3616 Compressor Exhaust – Attenuated	-	-	-	-	-	-	-	-	-	-	-	64.0	72.2	67.6	67.1	78.7	84.0	89.0	93.9	91.1	96.9
G3616 Compressor Utility Coolers	-	34.7	43.7	47.7	48.7	49.7	44.7	38.7	30.7	54.6	50.0	-	66.2	75.2	79.2	80.2	81.2	76.2	70.2	62.2	86.1
G3616 Compressor Process Coolers	-	38.4	47.4	51.4	52.4	53.4	48.4	42.4	34.4	58.3	50.0	-	69.9	78.9	82.9	83.9	84.9	79.9	73.9	65.9	89.8
MicroTurbine C1000 Generator – Attenuated [6]	-	-	-	-	-	-	-	-	-	65.0	32.8	-	-	-	-	-	-	-	-	-	92.8
Above-Ground Piping and Valves - Unattenuated	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0
Blowdown Silencer – Normal Unit Shutdown	-	-	-	-	-	-	-	-	-	85.0	3.0	-	-	-	-	-	-	-	-	-	92.0

[1] Unenclosed turbine packages will be located in an acoustically insulated turbine building.

[2] Unsilenced noise data for the T70 Turbine Intake was not provided.

[3] Unsilenced noise data for the T70 Turbine Exhaust was not provided.

[4] Unenclosed compressor packages will be located in an acoustically insulated compressor building.

[5] Unattenuated intake sound power levels for G3616 compressor intake were obtained from Caterpillar technical data sheet.

[6] Unsilenced noise data for the C-1000 generator was not provided.

Table 4-2. Compressor Station Sound Level Predictions – FERC Criteria

NSA	Distance to NSA from Compressor Building (ft)	Direction of NSA from Compressor Building	Existing Ambient Background L_{dn} (dBA)	Estimated L_{dn} from Station (dBA)	Estimated Total L_{dn} (dBA)	Predicted Change from Existing Ambient L_{dn} (dB)
NSA-1	3300	SW	50.5	37.3	50.7	+0.2
NSA-2	2300	SW	56.1	40.4	56.2	+0.1
NSA-3	1900	NW	47.3	46.2	49.8	+2.5
NSA-4	850	E	66.6	51.2	66.7	+0.1

Table 4-3. Compressor Station Sound Level Predictions – Township Ordinance

	Octave Bands (Hz)								
	31.5	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Township Ordinance – Noise Performance Standards									
Property Line Standard, dB	60	60	60	60	40	40	40	30	30
Property Line Standard, dBA	20.6	34.0	44.0	51.0	37.0	40.0	41.0	31.0	29.0
Sound Levels at Property Line									
North Property Line, dBA	--	--	41.4	42.0	43.9	47.3	45.9	44.9	28.3
Southwest Property Line, dBA	--	--	49.5	50.3	52.1	55.4	58.2	63.5	59.2
Southeast Property Line, dBA	--	--	37.7	37.8	39.8	43.6	42.4	40.8	19.7

4.1.2. Noise Mitigation Measures

The Station is expected meet the FERC L_{dn} criteria of 55 dBA at the NSAs through the implementation of the noise controls outlined in this section.

4.1.2.1. Turbine and Compressor Building Structure

Two buildings are proposed for the site: one to enclose the two compressor units and one to enclose the two turbine units.

The roof and walls of both buildings should have a minimum Sound Transmission Class (STC) of 40, with the interior surface of the building having a minimum Noise Reduction Coefficient (NRC) of 0.65. The roof-mounted ventilators should be a minimum of STC-30. All personnel doors should be a minimum of STC-20 with tight perimeter seals.

4.1.2.2. Turbine and Compressor Building Ventilation

The turbine building is proposed to consist of four general ventilation exhausts located in the walls, and three roof-top vents. The sound levels of the sidewall exhausts should not exceed 85 dBA at 3 feet. The roof-mounted vents are proposed to be a minimum of STC-30.

The compressor building is proposed to consist of four general ventilation air intake fans on the northeast façade of the building, and five roof-top vents. The sound pressure levels from the sidewall air intakes should not exceed 85 dBA at 3 feet. The roof-mounted vents are proposed to be a minimum of STC-30.

4.1.2.3. Turbine Intake

The turbine air intake system is proposed to be equipped with a silencer having the following insertion losses:

Estimated IL Values (dB) for Turbine Air Intake System

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	4	11	25	38	47	55	68	90	80

With this silencer, the attenuated sound pressure level of the turbine air intake system was provided to be 45 dBA at 800 feet, and noted to require a Splitter, a 48" and Donasonic.

4.1.2.4. Turbine Exhaust

The turbine exhaust system is proposed to be equipped with a silencer that will have an attenuated sound pressure level of 45 dBA at 200 feet, and having the following attenuated acoustic performance:

Acoustic Performance of Attenuated Turbine Exhaust System at 200 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	67	65	50	45	36	33	34	31	34

This information is based on a silencer designed by Mueller Environmental Designs Inc. for an identical turbine (Taurus 70) at another Equitrans compressor station. Insertion losses were not made available at the preparation of this report. Based on the acoustic analyses for the Redhook compressor station, this proposed silencer was determined to be sufficient for the station.

4.1.2.5. Turbine Lube Oil Coolers

The proposed lube oil cooler has the following sound pressure levels provided by the manufacturer, with an overall SPL of 50.5 dBA at 50 feet.

Sound Pressure Levels (dB) of Lube Oil Cooler at 50 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	56.5	55.5	52.5	47.5	45.5	39.5	33.5	27.5

Based on the acoustic analyses for the Redhook compressor station, this proposed lube oil cooler was determined to be sufficient for the station.

4.1.2.6. Turbine Gas Coolers

The proposed gas cooler has the following sound pressure levels provided by the manufacturer for two fans, with an overall SPL of 60 dBA at 16 feet.

Sound Pressure Levels (dB) of Gas Cooler (2 fans) at 16 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	66.0	65.0	62.0	57.0	55.0	49.0	43.0	37.0

Based on the acoustic analyses for the Redhook compressor station, this proposed gas cooler was determined to be sufficient for the station.

4.1.2.7. Compressor Intake

Each air intake for the compressor is proposed to be equipped with a silencer having the following insertion losses:

Estimated IL Values (dB) for Compressor Air Intake

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB		5	10	20	30	40	45	37	35

Silenced sound power levels were calculated using the unsilenced noise data obtained from Caterpillar and the insertion loss values specified above.

4.1.2.8. Compressor Exhaust

The compressor exhaust system is proposed to be equipped with a hospital-enhanced silencer that will have the following insertion losses:

Estimated IL Values (dB) for Compressor Air Exhaust System

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	17.0	30.	47.0	50.0	45.0	46.0	47.0	47.0	47.0

Based on the acoustic analyses for the Redhook compressor station, this proposed silencer was determined to be sufficient for the station.

4.1.2.9. Compressor Utility Coolers

The proposed utility cooler has the following sound power levels provided by the manufacturer for two fans, with an overall SPL of 54.7 dBA at 50 feet.

Sound Pressure Levels (dB) of Gas Cooler (2 fans) at 50 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	60.7	59.7	56.7	51.7	49.7	43.7	37.7	31.7

Based on the acoustic analyses for the Redhook compressor station, this proposed utility cooler was determined to be sufficient for the station.

4.1.2.10. Compressor Process Coolers

The proposed process (gas) cooler has the following sound power levels provided by the manufacturer for two fans, with an overall SPL of 58.4 dBA at 50 feet.

Sound Pressure Levels (dB) of Process Cooler (2 fans) at 50 feet

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	64.4	63.4	60.4	55.4	53.4	47.4	41.4	35.4

Based on the acoustic analyses for the Redhook compressor station, this proposed process cooler was determined to be sufficient for the station.

4.1.2.11. Capstone C-1000

The Capstone C-1000 generator enclosure, consisting of five C-200 generator units, were noted to have an overall attenuated sound pressure level of 65 dBA at 10 metres. Each C-200 microturbine exhaust will be equipped with a silencer having the following insertion losses:

Estimated IL Values (dB) for Each C-200 MicroTurbine Exhaust

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	0	10	15	30	35	35	35	30

4.1.2.12. Aboveground Piping and Valves

Assessment of the aboveground piping and valves were based on an expected sound pressure level of 85 dBA at 3 feet provided by Equitrans. Acoustic insulation meeting the specifications of ISO 15665:2003 Class 3 is required on the aboveground suction and discharge piping from the filter-separator to the intake of the gas aftercoolers. All outdoor valves should be covered with removable acoustical.

4.1.2.13. Blowdown Vents – Normal Unit Shutdown

The blowdown vents for normal unit shutdown were proposed to be equipped with silencer having the following insertion loss values.

Estimated IL Values (dB) for Blowdown Silencer

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	2	5	7	15	20	20	15	13

The attenuated sound pressure level of the noise emitted though the blowdown silencer was provided to be 85 dBA at 3 feet.

4.1.2.14. Pneumatic Starting System

The pneumatic starting systems for the compressor units are proposed to be equipped with a silencer having the following insertion loss values:

Estimated IL Values (dB) for Pneumatic Starting System

Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
dB	-	2	5	7	15	20	20	15	13

The pneumatic starting systems for the turbine units will be equipped with silencer having minimum insertion losses similar to the silencer for the compressor starting system. The pneumatic starting systems with the silencer are proposed to be located inside an acoustically insulated building. Based on the combination of the pneumatic starting system being equipped with a silencer and it being located inside an acoustically insulated building, the attenuated noise levels from the pneumatic starting system was considered to be insignificant.

4.2. CONSTRUCTION NOISE

As previously indicated, it was considered that the earthworking phase had the potential to cause the highest noise impact at the NSAs. The predominant source of noise from the construction activities would be the internal combustion engines of the construction equipment.

The noise from construction equipment was modeled in Cadna-A as an area source covering the impacted area within which all of the construction equipment identified in Table 4-4 would potentially operate simultaneously. Based on the acoustic modeling, one of the four NSAs was found to be impacted with an L_{dn} higher than the FERC criteria of 55 dBA, as summarized in Table 4-5. The L_{dn} at NSA 4 due to construction activities was determined to be 58.9 dBA. Although this maximum L_{dn} is higher than FERC's L_{dn} criteria of 55 dBA, the construction noise will be temporary and intermittent. Further, the estimated Ldn at NSA 4 resulting from construction activities is less than the existing ambient L_{dn}, and the predicted increase over the existing ambient Ldn is only 0.8 dBA. The construction noise is not considered to have an adverse impact at NSA 4.

Table 4-4. Estimated SPLs of Construction Activities Potentially Used During Earthmoving Phase

Equipment	Quantity	Typical Daily Operating Hours [1] (Hours per Day)	Sound Pressure Level (SPL) [2] (dBA)	Distance of SPL [2] (ft)	PWL [3] (dBA)
CONSTRUCTION EQUIPMENT					
Air Compressor	2	12	78	50	109.5
Backhoe	2	12	78	50	109.5
Bobcat [4]	3	12	70.7	23	95.4
Compactor, vibratory	1	12	82	50	113.5
Dozer	3	12	82	50	113.5
Excavator	2	12	81	50	112.5
Front-end Loader	1	12	79	50	110.5
Generator	4	12	81	50	112.5
Roller	2	12	80	50	111.5
Trackhoe	2	12	81	50	112.5
TOTAL	-	-	-	-	121.5
ON-SITE VEHICLES					
Dump Truck	3	12	76	50	107.5

[1] Anticipated construction hours of 7 AM to 7 PM

[2] Sound pressure levels obtained from FHWA Construction Noise Handbook *(https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm)*

[3] Construction equipment considered to operate continuously for the 12-hour operating period. Usage factor was not applied.

[4] Measured sound pressure level from a previous Trinity project.

Table 4-5. Estimated Impact at NSAs Due to Construction Activities

NSA	Distance to NSA from Compressor Building (ft)	Direction	Existing Ambient Background L_{dn} (dBA)	Estimated Maximum L_{dn} From Construction Activities (dBA)	Estimated Total L_{dn} (dBA)	Predicted Change from Existing Ambient L_{dn} (dBA)
NSA-1	3300	SW	50.5	44.1	51.4	+0.9
NSA-2	2300	SW	56.1	47.4	56.6	+0.5
NSA-3	1900	NW	47.3	52.6	53.7	+6.4
NSA-4	850	E	66.6	59.6	67.4	+0.8

4.3. HDD ACTIVITIES

Sound power levels for equipment used at HDD entry and exit points are provided in Tables 4-6 and 4-7. It was conservatively assumed that all equipment operate continuously and simultaneously for the period assessed. Assessment was conducted based on a 12-hour daytime operation and a 24-hour operation to provide the drilling contractor with flexibility.

Tables 4-8 and 4-9 provide L_{dn} NSAs near the H-316 HDD Entry and Exit points, respectively. Tables 4-10 and 4-11 provide the Ldn at NSAs near H-318 HDD Entry and Exit points, respectively. For each of the two HDD location, and for both entry and exit points, a 12-hour daytime only and a 24-hour operating scenario were assessed. The following two noise mitigation options were assessed for each HDD location, and for both the HDD Entry and Exit points:

- **Noise Mitigation 1**: All combustion engines will be fitted with a residential-grade exhaust muffler. This is expected to reduce the impact at the NSAs by approximately 10 dB.
- **Noise Mitigation 2:** A temporary acoustical sound wall (acoustical barrier blanket), or equivalent, will be installed along the perimeter of the HDD entry and/or exit points to a height of 16 feet, and be located as close to the construction equipment as possible, particularly the drill rig. This acoustical blanket is typically rated for STC-25, but has been conservatively considered to have a reduction of 20 dB in this assessment.

Where necessary, HDD operations can meet the FERC criteria of 55 dBA by implementing one or both of the two mitigation measures identified above.

Table 4-6. Estimated SPLs of Equipment at HDD Entry

Construction Equipment	Sound Pressure Level (SPL) [1] (dBA)	Distance of SPL [1] (ft)	Sound Power Level (PWL) [2] (dBA)
HDD Drill Rig & engine-driven hydraulic power unit	85	50	116.5
Mud Unit with engine-driven pump and engine-driven generator set	82	50	113.5
Generator	81	50	112.5
Air Compressor	80	50	111.5
Crane, Wheeled	83	50	114.5
Pump	77	50	108.5
Excavator	85	50	116.5
Excavator	85	50	116.5
TOTAL PWL			**123.5**

[1] Sound pressure levels obtained from FHWA Construction Noise Handbook
(https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm)

[2] Construction equipment considered to operate continuously for the 12-hour operating period. Usage factor was not applied

Table 4-7. Estimated SPLs of Equipment at HDD Exit

Construction Equipment	Sound Pressure Level (SPL) [1] (dBA)	Distance of SPL [1] (ft)	Sound Power Level (PWL) [2] (dBA)
Mud Unit with engine-driven pump and engine-driven generator set	82	50	113.5
Generator	81	50	112.5
Pump	77	50	108.5
Excavator/Sideboom	85	50	116.5
Excavator/Sideboom	85	50	116.5
TOTAL PWL			**121.3**

[1] Sound pressure levels obtained from FHWA Construction Noise Handbook
(https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm)

[2] Construction equipment considered to operate continuously for the 12-hour operating period. Usage factor was not applied

Table 4-8. Estimated Impact from HDD Activities at H-316 HDD Entry

Construction Equipment	L_{dn} at NSA		
	NSA-W (dBA)	NSA-N (dBA)	NSA-E (dBA)
Daytime Operation Only [1]			
Unmitigated Impact	58.6	61.5	58.6
Noise Mitigation Option 1	48.6	51.5	48.6
24-Hour Operation			
Unmitigated Impact	68	70.9	68
Noise Mitigation Option 1	58	60.9	58
Noise Mitigation Option 2	48	50.9	48

[1] Daytime operation from 7 AM to 7 PM

Table 4-9. Estimated Impact from HDD Activities at H-316 HDD Exit

Construction Equipment	L_{dn} at NSA	
	NSA-N (dBA)	NSA-SW (dBA)
Daytime Operation Only [1]		
Unmitigated Impact	56.5	51.4
Noise Mitigation Option 1	46.5	41.4
24-Hour Operation		
Unmitigated Impact	65.9	60.8
Noise Mitigation Option 1	55.9	50.8
Noise Mitigation Option 2	45.9	40.8

[1] Daytime operation from 7 AM to 7 PM

Table 4-10. Estimated Impact at NSAs Due to HDD Activities at H-318 HDD Entry

Construction Equipment	L_{dn} at NSA NSA-W (dBA)
Daytime Operation Only [1]	
Unmitigated Impact	73.2
Noise Mitigation Option 1	63.2
Noise Mitigation Option 2	53.2
24-Hour Operation	
Unmitigated Impact	82.6
Noise Mitigation Option 1	72.6
Noise Mitigation Option 2	62.6
Noise Mitigation Option 1 & 2	52.6

[1] Daytime operation from 7 AM to 7 PM

Table 4-11. Estimated Impact at NSAs Due to HDD Activities at 318 HDD Exit

Construction Equipment	L_{dn} at NSA		
	NSA-N1 (dBA)	NSA-N2 (dBA)	NSA-S (dBA)
Daytime Operation Only [1]			
Unmitigated Impact	55.4	60.6	68.9
Noise Mitigation Option 1	45.4	50.6	58.9
Noise Mitigation Option 2	35.4	40.6	48.9
24-Hour Operation			
Unmitigated Impact	64.8	70	78.3
Noise Mitigation Option 1	54.8	60	68.3
Noise Mitigation Option 2	44.8	50	58.3
Noise Mitigation Option 1 & 2	34.8	40	48.3

[1] Daytime operation from 7 AM to 7 PM

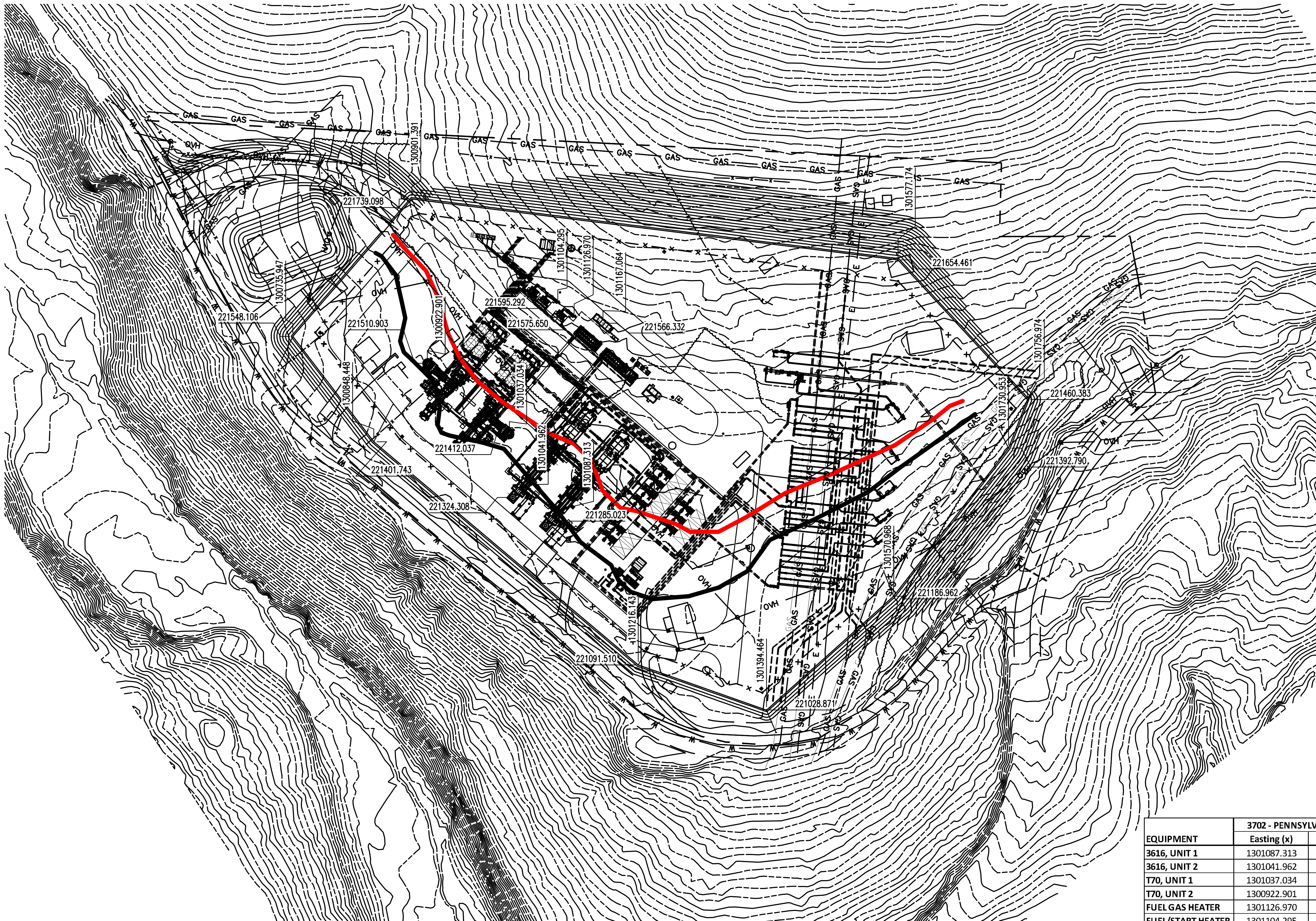
5. CONCLUSION

The noise impacts at the NSAs from the compressor station operation is predicted to be well below the FERC L_{dn} criteria of 55 dBA. The predicted increase in the ambient L_{dn} sound level due to the operation of the compressor station is imperceptible at three NSAs (under 0.5 dBA), and minimal at NSA 3 (2 dBA). Although the station is predicted to have sound levels higher than the Township's noise criteria at the station's property line, adverse impact to the community is not expected based on the non-residential land use of the surrounding properties; therefore, mitigation measures to meet the Township's noise criteria have not been proposed.

The L_{dn} associated with the construction activities at three of the four NSAs are below the FERC criteria of 55 dBA. At NSA-4, the L_{dn} from the construction activities (59.6 dBA) is lower than the existing ambient L_{dn} of 66.6 dBA; therefore, no adverse impacts are anticipated at the NSAs from construction noise.

HDD operations can occur on a 12-hour daytime operating schedule or on a 24-hour operating schedule if the identified mitigation measures are implemented for each operating scenario.

APPENDIX A: SITE PLANS



EQUIPMENT	3702 - PENNSYLVANIA SOUTH		DEGREES	
	Easting (x)	Northing (y)	Latitude	Longitude
3616, UNIT 1	1301087.313	221285.023	39.9160954	-80.1296017
3616, UNIT 2	1301041.962	221324.308	39.9161999	-80.1297671
T70, UNIT 1	1301037.034	221412.037	39.9164402	-80.1297930
T70, UNIT 2	1300922.901	221510.903	39.9167031	-80.1302093
FUEL GAS HEATER	1301126.970	221575.650	39.9168959	-80.1294883
FUEL/START HEATER	1301104.295	221595.292	39.9169481	-80.1295709
C1000 GENERATOR	1301167.064	221566.332	39.9168733	-80.1293445

Plotted by: Owens, Joshua on: August 5, 2015 - 11:09 AM

REFERENCE DRAWINGS	
DRAWING NUMBER	DRAWING TITLE
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NO.	DATE	REVISION	BY	CHK	APPD
P1	07–02–15	PRELIMINARY	JPO	DKM	DKM
P2	07–23–15	PRELIMINARY	JPO	DKM	DKM
P3	08–05–15	PRELIMINARY – FOR MODELING	JPO	DKM	DKM
–					
–					
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NO.	DATE	REVISION	BY	CHK	APPD
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TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE GUIDELINES AND SPECIFICATIONS

DOUG MACE — 07–02–15
MECHANICAL DESIGN ENGINEER — DATE

– — –
ELECTRICAL DESIGN ENGINEER — DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

EQT[SM]
DESIGN ENGINEERING

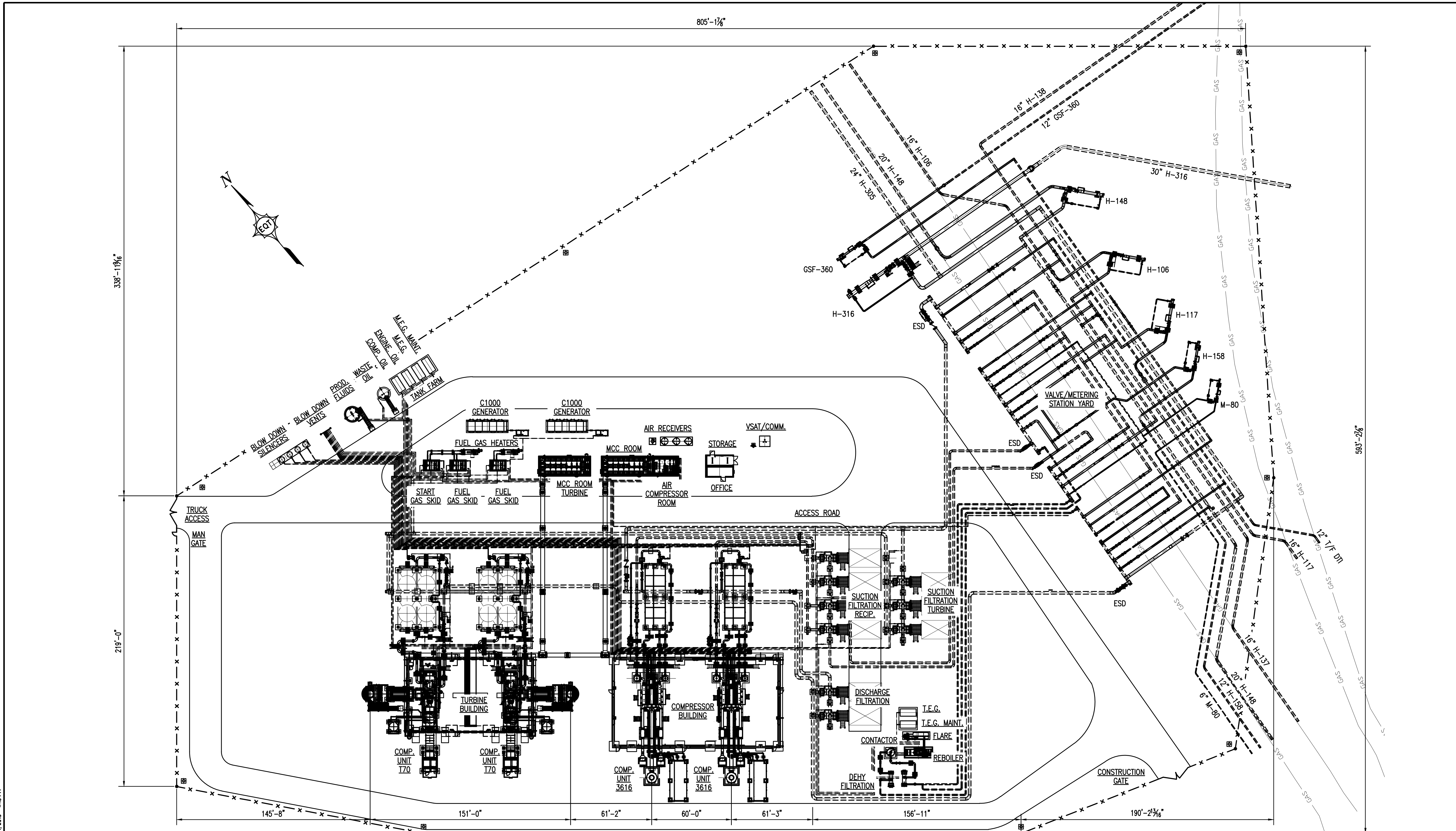
PROJECT ID

DRAWING SCALE: NTS

DRAWING TITLE:
RED HOOK COMPRESSOR STATION
CIVIL
SITE
PLOT PLAN

FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
C	P	RDH01	100	01	P3

File Path: C:\Vault Working\3D\Redhook\RDH01\Drawing Files\Design Files\Civil\C-P-RDH01-100-01.dwg



REFERENCE DRAWINGS		NO.	DATE	REVISION	BY	CHK	APPD	NO.	DATE	REVISION	BY	CHK	APPD
DRAWING NUMBER	DRAWING TITLE	P1	05/07/15	PRELIMINARY	DEB	DKM	DKM	–					
–		P2	07/02/15	PRELIMINARY	JPO	DKM	DKM	–					
–		P3	07/22/15	PRELIMINARY	JPO	DKM	DKM	–					
–		P4	08/05/15	PRELIMINARY	JPO	DKM	DKM	–					
–		P5	9/1/15	PRELIMINARY	JPO	DKM	DKM	–					
–		–						–					
–		–						–					
–		–						–					
–		–						–					

TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE GUIDELINES AND SPECIFICATIONS

DOUG MACE — 5-7-15
MECHANICAL DESIGN ENGINEER — DATE

– — –
ELECTRICAL DESIGN ENGINEER — DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

EQT℠ DESIGN ENGINEERING

PROJECT ID

DRAWING SCALE: 1/32" = 1'-0"

DRAWING TITLE:
RED HOOK COMPRESSOR STATION
MECHANICAL
PIPING
PLOT PLAN

FACILITY	STATE	IDENTIFICATION	SERIES	SHEET	REVISION
C	P	RDH01	1100	01	P5

Plotted by: Owens, Joshua on: September 1, 2015 - 4:18 PM

File Path: C:\Vault Working\3D\Equitrans Expansion Project\Redhook\RDH01\Drawing Files\Design Files\Mechanical\C-P-RDH01-1100-01.dwg

APPENDIX B: COMPRESSOR STATION ISOPLETH

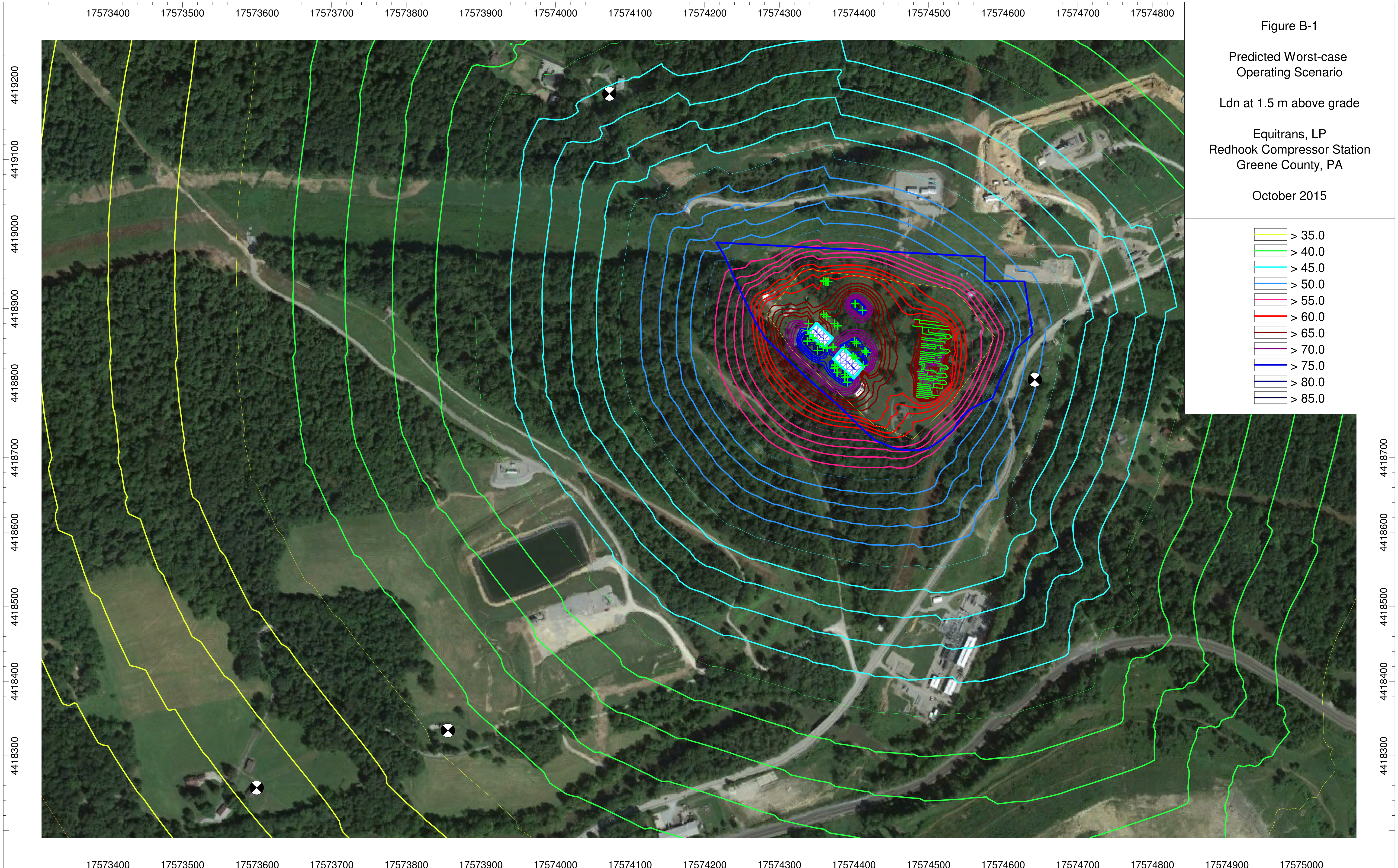


Figure B-1

Predicted Worst-case Operating Scenario

Ldn at 1.5 m above grade

Equitrans, LP
Redhook Compressor Station
Greene County, PA

October 2015

> 35.0
> 40.0
> 45.0
> 50.0
> 55.0
> 60.0
> 65.0
> 70.0
> 75.0
> 80.0
> 85.0

APPENDIX C: CADNA-A INPUT AND OUTPUT TABLES

Report (Redhook CS v5.cna)

Cadna-A Table of Noise Sources

Group Table, Day/Night

Name	Expression	Partial Sum Level			
		POR1	POR2	POR3	POR4
		Ldn	Ldn	Ldn	Ldn

Sound Sources

Point Sources

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
TurbineBuilding-SidewallExhaust1			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	Element (ÖAL28)	3.00	r	17574340.42	4418865.19	3.00
TurbineBuilding-SidewallExhaust2			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	Element (ÖAL28)	3.00	r	17574345.22	4418860.72	3.00
TurbineBuilding-SidewallExhaust3			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	Element (ÖAL28)	3.00	r	17574353.99	4418852.44	3.00
TurbineBuilding-SidewallExhaust4			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	Element (ÖAL28)	3.00	r	17574358.71	4418848.02	3.00
T70_Intake_1			100.5	100.5	100.5	Lw	100.5		0.0	0.0	0.0							0.0	500	Element (ÖAL28)	4.86	r	17574337.54	4418856.50	4.86
T70_Intake_2			100.5	100.5	100.5	Lw	100.5		0.0	0.0	0.0							0.0	500	Element (ÖAL28)	4.86	r	17574351.40	4418843.82	4.86
T70_OilCooler_1			81.8	81.8	81.8	Lw	T70LubeCooler		0.0	0.0	0.0							0.0		(none)	1.50	r	17574337.94	4418870.36	1.50
T70_OilCooler_2			81.8	81.8	81.8	Lw	T70LubeCooler		0.0	0.0	0.0							0.0		(none)	1.50	r	17574364.21	4418847.30	1.50
T70_Exhaust_1			87.6	87.6	87.6	Lw	T70Exhaust		0.0	0.0	0.0							0.0		(none)	13.87	r	17574339.10	4418879.66	13.87
T70_Exhaust_2			87.6	87.6	87.6	Lw	T70Exhaust		0.0	0.0	0.0							0.0		(none)	13.87	r	17574372.20	4418848.56	13.87
T70_GasCooler_1			81.5	81.5	81.5	Lw	T70GasCoolerFans		0.0	0.0	0.0							0.0		(none)	6.00	r	17574359.57	4418892.47	6.00
T70_GasCooler_2			81.5	81.5	81.5	Lw	T70GasCoolerFans		0.0	0.0	0.0							0.0		(none)	6.00	r	17574363.08	4418889.69	6.00
T70_GasCooler_3			81.5	81.5	81.5	Lw	T70GasCoolerFans		0.0	0.0	0.0							0.0		(none)	6.00	r	17574373.67	4418879.95	6.00
T70_GasCooler_4			81.5	81.5	81.5	Lw	T70GasCoolerFans		0.0	0.0	0.0							0.0		(none)	6.00	r	17574378.37	4418877.04	6.00
C1000_Generator_2			92.8	92.8	92.8	Lw	92.8		0.0	0.0	0.0							0.0	500	(none)	3.74	r	17574411.50	4418897.77	3.74
3616_Exhaust_1			96.9	96.9	96.9	Lw	C3616Exhaust		0.0	0.0	0.0							0.0		(none)	12.19	r	17574373.99	4418820.23	12.19
3616_Exhaust_2			96.9	96.9	96.9	Lw	C3616Exhaust		0.0	0.0	0.0							0.0		(none)	12.19	r	17574387.75	4418807.79	12.19
3616_UtilityCooler_1			86.1	86.1	86.1	Lw	C3616UtilityCoolers		0.0	0.0	0.0							0.0		(none)	4.36	r	17574377.50	4418814.02	4.36
3616_UtilityCooler_2			86.1	86.1	86.1	Lw	C3616UtilityCoolers		0.0	0.0	0.0							0.0		(none)	4.36	r	17574391.13	4418801.38	4.36
3616_GasCooler_1			89.8	89.8	89.8	Lw	C3616GasCoolers		0.0	0.0	0.0							0.0		(none)	5.12	r	17574400.91	4418856.01	5.12
3616_GasCooler_2			89.8	89.8	89.8	Lw	C3616GasCoolers		0.0	0.0	0.0							0.0		(none)	5.12	r	17574403.64	4418853.70	5.12
3616_GasCooler_3			89.8	89.8	89.8	Lw	C3616GasCoolers		0.0	0.0	0.0							0.0		(none)	5.12	r	17574414.88	4418843.40	5.12
3616_GasCooler_4			89.8	89.8	89.8	Lw	C3616GasCoolers		0.0	0.0	0.0							0.0		(none)	5.12	r	17574416.88	4418841.20	5.12
C1000_Generator_1			92.8	92.8	92.8	Lw	92.8		0.0	0.0	0.0							0.0	500	(none)	3.74	r	17574401.52	4418906.70	3.74
3616_Intake_4			92.1	92.1	92.1	Lw	C3616Intake		0.0	0.0	0.0							0.0		(none)	2.53	r	17574391.33	4418808.46	2.53
3616_Intake_2			92.1	92.1	92.1	Lw	C3616Intake		0.0	0.0	0.0							0.0		(none)	2.53	r	17574377.76	4418821.24	2.53
3616_Intake_3			92.1	92.1	92.1	Lw	C3616Intake		0.0	0.0	0.0							0.0		(none)	2.53	r	17574388.09	4418811.64	2.53
3616_Intake_1			92.1	92.1	92.1	Lw	C3616Intake		0.0	0.0	0.0							0.0		(none)	2.53	r	17574374.52	4418824.28	2.53
Blowdown Silencer			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0				0.00	0.00	5.00	0.0	500	(none)	6.80	r	17574359.54	4418936.99	6.80
Blowdown Silencer			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0				0.00	0.00	5.00	0.0	500	(none)	6.80	r	17574361.62	4418936.41	6.80
Blowdown Silencer			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0				0.00	0.00	5.00	0.0	500	(none)	6.80	r	17574364.05	4418936.32	6.80
Blowdown Silencer			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0				0.00	0.00	5.00	0.0	500	(none)	6.80	r	17574365.63	4418936.24	6.80
CompressorBuilding-SidewallExhaust4			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	(none)	3.00	r	17574412.58	4418823.92	3.00
CompressorBuilding-SidewallExhaust1			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	(none)	3.00	r	17574387.53	4418846.68	3.00
CompressorBuilding-SidewallExhaust2			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	(none)	3.00	r	17574398.94	4418836.48	3.00
CompressorBuilding-SidewallExhaust3			92.0	92.0	92.0	Lw	92		0.0	0.0	0.0							0.0	500	(none)	3.00	r	17574401.99	4418833.74	3.00

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
Aboveground Piping			78.0	78.0	78.0	63.0	63.0	63.0	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	61.7	61.7	61.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	60.9	60.9	60.9	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	61.7	61.7	61.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	62.4	62.4	62.4	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.7	65.7	65.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	64.3	64.3	64.3	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.1	63.1	63.1	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.4	63.4	63.4	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.6	65.6	65.6	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	66.3	66.3	66.3	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.2	63.2	63.2	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.1	65.1	65.1	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	64.5	64.5	64.5	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.5	63.5	63.5	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	71.0	71.0	71.0	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.0	65.0	65.0	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.1	65.1	65.1	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.7	63.7	63.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	68.5	68.5	68.5	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.6	65.6	65.6	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	66.2	66.2	66.2	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	67.1	67.1	67.1	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	62.3	62.3	62.3	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	66.3	66.3	66.3	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	68.4	68.4	68.4	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	66.6	66.6	66.6	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.7	63.7	63.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.1	65.1	65.1	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	61.9	61.9	61.9	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	64.4	64.4	64.4	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.4	65.4	65.4	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	62.5	62.5	62.5	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	62.0	62.0	62.0	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	64.5	64.5	64.5	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.2	63.2	63.2	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	64.1	64.1	64.1	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	65.7	65.7	65.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				
Aboveground Piping			78.0	78.0	78.0	63.7	63.7	63.7	Lw	92		0.0	0.0	0.0			ISO15665ClassC				0.0	500	(none)				

Area Sources

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
TurbineBuilding-RoofVent3			59.3	59.3	59.3	51.3	51.3	51.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	30	6.28					0.0		(none)			
TurbineBuilding-RoofVent2			59.3	59.3	59.3	51.3	51.3	51.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	30	6.28					0.0		(none)			
TurbineBuilding-RoofVent1			59.3	59.3	59.3	51.3	51.3	51.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	30	6.28					0.0		(none)			
CompressorBuilding-RoofVent2			71.4	71.4	71.4	62.3	62.3	62.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	30	8.29					0.0		(none)			
TurbineBuilding-RoofSouth			65.1	65.1	65.1	41.3	41.3	41.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	40	241.55					0.0		(none)			
TurbineBuilding-RoofNorth			65.4	65.4	65.4	41.3	41.3	41.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	40	253.82					0.0		(none)			
CompressorBuilding-RoofSouth			77.8	77.8	77.8	52.3	52.3	52.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	40	361.72					0.0		(none)			
CompressorBuilding-RoofNorth			78.0	78.0	78.0	52.3	52.3	52.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	40	376.32					0.0		(none)			
CompressorBuilding-RoofVent1			67.3	67.3	67.3	62.3	62.3	62.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	30	3.21					0.0		(none)			
CompressorBuilding-RoofVent5			67.9	67.9	67.9	62.3	62.3	62.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	30	3.70					0.0		(none)			
CompressorBuilding-RoofVent3			70.4	70.4	70.4	62.3	62.3	62.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	30	6.52					0.0		(none)			
CompressorBuilding-RoofVent4			71.4	71.4	71.4	62.3	62.3	62.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	30	8.29					0.0		(none)			

Area Sources vertical

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)	
TurbineBuilding-SouthWall			59.4	59.4	59.4	34.3	34.3	34.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	40	325.95					3.0	500	(none)
TurbineBuilding-EastWall			64.1	64.1	64.1	41.3	41.3	41.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	40	190.06					3.0		(none)
TurbineBuilding-NorthWall			66.5	66.5	66.5	41.3	41.3	41.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	40	326.66					3.0		(none)
TurbineBuilding-WestWall			64.1	64.1	64.1	41.3	41.3	41.3	Li	TurbineBuilding_Indoor		0.0	0.0	0.0	40	189.73					3.0		(none)
CompressorBuilding-SouthWall			77.7	77.7	77.7	52.3	52.3	52.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	40	346.91					3.0		(none)
CompressorBuilding-EastWall			75.0	75.0	75.0	52.3	52.3	52.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	40	186.88					3.0		(none)
CompressorBuilding-NorthWall			77.7	77.7	77.7	52.3	52.3	52.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	40	346.65					3.0		(none)
CompressorBuilding-WestWall			74.9	74.9	74.9	52.3	52.3	52.3	Li	CompressorBuildig_Indoo		0.0	0.0	0.0	40	183.50					3.0		(none)

Railway Tracks

Name	M.	ID	Lm,E		Train Class	Add.Level				Vmax
			Day	Night		Dfb	Dbr	Dbü	Dra	
			(dBA)	(dBA)		(dB)	(dB)	(dB)	(dB)	(km/h)

Railway Classes

Name	M.	ID	Lm,E		Train Class											Add.Level				Vmax
			Day	Night	Type	p	Number of Trains			v	l	Dfz	Dae	Lm,E,i (dB)		Dfb	Dbr	Dbü	Dra	
			(dBA)	(dBA)		(%)	Day	Evening	Night	(km/h)	(m)	(dB)	(dB)	Day	Night	(dB)	(dB)	(dB)	(dB)	(km/h)

Parking Lots

Name	M.	ID	Type	Lwa			Event Data						Penalty Type		Penalty Surface		According to	Operating Time		
				Day	Special	Night	Ref. Quantity	Number B	No. Spaces/RefQ	Events/h/RefQ			Kpa	Type	Kstro	Surface		Day	Special	Night
				(dBA)	(dBA)	(dBA)				Day	Special	Night	(dB)		(dB)			(min)	(min)	(min)

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)

Crossing

Name	M.	ID	Active			Height		Coordinates		
			Day	Evening	Night	Begin		X	Y	Z
						(m)		(m)	(m)	(m)

Receiver Points

Name	M.	ID	Level Lr	Limit. Value	Land Use			Height		Coordinates		
			Ldn	Ldn	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)				(m)		(m)	(m)	(m)
POR1			37.3	55.0				1.50	r	17573599.49	4418257.28	1.50
POR2			40.4	55.0				1.50	r	17573855.83	4418334.20	1.50
POR3			46.2	55.0				1.50	r	17574072.17	4419188.25	1.50
POR4			51.2	55.0				1.50	r	17574642.54	4418804.47	1.50

Designated Land Use

Name	M.	ID	Type	Persons
				(1/km²)

Obstacles

Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			
			left	right		horz.	vert.	Begin		End	
					(m)	(m)	(m)	(m)		(m)	

Buildings

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
Turbine Building				0		10.90	r
Compressor Building				0		9.10	r

Foilage

Name	M.	ID	Height
			(m)

Built-Up Area

Name	M.	ID	Type	Attenuation	B	m	Height
				dB/100m	%	1/m	(m)

Geometry Data

Geometry Line Sources

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
Aboveground Piping	1.00	r			17574481.85	4418885.51	1.00	0.00
					17574513.10	4418881.81	1.00	0.00
Aboveground Piping	1.00	r			17574487.79	4418884.89	1.00	0.00
					17574487.66	4418881.05	1.00	0.00
					17574487.85	4418880.32	1.00	0.00
					17574488.25	4418880.25	1.00	0.00
					17574526.05	4418875.95	1.00	0.00
Aboveground Piping	1.00	r			17574528.40	4418871.39	1.00	0.00
					17574477.89	4418877.02	1.00	0.00
Aboveground Piping	1.00	r			17574492.19	4418875.49	1.00	0.00
					17574491.40	4418867.55	1.00	0.00
					17574491.66	4418867.09	1.00	0.00
					17574492.32	4418866.49	1.00	0.00
					17574493.32	4418866.29	1.00	0.00
					17574523.37	4418863.05	1.00	0.00
					17574523.17	4418861.13	1.00	0.00
Aboveground Piping	1.00	r			17574499.87	4418871.85	1.00	0.00
					17574499.74	4418869.67	1.00	0.00
					17574500.07	4418868.74	1.00	0.00
					17574500.86	4418868.28	1.00	0.00
					17574501.59	4418867.81	1.00	0.00
					17574528.21	4418865.03	1.00	0.00
					17574530.99	4418861.66	1.00	0.00
Aboveground Piping	1.00	r			17574530.59	4418861.99	1.00	0.00
					17574527.35	4418859.34	1.00	0.00
					17574526.55	4418859.27	1.00	0.00
					17574515.69	4418860.47	1.00	0.00
					17574515.49	4418859.54	1.00	0.00
Aboveground Piping	1.00	r			17574514.37	4418858.61	1.00	0.00
					17574491.20	4418860.99	1.00	0.00
Aboveground Piping	1.00	r			17574520.83	4418854.32	1.00	0.00
					17574521.08	4418855.24	1.00	0.00
					17574491.05	4418858.49	1.00	0.00
Aboveground Piping	1.00	r			17574519.16	4418850.14	1.00	0.00
					17574490.30	4418853.23	1.00	0.00
Aboveground Piping	1.00	r			17574515.99	4418849.64	1.00	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
					17574515.83	4418847.14	1.00	0.00
					17574516.16	4418846.31	1.00	0.00
					17574517.16	4418846.06	1.00	0.00
					17574527.59	4418844.64	1.00	0.00
					17574529.01	4418842.72	1.00	0.00
Aboveground Piping	1.00	r			17574528.42	4418842.55	1.00	0.00
					17574525.09	4418840.22	1.00	0.00
					17574524.50	4418840.22	1.00	0.00
					17574515.33	4418841.22	1.00	0.00
					17574515.24	4418840.38	1.00	0.00
Aboveground Piping	1.00	r			17574519.50	4418839.13	1.00	0.00
					17574489.64	4418842.39	1.00	0.00
Aboveground Piping	1.00	r			17574508.32	4418845.30	1.00	0.00
					17574508.40	4418846.06	1.00	0.00
					17574489.80	4418848.22	1.00	0.00
Aboveground Piping	1.00	r			17574490.39	4418851.06	1.00	0.00
					17574509.99	4418848.64	1.00	0.00
					17574509.82	4418845.89	1.00	0.00
Aboveground Piping	1.00	r			17574488.90	4418839.93	1.00	0.00
					17574516.96	4418836.88	1.00	0.00
Aboveground Piping	1.00	r			17574512.54	4418834.99	1.00	0.00
					17574517.48	4418834.26	1.00	0.00
Aboveground Piping	1.00	r			17574508.65	4418835.20	1.00	0.00
					17574488.90	4418837.51	1.00	0.00
Aboveground Piping	1.00	r			17574488.48	4418834.78	1.00	0.00
					17574508.02	4418832.58	1.00	0.00
Aboveground Piping	1.00	r			17574488.58	4418832.16	1.00	0.00
					17574515.38	4418829.11	1.00	0.00
Aboveground Piping	1.00	r			17574507.92	4418827.32	1.00	0.00
					17574516.85	4418826.27	1.00	0.00
Aboveground Piping	1.00	r			17574505.61	4418827.64	1.00	0.00
					17574488.16	4418829.53	1.00	0.00
Aboveground Piping	1.00	r			17574487.74	4418827.43	1.00	0.00
					17574493.63	4418826.69	1.00	0.00
					17574494.26	4418825.95	1.00	0.00
					17574493.63	4418817.65	1.00	0.00
Aboveground Piping	1.00	r			17574487.64	4418824.90	1.00	0.00
					17574490.79	4418824.59	1.00	0.00
					17574491.52	4418824.06	1.00	0.00
					17574490.89	4418815.76	1.00	0.00
Aboveground Piping	1.00	r			17574491.00	4418818.28	1.00	0.00
					17574507.18	4418816.39	1.00	0.00
					17574509.81	4418813.66	1.00	0.00
					17574522.74	4418812.50	1.00	0.00
					17574525.05	4418809.35	1.00	0.00
Aboveground Piping	1.00	r			17574524.84	4418808.61	1.00	0.00
					17574523.58	4418807.35	1.00	0.00
					17574510.65	4418808.51	1.00	0.00
Aboveground Piping	1.00	r			17574484.38	4418816.29	1.00	0.00
					17574493.42	4418815.45	1.00	0.00
Aboveground Piping	1.00	r			17574486.90	4418813.45	1.00	0.00
					17574498.14	4418811.98	1.00	0.00
					17574498.35	4418814.50	1.00	0.00
Aboveground Piping	1.00	r			17574485.95	4418807.98	1.00	0.00
					17574511.70	4418805.46	1.00	0.00
					17574511.81	4418806.72	1.00	0.00
Aboveground Piping	1.00	r			17574505.58	4418808.69	1.00	0.00
					17574486.14	4418810.90	1.00	0.00
Aboveground Piping	1.00	r			17574485.96	4418806.01	1.00	0.00
					17574506.87	4418803.49	1.00	0.00
					17574507.29	4418804.75	1.00	0.00
					17574521.69	4418803.18	1.00	0.00
					17574524.74	4418800.13	1.00	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
Aboveground Piping	1.00	r			17574524.45	4418799.32	1.00	0.00
					17574522.87	4418797.98	1.00	0.00
					17574507.02	4418799.82	1.00	0.00
					17574506.52	4418795.15	1.00	0.00
Aboveground Piping	1.00	r			17574503.43	4418797.40	1.00	0.00
					17574485.33	4418799.32	1.00	0.00
Aboveground Piping	1.00	r			17574518.33	4418795.11	1.00	0.00
					17574518.33	4418793.01	1.00	0.00
					17574485.12	4418796.80	1.00	0.00
Aboveground Piping	1.00	r			17574484.70	4418794.59	1.00	0.00
					17574502.99	4418792.49	1.00	0.00
					17574502.78	4418789.86	1.00	0.00
					17574484.49	4418791.86	1.00	0.00
Aboveground Piping	1.00	r			17574504.35	4418789.33	1.00	0.00
					17574504.25	4418786.81	1.00	0.00
					17574484.28	4418789.23	1.00	0.00
Aboveground Piping	1.00	r			17574484.07	4418786.60	1.00	0.00
					17574513.81	4418783.13	1.00	0.00
Aboveground Piping	1.00	r			17574483.54	4418784.08	1.00	0.00
					17574507.93	4418781.14	1.00	0.00
Aboveground Piping	1.00	r			17574483.44	4418781.56	1.00	0.00
					17574500.15	4418779.46	1.00	0.00
Aboveground Piping	1.00	r			17574516.36	4418825.43	1.00	0.00
					17574516.49	4418824.50	1.00	0.00
					17574523.24	4418823.97	1.00	0.00
					17574526.69	4418820.26	1.00	0.00
					17574525.10	4418818.67	1.00	0.00
					17574516.36	4418819.47	1.00	0.00
					17574516.09	4418818.41	1.00	0.00
					17574515.83	4418816.55	1.00	0.00

Geometry Area Sources

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
TurbineBuilding-RoofVent3	10.97	r			17574358.88	4418859.42	10.97	0.00
					17574359.56	4418860.22	10.97	0.00
					17574363.96	4418856.08	10.97	0.00
					17574363.29	4418855.28	10.97	0.00
TurbineBuilding-RoofVent2	10.97	r			17574352.48	4418865.44	10.97	0.00
					17574353.15	4418866.23	10.97	0.00
					17574357.55	4418862.10	10.97	0.00
					17574356.88	4418861.29	10.97	0.00
TurbineBuilding-RoofVent1	10.97	r			17574345.81	4418871.67	10.97	0.00
					17574346.48	4418872.46	10.97	0.00
					17574350.88	4418868.32	10.97	0.00
					17574350.22	4418867.52	10.97	0.00
CompressorBuilding-RoofVent2	9.14	r			17574382.36	4418835.77	9.14	0.00
					17574383.03	4418836.57	9.14	0.00
					17574388.85	4418831.11	9.14	0.00
					17574388.11	4418830.36	9.14	0.00
TurbineBuilding-RoofSouth	10.97	r			17574338.78	4418867.42	10.97	0.00
					17574344.21	4418873.86	10.97	0.00
					17574346.14	4418872.06	10.97	0.00
					17574345.81	4418871.67	10.97	0.00
					17574350.22	4418867.52	10.97	0.00
					17574350.55	4418867.92	10.97	0.00
					17574352.80	4418865.81	10.97	0.00
					17574352.48	4418865.44	10.97	0.00
					17574356.88	4418861.30	10.97	0.00
					17574357.20	4418861.68	10.97	0.00
					17574359.21	4418859.80	10.97	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
					17574358.88	4418859.42	10.97	0.00
					17574363.29	4418855.28	10.97	0.00
					17574363.62	4418855.67	10.97	0.00
					17574365.91	4418853.52	10.97	0.00
					17574360.43	4418847.07	10.97	0.00
TurbineBuilding-RoofNorth	10.90	r			17574349.92	4418880.65	10.90	0.00
					17574344.21	4418873.86	10.90	0.00
					17574346.14	4418872.06	10.90	0.00
					17574346.48	4418872.46	10.90	0.00
					17574350.88	4418868.32	10.90	0.00
					17574350.55	4418867.92	10.90	0.00
					17574352.80	4418865.81	10.90	0.00
					17574353.15	4418866.23	10.90	0.00
					17574357.55	4418862.10	10.90	0.00
					17574357.20	4418861.68	10.90	0.00
					17574359.21	4418859.80	10.90	0.00
					17574359.56	4418860.22	10.90	0.00
					17574363.96	4418856.08	10.90	0.00
					17574363.62	4418855.67	10.90	0.00
					17574365.91	4418853.52	10.90	0.00
					17574371.64	4418860.28	10.90	0.00
CompressorBuilding-RoofSouth	9.14	r			17574372.23	4418832.39	9.14	0.00
					17574378.71	4418839.94	9.14	0.00
					17574379.30	4418839.39	9.14	0.00
					17574378.95	4418838.98	9.14	0.00
					17574381.19	4418836.87	9.14	0.00
					17574381.63	4418837.35	9.14	0.00
					17574382.77	4418836.26	9.14	0.00
					17574382.36	4418835.77	9.14	0.00
					17574388.11	4418830.36	9.14	0.00
					17574388.52	4418830.78	9.14	0.00
					17574390.03	4418829.34	9.14	0.00
					17574389.67	4418828.92	9.14	0.00
					17574394.17	4418824.68	9.14	0.00
					17574394.59	4418825.06	9.14	0.00
					17574395.94	4418823.80	9.14	0.00
					17574395.57	4418823.37	9.14	0.00
					17574401.32	4418817.96	9.14	0.00
					17574401.74	4418818.38	9.14	0.00
					17574403.08	4418817.12	9.14	0.00
					17574402.70	4418816.67	9.14	0.00
					17574405.26	4418814.27	9.14	0.00
					17574405.68	4418814.68	9.14	0.00
					17574406.40	4418814.00	9.14	0.00
					17574399.91	4418806.42	9.14	0.00
CompressorBuilding-RoofNorth	9.14	r			17574385.30	4418847.63	9.14	0.00
					17574378.71	4418839.94	9.14	0.00
					17574379.30	4418839.39	9.14	0.00
					17574379.63	4418839.77	9.14	0.00
					17574381.89	4418837.64	9.14	0.00
					17574381.63	4418837.35	9.14	0.00
					17574382.77	4418836.26	9.14	0.00
					17574383.03	4418836.57	9.14	0.00
					17574388.85	4418831.11	9.14	0.00
					17574388.52	4418830.78	9.14	0.00
					17574390.03	4418829.34	9.14	0.00
					17574390.34	4418829.71	9.14	0.00
					17574394.95	4418825.39	9.14	0.00
					17574394.59	4418825.06	9.14	0.00
					17574395.94	4418823.80	9.14	0.00
					17574396.24	4418824.16	9.14	0.00
					17574402.06	4418818.70	9.14	0.00
					17574401.74	4418818.38	9.14	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
					17574403.08	4418817.12	9.14	0.00
					17574403.37	4418817.47	9.14	0.00
					17574406.01	4418814.99	9.14	0.00
					17574405.68	4418814.68	9.14	0.00
					17574406.40	4418814.00	9.14	0.00
					17574413.21	4418821.95	9.14	0.00
CompressorBuilding-RoofVent1	9.14	r			17574378.95	4418838.98	9.14	0.00
					17574379.63	4418839.77	9.14	0.00
					17574381.89	4418837.64	9.14	0.00
					17574381.19	4418836.87	9.14	0.00
CompressorBuilding-RoofVent5	9.14	r			17574402.70	4418816.67	9.14	0.00
					17574403.37	4418817.47	9.14	0.00
					17574406.01	4418814.99	9.14	0.00
					17574405.26	4418814.27	9.14	0.00
CompressorBuilding-RoofVent3	9.14	r			17574389.67	4418828.92	9.14	0.00
					17574390.34	4418829.71	9.14	0.00
					17574394.95	4418825.39	9.14	0.00
					17574394.17	4418824.68	9.14	0.00
CompressorBuilding-RoofVent4	9.14	r			17574395.57	4418823.37	9.14	0.00
					17574396.24	4418824.16	9.14	0.00
					17574402.06	4418818.70	9.14	0.00
					17574401.32	4418817.96	9.14	0.00

Geometry Parkking Lots

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)

Geometry Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(m)	(%)
	(m)		(m)		(m)	(m)	(m)	(m)		

Geometry Railway Tracks

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)

Geometry Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height				Coordinates			
			left	right		horz.	vert.	Begin		End		x	y	z	Ground
					(m)	(m)	(m)	(m)		(m)		(m)	(m)	(m)	(m)

Geometry Buildings

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
Turbine Building				0		10.90	r	17574338.92	4418867.43	10.90	0.00
								17574349.94	4418880.43	10.90	0.00
								17574371.49	4418860.29	10.90	0.00
								17574360.38	4418847.25	10.90	0.00
Compressor Building				0		9.10	r	17574372.25	4418832.39	9.10	0.00
								17574385.30	4418847.62	9.10	0.00
								17574413.16	4418821.94	9.10	0.00
								17574399.91	4418806.45	9.10	0.00

Geometry Contour Lines

Name	M.	ID	OnlyPts	Height		Coordinates		
				Begin	End	x	y	z
				(m)	(m)	(m)	(m)	(m)

Geometry Lines of Fault

Name	M.	ID	Coordinates	
			x	y
			(m)	(m)

Cadna-A Table of Model Configuration and Parameters

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (m)	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	900.00
Reference Time Night (min)	540.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	0.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (℃)	10
rel. Humidity (%)	70
Ground Absorption G	0.70
Wind Speed for Dir. (m/s)	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03)	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Receiver
Name: POR4 **Cadna-A Table: Model Output for Most Impacted NSA Only (NSA-4)**
ID:
X: 17574642.54
Y: 4418804.47
Z: 1.50

Point Source, ISO 9613, Name: "TurbineBuilding-SidewallExhaust1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574340.42	4418865.19	3.00	0	500	92.0	92.0	0.0	-1.8	60.8	0.6	0.1	0.0	0.0	23.3	0.0	-0.0	5.5	5.5

Point Source, ISO 9613, Name: "TurbineBuilding-SidewallExhaust2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574345.22	4418860.72	3.00	0	500	92.0	92.0	0.0	-1.8	60.6	0.6	0.1	0.0	0.0	23.6	0.0	-0.0	5.3	5.3

Point Source, ISO 9613, Name: "TurbineBuilding-SidewallExhaust3", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574353.99	4418852.44	3.00	0	500	92.0	92.0	0.0	-1.8	60.3	0.6	0.2	0.0	0.0	23.7	0.0	-0.0	5.5	5.5

Point Source, ISO 9613, Name: "TurbineBuilding-SidewallExhaust4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574358.71	4418848.02	3.00	0	500	92.0	92.0	0.0	-1.8	60.2	0.6	0.2	0.0	0.0	22.1	0.0	-0.0	7.3	7.3

Point Source, ISO 9613, Name: "T70_Intake_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574337.54	4418856.50	4.86	0	500	100.5	100.5	0.0	-1.8	60.8	0.6	0.6	0.0	0.0	16.9	0.0	-0.0	19.9	19.9

Point Source, ISO 9613, Name: "T70_Intake_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574351.40	4418843.82	4.86	0	500	100.5	100.5	0.0	-1.8	60.4	0.6	0.7	0.0	0.0	10.3	0.0	-0.0	26.8	26.8

Point Source, ISO 9613, Name: "T70_OilCooler_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574337.94	4418870.36	1.50	0	63	61.9	61.9	0.0	0.0	60.9	0.0	-5.1	0.0	0.0	11.6	0.0	-0.0	-5.5	-5.5
2	17574337.94	4418870.36	1.50	0	125	70.9	70.9	0.0	0.0	60.9	0.1	-2.6	0.0	0.0	14.9	0.0	-0.0	-2.4	-2.4
3	17574337.94	4418870.36	1.50	0	250	74.9	74.9	0.0	0.0	60.9	0.3	1.1	0.0	0.0	17.8	0.0	-0.0	-5.1	-5.1
4	17574337.94	4418870.36	1.50	0	500	75.9	75.9	0.0	0.0	60.9	0.6	-0.4	0.0	0.0	20.4	0.0	-0.0	-5.6	-5.6
5	17574337.94	4418870.36	1.50	0	1000	76.9	76.9	0.0	0.0	60.9	1.1	-3.4	0.0	0.0	22.1	0.0	-0.0	-3.9	-3.9
6	17574337.94	4418870.36	1.50	0	2000	71.9	71.9	0.0	0.0	60.9	3.0	-3.8	0.0	0.0	23.3	0.0	-0.0	-11.5	-11.5
7	17574337.94	4418870.36	1.50	0	4000	65.9	65.9	0.0	0.0	60.9	10.2	-3.8	0.0	0.0	24.1	0.0	-0.0	-25.4	-25.4
8	17574337.94	4418870.36	1.50	0	8000	57.9	57.9	0.0	0.0	60.9	36.4	-3.8	0.0	0.0	24.5	0.0	-0.0	-60.1	-60.1

Point Source, ISO 9613, Name: "T70_OilCooler_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574364.21	4418847.30	1.50	0	63	61.9	61.9	0.0	0.0	60.0	0.0	-5.0	0.0	0.0	4.2	0.0	-0.0	2.7	2.7
2	17574364.21	4418847.30	1.50	0	125	70.9	70.9	0.0	0.0	60.0	0.1	-2.6	0.0	0.0	5.7	0.0	-0.0	7.6	7.6
3	17574364.21	4418847.30	1.50	0	250	74.9	74.9	0.0	0.0	60.0	0.3	1.2	0.0	0.0	7.5	0.0	-0.0	5.9	5.9
4	17574364.21	4418847.30	1.50	0	500	75.9	75.9	0.0	0.0	60.0	0.5	-0.3	0.0	0.0	10.3	0.0	-0.0	5.3	5.3
5	17574364.21	4418847.30	1.50	0	1000	76.9	76.9	0.0	0.0	60.0	1.0	-3.3	0.0	0.0	12.9	0.0	-0.0	6.3	6.3
6	17574364.21	4418847.30	1.50	0	2000	71.9	71.9	0.0	0.0	60.0	2.7	-3.7	0.0	0.0	15.5	0.0	-0.0	-2.6	-2.6
7	17574364.21	4418847.30	1.50	0	4000	65.9	65.9	0.0	0.0	60.0	9.2	-3.7	0.0	0.0	17.9	0.0	-0.0	-17.6	-17.6
8	17574364.21	4418847.30	1.50	0	8000	57.9	57.9	0.0	0.0	60.0	32.9	-3.7	0.0	0.0	20.1	0.0	-0.0	-51.4	-51.4

Point Source, ISO 9613, Name: "T70_Exhaust_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574339.10	4418879.66	13.87	0	32	71.1	71.1	0.0	0.0	60.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	13.2	13.2
2	17574339.10	4418879.66	13.87	0	63	82.5	82.5	0.0	0.0	60.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	24.6	24.6
3	17574339.10	4418879.66	13.87	0	125	77.5	77.5	0.0	0.0	60.9	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	16.9	16.9
4	17574339.10	4418879.66	13.87	0	250	79.5	79.5	0.0	0.0	60.9	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	15.0	15.0
5	17574339.10	4418879.66	13.87	0	500	76.5	76.5	0.0	0.0	60.9	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	13.2	13.2
6	17574339.10	4418879.66	13.87	0	1000	76.5	76.5	0.0	0.0	60.9	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	15.7	15.7
7	17574339.10	4418879.66	13.87	0	2000	78.5	78.5	0.0	0.0	60.9	3.0	-1.7	0.0	0.0	0.0	0.0	-0.0	16.3	16.3
8	17574339.10	4418879.66	13.87	0	4000	75.5	75.5	0.0	0.0	60.9	10.3	-1.7	0.0	0.0	0.0	0.0	-0.0	6.0	6.0
9	17574339.10	4418879.66	13.87	0	8000	76.5	76.5	0.0	0.0	60.9	36.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-19.3	-19.3

Point Source, ISO 9613, Name: "T70_Exhaust_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574372.20	4418848.56	13.87	0	32	71.1	71.1	0.0	0.0	59.8	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	14.3	14.3
2	17574372.20	4418848.56	13.87	0	63	82.5	82.5	0.0	0.0	59.8	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	25.7	25.7
3	17574372.20	4418848.56	13.87	0	125	77.5	77.5	0.0	0.0	59.8	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	18.2	18.2
4	17574372.20	4418848.56	13.87	0	250	79.5	79.5	0.0	0.0	59.8	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	16.2	16.2
5	17574372.20	4418848.56	13.87	0	500	76.5	76.5	0.0	0.0	59.8	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	14.4	14.4
6	17574372.20	4418848.56	13.87	0	1000	76.5	76.5	0.0	0.0	59.8	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	16.9	16.9
7	17574372.20	4418848.56	13.87	0	2000	78.5	78.5	0.0	0.0	59.8	2.6	-1.6	0.0	0.0	0.0	0.0	-0.0	17.7	17.7
8	17574372.20	4418848.56	13.87	0	4000	75.5	75.5	0.0	0.0	59.8	9.0	-1.6	0.0	0.0	0.0	0.0	-0.0	8.4	8.4
9	17574372.20	4418848.56	13.87	0	8000	76.5	76.5	0.0	0.0	59.8	32.0	-1.6	0.0	0.0	0.0	0.0	-0.0	-13.7	-13.7

Point Source, ISO 9613, Name: "T70_GasCooler_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574359.57	4418892.47	6.00	0	63	61.6	61.6	0.0	0.0	60.4	0.0	-3.7	0.0	0.0	0.0	0.0	-0.0	4.8	4.8
2	17574359.57	4418892.47	6.00	0	125	70.6	70.6	0.0	0.0	60.4	0.1	-1.3	0.0	0.0	0.0	0.0	-0.0	11.3	11.3
3	17574359.57	4418892.47	6.00	0	250	74.6	74.6	0.0	0.0	60.4	0.3	2.5	0.0	0.0	0.0	0.0	-0.0	11.4	11.4
4	17574359.57	4418892.47	6.00	0	500	75.6	75.6	0.0	0.0	60.4	0.6	1.0	0.0	0.0	0.0	0.0	-0.0	13.6	13.6
5	17574359.57	4418892.47	6.00	0	1000	76.6	76.6	0.0	0.0	60.4	1.1	-2.0	0.0	0.0	0.0	0.0	-0.0	17.1	17.1
6	17574359.57	4418892.47	6.00	0	2000	71.6	71.6	0.0	0.0	60.4	2.9	-2.4	0.0	0.0	0.0	0.0	-0.0	10.7	10.7
7	17574359.57	4418892.47	6.00	0	4000	65.6	65.6	0.0	0.0	60.4	9.7	-2.4	0.0	0.0	0.0	0.0	-0.0	-2.1	-2.1
8	17574359.57	4418892.47	6.00	0	8000	57.6	57.6	0.0	0.0	60.4	34.6	-2.4	0.0	0.0	0.0	0.0	-0.0	-35.0	-35.0

Point Source, ISO 9613, Name: "T70_GasCooler_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574363.08	4418889.69	6.00	0	63	61.6	61.6	0.0	0.0	60.3	0.0	-3.7	0.0	0.0	0.0	0.0	-0.0	4.9	4.9
2	17574363.08	4418889.69	6.00	0	125	70.6	70.6	0.0	0.0	60.3	0.1	-1.2	0.0	0.0	0.0	0.0	-0.0	11.4	11.4
3	17574363.08	4418889.69	6.00	0	250	74.6	74.6	0.0	0.0	60.3	0.3	2.5	0.0	0.0	0.0	0.0	-0.0	11.5	11.5
4	17574363.08	4418889.69	6.00	0	500	75.6	75.6	0.0	0.0	60.3	0.6	1.1	0.0	0.0	0.0	0.0	-0.0	13.7	13.7
5	17574363.08	4418889.69	6.00	0	1000	76.6	76.6	0.0	0.0	60.3	1.1	-2.0	0.0	0.0	0.0	0.0	-0.0	17.2	17.2
6	17574363.08	4418889.69	6.00	0	2000	71.6	71.6	0.0	0.0	60.3	2.8	-2.4	0.0	0.0	0.0	0.0	-0.0	10.9	10.9
7	17574363.08	4418889.69	6.00	0	4000	65.6	65.6	0.0	0.0	60.3	9.6	-2.4	0.0	0.0	0.0	0.0	-0.0	-1.9	-1.9
8	17574363.08	4418889.69	6.00	0	8000	57.6	57.6	0.0	0.0	60.3	34.1	-2.4	0.0	0.0	0.0	0.0	-0.0	-34.5	-34.5

Point Source, ISO 9613, Name: "T70_GasCooler_3", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574373.67	4418879.95	6.00	0	63	61.6	61.6	0.0	0.0	59.9	0.0	-3.6	0.0	0.0	0.0	0.0	-0.0	5.2	5.2
2	17574373.67	4418879.95	6.00	0	125	70.6	70.6	0.0	0.0	59.9	0.1	-1.2	0.0	0.0	0.0	0.0	-0.0	11.7	11.7
3	17574373.67	4418879.95	6.00	0	250	74.6	74.6	0.0	0.0	59.9	0.3	2.6	0.0	0.0	0.0	0.0	-0.0	11.8	11.8
4	17574373.67	4418879.95	6.00	0	500	75.6	75.6	0.0	0.0	59.9	0.5	1.2	0.0	0.0	0.0	0.0	-0.0	14.0	14.0
5	17574373.67	4418879.95	6.00	0	1000	76.6	76.6	0.0	0.0	59.9	1.0	-1.8	0.0	0.0	0.0	0.0	-0.0	17.5	17.5
6	17574373.67	4418879.95	6.00	0	2000	71.6	71.6	0.0	0.0	59.9	2.7	-2.3	0.0	0.0	0.0	0.0	-0.0	11.3	11.3
7	17574373.67	4418879.95	6.00	0	4000	65.6	65.6	0.0	0.0	59.9	9.2	-2.3	0.0	0.0	0.0	0.0	-0.0	-1.2	-1.2
8	17574373.67	4418879.95	6.00	0	8000	57.6	57.6	0.0	0.0	59.9	32.6	-2.3	0.0	0.0	0.0	0.0	-0.0	-32.7	-32.7

Point Source, ISO 9613, Name: "T70_GasCooler_4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574378.37	4418877.04	6.00	0	63	61.6	61.6	0.0	0.0	59.8	0.0	-3.5	0.0	0.0	0.0	0.0	-0.0	5.3	5.3

Point Source, ISO 9613, Name: "T70_GasCooler_4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
2	17574378.37	4418877.04	6.00	0	125	70.6	70.6	0.0	0.0	59.8	0.1	-1.1	0.0	0.0	0.0	0.0	-0.0	11.9	11.9
3	17574378.37	4418877.04	6.00	0	250	74.6	74.6	0.0	0.0	59.8	0.3	2.7	0.0	0.0	0.0	0.0	-0.0	11.9	11.9
4	17574378.37	4418877.04	6.00	0	500	75.6	75.6	0.0	0.0	59.8	0.5	1.2	0.0	0.0	0.0	0.0	-0.0	14.1	14.1
5	17574378.37	4418877.04	6.00	0	1000	76.6	76.6	0.0	0.0	59.8	1.0	-1.8	0.0	0.0	0.0	0.0	-0.0	17.6	17.6
6	17574378.37	4418877.04	6.00	0	2000	71.6	71.6	0.0	0.0	59.8	2.6	-2.2	0.0	0.0	0.0	0.0	-0.0	11.4	11.4
7	17574378.37	4418877.04	6.00	0	4000	65.6	65.6	0.0	0.0	59.8	9.0	-2.2	0.0	0.0	0.0	0.0	-0.0	-0.9	-0.9
8	17574378.37	4418877.04	6.00	0	8000	57.6	57.6	0.0	0.0	59.8	32.0	-2.2	0.0	0.0	0.0	0.0	-0.0	-31.9	-31.9

Point Source, ISO 9613, Name: "C1000_Generator_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574411.50	4418897.77	3.74	0	500	92.8	92.8	0.0	0.0	58.9	0.5	0.7	0.0	0.0	0.0	0.0	-0.0	32.7	32.7

Point Source, ISO 9613, Name: "3616_Exhaust_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574373.99	4418820.23	12.19	0	32	64.0	64.0	0.0	0.0	59.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	7.4	7.4
2	17574373.99	4418820.23	12.19	0	63	72.2	72.2	0.0	0.0	59.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	15.6	15.6
3	17574373.99	4418820.23	12.19	0	125	67.6	67.6	0.0	0.0	59.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	8.4	8.4
4	17574373.99	4418820.23	12.19	0	250	67.1	67.1	0.0	0.0	59.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	3.9	3.9
5	17574373.99	4418820.23	12.19	0	500	78.7	78.7	0.0	0.0	59.6	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	16.7	16.7
6	17574373.99	4418820.23	12.19	0	1000	84.0	84.0	0.0	0.0	59.6	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	24.6	24.6
7	17574373.99	4418820.23	12.19	0	2000	89.0	89.0	0.0	0.0	59.6	2.6	-1.6	0.0	0.0	0.0	0.0	-0.0	28.4	28.4
8	17574373.99	4418820.23	12.19	0	4000	93.9	93.9	0.0	0.0	59.6	8.8	-1.6	0.0	0.0	0.0	0.0	-0.0	27.1	27.1
9	17574373.99	4418820.23	12.19	0	8000	91.1	91.1	0.0	0.0	59.6	31.5	-1.6	0.0	0.0	0.0	0.0	-0.0	1.6	1.6

Point Source, ISO 9613, Name: "3616_Exhaust_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574387.75	4418807.79	12.19	0	32	64.0	64.0	0.0	0.0	59.1	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	7.9	7.9
2	17574387.75	4418807.79	12.19	0	63	72.2	72.2	0.0	0.0	59.1	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	16.0	16.0
3	17574387.75	4418807.79	12.19	0	125	67.6	67.6	0.0	0.0	59.1	0.1	-0.6	0.0	0.0	0.0	0.0	-0.0	8.9	8.9
4	17574387.75	4418807.79	12.19	0	250	67.1	67.1	0.0	0.0	59.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	4.4	4.4
5	17574387.75	4418807.79	12.19	0	500	78.7	78.7	0.0	0.0	59.1	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	17.2	17.2
6	17574387.75	4418807.79	12.19	0	1000	84.0	84.0	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	25.1	25.1
7	17574387.75	4418807.79	12.19	0	2000	89.0	89.0	0.0	0.0	59.1	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	29.0	29.0
8	17574387.75	4418807.79	12.19	0	4000	93.9	93.9	0.0	0.0	59.1	8.4	-1.6	0.0	0.0	0.0	0.0	-0.0	28.0	28.0
9	17574387.75	4418807.79	12.19	0	8000	91.1	91.1	0.0	0.0	59.1	29.8	-1.6	0.0	0.0	0.0	0.0	-0.0	3.7	3.7

Point Source, ISO 9613, Name: "3616_UtilityCooler_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574377.50	4418814.02	4.36	0	63	66.2	66.2	0.0	0.0	59.5	0.0	-4.0	0.0	0.0	4.8	0.0	-0.0	5.9	5.9
2	17574377.50	4418814.02	4.36	0	125	75.2	75.2	0.0	0.0	59.5	0.1	-1.6	0.0	0.0	7.0	0.0	-0.0	10.2	10.2
3	17574377.50	4418814.02	4.36	0	250	79.2	79.2	0.0	0.0	59.5	0.3	2.3	0.0	0.0	8.7	0.0	-0.0	8.5	8.5
4	17574377.50	4418814.02	4.36	0	500	80.2	80.2	0.0	0.0	59.5	0.5	0.8	0.0	0.0	12.6	0.0	-0.0	6.7	6.7
5	17574377.50	4418814.02	4.36	0	1000	81.2	81.2	0.0	0.0	59.5	1.0	-2.2	0.0	0.0	16.0	0.0	-0.0	6.9	6.9
6	17574377.50	4418814.02	4.36	0	2000	76.2	76.2	0.0	0.0	59.5	2.6	-2.6	0.0	0.0	19.0	0.0	-0.0	-2.2	-2.2
7	17574377.50	4418814.02	4.36	0	4000	70.2	70.2	0.0	0.0	59.5	8.7	-2.6	0.0	0.0	21.5	0.0	-0.0	-16.8	-16.8
8	17574377.50	4418814.02	4.36	0	8000	62.2	62.2	0.0	0.0	59.5	31.0	-2.6	0.0	0.0	22.9	0.0	-0.0	-48.5	-48.5

Point Source, ISO 9613, Name: "3616_UtilityCooler_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574391.13	4418801.38	4.36	0	63	66.2	66.2	0.0	0.0	59.0	0.0	-3.9	0.0	0.0	0.0	0.0	-0.0	11.1	11.1
2	17574391.13	4418801.38	4.36	0	125	75.2	75.2	0.0	0.0	59.0	0.1	-1.5	0.0	0.0	0.0	0.0	-0.0	17.6	17.6
3	17574391.13	4418801.38	4.36	0	250	79.2	79.2	0.0	0.0	59.0	0.3	2.4	0.0	0.0	0.0	0.0	-0.0	17.5	17.5
4	17574391.13	4418801.38	4.36	0	500	80.2	80.2	0.0	0.0	59.0	0.5	1.0	0.0	0.0	0.0	0.0	-0.0	19.7	19.7
5	17574391.13	4418801.38	4.36	0	1000	81.2	81.2	0.0	0.0	59.0	0.9	-2.0	0.0	0.0	0.0	0.0	-0.0	23.3	23.3
6	17574391.13	4418801.38	4.36	0	2000	76.2	76.2	0.0	0.0	59.0	2.4	-2.5	0.0	0.0	0.0	0.0	-0.0	17.2	17.2
7	17574391.13	4418801.38	4.36	0	4000	70.2	70.2	0.0	0.0	59.0	8.2	-2.5	0.0	0.0	0.0	0.0	-0.0	5.4	5.4
8	17574391.13	4418801.38	4.36	0	8000	62.2	62.2	0.0	0.0	59.0	29.4	-2.5	0.0	0.0	0.0	0.0	-0.0	-23.7	-23.7

Point Source, ISO 9613, Name: "3616_GasCooler_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574400.91	4418856.01	5.12	0	63	69.9	69.9	0.0	0.0	58.9	0.0	-3.6	0.0	0.0	0.0	0.0	-0.0	14.6	14.6
2	17574400.91	4418856.01	5.12	0	125	78.9	78.9	0.0	0.0	58.9	0.1	-1.3	0.0	0.0	0.0	0.0	-0.0	21.2	21.2
3	17574400.91	4418856.01	5.12	0	250	82.9	82.9	0.0	0.0	58.9	0.3	2.6	0.0	0.0	0.0	0.0	-0.0	21.2	21.2
4	17574400.91	4418856.01	5.12	0	500	83.9	83.9	0.0	0.0	58.9	0.5	1.2	0.0	0.0	0.0	0.0	-0.0	23.4	23.4
5	17574400.91	4418856.01	5.12	0	1000	84.9	84.9	0.0	0.0	58.9	0.9	-1.8	0.0	0.0	0.0	0.0	-0.0	26.9	26.9
6	17574400.91	4418856.01	5.12	0	2000	79.9	79.9	0.0	0.0	58.9	2.4	-2.2	0.0	0.0	0.0	0.0	-0.0	20.9	20.9
7	17574400.91	4418856.01	5.12	0	4000	73.9	73.9	0.0	0.0	58.9	8.1	-2.2	0.0	0.0	0.0	0.0	-0.0	9.2	9.2
8	17574400.91	4418856.01	5.12	0	8000	65.9	65.9	0.0	0.0	58.9	28.9	-2.2	0.0	0.0	0.0	0.0	-0.0	-19.6	-19.6

Point Source, ISO 9613, Name: "3616_GasCooler_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574403.64	4418853.70	5.12	0	63	69.9	69.9	0.0	0.0	58.8	0.0	-3.6	0.0	0.0	0.0	0.0	-0.0	14.7	14.7
2	17574403.64	4418853.70	5.12	0	125	78.9	78.9	0.0	0.0	58.8	0.1	-1.2	0.0	0.0	0.0	0.0	-0.0	21.3	21.3
3	17574403.64	4418853.70	5.12	0	250	82.9	82.9	0.0	0.0	58.8	0.3	2.7	0.0	0.0	0.0	0.0	-0.0	21.2	21.2
4	17574403.64	4418853.70	5.12	0	500	83.9	83.9	0.0	0.0	58.8	0.5	1.3	0.0	0.0	0.0	0.0	-0.0	23.4	23.4
5	17574403.64	4418853.70	5.12	0	1000	84.9	84.9	0.0	0.0	58.8	0.9	-1.8	0.0	0.0	0.0	0.0	-0.0	27.0	27.0
6	17574403.64	4418853.70	5.12	0	2000	79.9	79.9	0.0	0.0	58.8	2.4	-2.2	0.0	0.0	0.0	0.0	-0.0	21.0	21.0
7	17574403.64	4418853.70	5.12	0	4000	73.9	73.9	0.0	0.0	58.8	8.0	-2.2	0.0	0.0	0.0	0.0	-0.0	9.4	9.4
8	17574403.64	4418853.70	5.12	0	8000	65.9	65.9	0.0	0.0	58.8	28.5	-2.2	0.0	0.0	0.0	0.0	-0.0	-19.2	-19.2

Point Source, ISO 9613, Name: "3616_GasCooler_3", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574414.88	4418843.40	5.12	0	63	69.9	69.9	0.0	0.0	58.3	0.0	-3.4	0.0	0.0	0.0	0.0	-0.0	15.0	15.0
2	17574414.88	4418843.40	5.12	0	125	78.9	78.9	0.0	0.0	58.3	0.1	-1.1	0.0	0.0	0.0	0.0	-0.0	21.6	21.6
3	17574414.88	4418843.40	5.12	0	250	82.9	82.9	0.0	0.0	58.3	0.2	2.8	0.0	0.0	0.0	0.0	-0.0	21.6	21.6
4	17574414.88	4418843.40	5.12	0	500	83.9	83.9	0.0	0.0	58.3	0.5	1.4	0.0	0.0	0.0	0.0	-0.0	23.8	23.8
5	17574414.88	4418843.40	5.12	0	1000	84.9	84.9	0.0	0.0	58.3	0.8	-1.6	0.0	0.0	0.0	0.0	-0.0	27.4	27.4
6	17574414.88	4418843.40	5.12	0	2000	79.9	79.9	0.0	0.0	58.3	2.2	-2.0	0.0	0.0	0.0	0.0	-0.0	21.4	21.4
7	17574414.88	4418843.40	5.12	0	4000	73.9	73.9	0.0	0.0	58.3	7.6	-2.0	0.0	0.0	0.0	0.0	-0.0	10.1	10.1
8	17574414.88	4418843.40	5.12	0	8000	65.9	65.9	0.0	0.0	58.3	27.0	-2.0	0.0	0.0	0.0	0.0	-0.0	-17.3	-17.3

Point Source, ISO 9613, Name: "3616_GasCooler_4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574416.88	4418841.20	5.12	0	63	69.9	69.9	0.0	0.0	58.2	0.0	-3.4	0.0	0.0	0.0	0.0	-0.0	15.1	15.1
2	17574416.88	4418841.20	5.12	0	125	78.9	78.9	0.0	0.0	58.2	0.1	-1.0	0.0	0.0	0.0	0.0	-0.0	21.6	21.6
3	17574416.88	4418841.20	5.12	0	250	82.9	82.9	0.0	0.0	58.2	0.2	2.9	0.0	0.0	0.0	0.0	-0.0	21.6	21.6
4	17574416.88	4418841.20	5.12	0	500	83.9	83.9	0.0	0.0	58.2	0.4	1.4	0.0	0.0	0.0	0.0	-0.0	23.9	23.9
5	17574416.88	4418841.20	5.12	0	1000	84.9	84.9	0.0	0.0	58.2	0.8	-1.6	0.0	0.0	0.0	0.0	-0.0	27.4	27.4
6	17574416.88	4418841.20	5.12	0	2000	79.9	79.9	0.0	0.0	58.2	2.2	-2.0	0.0	0.0	0.0	0.0	-0.0	21.5	21.5
7	17574416.88	4418841.20	5.12	0	4000	73.9	73.9	0.0	0.0	58.2	7.5	-2.0	0.0	0.0	0.0	0.0	-0.0	10.2	10.2
8	17574416.88	4418841.20	5.12	0	8000	65.9	65.9	0.0	0.0	58.2	26.7	-2.0	0.0	0.0	0.0	0.0	-0.0	-17.0	-17.0

Point Source, ISO 9613, Name: "C1000_Generator_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574401.52	4418906.70	3.74	0	500	92.8	92.8	0.0	0.0	59.4	0.5	0.6	0.0	0.0	0.0	0.0	-0.0	32.4	32.4

Point Source, ISO 9613, Name: "3616_Intake_4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574391.33	4418808.46	2.53	0	32	61.0	61.0	0.0	0.0	59.0	0.0	-4.6	0.0	0.0	3.6	0.0	-0.0	2.9	2.9
2	17574391.33	4418808.46	2.53	0	63	69.0	69.0	0.0	0.0	59.0	0.0	-4.6	0.0	0.0	4.5	0.0	-0.0	10.0	10.0
3	17574391.33	4418808.46	2.53	0	125	73.9	73.9	0.0	0.0	59.0	0.1	-2.1	0.0	0.0	5.7	0.0	-0.0	11.2	11.2
4	17574391.33	4418808.46	2.53	0	250	73.9	73.9	0.0	0.0	59.0	0.3	1.8	0.0	0.0	7.0	0.0	-0.0	5.9	5.9
5	17574391.33	4418808.46	2.53	0	500	69.9	69.9	0.0	0.0	59.0	0.5	0.3	0.0	0.0	9.2	0.0	-0.0	0.9	0.9
6	17574391.33	4418808.46	2.53	0	1000	68.0	68.0	0.0	0.0	59.0	0.9	-2.7	0.0	0.0	11.6	0.0	-0.0	-0.9	-0.9
7	17574391.33	4418808.46	2.53	0	2000	68.8	68.8	0.0	0.0	59.0	2.4	-3.1	0.0	0.0	14.0	0.0	-0.0	-3.5	-3.5
8	17574391.33	4418808.46	2.53	0	4000	88.2	88.2	0.0	0.0	59.0	8.2	-3.1	0.0	0.0	16.5	0.0	-0.0	7.6	7.6
9	17574391.33	4418808.46	2.53	0	8000	89.5	89.5	0.0	0.0	59.0	29.4	-3.1	0.0	0.0	18.8	0.0	-0.0	-14.6	-14.6

Point Source, ISO 9613, Name: "3616_Intake_2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574377.76	4418821.24	2.53	0	32	61.0	61.0	0.0	0.0	59.5	0.0	-4.6	0.0	0.0	6.2	0.0	-0.0	-0.1	-0.1
2	17574377.76	4418821.24	2.53	0	63	69.0	69.0	0.0	0.0	59.5	0.0	-4.6	0.0	0.0	9.0	0.0	-0.0	5.2	5.2
3	17574377.76	4418821.24	2.53	0	125	73.9	73.9	0.0	0.0	59.5	0.1	-2.2	0.0	0.0	12.3	0.0	-0.0	4.2	4.2
4	17574377.76	4418821.24	2.53	0	250	73.9	73.9	0.0	0.0	59.5	0.3	1.6	0.0	0.0	14.9	0.0	-0.0	-2.3	-2.3
5	17574377.76	4418821.24	2.53	0	500	69.9	69.9	0.0	0.0	59.5	0.5	0.2	0.0	0.0	18.6	0.0	-0.0	-8.9	-8.9
6	17574377.76	4418821.24	2.53	0	1000	68.0	68.0	0.0	0.0	59.5	1.0	-2.8	0.0	0.0	21.2	0.0	-0.0	-10.8	-10.8
7	17574377.76	4418821.24	2.53	0	2000	68.8	68.8	0.0	0.0	59.5	2.6	-3.3	0.0	0.0	22.7	0.0	-0.0	-12.7	-12.7
8	17574377.76	4418821.24	2.53	0	4000	88.2	88.2	0.0	0.0	59.5	8.7	-3.3	0.0	0.0	23.7	0.0	-0.0	-0.4	-0.4
9	17574377.76	4418821.24	2.53	0	8000	89.5	89.5	0.0	0.0	59.5	31.0	-3.3	0.0	0.0	24.3	0.0	-0.0	-22.0	-22.0

Point Source, ISO 9613, Name: "3616_Intake_3", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574388.09	4418811.64	2.53	0	32	61.0	61.0	0.0	0.0	59.1	0.0	-4.6	0.0	0.0	4.6	0.0	-0.0	1.9	1.9
2	17574388.09	4418811.64	2.53	0	63	69.0	69.0	0.0	0.0	59.1	0.0	-4.6	0.0	0.0	6.3	0.0	-0.0	8.1	8.1
3	17574388.09	4418811.64	2.53	0	125	73.9	73.9	0.0	0.0	59.1	0.1	-2.1	0.0	0.0	8.6	0.0	-0.0	8.2	8.2
4	17574388.09	4418811.64	2.53	0	250	73.9	73.9	0.0	0.0	59.1	0.3	1.7	0.0	0.0	11.0	0.0	-0.0	1.8	1.8
5	17574388.09	4418811.64	2.53	0	500	69.9	69.9	0.0	0.0	59.1	0.5	0.3	0.0	0.0	14.3	0.0	-0.0	-4.3	-4.3
6	17574388.09	4418811.64	2.53	0	1000	68.0	68.0	0.0	0.0	59.1	0.9	-2.7	0.0	0.0	17.1	0.0	-0.0	-6.4	-6.4
7	17574388.09	4418811.64	2.53	0	2000	68.8	68.8	0.0	0.0	59.1	2.5	-3.2	0.0	0.0	19.4	0.0	-0.0	-9.0	-9.0
8	17574388.09	4418811.64	2.53	0	4000	88.2	88.2	0.0	0.0	59.1	8.3	-3.2	0.0	0.0	21.3	0.0	-0.0	2.6	2.6
9	17574388.09	4418811.64	2.53	0	8000	89.5	89.5	0.0	0.0	59.1	29.8	-3.2	0.0	0.0	22.8	0.0	-0.0	-19.0	-19.0

Point Source, ISO 9613, Name: "3616_Intake_1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574374.52	4418824.28	2.53	0	32	61.0	61.0	0.0	0.0	59.6	0.0	-4.6	0.0	0.0	6.4	0.0	-0.0	-0.4	-0.4
2	17574374.52	4418824.28	2.53	0	63	69.0	69.0	0.0	0.0	59.6	0.0	-4.6	0.0	0.0	9.4	0.0	-0.0	4.7	4.7
3	17574374.52	4418824.28	2.53	0	125	73.9	73.9	0.0	0.0	59.6	0.1	-2.2	0.0	0.0	12.8	0.0	-0.0	3.6	3.6
4	17574374.52	4418824.28	2.53	0	250	73.9	73.9	0.0	0.0	59.6	0.3	1.6	0.0	0.0	15.3	0.0	-0.0	-2.9	-2.9
5	17574374.52	4418824.28	2.53	0	500	69.9	69.9	0.0	0.0	59.6	0.5	0.2	0.0	0.0	19.0	0.0	-0.0	-9.4	-9.4
6	17574374.52	4418824.28	2.53	0	1000	68.0	68.0	0.0	0.0	59.6	1.0	-2.8	0.0	0.0	21.6	0.0	-0.0	-11.4	-11.4
7	17574374.52	4418824.28	2.53	0	2000	68.8	68.8	0.0	0.0	59.6	2.6	-3.3	0.0	0.0	23.0	0.0	-0.0	-13.1	-13.1
8	17574374.52	4418824.28	2.53	0	4000	88.2	88.2	0.0	0.0	59.6	8.8	-3.3	0.0	0.0	23.9	0.0	-0.0	-0.8	-0.8
9	17574374.52	4418824.28	2.53	0	8000	89.5	89.5	0.0	0.0	59.6	31.4	-3.3	0.0	0.0	24.4	0.0	-0.0	-22.6	-22.6

Point Source, ISO 9613, Name: "Blowdown Silencer", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574359.54	4418936.99	6.80	0	500	-88.0	71.7	0.0	0.0	60.9	0.6	1.1	0.0	0.0	0.0	0.0	-0.0	-88.0	9.1

Point Source, ISO 9613, Name: "Blowdown Silencer", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574361.62	4418936.41	6.80	0	500	-88.0	71.7	0.0	0.0	60.8	0.6	1.1	0.0	0.0	0.0	0.0	-0.0	-88.0	9.1

Point Source, ISO 9613, Name: "Blowdown Silencer", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574364.05	4418936.32	6.80	0	500	-88.0	71.7	0.0	0.0	60.8	0.6	1.2	0.0	0.0	0.0	0.0	-0.0	-88.0	9.2

Point Source, ISO 9613, Name: "Blowdown Silencer", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574365.63	4418936.24	6.80	0	500	-88.0	71.7	0.0	0.0	60.7	0.6	1.2	0.0	0.0	0.0	0.0	-0.0	-88.0	9.2

Point Source, ISO 9613, Name: "CompressorBuilding-SidewallExhaust4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574412.58	4418823.92	3.00	0	500	92.0	92.0	0.0	0.0	58.3	0.4	0.6	0.0	0.0	0.0	0.0	-0.0	32.7	32.7

Point Source, ISO 9613, Name: "CompressorBuilding-SidewallExhaust1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574387.53	4418846.68	3.00	0	500	92.0	92.0	0.0	0.0	59.3	0.5	0.4	0.0	0.0	0.0	0.0	-0.0	31.9	31.9

Point Source, ISO 9613, Name: "CompressorBuilding-SidewallExhaust2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574398.94	4418836.48	3.00	0	500	92.0	92.0	0.0	0.0	58.8	0.5	0.5	0.0	0.0	0.0	0.0	-0.0	32.2	32.2

Point Source, ISO 9613, Name: "CompressorBuilding-SidewallExhaust3", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574401.99	4418833.74	3.00	0	500	92.0	92.0	0.0	0.0	58.7	0.5	0.5	0.0	0.0	0.0	0.0	-0.0	32.3	32.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574497.48	4418883.66	1.00	0	500	78.0	78.0	0.0	0.0	55.4	0.3	0.1	0.0	0.0	0.0	0.0	-0.0	22.2	22.2

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574507.15	4418878.10	1.00	0	500	77.5	77.5	0.0	0.0	54.8	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	22.2	22.2
2	17574487.72	4418882.97	1.00	0	500	67.5	67.5	0.0	0.0	55.8	0.3	0.1	0.0	0.0	0.0	0.0	-0.0	11.3	11.3
3	17574487.76	4418880.68	1.00	0	500	60.4	60.4	0.0	0.0	55.7	0.3	0.1	0.0	0.0	0.0	0.0	-0.0	4.3	4.3
4	17574488.05	4418880.28	1.00	0	500	57.7	57.7	0.0	0.0	55.7	0.3	0.1	0.0	0.0	0.0	0.0	-0.0	1.6	1.6

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574503.15	4418874.20	1.00	0	500	78.0	78.0	0.0	0.0	54.8	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	22.6	22.6

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574508.35	4418864.67	1.00	0	500	76.5	76.5	0.0	0.0	54.3	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	21.6	21.6
2	17574491.79	4418871.52	1.00	0	500	70.7	70.7	0.0	0.0	55.3	0.3	0.1	0.0	0.0	0.0	0.0	-0.0	14.9	14.9
3	17574523.27	4418862.09	1.00	0	500	64.6	64.6	0.0	0.0	53.4	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	10.4	10.4
4	17574492.82	4418866.39	1.00	0	500	61.8	61.8	0.0	0.0	55.2	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	6.1	6.1
5	17574491.99	4418866.79	1.00	0	500	61.2	61.2	0.0	0.0	55.2	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	5.5	5.5
6	17574491.53	4418867.32	1.00	0	500	59.0	59.0	0.0	0.0	55.3	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	3.2	3.2

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574514.90	4418866.42	1.00	0	500	76.7	76.7	0.0	0.0	54.0	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	22.0	22.0
2	17574529.60	4418863.35	1.00	0	500	68.8	68.8	0.0	0.0	53.1	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	15.0	15.0
3	17574499.81	4418870.76	1.00	0	500	65.8	65.8	0.0	0.0	54.9	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	10.4	10.4
4	17574499.90	4418869.20	1.00	0	500	62.4	62.4	0.0	0.0	54.9	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	6.9	6.9
5	17574500.47	4418868.51	1.00	0	500	62.1	62.1	0.0	0.0	54.8	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	6.7	6.7
6	17574501.23	4418868.05	1.00	0	500	61.8	61.8	0.0	0.0	54.8	0.3	0.2	0.0	0.0	0.0	0.0	-0.0	6.5	6.5

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574521.12	4418859.87	1.00	0	500	76.1	76.1	0.0	0.0	53.5	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	21.9	21.9
2	17574528.97	4418860.66	1.00	0	500	72.0	72.0	0.0	0.0	53.1	0.2	0.5	0.0	0.0	0.0	0.0	-0.0	18.1	18.1
3	17574515.59	4418860.00	1.00	0	500	65.5	65.5	0.0	0.0	53.8	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	11.0	11.0
4	17574526.95	4418859.31	1.00	0	500	64.7	64.7	0.0	0.0	53.1	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	10.9	10.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574502.78	4418859.80	1.00	0	500	78.0	78.0	0.0	0.0	54.5	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	22.9	22.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574506.06	4418856.87	1.00	0	500	77.9	77.9	0.0	0.0	54.3	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	23.0	23.0
2	17574520.95	4418854.78	1.00	0	500	62.8	62.8	0.0	0.0	53.4	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	8.7	8.7

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574504.73	4418851.69	1.00	0	500	78.0	78.0	0.0	0.0	54.3	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	23.1	23.1

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574522.38	4418845.35	1.00	0	500	75.8	75.8	0.0	0.0	53.1	0.2	0.6	0.0	0.0	0.0	0.0	-0.0	22.0	22.0
2	17574528.30	4418843.68	1.00	0	500	69.4	69.4	0.0	0.0	52.6	0.2	0.6	0.0	0.0	0.0	0.0	-0.0	15.9	15.9
3	17574515.91	4418848.39	1.00	0	500	69.6	69.6	0.0	0.0	53.5	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	15.3	15.3
4	17574516.66	4418846.18	1.00	0	500	65.7	65.7	0.0	0.0	53.4	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	11.6	11.6
5	17574515.99	4418846.72	1.00	0	500	65.1	65.1	0.0	0.0	53.5	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	10.9	10.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574519.92	4418840.72	1.00	0	500	76.0	76.0	0.0	0.0	53.1	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	22.0	22.0
2	17574526.75	4418841.38	1.00	0	500	72.4	72.4	0.0	0.0	52.7	0.2	0.6	0.0	0.0	0.0	0.0	-0.0	18.9	18.9
3	17574515.29	4418840.80	1.00	0	500	65.6	65.6	0.0	0.0	53.4	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	11.4	11.4
4	17574524.79	4418840.22	1.00	0	500	64.0	64.0	0.0	0.0	52.8	0.2	0.6	0.0	0.0	0.0	0.0	-0.0	10.3	10.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574510.48	4418840.12	1.00	0	500	75.8	75.8	0.0	0.0	53.7	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	21.4	21.4
2	17574495.55	4418841.74	1.00	0	500	74.0	74.0	0.0	0.0	54.6	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	18.8	18.8

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574499.10	4418847.14	1.00	0	500	77.8	77.8	0.0	0.0	54.5	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	22.7	22.7
2	17574508.36	4418845.68	1.00	0	500	63.9	63.9	0.0	0.0	53.9	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	9.3	9.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574500.19	4418849.85	1.00	0	500	77.4	77.4	0.0	0.0	54.5	0.3	0.3	0.0	0.0	0.0	0.0	-0.0	22.4	22.4
2	17574509.91	4418847.26	1.00	0	500	68.9	68.9	0.0	0.0	53.9	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	14.3	14.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574502.93	4418838.41	1.00	0	500	78.0	78.0	0.0	0.0	54.1	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	23.2	23.2

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574515.01	4418834.62	1.00	0	500	78.0	78.0	0.0	0.0	53.3	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	23.9	23.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574498.77	4418836.36	1.00	0	500	78.0	78.0	0.0	0.0	54.4	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	23.0	23.0

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574498.25	4418833.68	1.00	0	500	78.0	78.0	0.0	0.0	54.4	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	23.0	23.0

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574501.98	4418830.63	1.00	0	500	78.0	78.0	0.0	0.0	54.1	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	23.2	23.2

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574512.38	4418826.80	1.00	0	500	78.0	78.0	0.0	0.0	53.4	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	23.8	23.8

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574503.93	4418827.82	1.00	0	500	70.8	70.8	0.0	0.0	54.0	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	16.1	16.1
2	17574495.21	4418828.76	1.00	0	500	77.1	77.1	0.0	0.0	54.5	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	21.9	21.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574493.94	4418821.80	1.00	0	500	75.4	75.4	0.0	0.0	54.5	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	20.2	20.2
2	17574490.68	4418827.06	1.00	0	500	73.9	73.9	0.0	0.0	54.7	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	18.5	18.5
3	17574493.94	4418826.32	1.00	0	500	66.0	66.0	0.0	0.0	54.5	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	10.8	10.8

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574491.21	4418819.91	1.00	0	500	76.3	76.3	0.0	0.0	54.6	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	20.9	20.9
2	17574489.21	4418824.75	1.00	0	500	72.1	72.1	0.0	0.0	54.8	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	16.6	16.6
3	17574491.16	4418824.33	1.00	0	500	66.6	66.6	0.0	0.0	54.7	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	11.3	11.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574516.27	4418813.08	1.00	0	500	73.5	73.5	0.0	0.0	53.0	0.2	0.7	0.0	0.0	0.0	0.0	-0.0	19.4	19.4
2	17574499.09	4418817.34	1.00	0	500	74.4	74.4	0.0	0.0	54.2	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	19.5	19.5
3	17574523.89	4418810.93	1.00	0	500	68.2	68.2	0.0	0.0	52.5	0.2	0.8	0.0	0.0	0.0	0.0	-0.0	14.7	14.7
4	17574508.50	4418815.03	1.00	0	500	68.1	68.1	0.0	0.0	53.6	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	13.7	13.7

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574517.11	4418807.93	1.00	0	500	77.4	77.4	0.0	0.0	53.0	0.2	0.8	0.0	0.0	0.0	0.0	-0.0	23.5	23.5
2	17574524.21	4418807.98	1.00	0	500	68.8	68.8	0.0	0.0	52.5	0.2	0.9	0.0	0.0	0.0	0.0	-0.0	15.2	15.2

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574488.90	4418815.87	1.00	0	500	78.0	78.0	0.0	0.0	54.8	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	22.6	22.6

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574492.52	4418812.71	1.00	0	500	77.1	77.1	0.0	0.0	54.5	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	21.9	21.9
2	17574498.25	4418813.24	1.00	0	500	70.6	70.6	0.0	0.0	54.2	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	15.6	15.6

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574498.40	4418806.77	1.00	0	500	77.6	77.6	0.0	0.0	54.2	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	22.7	22.7
2	17574511.28	4418805.50	1.00	0	500	63.0	63.0	0.0	0.0	53.4	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	8.7	8.7
3	17574511.75	4418806.09	1.00	0	500	64.7	64.7	0.0	0.0	53.3	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	10.4	10.4

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574495.86	4418809.80	1.00	0	500	78.0	78.0	0.0	0.0	54.3	0.3	0.5	0.0	0.0	0.0	0.0	-0.0	22.9	22.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574487.13	4418805.87	1.00	0	500	65.6	65.6	0.0	0.0	54.8	0.3	0.4	0.0	0.0	0.0	0.0	-0.0	10.0	10.0
2	17574497.59	4418804.61	1.00	0	500	74.6	74.6	0.0	0.0	54.2	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	19.5	19.5
3	17574514.49	4418803.96	1.00	0	500	73.5	73.5	0.0	0.0	53.1	0.3	0.8	0.0	0.0	0.0	0.0	-0.0	19.3	19.3
4	17574523.21	4418801.65	1.00	0	500	68.2	68.2	0.0	0.0	52.5	0.2	1.4	0.0	0.0	0.0	0.0	-0.0	14.0	14.0
5	17574507.08	4418804.12	1.00	0	500	63.1	63.1	0.0	0.0	53.6	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	8.5	8.5

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574514.94	4418798.90	1.00	0	500	76.5	76.5	0.0	0.0	53.1	0.3	0.8	0.0	0.0	0.0	0.0	-0.0	22.3	22.3
2	17574506.77	4418797.48	1.00	0	500	71.2	71.2	0.0	0.0	53.7	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	16.5	16.5
3	17574523.66	4418798.65	1.00	0	500	67.6	67.6	0.0	0.0	52.5	0.2	1.9	0.0	0.0	0.0	0.0	-0.0	12.9	12.9

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574494.38	4418798.36	1.00	0	500	78.0	78.0	0.0	0.0	54.4	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	22.7	22.7

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574501.73	4418794.90	1.00	0	500	77.7	77.7	0.0	0.0	54.0	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	22.8	22.8
2	17574518.33	4418794.06	1.00	0	500	65.7	65.7	0.0	0.0	52.9	0.2	1.3	0.0	0.0	0.0	0.0	-0.0	11.3	11.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574493.84	4418793.54	1.00	0	500	74.7	74.7	0.0	0.0	54.5	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	19.4	19.4
2	17574493.63	4418790.86	1.00	0	500	74.7	74.7	0.0	0.0	54.5	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	19.3	19.3
3	17574502.88	4418791.17	1.00	0	500	66.2	66.2	0.0	0.0	53.9	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	11.3	11.3

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574494.26	4418788.02	1.00	0	500	77.5	77.5	0.0	0.0	54.5	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	22.1	22.1
2	17574504.30	4418788.07	1.00	0	500	68.5	68.5	0.0	0.0	53.9	0.3	0.8	0.0	0.0	0.0	0.0	-0.0	13.6	13.6

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574498.94	4418784.87	1.00	0	500	78.0	78.0	0.0	0.0	54.2	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	22.8	22.8

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574495.74	4418782.61	1.00	0	500	78.0	78.0	0.0	0.0	54.4	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	22.6	22.6

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574491.79	4418780.51	1.00	0	500	78.0	78.0	0.0	0.0	54.7	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	22.4	22.4

Line Source, ISO 9613, Name: "Aboveground Piping", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574520.73	4418819.07	1.00	0	500	73.2	73.2	0.0	0.0	52.8	0.2	0.7	0.0	0.0	0.0	0.0	-0.0	19.4	19.4
2	17574519.87	4418824.23	1.00	0	500	72.0	72.0	0.0	0.0	52.9	0.2	0.7	0.0	0.0	0.0	0.0	-0.0	18.2	18.2
3	17574524.96	4418822.12	1.00	0	500	70.8	70.8	0.0	0.0	52.5	0.2	0.8	0.0	0.0	0.0	0.0	-0.0	17.3	17.3
4	17574525.89	4418819.47	1.00	0	500	67.2	67.2	0.0	0.0	52.4	0.2	0.8	0.0	0.0	0.0	0.0	-0.0	13.8	13.8
5	17574515.96	4418817.48	1.00	0	500	66.5	66.5	0.0	0.0	53.1	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	12.4	12.4
6	17574516.23	4418818.94	1.00	0	500	64.1	64.1	0.0	0.0	53.1	0.3	0.7	0.0	0.0	0.0	0.0	-0.0	10.1	10.1
7	17574516.42	4418824.96	1.00	0	500	63.4	63.4	0.0	0.0	53.1	0.3	0.6	0.0	0.0	0.0	0.0	-0.0	9.4	9.4

Area Source, ISO 9613, Name: "TurbineBuilding-RoofVent3", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574362.04	4418856.93	10.97	0	32	34.3	34.3	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.6	-27.6
2	17574362.04	4418856.93	10.97	0	63	34.3	34.3	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.7	-27.7
3	17574362.04	4418856.93	10.97	0	125	43.3	43.3	0.0	0.0	60.1	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.3	-21.3
4	17574362.04	4418856.93	10.97	0	250	43.3	43.3	0.0	0.0	60.1	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-21.9	-21.9
5	17574362.04	4418856.93	10.97	0	500	47.3	47.3	0.0	0.0	60.1	0.6	1.8	0.0	0.0	2.9	0.0	-0.0	-18.2	-18.2
6	17574362.04	4418856.93	10.97	0	1000	45.3	45.3	0.0	0.0	60.1	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-19.5	-19.5
7	17574362.04	4418856.93	10.97	0	2000	53.3	53.3	0.0	0.0	60.1	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-12.7	-12.7
8	17574362.04	4418856.93	10.97	0	4000	47.3	47.3	0.0	0.0	60.1	9.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-25.3	-25.3
9	17574362.04	4418856.93	10.97	0	8000	44.3	44.3	0.0	0.0	60.1	33.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-52.3	-52.3
10	17574360.80	4418858.57	10.97	0	32	34.2	34.2	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.7	-27.7
11	17574360.80	4418858.57	10.97	0	63	34.2	34.2	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.7	-27.7
12	17574360.80	4418858.57	10.97	0	125	43.2	43.2	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.3	-21.3
13	17574360.80	4418858.57	10.97	0	250	43.2	43.2	0.0	0.0	60.2	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-22.0	-22.0
14	17574360.80	4418858.57	10.97	0	500	47.2	47.2	0.0	0.0	60.2	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-18.2	-18.2
15	17574360.80	4418858.57	10.97	0	1000	45.2	45.2	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-19.5	-19.5
16	17574360.80	4418858.57	10.97	0	2000	53.2	53.2	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-12.8	-12.8
17	17574360.80	4418858.57	10.97	0	4000	47.2	47.2	0.0	0.0	60.2	9.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-25.4	-25.4
18	17574360.80	4418858.57	10.97	0	8000	44.2	44.2	0.0	0.0	60.2	33.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-52.6	-52.6

Area Source, ISO 9613, Name: "TurbineBuilding-RoofVent2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574355.64	4418862.94	10.97	0	32	34.3	34.3	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.9	-27.9
2	17574355.64	4418862.94	10.97	0	63	34.3	34.3	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.9	-27.9
3	17574355.64	4418862.94	10.97	0	125	43.3	43.3	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.5	-21.5
4	17574355.64	4418862.94	10.97	0	250	43.3	43.3	0.0	0.0	60.3	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-22.2	-22.2
5	17574355.64	4418862.94	10.97	0	500	47.3	47.3	0.0	0.0	60.3	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-18.4	-18.4
6	17574355.64	4418862.94	10.97	0	1000	45.3	45.3	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-19.7	-19.7
7	17574355.64	4418862.94	10.97	0	2000	53.3	53.3	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-13.0	-13.0
8	17574355.64	4418862.94	10.97	0	4000	47.3	47.3	0.0	0.0	60.3	9.6	-1.7	0.0	0.0	4.8	0.0	-0.0	-25.8	-25.8
9	17574355.64	4418862.94	10.97	0	8000	44.3	44.3	0.0	0.0	60.3	34.2	-1.7	0.0	0.0	4.8	0.0	-0.0	-53.5	-53.5
10	17574354.39	4418864.59	10.97	0	32	34.2	34.2	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.9	-27.9
11	17574354.39	4418864.59	10.97	0	63	34.2	34.2	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-27.9	-27.9
12	17574354.39	4418864.59	10.97	0	125	43.2	43.2	0.0	0.0	60.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.6	-21.6
13	17574354.39	4418864.59	10.97	0	250	43.2	43.2	0.0	0.0	60.4	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-22.2	-22.2
14	17574354.39	4418864.59	10.97	0	500	47.2	47.2	0.0	0.0	60.4	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-18.5	-18.5
15	17574354.39	4418864.59	10.97	0	1000	45.2	45.2	0.0	0.0	60.4	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-19.8	-19.8
16	17574354.39	4418864.59	10.97	0	2000	53.2	53.2	0.0	0.0	60.4	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-13.1	-13.1
17	17574354.39	4418864.59	10.97	0	4000	47.2	47.2	0.0	0.0	60.4	9.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-25.9	-25.9
18	17574354.39	4418864.59	10.97	0	8000	44.2	44.2	0.0	0.0	60.4	34.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-53.7	-53.7

Area Source, ISO 9613, Name: "TurbineBuilding-RoofVent1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574348.97	4418869.17	10.97	0	32	34.3	34.3	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-28.1	-28.1
2	17574348.97	4418869.17	10.97	0	63	34.3	34.3	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-28.1	-28.1
3	17574348.97	4418869.17	10.97	0	125	43.3	43.3	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.8	-21.8
4	17574348.97	4418869.17	10.97	0	250	43.3	43.3	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-22.4	-22.4
5	17574348.97	4418869.17	10.97	0	500	47.3	47.3	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-18.7	-18.7
6	17574348.97	4418869.17	10.97	0	1000	45.3	45.3	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-20.0	-20.0
7	17574348.97	4418869.17	10.97	0	2000	53.3	53.3	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-13.3	-13.3
8	17574348.97	4418869.17	10.97	0	4000	47.3	47.3	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-26.3	-26.3
9	17574348.97	4418869.17	10.97	0	8000	44.3	44.3	0.0	0.0	60.6	35.1	-1.7	0.0	0.0	4.8	0.0	-0.0	-54.6	-54.6
10	17574347.72	4418870.82	10.97	0	32	34.2	34.2	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-28.1	-28.1
11	17574347.72	4418870.82	10.97	0	63	34.2	34.2	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-28.2	-28.2
12	17574347.72	4418870.82	10.97	0	125	43.2	43.2	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.8	-21.8
13	17574347.72	4418870.82	10.97	0	250	43.2	43.2	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-22.4	-22.4
14	17574347.72	4418870.82	10.97	0	500	47.2	47.2	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-18.7	-18.7
15	17574347.72	4418870.82	10.97	0	1000	45.2	45.2	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-20.0	-20.0
16	17574347.72	4418870.82	10.97	0	2000	53.2	53.2	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-13.4	-13.4
17	17574347.72	4418870.82	10.97	0	4000	47.2	47.2	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-26.4	-26.4
18	17574347.72	4418870.82	10.97	0	8000	44.2	44.2	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	4.8	0.0	-0.0	-54.8	-54.8

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent2", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574384.75	4418834.48	9.14	0	125	42.1	42.1	0.0	0.0	59.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.6	-21.6
2	17574384.75	4418834.48	9.14	0	250	48.6	48.6	0.0	0.0	59.3	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-15.7	-15.7
3	17574384.75	4418834.48	9.14	0	500	53.7	53.7	0.0	0.0	59.3	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-10.9	-10.9
4	17574384.75	4418834.48	9.14	0	1000	60.0	60.0	0.0	0.0	59.3	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-3.9	-3.9
5	17574384.75	4418834.48	9.14	0	2000	63.2	63.2	0.0	0.0	59.3	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-1.8	-1.8
6	17574384.75	4418834.48	9.14	0	4000	65.1	65.1	0.0	0.0	59.3	8.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-5.9	-5.9
7	17574384.75	4418834.48	9.14	0	8000	55.3	55.3	0.0	0.0	59.3	30.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.5	-37.5
8	17574386.44	4418832.41	9.14	0	125	42.1	42.1	0.0	0.0	59.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.5	-21.5
9	17574386.44	4418832.41	9.14	0	250	48.6	48.6	0.0	0.0	59.2	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-15.7	-15.7
10	17574386.44	4418832.41	9.14	0	500	53.7	53.7	0.0	0.0	59.2	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-10.8	-10.8
11	17574386.44	4418832.41	9.14	0	1000	60.0	60.0	0.0	0.0	59.2	0.9	-1.2	0.0	0.0	4.8	0.0	-0.0	-3.8	-3.8
12	17574386.44	4418832.41	9.14	0	2000	63.2	63.2	0.0	0.0	59.2	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-1.7	-1.7
13	17574386.44	4418832.41	9.14	0	4000	65.1	65.1	0.0	0.0	59.2	8.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-5.8	-5.8
14	17574386.44	4418832.41	9.14	0	8000	55.3	55.3	0.0	0.0	59.2	30.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.3	-37.3

Area Source, ISO 9613, Name: "TurbineBuilding-RoofSouth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574351.80	4418859.05	10.97	0	32	37.7	37.7	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-19.8	-19.8
2	17574351.80	4418859.05	10.97	0	63	37.7	37.7	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-19.8	-19.8
3	17574351.80	4418859.05	10.97	0	125	46.7	46.7	0.0	0.0	60.4	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.4	-13.4
4	17574351.80	4418859.05	10.97	0	250	46.7	46.7	0.0	0.0	60.4	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-17.3	-17.3
5	17574351.80	4418859.05	10.97	0	500	50.7	50.7	0.0	0.0	60.4	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-12.1	-12.1
6	17574351.80	4418859.05	10.97	0	1000	48.7	48.7	0.0	0.0	60.4	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-11.6	-11.6
7	17574351.80	4418859.05	10.97	0	2000	56.7	56.7	0.0	0.0	60.4	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-5.0	-5.0
8	17574351.80	4418859.05	10.97	0	4000	50.7	50.7	0.0	0.0	60.4	9.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-17.8	-17.8
9	17574351.80	4418859.05	10.97	0	8000	47.7	47.7	0.0	0.0	60.4	34.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.7	-45.7
10	17574358.64	4418853.55	10.97	0	32	34.6	34.6	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-22.6	-22.6
11	17574358.64	4418853.55	10.97	0	63	34.6	34.6	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-22.7	-22.7
12	17574358.64	4418853.55	10.97	0	125	43.6	43.6	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-16.3	-16.3
13	17574358.64	4418853.55	10.97	0	250	43.6	43.6	0.0	0.0	60.2	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-20.2	-20.2
14	17574358.64	4418853.55	10.97	0	500	47.6	47.6	0.0	0.0	60.2	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-15.0	-15.0
15	17574358.64	4418853.55	10.97	0	1000	45.6	45.6	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-14.5	-14.5
16	17574358.64	4418853.55	10.97	0	2000	53.6	53.6	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-7.8	-7.8
17	17574358.64	4418853.55	10.97	0	4000	47.6	47.6	0.0	0.0	60.2	9.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-20.4	-20.4
18	17574358.64	4418853.55	10.97	0	8000	44.6	44.6	0.0	0.0	60.2	33.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-47.7	-47.7
19	17574359.56	4418850.36	10.97	0	32	32.8	32.8	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-24.3	-24.3
20	17574359.56	4418850.36	10.97	0	63	32.8	32.8	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-24.4	-24.4
21	17574359.56	4418850.36	10.97	0	125	41.8	41.8	0.0	0.0	60.1	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-17.9	-17.9
22	17574359.56	4418850.36	10.97	0	250	41.8	41.8	0.0	0.0	60.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-21.9	-21.9
23	17574359.56	4418850.36	10.97	0	500	45.8	45.8	0.0	0.0	60.1	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-16.7	-16.7
24	17574359.56	4418850.36	10.97	0	1000	43.8	43.8	0.0	0.0	60.1	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
25	17574359.56	4418850.36	10.97	0	2000	51.8	51.8	0.0	0.0	60.1	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-9.4	-9.4
26	17574359.56	4418850.36	10.97	0	4000	45.8	45.8	0.0	0.0	60.1	9.4	-1.7	0.0	0.0	0.0	0.0	-0.0	-22.1	-22.1
27	17574359.56	4418850.36	10.97	0	8000	42.8	42.8	0.0	0.0	60.1	33.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-49.2	-49.2
28	17574350.76	4418863.41	10.97	0	32	37.8	37.8	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-19.7	-19.7
29	17574350.76	4418863.41	10.97	0	63	37.8	37.8	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-19.7	-19.7
30	17574350.76	4418863.41	10.97	0	125	46.8	46.8	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.4	-13.4
31	17574350.76	4418863.41	10.97	0	250	46.8	46.8	0.0	0.0	60.5	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-17.3	-17.3
32	17574350.76	4418863.41	10.97	0	500	50.8	50.8	0.0	0.0	60.5	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-12.1	-12.1
33	17574350.76	4418863.41	10.97	0	1000	48.8	48.8	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-11.6	-11.6
34	17574350.76	4418863.41	10.97	0	2000	56.8	56.8	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-4.9	-4.9
35	17574350.76	4418863.41	10.97	0	4000	50.8	50.8	0.0	0.0	60.5	9.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-17.8	-17.8
36	17574350.76	4418863.41	10.97	0	8000	47.8	47.8	0.0	0.0	60.5	34.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.8	-45.8
37	17574344.94	4418868.87	10.97	0	32	33.1	33.1	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-24.6	-24.6
38	17574344.94	4418868.87	10.97	0	63	33.1	33.1	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-24.7	-24.7
39	17574344.94	4418868.87	10.97	0	125	42.1	42.1	0.0	0.0	60.7	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-18.3	-18.3
40	17574344.94	4418868.87	10.97	0	250	42.1	42.1	0.0	0.0	60.7	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-22.2	-22.2
41	17574344.94	4418868.87	10.97	0	500	46.1	46.1	0.0	0.0	60.7	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-17.0	-17.0
42	17574344.94	4418868.87	10.97	0	1000	44.1	44.1	0.0	0.0	60.7	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-16.5	-16.5
43	17574344.94	4418868.87	10.97	0	2000	52.1	52.1	0.0	0.0	60.7	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-9.9	-9.9
44	17574344.94	4418868.87	10.97	0	4000	46.1	46.1	0.0	0.0	60.7	10.0	-1.7	0.0	0.0	0.0	0.0	-0.0	-22.9	-22.9
45	17574344.94	4418868.87	10.97	0	8000	43.1	43.1	0.0	0.0	60.7	35.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-51.5	-51.5

Area Source, ISO 9613, Name: "TurbineBuilding-RoofSouth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
46	17574343.04	4418871.11	10.97	0	32	29.7	29.7	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-28.0	-28.0
47	17574343.04	4418871.11	10.97	0	63	29.7	29.7	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-28.0	-28.0
48	17574343.04	4418871.11	10.97	0	125	38.7	38.7	0.0	0.0	60.7	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-21.7	-21.7
49	17574343.04	4418871.11	10.97	0	250	38.7	38.7	0.0	0.0	60.7	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-25.6	-25.6
50	17574343.04	4418871.11	10.97	0	500	42.7	42.7	0.0	0.0	60.7	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-20.4	-20.4
51	17574343.04	4418871.11	10.97	0	1000	40.7	40.7	0.0	0.0	60.7	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-19.9	-19.9
52	17574343.04	4418871.11	10.97	0	2000	48.7	48.7	0.0	0.0	60.7	3.0	-1.7	0.0	0.0	0.0	0.0	-0.0	-13.3	-13.3
53	17574343.04	4418871.11	10.97	0	4000	42.7	42.7	0.0	0.0	60.7	10.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-26.4	-26.4
54	17574343.04	4418871.11	10.97	0	8000	39.7	39.7	0.0	0.0	60.7	35.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-55.2	-55.2
55	17574355.99	4418858.74	10.97	0	32	26.8	26.8	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-30.5	-30.5
56	17574355.99	4418858.74	10.97	0	63	26.8	26.8	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-30.5	-30.5
57	17574355.99	4418858.74	10.97	0	125	35.8	35.8	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-24.1	-24.1
58	17574355.99	4418858.74	10.97	0	250	35.8	35.8	0.0	0.0	60.3	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-28.0	-28.0
59	17574355.99	4418858.74	10.97	0	500	39.8	39.8	0.0	0.0	60.3	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-22.9	-22.9
60	17574355.99	4418858.74	10.97	0	1000	37.8	37.8	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-22.4	-22.4
61	17574355.99	4418858.74	10.97	0	2000	45.8	45.8	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-15.6	-15.6
62	17574355.99	4418858.74	10.97	0	4000	39.8	39.8	0.0	0.0	60.3	9.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-28.4	-28.4
63	17574355.99	4418858.74	10.97	0	8000	36.8	36.8	0.0	0.0	60.3	34.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-55.9	-55.9
64	17574364.27	4418854.82	10.97	0	32	18.3	18.3	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-38.8	-38.8
65	17574364.27	4418854.82	10.97	0	63	18.3	18.3	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-38.8	-38.8
66	17574364.27	4418854.82	10.97	0	125	27.3	27.3	0.0	0.0	60.0	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-32.3	-32.3
67	17574364.27	4418854.82	10.97	0	250	27.3	27.3	0.0	0.0	60.0	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-36.3	-36.3
68	17574364.27	4418854.82	10.97	0	500	31.3	31.3	0.0	0.0	60.0	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-31.1	-31.1
69	17574364.27	4418854.82	10.97	0	1000	29.3	29.3	0.0	0.0	60.0	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-30.6	-30.6
70	17574364.27	4418854.82	10.97	0	2000	37.3	37.3	0.0	0.0	60.0	2.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-23.8	-23.8
71	17574364.27	4418854.82	10.97	0	4000	31.3	31.3	0.0	0.0	60.0	9.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-36.4	-36.4
72	17574364.27	4418854.82	10.97	0	8000	28.3	28.3	0.0	0.0	60.0	33.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-63.2	-63.2
73	17574351.19	4418867.09	10.97	0	32	18.3	18.3	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.2	-39.2
74	17574351.19	4418867.09	10.97	0	63	18.3	18.3	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.2	-39.2
75	17574351.19	4418867.09	10.97	0	125	27.3	27.3	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-32.8	-32.8
76	17574351.19	4418867.09	10.97	0	250	27.3	27.3	0.0	0.0	60.5	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-36.7	-36.7
77	17574351.19	4418867.09	10.97	0	500	31.3	31.3	0.0	0.0	60.5	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-31.6	-31.6
78	17574351.19	4418867.09	10.97	0	1000	29.3	29.3	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-31.1	-31.1
79	17574351.19	4418867.09	10.97	0	2000	37.3	37.3	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-24.4	-24.4
80	17574351.19	4418867.09	10.97	0	4000	31.3	31.3	0.0	0.0	60.5	9.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-37.3	-37.3
81	17574351.19	4418867.09	10.97	0	8000	28.3	28.3	0.0	0.0	60.5	34.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-65.4	-65.4
82	17574351.83	4418866.26	10.97	0	32	18.0	18.0	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.4	-39.4
83	17574351.83	4418866.26	10.97	0	63	18.0	18.0	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.5	-39.5
84	17574351.83	4418866.26	10.97	0	125	27.0	27.0	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-33.1	-33.1
85	17574351.83	4418866.26	10.97	0	250	27.0	27.0	0.0	0.0	60.5	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-37.0	-37.0
86	17574351.83	4418866.26	10.97	0	500	31.0	31.0	0.0	0.0	60.5	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-31.8	-31.8
87	17574351.83	4418866.26	10.97	0	1000	29.0	29.0	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-31.3	-31.3
88	17574351.83	4418866.26	10.97	0	2000	37.0	37.0	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-24.6	-24.6
89	17574351.83	4418866.26	10.97	0	4000	31.0	31.0	0.0	0.0	60.5	9.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-37.5	-37.5
90	17574351.83	4418866.26	10.97	0	8000	28.0	28.0	0.0	0.0	60.5	34.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-65.5	-65.5
91	17574357.77	4418860.93	10.97	0	32	17.6	17.6	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.6	-39.6
92	17574357.77	4418860.93	10.97	0	63	17.6	17.6	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.7	-39.7
93	17574357.77	4418860.93	10.97	0	125	26.6	26.6	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-33.3	-33.3
94	17574357.77	4418860.93	10.97	0	250	26.6	26.6	0.0	0.0	60.3	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-37.2	-37.2
95	17574357.77	4418860.93	10.97	0	500	30.6	30.6	0.0	0.0	60.3	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-32.0	-32.0
96	17574357.77	4418860.93	10.97	0	1000	28.6	28.6	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-31.5	-31.5
97	17574357.77	4418860.93	10.97	0	2000	36.6	36.6	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-24.8	-24.8
98	17574357.77	4418860.93	10.97	0	4000	30.6	30.6	0.0	0.0	60.3	9.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-37.5	-37.5
99	17574357.77	4418860.93	10.97	0	8000	27.6	27.6	0.0	0.0	60.3	33.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-64.9	-64.9
100	17574358.33	4418860.17	10.97	0	32	17.6	17.6	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.6	-39.6
101	17574358.33	4418860.17	10.97	0	63	17.6	17.6	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-39.6	-39.6
102	17574358.33	4418860.17	10.97	0	125	26.6	26.6	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-33.2	-33.2
103	17574358.33	4418860.17	10.97	0	250	26.6	26.6	0.0	0.0	60.2	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-37.1	-37.1
104	17574358.33	4418860.17	10.97	0	500	30.6	30.6	0.0	0.0	60.2	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-32.0	-32.0
105	17574358.33	4418860.17	10.97	0	1000	28.6	28.6	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-31.5	-31.5
106	17574358.33	4418860.17	10.97	0	2000	36.6	36.6	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-24.8	-24.8
107	17574358.33	4418860.17	10.97	0	4000	30.6	30.6	0.0	0.0	60.2	9.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-37.4	-37.4
108	17574358.33	4418860.17	10.97	0	8000	27.6	27.6	0.0	0.0	60.2	33.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-64.8	-64.8

Area Source, ISO 9613, Name: "TurbineBuilding-RoofSouth", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
109	17574343.58	4418870.38	10.97	0	32	17.6	17.6	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-40.2	-40.2
110	17574343.58	4418870.38	10.97	0	63	17.6	17.6	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-40.2	-40.2
111	17574343.58	4418870.38	10.97	0	125	26.6	26.6	0.0	0.0	60.7	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-33.9	-33.9
112	17574343.58	4418870.38	10.97	0	250	26.6	26.6	0.0	0.0	60.7	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-37.7	-37.7
113	17574343.58	4418870.38	10.97	0	500	30.6	30.6	0.0	0.0	60.7	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-32.6	-32.6
114	17574343.58	4418870.38	10.97	0	1000	28.6	28.6	0.0	0.0	60.7	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-32.1	-32.1
115	17574343.58	4418870.38	10.97	0	2000	36.6	36.6	0.0	0.0	60.7	3.0	-1.7	0.0	0.0	0.0	0.0	-0.0	-25.5	-25.5
116	17574343.58	4418870.38	10.97	0	4000	30.6	30.6	0.0	0.0	60.7	10.0	-1.7	0.0	0.0	0.0	0.0	-0.0	-38.5	-38.5
117	17574343.58	4418870.38	10.97	0	8000	27.6	27.6	0.0	0.0	60.7	35.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-67.3	-67.3
118	17574356.80	4418861.37	10.97	0	32	9.9	9.9	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-47.4	-47.4
119	17574356.80	4418861.37	10.97	0	63	9.9	9.9	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-47.4	-47.4
120	17574356.80	4418861.37	10.97	0	125	18.9	18.9	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-41.0	-41.0
121	17574356.80	4418861.37	10.97	0	250	18.9	18.9	0.0	0.0	60.3	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-44.9	-44.9
122	17574356.80	4418861.37	10.97	0	500	22.9	22.9	0.0	0.0	60.3	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-39.8	-39.8
123	17574356.80	4418861.37	10.97	0	1000	20.9	20.9	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-39.3	-39.3
124	17574356.80	4418861.37	10.97	0	2000	28.9	28.9	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-32.5	-32.5
125	17574356.80	4418861.37	10.97	0	4000	22.9	22.9	0.0	0.0	60.3	9.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.3	-45.3
126	17574356.80	4418861.37	10.97	0	8000	19.9	19.9	0.0	0.0	60.3	34.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-72.8	-72.8
127	17574353.19	4418864.75	10.97	0	32	9.4	9.4	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-48.0	-48.0
128	17574353.19	4418864.75	10.97	0	63	9.4	9.4	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-48.1	-48.1
129	17574353.19	4418864.75	10.97	0	125	18.4	18.4	0.0	0.0	60.4	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-41.7	-41.7
130	17574353.19	4418864.75	10.97	0	250	18.4	18.4	0.0	0.0	60.4	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-45.6	-45.6
131	17574353.19	4418864.75	10.97	0	500	22.4	22.4	0.0	0.0	60.4	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-40.4	-40.4
132	17574353.19	4418864.75	10.97	0	1000	20.4	20.4	0.0	0.0	60.4	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-39.9	-39.9
133	17574353.19	4418864.75	10.97	0	2000	28.4	28.4	0.0	0.0	60.4	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-33.2	-33.2
134	17574353.19	4418864.75	10.97	0	4000	22.4	22.4	0.0	0.0	60.4	9.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-46.0	-46.0
135	17574353.19	4418864.75	10.97	0	8000	19.4	19.4	0.0	0.0	60.4	34.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-73.9	-73.9
136	17574359.69	4418858.67	10.97	0	32	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-57.2	-57.2
137	17574359.69	4418858.67	10.97	0	63	0.0	0.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-57.2	-57.2
138	17574359.69	4418858.67	10.97	0	125	9.0	9.0	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-50.8	-50.8
139	17574359.69	4418858.67	10.97	0	250	9.0	9.0	0.0	0.0	60.2	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-54.7	-54.7
140	17574359.69	4418858.67	10.97	0	500	13.0	13.0	0.0	0.0	60.2	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-49.5	-49.5
141	17574359.69	4418858.67	10.97	0	1000	11.0	11.0	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-49.0	-49.0
142	17574359.69	4418858.67	10.97	0	2000	19.0	19.0	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-42.3	-42.3
143	17574359.69	4418858.67	10.97	0	4000	13.0	13.0	0.0	0.0	60.2	9.4	-1.7	0.0	0.0	0.0	0.0	-0.0	-55.0	-55.0
144	17574359.69	4418858.67	10.97	0	8000	10.0	10.0	0.0	0.0	60.2	33.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-82.2	-82.2

Area Source, ISO 9613, Name: "TurbineBuilding-RoofNorth", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574350.08	4418880.47	10.90	0	32	1.8	1.8	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-55.8	-55.8
2	17574350.08	4418880.47	10.90	0	63	1.8	1.8	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-55.9	-55.9
3	17574350.08	4418880.47	10.90	0	125	10.8	10.8	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-49.5	-49.5
4	17574350.08	4418880.47	10.90	0	250	10.8	10.8	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-53.4	-53.4
5	17574350.08	4418880.47	10.90	0	500	14.8	14.8	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-48.2	-48.2
6	17574350.08	4418880.47	10.90	0	1000	12.8	12.8	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-47.7	-47.7
7	17574350.08	4418880.47	10.90	0	2000	20.8	20.8	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-41.1	-41.1
8	17574350.08	4418880.47	10.90	0	4000	14.8	14.8	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-54.1	-54.1
9	17574350.08	4418880.47	10.90	0	8000	11.8	11.8	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-82.5	-82.5
10	17574360.72	4418867.82	10.90	0	32	38.7	38.7	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-23.3	-23.3
11	17574360.72	4418867.82	10.90	0	63	38.7	38.7	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-23.3	-23.3
12	17574360.72	4418867.82	10.90	0	125	47.7	47.7	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-16.9	-16.9
13	17574360.72	4418867.82	10.90	0	250	47.7	47.7	0.0	0.0	60.2	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-17.6	-17.6
14	17574360.72	4418867.82	10.90	0	500	51.7	51.7	0.0	0.0	60.2	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-13.8	-13.8
15	17574360.72	4418867.82	10.90	0	1000	49.7	49.7	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-15.1	-15.1
16	17574360.72	4418867.82	10.90	0	2000	57.7	57.7	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-8.4	-8.4
17	17574360.72	4418867.82	10.90	0	4000	51.7	51.7	0.0	0.0	60.2	9.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-21.1	-21.1
18	17574360.72	4418867.82	10.90	0	8000	48.7	48.7	0.0	0.0	60.2	33.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-48.4	-48.4
19	17574366.04	4418858.78	10.90	0	32	35.7	35.7	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-26.1	-26.1
20	17574366.04	4418858.78	10.90	0	63	35.7	35.7	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-26.1	-26.1
21	17574366.04	4418858.78	10.90	0	125	44.7	44.7	0.0	0.0	60.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-19.7	-19.7
22	17574366.04	4418858.78	10.90	0	250	44.7	44.7	0.0	0.0	60.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-20.4	-20.4
23	17574366.04	4418858.78	10.90	0	500	48.7	48.7	0.0	0.0	60.0	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-16.6	-16.6

Area Source, ISO 9613, Name: "TurbineBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
24	17574366.04	4418858.78	10.90	0	1000	46.7	46.7	0.0	0.0	60.0	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-17.9	-17.9
25	17574366.04	4418858.78	10.90	0	2000	54.7	54.7	0.0	0.0	60.0	2.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-11.2	-11.2
26	17574366.04	4418858.78	10.90	0	4000	48.7	48.7	0.0	0.0	60.0	9.2	-1.7	0.0	0.0	4.8	0.0	-0.0	-23.7	-23.7
27	17574366.04	4418858.78	10.90	0	8000	45.7	45.7	0.0	0.0	60.0	32.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-50.4	-50.4
28	17574356.61	4418863.94	10.90	0	32	28.9	28.9	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-33.2	-33.2
29	17574356.61	4418863.94	10.90	0	63	28.9	28.9	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-33.2	-33.2
30	17574356.61	4418863.94	10.90	0	125	37.9	37.9	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-26.8	-26.8
31	17574356.61	4418863.94	10.90	0	250	37.9	37.9	0.0	0.0	60.3	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-27.5	-27.5
32	17574356.61	4418863.94	10.90	0	500	41.9	41.9	0.0	0.0	60.3	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-23.7	-23.7
33	17574356.61	4418863.94	10.90	0	1000	39.9	39.9	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-25.0	-25.0
34	17574356.61	4418863.94	10.90	0	2000	47.9	47.9	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-18.3	-18.3
35	17574356.61	4418863.94	10.90	0	4000	41.9	41.9	0.0	0.0	60.3	9.6	-1.7	0.0	0.0	4.8	0.0	-0.0	-31.1	-31.1
36	17574356.61	4418863.94	10.90	0	8000	38.9	38.9	0.0	0.0	60.3	34.1	-1.7	0.0	0.0	4.8	0.0	-0.0	-58.7	-58.7
37	17574353.40	4418870.75	10.90	0	32	33.6	33.6	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-28.6	-28.6
38	17574353.40	4418870.75	10.90	0	63	33.6	33.6	0.0	0.0	60.4	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-28.6	-28.6
39	17574353.40	4418870.75	10.90	0	125	42.6	42.6	0.0	0.0	60.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-22.3	-22.3
40	17574353.40	4418870.75	10.90	0	250	42.6	42.6	0.0	0.0	60.4	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-22.9	-22.9
41	17574353.40	4418870.75	10.90	0	500	46.6	46.6	0.0	0.0	60.4	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-19.2	-19.2
42	17574353.40	4418870.75	10.90	0	1000	44.6	44.6	0.0	0.0	60.4	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-20.5	-20.5
43	17574353.40	4418870.75	10.90	0	2000	52.6	52.6	0.0	0.0	60.4	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-13.8	-13.8
44	17574353.40	4418870.75	10.90	0	4000	46.6	46.6	0.0	0.0	60.4	9.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-26.7	-26.7
45	17574353.40	4418870.75	10.90	0	8000	43.6	43.6	0.0	0.0	60.4	34.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-54.6	-54.6
46	17574349.98	4418880.49	10.90	0	32	-2.4	-2.4	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-60.0	-60.0
47	17574349.98	4418880.49	10.90	0	63	-2.4	-2.4	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-60.0	-60.0
48	17574349.98	4418880.49	10.90	0	125	6.6	6.6	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-53.7	-53.7
49	17574349.98	4418880.49	10.90	0	250	6.6	6.6	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-57.5	-57.5
50	17574349.98	4418880.49	10.90	0	500	10.6	10.6	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-52.4	-52.4
51	17574349.98	4418880.49	10.90	0	1000	8.6	8.6	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-51.9	-51.9
52	17574349.98	4418880.49	10.90	0	2000	16.6	16.6	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.2	-45.2
53	17574349.98	4418880.49	10.90	0	4000	10.6	10.6	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-58.2	-58.2
54	17574349.98	4418880.49	10.90	0	8000	7.6	7.6	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-86.7	-86.7
55	17574361.79	4418858.69	10.90	0	32	25.0	25.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-36.9	-36.9
56	17574361.79	4418858.69	10.90	0	63	25.0	25.0	0.0	0.0	60.1	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-36.9	-36.9
57	17574361.79	4418858.69	10.90	0	125	34.0	34.0	0.0	0.0	60.1	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-30.5	-30.5
58	17574361.79	4418858.69	10.90	0	250	34.0	34.0	0.0	0.0	60.1	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-31.2	-31.2
59	17574361.79	4418858.69	10.90	0	500	38.0	38.0	0.0	0.0	60.1	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-27.4	-27.4
60	17574361.79	4418858.69	10.90	0	1000	36.0	36.0	0.0	0.0	60.1	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-28.7	-28.7
61	17574361.79	4418858.69	10.90	0	2000	44.0	44.0	0.0	0.0	60.1	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-22.0	-22.0
62	17574361.79	4418858.69	10.90	0	4000	38.0	38.0	0.0	0.0	60.1	9.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-34.6	-34.6
63	17574361.79	4418858.69	10.90	0	8000	35.0	35.0	0.0	0.0	60.1	33.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-61.7	-61.7
64	17574357.11	4418866.87	10.90	0	32	32.6	32.6	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-29.5	-29.5
65	17574357.11	4418866.87	10.90	0	63	32.6	32.6	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-29.6	-29.6
66	17574357.11	4418866.87	10.90	0	125	41.6	41.6	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-23.2	-23.2
67	17574357.11	4418866.87	10.90	0	250	41.6	41.6	0.0	0.0	60.3	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-23.8	-23.8
68	17574357.11	4418866.87	10.90	0	500	45.6	45.6	0.0	0.0	60.3	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-20.1	-20.1
69	17574357.11	4418866.87	10.90	0	1000	43.6	43.6	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-21.4	-21.4
70	17574357.11	4418866.87	10.90	0	2000	51.6	51.6	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-14.7	-14.7
71	17574357.11	4418866.87	10.90	0	4000	45.6	45.6	0.0	0.0	60.3	9.6	-1.7	0.0	0.0	4.8	0.0	-0.0	-27.5	-27.5
72	17574357.11	4418866.87	10.90	0	8000	42.6	42.6	0.0	0.0	60.3	34.2	-1.7	0.0	0.0	4.8	0.0	-0.0	-55.1	-55.1
73	17574350.01	4418880.48	10.90	0	32	-5.9	-5.9	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-63.5	-63.5
74	17574350.01	4418880.48	10.90	0	63	-5.9	-5.9	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-63.5	-63.5
75	17574350.01	4418880.48	10.90	0	125	3.1	3.1	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-57.2	-57.2
76	17574350.01	4418880.48	10.90	0	250	3.1	3.1	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-61.0	-61.0
77	17574350.01	4418880.48	10.90	0	500	7.1	7.1	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-55.9	-55.9
78	17574350.01	4418880.48	10.90	0	1000	5.1	5.1	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-55.4	-55.4
79	17574350.01	4418880.48	10.90	0	2000	13.1	13.1	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-48.8	-48.8
80	17574350.01	4418880.48	10.90	0	4000	7.1	7.1	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-61.7	-61.7
81	17574350.01	4418880.48	10.90	0	8000	4.1	4.1	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-90.2	-90.2
82	17574349.33	4418870.76	10.90	0	32	27.4	27.4	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-34.9	-34.9
83	17574349.33	4418870.76	10.90	0	63	27.4	27.4	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-35.0	-35.0
84	17574349.33	4418870.76	10.90	0	125	36.4	36.4	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-28.6	-28.6
85	17574349.33	4418870.76	10.90	0	250	36.4	36.4	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-29.3	-29.3
86	17574349.33	4418870.76	10.90	0	500	40.4	40.4	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-25.5	-25.5

Area Source, ISO 9613, Name: "TurbineBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
87	17574349.33	4418870.76	10.90	0	1000	38.4	38.4	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-26.8	-26.8
88	17574349.33	4418870.76	10.90	0	2000	46.4	46.4	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-20.2	-20.2
89	17574349.33	4418870.76	10.90	0	4000	40.4	40.4	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-33.1	-33.1
90	17574349.33	4418870.76	10.90	0	8000	37.4	37.4	0.0	0.0	60.6	35.1	-1.7	0.0	0.0	4.8	0.0	-0.0	-61.5	-61.5
91	17574349.01	4418874.87	10.90	0	32	32.0	32.0	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-30.4	-30.4
92	17574349.01	4418874.87	10.90	0	63	32.0	32.0	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-30.4	-30.4
93	17574349.01	4418874.87	10.90	0	125	41.0	41.0	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-24.1	-24.1
94	17574349.01	4418874.87	10.90	0	250	41.0	41.0	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-24.7	-24.7
95	17574349.01	4418874.87	10.90	0	500	45.0	45.0	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-21.0	-21.0
96	17574349.01	4418874.87	10.90	0	1000	43.0	43.0	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-22.3	-22.3
97	17574349.01	4418874.87	10.90	0	2000	51.0	51.0	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-15.6	-15.6
98	17574349.01	4418874.87	10.90	0	4000	45.0	45.0	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-28.6	-28.6
99	17574349.01	4418874.87	10.90	0	8000	42.0	42.0	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	4.8	0.0	-0.0	-57.0	-57.0
100	17574349.90	4418880.51	10.90	0	32	-0.5	-0.5	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-58.1	-58.1
101	17574349.90	4418880.51	10.90	0	63	-0.5	-0.5	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-58.1	-58.1
102	17574349.90	4418880.51	10.90	0	125	8.5	8.5	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-51.8	-51.8
103	17574349.90	4418880.51	10.90	0	250	8.5	8.5	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-55.6	-55.6
104	17574349.90	4418880.51	10.90	0	500	12.5	12.5	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-50.5	-50.5
105	17574349.90	4418880.51	10.90	0	1000	10.5	10.5	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-50.0	-50.0
106	17574349.90	4418880.51	10.90	0	2000	18.5	18.5	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-43.3	-43.3
107	17574349.90	4418880.51	10.90	0	4000	12.5	12.5	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-56.3	-56.3
108	17574349.90	4418880.51	10.90	0	8000	9.5	9.5	0.0	0.0	60.6	35.4	-1.7	0.0	0.0	0.0	0.0	-0.0	-84.8	-84.8
109	17574352.27	4418867.49	10.90	0	32	21.1	21.1	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-41.2	-41.2
110	17574352.27	4418867.49	10.90	0	63	21.1	21.1	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-41.2	-41.2
111	17574352.27	4418867.49	10.90	0	125	30.1	30.1	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-34.8	-34.8
112	17574352.27	4418867.49	10.90	0	250	30.1	30.1	0.0	0.0	60.5	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-35.5	-35.5
113	17574352.27	4418867.49	10.90	0	500	34.1	34.1	0.0	0.0	60.5	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-31.7	-31.7
114	17574352.27	4418867.49	10.90	0	1000	32.1	32.1	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-33.0	-33.0
115	17574352.27	4418867.49	10.90	0	2000	40.1	40.1	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-26.4	-26.4
116	17574352.27	4418867.49	10.90	0	4000	34.1	34.1	0.0	0.0	60.5	9.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-39.3	-39.3
117	17574352.27	4418867.49	10.90	0	8000	31.1	31.1	0.0	0.0	60.5	34.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-67.3	-67.3
118	17574351.19	4418872.29	10.90	0	32	29.9	29.9	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-32.4	-32.4
119	17574351.19	4418872.29	10.90	0	63	29.9	29.9	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-32.4	-32.4
120	17574351.19	4418872.29	10.90	0	125	38.9	38.9	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-26.1	-26.1
121	17574351.19	4418872.29	10.90	0	250	38.9	38.9	0.0	0.0	60.5	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-26.7	-26.7
122	17574351.19	4418872.29	10.90	0	500	42.9	42.9	0.0	0.0	60.5	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-23.0	-23.0
123	17574351.19	4418872.29	10.90	0	1000	40.9	40.9	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-24.3	-24.3
124	17574351.19	4418872.29	10.90	0	2000	48.9	48.9	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-17.7	-17.7
125	17574351.19	4418872.29	10.90	0	4000	42.9	42.9	0.0	0.0	60.5	9.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-30.6	-30.6
126	17574351.19	4418872.29	10.90	0	8000	39.9	39.9	0.0	0.0	60.5	35.0	-1.7	0.0	0.0	4.8	0.0	-0.0	-58.8	-58.8
127	17574349.96	4418880.41	10.90	0	32	-10.9	-10.9	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-73.3	-73.3
128	17574349.96	4418880.41	10.90	0	63	-10.9	-10.9	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-73.4	-73.4
129	17574349.96	4418880.41	10.90	0	125	-1.9	-1.9	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-67.0	-67.0
130	17574349.96	4418880.41	10.90	0	250	-1.9	-1.9	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-67.6	-67.6
131	17574349.96	4418880.41	10.90	0	500	2.1	2.1	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-63.9	-63.9
132	17574349.96	4418880.41	10.90	0	1000	0.1	0.1	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-65.2	-65.2
133	17574349.96	4418880.41	10.90	0	2000	8.1	8.1	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-58.6	-58.6
134	17574349.96	4418880.41	10.90	0	4000	2.1	2.1	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-71.6	-71.6
135	17574349.96	4418880.41	10.90	0	8000	-0.9	-0.9	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	4.8	0.0	-0.0	-100.0	-100.0
136	17574349.94	4418880.50	10.90	0	32	-5.1	-5.1	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-62.8	-62.8
137	17574349.94	4418880.50	10.90	0	63	-5.1	-5.1	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-62.8	-62.8
138	17574349.94	4418880.50	10.90	0	125	3.9	3.9	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-56.4	-56.4
139	17574349.94	4418880.50	10.90	0	250	3.9	3.9	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-60.3	-60.3
140	17574349.94	4418880.50	10.90	0	500	7.9	7.9	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-55.1	-55.1
141	17574349.94	4418880.50	10.90	0	1000	5.9	5.9	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-54.6	-54.6
142	17574349.94	4418880.50	10.90	0	2000	13.9	13.9	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-48.0	-48.0
143	17574349.94	4418880.50	10.90	0	4000	7.9	7.9	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-61.0	-61.0
144	17574349.94	4418880.50	10.90	0	8000	4.9	4.9	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-89.4	-89.4
145	17574345.68	4418873.07	10.90	0	32	21.5	21.5	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-40.9	-40.9
146	17574345.68	4418873.07	10.90	0	63	21.5	21.5	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-40.9	-40.9
147	17574345.68	4418873.07	10.90	0	125	30.5	30.5	0.0	0.0	60.7	0.1	-0.4	0.0	0.0	4.8	0.0	-0.0	-34.6	-34.6
148	17574345.68	4418873.07	10.90	0	250	30.5	30.5	0.0	0.0	60.7	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-35.2	-35.2
149	17574345.68	4418873.07	10.90	0	500	34.5	34.5	0.0	0.0	60.7	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-31.5	-31.5

Area Source, ISO 9613, Name: "TurbineBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
150	17574345.68	4418873.07	10.90	0	1000	32.5	32.5	0.0	0.0	60.7	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-32.8	-32.8
151	17574345.68	4418873.07	10.90	0	2000	40.5	40.5	0.0	0.0	60.7	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-26.2	-26.2
152	17574345.68	4418873.07	10.90	0	4000	34.5	34.5	0.0	0.0	60.7	10.0	-1.7	0.0	0.0	4.8	0.0	-0.0	-39.3	-39.3
153	17574345.68	4418873.07	10.90	0	8000	31.5	31.5	0.0	0.0	60.7	35.6	-1.7	0.0	0.0	4.8	0.0	-0.0	-67.9	-67.9
154	17574346.92	4418875.91	10.90	0	32	29.3	29.3	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-33.2	-33.2
155	17574346.92	4418875.91	10.90	0	63	29.3	29.3	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-33.2	-33.2
156	17574346.92	4418875.91	10.90	0	125	38.3	38.3	0.0	0.0	60.7	0.1	-0.4	0.0	0.0	4.8	0.0	-0.0	-26.8	-26.8
157	17574346.92	4418875.91	10.90	0	250	38.3	38.3	0.0	0.0	60.7	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-27.5	-27.5
158	17574346.92	4418875.91	10.90	0	500	42.3	42.3	0.0	0.0	60.7	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-23.8	-23.8
159	17574346.92	4418875.91	10.90	0	1000	40.3	40.3	0.0	0.0	60.7	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-25.1	-25.1
160	17574346.92	4418875.91	10.90	0	2000	48.3	48.3	0.0	0.0	60.7	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-18.4	-18.4
161	17574346.92	4418875.91	10.90	0	4000	42.3	42.3	0.0	0.0	60.7	10.0	-1.7	0.0	0.0	4.8	0.0	-0.0	-31.5	-31.5
162	17574346.92	4418875.91	10.90	0	8000	39.3	39.3	0.0	0.0	60.7	35.6	-1.7	0.0	0.0	4.8	0.0	-0.0	-60.1	-60.1
163	17574349.70	4418880.30	10.90	0	32	5.2	5.2	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-57.2	-57.2
164	17574349.70	4418880.30	10.90	0	63	5.2	5.2	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-57.3	-57.3
165	17574349.70	4418880.30	10.90	0	125	14.2	14.2	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-50.9	-50.9
166	17574349.70	4418880.30	10.90	0	250	14.2	14.2	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-51.5	-51.5
167	17574349.70	4418880.30	10.90	0	500	18.2	18.2	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-47.8	-47.8
168	17574349.70	4418880.30	10.90	0	1000	16.2	16.2	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-49.1	-49.1
169	17574349.70	4418880.30	10.90	0	2000	24.2	24.2	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-42.5	-42.5
170	17574349.70	4418880.30	10.90	0	4000	18.2	18.2	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-55.5	-55.5
171	17574349.70	4418880.30	10.90	0	8000	15.2	15.2	0.0	0.0	60.6	35.4	-1.7	0.0	0.0	4.8	0.0	-0.0	-83.9	-83.9
172	17574349.84	4418880.53	10.90	0	32	-2.4	-2.4	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-60.0	-60.0
173	17574349.84	4418880.53	10.90	0	63	-2.4	-2.4	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-60.1	-60.1
174	17574349.84	4418880.53	10.90	0	125	6.6	6.6	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-53.7	-53.7
175	17574349.84	4418880.53	10.90	0	250	6.6	6.6	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-57.6	-57.6
176	17574349.84	4418880.53	10.90	0	500	10.6	10.6	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-52.4	-52.4
177	17574349.84	4418880.53	10.90	0	1000	8.6	8.6	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-51.9	-51.9
178	17574349.84	4418880.53	10.90	0	2000	16.6	16.6	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.3	-45.3
179	17574349.84	4418880.53	10.90	0	4000	10.6	10.6	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-58.3	-58.3
180	17574349.84	4418880.53	10.90	0	8000	7.6	7.6	0.0	0.0	60.6	35.4	-1.7	0.0	0.0	0.0	0.0	-0.0	-86.7	-86.7
181	17574364.77	4418855.19	10.90	0	32	16.7	16.7	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-45.1	-45.1
182	17574364.77	4418855.19	10.90	0	63	16.7	16.7	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-45.2	-45.2
183	17574364.77	4418855.19	10.90	0	125	25.7	25.7	0.0	0.0	60.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-38.7	-38.7
184	17574364.77	4418855.19	10.90	0	250	25.7	25.7	0.0	0.0	60.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-39.4	-39.4
185	17574364.77	4418855.19	10.90	0	500	29.7	29.7	0.0	0.0	60.0	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-35.7	-35.7
186	17574364.77	4418855.19	10.90	0	1000	27.7	27.7	0.0	0.0	60.0	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-37.0	-37.0
187	17574364.77	4418855.19	10.90	0	2000	35.7	35.7	0.0	0.0	60.0	2.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-30.2	-30.2
188	17574364.77	4418855.19	10.90	0	4000	29.7	29.7	0.0	0.0	60.0	9.3	-1.7	0.0	0.0	4.8	0.0	-0.0	-42.7	-42.7
189	17574364.77	4418855.19	10.90	0	8000	26.7	26.7	0.0	0.0	60.0	33.0	-1.7	0.0	0.0	4.8	0.0	-0.0	-69.5	-69.5
190	17574359.45	4418864.23	10.90	0	32	26.7	26.7	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-35.4	-35.4
191	17574359.45	4418864.23	10.90	0	63	26.7	26.7	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-35.4	-35.4
192	17574359.45	4418864.23	10.90	0	125	35.7	35.7	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-29.0	-29.0
193	17574359.45	4418864.23	10.90	0	250	35.7	35.7	0.0	0.0	60.2	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-29.7	-29.7
194	17574359.45	4418864.23	10.90	0	500	39.7	39.7	0.0	0.0	60.2	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-25.9	-25.9
195	17574359.45	4418864.23	10.90	0	1000	37.7	37.7	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-27.2	-27.2
196	17574359.45	4418864.23	10.90	0	2000	45.7	45.7	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-20.5	-20.5
197	17574359.45	4418864.23	10.90	0	4000	39.7	39.7	0.0	0.0	60.2	9.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-33.2	-33.2
198	17574359.45	4418864.23	10.90	0	8000	36.7	36.7	0.0	0.0	60.2	33.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-60.6	-60.6
199	17574350.13	4418880.29	10.90	0	32	-9.8	-9.8	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-67.4	-67.4
200	17574350.13	4418880.29	10.90	0	63	-9.8	-9.8	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-67.5	-67.5
201	17574350.13	4418880.29	10.90	0	125	-0.8	-0.8	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-61.1	-61.1
202	17574350.13	4418880.29	10.90	0	250	-0.8	-0.8	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-65.0	-65.0
203	17574350.13	4418880.29	10.90	0	500	3.2	3.2	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-59.8	-59.8
204	17574350.13	4418880.29	10.90	0	1000	1.2	1.2	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-59.3	-59.3
205	17574350.13	4418880.29	10.90	0	2000	9.2	9.2	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-52.7	-52.7
206	17574350.13	4418880.29	10.90	0	4000	3.2	3.2	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-65.6	-65.6
207	17574350.13	4418880.29	10.90	0	8000	0.2	0.2	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-94.1	-94.1
208	17574350.02	4418880.48	10.90	0	32	-13.2	-13.2	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-70.8	-70.8
209	17574350.02	4418880.48	10.90	0	63	-13.2	-13.2	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-70.8	-70.8
210	17574350.02	4418880.48	10.90	0	125	-4.2	-4.2	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-64.5	-64.5
211	17574350.02	4418880.48	10.90	0	250	-4.2	-4.2	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-68.3	-68.3
212	17574350.02	4418880.48	10.90	0	500	-0.2	-0.2	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-63.1	-63.1

Area Source, ISO 9613, Name: "TurbineBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
213	17574350.02	4418880.48	10.90	0	1000	-2.2	-2.2	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-62.7	-62.7
214	17574350.02	4418880.48	10.90	0	2000	5.8	5.8	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-56.0	-56.0
215	17574350.02	4418880.48	10.90	0	4000	-0.2	-0.2	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-69.0	-69.0
216	17574350.02	4418880.48	10.90	0	8000	-3.2	-3.2	0.0	0.0	60.6	35.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-97.4	-97.4
217	17574365.83	4418853.60	10.90	0	32	-7.2	-7.2	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-64.2	-64.2
218	17574365.83	4418853.60	10.90	0	63	-7.2	-7.2	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-64.2	-64.2
219	17574365.83	4418853.60	10.90	0	125	1.8	1.8	0.0	0.0	60.0	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-57.8	-57.8
220	17574365.83	4418853.60	10.90	0	250	1.8	1.8	0.0	0.0	60.0	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-61.8	-61.8
221	17574365.83	4418853.60	10.90	0	500	5.8	5.8	0.0	0.0	60.0	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-56.6	-56.6
222	17574365.83	4418853.60	10.90	0	1000	3.8	3.8	0.0	0.0	60.0	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-56.0	-56.0
223	17574365.83	4418853.60	10.90	0	2000	11.8	11.8	0.0	0.0	60.0	2.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-49.3	-49.3
224	17574365.83	4418853.60	10.90	0	4000	5.8	5.8	0.0	0.0	60.0	9.2	-1.7	0.0	0.0	0.0	0.0	-0.0	-61.8	-61.8
225	17574365.83	4418853.60	10.90	0	8000	2.8	2.8	0.0	0.0	60.0	32.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-88.4	-88.4
226	17574364.63	4418854.91	10.90	0	32	17.4	17.4	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.4	-44.4
227	17574364.63	4418854.91	10.90	0	63	17.4	17.4	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.4	-44.4
228	17574364.63	4418854.91	10.90	0	125	26.4	26.4	0.0	0.0	60.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-38.0	-38.0
229	17574364.63	4418854.91	10.90	0	250	26.4	26.4	0.0	0.0	60.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-38.7	-38.7
230	17574364.63	4418854.91	10.90	0	500	30.4	30.4	0.0	0.0	60.0	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-34.9	-34.9
231	17574364.63	4418854.91	10.90	0	1000	28.4	28.4	0.0	0.0	60.0	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-36.2	-36.2
232	17574364.63	4418854.91	10.90	0	2000	36.4	36.4	0.0	0.0	60.0	2.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-29.4	-29.4
233	17574364.63	4418854.91	10.90	0	4000	30.4	30.4	0.0	0.0	60.0	9.3	-1.7	0.0	0.0	4.8	0.0	-0.0	-42.0	-42.0
234	17574364.63	4418854.91	10.90	0	8000	27.4	27.4	0.0	0.0	60.0	33.0	-1.7	0.0	0.0	4.8	0.0	-0.0	-68.8	-68.8
235	17574363.98	4418855.76	10.90	0	32	11.8	11.8	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-50.0	-50.0
236	17574363.98	4418855.76	10.90	0	63	11.8	11.8	0.0	0.0	60.0	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-50.1	-50.1
237	17574363.98	4418855.76	10.90	0	125	20.8	20.8	0.0	0.0	60.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-43.6	-43.6
238	17574363.98	4418855.76	10.90	0	250	20.8	20.8	0.0	0.0	60.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-44.3	-44.3
239	17574363.98	4418855.76	10.90	0	500	24.8	24.8	0.0	0.0	60.0	0.6	1.8	0.0	0.0	2.9	0.0	-0.0	-40.6	-40.6
240	17574363.98	4418855.76	10.90	0	1000	22.8	22.8	0.0	0.0	60.0	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-41.9	-41.9
241	17574363.98	4418855.76	10.90	0	2000	30.8	30.8	0.0	0.0	60.0	2.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-35.1	-35.1
242	17574363.98	4418855.76	10.90	0	4000	24.8	24.8	0.0	0.0	60.0	9.3	-1.7	0.0	0.0	4.8	0.0	-0.0	-47.7	-47.7
243	17574363.98	4418855.76	10.90	0	8000	21.8	21.8	0.0	0.0	60.0	33.1	-1.7	0.0	0.0	4.8	0.0	-0.0	-74.5	-74.5
244	17574352.27	4418866.79	10.90	0	32	18.6	18.6	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-43.7	-43.7
245	17574352.27	4418866.79	10.90	0	63	18.6	18.6	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-43.7	-43.7
246	17574352.27	4418866.79	10.90	0	125	27.6	27.6	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-37.3	-37.3
247	17574352.27	4418866.79	10.90	0	250	27.6	27.6	0.0	0.0	60.5	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-38.0	-38.0
248	17574352.27	4418866.79	10.90	0	500	31.6	31.6	0.0	0.0	60.5	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-34.3	-34.3
249	17574352.27	4418866.79	10.90	0	1000	29.6	29.6	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-35.6	-35.6
250	17574352.27	4418866.79	10.90	0	2000	37.6	37.6	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-28.9	-28.9
251	17574352.27	4418866.79	10.90	0	4000	31.6	31.6	0.0	0.0	60.5	9.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-41.8	-41.8
252	17574352.27	4418866.79	10.90	0	8000	28.6	28.6	0.0	0.0	60.5	34.7	-1.7	0.0	0.0	4.8	0.0	-0.0	-69.8	-69.8
253	17574351.41	4418867.35	10.90	0	32	18.3	18.3	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-43.9	-43.9
254	17574351.41	4418867.35	10.90	0	63	18.3	18.3	0.0	0.0	60.5	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.0	-44.0
255	17574351.41	4418867.35	10.90	0	125	27.3	27.3	0.0	0.0	60.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-37.6	-37.6
256	17574351.41	4418867.35	10.90	0	250	27.3	27.3	0.0	0.0	60.5	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-38.2	-38.2
257	17574351.41	4418867.35	10.90	0	500	31.3	31.3	0.0	0.0	60.5	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-34.5	-34.5
258	17574351.41	4418867.35	10.90	0	1000	29.3	29.3	0.0	0.0	60.5	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-35.8	-35.8
259	17574351.41	4418867.35	10.90	0	2000	37.3	37.3	0.0	0.0	60.5	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-29.2	-29.2
260	17574351.41	4418867.35	10.90	0	4000	31.3	31.3	0.0	0.0	60.5	9.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-42.1	-42.1
261	17574351.41	4418867.35	10.90	0	8000	28.3	28.3	0.0	0.0	60.5	34.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-70.2	-70.2
262	17574358.77	4418860.70	10.90	0	32	18.0	18.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.0	-44.0
263	17574358.77	4418860.70	10.90	0	63	18.0	18.0	0.0	0.0	60.2	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.1	-44.1
264	17574358.77	4418860.70	10.90	0	125	27.0	27.0	0.0	0.0	60.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-37.7	-37.7
265	17574358.77	4418860.70	10.90	0	250	27.0	27.0	0.0	0.0	60.2	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-38.3	-38.3
266	17574358.77	4418860.70	10.90	0	500	31.0	31.0	0.0	0.0	60.2	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-34.6	-34.6
267	17574358.77	4418860.70	10.90	0	1000	29.0	29.0	0.0	0.0	60.2	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-35.9	-35.9
268	17574358.77	4418860.70	10.90	0	2000	37.0	37.0	0.0	0.0	60.2	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-29.2	-29.2
269	17574358.77	4418860.70	10.90	0	4000	31.0	31.0	0.0	0.0	60.2	9.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-41.9	-41.9
270	17574358.77	4418860.70	10.90	0	8000	28.0	28.0	0.0	0.0	60.2	33.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-69.3	-69.3
271	17574357.99	4418861.19	10.90	0	32	18.0	18.0	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.1	-44.1
272	17574357.99	4418861.19	10.90	0	63	18.0	18.0	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.1	-44.1
273	17574357.99	4418861.19	10.90	0	125	27.0	27.0	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-37.7	-37.7
274	17574357.99	4418861.19	10.90	0	250	27.0	27.0	0.0	0.0	60.3	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-38.4	-38.4
275	17574357.99	4418861.19	10.90	0	500	31.0	31.0	0.0	0.0	60.3	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-34.6	-34.6

Area Source, ISO 9613, Name: "TurbineBuilding-RoofNorth", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
276	17574357.99	4418861.19	10.90	0	1000	29.0	29.0	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-35.9	-35.9
277	17574357.99	4418861.19	10.90	0	2000	37.0	37.0	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-29.2	-29.2
278	17574357.99	4418861.19	10.90	0	4000	31.0	31.0	0.0	0.0	60.3	9.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-41.9	-41.9
279	17574357.99	4418861.19	10.90	0	8000	28.0	28.0	0.0	0.0	60.3	33.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-69.4	-69.4
280	17574349.87	4418880.52	10.90	0	32	-15.0	-15.0	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-72.6	-72.6
281	17574349.87	4418880.52	10.90	0	63	-15.0	-15.0	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-72.6	-72.6
282	17574349.87	4418880.52	10.90	0	125	-6.0	-6.0	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-66.3	-66.3
283	17574349.87	4418880.52	10.90	0	250	-6.0	-6.0	0.0	0.0	60.6	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-70.1	-70.1
284	17574349.87	4418880.52	10.90	0	500	-2.0	-2.0	0.0	0.0	60.6	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-65.0	-65.0
285	17574349.87	4418880.52	10.90	0	1000	-4.0	-4.0	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-64.5	-64.5
286	17574349.87	4418880.52	10.90	0	2000	4.0	4.0	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-57.8	-57.8
287	17574349.87	4418880.52	10.90	0	4000	-2.0	-2.0	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-70.8	-70.8
288	17574349.87	4418880.52	10.90	0	8000	-5.0	-5.0	0.0	0.0	60.6	35.4	-1.7	0.0	0.0	0.0	0.0	-0.0	-99.3	-99.3
289	17574347.58	4418875.20	10.90	0	32	17.6	17.6	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.8	-44.8
290	17574347.58	4418875.20	10.90	0	63	17.6	17.6	0.0	0.0	60.6	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-44.8	-44.8
291	17574347.58	4418875.20	10.90	0	125	26.6	26.6	0.0	0.0	60.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-38.5	-38.5
292	17574347.58	4418875.20	10.90	0	250	26.6	26.6	0.0	0.0	60.6	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-39.1	-39.1
293	17574347.58	4418875.20	10.90	0	500	30.6	30.6	0.0	0.0	60.6	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-35.4	-35.4
294	17574347.58	4418875.20	10.90	0	1000	28.6	28.6	0.0	0.0	60.6	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-36.7	-36.7
295	17574347.58	4418875.20	10.90	0	2000	36.6	36.6	0.0	0.0	60.6	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-30.1	-30.1
296	17574347.58	4418875.20	10.90	0	4000	30.6	30.6	0.0	0.0	60.6	9.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-43.1	-43.1
297	17574347.58	4418875.20	10.90	0	8000	27.6	27.6	0.0	0.0	60.6	35.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-71.6	-71.6
298	17574346.32	4418872.33	10.90	0	32	4.9	4.9	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-57.6	-57.6
299	17574346.32	4418872.33	10.90	0	63	4.9	4.9	0.0	0.0	60.7	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-57.6	-57.6
300	17574346.32	4418872.33	10.90	0	125	13.9	13.9	0.0	0.0	60.7	0.1	-0.4	0.0	0.0	4.8	0.0	-0.0	-51.2	-51.2
301	17574346.32	4418872.33	10.90	0	250	13.9	13.9	0.0	0.0	60.7	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-51.9	-51.9
302	17574346.32	4418872.33	10.90	0	500	17.9	17.9	0.0	0.0	60.7	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-48.1	-48.1
303	17574346.32	4418872.33	10.90	0	1000	15.9	15.9	0.0	0.0	60.7	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-49.5	-49.5
304	17574346.32	4418872.33	10.90	0	2000	23.9	23.9	0.0	0.0	60.7	2.9	-1.7	0.0	0.0	4.8	0.0	-0.0	-42.8	-42.8
305	17574346.32	4418872.33	10.90	0	4000	17.9	17.9	0.0	0.0	60.7	10.0	-1.7	0.0	0.0	4.8	0.0	-0.0	-55.9	-55.9
306	17574346.32	4418872.33	10.90	0	8000	14.9	14.9	0.0	0.0	60.7	35.5	-1.7	0.0	0.0	4.8	0.0	-0.0	-84.5	-84.5
307	17574356.75	4418862.85	10.90	0	32	0.2	0.2	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-61.9	-61.9
308	17574356.75	4418862.85	10.90	0	63	0.2	0.2	0.0	0.0	60.3	0.0	-3.0	0.0	0.0	4.8	0.0	-0.0	-61.9	-61.9
309	17574356.75	4418862.85	10.90	0	125	9.2	9.2	0.0	0.0	60.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-55.5	-55.5
310	17574356.75	4418862.85	10.90	0	250	9.2	9.2	0.0	0.0	60.3	0.3	3.2	0.0	0.0	1.5	0.0	-0.0	-56.2	-56.2
311	17574356.75	4418862.85	10.90	0	500	13.2	13.2	0.0	0.0	60.3	0.6	1.8	0.0	0.0	3.0	0.0	-0.0	-52.4	-52.4
312	17574356.75	4418862.85	10.90	0	1000	11.2	11.2	0.0	0.0	60.3	1.1	-1.2	0.0	0.0	4.8	0.0	-0.0	-53.8	-53.8
313	17574356.75	4418862.85	10.90	0	2000	19.2	19.2	0.0	0.0	60.3	2.8	-1.7	0.0	0.0	4.8	0.0	-0.0	-47.1	-47.1
314	17574356.75	4418862.85	10.90	0	4000	13.2	13.2	0.0	0.0	60.3	9.6	-1.7	0.0	0.0	4.8	0.0	-0.0	-59.8	-59.8
315	17574356.75	4418862.85	10.90	0	8000	10.2	10.2	0.0	0.0	60.3	34.1	-1.7	0.0	0.0	4.8	0.0	-0.0	-87.4	-87.4

Area Source, ISO 9613, Name: "CompressorBuilding-RoofSouth", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574383.70	4418825.93	9.14	0	125	48.4	48.4	0.0	0.0	59.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-10.5	-10.5
2	17574383.70	4418825.93	9.14	0	250	54.9	54.9	0.0	0.0	59.3	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-7.9	-7.9
3	17574383.70	4418825.93	9.14	0	500	60.0	60.0	0.0	0.0	59.3	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-1.6	-1.6
4	17574383.70	4418825.93	9.14	0	1000	66.3	66.3	0.0	0.0	59.3	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	7.2	7.2
5	17574383.70	4418825.93	9.14	0	2000	69.5	69.5	0.0	0.0	59.3	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	9.3	9.3
6	17574383.70	4418825.93	9.14	0	4000	71.4	71.4	0.0	0.0	59.3	8.5	-1.6	0.0	0.0	0.0	0.0	-0.0	5.2	5.2
7	17574383.70	4418825.93	9.14	0	8000	61.6	61.6	0.0	0.0	59.3	30.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-26.4	-26.4
8	17574396.45	4418818.25	9.14	0	125	45.2	45.2	0.0	0.0	58.8	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.2	-13.2
9	17574396.45	4418818.25	9.14	0	250	51.7	51.7	0.0	0.0	58.8	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-10.7	-10.7
10	17574396.45	4418818.25	9.14	0	500	56.8	56.8	0.0	0.0	58.8	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-4.4	-4.4
11	17574396.45	4418818.25	9.14	0	1000	63.1	63.1	0.0	0.0	58.8	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	4.5	4.5
12	17574396.45	4418818.25	9.14	0	2000	66.3	66.3	0.0	0.0	58.8	2.4	-1.6	0.0	0.0	0.0	0.0	-0.0	6.7	6.7
13	17574396.45	4418818.25	9.14	0	4000	68.2	68.2	0.0	0.0	58.8	8.1	-1.6	0.0	0.0	0.0	0.0	-0.0	2.9	2.9
14	17574396.45	4418818.25	9.14	0	8000	58.4	58.4	0.0	0.0	58.8	28.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-27.7	-27.7
15	17574389.74	4418824.55	9.14	0	125	42.4	42.4	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-16.3	-16.3
16	17574389.74	4418824.55	9.14	0	250	48.9	48.9	0.0	0.0	59.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-13.8	-13.8
17	17574389.74	4418824.55	9.14	0	500	54.0	54.0	0.0	0.0	59.1	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-7.5	-7.5
18	17574389.74	4418824.55	9.14	0	1000	60.3	60.3	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	1.4	1.4
19	17574389.74	4418824.55	9.14	0	2000	63.5	63.5	0.0	0.0	59.1	2.4	-1.6	0.0	0.0	0.0	0.0	-0.0	3.5	3.5

Area Source, ISO 9613, Name: "CompressorBuilding-RoofSouth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
20	17574389.74	4418824.55	9.14	0	4000	65.4	65.4	0.0	0.0	59.1	8.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-0.4	-0.4
21	17574389.74	4418824.55	9.14	0	8000	55.6	55.6	0.0	0.0	59.1	29.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-31.6	-31.6
22	17574402.16	4418812.88	9.14	0	125	40.0	40.0	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-18.3	-18.3
23	17574402.16	4418812.88	9.14	0	250	46.5	46.5	0.0	0.0	58.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-15.7	-15.7
24	17574402.16	4418812.88	9.14	0	500	51.6	51.6	0.0	0.0	58.6	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-9.4	-9.4
25	17574402.16	4418812.88	9.14	0	1000	57.9	57.9	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-0.6	-0.6
26	17574402.16	4418812.88	9.14	0	2000	61.1	61.1	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	1.7	1.7
27	17574402.16	4418812.88	9.14	0	4000	63.0	63.0	0.0	0.0	58.6	7.9	-1.6	0.0	0.0	0.0	0.0	-0.0	-2.0	-2.0
28	17574402.16	4418812.88	9.14	0	8000	53.2	53.2	0.0	0.0	58.6	28.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-32.0	-32.0
29	17574386.69	4418827.42	9.14	0	125	37.5	37.5	0.0	0.0	59.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-21.3	-21.3
30	17574386.69	4418827.42	9.14	0	250	44.0	44.0	0.0	0.0	59.2	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-18.8	-18.8
31	17574386.69	4418827.42	9.14	0	500	49.1	49.1	0.0	0.0	59.2	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-12.5	-12.5
32	17574386.69	4418827.42	9.14	0	1000	55.4	55.4	0.0	0.0	59.2	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-3.6	-3.6
33	17574386.69	4418827.42	9.14	0	2000	58.6	58.6	0.0	0.0	59.2	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-1.5	-1.5
34	17574386.69	4418827.42	9.14	0	4000	60.5	60.5	0.0	0.0	59.2	8.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-5.5	-5.5
35	17574386.69	4418827.42	9.14	0	8000	50.7	50.7	0.0	0.0	59.2	30.0	-1.6	0.0	0.0	0.0	0.0	-0.0	-36.9	-36.9
36	17574403.86	4418811.57	9.14	0	125	33.1	33.1	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-25.1	-25.1
37	17574403.86	4418811.57	9.14	0	250	39.6	39.6	0.0	0.0	58.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-22.6	-22.6
38	17574403.86	4418811.57	9.14	0	500	44.7	44.7	0.0	0.0	58.6	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
39	17574403.86	4418811.57	9.14	0	1000	51.0	51.0	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-7.3	-7.3
40	17574403.86	4418811.57	9.14	0	2000	54.2	54.2	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-5.1	-5.1
41	17574403.86	4418811.57	9.14	0	4000	56.1	56.1	0.0	0.0	58.6	7.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-8.8	-8.8
42	17574403.86	4418811.57	9.14	0	8000	46.3	46.3	0.0	0.0	58.6	27.9	-1.6	0.0	0.0	0.0	0.0	-0.0	-38.6	-38.6
43	17574376.75	4418837.24	9.14	0	125	32.0	32.0	0.0	0.0	59.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-27.2	-27.2
44	17574376.75	4418837.24	9.14	0	250	38.5	38.5	0.0	0.0	59.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-24.6	-24.6
45	17574376.75	4418837.24	9.14	0	500	43.6	43.6	0.0	0.0	59.6	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-18.3	-18.3
46	17574376.75	4418837.24	9.14	0	1000	49.9	49.9	0.0	0.0	59.6	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-9.5	-9.5
47	17574376.75	4418837.24	9.14	0	2000	53.1	53.1	0.0	0.0	59.6	2.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-7.4	-7.4
48	17574376.75	4418837.24	9.14	0	4000	55.0	55.0	0.0	0.0	59.6	8.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-11.7	-11.7
49	17574376.75	4418837.24	9.14	0	8000	45.2	45.2	0.0	0.0	59.6	31.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-44.1	-44.1
50	17574402.37	4418817.25	9.14	0	125	23.3	23.3	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-34.9	-34.9
51	17574402.37	4418817.25	9.14	0	250	29.8	29.8	0.0	0.0	58.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-32.3	-32.3
52	17574402.37	4418817.25	9.14	0	500	34.9	34.9	0.0	0.0	58.6	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-26.0	-26.0
53	17574402.37	4418817.25	9.14	0	1000	41.2	41.2	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-17.2	-17.2
54	17574402.37	4418817.25	9.14	0	2000	44.4	44.4	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-15.0	-15.0
55	17574402.37	4418817.25	9.14	0	4000	46.3	46.3	0.0	0.0	58.6	7.9	-1.6	0.0	0.0	0.0	0.0	-0.0	-18.6	-18.6
56	17574402.37	4418817.25	9.14	0	8000	36.5	36.5	0.0	0.0	58.6	28.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-48.6	-48.6
57	17574402.04	4418817.82	9.14	0	125	23.3	23.3	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-35.0	-35.0
58	17574402.04	4418817.82	9.14	0	250	29.8	29.8	0.0	0.0	58.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-32.4	-32.4
59	17574402.04	4418817.82	9.14	0	500	34.9	34.9	0.0	0.0	58.6	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-26.1	-26.1
60	17574402.04	4418817.82	9.14	0	1000	41.2	41.2	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-17.2	-17.2
61	17574402.04	4418817.82	9.14	0	2000	44.4	44.4	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-15.0	-15.0
62	17574402.04	4418817.82	9.14	0	4000	46.3	46.3	0.0	0.0	58.6	7.9	-1.6	0.0	0.0	0.0	0.0	-0.0	-18.7	-18.7
63	17574402.04	4418817.82	9.14	0	8000	36.5	36.5	0.0	0.0	58.6	28.2	-1.6	0.0	0.0	0.0	0.0	-0.0	-48.8	-48.8
64	17574388.89	4418830.16	9.14	0	125	23.7	23.7	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-35.0	-35.0
65	17574388.89	4418830.16	9.14	0	250	30.2	30.2	0.0	0.0	59.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-32.4	-32.4
66	17574388.89	4418830.16	9.14	0	500	35.3	35.3	0.0	0.0	59.1	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-26.1	-26.1
67	17574388.89	4418830.16	9.14	0	1000	41.6	41.6	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-17.3	-17.3
68	17574388.89	4418830.16	9.14	0	2000	44.8	44.8	0.0	0.0	59.1	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-15.2	-15.2
69	17574388.89	4418830.16	9.14	0	4000	46.7	46.7	0.0	0.0	59.1	8.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-19.2	-19.2
70	17574388.89	4418830.16	9.14	0	8000	36.9	36.9	0.0	0.0	59.1	29.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-50.4	-50.4
71	17574389.27	4418829.54	9.14	0	125	23.6	23.6	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-35.1	-35.1
72	17574389.27	4418829.54	9.14	0	250	30.1	30.1	0.0	0.0	59.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-32.6	-32.6
73	17574389.27	4418829.54	9.14	0	500	35.2	35.2	0.0	0.0	59.1	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-26.3	-26.3
74	17574389.27	4418829.54	9.14	0	1000	41.5	41.5	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-17.4	-17.4
75	17574389.27	4418829.54	9.14	0	2000	44.7	44.7	0.0	0.0	59.1	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-15.3	-15.3
76	17574389.27	4418829.54	9.14	0	4000	46.6	46.6	0.0	0.0	59.1	8.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-19.3	-19.3
77	17574389.27	4418829.54	9.14	0	8000	36.8	36.8	0.0	0.0	59.1	29.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-50.5	-50.5
78	17574395.23	4418823.95	9.14	0	125	23.3	23.3	0.0	0.0	58.9	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-35.2	-35.2
79	17574395.23	4418823.95	9.14	0	250	29.8	29.8	0.0	0.0	58.9	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-32.7	-32.7
80	17574395.23	4418823.95	9.14	0	500	34.9	34.9	0.0	0.0	58.9	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-26.4	-26.4
81	17574395.23	4418823.95	9.14	0	1000	41.2	41.2	0.0	0.0	58.9	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-17.5	-17.5
82	17574395.23	4418823.95	9.14	0	2000	44.4	44.4	0.0	0.0	58.9	2.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-15.3	-15.3

Area Source, ISO 9613, Name: "CompressorBuilding-RoofSouth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
83	17574395.23	4418823.95	9.14	0	4000	46.3	46.3	0.0	0.0	58.9	8.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-19.2	-19.2
84	17574395.23	4418823.95	9.14	0	8000	36.5	36.5	0.0	0.0	58.9	29.0	-1.6	0.0	0.0	0.0	0.0	-0.0	-49.8	-49.8
85	17574394.90	4418824.52	9.14	0	125	23.1	23.1	0.0	0.0	58.9	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-35.4	-35.4
86	17574394.90	4418824.52	9.14	0	250	29.6	29.6	0.0	0.0	58.9	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-32.9	-32.9
87	17574394.90	4418824.52	9.14	0	500	34.7	34.7	0.0	0.0	58.9	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-26.6	-26.6
88	17574394.90	4418824.52	9.14	0	1000	41.0	41.0	0.0	0.0	58.9	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-17.7	-17.7
89	17574394.90	4418824.52	9.14	0	2000	44.2	44.2	0.0	0.0	58.9	2.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-15.5	-15.5
90	17574394.90	4418824.52	9.14	0	4000	46.1	46.1	0.0	0.0	58.9	8.2	-1.6	0.0	0.0	0.0	0.0	-0.0	-19.4	-19.4
91	17574394.90	4418824.52	9.14	0	8000	36.3	36.3	0.0	0.0	58.9	29.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-50.1	-50.1
92	17574381.86	4418836.83	9.14	0	125	23.0	23.0	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-36.0	-36.0
93	17574381.86	4418836.83	9.14	0	250	29.5	29.5	0.0	0.0	59.4	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-33.5	-33.5
94	17574381.86	4418836.83	9.14	0	500	34.6	34.6	0.0	0.0	59.4	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-27.2	-27.2
95	17574381.86	4418836.83	9.14	0	1000	40.9	40.9	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-18.3	-18.3
96	17574381.86	4418836.83	9.14	0	2000	44.1	44.1	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
97	17574381.86	4418836.83	9.14	0	4000	46.0	46.0	0.0	0.0	59.4	8.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-20.4	-20.4
98	17574381.86	4418836.83	9.14	0	8000	36.2	36.2	0.0	0.0	59.4	30.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-52.3	-52.3
99	17574382.11	4418836.30	9.14	0	125	23.0	23.0	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-36.0	-36.0
100	17574382.11	4418836.30	9.14	0	250	29.5	29.5	0.0	0.0	59.4	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-33.5	-33.5
101	17574382.11	4418836.30	9.14	0	500	34.6	34.6	0.0	0.0	59.4	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-27.2	-27.2
102	17574382.11	4418836.30	9.14	0	1000	40.9	40.9	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-18.3	-18.3
103	17574382.11	4418836.30	9.14	0	2000	44.1	44.1	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
104	17574382.11	4418836.30	9.14	0	4000	46.0	46.0	0.0	0.0	59.4	8.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-20.4	-20.4
105	17574382.11	4418836.30	9.14	0	8000	36.2	36.2	0.0	0.0	59.4	30.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-52.3	-52.3
106	17574405.78	4418814.32	9.14	0	125	20.5	20.5	0.0	0.0	58.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-37.6	-37.6
107	17574405.78	4418814.32	9.14	0	250	27.0	27.0	0.0	0.0	58.5	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-35.0	-35.0
108	17574405.78	4418814.32	9.14	0	500	32.1	32.1	0.0	0.0	58.5	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-28.7	-28.7
109	17574405.78	4418814.32	9.14	0	1000	38.4	38.4	0.0	0.0	58.5	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-19.8	-19.8
110	17574405.78	4418814.32	9.14	0	2000	41.6	41.6	0.0	0.0	58.5	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-17.6	-17.6
111	17574405.78	4418814.32	9.14	0	4000	43.5	43.5	0.0	0.0	58.5	7.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-21.2	-21.2
112	17574405.78	4418814.32	9.14	0	8000	33.7	33.7	0.0	0.0	58.5	27.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-50.9	-50.9
113	17574376.83	4418836.92	9.14	0	125	19.6	19.6	0.0	0.0	59.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-39.6	-39.6
114	17574376.83	4418836.92	9.14	0	250	26.1	26.1	0.0	0.0	59.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-37.0	-37.0
115	17574376.83	4418836.92	9.14	0	500	31.2	31.2	0.0	0.0	59.6	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-30.7	-30.7
116	17574376.83	4418836.92	9.14	0	1000	37.5	37.5	0.0	0.0	59.6	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-21.9	-21.9
117	17574376.83	4418836.92	9.14	0	2000	40.7	40.7	0.0	0.0	59.6	2.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-19.8	-19.8
118	17574376.83	4418836.92	9.14	0	4000	42.6	42.6	0.0	0.0	59.6	8.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-24.1	-24.1
119	17574376.83	4418836.92	9.14	0	8000	32.8	32.8	0.0	0.0	59.6	31.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-56.4	-56.4
120	17574394.53	4418824.33	9.14	0	125	14.7	14.7	0.0	0.0	58.9	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-43.9	-43.9
121	17574394.53	4418824.33	9.14	0	250	21.2	21.2	0.0	0.0	58.9	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-41.3	-41.3
122	17574394.53	4418824.33	9.14	0	500	26.3	26.3	0.0	0.0	58.9	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-35.0	-35.0
123	17574394.53	4418824.33	9.14	0	1000	32.6	32.6	0.0	0.0	58.9	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-26.1	-26.1
124	17574394.53	4418824.33	9.14	0	2000	35.8	35.8	0.0	0.0	58.9	2.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-24.0	-24.0
125	17574394.53	4418824.33	9.14	0	4000	37.7	37.7	0.0	0.0	58.9	8.2	-1.6	0.0	0.0	0.0	0.0	-0.0	-27.8	-27.8
126	17574394.53	4418824.33	9.14	0	8000	27.9	27.9	0.0	0.0	58.9	29.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-58.6	-58.6
127	17574390.65	4418827.99	9.14	0	125	13.3	13.3	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-45.4	-45.4
128	17574390.65	4418827.99	9.14	0	250	19.8	19.8	0.0	0.0	59.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-42.8	-42.8
129	17574390.65	4418827.99	9.14	0	500	24.9	24.9	0.0	0.0	59.1	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-36.5	-36.5
130	17574390.65	4418827.99	9.14	0	1000	31.2	31.2	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-27.6	-27.6
131	17574390.65	4418827.99	9.14	0	2000	34.4	34.4	0.0	0.0	59.1	2.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-25.5	-25.5
132	17574390.65	4418827.99	9.14	0	4000	36.3	36.3	0.0	0.0	59.1	8.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-29.4	-29.4
133	17574390.65	4418827.99	9.14	0	8000	26.5	26.5	0.0	0.0	59.1	29.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-60.5	-60.5
134	17574403.09	4418816.30	9.14	0	125	7.3	7.3	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-50.9	-50.9
135	17574403.09	4418816.30	9.14	0	250	13.8	13.8	0.0	0.0	58.6	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-48.4	-48.4
136	17574403.09	4418816.30	9.14	0	500	18.9	18.9	0.0	0.0	58.6	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-42.1	-42.1
137	17574403.09	4418816.30	9.14	0	1000	25.2	25.2	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-33.2	-33.2
138	17574403.09	4418816.30	9.14	0	2000	28.4	28.4	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-31.0	-31.0
139	17574403.09	4418816.30	9.14	0	4000	30.3	30.3	0.0	0.0	58.6	7.9	-1.6	0.0	0.0	0.0	0.0	-0.0	-34.6	-34.6
140	17574403.09	4418816.30	9.14	0	8000	20.5	20.5	0.0	0.0	58.6	28.0	-1.6	0.0	0.0	0.0	0.0	-0.0	-64.6	-64.6
141	17574383.89	4418834.34	9.14	0	125	6.1	6.1	0.0	0.0	59.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-52.8	-52.8
142	17574383.89	4418834.34	9.14	0	250	12.6	12.6	0.0	0.0	59.3	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-50.2	-50.2
143	17574383.89	4418834.34	9.14	0	500	17.7	17.7	0.0	0.0	59.3	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-43.9	-43.9
144	17574383.89	4418834.34	9.14	0	1000	24.0	24.0	0.0	0.0	59.3	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-35.1	-35.1
145	17574383.89	4418834.34	9.14	0	2000	27.2	27.2	0.0	0.0	59.3	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-33.0	-33.0

Area Source, ISO 9613, Name: "CompressorBuilding-RoofSouth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
146	17574383.89	4418834.34	9.14	0	4000	29.1	29.1	0.0	0.0	59.3	8.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-37.1	-37.1
147	17574383.89	4418834.34	9.14	0	8000	19.3	19.3	0.0	0.0	59.3	30.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-68.8	-68.8

Area Source, ISO 9613, Name: "CompressorBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574396.37	4418833.09	9.14	0	125	46.4	46.4	0.0	0.0	58.9	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-16.9	-16.9
2	17574396.37	4418833.09	9.14	0	250	52.9	52.9	0.0	0.0	58.9	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-11.1	-11.1
3	17574396.37	4418833.09	9.14	0	500	58.0	58.0	0.0	0.0	58.9	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-6.2	-6.2
4	17574396.37	4418833.09	9.14	0	1000	64.3	64.3	0.0	0.0	58.9	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	0.8	0.8
5	17574396.37	4418833.09	9.14	0	2000	67.5	67.5	0.0	0.0	58.9	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	3.0	3.0
6	17574396.37	4418833.09	9.14	0	4000	69.4	69.4	0.0	0.0	58.9	8.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-0.8	-0.8
7	17574396.37	4418833.09	9.14	0	8000	59.6	59.6	0.0	0.0	58.9	29.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-31.5	-31.5
8	17574387.33	4418840.70	9.14	0	125	43.3	43.3	0.0	0.0	59.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-20.3	-20.3
9	17574387.33	4418840.70	9.14	0	250	49.8	49.8	0.0	0.0	59.2	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-14.5	-14.5
10	17574387.33	4418840.70	9.14	0	500	54.9	54.9	0.0	0.0	59.2	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-9.6	-9.6
11	17574387.33	4418840.70	9.14	0	1000	61.2	61.2	0.0	0.0	59.2	0.9	-1.2	0.0	0.0	4.8	0.0	-0.0	-2.6	-2.6
12	17574387.33	4418840.70	9.14	0	2000	64.4	64.4	0.0	0.0	59.2	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-0.5	-0.5
13	17574387.33	4418840.70	9.14	0	4000	66.3	66.3	0.0	0.0	59.2	8.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-4.5	-4.5
14	17574387.33	4418840.70	9.14	0	8000	56.5	56.5	0.0	0.0	59.2	30.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-36.0	-36.0
15	17574386.20	4418844.72	9.14	0	125	38.2	38.2	0.0	0.0	59.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-25.5	-25.5
16	17574386.20	4418844.72	9.14	0	250	44.7	44.7	0.0	0.0	59.3	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-19.6	-19.6
17	17574386.20	4418844.72	9.14	0	500	49.8	49.8	0.0	0.0	59.3	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-14.8	-14.8
18	17574386.20	4418844.72	9.14	0	1000	56.1	56.1	0.0	0.0	59.3	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-7.8	-7.8
19	17574386.20	4418844.72	9.14	0	2000	59.3	59.3	0.0	0.0	59.3	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-5.7	-5.7
20	17574386.20	4418844.72	9.14	0	4000	61.2	61.2	0.0	0.0	59.3	8.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-9.8	-9.8
21	17574386.20	4418844.72	9.14	0	8000	51.4	51.4	0.0	0.0	59.3	30.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-41.4	-41.4
22	17574403.84	4418821.60	9.14	0	125	43.5	43.5	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-19.4	-19.4
23	17574403.84	4418821.60	9.14	0	250	50.0	50.0	0.0	0.0	58.6	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-13.6	-13.6
24	17574403.84	4418821.60	9.14	0	500	55.1	55.1	0.0	0.0	58.6	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-8.7	-8.7
25	17574403.84	4418821.60	9.14	0	1000	61.4	61.4	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-1.7	-1.7
26	17574403.84	4418821.60	9.14	0	2000	64.6	64.6	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	0.5	0.5
27	17574403.84	4418821.60	9.14	0	4000	66.5	66.5	0.0	0.0	58.6	7.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-3.1	-3.1
28	17574403.84	4418821.60	9.14	0	8000	56.7	56.7	0.0	0.0	58.6	28.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-33.1	-33.1
29	17574411.12	4418822.78	9.14	0	125	24.3	24.3	0.0	0.0	58.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-38.4	-38.4
30	17574411.12	4418822.78	9.14	0	250	30.8	30.8	0.0	0.0	58.3	0.2	3.3	0.0	0.0	1.5	0.0	-0.0	-32.6	-32.6
31	17574411.12	4418822.78	9.14	0	500	35.9	35.9	0.0	0.0	58.3	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-27.7	-27.7
32	17574411.12	4418822.78	9.14	0	1000	42.2	42.2	0.0	0.0	58.3	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-20.7	-20.7
33	17574411.12	4418822.78	9.14	0	2000	45.4	45.4	0.0	0.0	58.3	2.2	-1.6	0.0	0.0	4.8	0.0	-0.0	-18.4	-18.4
34	17574411.12	4418822.78	9.14	0	4000	47.3	47.3	0.0	0.0	58.3	7.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-21.9	-21.9
35	17574411.12	4418822.78	9.14	0	8000	37.5	37.5	0.0	0.0	58.3	27.2	-1.6	0.0	0.0	4.8	0.0	-0.0	-51.2	-51.2
36	17574400.53	4418826.96	9.14	0	125	39.5	39.5	0.0	0.0	58.7	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-23.6	-23.6
37	17574400.53	4418826.96	9.14	0	250	46.0	46.0	0.0	0.0	58.7	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-17.7	-17.7
38	17574400.53	4418826.96	9.14	0	500	51.1	51.1	0.0	0.0	58.7	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-12.8	-12.8
39	17574400.53	4418826.96	9.14	0	1000	57.4	57.4	0.0	0.0	58.7	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-5.8	-5.8
40	17574400.53	4418826.96	9.14	0	2000	60.6	60.6	0.0	0.0	58.7	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-3.6	-3.6
41	17574400.53	4418826.96	9.14	0	4000	62.5	62.5	0.0	0.0	58.7	8.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-7.4	-7.4
42	17574400.53	4418826.96	9.14	0	8000	52.7	52.7	0.0	0.0	58.7	28.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.6	-37.6
43	17574390.78	4418831.71	9.14	0	125	40.1	40.1	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-23.3	-23.3
44	17574390.78	4418831.71	9.14	0	250	46.6	46.6	0.0	0.0	59.1	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-17.5	-17.5
45	17574390.78	4418831.71	9.14	0	500	51.7	51.7	0.0	0.0	59.1	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-12.6	-12.6
46	17574390.78	4418831.71	9.14	0	1000	58.0	58.0	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-5.6	-5.6
47	17574390.78	4418831.71	9.14	0	2000	61.2	61.2	0.0	0.0	59.1	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-3.5	-3.5
48	17574390.78	4418831.71	9.14	0	4000	63.1	63.1	0.0	0.0	59.1	8.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-7.4	-7.4
49	17574390.78	4418831.71	9.14	0	8000	53.3	53.3	0.0	0.0	59.1	29.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-38.6	-38.6
50	17574411.14	4418822.43	9.14	0	125	23.8	23.8	0.0	0.0	58.3	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-38.9	-38.9
51	17574411.14	4418822.43	9.14	0	250	30.3	30.3	0.0	0.0	58.3	0.2	3.3	0.0	0.0	1.5	0.0	-0.0	-33.0	-33.0
52	17574411.14	4418822.43	9.14	0	500	35.4	35.4	0.0	0.0	58.3	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-28.2	-28.2
53	17574411.14	4418822.43	9.14	0	1000	41.7	41.7	0.0	0.0	58.3	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-21.2	-21.2
54	17574411.14	4418822.43	9.14	0	2000	44.9	44.9	0.0	0.0	58.3	2.2	-1.6	0.0	0.0	4.8	0.0	-0.0	-18.9	-18.9
55	17574411.14	4418822.43	9.14	0	4000	46.8	46.8	0.0	0.0	58.3	7.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-22.4	-22.4
56	17574411.14	4418822.43	9.14	0	8000	37.0	37.0	0.0	0.0	58.3	27.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-51.7	-51.7
57	17574404.23	4418824.03	9.14	0	125	35.8	35.8	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-27.2	-27.2

Area Source, ISO 9613, Name: "CompressorBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
58	17574404.23	4418824.03	9.14	0	250	42.3	42.3	0.0	0.0	58.6	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-21.3	-21.3
59	17574404.23	4418824.03	9.14	0	500	47.4	47.4	0.0	0.0	58.6	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-16.4	-16.4
60	17574404.23	4418824.03	9.14	0	1000	53.7	53.7	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-9.4	-9.4
61	17574404.23	4418824.03	9.14	0	2000	56.9	56.9	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-7.2	-7.2
62	17574404.23	4418824.03	9.14	0	4000	58.8	58.8	0.0	0.0	58.6	7.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-10.9	-10.9
63	17574404.23	4418824.03	9.14	0	8000	49.0	49.0	0.0	0.0	58.6	28.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-40.8	-40.8
64	17574397.02	4418826.53	9.14	0	125	39.2	39.2	0.0	0.0	58.8	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-24.0	-24.0
65	17574397.02	4418826.53	9.14	0	250	45.7	45.7	0.0	0.0	58.8	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-18.2	-18.2
66	17574397.02	4418826.53	9.14	0	500	50.8	50.8	0.0	0.0	58.8	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-13.3	-13.3
67	17574397.02	4418826.53	9.14	0	1000	57.1	57.1	0.0	0.0	58.8	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-6.3	-6.3
68	17574397.02	4418826.53	9.14	0	2000	60.3	60.3	0.0	0.0	58.8	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-4.1	-4.1
69	17574397.02	4418826.53	9.14	0	4000	62.2	62.2	0.0	0.0	58.8	8.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-7.9	-7.9
70	17574397.02	4418826.53	9.14	0	8000	52.4	52.4	0.0	0.0	58.8	28.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-38.5	-38.5
71	17574411.28	4418822.93	9.14	0	125	18.8	18.8	0.0	0.0	58.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-39.1	-39.1
72	17574411.28	4418822.93	9.14	0	250	25.3	25.3	0.0	0.0	58.3	0.2	3.3	0.0	0.0	0.0	0.0	-0.0	-36.6	-36.6
73	17574411.28	4418822.93	9.14	0	500	30.4	30.4	0.0	0.0	58.3	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-30.3	-30.3
74	17574411.28	4418822.93	9.14	0	1000	36.7	36.7	0.0	0.0	58.3	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-21.4	-21.4
75	17574411.28	4418822.93	9.14	0	2000	39.9	39.9	0.0	0.0	58.3	2.2	-1.6	0.0	0.0	0.0	0.0	-0.0	-19.1	-19.1
76	17574411.28	4418822.93	9.14	0	4000	41.8	41.8	0.0	0.0	58.3	7.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-22.6	-22.6
77	17574411.28	4418822.93	9.14	0	8000	32.0	32.0	0.0	0.0	58.3	27.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-51.9	-51.9
78	17574394.06	4418831.65	9.14	0	125	38.6	38.6	0.0	0.0	59.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-24.8	-24.8
79	17574394.06	4418831.65	9.14	0	250	45.1	45.1	0.0	0.0	59.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-18.9	-18.9
80	17574394.06	4418831.65	9.14	0	500	50.2	50.2	0.0	0.0	59.0	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-14.0	-14.0
81	17574394.06	4418831.65	9.14	0	1000	56.5	56.5	0.0	0.0	59.0	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-7.0	-7.0
82	17574394.06	4418831.65	9.14	0	2000	59.7	59.7	0.0	0.0	59.0	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-4.9	-4.9
83	17574394.06	4418831.65	9.14	0	4000	61.6	61.6	0.0	0.0	59.0	8.2	-1.6	0.0	0.0	4.8	0.0	-0.0	-8.8	-8.8
84	17574394.06	4418831.65	9.14	0	8000	51.8	51.8	0.0	0.0	59.0	29.2	-1.6	0.0	0.0	4.8	0.0	-0.0	-39.6	-39.6
85	17574383.04	4418837.50	9.14	0	125	32.7	32.7	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-31.1	-31.1
86	17574383.04	4418837.50	9.14	0	250	39.2	39.2	0.0	0.0	59.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-25.2	-25.2
87	17574383.04	4418837.50	9.14	0	500	44.3	44.3	0.0	0.0	59.4	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-20.3	-20.3
88	17574383.04	4418837.50	9.14	0	1000	50.6	50.6	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-13.3	-13.3
89	17574383.04	4418837.50	9.14	0	2000	53.8	53.8	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-11.3	-11.3
90	17574383.04	4418837.50	9.14	0	4000	55.7	55.7	0.0	0.0	59.4	8.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-15.4	-15.4
91	17574383.04	4418837.50	9.14	0	8000	45.9	45.9	0.0	0.0	59.4	30.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-47.3	-47.3
92	17574407.53	4418818.13	9.14	0	125	38.5	38.5	0.0	0.0	58.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-24.3	-24.3
93	17574407.53	4418818.13	9.14	0	250	45.0	45.0	0.0	0.0	58.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-18.5	-18.5
94	17574407.53	4418818.13	9.14	0	500	50.1	50.1	0.0	0.0	58.4	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-13.6	-13.6
95	17574407.53	4418818.13	9.14	0	1000	56.4	56.4	0.0	0.0	58.4	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-6.6	-6.6
96	17574407.53	4418818.13	9.14	0	2000	59.6	59.6	0.0	0.0	58.4	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-4.3	-4.3
97	17574407.53	4418818.13	9.14	0	4000	61.5	61.5	0.0	0.0	58.4	7.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-7.9	-7.9
98	17574407.53	4418818.13	9.14	0	8000	51.7	51.7	0.0	0.0	58.4	27.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.5	-37.5
99	17574408.54	4418816.98	9.14	0	125	32.8	32.8	0.0	0.0	58.4	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-25.1	-25.1
100	17574408.54	4418816.98	9.14	0	250	39.3	39.3	0.0	0.0	58.4	0.2	3.3	0.0	0.0	0.0	0.0	-0.0	-22.6	-22.6
101	17574408.54	4418816.98	9.14	0	500	44.4	44.4	0.0	0.0	58.4	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-16.3	-16.3
102	17574408.54	4418816.98	9.14	0	1000	50.7	50.7	0.0	0.0	58.4	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-7.4	-7.4
103	17574408.54	4418816.98	9.14	0	2000	53.9	53.9	0.0	0.0	58.4	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-5.2	-5.2
104	17574408.54	4418816.98	9.14	0	4000	55.8	55.8	0.0	0.0	58.4	7.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-8.7	-8.7
105	17574408.54	4418816.98	9.14	0	8000	46.0	46.0	0.0	0.0	58.4	27.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-38.2	-38.2
106	17574379.21	4418839.72	9.14	0	125	19.3	19.3	0.0	0.0	59.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-44.6	-44.6
107	17574379.21	4418839.72	9.14	0	250	25.8	25.8	0.0	0.0	59.5	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-38.8	-38.8
108	17574379.21	4418839.72	9.14	0	500	30.9	30.9	0.0	0.0	59.5	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-33.9	-33.9
109	17574379.21	4418839.72	9.14	0	1000	37.2	37.2	0.0	0.0	59.5	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-26.9	-26.9
110	17574379.21	4418839.72	9.14	0	2000	40.4	40.4	0.0	0.0	59.5	2.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-24.8	-24.8
111	17574379.21	4418839.72	9.14	0	4000	42.3	42.3	0.0	0.0	59.5	8.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-29.1	-29.1
112	17574379.21	4418839.72	9.14	0	8000	32.5	32.5	0.0	0.0	59.5	31.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-61.3	-61.3
113	17574381.18	4418842.43	9.14	0	125	31.8	31.8	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-32.0	-32.0
114	17574381.18	4418842.43	9.14	0	250	38.3	38.3	0.0	0.0	59.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-26.2	-26.2
115	17574381.18	4418842.43	9.14	0	500	43.4	43.4	0.0	0.0	59.4	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-21.3	-21.3
116	17574381.18	4418842.43	9.14	0	1000	49.7	49.7	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-14.3	-14.3
117	17574381.18	4418842.43	9.14	0	2000	52.9	52.9	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-12.2	-12.2
118	17574381.18	4418842.43	9.14	0	4000	54.8	54.8	0.0	0.0	59.4	8.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-16.4	-16.4
119	17574381.18	4418842.43	9.14	0	8000	45.0	45.0	0.0	0.0	59.4	30.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-48.5	-48.5
120	17574384.97	4418847.22	9.14	0	125	9.8	9.8	0.0	0.0	59.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-49.1	-49.1

Area Source, ISO 9613, Name: "CompressorBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
121	17574384.97	4418847.22	9.14	0	250	16.3	16.3	0.0	0.0	59.3	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-46.6	-46.6
122	17574384.97	4418847.22	9.14	0	500	21.4	21.4	0.0	0.0	59.3	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-40.3	-40.3
123	17574384.97	4418847.22	9.14	0	1000	27.7	27.7	0.0	0.0	59.3	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-31.4	-31.4
124	17574384.97	4418847.22	9.14	0	2000	30.9	30.9	0.0	0.0	59.3	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-29.3	-29.3
125	17574384.97	4418847.22	9.14	0	4000	32.8	32.8	0.0	0.0	59.3	8.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-33.5	-33.5
126	17574384.97	4418847.22	9.14	0	8000	23.0	23.0	0.0	0.0	59.3	30.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-65.3	-65.3
127	17574389.74	4418830.05	9.14	0	125	22.9	22.9	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-40.6	-40.6
128	17574389.74	4418830.05	9.14	0	250	29.4	29.4	0.0	0.0	59.1	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-34.8	-34.8
129	17574389.74	4418830.05	9.14	0	500	34.5	34.5	0.0	0.0	59.1	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-29.9	-29.9
130	17574389.74	4418830.05	9.14	0	1000	40.8	40.8	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-22.9	-22.9
131	17574389.74	4418830.05	9.14	0	2000	44.0	44.0	0.0	0.0	59.1	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-20.8	-20.8
132	17574389.74	4418830.05	9.14	0	4000	45.9	45.9	0.0	0.0	59.1	8.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-24.8	-24.8
133	17574389.74	4418830.05	9.14	0	8000	36.1	36.1	0.0	0.0	59.1	29.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-56.0	-56.0
134	17574389.13	4418830.41	9.14	0	125	22.8	22.8	0.0	0.0	59.1	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-40.8	-40.8
135	17574389.13	4418830.41	9.14	0	250	29.3	29.3	0.0	0.0	59.1	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-34.9	-34.9
136	17574389.13	4418830.41	9.14	0	500	34.4	34.4	0.0	0.0	59.1	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-30.0	-30.0
137	17574389.13	4418830.41	9.14	0	1000	40.7	40.7	0.0	0.0	59.1	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-23.0	-23.0
138	17574389.13	4418830.41	9.14	0	2000	43.9	43.9	0.0	0.0	59.1	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-20.9	-20.9
139	17574389.13	4418830.41	9.14	0	4000	45.8	45.8	0.0	0.0	59.1	8.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-24.9	-24.9
140	17574389.13	4418830.41	9.14	0	8000	36.0	36.0	0.0	0.0	59.1	29.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-56.2	-56.2
141	17574402.29	4418818.06	9.14	0	125	22.2	22.2	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-40.8	-40.8
142	17574402.29	4418818.06	9.14	0	250	28.7	28.7	0.0	0.0	58.6	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-35.0	-35.0
143	17574402.29	4418818.06	9.14	0	500	33.8	33.8	0.0	0.0	58.6	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-30.1	-30.1
144	17574402.29	4418818.06	9.14	0	1000	40.1	40.1	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-23.1	-23.1
145	17574402.29	4418818.06	9.14	0	2000	43.3	43.3	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-20.9	-20.9
146	17574402.29	4418818.06	9.14	0	4000	45.2	45.2	0.0	0.0	58.6	7.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-24.6	-24.6
147	17574402.29	4418818.06	9.14	0	8000	35.4	35.4	0.0	0.0	58.6	28.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-54.6	-54.6
148	17574395.16	4418824.75	9.14	0	125	22.4	22.4	0.0	0.0	58.9	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-40.9	-40.9
149	17574395.16	4418824.75	9.14	0	250	28.9	28.9	0.0	0.0	58.9	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-35.1	-35.1
150	17574395.16	4418824.75	9.14	0	500	34.0	34.0	0.0	0.0	58.9	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-30.2	-30.2
151	17574395.16	4418824.75	9.14	0	1000	40.3	40.3	0.0	0.0	58.9	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-23.2	-23.2
152	17574395.16	4418824.75	9.14	0	2000	43.5	43.5	0.0	0.0	58.9	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-21.0	-21.0
153	17574395.16	4418824.75	9.14	0	4000	45.4	45.4	0.0	0.0	58.9	8.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-24.9	-24.9
154	17574395.16	4418824.75	9.14	0	8000	35.6	35.6	0.0	0.0	58.9	29.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-55.6	-55.6
155	17574402.84	4418817.76	9.14	0	125	22.1	22.1	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-40.9	-40.9
156	17574402.84	4418817.76	9.14	0	250	28.6	28.6	0.0	0.0	58.6	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-35.1	-35.1
157	17574402.84	4418817.76	9.14	0	500	33.7	33.7	0.0	0.0	58.6	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-30.2	-30.2
158	17574402.84	4418817.76	9.14	0	1000	40.0	40.0	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-23.2	-23.2
159	17574402.84	4418817.76	9.14	0	2000	43.2	43.2	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-21.0	-21.0
160	17574402.84	4418817.76	9.14	0	4000	45.1	45.1	0.0	0.0	58.6	7.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-24.6	-24.6
161	17574402.84	4418817.76	9.14	0	8000	35.3	35.3	0.0	0.0	58.6	28.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-54.6	-54.6
162	17574395.71	4418824.45	9.14	0	125	22.1	22.1	0.0	0.0	58.9	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-41.1	-41.1
163	17574395.71	4418824.45	9.14	0	250	28.6	28.6	0.0	0.0	58.9	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-35.3	-35.3
164	17574395.71	4418824.45	9.14	0	500	33.7	33.7	0.0	0.0	58.9	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-30.4	-30.4
165	17574395.71	4418824.45	9.14	0	1000	40.0	40.0	0.0	0.0	58.9	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-23.4	-23.4
166	17574395.71	4418824.45	9.14	0	2000	43.2	43.2	0.0	0.0	58.9	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-21.3	-21.3
167	17574395.71	4418824.45	9.14	0	4000	45.1	45.1	0.0	0.0	58.9	8.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-25.1	-25.1
168	17574395.71	4418824.45	9.14	0	8000	35.3	35.3	0.0	0.0	58.9	29.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-55.8	-55.8
169	17574382.57	4418836.82	9.14	0	125	21.0	21.0	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-42.8	-42.8
170	17574382.57	4418836.82	9.14	0	250	27.5	27.5	0.0	0.0	59.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-37.0	-37.0
171	17574382.57	4418836.82	9.14	0	500	32.6	32.6	0.0	0.0	59.4	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-32.1	-32.1
172	17574382.57	4418836.82	9.14	0	1000	38.9	38.9	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-25.1	-25.1
173	17574382.57	4418836.82	9.14	0	2000	42.1	42.1	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-23.0	-23.0
174	17574382.57	4418836.82	9.14	0	4000	44.0	44.0	0.0	0.0	59.4	8.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-27.2	-27.2
175	17574382.57	4418836.82	9.14	0	8000	34.2	34.2	0.0	0.0	59.4	30.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-59.0	-59.0
176	17574382.10	4418837.08	9.14	0	125	20.8	20.8	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-42.9	-42.9
177	17574382.10	4418837.08	9.14	0	250	27.3	27.3	0.0	0.0	59.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-37.1	-37.1
178	17574382.10	4418837.08	9.14	0	500	32.4	32.4	0.0	0.0	59.4	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-32.2	-32.2
179	17574382.10	4418837.08	9.14	0	1000	38.7	38.7	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-25.2	-25.2
180	17574382.10	4418837.08	9.14	0	2000	41.9	41.9	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-23.1	-23.1
181	17574382.10	4418837.08	9.14	0	4000	43.8	43.8	0.0	0.0	59.4	8.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-27.3	-27.3
182	17574382.10	4418837.08	9.14	0	8000	34.0	34.0	0.0	0.0	59.4	30.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-59.2	-59.2
183	17574406.03	4418814.55	9.14	0	125	19.4	19.4	0.0	0.0	58.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-38.7	-38.7

Area Source, ISO 9613, Name: "CompressorBuilding-RoofNorth", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
184	17574406.03	4418814.55	9.14	0	250	25.9	25.9	0.0	0.0	58.5	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-36.2	-36.2
185	17574406.03	4418814.55	9.14	0	500	31.0	31.0	0.0	0.0	58.5	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-29.9	-29.9
186	17574406.03	4418814.55	9.14	0	1000	37.3	37.3	0.0	0.0	58.5	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-21.0	-21.0
187	17574406.03	4418814.55	9.14	0	2000	40.5	40.5	0.0	0.0	58.5	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-18.7	-18.7
188	17574406.03	4418814.55	9.14	0	4000	42.4	42.4	0.0	0.0	58.5	7.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-22.3	-22.3
189	17574406.03	4418814.55	9.14	0	8000	32.6	32.6	0.0	0.0	58.5	27.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-52.0	-52.0
190	17574385.00	4418847.22	9.14	0	125	-3.7	-3.7	0.0	0.0	59.3	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-62.7	-62.7
191	17574385.00	4418847.22	9.14	0	250	2.8	2.8	0.0	0.0	59.3	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-60.1	-60.1
192	17574385.00	4418847.22	9.14	0	500	7.9	7.9	0.0	0.0	59.3	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-53.8	-53.8
193	17574385.00	4418847.22	9.14	0	1000	14.2	14.2	0.0	0.0	59.3	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-44.9	-44.9
194	17574385.00	4418847.22	9.14	0	2000	17.4	17.4	0.0	0.0	59.3	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-42.8	-42.8
195	17574385.00	4418847.22	9.14	0	4000	19.3	19.3	0.0	0.0	59.3	8.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-47.0	-47.0
196	17574385.00	4418847.22	9.14	0	8000	9.5	9.5	0.0	0.0	59.3	30.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-78.8	-78.8
197	17574381.48	4418842.36	9.14	0	125	18.3	18.3	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-45.5	-45.5
198	17574381.48	4418842.36	9.14	0	250	24.8	24.8	0.0	0.0	59.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-39.6	-39.6
199	17574381.48	4418842.36	9.14	0	500	29.9	29.9	0.0	0.0	59.4	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-34.8	-34.8
200	17574381.48	4418842.36	9.14	0	1000	36.2	36.2	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-27.8	-27.8
201	17574381.48	4418842.36	9.14	0	2000	39.4	39.4	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-25.7	-25.7
202	17574381.48	4418842.36	9.14	0	4000	41.3	41.3	0.0	0.0	59.4	8.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-29.9	-29.9
203	17574381.48	4418842.36	9.14	0	8000	31.5	31.5	0.0	0.0	59.4	30.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-61.9	-61.9
204	17574379.50	4418839.64	9.14	0	125	5.3	5.3	0.0	0.0	59.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-58.6	-58.6
205	17574379.50	4418839.64	9.14	0	250	11.8	11.8	0.0	0.0	59.5	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-52.7	-52.7
206	17574379.50	4418839.64	9.14	0	500	16.9	16.9	0.0	0.0	59.5	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-47.8	-47.8
207	17574379.50	4418839.64	9.14	0	1000	23.2	23.2	0.0	0.0	59.5	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-40.8	-40.8
208	17574379.50	4418839.64	9.14	0	2000	26.4	26.4	0.0	0.0	59.5	2.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-38.8	-38.8
209	17574379.50	4418839.64	9.14	0	4000	28.3	28.3	0.0	0.0	59.5	8.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-43.0	-43.0
210	17574379.50	4418839.64	9.14	0	8000	18.5	18.5	0.0	0.0	59.5	31.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-75.2	-75.2
211	17574397.75	4418822.75	9.14	0	125	11.1	11.1	0.0	0.0	58.8	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-52.1	-52.1
212	17574397.75	4418822.75	9.14	0	250	17.6	17.6	0.0	0.0	58.8	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-46.3	-46.3
213	17574397.75	4418822.75	9.14	0	500	22.7	22.7	0.0	0.0	58.8	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-41.4	-41.4
214	17574397.75	4418822.75	9.14	0	1000	29.0	29.0	0.0	0.0	58.8	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-34.4	-34.4
215	17574397.75	4418822.75	9.14	0	2000	32.2	32.2	0.0	0.0	58.8	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-32.2	-32.2
216	17574397.75	4418822.75	9.14	0	4000	34.1	34.1	0.0	0.0	58.8	8.1	-1.6	0.0	0.0	4.8	0.0	-0.0	-36.0	-36.0
217	17574397.75	4418822.75	9.14	0	8000	24.3	24.3	0.0	0.0	58.8	28.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-66.5	-66.5
218	17574387.41	4418832.46	9.14	0	125	10.2	10.2	0.0	0.0	59.2	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-53.4	-53.4
219	17574387.41	4418832.46	9.14	0	250	16.7	16.7	0.0	0.0	59.2	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-47.5	-47.5
220	17574387.41	4418832.46	9.14	0	500	21.8	21.8	0.0	0.0	59.2	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-42.6	-42.6
221	17574387.41	4418832.46	9.14	0	1000	28.1	28.1	0.0	0.0	59.2	0.9	-1.2	0.0	0.0	4.8	0.0	-0.0	-35.6	-35.6
222	17574387.41	4418832.46	9.14	0	2000	31.3	31.3	0.0	0.0	59.2	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-33.5	-33.5
223	17574387.41	4418832.46	9.14	0	4000	33.2	33.2	0.0	0.0	59.2	8.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.6	-37.6
224	17574387.41	4418832.46	9.14	0	8000	23.4	23.4	0.0	0.0	59.2	30.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-69.0	-69.0
225	17574400.13	4418820.52	9.14	0	125	6.8	6.8	0.0	0.0	58.7	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-56.3	-56.3
226	17574400.13	4418820.52	9.14	0	250	13.3	13.3	0.0	0.0	58.7	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-50.5	-50.5
227	17574400.13	4418820.52	9.14	0	500	18.4	18.4	0.0	0.0	58.7	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-45.6	-45.6
228	17574400.13	4418820.52	9.14	0	1000	24.7	24.7	0.0	0.0	58.7	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-38.6	-38.6
229	17574400.13	4418820.52	9.14	0	2000	27.9	27.9	0.0	0.0	58.7	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-36.4	-36.4
230	17574400.13	4418820.52	9.14	0	4000	29.8	29.8	0.0	0.0	58.7	8.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-40.1	-40.1
231	17574400.13	4418820.52	9.14	0	8000	20.0	20.0	0.0	0.0	58.7	28.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-70.4	-70.4

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent1", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574380.16	4418838.79	9.14	0	125	38.0	38.0	0.0	0.0	59.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-25.9	-25.9
2	17574380.16	4418838.79	9.14	0	250	44.5	44.5	0.0	0.0	59.5	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-20.0	-20.0
3	17574380.16	4418838.79	9.14	0	500	49.6	49.6	0.0	0.0	59.5	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-15.1	-15.1
4	17574380.16	4418838.79	9.14	0	1000	55.9	55.9	0.0	0.0	59.5	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-8.1	-8.1
5	17574380.16	4418838.79	9.14	0	2000	59.1	59.1	0.0	0.0	59.5	2.6	-1.6	0.0	0.0	4.8	0.0	-0.0	-6.1	-6.1
6	17574380.16	4418838.79	9.14	0	4000	61.0	61.0	0.0	0.0	59.5	8.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-10.3	-10.3
7	17574380.16	4418838.79	9.14	0	8000	51.2	51.2	0.0	0.0	59.5	30.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-42.4	-42.4
8	17574380.68	4418837.83	9.14	0	125	37.9	37.9	0.0	0.0	59.4	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-25.9	-25.9
9	17574380.68	4418837.83	9.14	0	250	44.4	44.4	0.0	0.0	59.4	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-20.1	-20.1
10	17574380.68	4418837.83	9.14	0	500	49.5	49.5	0.0	0.0	59.4	0.5	1.8	0.0	0.0	2.9	0.0	-0.0	-15.2	-15.2
11	17574380.68	4418837.83	9.14	0	1000	55.8	55.8	0.0	0.0	59.4	1.0	-1.2	0.0	0.0	4.8	0.0	-0.0	-8.2	-8.2

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent1", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
12	17574380.68	4418837.83	9.14	0	2000	59.0	59.0	0.0	0.0	59.4	2.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-6.1	-6.1
13	17574380.68	4418837.83	9.14	0	4000	60.9	60.9	0.0	0.0	59.4	8.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-10.3	-10.3
14	17574380.68	4418837.83	9.14	0	8000	51.1	51.1	0.0	0.0	59.4	30.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-42.4	-42.4

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent5", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574405.97	4418815.02	9.14	0	125	5.2	5.2	0.0	0.0	58.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-52.9	-52.9
2	17574405.97	4418815.02	9.14	0	250	11.7	11.7	0.0	0.0	58.5	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-50.4	-50.4
3	17574405.97	4418815.02	9.14	0	500	16.8	16.8	0.0	0.0	58.5	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-44.1	-44.1
4	17574405.97	4418815.02	9.14	0	1000	23.1	23.1	0.0	0.0	58.5	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-35.2	-35.2
5	17574405.97	4418815.02	9.14	0	2000	26.3	26.3	0.0	0.0	58.5	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-32.9	-32.9
6	17574405.97	4418815.02	9.14	0	4000	28.2	28.2	0.0	0.0	58.5	7.8	-1.6	0.0	0.0	0.0	0.0	-0.0	-36.5	-36.5
7	17574405.97	4418815.02	9.14	0	8000	18.4	18.4	0.0	0.0	58.5	27.7	-1.6	0.0	0.0	0.0	0.0	-0.0	-66.2	-66.2
8	17574404.34	4418816.08	9.14	0	125	36.8	36.8	0.0	0.0	58.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-26.2	-26.2
9	17574404.34	4418816.08	9.14	0	250	43.3	43.3	0.0	0.0	58.5	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-20.3	-20.3
10	17574404.34	4418816.08	9.14	0	500	48.4	48.4	0.0	0.0	58.5	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-15.4	-15.4
11	17574404.34	4418816.08	9.14	0	1000	54.7	54.7	0.0	0.0	58.5	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-8.4	-8.4
12	17574404.34	4418816.08	9.14	0	2000	57.9	57.9	0.0	0.0	58.5	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-6.2	-6.2
13	17574404.34	4418816.08	9.14	0	4000	59.8	59.8	0.0	0.0	58.5	7.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-9.8	-9.8
14	17574404.34	4418816.08	9.14	0	8000	50.0	50.0	0.0	0.0	58.5	27.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-39.7	-39.7
15	17574403.46	4418816.91	9.14	0	125	34.1	34.1	0.0	0.0	58.6	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-28.8	-28.8
16	17574403.46	4418816.91	9.14	0	250	40.6	40.6	0.0	0.0	58.6	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-23.0	-23.0
17	17574403.46	4418816.91	9.14	0	500	45.7	45.7	0.0	0.0	58.6	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-18.1	-18.1
18	17574403.46	4418816.91	9.14	0	1000	52.0	52.0	0.0	0.0	58.6	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-11.1	-11.1
19	17574403.46	4418816.91	9.14	0	2000	55.2	55.2	0.0	0.0	58.6	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-8.9	-8.9
20	17574403.46	4418816.91	9.14	0	4000	57.1	57.1	0.0	0.0	58.6	7.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-12.5	-12.5
21	17574403.46	4418816.91	9.14	0	8000	47.3	47.3	0.0	0.0	58.6	28.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-42.4	-42.4
22	17574404.66	4418815.31	9.14	0	125	38.5	38.5	0.0	0.0	58.5	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-24.4	-24.4
23	17574404.66	4418815.31	9.14	0	250	45.0	45.0	0.0	0.0	58.5	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-18.6	-18.6
24	17574404.66	4418815.31	9.14	0	500	50.1	50.1	0.0	0.0	58.5	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-13.7	-13.7
25	17574404.66	4418815.31	9.14	0	1000	56.4	56.4	0.0	0.0	58.5	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-6.7	-6.7
26	17574404.66	4418815.31	9.14	0	2000	59.6	59.6	0.0	0.0	58.5	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-4.4	-4.4
27	17574404.66	4418815.31	9.14	0	4000	61.5	61.5	0.0	0.0	58.5	7.8	-1.6	0.0	0.0	4.8	0.0	-0.0	-8.1	-8.1
28	17574404.66	4418815.31	9.14	0	8000	51.7	51.7	0.0	0.0	58.5	27.9	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.9	-37.9

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent3", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574391.65	4418828.01	9.14	0	125	41.1	41.1	0.0	0.0	59.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-22.3	-22.3
2	17574391.65	4418828.01	9.14	0	250	47.6	47.6	0.0	0.0	59.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-16.5	-16.5
3	17574391.65	4418828.01	9.14	0	500	52.7	52.7	0.0	0.0	59.0	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-11.6	-11.6
4	17574391.65	4418828.01	9.14	0	1000	59.0	59.0	0.0	0.0	59.0	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-4.6	-4.6
5	17574391.65	4418828.01	9.14	0	2000	62.2	62.2	0.0	0.0	59.0	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-2.5	-2.5
6	17574391.65	4418828.01	9.14	0	4000	64.1	64.1	0.0	0.0	59.0	8.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-6.4	-6.4
7	17574391.65	4418828.01	9.14	0	8000	54.3	54.3	0.0	0.0	59.0	29.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.5	-37.5
8	17574392.93	4418826.33	9.14	0	125	41.0	41.0	0.0	0.0	59.0	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-22.3	-22.3
9	17574392.93	4418826.33	9.14	0	250	47.5	47.5	0.0	0.0	59.0	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-16.5	-16.5
10	17574392.93	4418826.33	9.14	0	500	52.6	52.6	0.0	0.0	59.0	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-11.6	-11.6
11	17574392.93	4418826.33	9.14	0	1000	58.9	58.9	0.0	0.0	59.0	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-4.6	-4.6
12	17574392.93	4418826.33	9.14	0	2000	62.1	62.1	0.0	0.0	59.0	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-2.5	-2.5
13	17574392.93	4418826.33	9.14	0	4000	64.0	64.0	0.0	0.0	59.0	8.2	-1.6	0.0	0.0	4.8	0.0	-0.0	-6.4	-6.4
14	17574392.93	4418826.33	9.14	0	8000	54.2	54.2	0.0	0.0	59.0	29.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-37.3	-37.3

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent4", ID: "-"

Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574397.96	4418822.08	9.14	0	125	42.1	42.1	0.0	0.0	58.8	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.1	-21.1
2	17574397.96	4418822.08	9.14	0	250	48.6	48.6	0.0	0.0	58.8	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-15.2	-15.2
3	17574397.96	4418822.08	9.14	0	500	53.7	53.7	0.0	0.0	58.8	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-10.4	-10.4
4	17574397.96	4418822.08	9.14	0	1000	60.0	60.0	0.0	0.0	58.8	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-3.3	-3.3
5	17574397.96	4418822.08	9.14	0	2000	63.2	63.2	0.0	0.0	58.8	2.4	-1.6	0.0	0.0	4.8	0.0	-0.0	-1.2	-1.2
6	17574397.96	4418822.08	9.14	0	4000	65.1	65.1	0.0	0.0	58.8	8.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-5.0	-5.0

Area Source, ISO 9613, Name: "CompressorBuilding-RoofVent4", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
7	17574397.96	4418822.08	9.14	0	8000	55.3	55.3	0.0	0.0	58.8	28.7	-1.6	0.0	0.0	4.8	0.0	-0.0	-35.4	-35.4
8	17574399.65	4418820.01	9.14	0	125	42.1	42.1	0.0	0.0	58.7	0.1	-0.5	0.0	0.0	4.8	0.0	-0.0	-21.0	-21.0
9	17574399.65	4418820.01	9.14	0	250	48.6	48.6	0.0	0.0	58.7	0.3	3.3	0.0	0.0	1.5	0.0	-0.0	-15.2	-15.2
10	17574399.65	4418820.01	9.14	0	500	53.7	53.7	0.0	0.0	58.7	0.5	1.9	0.0	0.0	2.9	0.0	-0.0	-10.3	-10.3
11	17574399.65	4418820.01	9.14	0	1000	60.0	60.0	0.0	0.0	58.7	0.9	-1.1	0.0	0.0	4.8	0.0	-0.0	-3.3	-3.3
12	17574399.65	4418820.01	9.14	0	2000	63.2	63.2	0.0	0.0	58.7	2.3	-1.6	0.0	0.0	4.8	0.0	-0.0	-1.1	-1.1
13	17574399.65	4418820.01	9.14	0	4000	65.1	65.1	0.0	0.0	58.7	8.0	-1.6	0.0	0.0	4.8	0.0	-0.0	-4.8	-4.8
14	17574399.65	4418820.01	9.14	0	8000	55.3	55.3	0.0	0.0	58.7	28.5	-1.6	0.0	0.0	4.8	0.0	-0.0	-35.1	-35.1

vert. Area Source, ISO 9613, Name: "TurbineBuilding-SouthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574346.55	4418860.12	2.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	-0.0	0.0	0.0	23.7	0.0	-0.0	-34.3	-34.3
2	17574357.27	4418850.04	2.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	0.0	0.0	0.0	23.8	0.0	-0.0	-38.2	-38.2
3	17574360.32	4418847.17	2.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	0.1	0.0	0.0	10.5	0.0	-0.0	-39.1	-39.1
4	17574346.55	4418860.12	5.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	0.9	0.0	0.0	23.1	0.0	-0.0	-34.5	-34.5
5	17574357.27	4418850.04	5.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	1.0	0.0	0.0	22.4	0.0	-0.0	-37.7	-37.7
6	17574360.32	4418847.17	5.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	1.0	0.0	0.0	8.3	0.0	-0.0	-37.9	-37.9
7	17574346.55	4418860.12	1.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	-0.3	0.0	0.0	23.7	0.0	-0.0	-34.0	-34.0
8	17574357.27	4418850.04	1.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	-0.3	0.0	0.0	23.8	0.0	-0.0	-37.9	-37.9
9	17574360.32	4418847.17	1.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	-0.3	0.0	0.0	10.7	0.0	-0.0	-39.0	-39.0
10	17574346.55	4418860.12	3.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	0.3	0.0	0.0	23.5	0.0	-0.0	-34.4	-34.4
11	17574357.27	4418850.04	3.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	0.3	0.0	0.0	23.6	0.0	-0.0	-38.3	-38.3
12	17574360.32	4418847.17	3.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	0.4	0.0	0.0	10.0	0.0	-0.0	-39.0	-39.0
13	17574346.55	4418860.12	4.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	0.6	0.0	0.0	23.3	0.0	-0.0	-34.4	-34.4
14	17574357.27	4418850.04	4.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	0.7	0.0	0.0	23.2	0.0	-0.0	-38.3	-38.3
15	17574360.32	4418847.17	4.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	0.7	0.0	0.0	9.3	0.0	-0.0	-38.6	-38.6
16	17574346.55	4418860.12	6.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	1.2	0.0	0.0	22.8	0.0	-0.0	-34.6	-34.6
17	17574357.27	4418850.04	6.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	1.3	0.0	0.0	21.3	0.0	-0.0	-37.0	-37.0
18	17574360.32	4418847.17	6.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	1.3	0.0	0.0	6.6	0.0	-0.0	-36.5	-36.5
19	17574346.55	4418860.12	7.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	1.4	0.0	0.0	22.3	0.0	-0.0	-34.4	-34.4
20	17574357.27	4418850.04	7.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	1.5	0.0	0.0	20.1	0.0	-0.0	-36.0	-36.0
21	17574360.32	4418847.17	7.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	1.6	0.0	0.0	4.5	0.0	-0.0	-34.7	-34.7
22	17574346.55	4418860.12	8.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	1.7	0.0	0.0	20.7	0.0	-0.0	-32.9	-32.9
23	17574357.27	4418850.04	8.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	1.7	0.0	0.0	18.8	0.0	-0.0	-35.0	-35.0
24	17574360.32	4418847.17	8.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	1.7	0.0	0.0	2.8	0.0	-0.0	-33.1	-33.1
25	17574346.55	4418860.12	9.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	1.8	0.0	0.0	18.3	0.0	-0.0	-30.7	-30.7
26	17574357.27	4418850.04	9.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	1.8	0.0	0.0	16.3	0.0	-0.0	-32.5	-32.5
27	17574360.32	4418847.17	9.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	1.8	0.0	0.0	2.9	0.0	-0.0	-33.4	-33.4
28	17574346.55	4418860.12	10.47	0	500	47.6	47.6	3.0	0.0	60.6	0.6	1.8	0.0	0.0	12.3	0.0	-0.0	-24.7	-24.7
29	17574357.27	4418850.04	10.47	0	500	43.4	43.4	3.0	0.0	60.2	0.6	1.8	0.0	0.0	8.8	0.0	-0.0	-25.0	-25.0
30	17574360.32	4418847.17	10.47	0	500	29.1	29.1	3.0	0.0	60.1	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-30.4	-30.4
31	17574346.55	4418860.12	0.49	0	500	47.4	47.4	3.0	0.0	60.6	0.6	-0.6	0.0	0.0	23.7	0.0	-0.0	-33.8	-33.8
32	17574357.27	4418850.04	0.49	0	500	43.2	43.2	3.0	0.0	60.2	0.6	-0.6	0.0	0.0	23.8	0.0	-0.0	-37.8	-37.8
33	17574360.32	4418847.17	0.49	0	500	28.9	28.9	3.0	0.0	60.1	0.6	-0.6	0.0	0.0	10.9	0.0	-0.0	-39.0	-39.0

vert. Area Source, ISO 9613, Name: "TurbineBuilding-EastWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574362.18	4418849.13	4.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-4.1	0.0	0.0	2.1	0.0	-0.0	-28.5	-28.5
2	17574362.18	4418849.13	4.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-4.1	0.0	0.0	2.7	0.0	-0.0	-29.1	-29.1
3	17574362.18	4418849.13	4.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-1.6	0.0	0.0	3.5	0.0	-0.0	-23.4	-23.4
4	17574362.18	4418849.13	4.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	2.1	0.0	0.0	4.0	0.0	-0.0	-27.8	-27.8
5	17574362.18	4418849.13	4.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	0.7	0.0	0.0	6.5	0.0	-0.0	-25.2	-25.2
6	17574362.18	4418849.13	4.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-2.3	0.0	0.0	8.9	0.0	-0.0	-27.1	-27.1
7	17574362.18	4418849.13	4.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-2.8	0.0	0.0	11.4	0.0	-0.0	-22.8	-22.8
8	17574362.18	4418849.13	4.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-2.8	0.0	0.0	14.0	0.0	-0.0	-38.0	-38.0
9	17574362.18	4418849.13	4.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-2.8	0.0	0.0	16.6	0.0	-0.0	-67.5	-67.5
10	17574367.79	4418855.74	4.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-4.1	0.0	0.0	0.0	0.0	-0.0	-22.8	-22.8
11	17574367.79	4418855.74	4.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-4.1	0.0	0.0	0.0	0.0	-0.0	-22.9	-22.9
12	17574367.79	4418855.74	4.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-16.4	-16.4
13	17574367.79	4418855.74	4.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	2.1	0.0	0.0	0.0	0.0	-0.0	-20.3	-20.3
14	17574367.79	4418855.74	4.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	0.7	0.0	0.0	0.0	0.0	-0.0	-15.1	-15.1

vert. Area Source, ISO 9613, Name: "TurbineBuilding-EastWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
15	17574367.79	4418855.74	4.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-2.3	0.0	0.0	0.0	0.0	-0.0	-14.6	-14.6
16	17574367.79	4418855.74	4.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-2.8	0.0	0.0	0.0	0.0	-0.0	-7.8	-7.8
17	17574367.79	4418855.74	4.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-2.8	0.0	0.0	0.0	0.0	-0.0	-20.3	-20.3
18	17574367.79	4418855.74	4.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-2.8	0.0	0.0	0.0	0.0	-0.0	-46.8	-46.8
19	17574362.18	4418849.13	3.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-4.4	0.0	0.0	2.3	0.0	-0.0	-28.3	-28.3
20	17574362.18	4418849.13	3.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-4.4	0.0	0.0	2.9	0.0	-0.0	-29.0	-29.0
21	17574362.18	4418849.13	3.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-2.0	0.0	0.0	3.9	0.0	-0.0	-23.5	-23.5
22	17574362.18	4418849.13	3.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	1.8	0.0	0.0	4.6	0.0	-0.0	-28.2	-28.2
23	17574362.18	4418849.13	3.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	0.4	0.0	0.0	7.0	0.0	-0.0	-25.3	-25.3
24	17574362.18	4418849.13	3.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-2.6	0.0	0.0	9.2	0.0	-0.0	-27.0	-27.0
25	17574362.18	4418849.13	3.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-3.1	0.0	0.0	11.6	0.0	-0.0	-22.6	-22.6
26	17574362.18	4418849.13	3.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-3.1	0.0	0.0	14.1	0.0	-0.0	-37.8	-37.8
27	17574362.18	4418849.13	3.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-3.1	0.0	0.0	16.6	0.0	-0.0	-67.1	-67.1
28	17574367.79	4418855.74	3.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-4.4	0.0	0.0	0.0	0.0	-0.0	-22.5	-22.5
29	17574367.79	4418855.74	3.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-4.4	0.0	0.0	0.0	0.0	-0.0	-22.5	-22.5
30	17574367.79	4418855.74	3.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-2.0	0.0	0.0	0.0	0.0	-0.0	-16.0	-16.0
31	17574367.79	4418855.74	3.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	1.8	0.0	0.0	0.0	0.0	-0.0	-20.0	-20.0
32	17574367.79	4418855.74	3.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	0.4	0.0	0.0	0.0	0.0	-0.0	-14.8	-14.8
33	17574367.79	4418855.74	3.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-2.6	0.0	0.0	0.0	0.0	-0.0	-14.3	-14.3
34	17574367.79	4418855.74	3.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-3.1	0.0	0.0	0.0	0.0	-0.0	-7.5	-7.5
35	17574367.79	4418855.74	3.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-3.1	0.0	0.0	0.0	0.0	-0.0	-20.0	-20.0
36	17574367.79	4418855.74	3.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-3.1	0.0	0.0	0.0	0.0	-0.0	-46.5	-46.5
37	17574362.18	4418849.13	7.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-3.2	0.0	0.0	1.9	0.0	-0.0	-29.2	-29.2
38	17574362.18	4418849.13	7.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-3.2	0.0	0.0	2.1	0.0	-0.0	-29.4	-29.4
39	17574362.18	4418849.13	7.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-0.7	0.0	0.0	2.4	0.0	-0.0	-23.3	-23.3
40	17574362.18	4418849.13	7.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	3.0	0.0	0.0	1.1	0.0	-0.0	-25.8	-25.8
41	17574362.18	4418849.13	7.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	1.6	0.0	0.0	3.1	0.0	-0.0	-22.7	-22.7
42	17574362.18	4418849.13	7.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-1.4	0.0	0.0	6.0	0.0	-0.0	-25.1	-25.1
43	17574362.18	4418849.13	7.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-1.9	0.0	0.0	8.4	0.0	-0.0	-20.7	-20.7
44	17574362.18	4418849.13	7.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-1.9	0.0	0.0	11.0	0.0	-0.0	-35.9	-35.9
45	17574362.18	4418849.13	7.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-1.9	0.0	0.0	13.8	0.0	-0.0	-65.5	-65.5
46	17574367.79	4418855.74	7.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-3.1	0.0	0.0	0.0	0.0	-0.0	-23.8	-23.8
47	17574367.79	4418855.74	7.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-3.1	0.0	0.0	0.0	0.0	-0.0	-23.8	-23.8
48	17574367.79	4418855.74	7.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-0.6	0.0	0.0	0.0	0.0	-0.0	-17.4	-17.4
49	17574367.79	4418855.74	7.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	3.0	0.0	0.0	0.0	0.0	-0.0	-21.2	-21.2
50	17574367.79	4418855.74	7.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	1.6	0.0	0.0	0.0	0.0	-0.0	-16.0	-16.0
51	17574367.79	4418855.74	7.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-1.4	0.0	0.0	0.0	0.0	-0.0	-15.5	-15.5
52	17574367.79	4418855.74	7.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-1.9	0.0	0.0	0.0	0.0	-0.0	-8.7	-8.7
53	17574367.79	4418855.74	7.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-1.9	0.0	0.0	0.0	0.0	-0.0	-21.2	-21.2
54	17574367.79	4418855.74	7.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-1.9	0.0	0.0	0.0	0.0	-0.0	-47.7	-47.7
55	17574362.18	4418849.13	10.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-27.5	-27.5
56	17574362.18	4418849.13	10.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-27.5	-27.5
57	17574362.18	4418849.13	10.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-21.1	-21.1
58	17574362.18	4418849.13	10.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-25.0	-25.0
59	17574362.18	4418849.13	10.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-19.8	-19.8
60	17574362.18	4418849.13	10.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-19.3	-19.3
61	17574362.18	4418849.13	10.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-12.6	-12.6
62	17574362.18	4418849.13	10.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-25.1	-25.1
63	17574362.18	4418849.13	10.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-1.7	0.0	0.0	0.0	0.0	-0.0	-52.0	-52.0
64	17574367.79	4418855.74	10.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-23.9	-23.9
65	17574367.79	4418855.74	10.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-23.9	-23.9
66	17574367.79	4418855.74	10.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-17.5	-17.5
67	17574367.79	4418855.74	10.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-21.4	-21.4
68	17574367.79	4418855.74	10.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-16.3	-16.3
69	17574367.79	4418855.74	10.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-15.7	-15.7
70	17574367.79	4418855.74	10.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-9.0	-9.0
71	17574367.79	4418855.74	10.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-1.7	0.0	0.0	0.0	0.0	-0.0	-21.4	-21.4
72	17574367.79	4418855.74	10.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-47.9	-47.9
73	17574362.18	4418849.13	8.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-3.0	0.0	0.0	1.9	0.0	-0.0	-29.4	-29.4
74	17574362.18	4418849.13	8.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-3.0	0.0	0.0	2.0	0.0	-0.0	-29.5	-29.5
75	17574362.18	4418849.13	8.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-0.5	0.0	0.0	2.3	0.0	-0.0	-23.3	-23.3
76	17574362.18	4418849.13	8.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	3.2	0.0	0.0	0.5	0.0	-0.0	-25.4	-25.4
77	17574362.18	4418849.13	8.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	1.7	0.0	0.0	2.0	0.0	-0.0	-21.7	-21.7

vert. Area Source, ISO 9613, Name: "TurbineBuilding-EastWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
78	17574362.18	4418849.13	8.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-1.3	0.0	0.0	4.0	0.0	-0.0	-23.3	-23.3
79	17574362.18	4418849.13	8.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-1.7	0.0	0.0	5.1	0.0	-0.0	-17.6	-17.6
80	17574362.18	4418849.13	8.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-1.7	0.0	0.0	6.5	0.0	-0.0	-31.5	-31.5
81	17574362.18	4418849.13	8.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-1.7	0.0	0.0	8.3	0.0	-0.0	-60.2	-60.2
82	17574367.79	4418855.74	8.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-23.9	-23.9
83	17574367.79	4418855.74	8.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-23.9	-23.9
84	17574367.79	4418855.74	8.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-17.5	-17.5
85	17574367.79	4418855.74	8.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-21.4	-21.4
86	17574367.79	4418855.74	8.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
87	17574367.79	4418855.74	8.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-1.3	0.0	0.0	0.0	0.0	-0.0	-15.7	-15.7
88	17574367.79	4418855.74	8.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-8.9	-8.9
89	17574367.79	4418855.74	8.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-1.7	0.0	0.0	0.0	0.0	-0.0	-21.3	-21.3
90	17574367.79	4418855.74	8.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-47.8	-47.8
91	17574362.18	4418849.13	5.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-3.8	0.0	0.0	2.1	0.0	-0.0	-28.8	-28.8
92	17574362.18	4418849.13	5.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-3.8	0.0	0.0	2.5	0.0	-0.0	-29.2	-29.2
93	17574362.18	4418849.13	5.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-1.3	0.0	0.0	3.1	0.0	-0.0	-23.4	-23.4
94	17574362.18	4418849.13	5.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	2.4	0.0	0.0	3.1	0.0	-0.0	-27.3	-27.3
95	17574362.18	4418849.13	5.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	1.0	0.0	0.0	5.8	0.0	-0.0	-24.8	-24.8
96	17574362.18	4418849.13	5.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-2.0	0.0	0.0	8.5	0.0	-0.0	-27.0	-27.0
97	17574362.18	4418849.13	5.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-2.5	0.0	0.0	11.0	0.0	-0.0	-22.7	-22.7
98	17574362.18	4418849.13	5.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-2.5	0.0	0.0	13.7	0.0	-0.0	-38.0	-38.0
99	17574362.18	4418849.13	5.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-2.5	0.0	0.0	16.5	0.0	-0.0	-67.7	-67.7
100	17574367.79	4418855.74	5.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-3.8	0.0	0.0	0.0	0.0	-0.0	-23.1	-23.1
101	17574367.79	4418855.74	5.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-3.8	0.0	0.0	0.0	0.0	-0.0	-23.2	-23.2
102	17574367.79	4418855.74	5.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-1.3	0.0	0.0	0.0	0.0	-0.0	-16.7	-16.7
103	17574367.79	4418855.74	5.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	2.5	0.0	0.0	0.0	0.0	-0.0	-20.6	-20.6
104	17574367.79	4418855.74	5.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	1.0	0.0	0.0	0.0	0.0	-0.0	-15.5	-15.5
105	17574367.79	4418855.74	5.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-2.0	0.0	0.0	0.0	0.0	-0.0	-14.9	-14.9
106	17574367.79	4418855.74	5.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-2.4	0.0	0.0	0.0	0.0	-0.0	-8.2	-8.2
107	17574367.79	4418855.74	5.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-2.4	0.0	0.0	0.0	0.0	-0.0	-20.6	-20.6
108	17574367.79	4418855.74	5.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-2.4	0.0	0.0	0.0	0.0	-0.0	-47.1	-47.1
109	17574362.18	4418849.13	9.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-3.0	0.0	0.0	1.9	0.0	-0.0	-29.4	-29.4
110	17574362.18	4418849.13	9.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-3.0	0.0	0.0	2.0	0.0	-0.0	-29.5	-29.5
111	17574362.18	4418849.13	9.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-0.5	0.0	0.0	2.2	0.0	-0.0	-23.4	-23.4
112	17574362.18	4418849.13	9.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	3.3	0.0	0.0	0.4	0.0	-0.0	-25.4	-25.4
113	17574362.18	4418849.13	9.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	1.8	0.0	0.0	1.7	0.0	-0.0	-21.6	-21.6
114	17574362.18	4418849.13	9.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-1.2	0.0	0.0	3.6	0.0	-0.0	-22.9	-22.9
115	17574362.18	4418849.13	9.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-1.7	0.0	0.0	4.0	0.0	-0.0	-16.6	-16.6
116	17574362.18	4418849.13	9.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-1.7	0.0	0.0	4.3	0.0	-0.0	-29.4	-29.4
117	17574362.18	4418849.13	9.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-1.7	0.0	0.0	4.5	0.0	-0.0	-56.5	-56.5
118	17574367.79	4418855.74	9.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-23.9	-23.9
119	17574367.79	4418855.74	9.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-23.9	-23.9
120	17574367.79	4418855.74	9.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-17.5	-17.5
121	17574367.79	4418855.74	9.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-21.4	-21.4
122	17574367.79	4418855.74	9.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-16.3	-16.3
123	17574367.79	4418855.74	9.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-1.2	0.0	0.0	0.0	0.0	-0.0	-15.7	-15.7
124	17574367.79	4418855.74	9.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-9.0	-9.0
125	17574367.79	4418855.74	9.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-1.7	0.0	0.0	0.0	0.0	-0.0	-21.4	-21.4
126	17574367.79	4418855.74	9.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-1.7	0.0	0.0	0.0	0.0	-0.0	-47.9	-47.9
127	17574362.18	4418849.13	1.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-5.1	0.0	0.0	2.6	0.0	-0.0	-28.0	-28.0
128	17574362.18	4418849.13	1.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-5.1	0.0	0.0	3.4	0.0	-0.0	-28.9	-28.9
129	17574362.18	4418849.13	1.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-2.6	0.0	0.0	4.4	0.0	-0.0	-23.4	-23.4
130	17574362.18	4418849.13	1.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	1.2	0.0	0.0	5.5	0.0	-0.0	-28.4	-28.4
131	17574362.18	4418849.13	1.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	-0.3	0.0	0.0	7.4	0.0	-0.0	-25.1	-25.1
132	17574362.18	4418849.13	1.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-3.3	0.0	0.0	9.4	0.0	-0.0	-26.6	-26.6
133	17574362.18	4418849.13	1.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-3.7	0.0	0.0	11.7	0.0	-0.0	-22.2	-22.2
134	17574362.18	4418849.13	1.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-3.7	0.0	0.0	14.1	0.0	-0.0	-37.1	-37.1
135	17574362.18	4418849.13	1.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-3.7	0.0	0.0	16.6	0.0	-0.0	-66.5	-66.5
136	17574367.79	4418855.74	1.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-5.0	0.0	0.0	0.0	0.0	-0.0	-21.9	-21.9
137	17574367.79	4418855.74	1.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-5.0	0.0	0.0	0.0	0.0	-0.0	-21.9	-21.9
138	17574367.79	4418855.74	1.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-2.6	0.0	0.0	0.0	0.0	-0.0	-15.4	-15.4
139	17574367.79	4418855.74	1.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	1.2	0.0	0.0	0.0	0.0	-0.0	-19.4	-19.4
140	17574367.79	4418855.74	1.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	-0.3	0.0	0.0	0.0	0.0	-0.0	-14.2	-14.2

vert. Area Source, ISO 9613, Name: "TurbineBuilding-EastWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
141	17574367.79	4418855.74	1.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-3.3	0.0	0.0	0.0	0.0	-0.0	-13.7	-13.7
142	17574367.79	4418855.74	1.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-3.7	0.0	0.0	0.0	0.0	-0.0	-6.9	-6.9
143	17574367.79	4418855.74	1.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-3.7	0.0	0.0	0.0	0.0	-0.0	-19.3	-19.3
144	17574367.79	4418855.74	1.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-3.7	0.0	0.0	0.0	0.0	-0.0	-45.8	-45.8
145	17574362.18	4418849.13	6.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-3.5	0.0	0.0	2.0	0.0	-0.0	-29.0	-29.0
146	17574362.18	4418849.13	6.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-3.5	0.0	0.0	2.3	0.0	-0.0	-29.3	-29.3
147	17574362.18	4418849.13	6.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-1.0	0.0	0.0	2.7	0.0	-0.0	-23.3	-23.3
148	17574362.18	4418849.13	6.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	2.8	0.0	0.0	2.0	0.0	-0.0	-26.5	-26.5
149	17574362.18	4418849.13	6.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	1.3	0.0	0.0	4.7	0.0	-0.0	-24.0	-24.0
150	17574362.18	4418849.13	6.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-1.7	0.0	0.0	7.7	0.0	-0.0	-26.4	-26.4
151	17574362.18	4418849.13	6.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-2.1	0.0	0.0	10.2	0.0	-0.0	-22.3	-22.3
152	17574362.18	4418849.13	6.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-2.1	0.0	0.0	12.9	0.0	-0.0	-37.5	-37.5
153	17574362.18	4418849.13	6.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-2.1	0.0	0.0	15.8	0.0	-0.0	-67.3	-67.3
154	17574367.79	4418855.74	6.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-3.4	0.0	0.0	0.0	0.0	-0.0	-23.5	-23.5
155	17574367.79	4418855.74	6.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-3.4	0.0	0.0	0.0	0.0	-0.0	-23.5	-23.5
156	17574367.79	4418855.74	6.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-1.0	0.0	0.0	0.0	0.0	-0.0	-17.0	-17.0
157	17574367.79	4418855.74	6.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	2.8	0.0	0.0	0.0	0.0	-0.0	-21.0	-21.0
158	17574367.79	4418855.74	6.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	1.4	0.0	0.0	0.0	0.0	-0.0	-15.8	-15.8
159	17574367.79	4418855.74	6.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-1.7	0.0	0.0	0.0	0.0	-0.0	-15.3	-15.3
160	17574367.79	4418855.74	6.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-2.1	0.0	0.0	0.0	0.0	-0.0	-8.5	-8.5
161	17574367.79	4418855.74	6.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-2.1	0.0	0.0	0.0	0.0	-0.0	-20.9	-20.9
162	17574367.79	4418855.74	6.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-2.1	0.0	0.0	0.0	0.0	-0.0	-47.4	-47.4
163	17574362.18	4418849.13	2.47	0	32	26.6	26.6	3.0	0.0	60.1	0.0	-4.7	0.0	0.0	2.5	0.0	-0.0	-28.2	-28.2
164	17574362.18	4418849.13	2.47	0	63	26.6	26.6	3.0	0.0	60.1	0.0	-4.7	0.0	0.0	3.2	0.0	-0.0	-28.9	-28.9
165	17574362.18	4418849.13	2.47	0	125	35.6	35.6	3.0	0.0	60.1	0.1	-2.3	0.0	0.0	4.2	0.0	-0.0	-23.4	-23.4
166	17574362.18	4418849.13	2.47	0	250	35.6	35.6	3.0	0.0	60.1	0.3	1.5	0.0	0.0	5.1	0.0	-0.0	-28.4	-28.4
167	17574362.18	4418849.13	2.47	0	500	39.6	39.6	3.0	0.0	60.1	0.6	0.1	0.0	0.0	7.2	0.0	-0.0	-25.3	-25.3
168	17574362.18	4418849.13	2.47	0	1000	37.6	37.6	3.0	0.0	60.1	1.0	-3.0	0.0	0.0	9.3	0.0	-0.0	-26.8	-26.8
169	17574362.18	4418849.13	2.47	0	2000	45.6	45.6	3.0	0.0	60.1	2.7	-3.4	0.0	0.0	11.7	0.0	-0.0	-22.4	-22.4
170	17574362.18	4418849.13	2.47	0	4000	39.6	39.6	3.0	0.0	60.1	9.3	-3.4	0.0	0.0	14.1	0.0	-0.0	-37.5	-37.5
171	17574362.18	4418849.13	2.47	0	8000	36.6	36.6	3.0	0.0	60.1	33.2	-3.4	0.0	0.0	16.6	0.0	-0.0	-66.8	-66.8
172	17574367.79	4418855.74	2.47	0	32	30.0	30.0	3.0	0.0	59.9	0.0	-4.7	0.0	0.0	0.0	0.0	-0.0	-22.2	-22.2
173	17574367.79	4418855.74	2.47	0	63	30.0	30.0	3.0	0.0	59.9	0.0	-4.7	0.0	0.0	0.0	0.0	-0.0	-22.2	-22.2
174	17574367.79	4418855.74	2.47	0	125	39.0	39.0	3.0	0.0	59.9	0.1	-2.3	0.0	0.0	0.0	0.0	-0.0	-15.7	-15.7
175	17574367.79	4418855.74	2.47	0	250	39.0	39.0	3.0	0.0	59.9	0.3	1.5	0.0	0.0	0.0	0.0	-0.0	-19.7	-19.7
176	17574367.79	4418855.74	2.47	0	500	43.0	43.0	3.0	0.0	59.9	0.5	0.1	0.0	0.0	0.0	0.0	-0.0	-14.5	-14.5
177	17574367.79	4418855.74	2.47	0	1000	41.0	41.0	3.0	0.0	59.9	1.0	-2.9	0.0	0.0	0.0	0.0	-0.0	-14.0	-14.0
178	17574367.79	4418855.74	2.47	0	2000	49.0	49.0	3.0	0.0	59.9	2.7	-3.4	0.0	0.0	0.0	0.0	-0.0	-7.2	-7.2
179	17574367.79	4418855.74	2.47	0	4000	43.0	43.0	3.0	0.0	59.9	9.2	-3.4	0.0	0.0	0.0	0.0	-0.0	-19.7	-19.7
180	17574367.79	4418855.74	2.47	0	8000	40.0	40.0	3.0	0.0	59.9	32.7	-3.4	0.0	0.0	0.0	0.0	-0.0	-46.1	-46.1
181	17574362.18	4418849.13	0.49	0	32	26.5	26.5	3.0	0.0	60.1	0.0	-5.4	0.0	0.0	2.8	0.0	-0.0	-28.0	-28.0
182	17574362.18	4418849.13	0.49	0	63	26.5	26.5	3.0	0.0	60.1	0.0	-5.4	0.0	0.0	3.6	0.0	-0.0	-28.9	-28.9
183	17574362.18	4418849.13	0.49	0	125	35.5	35.5	3.0	0.0	60.1	0.1	-2.9	0.0	0.0	4.6	0.0	-0.0	-23.4	-23.4
184	17574362.18	4418849.13	0.49	0	250	35.5	35.5	3.0	0.0	60.1	0.3	0.9	0.0	0.0	5.7	0.0	-0.0	-28.5	-28.5
185	17574362.18	4418849.13	0.49	0	500	39.5	39.5	3.0	0.0	60.1	0.6	-0.6	0.0	0.0	7.5	0.0	-0.0	-25.0	-25.0
186	17574362.18	4418849.13	0.49	0	1000	37.5	37.5	3.0	0.0	60.1	1.0	-3.6	0.0	0.0	9.5	0.0	-0.0	-26.5	-26.5
187	17574362.18	4418849.13	0.49	0	2000	45.5	45.5	3.0	0.0	60.1	2.7	-4.0	0.0	0.0	11.7	0.0	-0.0	-22.0	-22.0
188	17574362.18	4418849.13	0.49	0	4000	39.5	39.5	3.0	0.0	60.1	9.3	-4.0	0.0	0.0	14.1	0.0	-0.0	-37.0	-37.0
189	17574362.18	4418849.13	0.49	0	8000	36.5	36.5	3.0	0.0	60.1	33.2	-4.0	0.0	0.0	16.6	0.0	-0.0	-66.3	-66.3
190	17574367.79	4418855.74	0.49	0	32	29.9	29.9	3.0	0.0	59.9	0.0	-5.4	0.0	0.0	0.0	0.0	-0.0	-21.7	-21.7
191	17574367.79	4418855.74	0.49	0	63	29.9	29.9	3.0	0.0	59.9	0.0	-5.4	0.0	0.0	0.0	0.0	-0.0	-21.7	-21.7
192	17574367.79	4418855.74	0.49	0	125	38.9	38.9	3.0	0.0	59.9	0.1	-2.9	0.0	0.0	0.0	0.0	-0.0	-15.2	-15.2
193	17574367.79	4418855.74	0.49	0	250	38.9	38.9	3.0	0.0	59.9	0.3	0.9	0.0	0.0	0.0	0.0	-0.0	-19.2	-19.2
194	17574367.79	4418855.74	0.49	0	500	42.9	42.9	3.0	0.0	59.9	0.5	-0.6	0.0	0.0	0.0	0.0	-0.0	-14.0	-14.0
195	17574367.79	4418855.74	0.49	0	1000	40.9	40.9	3.0	0.0	59.9	1.0	-3.6	0.0	0.0	0.0	0.0	-0.0	-13.5	-13.5
196	17574367.79	4418855.74	0.49	0	2000	48.9	48.9	3.0	0.0	59.9	2.7	-4.0	0.0	0.0	0.0	0.0	-0.0	-6.7	-6.7
197	17574367.79	4418855.74	0.49	0	4000	42.9	42.9	3.0	0.0	59.9	9.2	-4.0	0.0	0.0	0.0	0.0	-0.0	-19.1	-19.1
198	17574367.79	4418855.74	0.49	0	8000	39.9	39.9	3.0	0.0	59.9	32.7	-4.0	0.0	0.0	0.0	0.0	-0.0	-45.6	-45.6

vert. Area Source, ISO 9613, Name: "TurbineBuilding-NorthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574360.78	4418870.46	7.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-3.2	0.0	0.0	0.0	0.0	-0.0	-20.0	-20.0

vert. Area Source, ISO 9613, Name: "TurbineBuilding-NorthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
2	17574360.78	4418870.46	7.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-3.2	0.0	0.0	0.0	0.0	-0.0	-20.0	-20.0
3	17574360.78	4418870.46	7.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-0.7	0.0	0.0	0.0	0.0	-0.0	-13.6	-13.6
4	17574360.78	4418870.46	7.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	3.0	0.0	0.0	0.0	0.0	-0.0	-17.5	-17.5
5	17574360.78	4418870.46	7.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	1.5	0.0	0.0	0.0	0.0	-0.0	-12.3	-12.3
6	17574360.78	4418870.46	7.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-1.5	0.0	0.0	0.0	0.0	-0.0	-11.8	-11.8
7	17574360.78	4418870.46	7.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-2.0	0.0	0.0	0.0	0.0	-0.0	-5.1	-5.1
8	17574360.78	4418870.46	7.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-2.0	0.0	0.0	0.0	0.0	-0.0	-17.8	-17.8
9	17574360.78	4418870.46	7.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-2.0	0.0	0.0	0.0	0.0	-0.0	-45.1	-45.1
10	17574360.78	4418870.46	3.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-4.5	0.0	0.0	0.0	0.0	-0.0	-18.8	-18.8
11	17574360.78	4418870.46	3.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-4.5	0.0	0.0	0.0	0.0	-0.0	-18.8	-18.8
12	17574360.78	4418870.46	3.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-2.0	0.0	0.0	0.0	0.0	-0.0	-12.3	-12.3
13	17574360.78	4418870.46	3.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	1.8	0.0	0.0	0.0	0.0	-0.0	-16.3	-16.3
14	17574360.78	4418870.46	3.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	0.3	0.0	0.0	0.0	0.0	-0.0	-11.1	-11.1
15	17574360.78	4418870.46	3.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-2.7	0.0	0.0	0.0	0.0	-0.0	-10.6	-10.6
16	17574360.78	4418870.46	3.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-3.2	0.0	0.0	0.0	0.0	-0.0	-3.8	-3.8
17	17574360.78	4418870.46	3.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-3.2	0.0	0.0	0.0	0.0	-0.0	-16.5	-16.5
18	17574360.78	4418870.46	3.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-3.2	0.0	0.0	0.0	0.0	-0.0	-43.9	-43.9
19	17574360.78	4418870.46	1.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-5.1	0.0	0.0	0.0	0.0	-0.0	-18.1	-18.1
20	17574360.78	4418870.46	1.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-5.1	0.0	0.0	0.0	0.0	-0.0	-18.2	-18.2
21	17574360.78	4418870.46	1.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-2.6	0.0	0.0	0.0	0.0	-0.0	-11.7	-11.7
22	17574360.78	4418870.46	1.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	1.1	0.0	0.0	0.0	0.0	-0.0	-15.6	-15.6
23	17574360.78	4418870.46	1.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	-0.3	0.0	0.0	0.0	0.0	-0.0	-10.5	-10.5
24	17574360.78	4418870.46	1.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-3.3	0.0	0.0	0.0	0.0	-0.0	-10.0	-10.0
25	17574360.78	4418870.46	1.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-3.8	0.0	0.0	0.0	0.0	-0.0	-3.2	-3.2
26	17574360.78	4418870.46	1.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-3.8	0.0	0.0	0.0	0.0	-0.0	-15.9	-15.9
27	17574360.78	4418870.46	1.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-3.8	0.0	0.0	0.0	0.0	-0.0	-43.3	-43.3
28	17574360.78	4418870.46	8.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-20.2	-20.2
29	17574360.78	4418870.46	8.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-20.3	-20.3
30	17574360.78	4418870.46	8.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.8	-13.8
31	17574360.78	4418870.46	8.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	3.1	0.0	0.0	0.0	0.0	-0.0	-17.7	-17.7
32	17574360.78	4418870.46	8.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	1.7	0.0	0.0	0.0	0.0	-0.0	-12.5	-12.5
33	17574360.78	4418870.46	8.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-1.3	0.0	0.0	0.0	0.0	-0.0	-12.0	-12.0
34	17574360.78	4418870.46	8.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-1.8	0.0	0.0	0.0	0.0	-0.0	-5.2	-5.2
35	17574360.78	4418870.46	8.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-1.8	0.0	0.0	0.0	0.0	-0.0	-17.9	-17.9
36	17574360.78	4418870.46	8.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-1.8	0.0	0.0	0.0	0.0	-0.0	-45.3	-45.3
37	17574360.78	4418870.46	10.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-20.2	-20.2
38	17574360.78	4418870.46	10.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-20.3	-20.3
39	17574360.78	4418870.46	10.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.9	-13.9
40	17574360.78	4418870.46	10.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-17.8	-17.8
41	17574360.78	4418870.46	10.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-12.6	-12.6
42	17574360.78	4418870.46	10.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-12.1	-12.1
43	17574360.78	4418870.46	10.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-5.3	-5.3
44	17574360.78	4418870.46	10.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-18.0	-18.0
45	17574360.78	4418870.46	10.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.4	-45.4
46	17574360.78	4418870.46	6.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-3.5	0.0	0.0	0.0	0.0	-0.0	-19.7	-19.7
47	17574360.78	4418870.46	6.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-3.5	0.0	0.0	0.0	0.0	-0.0	-19.7	-19.7
48	17574360.78	4418870.46	6.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-1.1	0.0	0.0	0.0	0.0	-0.0	-13.3	-13.3
49	17574360.78	4418870.46	6.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	2.7	0.0	0.0	0.0	0.0	-0.0	-17.2	-17.2
50	17574360.78	4418870.46	6.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	1.3	0.0	0.0	0.0	0.0	-0.0	-12.0	-12.0
51	17574360.78	4418870.46	6.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-1.8	0.0	0.0	0.0	0.0	-0.0	-11.5	-11.5
52	17574360.78	4418870.46	6.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-2.2	0.0	0.0	0.0	0.0	-0.0	-4.8	-4.8
53	17574360.78	4418870.46	6.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-2.2	0.0	0.0	0.0	0.0	-0.0	-17.5	-17.5
54	17574360.78	4418870.46	6.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-2.2	0.0	0.0	0.0	0.0	-0.0	-44.8	-44.8
55	17574360.78	4418870.46	9.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-20.2	-20.2
56	17574360.78	4418870.46	9.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-20.3	-20.3
57	17574360.78	4418870.46	9.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.9	-13.9
58	17574360.78	4418870.46	9.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-17.7	-17.7
59	17574360.78	4418870.46	9.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	1.8	0.0	0.0	0.0	0.0	-0.0	-12.6	-12.6
60	17574360.78	4418870.46	9.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-1.2	0.0	0.0	0.0	0.0	-0.0	-12.1	-12.1
61	17574360.78	4418870.46	9.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-5.3	-5.3
62	17574360.78	4418870.46	9.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-18.0	-18.0
63	17574360.78	4418870.46	9.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-1.7	0.0	0.0	0.0	0.0	-0.0	-45.4	-45.4
64	17574360.78	4418870.46	5.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-3.8	0.0	0.0	0.0	0.0	-0.0	-19.4	-19.4

vert. Area Source, ISO 9613, Name: "TurbineBuilding-NorthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
65	17574360.78	4418870.46	5.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-3.8	0.0	0.0	0.0	0.0	-0.0	-19.4	-19.4
66	17574360.78	4418870.46	5.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-1.4	0.0	0.0	0.0	0.0	-0.0	-13.0	-13.0
67	17574360.78	4418870.46	5.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	2.4	0.0	0.0	0.0	0.0	-0.0	-16.9	-16.9
68	17574360.78	4418870.46	5.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	0.9	0.0	0.0	0.0	0.0	-0.0	-11.7	-11.7
69	17574360.78	4418870.46	5.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-2.1	0.0	0.0	0.0	0.0	-0.0	-11.2	-11.2
70	17574360.78	4418870.46	5.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-2.5	0.0	0.0	0.0	0.0	-0.0	-4.5	-4.5
71	17574360.78	4418870.46	5.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-2.5	0.0	0.0	0.0	0.0	-0.0	-17.2	-17.2
72	17574360.78	4418870.46	5.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-2.5	0.0	0.0	0.0	0.0	-0.0	-44.5	-44.5
73	17574360.78	4418870.46	2.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-4.8	0.0	0.0	0.0	0.0	-0.0	-18.4	-18.4
74	17574360.78	4418870.46	2.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-4.8	0.0	0.0	0.0	0.0	-0.0	-18.5	-18.5
75	17574360.78	4418870.46	2.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-2.3	0.0	0.0	0.0	0.0	-0.0	-12.0	-12.0
76	17574360.78	4418870.46	2.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	1.4	0.0	0.0	0.0	0.0	-0.0	-16.0	-16.0
77	17574360.78	4418870.46	2.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	0.0	0.0	0.0	0.0	0.0	-0.0	-10.8	-10.8
78	17574360.78	4418870.46	2.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-3.0	0.0	0.0	0.0	0.0	-0.0	-10.3	-10.3
79	17574360.78	4418870.46	2.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-3.5	0.0	0.0	0.0	0.0	-0.0	-3.5	-3.5
80	17574360.78	4418870.46	2.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-3.5	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
81	17574360.78	4418870.46	2.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-3.5	0.0	0.0	0.0	0.0	-0.0	-43.6	-43.6
82	17574360.78	4418870.46	4.47	0	32	34.0	34.0	3.0	0.0	60.2	0.0	-4.1	0.0	0.0	0.0	0.0	-0.0	-19.1	-19.1
83	17574360.78	4418870.46	4.47	0	63	34.0	34.0	3.0	0.0	60.2	0.0	-4.1	0.0	0.0	0.0	0.0	-0.0	-19.1	-19.1
84	17574360.78	4418870.46	4.47	0	125	43.0	43.0	3.0	0.0	60.2	0.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-12.7	-12.7
85	17574360.78	4418870.46	4.47	0	250	43.0	43.0	3.0	0.0	60.2	0.3	2.1	0.0	0.0	0.0	0.0	-0.0	-16.6	-16.6
86	17574360.78	4418870.46	4.47	0	500	47.0	47.0	3.0	0.0	60.2	0.6	0.6	0.0	0.0	0.0	0.0	-0.0	-11.4	-11.4
87	17574360.78	4418870.46	4.47	0	1000	45.0	45.0	3.0	0.0	60.2	1.1	-2.4	0.0	0.0	0.0	0.0	-0.0	-10.9	-10.9
88	17574360.78	4418870.46	4.47	0	2000	53.0	53.0	3.0	0.0	60.2	2.8	-2.8	0.0	0.0	0.0	0.0	-0.0	-4.2	-4.2
89	17574360.78	4418870.46	4.47	0	4000	47.0	47.0	3.0	0.0	60.2	9.5	-2.8	0.0	0.0	0.0	0.0	-0.0	-16.9	-16.9
90	17574360.78	4418870.46	4.47	0	8000	44.0	44.0	3.0	0.0	60.2	33.8	-2.8	0.0	0.0	0.0	0.0	-0.0	-44.2	-44.2
91	17574360.78	4418870.46	0.49	0	32	33.9	33.9	3.0	0.0	60.2	0.0	-5.4	0.0	0.0	0.0	0.0	-0.0	-18.0	-18.0
92	17574360.78	4418870.46	0.49	0	63	33.9	33.9	3.0	0.0	60.2	0.0	-5.4	0.0	0.0	0.0	0.0	-0.0	-18.0	-18.0
93	17574360.78	4418870.46	0.49	0	125	42.9	42.9	3.0	0.0	60.2	0.1	-2.9	0.0	0.0	0.0	0.0	-0.0	-11.5	-11.5
94	17574360.78	4418870.46	0.49	0	250	42.9	42.9	3.0	0.0	60.2	0.3	0.8	0.0	0.0	0.0	0.0	-0.0	-15.5	-15.5
95	17574360.78	4418870.46	0.49	0	500	46.9	46.9	3.0	0.0	60.2	0.6	-0.6	0.0	0.0	0.0	0.0	-0.0	-10.3	-10.3
96	17574360.78	4418870.46	0.49	0	1000	44.9	44.9	3.0	0.0	60.2	1.1	-3.6	0.0	0.0	0.0	0.0	-0.0	-9.8	-9.8
97	17574360.78	4418870.46	0.49	0	2000	52.9	52.9	3.0	0.0	60.2	2.8	-4.1	0.0	0.0	0.0	0.0	-0.0	-3.1	-3.1
98	17574360.78	4418870.46	0.49	0	4000	46.9	46.9	3.0	0.0	60.2	9.5	-4.1	0.0	0.0	0.0	0.0	-0.0	-15.7	-15.7
99	17574360.78	4418870.46	0.49	0	8000	43.9	43.9	3.0	0.0	60.2	33.8	-4.1	0.0	0.0	0.0	0.0	-0.0	-43.1	-43.1

vert. Area Source, ISO 9613, Name: "TurbineBuilding-WestWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574344.35	4418874.04	9.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-3.0	0.0	0.0	5.6	0.0	-0.0	-28.7	-28.7
2	17574344.35	4418874.04	9.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-3.0	0.0	0.0	7.8	0.0	-0.0	-30.9	-30.9
3	17574344.35	4418874.04	9.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-0.5	0.0	0.0	10.8	0.0	-0.0	-27.5	-27.5
4	17574344.35	4418874.04	9.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	3.2	0.0	0.0	12.2	0.0	-0.0	-32.7	-32.7
5	17574344.35	4418874.04	9.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	1.7	0.0	0.0	16.6	0.0	-0.0	-32.0	-32.0
6	17574344.35	4418874.04	9.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-1.3	0.0	0.0	20.8	0.0	-0.0	-35.7	-35.7
7	17574344.35	4418874.04	9.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-1.7	0.0	0.0	23.0	0.0	-0.0	-31.3	-31.3
8	17574344.35	4418874.04	9.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-1.7	0.0	0.0	23.9	0.0	-0.0	-45.3	-45.3
9	17574344.35	4418874.04	9.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-1.7	0.0	0.0	24.4	0.0	-0.0	-74.5	-74.5
10	17574344.35	4418874.04	7.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-3.4	0.0	0.0	7.0	0.0	-0.0	-29.7	-29.7
11	17574344.35	4418874.04	7.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-3.4	0.0	0.0	9.6	0.0	-0.0	-32.3	-32.3
12	17574344.35	4418874.04	7.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-0.8	0.0	0.0	12.9	0.0	-0.0	-29.2	-29.2
13	17574344.35	4418874.04	7.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	2.8	0.0	0.0	15.0	0.0	-0.0	-35.2	-35.2
14	17574344.35	4418874.04	7.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	1.4	0.0	0.0	19.0	0.0	-0.0	-34.0	-34.0
15	17574344.35	4418874.04	7.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-1.6	0.0	0.0	21.7	0.0	-0.0	-36.2	-36.2
16	17574344.35	4418874.04	7.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-2.1	0.0	0.0	23.0	0.0	-0.0	-30.9	-30.9
17	17574344.35	4418874.04	7.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-2.1	0.0	0.0	23.9	0.0	-0.0	-44.9	-44.9
18	17574344.35	4418874.04	7.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-2.1	0.0	0.0	24.4	0.0	-0.0	-74.2	-74.2
19	17574344.35	4418874.04	8.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-3.1	0.0	0.0	6.5	0.0	-0.0	-29.5	-29.5
20	17574344.35	4418874.04	8.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-3.1	0.0	0.0	8.9	0.0	-0.0	-31.9	-31.9
21	17574344.35	4418874.04	8.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-0.6	0.0	0.0	12.1	0.0	-0.0	-28.7	-28.7
22	17574344.35	4418874.04	8.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	3.0	0.0	0.0	13.9	0.0	-0.0	-34.3	-34.3
23	17574344.35	4418874.04	8.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	1.6	0.0	0.0	18.1	0.0	-0.0	-33.4	-33.4
24	17574344.35	4418874.04	8.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-1.4	0.0	0.0	21.7	0.0	-0.0	-36.4	-36.4

vert. Area Source, ISO 9613, Name: "TurbineBuilding-WestWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
25	17574344.35	4418874.04	8.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-1.9	0.0	0.0	23.0	0.0	-0.0	-31.2	-31.2
26	17574344.35	4418874.04	8.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-1.9	0.0	0.0	23.9	0.0	-0.0	-45.1	-45.1
27	17574344.35	4418874.04	8.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-1.9	0.0	0.0	24.4	0.0	-0.0	-74.4	-74.4
28	17574344.35	4418874.04	6.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-3.7	0.0	0.0	7.5	0.0	-0.0	-29.9	-29.9
29	17574344.35	4418874.04	6.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-3.7	0.0	0.0	10.1	0.0	-0.0	-32.5	-32.5
30	17574344.35	4418874.04	6.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-1.1	0.0	0.0	13.3	0.0	-0.0	-29.4	-29.4
31	17574344.35	4418874.04	6.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	2.5	0.0	0.0	15.7	0.0	-0.0	-35.6	-35.6
32	17574344.35	4418874.04	6.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	1.1	0.0	0.0	19.5	0.0	-0.0	-34.2	-34.2
33	17574344.35	4418874.04	6.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-1.9	0.0	0.0	21.7	0.0	-0.0	-35.9	-35.9
34	17574344.35	4418874.04	6.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-2.4	0.0	0.0	23.0	0.0	-0.0	-30.7	-30.7
35	17574344.35	4418874.04	6.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-2.4	0.0	0.0	23.9	0.0	-0.0	-44.6	-44.6
36	17574344.35	4418874.04	6.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-2.4	0.0	0.0	24.4	0.0	-0.0	-73.9	-73.9
37	17574344.35	4418874.04	10.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-3.0	0.0	0.0	5.5	0.0	-0.0	-28.6	-28.6
38	17574344.35	4418874.04	10.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-3.0	0.0	0.0	6.4	0.0	-0.0	-29.5	-29.5
39	17574344.35	4418874.04	10.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-0.4	0.0	0.0	8.2	0.0	-0.0	-24.9	-24.9
40	17574344.35	4418874.04	10.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	3.2	0.0	0.0	7.9	0.0	-0.0	-28.5	-28.5
41	17574344.35	4418874.04	10.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	1.8	0.0	0.0	12.5	0.0	-0.0	-27.9	-27.9
42	17574344.35	4418874.04	10.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-1.2	0.0	0.0	17.3	0.0	-0.0	-32.2	-32.2
43	17574344.35	4418874.04	10.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-1.7	0.0	0.0	20.2	0.0	-0.0	-28.6	-28.6
44	17574344.35	4418874.04	10.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-1.7	0.0	0.0	23.2	0.0	-0.0	-44.6	-44.6
45	17574344.35	4418874.04	10.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-1.7	0.0	0.0	25.0	0.0	-0.0	-75.2	-75.2
46	17574344.35	4418874.04	3.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-4.5	0.0	0.0	8.0	0.0	-0.0	-29.6	-29.6
47	17574344.35	4418874.04	3.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-4.5	0.0	0.0	10.8	0.0	-0.0	-32.4	-32.4
48	17574344.35	4418874.04	3.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-2.0	0.0	0.0	13.9	0.0	-0.0	-29.1	-29.1
49	17574344.35	4418874.04	3.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	1.7	0.0	0.0	16.8	0.0	-0.0	-35.8	-35.8
50	17574344.35	4418874.04	3.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	0.2	0.0	0.0	19.6	0.0	-0.0	-33.5	-33.5
51	17574344.35	4418874.04	3.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-2.8	0.0	0.0	21.6	0.0	-0.0	-34.9	-34.9
52	17574344.35	4418874.04	3.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-3.3	0.0	0.0	22.9	0.0	-0.0	-29.7	-29.7
53	17574344.35	4418874.04	3.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-3.3	0.0	0.0	23.8	0.0	-0.0	-43.7	-43.7
54	17574344.35	4418874.04	3.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-3.3	0.0	0.0	24.4	0.0	-0.0	-73.0	-73.0
55	17574344.35	4418874.04	1.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-5.1	0.0	0.0	8.4	0.0	-0.0	-29.3	-29.3
56	17574344.35	4418874.04	1.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-5.1	0.0	0.0	11.1	0.0	-0.0	-32.1	-32.1
57	17574344.35	4418874.04	1.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-2.6	0.0	0.0	14.2	0.0	-0.0	-28.8	-28.8
58	17574344.35	4418874.04	1.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	1.1	0.0	0.0	17.2	0.0	-0.0	-35.6	-35.6
59	17574344.35	4418874.04	1.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	-0.4	0.0	0.0	19.7	0.0	-0.0	-33.0	-33.0
60	17574344.35	4418874.04	1.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-3.4	0.0	0.0	21.6	0.0	-0.0	-34.3	-34.3
61	17574344.35	4418874.04	1.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-3.8	0.0	0.0	22.9	0.0	-0.0	-29.1	-29.1
62	17574344.35	4418874.04	1.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-3.8	0.0	0.0	23.8	0.0	-0.0	-43.1	-43.1
63	17574344.35	4418874.04	1.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-3.8	0.0	0.0	24.4	0.0	-0.0	-72.4	-72.4
64	17574344.35	4418874.04	2.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-4.8	0.0	0.0	8.2	0.0	-0.0	-29.4	-29.4
65	17574344.35	4418874.04	2.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-4.8	0.0	0.0	11.0	0.0	-0.0	-32.2	-32.2
66	17574344.35	4418874.04	2.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-2.3	0.0	0.0	14.1	0.0	-0.0	-29.0	-29.0
67	17574344.35	4418874.04	2.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	1.4	0.0	0.0	17.0	0.0	-0.0	-35.7	-35.7
68	17574344.35	4418874.04	2.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	-0.1	0.0	0.0	19.7	0.0	-0.0	-33.3	-33.3
69	17574344.35	4418874.04	2.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-3.1	0.0	0.0	21.6	0.0	-0.0	-34.6	-34.6
70	17574344.35	4418874.04	2.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-3.5	0.0	0.0	22.9	0.0	-0.0	-29.4	-29.4
71	17574344.35	4418874.04	2.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-3.5	0.0	0.0	23.8	0.0	-0.0	-43.4	-43.4
72	17574344.35	4418874.04	2.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-3.5	0.0	0.0	24.4	0.0	-0.0	-72.7	-72.7
73	17574344.35	4418874.04	4.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-4.3	0.0	0.0	7.8	0.0	-0.0	-29.7	-29.7
74	17574344.35	4418874.04	4.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-4.3	0.0	0.0	10.6	0.0	-0.0	-32.4	-32.4
75	17574344.35	4418874.04	4.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-1.7	0.0	0.0	13.8	0.0	-0.0	-29.2	-29.2
76	17574344.35	4418874.04	4.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	2.0	0.0	0.0	16.4	0.0	-0.0	-35.8	-35.8
77	17574344.35	4418874.04	4.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	0.5	0.0	0.0	19.5	0.0	-0.0	-33.7	-33.7
78	17574344.35	4418874.04	4.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-2.5	0.0	0.0	21.6	0.0	-0.0	-35.2	-35.2
79	17574344.35	4418874.04	4.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-3.0	0.0	0.0	22.9	0.0	-0.0	-30.0	-30.0
80	17574344.35	4418874.04	4.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-3.0	0.0	0.0	23.8	0.0	-0.0	-44.0	-44.0
81	17574344.35	4418874.04	4.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-3.0	0.0	0.0	24.4	0.0	-0.0	-73.3	-73.3
82	17574344.35	4418874.04	5.47	0	32	31.7	31.7	3.0	0.0	60.7	0.0	-3.9	0.0	0.0	7.6	0.0	-0.0	-29.7	-29.7
83	17574344.35	4418874.04	5.47	0	63	31.7	31.7	3.0	0.0	60.7	0.0	-3.9	0.0	0.0	10.3	0.0	-0.0	-32.5	-32.5
84	17574344.35	4418874.04	5.47	0	125	40.7	40.7	3.0	0.0	60.7	0.1	-1.4	0.0	0.0	13.5	0.0	-0.0	-29.3	-29.3
85	17574344.35	4418874.04	5.47	0	250	40.7	40.7	3.0	0.0	60.7	0.3	2.2	0.0	0.0	16.1	0.0	-0.0	-35.7	-35.7
86	17574344.35	4418874.04	5.47	0	500	44.7	44.7	3.0	0.0	60.7	0.6	0.8	0.0	0.0	19.4	0.0	-0.0	-33.9	-33.9
87	17574344.35	4418874.04	5.47	0	1000	42.7	42.7	3.0	0.0	60.7	1.1	-2.2	0.0	0.0	21.6	0.0	-0.0	-35.5	-35.5

vert. Area Source, ISO 9613, Name: "TurbineBuilding-WestWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
88	17574344.35	4418874.04	5.47	0	2000	50.7	50.7	3.0	0.0	60.7	3.0	-2.7	0.0	0.0	22.9	0.0	-0.0	-30.3	-30.3
89	17574344.35	4418874.04	5.47	0	4000	44.7	44.7	3.0	0.0	60.7	10.0	-2.7	0.0	0.0	23.8	0.0	-0.0	-44.3	-44.3
90	17574344.35	4418874.04	5.47	0	8000	41.7	41.7	3.0	0.0	60.7	35.8	-2.7	0.0	0.0	24.4	0.0	-0.0	-73.6	-73.6
91	17574344.35	4418874.04	0.49	0	32	31.5	31.5	3.0	0.0	60.7	0.0	-5.4	0.0	0.0	8.5	0.0	-0.0	-29.3	-29.3
92	17574344.35	4418874.04	0.49	0	63	31.5	31.5	3.0	0.0	60.7	0.0	-5.4	0.0	0.0	11.2	0.0	-0.0	-32.1	-32.1
93	17574344.35	4418874.04	0.49	0	125	40.5	40.5	3.0	0.0	60.7	0.1	-2.9	0.0	0.0	14.3	0.0	-0.0	-28.7	-28.7
94	17574344.35	4418874.04	0.49	0	250	40.5	40.5	3.0	0.0	60.7	0.3	0.8	0.0	0.0	17.3	0.0	-0.0	-35.6	-35.6
95	17574344.35	4418874.04	0.49	0	500	44.5	44.5	3.0	0.0	60.7	0.6	-0.7	0.0	0.0	19.7	0.0	-0.0	-32.8	-32.8
96	17574344.35	4418874.04	0.49	0	1000	42.5	42.5	3.0	0.0	60.7	1.1	-3.7	0.0	0.0	21.6	0.0	-0.0	-34.2	-34.2
97	17574344.35	4418874.04	0.49	0	2000	50.5	50.5	3.0	0.0	60.7	3.0	-4.1	0.0	0.0	22.9	0.0	-0.0	-28.9	-28.9
98	17574344.35	4418874.04	0.49	0	4000	44.5	44.5	3.0	0.0	60.7	10.0	-4.1	0.0	0.0	23.8	0.0	-0.0	-42.9	-42.9
99	17574344.35	4418874.04	0.49	0	8000	41.5	41.5	3.0	0.0	60.7	35.8	-4.1	0.0	0.0	24.4	0.0	-0.0	-72.2	-72.2

vert. Area Source, ISO 9613, Name: "CompressorBuilding-SouthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574386.05	4418819.42	2.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-2.1	0.0	0.0	14.1	0.0	-0.0	-26.5	-26.5
2	17574386.05	4418819.42	2.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	1.7	0.0	0.0	16.8	0.0	-0.0	-26.8	-26.8
3	17574386.05	4418819.42	2.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	0.3	0.0	0.0	19.7	0.0	-0.0	-23.4	-23.4
4	17574386.05	4418819.42	2.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-2.7	0.0	0.0	21.6	0.0	-0.0	-16.5	-16.5
5	17574386.05	4418819.42	2.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-3.2	0.0	0.0	23.0	0.0	-0.0	-15.7	-15.7
6	17574386.05	4418819.42	2.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-3.2	0.0	0.0	23.9	0.0	-0.0	-20.6	-20.6
7	17574386.05	4418819.42	2.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-3.2	0.0	0.0	24.4	0.0	-0.0	-52.6	-52.6
8	17574399.89	4418806.44	2.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-2.0	0.0	0.0	0.0	0.0	-0.0	-41.3	-41.3
9	17574399.89	4418806.44	2.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	1.9	0.0	0.0	0.0	0.0	-0.0	-38.8	-38.8
10	17574399.89	4418806.44	2.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	0.4	0.0	0.0	0.0	0.0	-0.0	-32.5	-32.5
11	17574399.89	4418806.44	2.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-2.6	0.0	0.0	0.0	0.0	-0.0	-23.7	-23.7
12	17574399.89	4418806.44	2.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-3.0	0.0	0.0	0.0	0.0	-0.0	-21.5	-21.5
13	17574399.89	4418806.44	2.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-3.0	0.0	0.0	0.0	0.0	-0.0	-25.2	-25.2
14	17574399.89	4418806.44	2.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-3.0	0.0	0.0	0.0	0.0	-0.0	-55.4	-55.4
15	17574386.05	4418819.42	8.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-0.4	0.0	0.0	9.7	0.0	-0.0	-23.8	-23.8
16	17574386.05	4418819.42	8.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	3.3	0.0	0.0	9.5	0.0	-0.0	-21.1	-21.1
17	17574386.05	4418819.42	8.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	1.9	0.0	0.0	14.0	0.0	-0.0	-19.3	-19.3
18	17574386.05	4418819.42	8.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-1.1	0.0	0.0	18.8	0.0	-0.0	-15.2	-15.2
19	17574386.05	4418819.42	8.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-1.6	0.0	0.0	21.8	0.0	-0.0	-16.1	-16.1
20	17574386.05	4418819.42	8.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-1.6	0.0	0.0	24.8	0.0	-0.0	-23.1	-23.1
21	17574386.05	4418819.42	8.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-1.6	0.0	0.0	25.0	0.0	-0.0	-54.7	-54.7
22	17574399.89	4418806.44	8.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-42.9	-42.9
23	17574399.89	4418806.44	8.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-40.3	-40.3
24	17574399.89	4418806.44	8.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-34.0	-34.0
25	17574399.89	4418806.44	8.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-25.1	-25.1
26	17574399.89	4418806.44	8.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-22.9	-22.9
27	17574399.89	4418806.44	8.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-1.6	0.0	0.0	0.0	0.0	-0.0	-26.6	-26.6
28	17574399.89	4418806.44	8.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-56.9	-56.9
29	17574386.05	4418819.42	0.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-2.8	0.0	0.0	14.4	0.0	-0.0	-26.1	-26.1
30	17574386.05	4418819.42	0.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	1.0	0.0	0.0	17.3	0.0	-0.0	-26.6	-26.6
31	17574386.05	4418819.42	0.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	-0.4	0.0	0.0	19.8	0.0	-0.0	-22.8	-22.8
32	17574386.05	4418819.42	0.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-3.4	0.0	0.0	21.6	0.0	-0.0	-15.8	-15.8
33	17574386.05	4418819.42	0.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-3.9	0.0	0.0	23.0	0.0	-0.0	-15.0	-15.0
34	17574386.05	4418819.42	0.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-3.9	0.0	0.0	23.9	0.0	-0.0	-19.9	-19.9
35	17574386.05	4418819.42	0.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-3.9	0.0	0.0	24.4	0.0	-0.0	-51.9	-51.9
36	17574399.89	4418806.44	0.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-2.8	0.0	0.0	0.0	0.0	-0.0	-40.5	-40.5
37	17574399.89	4418806.44	0.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	1.1	0.0	0.0	0.0	0.0	-0.0	-38.1	-38.1
38	17574399.89	4418806.44	0.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	-0.3	0.0	0.0	0.0	0.0	-0.0	-31.8	-31.8
39	17574399.89	4418806.44	0.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-3.3	0.0	0.0	0.0	0.0	-0.0	-22.9	-22.9
40	17574399.89	4418806.44	0.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-3.8	0.0	0.0	0.0	0.0	-0.0	-20.7	-20.7
41	17574399.89	4418806.44	0.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-3.8	0.0	0.0	0.0	0.0	-0.0	-24.4	-24.4
42	17574399.89	4418806.44	0.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-3.8	0.0	0.0	0.0	0.0	-0.0	-54.6	-54.6
43	17574386.05	4418819.42	7.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-0.4	0.0	0.0	11.6	0.0	-0.0	-25.7	-25.7
44	17574386.05	4418819.42	7.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	3.2	0.0	0.0	12.9	0.0	-0.0	-24.3	-24.3
45	17574386.05	4418819.42	7.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	1.8	0.0	0.0	17.0	0.0	-0.0	-22.2	-22.2
46	17574386.05	4418819.42	7.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-1.2	0.0	0.0	21.1	0.0	-0.0	-17.4	-17.4
47	17574386.05	4418819.42	7.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-1.7	0.0	0.0	23.0	0.0	-0.0	-17.2	-17.2

vert. Area Source, ISO 9613, Name: "CompressorBuilding-SouthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
48	17574386.05	4418819.42	7.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-1.7	0.0	0.0	23.9	0.0	-0.0	-22.1	-22.1
49	17574386.05	4418819.42	7.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-1.7	0.0	0.0	24.4	0.0	-0.0	-54.1	-54.1
50	17574399.89	4418806.44	7.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-0.3	0.0	0.0	0.0	0.0	-0.0	-43.0	-43.0
51	17574399.89	4418806.44	7.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-40.3	-40.3
52	17574399.89	4418806.44	7.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-34.0	-34.0
53	17574399.89	4418806.44	7.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	-25.1	-25.1
54	17574399.89	4418806.44	7.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-22.9	-22.9
55	17574399.89	4418806.44	7.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-1.6	0.0	0.0	0.0	0.0	-0.0	-26.6	-26.6
56	17574399.89	4418806.44	7.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-1.6	0.0	0.0	0.0	0.0	-0.0	-56.8	-56.8
57	17574386.05	4418819.42	6.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-0.6	0.0	0.0	12.7	0.0	-0.0	-26.7	-26.7
58	17574386.05	4418819.42	6.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	3.1	0.0	0.0	14.4	0.0	-0.0	-25.8	-25.8
59	17574386.05	4418819.42	6.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	1.6	0.0	0.0	18.4	0.0	-0.0	-23.4	-23.4
60	17574386.05	4418819.42	6.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-1.4	0.0	0.0	21.7	0.0	-0.0	-17.9	-17.9
61	17574386.05	4418819.42	6.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-1.8	0.0	0.0	23.0	0.0	-0.0	-17.1	-17.1
62	17574386.05	4418819.42	6.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-1.8	0.0	0.0	23.9	0.0	-0.0	-22.0	-22.0
63	17574386.05	4418819.42	6.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-1.8	0.0	0.0	24.4	0.0	-0.0	-53.9	-53.9
64	17574399.89	4418806.44	6.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-43.0	-43.0
65	17574399.89	4418806.44	6.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-40.2	-40.2
66	17574399.89	4418806.44	6.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-33.9	-33.9
67	17574399.89	4418806.44	6.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-1.3	0.0	0.0	0.0	0.0	-0.0	-25.0	-25.0
68	17574399.89	4418806.44	6.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-22.8	-22.8
69	17574399.89	4418806.44	6.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-1.7	0.0	0.0	0.0	0.0	-0.0	-26.5	-26.5
70	17574399.89	4418806.44	6.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-1.7	0.0	0.0	0.0	0.0	-0.0	-56.7	-56.7
71	17574386.05	4418819.42	3.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-1.8	0.0	0.0	13.9	0.0	-0.0	-26.7	-26.7
72	17574386.05	4418819.42	3.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	2.1	0.0	0.0	16.4	0.0	-0.0	-26.8	-26.8
73	17574386.05	4418819.42	3.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	0.7	0.0	0.0	19.6	0.0	-0.0	-23.6	-23.6
74	17574386.05	4418819.42	3.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-2.3	0.0	0.0	21.6	0.0	-0.0	-16.8	-16.8
75	17574386.05	4418819.42	3.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-2.8	0.0	0.0	23.0	0.0	-0.0	-16.1	-16.1
76	17574386.05	4418819.42	3.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-2.8	0.0	0.0	23.9	0.0	-0.0	-21.0	-21.0
77	17574386.05	4418819.42	3.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-2.8	0.0	0.0	24.4	0.0	-0.0	-52.9	-52.9
78	17574399.89	4418806.44	3.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-41.7	-41.7
79	17574399.89	4418806.44	3.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	2.2	0.0	0.0	0.0	0.0	-0.0	-39.2	-39.2
80	17574399.89	4418806.44	3.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	0.8	0.0	0.0	0.0	0.0	-0.0	-32.9	-32.9
81	17574399.89	4418806.44	3.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-2.2	0.0	0.0	0.0	0.0	-0.0	-24.0	-24.0
82	17574399.89	4418806.44	3.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-2.7	0.0	0.0	0.0	0.0	-0.0	-21.8	-21.8
83	17574399.89	4418806.44	3.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-2.7	0.0	0.0	0.0	0.0	-0.0	-25.5	-25.5
84	17574399.89	4418806.44	3.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-2.7	0.0	0.0	0.0	0.0	-0.0	-55.8	-55.8
85	17574386.05	4418819.42	1.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-2.5	0.0	0.0	14.2	0.0	-0.0	-26.3	-26.3
86	17574386.05	4418819.42	1.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	1.4	0.0	0.0	17.1	0.0	-0.0	-26.7	-26.7
87	17574386.05	4418819.42	1.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	-0.1	0.0	0.0	19.8	0.0	-0.0	-23.1	-23.1
88	17574386.05	4418819.42	1.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-3.0	0.0	0.0	21.6	0.0	-0.0	-16.1	-16.1
89	17574386.05	4418819.42	1.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-3.5	0.0	0.0	23.0	0.0	-0.0	-15.4	-15.4
90	17574386.05	4418819.42	1.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-3.5	0.0	0.0	23.9	0.0	-0.0	-20.3	-20.3
91	17574386.05	4418819.42	1.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-3.5	0.0	0.0	24.4	0.0	-0.0	-52.2	-52.2
92	17574399.89	4418806.44	1.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-2.4	0.0	0.0	0.0	0.0	-0.0	-40.9	-40.9
93	17574399.89	4418806.44	1.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	1.5	0.0	0.0	0.0	0.0	-0.0	-38.5	-38.5
94	17574399.89	4418806.44	1.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	0.1	0.0	0.0	0.0	0.0	-0.0	-32.2	-32.2
95	17574399.89	4418806.44	1.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-2.9	0.0	0.0	0.0	0.0	-0.0	-23.3	-23.3
96	17574399.89	4418806.44	1.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-3.4	0.0	0.0	0.0	0.0	-0.0	-21.1	-21.1
97	17574399.89	4418806.44	1.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-3.4	0.0	0.0	0.0	0.0	-0.0	-24.8	-24.8
98	17574399.89	4418806.44	1.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-3.4	0.0	0.0	0.0	0.0	-0.0	-55.0	-55.0
99	17574386.05	4418819.42	4.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-1.4	0.0	0.0	13.6	0.0	-0.0	-26.8	-26.8
100	17574386.05	4418819.42	4.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	2.4	0.0	0.0	16.0	0.0	-0.0	-26.7	-26.7
101	17574386.05	4418819.42	4.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	1.0	0.0	0.0	19.4	0.0	-0.0	-23.8	-23.8
102	17574386.05	4418819.42	4.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-2.0	0.0	0.0	21.6	0.0	-0.0	-17.2	-17.2
103	17574386.05	4418819.42	4.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-2.5	0.0	0.0	23.0	0.0	-0.0	-16.4	-16.4
104	17574386.05	4418819.42	4.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-2.5	0.0	0.0	23.9	0.0	-0.0	-21.3	-21.3
105	17574386.05	4418819.42	4.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-2.5	0.0	0.0	24.4	0.0	-0.0	-53.3	-53.3
106	17574399.89	4418806.44	4.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-1.3	0.0	0.0	0.0	0.0	-0.0	-42.0	-42.0
107	17574399.89	4418806.44	4.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	2.6	0.0	0.0	0.0	0.0	-0.0	-39.6	-39.6
108	17574399.89	4418806.44	4.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	1.2	0.0	0.0	0.0	0.0	-0.0	-33.3	-33.3
109	17574399.89	4418806.44	4.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-1.8	0.0	0.0	0.0	0.0	-0.0	-24.4	-24.4
110	17574399.89	4418806.44	4.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-2.3	0.0	0.0	0.0	0.0	-0.0	-22.2	-22.2

vert. Area Source, ISO 9613, Name: "CompressorBuilding-SouthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
111	17574399.89	4418806.44	4.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-2.3	0.0	0.0	0.0	0.0	-0.0	-25.9	-25.9
112	17574399.89	4418806.44	4.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-2.3	0.0	0.0	0.0	0.0	-0.0	-56.1	-56.1
113	17574386.05	4418819.42	5.64	0	125	41.7	41.7	3.0	0.0	59.2	0.1	-1.1	0.0	0.0	13.2	0.0	-0.0	-26.7	-26.7
114	17574386.05	4418819.42	5.64	0	250	48.2	48.2	3.0	0.0	59.2	0.3	2.8	0.0	0.0	15.3	0.0	-0.0	-26.4	-26.4
115	17574386.05	4418819.42	5.64	0	500	53.3	53.3	3.0	0.0	59.2	0.5	1.4	0.0	0.0	19.1	0.0	-0.0	-23.9	-23.9
116	17574386.05	4418819.42	5.64	0	1000	59.6	59.6	3.0	0.0	59.2	0.9	-1.7	0.0	0.0	21.6	0.0	-0.0	-17.5	-17.5
117	17574386.05	4418819.42	5.64	0	2000	62.8	62.8	3.0	0.0	59.2	2.5	-2.1	0.0	0.0	23.0	0.0	-0.0	-16.8	-16.8
118	17574386.05	4418819.42	5.64	0	4000	64.7	64.7	3.0	0.0	59.2	8.4	-2.1	0.0	0.0	23.9	0.0	-0.0	-21.7	-21.7
119	17574386.05	4418819.42	5.64	0	8000	54.9	54.9	3.0	0.0	59.2	30.0	-2.1	0.0	0.0	24.4	0.0	-0.0	-53.6	-53.6
120	17574399.89	4418806.44	5.64	0	125	12.5	12.5	3.0	0.0	58.7	0.1	-0.8	0.0	0.0	0.0	0.0	-0.0	-42.6	-42.6
121	17574399.89	4418806.44	5.64	0	250	19.0	19.0	3.0	0.0	58.7	0.3	3.0	0.0	0.0	0.0	0.0	-0.0	-39.9	-39.9
122	17574399.89	4418806.44	5.64	0	500	24.1	24.1	3.0	0.0	58.7	0.5	1.5	0.0	0.0	0.0	0.0	-0.0	-33.6	-33.6
123	17574399.89	4418806.44	5.64	0	1000	30.4	30.4	3.0	0.0	58.7	0.9	-1.5	0.0	0.0	0.0	0.0	-0.0	-24.7	-24.7
124	17574399.89	4418806.44	5.64	0	2000	33.6	33.6	3.0	0.0	58.7	2.3	-2.0	0.0	0.0	0.0	0.0	-0.0	-22.5	-22.5
125	17574399.89	4418806.44	5.64	0	4000	35.5	35.5	3.0	0.0	58.7	8.0	-2.0	0.0	0.0	0.0	0.0	-0.0	-26.2	-26.2
126	17574399.89	4418806.44	5.64	0	8000	25.7	25.7	3.0	0.0	58.7	28.4	-2.0	0.0	0.0	0.0	0.0	-0.0	-56.5	-56.5
127	17574386.05	4418819.42	0.07	0	125	33.2	33.2	3.0	0.0	59.2	0.1	-3.0	0.0	0.0	14.4	0.0	-0.0	-34.5	-34.5
128	17574386.05	4418819.42	0.07	0	250	39.7	39.7	3.0	0.0	59.2	0.3	0.8	0.0	0.0	17.4	0.0	-0.0	-35.0	-35.0
129	17574386.05	4418819.42	0.07	0	500	44.8	44.8	3.0	0.0	59.2	0.5	-0.6	0.0	0.0	19.8	0.0	-0.0	-31.1	-31.1
130	17574386.05	4418819.42	0.07	0	1000	51.1	51.1	3.0	0.0	59.2	0.9	-3.6	0.0	0.0	21.6	0.0	-0.0	-24.1	-24.1
131	17574386.05	4418819.42	0.07	0	2000	54.3	54.3	3.0	0.0	59.2	2.5	-4.1	0.0	0.0	23.0	0.0	-0.0	-23.3	-23.3
132	17574386.05	4418819.42	0.07	0	4000	56.2	56.2	3.0	0.0	59.2	8.4	-4.1	0.0	0.0	23.9	0.0	-0.0	-28.3	-28.3
133	17574386.05	4418819.42	0.07	0	8000	46.4	46.4	3.0	0.0	59.2	30.0	-4.1	0.0	0.0	24.4	0.0	-0.0	-60.2	-60.2

vert. Area Source, ISO 9613, Name: "CompressorBuilding-EastWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574406.56	4418814.19	2.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-2.0	0.0	0.0	0.0	0.0	-0.0	-14.5	-14.5
2	17574406.56	4418814.19	2.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	1.9	0.0	0.0	0.0	0.0	-0.0	-12.1	-12.1
3	17574406.56	4418814.19	2.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	0.5	0.0	0.0	0.0	0.0	-0.0	-5.8	-5.8
4	17574406.56	4418814.19	2.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-2.5	0.0	0.0	0.0	0.0	-0.0	3.1	3.1
5	17574406.56	4418814.19	2.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-3.0	0.0	0.0	0.0	0.0	-0.0	5.4	5.4
6	17574406.56	4418814.19	2.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-3.0	0.0	0.0	0.0	0.0	-0.0	1.8	1.8
7	17574406.56	4418814.19	2.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-3.0	0.0	0.0	0.0	0.0	-0.0	-27.9	-27.9
8	17574406.56	4418814.19	1.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-2.4	0.0	0.0	0.0	0.0	-0.0	-14.1	-14.1
9	17574406.56	4418814.19	1.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	1.5	0.0	0.0	0.0	0.0	-0.0	-11.7	-11.7
10	17574406.56	4418814.19	1.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	0.1	0.0	0.0	0.0	0.0	-0.0	-5.4	-5.4
11	17574406.56	4418814.19	1.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-2.9	0.0	0.0	0.0	0.0	-0.0	3.5	3.5
12	17574406.56	4418814.19	1.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-3.4	0.0	0.0	0.0	0.0	-0.0	5.8	5.8
13	17574406.56	4418814.19	1.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-3.4	0.0	0.0	0.0	0.0	-0.0	2.2	2.2
14	17574406.56	4418814.19	1.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-3.4	0.0	0.0	0.0	0.0	-0.0	-27.5	-27.5
15	17574406.56	4418814.19	8.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-16.1	-16.1
16	17574406.56	4418814.19	8.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-13.5	-13.5
17	17574406.56	4418814.19	8.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-7.2	-7.2
18	17574406.56	4418814.19	8.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	1.7	1.7
19	17574406.56	4418814.19	8.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	3.9	3.9
20	17574406.56	4418814.19	8.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-1.6	0.0	0.0	0.0	0.0	-0.0	0.4	0.4
21	17574406.56	4418814.19	8.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-29.3	-29.3
22	17574406.56	4418814.19	7.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-0.3	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2
23	17574406.56	4418814.19	7.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-13.5	-13.5
24	17574406.56	4418814.19	7.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-7.2	-7.2
25	17574406.56	4418814.19	7.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	1.7	1.7
26	17574406.56	4418814.19	7.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	3.9	3.9
27	17574406.56	4418814.19	7.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-1.6	0.0	0.0	0.0	0.0	-0.0	0.4	0.4
28	17574406.56	4418814.19	7.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-1.6	0.0	0.0	0.0	0.0	-0.0	-29.3	-29.3
29	17574406.56	4418814.19	0.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-2.8	0.0	0.0	0.0	0.0	-0.0	-13.7	-13.7
30	17574406.56	4418814.19	0.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	1.1	0.0	0.0	0.0	0.0	-0.0	-11.3	-11.3
31	17574406.56	4418814.19	0.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	-0.3	0.0	0.0	0.0	0.0	-0.0	-5.0	-5.0
32	17574406.56	4418814.19	0.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-3.3	0.0	0.0	0.0	0.0	-0.0	3.9	3.9
33	17574406.56	4418814.19	0.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-3.8	0.0	0.0	0.0	0.0	-0.0	6.1	6.1
34	17574406.56	4418814.19	0.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-3.8	0.0	0.0	0.0	0.0	-0.0	2.6	2.6
35	17574406.56	4418814.19	0.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-3.8	0.0	0.0	0.0	0.0	-0.0	-27.1	-27.1
36	17574406.56	4418814.19	6.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-16.2	-16.2

vert. Area Source, ISO 9613, Name: "CompressorBuilding-EastWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
37	17574406.56	4418814.19	6.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-13.4	-13.4
38	17574406.56	4418814.19	6.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-7.1	-7.1
39	17574406.56	4418814.19	6.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-1.2	0.0	0.0	0.0	0.0	-0.0	1.8	1.8
40	17574406.56	4418814.19	6.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-1.7	0.0	0.0	0.0	0.0	-0.0	4.1	4.1
41	17574406.56	4418814.19	6.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-1.7	0.0	0.0	0.0	0.0	-0.0	0.5	0.5
42	17574406.56	4418814.19	6.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-1.7	0.0	0.0	0.0	0.0	-0.0	-29.2	-29.2
43	17574406.56	4418814.19	5.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-0.7	0.0	0.0	0.0	0.0	-0.0	-15.8	-15.8
44	17574406.56	4418814.19	5.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	3.0	0.0	0.0	0.0	0.0	-0.0	-13.2	-13.2
45	17574406.56	4418814.19	5.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	1.6	0.0	0.0	0.0	0.0	-0.0	-6.8	-6.8
46	17574406.56	4418814.19	5.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-1.5	0.0	0.0	0.0	0.0	-0.0	2.0	2.0
47	17574406.56	4418814.19	5.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-1.9	0.0	0.0	0.0	0.0	-0.0	4.3	4.3
48	17574406.56	4418814.19	5.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-1.9	0.0	0.0	0.0	0.0	-0.0	0.7	0.7
49	17574406.56	4418814.19	5.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-1.9	0.0	0.0	0.0	0.0	-0.0	-28.9	-28.9
50	17574406.56	4418814.19	3.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-14.9	-14.9
51	17574406.56	4418814.19	3.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	2.3	0.0	0.0	0.0	0.0	-0.0	-12.5	-12.5
52	17574406.56	4418814.19	3.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	0.8	0.0	0.0	0.0	0.0	-0.0	-6.1	-6.1
53	17574406.56	4418814.19	3.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-2.1	0.0	0.0	0.0	0.0	-0.0	2.8	2.8
54	17574406.56	4418814.19	3.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-2.6	0.0	0.0	0.0	0.0	-0.0	5.0	5.0
55	17574406.56	4418814.19	3.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-2.6	0.0	0.0	0.0	0.0	-0.0	1.4	1.4
56	17574406.56	4418814.19	3.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-2.6	0.0	0.0	0.0	0.0	-0.0	-28.2	-28.2
57	17574406.56	4418814.19	4.64	0	125	39.0	39.0	3.0	0.0	58.5	0.1	-1.3	0.0	0.0	0.0	0.0	-0.0	-15.3	-15.3
58	17574406.56	4418814.19	4.64	0	250	45.5	45.5	3.0	0.0	58.5	0.3	2.6	0.0	0.0	0.0	0.0	-0.0	-12.8	-12.8
59	17574406.56	4418814.19	4.64	0	500	50.6	50.6	3.0	0.0	58.5	0.5	1.2	0.0	0.0	0.0	0.0	-0.0	-6.5	-6.5
60	17574406.56	4418814.19	4.64	0	1000	56.9	56.9	3.0	0.0	58.5	0.9	-1.8	0.0	0.0	0.0	0.0	-0.0	2.4	2.4
61	17574406.56	4418814.19	4.64	0	2000	60.1	60.1	3.0	0.0	58.5	2.3	-2.2	0.0	0.0	0.0	0.0	-0.0	4.6	4.6
62	17574406.56	4418814.19	4.64	0	4000	62.0	62.0	3.0	0.0	58.5	7.7	-2.2	0.0	0.0	0.0	0.0	-0.0	1.1	1.1
63	17574406.56	4418814.19	4.64	0	8000	52.2	52.2	3.0	0.0	58.5	27.6	-2.2	0.0	0.0	0.0	0.0	-0.0	-28.6	-28.6
64	17574406.56	4418814.19	0.07	0	125	30.5	30.5	3.0	0.0	58.5	0.1	-3.0	0.0	0.0	0.0	0.0	-0.0	-22.1	-22.1
65	17574406.56	4418814.19	0.07	0	250	37.0	37.0	3.0	0.0	58.5	0.3	0.9	0.0	0.0	0.0	0.0	-0.0	-19.6	-19.6
66	17574406.56	4418814.19	0.07	0	500	42.1	42.1	3.0	0.0	58.5	0.5	-0.5	0.0	0.0	0.0	0.0	-0.0	-13.3	-13.3
67	17574406.56	4418814.19	0.07	0	1000	48.4	48.4	3.0	0.0	58.5	0.9	-3.5	0.0	0.0	0.0	0.0	-0.0	-4.4	-4.4
68	17574406.56	4418814.19	0.07	0	2000	51.6	51.6	3.0	0.0	58.5	2.3	-4.0	0.0	0.0	0.0	0.0	-0.0	-2.2	-2.2
69	17574406.56	4418814.19	0.07	0	4000	53.5	53.5	3.0	0.0	58.5	7.7	-4.0	0.0	0.0	0.0	0.0	-0.0	-5.8	-5.8
70	17574406.56	4418814.19	0.07	0	8000	43.7	43.7	3.0	0.0	58.5	27.6	-4.0	0.0	0.0	0.0	0.0	-0.0	-35.4	-35.4

vert. Area Source, ISO 9613, Name: "CompressorBuilding-NorthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574401.96	4418832.30	7.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-0.4	0.0	0.0	0.0	0.0	-0.0	-14.6	-14.6
2	17574401.96	4418832.30	7.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-11.9	-11.9
3	17574401.96	4418832.30	7.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-5.6	-5.6
4	17574401.96	4418832.30	7.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-1.2	0.0	0.0	0.0	0.0	-0.0	3.3	3.3
5	17574401.96	4418832.30	7.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	5.5	5.5
6	17574401.96	4418832.30	7.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-1.6	0.0	0.0	0.0	0.0	-0.0	1.8	1.8
7	17574401.96	4418832.30	7.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-28.4	-28.4
8	17574388.01	4418845.14	7.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-21.3	-21.3
9	17574388.01	4418845.14	7.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-18.6	-18.6
10	17574388.01	4418845.14	7.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-12.3	-12.3
11	17574388.01	4418845.14	7.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-1.3	0.0	0.0	0.0	0.0	-0.0	-3.4	-3.4
12	17574388.01	4418845.14	7.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-1.3	-1.3
13	17574388.01	4418845.14	7.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-1.7	0.0	0.0	0.0	0.0	-0.0	-5.4	-5.4
14	17574388.01	4418845.14	7.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-36.9	-36.9
15	17574401.96	4418832.30	0.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-2.8	0.0	0.0	0.0	0.0	-0.0	-12.2	-12.2
16	17574401.96	4418832.30	0.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	1.1	0.0	0.0	0.0	0.0	-0.0	-9.7	-9.7
17	17574401.96	4418832.30	0.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	-0.4	0.0	0.0	0.0	0.0	-0.0	-3.4	-3.4
18	17574401.96	4418832.30	0.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-3.4	0.0	0.0	0.0	0.0	-0.0	5.5	5.5
19	17574401.96	4418832.30	0.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-3.8	0.0	0.0	0.0	0.0	-0.0	7.7	7.7
20	17574401.96	4418832.30	0.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-3.8	0.0	0.0	0.0	0.0	-0.0	4.0	4.0
21	17574401.96	4418832.30	0.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-3.8	0.0	0.0	0.0	0.0	-0.0	-26.2	-26.2
22	17574388.01	4418845.14	0.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-2.9	0.0	0.0	0.0	0.0	-0.0	-18.9	-18.9
23	17574388.01	4418845.14	0.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	1.0	0.0	0.0	0.0	0.0	-0.0	-16.4	-16.4
24	17574388.01	4418845.14	0.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	-0.4	0.0	0.0	0.0	0.0	-0.0	-10.1	-10.1
25	17574388.01	4418845.14	0.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-3.4	0.0	0.0	0.0	0.0	-0.0	-1.2	-1.2

vert. Area Source, ISO 9613, Name: "CompressorBuilding-NorthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
26	17574388.01	4418845.14	0.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-3.9	0.0	0.0	0.0	0.0	-0.0	0.9	0.9
27	17574388.01	4418845.14	0.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-3.9	0.0	0.0	0.0	0.0	-0.0	-3.2	-3.2
28	17574388.01	4418845.14	0.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-3.9	0.0	0.0	0.0	0.0	-0.0	-34.7	-34.7
29	17574401.96	4418832.30	1.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-2.5	0.0	0.0	0.0	0.0	-0.0	-12.5	-12.5
30	17574401.96	4418832.30	1.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	1.4	0.0	0.0	0.0	0.0	-0.0	-10.1	-10.1
31	17574401.96	4418832.30	1.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	0.0	0.0	0.0	0.0	0.0	-0.0	-3.8	-3.8
32	17574401.96	4418832.30	1.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-3.0	0.0	0.0	0.0	0.0	-0.0	5.1	5.1
33	17574401.96	4418832.30	1.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-3.4	0.0	0.0	0.0	0.0	-0.0	7.3	7.3
34	17574401.96	4418832.30	1.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-3.4	0.0	0.0	0.0	0.0	-0.0	3.6	3.6
35	17574401.96	4418832.30	1.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-3.4	0.0	0.0	0.0	0.0	-0.0	-26.6	-26.6
36	17574388.01	4418845.14	1.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-2.5	0.0	0.0	0.0	0.0	-0.0	-19.2	-19.2
37	17574388.01	4418845.14	1.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	1.3	0.0	0.0	0.0	0.0	-0.0	-16.8	-16.8
38	17574388.01	4418845.14	1.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	-0.1	0.0	0.0	0.0	0.0	-0.0	-10.5	-10.5
39	17574388.01	4418845.14	1.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-3.1	0.0	0.0	0.0	0.0	-0.0	-1.6	-1.6
40	17574388.01	4418845.14	1.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-3.5	0.0	0.0	0.0	0.0	-0.0	0.5	0.5
41	17574388.01	4418845.14	1.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-3.5	0.0	0.0	0.0	0.0	-0.0	-3.5	-3.5
42	17574388.01	4418845.14	1.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-3.5	0.0	0.0	0.0	0.0	-0.0	-35.0	-35.0
43	17574401.96	4418832.30	3.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-1.7	0.0	0.0	0.0	0.0	-0.0	-13.3	-13.3
44	17574401.96	4418832.30	3.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	2.2	0.0	0.0	0.0	0.0	-0.0	-10.8	-10.8
45	17574401.96	4418832.30	3.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	0.8	0.0	0.0	0.0	0.0	-0.0	-4.5	-4.5
46	17574401.96	4418832.30	3.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-2.2	0.0	0.0	0.0	0.0	-0.0	4.3	4.3
47	17574401.96	4418832.30	3.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-2.7	0.0	0.0	0.0	0.0	-0.0	6.5	6.5
48	17574401.96	4418832.30	3.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-2.7	0.0	0.0	0.0	0.0	-0.0	2.8	2.8
49	17574401.96	4418832.30	3.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-2.7	0.0	0.0	0.0	0.0	-0.0	-27.3	-27.3
50	17574388.01	4418845.14	3.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-1.8	0.0	0.0	0.0	0.0	-0.0	-19.9	-19.9
51	17574388.01	4418845.14	3.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	2.0	0.0	0.0	0.0	0.0	-0.0	-17.4	-17.4
52	17574388.01	4418845.14	3.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	0.6	0.0	0.0	0.0	0.0	-0.0	-11.2	-11.2
53	17574388.01	4418845.14	3.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-2.4	0.0	0.0	0.0	0.0	-0.0	-2.3	-2.3
54	17574388.01	4418845.14	3.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-2.8	0.0	0.0	0.0	0.0	-0.0	-0.2	-0.2
55	17574388.01	4418845.14	3.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-2.8	0.0	0.0	0.0	0.0	-0.0	-4.2	-4.2
56	17574388.01	4418845.14	3.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-2.8	0.0	0.0	0.0	0.0	-0.0	-35.7	-35.7
57	17574401.96	4418832.30	5.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-0.9	0.0	0.0	0.0	0.0	-0.0	-14.1	-14.1
58	17574401.96	4418832.30	5.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	2.9	0.0	0.0	0.0	0.0	-0.0	-11.6	-11.6
59	17574401.96	4418832.30	5.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	1.5	0.0	0.0	0.0	0.0	-0.0	-5.3	-5.3
60	17574401.96	4418832.30	5.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-1.5	0.0	0.0	0.0	0.0	-0.0	3.6	3.6
61	17574401.96	4418832.30	5.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-2.0	0.0	0.0	0.0	0.0	-0.0	5.8	5.8
62	17574401.96	4418832.30	5.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-2.0	0.0	0.0	0.0	0.0	-0.0	2.1	2.1
63	17574401.96	4418832.30	5.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-2.0	0.0	0.0	0.0	0.0	-0.0	-28.0	-28.0
64	17574388.01	4418845.14	5.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-1.1	0.0	0.0	0.0	0.0	-0.0	-20.6	-20.6
65	17574388.01	4418845.14	5.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	2.7	0.0	0.0	0.0	0.0	-0.0	-18.1	-18.1
66	17574388.01	4418845.14	5.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	1.3	0.0	0.0	0.0	0.0	-0.0	-11.9	-11.9
67	17574388.01	4418845.14	5.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-1.7	0.0	0.0	0.0	0.0	-0.0	-3.0	-3.0
68	17574388.01	4418845.14	5.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-2.2	0.0	0.0	0.0	0.0	-0.0	-0.9	-0.9
69	17574388.01	4418845.14	5.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-2.2	0.0	0.0	0.0	0.0	-0.0	-4.9	-4.9
70	17574388.01	4418845.14	5.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-2.2	0.0	0.0	0.0	0.0	-0.0	-36.4	-36.4
71	17574401.96	4418832.30	8.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-14.6	-14.6
72	17574401.96	4418832.30	8.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-12.0	-12.0
73	17574401.96	4418832.30	8.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	1.9	0.0	0.0	0.0	0.0	-0.0	-5.6	-5.6
74	17574401.96	4418832.30	8.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-1.1	0.0	0.0	0.0	0.0	-0.0	3.2	3.2
75	17574401.96	4418832.30	8.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-1.6	0.0	0.0	0.0	0.0	-0.0	5.4	5.4
76	17574401.96	4418832.30	8.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-1.6	0.0	0.0	0.0	0.0	-0.0	1.7	1.7
77	17574401.96	4418832.30	8.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-1.6	0.0	0.0	0.0	0.0	-0.0	-28.4	-28.4
78	17574388.01	4418845.14	8.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-21.3	-21.3
79	17574388.01	4418845.14	8.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	3.3	0.0	0.0	0.0	0.0	-0.0	-18.7	-18.7
80	17574388.01	4418845.14	8.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	1.8	0.0	0.0	0.0	0.0	-0.0	-12.4	-12.4
81	17574388.01	4418845.14	8.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-1.2	0.0	0.0	0.0	0.0	-0.0	-3.5	-3.5
82	17574388.01	4418845.14	8.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-1.4	-1.4
83	17574388.01	4418845.14	8.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-1.6	0.0	0.0	0.0	0.0	-0.0	-5.5	-5.5
84	17574388.01	4418845.14	8.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-1.6	0.0	0.0	0.0	0.0	-0.0	-37.0	-37.0
85	17574401.96	4418832.30	6.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-0.5	0.0	0.0	0.0	0.0	-0.0	-14.6	-14.6
86	17574401.96	4418832.30	6.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	3.2	0.0	0.0	0.0	0.0	-0.0	-11.8	-11.8
87	17574401.96	4418832.30	6.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	1.7	0.0	0.0	0.0	0.0	-0.0	-5.5	-5.5
88	17574401.96	4418832.30	6.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-1.3	0.0	0.0	0.0	0.0	-0.0	3.4	3.4

vert. Area Source, ISO 9613, Name: "CompressorBuilding-NorthWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
89	17574401.96	4418832.30	6.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-1.7	0.0	0.0	0.0	0.0	-0.0	5.6	5.6
90	17574401.96	4418832.30	6.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-1.7	0.0	0.0	0.0	0.0	-0.0	1.9	1.9
91	17574401.96	4418832.30	6.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-1.7	0.0	0.0	0.0	0.0	-0.0	-28.3	-28.3
92	17574388.01	4418845.14	6.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-0.7	0.0	0.0	0.0	0.0	-0.0	-21.1	-21.1
93	17574388.01	4418845.14	6.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	3.0	0.0	0.0	0.0	0.0	-0.0	-18.4	-18.4
94	17574388.01	4418845.14	6.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	1.6	0.0	0.0	0.0	0.0	-0.0	-12.1	-12.1
95	17574388.01	4418845.14	6.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-1.4	0.0	0.0	0.0	0.0	-0.0	-3.3	-3.3
96	17574388.01	4418845.14	6.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-1.9	0.0	0.0	0.0	0.0	-0.0	-1.2	-1.2
97	17574388.01	4418845.14	6.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-1.9	0.0	0.0	0.0	0.0	-0.0	-5.2	-5.2
98	17574388.01	4418845.14	6.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-1.9	0.0	0.0	0.0	0.0	-0.0	-36.7	-36.7
99	17574401.96	4418832.30	4.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-1.4	0.0	0.0	0.0	0.0	-0.0	-13.7	-13.7
100	17574401.96	4418832.30	4.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	2.5	0.0	0.0	0.0	0.0	-0.0	-11.2	-11.2
101	17574401.96	4418832.30	4.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	1.1	0.0	0.0	0.0	0.0	-0.0	-4.9	-4.9
102	17574401.96	4418832.30	4.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-1.9	0.0	0.0	0.0	0.0	-0.0	4.0	4.0
103	17574401.96	4418832.30	4.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-2.3	0.0	0.0	0.0	0.0	-0.0	6.2	6.2
104	17574401.96	4418832.30	4.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-2.3	0.0	0.0	0.0	0.0	-0.0	2.5	2.5
105	17574401.96	4418832.30	4.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-2.3	0.0	0.0	0.0	0.0	-0.0	-27.7	-27.7
106	17574388.01	4418845.14	4.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-1.5	0.0	0.0	0.0	0.0	-0.0	-20.3	-20.3
107	17574388.01	4418845.14	4.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	2.4	0.0	0.0	0.0	0.0	-0.0	-17.8	-17.8
108	17574388.01	4418845.14	4.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	1.0	0.0	0.0	0.0	0.0	-0.0	-11.5	-11.5
109	17574388.01	4418845.14	4.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-2.0	0.0	0.0	0.0	0.0	-0.0	-2.6	-2.6
110	17574388.01	4418845.14	4.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-2.5	0.0	0.0	0.0	0.0	-0.0	-0.5	-0.5
111	17574388.01	4418845.14	4.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-2.5	0.0	0.0	0.0	0.0	-0.0	-4.6	-4.6
112	17574388.01	4418845.14	4.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-2.5	0.0	0.0	0.0	0.0	-0.0	-36.1	-36.1
113	17574401.96	4418832.30	2.64	0	125	40.8	40.8	3.0	0.0	58.7	0.1	-2.1	0.0	0.0	0.0	0.0	-0.0	-12.9	-12.9
114	17574401.96	4418832.30	2.64	0	250	47.3	47.3	3.0	0.0	58.7	0.3	1.8	0.0	0.0	0.0	0.0	-0.0	-10.5	-10.5
115	17574401.96	4418832.30	2.64	0	500	52.4	52.4	3.0	0.0	58.7	0.5	0.4	0.0	0.0	0.0	0.0	-0.0	-4.2	-4.2
116	17574401.96	4418832.30	2.64	0	1000	58.7	58.7	3.0	0.0	58.7	0.9	-2.6	0.0	0.0	0.0	0.0	-0.0	4.7	4.7
117	17574401.96	4418832.30	2.64	0	2000	61.9	61.9	3.0	0.0	58.7	2.3	-3.1	0.0	0.0	0.0	0.0	-0.0	6.9	6.9
118	17574401.96	4418832.30	2.64	0	4000	63.8	63.8	3.0	0.0	58.7	7.9	-3.1	0.0	0.0	0.0	0.0	-0.0	3.2	3.2
119	17574401.96	4418832.30	2.64	0	8000	54.0	54.0	3.0	0.0	58.7	28.3	-3.1	0.0	0.0	0.0	0.0	-0.0	-26.9	-26.9
120	17574388.01	4418845.14	2.64	0	125	34.6	34.6	3.0	0.0	59.2	0.1	-2.2	0.0	0.0	0.0	0.0	-0.0	-19.6	-19.6
121	17574388.01	4418845.14	2.64	0	250	41.1	41.1	3.0	0.0	59.2	0.3	1.7	0.0	0.0	0.0	0.0	-0.0	-17.1	-17.1
122	17574388.01	4418845.14	2.64	0	500	46.2	46.2	3.0	0.0	59.2	0.5	0.3	0.0	0.0	0.0	0.0	-0.0	-10.8	-10.8
123	17574388.01	4418845.14	2.64	0	1000	52.5	52.5	3.0	0.0	59.2	0.9	-2.7	0.0	0.0	0.0	0.0	-0.0	-1.9	-1.9
124	17574388.01	4418845.14	2.64	0	2000	55.7	55.7	3.0	0.0	59.2	2.5	-3.2	0.0	0.0	0.0	0.0	-0.0	0.2	0.2
125	17574388.01	4418845.14	2.64	0	4000	57.6	57.6	3.0	0.0	59.2	8.5	-3.2	0.0	0.0	0.0	0.0	-0.0	-3.9	-3.9
126	17574388.01	4418845.14	2.64	0	8000	47.8	47.8	3.0	0.0	59.2	30.1	-3.2	0.0	0.0	0.0	0.0	-0.0	-35.4	-35.4
127	17574401.96	4418832.30	0.07	0	125	32.2	32.2	3.0	0.0	58.7	0.1	-3.1	0.0	0.0	0.0	0.0	-0.0	-20.5	-20.5
128	17574401.96	4418832.30	0.07	0	250	38.7	38.7	3.0	0.0	58.7	0.3	0.9	0.0	0.0	0.0	0.0	-0.0	-18.1	-18.1
129	17574401.96	4418832.30	0.07	0	500	43.8	43.8	3.0	0.0	58.7	0.5	-0.6	0.0	0.0	0.0	0.0	-0.0	-11.7	-11.7
130	17574401.96	4418832.30	0.07	0	1000	50.1	50.1	3.0	0.0	58.7	0.9	-3.6	0.0	0.0	0.0	0.0	-0.0	-2.9	-2.9
131	17574401.96	4418832.30	0.07	0	2000	53.3	53.3	3.0	0.0	58.7	2.3	-4.0	0.0	0.0	0.0	0.0	-0.0	-0.7	-0.7
132	17574401.96	4418832.30	0.07	0	4000	55.2	55.2	3.0	0.0	58.7	7.9	-4.0	0.0	0.0	0.0	0.0	-0.0	-4.4	-4.4
133	17574401.96	4418832.30	0.07	0	8000	45.4	45.4	3.0	0.0	58.7	28.3	-4.0	0.0	0.0	0.0	0.0	-0.0	-34.5	-34.5
134	17574388.01	4418845.14	0.07	0	125	26.0	26.0	3.0	0.0	59.2	0.1	-3.1	0.0	0.0	0.0	0.0	-0.0	-27.2	-27.2
135	17574388.01	4418845.14	0.07	0	250	32.5	32.5	3.0	0.0	59.2	0.3	0.8	0.0	0.0	0.0	0.0	-0.0	-24.7	-24.7
136	17574388.01	4418845.14	0.07	0	500	37.6	37.6	3.0	0.0	59.2	0.5	-0.6	0.0	0.0	0.0	0.0	-0.0	-18.4	-18.4
137	17574388.01	4418845.14	0.07	0	1000	43.9	43.9	3.0	0.0	59.2	0.9	-3.6	0.0	0.0	0.0	0.0	-0.0	-9.6	-9.6
138	17574388.01	4418845.14	0.07	0	2000	47.1	47.1	3.0	0.0	59.2	2.5	-4.1	0.0	0.0	0.0	0.0	-0.0	-7.5	-7.5
139	17574388.01	4418845.14	0.07	0	4000	49.0	49.0	3.0	0.0	59.2	8.5	-4.1	0.0	0.0	0.0	0.0	-0.0	-11.5	-11.5
140	17574388.01	4418845.14	0.07	0	8000	39.2	39.2	3.0	0.0	59.2	30.1	-4.1	0.0	0.0	0.0	0.0	-0.0	-43.0	-43.0

vert. Area Source, ISO 9613, Name: "CompressorBuilding-WestWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
1	17574378.77	4418840.01	5.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-1.2	0.0	0.0	12.9	0.0	-0.0	-29.4	-29.4
2	17574378.77	4418840.01	5.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	2.7	0.0	0.0	15.1	0.0	-0.0	-29.1	-29.1
3	17574378.77	4418840.01	5.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	1.2	0.0	0.0	19.0	0.0	-0.0	-26.7	-26.7
4	17574378.77	4418840.01	5.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-1.8	0.0	0.0	21.6	0.0	-0.0	-20.4	-20.4
5	17574378.77	4418840.01	5.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-2.2	0.0	0.0	22.9	0.0	-0.0	-19.7	-19.7
6	17574378.77	4418840.01	5.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-2.2	0.0	0.0	23.9	0.0	-0.0	-24.9	-24.9
7	17574378.77	4418840.01	5.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-2.2	0.0	0.0	24.4	0.0	-0.0	-57.6	-57.6

vert. Area Source, ISO 9613, Name: "CompressorBuilding-WestWall", ID: "-"																			
Nr.	X	Y	Z	Refl.	Freq.	LxT	LxN	K0	Dc	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	LrT	LrN
	(m)	(m)	(m)		(Hz)	dB(A)	dB(A)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)	dB(A)
8	17574378.77	4418840.01	2.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-2.2	0.0	0.0	13.8	0.0	-0.0	-29.3	-29.3
9	17574378.77	4418840.01	2.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	1.6	0.0	0.0	16.6	0.0	-0.0	-29.6	-29.6
10	17574378.77	4418840.01	2.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	0.2	0.0	0.0	19.6	0.0	-0.0	-26.3	-26.3
11	17574378.77	4418840.01	2.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-2.8	0.0	0.0	21.6	0.0	-0.0	-19.4	-19.4
12	17574378.77	4418840.01	2.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-3.3	0.0	0.0	22.9	0.0	-0.0	-18.7	-18.7
13	17574378.77	4418840.01	2.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-3.3	0.0	0.0	23.9	0.0	-0.0	-23.9	-23.9
14	17574378.77	4418840.01	2.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-3.3	0.0	0.0	24.4	0.0	-0.0	-56.6	-56.6
15	17574378.77	4418840.01	8.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-0.5	0.0	0.0	9.2	0.0	-0.0	-26.4	-26.4
16	17574378.77	4418840.01	8.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	3.3	0.0	0.0	9.3	0.0	-0.0	-23.9	-23.9
17	17574378.77	4418840.01	8.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	1.8	0.0	0.0	14.0	0.0	-0.0	-22.3	-22.3
18	17574378.77	4418840.01	8.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-1.2	0.0	0.0	18.8	0.0	-0.0	-18.3	-18.3
19	17574378.77	4418840.01	8.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-1.6	0.0	0.0	21.8	0.0	-0.0	-19.2	-19.2
20	17574378.77	4418840.01	8.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-1.6	0.0	0.0	24.8	0.0	-0.0	-26.4	-26.4
21	17574378.77	4418840.01	8.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-1.6	0.0	0.0	25.0	0.0	-0.0	-58.8	-58.8
22	17574378.77	4418840.01	4.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-1.5	0.0	0.0	13.3	0.0	-0.0	-29.4	-29.4
23	17574378.77	4418840.01	4.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	2.3	0.0	0.0	15.8	0.0	-0.0	-29.4	-29.4
24	17574378.77	4418840.01	4.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	0.9	0.0	0.0	19.4	0.0	-0.0	-26.8	-26.8
25	17574378.77	4418840.01	4.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-2.1	0.0	0.0	21.6	0.0	-0.0	-20.1	-20.1
26	17574378.77	4418840.01	4.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-2.6	0.0	0.0	22.9	0.0	-0.0	-19.4	-19.4
27	17574378.77	4418840.01	4.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-2.6	0.0	0.0	23.9	0.0	-0.0	-24.6	-24.6
28	17574378.77	4418840.01	4.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-2.6	0.0	0.0	24.4	0.0	-0.0	-57.3	-57.3
29	17574378.77	4418840.01	0.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-2.9	0.0	0.0	14.1	0.0	-0.0	-28.9	-28.9
30	17574378.77	4418840.01	0.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	1.0	0.0	0.0	17.1	0.0	-0.0	-29.4	-29.4
31	17574378.77	4418840.01	0.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	-0.5	0.0	0.0	19.7	0.0	-0.0	-25.7	-25.7
32	17574378.77	4418840.01	0.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-3.5	0.0	0.0	21.6	0.0	-0.0	-18.7	-18.7
33	17574378.77	4418840.01	0.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-3.9	0.0	0.0	22.9	0.0	-0.0	-18.1	-18.1
34	17574378.77	4418840.01	0.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-3.9	0.0	0.0	23.9	0.0	-0.0	-23.2	-23.2
35	17574378.77	4418840.01	0.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-3.9	0.0	0.0	24.4	0.0	-0.0	-55.9	-55.9
36	17574378.77	4418840.01	7.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-0.5	0.0	0.0	11.2	0.0	-0.0	-28.4	-28.4
37	17574378.77	4418840.01	7.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	3.2	0.0	0.0	12.6	0.0	-0.0	-27.1	-27.1
38	17574378.77	4418840.01	7.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	1.7	0.0	0.0	17.0	0.0	-0.0	-25.2	-25.2
39	17574378.77	4418840.01	7.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-1.3	0.0	0.0	21.1	0.0	-0.0	-20.4	-20.4
40	17574378.77	4418840.01	7.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-1.7	0.0	0.0	23.0	0.0	-0.0	-20.3	-20.3
41	17574378.77	4418840.01	7.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-1.7	0.0	0.0	23.9	0.0	-0.0	-25.5	-25.5
42	17574378.77	4418840.01	7.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-1.7	0.0	0.0	24.4	0.0	-0.0	-58.2	-58.2
43	17574378.77	4418840.01	3.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-1.9	0.0	0.0	13.6	0.0	-0.0	-29.4	-29.4
44	17574378.77	4418840.01	3.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	2.0	0.0	0.0	16.3	0.0	-0.0	-29.6	-29.6
45	17574378.77	4418840.01	3.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	0.6	0.0	0.0	19.5	0.0	-0.0	-26.6	-26.6
46	17574378.77	4418840.01	3.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-2.4	0.0	0.0	21.6	0.0	-0.0	-19.8	-19.8
47	17574378.77	4418840.01	3.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-2.9	0.0	0.0	22.9	0.0	-0.0	-19.1	-19.1
48	17574378.77	4418840.01	3.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-2.9	0.0	0.0	23.9	0.0	-0.0	-24.2	-24.2
49	17574378.77	4418840.01	3.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-2.9	0.0	0.0	24.4	0.0	-0.0	-56.9	-56.9
50	17574378.77	4418840.01	1.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-2.5	0.0	0.0	14.0	0.0	-0.0	-29.1	-29.1
51	17574378.77	4418840.01	1.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	1.3	0.0	0.0	16.9	0.0	-0.0	-29.6	-29.6
52	17574378.77	4418840.01	1.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	-0.1	0.0	0.0	19.7	0.0	-0.0	-26.1	-26.1
53	17574378.77	4418840.01	1.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-3.1	0.0	0.0	21.6	0.0	-0.0	-19.1	-19.1
54	17574378.77	4418840.01	1.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-3.6	0.0	0.0	22.9	0.0	-0.0	-18.4	-18.4
55	17574378.77	4418840.01	1.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-3.6	0.0	0.0	23.9	0.0	-0.0	-23.5	-23.5
56	17574378.77	4418840.01	1.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-3.6	0.0	0.0	24.4	0.0	-0.0	-56.3	-56.3
57	17574378.77	4418840.01	6.64	0	125	38.9	38.9	3.0	0.0	59.5	0.1	-0.8	0.0	0.0	12.4	0.0	-0.0	-29.3	-29.3
58	17574378.77	4418840.01	6.64	0	250	45.4	45.4	3.0	0.0	59.5	0.3	3.0	0.0	0.0	14.2	0.0	-0.0	-28.5	-28.5
59	17574378.77	4418840.01	6.64	0	500	50.5	50.5	3.0	0.0	59.5	0.5	1.5	0.0	0.0	18.4	0.0	-0.0	-26.4	-26.4
60	17574378.77	4418840.01	6.64	0	1000	56.8	56.8	3.0	0.0	59.5	1.0	-1.5	0.0	0.0	21.7	0.0	-0.0	-20.9	-20.9
61	17574378.77	4418840.01	6.64	0	2000	60.0	60.0	3.0	0.0	59.5	2.6	-1.9	0.0	0.0	23.0	0.0	-0.0	-20.1	-20.1
62	17574378.77	4418840.01	6.64	0	4000	61.9	61.9	3.0	0.0	59.5	8.7	-1.9	0.0	0.0	23.9	0.0	-0.0	-25.3	-25.3
63	17574378.77	4418840.01	6.64	0	8000	52.1	52.1	3.0	0.0	59.5	31.1	-1.9	0.0	0.0	24.4	0.0	-0.0	-58.0	-58.0
64	17574378.77	4418840.01	0.07	0	125	30.4	30.4	3.0	0.0	59.5	0.1	-3.0	0.0	0.0	14.2	0.0	-0.0	-37.3	-37.3
65	17574378.77	4418840.01	0.07	0	250	36.9	36.9	3.0	0.0	59.5	0.3	0.8	0.0	0.0	17.2	0.0	-0.0	-37.9	-37.9
66	17574378.77	4418840.01	0.07	0	500	42.0	42.0	3.0	0.0	59.5	0.5	-0.7	0.0	0.0	19.7	0.0	-0.0	-34.1	-34.1
67	17574378.77	4418840.01	0.07	0	1000	48.3	48.3	3.0	0.0	59.5	1.0	-3.7	0.0	0.0	21.6	0.0	-0.0	-27.1	-27.1
68	17574378.77	4418840.01	0.07	0	2000	51.5	51.5	3.0	0.0	59.5	2.6	-4.1	0.0	0.0	22.9	0.0	-0.0	-26.4	-26.4
69	17574378.77	4418840.01	0.07	0	4000	53.4	53.4	3.0	0.0	59.5	8.7	-4.1	0.0	0.0	23.9	0.0	-0.0	-31.6	-31.6
70	17574378.77	4418840.01	0.07	0	8000	43.6	43.6	3.0	0.0	59.5	31.1	-4.1	0.0	0.0	24.4	0.0	-0.0	-64.3	-64.3