Environmental Consulting & Technology, Inc.

July 31, 2017
ECT No.: 150533.0200

John La Rosa
Pennsylvania Department of Environmental Protection
Bureau of Air Quality
400 Market Street
Harrisburg, PA 17101

Re: Response to DEP Comments on Air Quality Analysis
Plan Approval Application No. 30-00233B
Hill Top Energy Center
Cumberland Township, Greene County, PA

Dear Mr. La Rosa:

On behalf of Hill Top Energy Center, LLC (HTEC), please accept the following responses to your technical questions received July 12, 2017. For ease of understanding, your questions are repeated and followed by our response.

The responses have been incorporated into the enclosed Revised Plan Approval Application (Revision I).

<u>7.6 – Receptor Data</u>

1. The second sentence of this subsection states, "[t]he entire perimeter of the Project Site will be fenced." The "switchyard," however, appears to be a part of the Project Site that would not be fenced, based on the model's fence line (i.e., ambient air boundary) receptors. If the placement of the model's fence line receptors is correct, the last paragraph of this subsection should also mention that model receptor elevations within the "switchyard" were adjusted to the graded elevation of 1,122 feet.

<u>Response</u>:
The text was updated to read that the model receptor elevations within the switchyard were adjusted to the graded site elevation of 1,122 feet.

<u>7.8 – Representative Background Ambient Concentrations</u>

2. The 1-hour nitrogen dioxide (NO2) 2013-2015 design value measured at the DEP's Charleroi monitor (Site ID: 42-125-0005) is 36 parts per billion (ppb), or 67.68190 micrograms per cubic meter (µg/m3) as calculated by AERMOD. Table 7-11 (and Table 8-1) should be updated.

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Response:
The 1-hour NO_2 design values was updated to 67.68 μg/m^3 in Table 7-11 and Table 8-1.

8.2.5.1 NO2 1-Hour Average NAAQS Modeling Results

3. If the correct 1-hour NO2 2013-2015 design value of 36 ppb is specified in AERMOD using the BACKGRND keyword in the source (SO) pathway and the BACKGRND keyword is included with the appropriate source group(s), AERMOD predicts additional modeled violations of the 1-hour NO2 National Ambient Air Quality Standard (NAAQS). Hill Top Energy Center's sources during at least one emission scenario (e.g., cold start) will contribute significantly (> 7.5 μg/m3) to these additional modeled 1-hour NO2 NAAQS violations. A possible solution to this issue may be to utilize a less conservative methodology for representing the 1-hour NO2 background concentration in AERMOD by using multiyear averages of the 98th-percentile concentrations by season and hour-of-day as described in the U.S. Environmental Protection Agency's (EPA) March 1, 2011, memorandum, "Additional Clarification Regarding Applicability of Appendix W Modeling Guidance for the 1-hour NO2 NAAQS." The DEP will provide the hourly NO2 concentrations for 2013-2015 from the Charleroi monitor to utilize this method. If this method is pursued, HTEC should forward the seasonal/hourly background concentrations to the DEP for review prior to the execution of AERMOD. Also, Table 8-5 and Table 8-6 should be updated.

Response:
The 1-hour NO_2 NAAQS modeling was revised to include the background concentrations by using multiyear averages of the 98th percentile concentrations by season and hour of day. The concentrations used in the modeling are presented below. These values were verified by Andrew Fleck in an email received July 14, 2017. The results in Table 8-5 and Table 8-6 have been updated to account for the new background concentrations.

2013-2015 3-Year Average Background Concentration				
Hour	winter	spring	summer	fall
0:00	31.0	28.0	20.3	22.7
1:00	31.0	28.7	19.0	22.0
2:00	31.3	31.0	17.0	21.0
3:00	30.3	30.7	18.3	21.0
4:00	29.7	29.3	15.7	20.3
5:00	30.7	29.7	15.7	20.3
6:00	30.7	29.7	16.7	20.3
7:00	33.3	31.3	19.0	22.3
8:00	33.7	29.0	17.0	23.0
9:00	34.3	29.3	14.0	25.0
10:00	32.0	20.3	11.0	23.0
11:00	31.0	14.7	9.0	17.3
12:00	28.7	15.0	8.0	11.3
13:00	24.7	14.0	8.0	11.0
14:00	24.3	11.0	7.7	10.7
15:00	23.7	11.3	8.0	10.3
16:00	23.0	11.3	7.3	12.7
17:00	22.3	12.0	9.0	16.7
18:00	25.7	16.3	9.7	20.3
19:00	27.7	20.3	11.7	23.7
20:00	27.7	21.3	12.3	24.7
21:00	28.7	24.3	14.3	26.0
22:00	30.3	28.0	17.0	25.3
23:00	32.3	27.0	19.3	24.0

10.4.2.2 Ancillary Equipment

4. In Table 10-8, the annual sulfuric acid mist (H_2SO_4) emission rates for the fuel gas heater, emergency generator, and fire water pump do not match those listed in Table C-2 of Appendix C and those entered in the AERMOD input files.

Response:
The annual sulfuric acid mist (H_2SO_4) emission rates for the fuel gas heater was updated in Table 10-8 to match those listed in the tables in Appendix C.

Additionally the 1-hour emission rates in the modeling file were updated to be consistent with the emission rates presented in Table 10-8 and Appendix C. The results in Table 10-9 have been updated accordingly.

Upon completion of your review of the responses provided and the attached Revised Plan Approval Application (Revision I), please do not hesitate to contact us at (919) 861-8888 if you have any additional questions or comments.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Joshua Ralph
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w/ enclosures

REVISED
PLAN APPROVAL APPLICATION FOR THE HILL TOP ENERGY CENTER COMBINED-CYCLE PROJECT

Revision I

Prepared for:

HILL TOP ENERGY CENTER, LLC
Nemacolin, Pennsylvania

Prepared by:

ECT Environmental Consulting & Technology, Inc.

7208 Falls of Neuse Road, Suite 102
Raleigh, North Carolina 27615

ECT No. 150533-0500

July 2017

DOCUMENT REVIEW

The dual signatory process is an integral part of Environmental Consulting & Technology, Inc.'s (ECT's) Document Review Policy No. 9.03. All ECT documents undergo technical/peer review prior to dispatching these documents to any outside entity.

This document has been authored and reviewed by the following employees:

Joshua Ralph	William C. Campbell, III, P.E.
Author	Peer Review
Joshua Ralph	William C. Campbell III
Signature	Signature
July 31, 2017	July 31, 2017
Date	Date

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degree Fahrenheit
$\mu g/m^3$	microgram per cubic meter
1×1	one-on-one
ACFM	actual cubic foot per minute
ACHD	Allegheny County Health Department
AERMAP	AERMOD terrain preprocessor program
AERMET	AERMOD meteorological preprocessor program
AERMIC	American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model Improvement Committee
AERMOD	American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model Improvement Committee model
AMS	American Meteorological Society
AQRV	air quality-related value
ARM2	Ambient Ratio Method Version 2
ARP	Acid Rain Program
BACT	best available control technology
BASEDB	base with evaporative cooler and duct burner
BAT	best available technology
BEEST	Providence Engineering and Environmental Group, LLC BEEST Suite
bhp	brake-horsepower
BPIP	Building Profile Input Program
BPIPPRM	Building Profile Input Program for Plume Rise Model Enhancement
Btu/kWh	British thermal unit per kilowatt-hour
CAA	Clean Air Act
CAM	compliance assurance monitoring
CCS	carbon capture and sequestration
CEMS	Continues Emissions Monitoring Systems
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSAPR	Cross-State Air Pollution Rule
CT	combustion turbine
EGU	electric generating unit
EPA	U.S. Environmental Protection Agency
FBN	fuel-bound nitrogen
FLAG	Federal Land Managers' Air Quality-Related Values Work Group
FLM	Federal Land Managers
fps	foot per second
FR	Federal Register
ft	foot
ft^3/sec	cubic foot per second

LIST OF ACRONYMS AND ABBREVIATIONS
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g/bhp-hr	gram per brake-horsepower-hour
g/kW-hr	gram per kilowatt-hour
g/sec	gram per second
GAQM	EPA's Guideline on Air Quality Models
GCP	good combustion practices
GE	General Electric International, Inc.
GEP	good engineering practice
GHG	greenhouse gas
gr/100 scf	grain per 100 standard cubic feet
H2H	highest 2nd-high
H_2SO_4	sulfuric acid
HAP	hazardous air pollutant
HHV	higher heating value
Hill Top	Hill Top Energy Center
hp	horsepower
hr/yr	hour per year
HRSG	heat recovery steam generator
HTEC	Hill Top Energy Center, LLC
IEA	International Energy Agency
km	kilometer
KMGW	Morgantown Municipal Airport
kW	kilowatt
LAER	lowest achievable emissions rate
lb	pound
lb/hr	pound per hour
lb/MMBtu	pound per million British thermal units
lb/MWh	pound per megawatt-hour
m/sec	meter per second
MATS	Mercury and Air Toxics Standards
MMBtu/hr	million British thermal units per hour
MW	megawatt
N_2	molecular nitrogen
NAAQS	national ambient air quality standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
NESHAP	National Emissions Standards for Hazardous Air Pollutants
ng/J	nanogram per joule
NH_3	ammonia
NMHC	nonmethane hydrocarbon
NNSR	nonattainment new source review
NO	nitric oxide

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued, Page 3 of 4)

NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPS	National Park Service
NRCS	National Resource Conservation Service
NSCR	nonselective catalytic reduction
NSPS	New Source Performance Standards
NSR	new source review
NWS	National Weather Station
O_2	oxygen
Pa. Code	The Pennsylvania Code
PADEP	Pennsylvania Department of Environmental Protection
PJM	PJM Interconnection LLC
PM	particulate matter
PM_{10}	particulate matter less than or equal to 10 micrometers
$PM_{2.5}$	particulate matter less than or equal to 2.5 micrometers
ppm	part per million
ppmv	part per million by volume
ppmvd	part per million volume dry
PRIME	Plume Rise Model Enhancement
Project	Hill Top Energy Center
Project Site	Hill Top Project located near the town of Nemacolin in Cumberland Township, Greene County, Pennsylvania
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RACT	reasonably available control technology
RBLC	U.S. Environmental Protection Agency's RACT/BACT/LAER Clearinghouse
scf/MMBtu	standard cubic foot per million British thermal units
SCR	selective catalytic reduction
SER	significant emissions rates
SF_6	sulfur hexafluoride
SIA	significant impact area
SIL	significant impact level
SMC	significant monitoring concentration
SNCR	selective noncatalytic reduction
SO_2	sulfur dioxide
SO_3	sulfur trioxide
SO_4	sulfate
SSURGO	U.S. Department of Agriculture National Resource Conservation Service's soil survey geographic
ST	steam turbine

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued, Page 4 of 4)

tpy	ton per year
tpy/km	ton per year per kilometer
ULSD	ultra-low-sulfur diesel
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1.0 INTRODUCTION

Hill Top Energy Center, LLC (HTEC), is proposing to construct and operate a natural gas-fired, combined-cycle power plant to be known as the Hill Top Energy Center (Hill Top or Project). Hill Top will be located near the town of Nemacolin in Cumberland Township, Greene County, Pennsylvania (Project Site). The Project will consist of a single power block in a one-on-one (1×1), combined-cycle, single-shaft configuration, including a combustion turbine (CT) and heat recovery steam generator (HRSG) with a steam turbine (ST). The CT will have an electric generator. HTEC is requesting a plan approval to construct/operate a General Electric International, Inc. (GE), 7HA.02 CT (or equivalent) in a 1×1, combined-cycle configuration.

The plan approval application requires demonstrations, including regulatory compliance demonstrations and air quality modeling analyses, be performed to evaluate the 1×1, combined-cycle, single-shaft configuration.

Duct burners will be installed in the HRSG of the proposed new unit. The CT and duct burners will fire only pipeline-quality natural gas. The HRSG will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NO_x) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CT and duct burners.

This plan approval application documents emissions and applicable regulatory compliance demonstrations for the proposed plant configuration.

Hill Top will also include several pieces of ancillary equipment, including:

- One ST (not an emissions source).
- One auxiliary boiler, natural gas-fired.
- One fuel gas heater, natural gas-fired.
- One CT inlet evaporative cooler (not an emissions source).
- A multiple-cell, mechanical draft, counter-flow, evaporative cooling tower system.

- One diesel engine-powered emergency generator.
- One diesel engine-powered fire water pump.
- Diesel fuel, lubricating oil, and aqueous ammonia (NH_3) storage tanks.
- Sulfur hexafluoride (SF_6) emissions circuit breakers.

The proposed facility will be a "major source" of criteria air pollutants. HTEC is applying to the Pennsylvania Department of Environmental Protection's (PADEP's) Southwest Regional Office for a plan approval addressing new source review (NSR) as required by Pennsylvania Code (Pa. Code), Title 25, Chapter 127, Subchapters D and E.

1.1 APPLICATION INFORMATION

HTEC is a privately held company formed to develop power generation facilities in North America. To facilitate PADEP's review of this document, individuals familiar with both the facility and preparation of this plan approval application are identified in the following table. PADEP should contact these individuals if additional information or clarification is required during the review process:

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1.2 DOCUMENT ORGANIZATION

The balance of this document is divided into sections that address each component of a complete air permit application. The following outline provides an overview of the contents of each of the remaining sections:

- Section 2.0, Process Description—General description of the Project Site and primary combined-cycle process by which Hill Top will produce power.
- Section 3.0, Project Emissions—Detailed review of the emissions during normal operations and startup/shutdown events that will occur at the Project Site subsequent to completion of Project development and construction. Summaries of the methods used to quantify short-term and annual emissions rates are provided.
- Section 4.0, Applicable Regulatory Requirements and Standards—Discussion of applicable federal and/or state regulatory programs focusing on establishing which regulations are directly applicable to the CT and ancillary equipment for which compliance must be demonstrated and how they will comply.
- Section 5.0, Control Technology Analysis—Substantial requirement of NSR components of the air permit application. Because Project emissions will result in a major source of NO_x, CO, VOCs, and greenhouse gases (GHGs) and a significant increase in the emissions of certain criteria pollutants (as defined under NSR regulations), a detailed evaluation of control technologies is provided. Emissions are significant and will be subject to Prevention of Significant Deterioration (PSD) review for NO_x, CO, VOC, particular matter (PM), particulate matter less than or equal to 10 micrometers (PM_{10}), particulate matter less than or equal to 2.5 micrometers ($PM_{2.5}$), sulfuric acid (H_2SO_4), and GHG emissions. As such, top-down best available control technology (BACT) analyses for these pollutants have been provided, as well as lowest achievable emissions rate (LAER) analysis for NO_x and VOC.
- Section 6.0, Additional 25 Pa. Code §127, Subchapter E, Requirements—Additional information required by Pennsylvania Code.
- Section 7.0, Ambient Impact Analysis Modeling Procedures—Modeling procedures used to perform the National Ambient Air Quality Standards

(NAAQS) Class II area, Class I area, and other air quality analyses as required under PSD review.

- Section 8.0, Results of the Class II Area Analysis—Results of the Class II area analysis performed for the Project in accordance with PADEP modeling procedures, including the load screening analysis, significant impact analysis, and Class II area NAAQS analysis. This section also includes the preconstruction monitoring waiver request.
- Section 9.0, Class I Area Modeling Analysis—Results of the Class I area air quality analysis performed for the Project.
- Section 10.0, Other Air Quality Analyses—Supplemental information regarding potential impacts of the Project. Specifically, this section discusses the potential for impacts to soils and vegetation and impacts to the visibility of PSD Class II areas.

2.0 PROJECT DESCRIPTION

HTEC proposes to construct and operate a nominal 620-megawatt (MW), natural gas-fired, combined-cycle power plant located near the town of Nemacolin in Cumberland Township, Greene County, Pennsylvania. The Project will be one of the most efficient and clean sources of capacity and energy in Pennsylvania. Hill Top will employ GE advanced turbine technology in a combined-cycle configuration, using the exhaust heat of the gas turbine to produce steam to generate additional energy in an ST generator. This section presents a description of the Project Site, technology, and operations for the proposed Project.

2.1 SITE LOCATION AND ACCESS

The Project will be located on an approximately 41-acre site set back from Thomas Road, approximately 1.6 kilometers (km) north of the town of Nemacolin, Greene County, Pennsylvania. The Project Site is situated in Southwest Pennsylvania in the Cumberland Township on a man-made bluff above the Monongahela River prepared for a 520-MW, coal-fired power plant that was not completed. The property is a portion of the abandoned LTV Mining company site. Figure 2-1 provides an aerial image showing the location of the Project and surrounding area. The general coordinates of the Project Site are 39° 53′ 34.900″ north latitude and 79° 55′ 51.150″ west longitude.

2.2 SURROUNDING PROPERTY

Figure 2-2 shows the land use within a 3-km region surrounding the Project. From review of this figure, it is noted the 3-km region surrounding the Project Site is characterized as rural mixed with agriculture, forested land, and residential properties. The Project has been given a special use permit for a power generating facility located in Greene County. The First Energy Hatfields Ferry coal-fired power plant is located approximately 2.5 miles south of the Project, and the Fayette Power combined-cycle power plant is located on the other side of the river approximately 2.5 miles south of the Plant. The closest residential areas to the Project are approximately 0.42 mile east across the river and 0.85 mile southeast to Adah. The area to the west is forested and/or agricultural in nature.

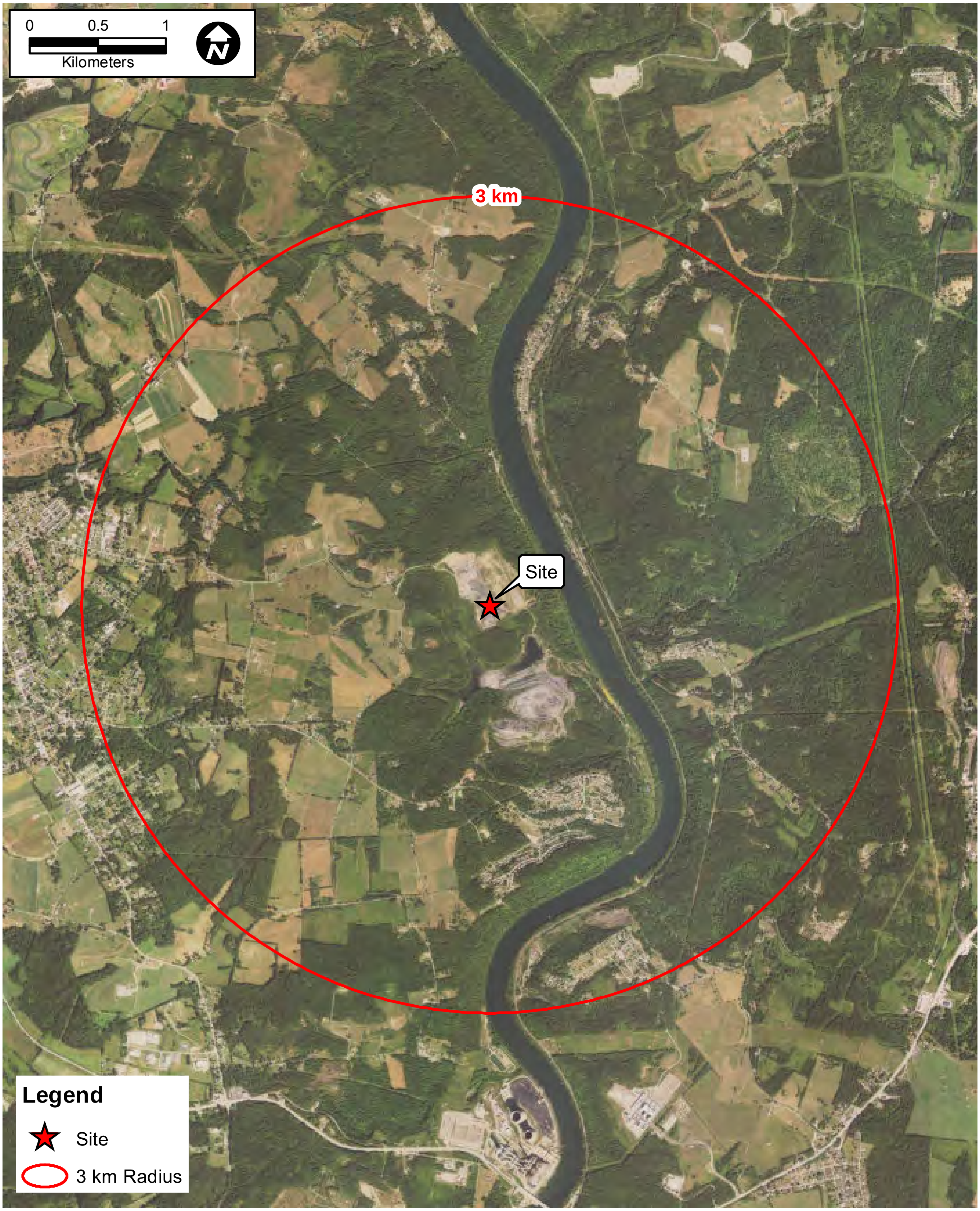

FIGURE 2-1.
SITE LOCATION AERIAL MAP

Sources: Esri Basemap Imagery, ECT 2017.

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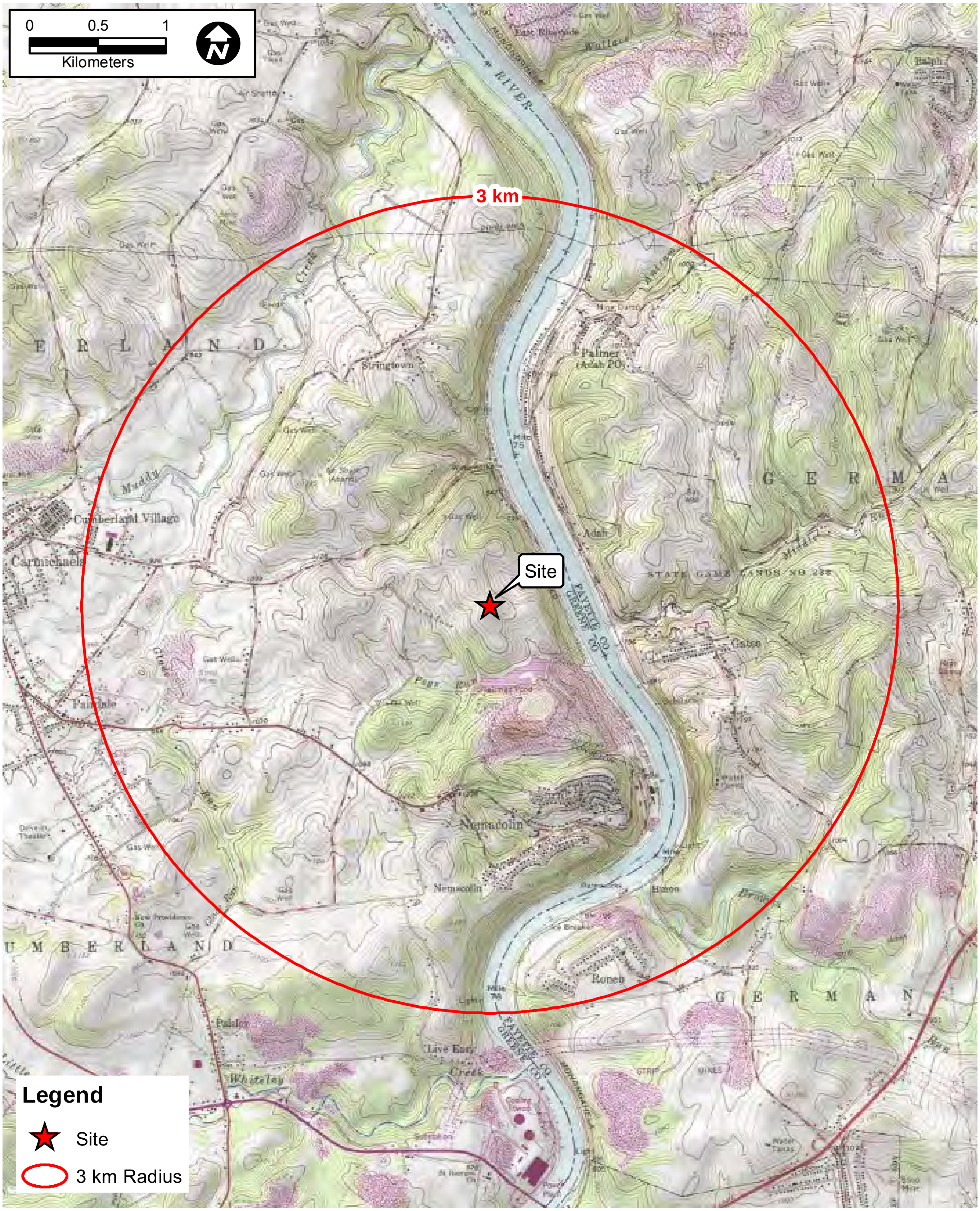

FIGURE 2-2.
SITE LOCATION TOPOGRAPHIC MAP

Sources: Esri Basemap USGS Topographic Quadrangle, ECT 2017.

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2.3 PROCESS DESCRIPTION

The Project consists of a combined-cycle power block in a 1×1, single-shaft configuration consisting of a CT, HRSG, and ST. The CT will have an electric generator. Figure 2-3 presents a schematic of a 1×1, combined-cycle configuration. The major components of the Project include:

- One CT (GE Model 7HA.02).
- One supplementary-fired HRSG (with duct burners) containing SCR for NO_x control and oxidation catalysts for CO and VOC control.
- One ST generating electricity from steam generated by the HRSG (not an emissions source).
- One auxiliary boiler, natural gas-fired.
- One fuel gas heater, natural gas-fired.
- One CT inlet evaporative cooler (not an emissions sources).
- A multiple-cell mechanical draft, counter-flow, evaporative cooling tower system.
- One diesel engine-powered emergency generator.
- One diesel engine-powered fire water pump.
- Diesel fuel, lubricating oil, and aqueous ammonia storage tanks.
- SF_6 emissions circuit breakers.

Appendix E presents the proposed general plant arrangement, and Figure 2-4 illustrates the site plan. The Project components that produce air emissions in quantities subject to this air permit application are discussed in the following subsections.

2.3.1 CTS AND HRSGS

The combined-cycle CT/HRSG package incorporates an advanced GE Model 7HA.02 CT that is similar in design and performance to the current generation commercially available or under development by GE's major competitors. For purposes of developing worst-case Project emissions rates and stack parameters and conducting required regulatory compliance demonstrations, control technology evaluations, and air quality impact analyses for this plan approval application, HTEC obtained performance and emissions data for the GE

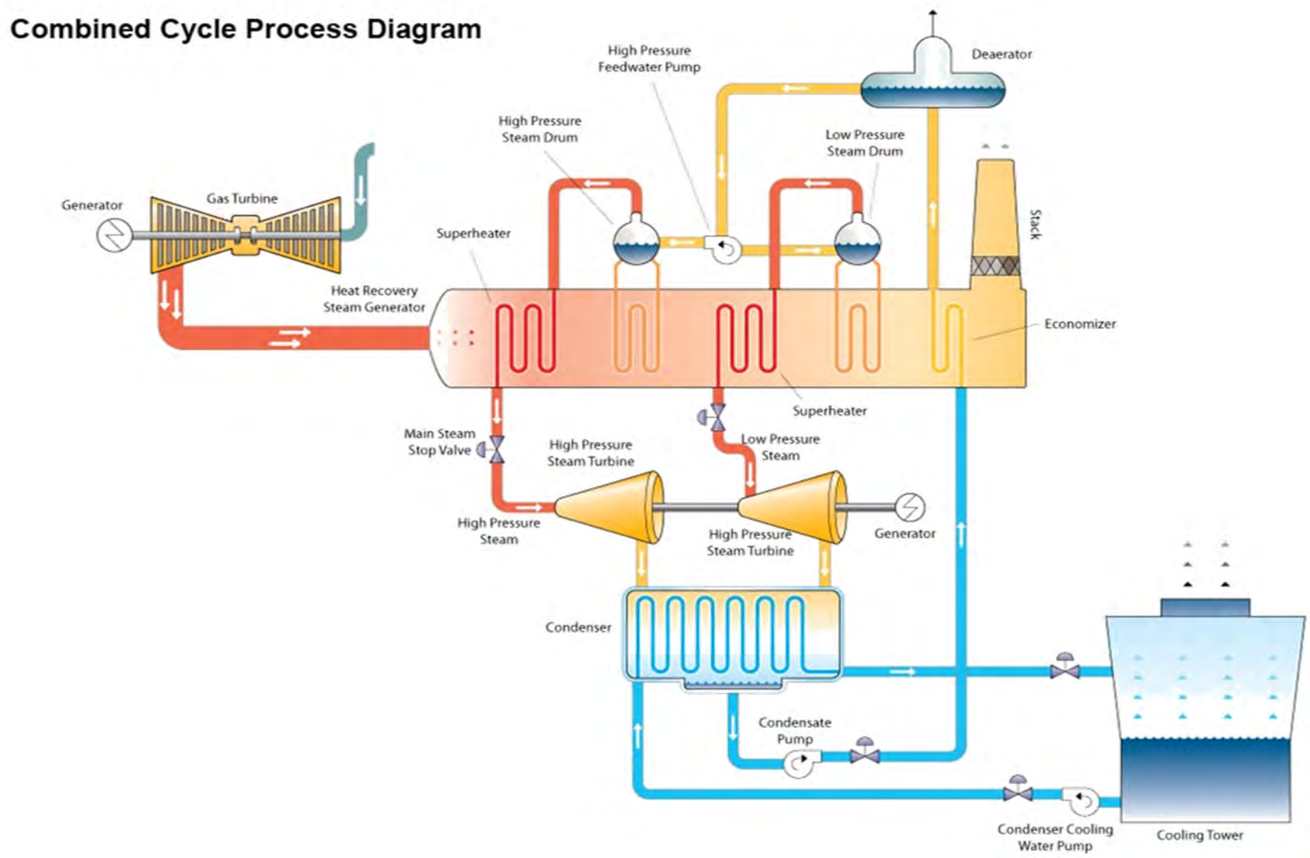

FIGURE 2-3.

1×1 SINGLE-SHAFT COMBINED-CYCLE SCHEMATIC

Source: Hill Top, 2017.

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FIGURE 2-4.
SITE PLAN

Sources: Esri Basemap Imagery, Kiewit 2017, ECT 2017.

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7HA.02 CT in combined-cycle configuration. All required demonstrations were performed using worst-case emissions and other specifications from the CT model.

In the combined-cycle process, ambient air is drawn into the compressor element of the CT through an inlet air filtration and silencing system. Inlet evaporative cooling may take place during periods of warm ambient temperatures and low relative humidity to further enhance overall production capability of the CT. After the evaporative cooler section, air enters the compressor section, where it is compressed and channeled to the fuel/mix combustion stage of the CT. This section of the CT is commonly referred to as the gas generator section. The gas generator is the component that generates criteria and hazardous air pollutant (HAP) emissions by means of the fuel combustion process.

A transition duct within the CT directs the flow of hot gases from the gas generator to the power section of the turbine. Gas generator combustion products (hot gases) expand through the stages of the power turbine where the thermodynamic, or gas, energy is converted to mechanical power.

This power is transmitted through rotation of the shaft to the generator for the CT, which is directly coupled to the turbine. The generator takes this rotative power and converts it to electricity.

The hot gases produced in the CT are directed into the HRSG through an exhaust transition duct, where waste heat is captured and converted into steam energy before the exhaust gases exit the vertical stack for the HRSG. The HRSG contains natural gas-fired duct burners that will be used at times to increase the temperature of the exhaust gases in the HRSG. This is done to maximize output of the steam cycle in the plant.

The steam produced in the HRSG is used in the ST to produce additional electrical power. Once the steam does its work in the ST, it is exhausted and condensed at a vacuum in the steam surface condenser. The cycle is a closed-loop system, as the condensate is reused as feed water to the HRSG. Circulating cooling water from the cooling tower is used to condense the steam in the condenser.

The CT and duct burners in the HRSG are the primary emissions units at the Project. The CT controls NO_x emissions by using dry low-NO_x technology, also known as lean-premix technology. In addition, NO_x emissions will be further controlled with SCR at all steady-state operating loads, with or without duct burner firing, to a level of 2 parts per million volume dry (ppmvd) corrected to 15-percent oxygen. CO emissions, with and without duct burner firing, will be controlled with catalytic oxidation to a level of 2 ppmvd corrected to 15-percent oxygen at all operating loads between approximately 30 and 100 percent, depending on ambient temperature. With duct burner firing, VOC and PM emissions will increase slightly.

The CT/HRSG is designed to operate up to 8,760 hours per year (hr/yr) at 100-percent load firing natural gas, which will be the exclusive fuel used in this equipment. The CT can maintain these stated emissions rates down to a load range of 30- to 45-percent power, depending on ambient temperature. The duct burner is also designed for exclusive natural gas firing and typically is operated only when the CT is above 90-percent load.

2.3.2 ANCILLARY EQUIPMENT

Other sources of Project emissions include a diesel engine-powered emergency generator and diesel engine-powered fire water pump. The fire water pump will be used for emergency purposes in the event of a fire and for routine operations and testing as required by the National Fire Prevention Association Code. The emergency diesel fire water pump is rated at a maximum 422 horsepower (hp). The emergency diesel engine-powered standby generator, rated at 2,000 kilowatts (kW), will allow maintenance of vital plant loads during power outages or switchyard maintenance. The emergency diesel engine will not be used for peak shaving. The diesel engine generator and fire water pump will only be operated during power interruptions to provide emergency power, lighting, and fire protection when the Project CT is not operating and, at most, once per week for less than 30 minutes for operational testing purposes when the CT is operational. The Project is proposing to accept operating restrictions on the emergency generator and fire water pump through the air quality permit that would limit annual cumulative nonemergency operation (e.g., engine test-

ing) to less than 52 hours per consecutive 12 months for each engine. The 52-hour operational restriction for each engine would not apply toward operation during actual emergency situations. Potential emissions from each emergency diesel engine have been estimated based on 100-hr/yr operation.

Ultra-low-sulfur diesel (ULSD) fuel (15 parts per million [ppm] by weight sulfur) will be used in both the fire water pump and standby generator engines. The diesel fuel tanks for the emergency generator and fire water pump are contained in the base of the engines. The emergency generator tank size is 3,000 gallons, and the fire water pump tank is a 500-gallon tank. As discussed in Section 3.0, insignificant amounts of VOC emissions will result from storage of diesel oil in these tanks.

A natural gas-fired auxiliary boiler, rated at 42 million British thermal units per hour (MMBtu/hr) will be used primarily to provide high-temperature steam when the CT is offline to accommodate more rapid ST startups after extended shutdowns and potentially to provide fuel gas heating. It will not operate once the CT has achieved steady-state operations; however, there will be some overlapping operation during startup and shutdown of the CT. Total operation of the auxiliary boiler is anticipated to be 8,760 hr/yr at maximum capacity.

Another small natural gas combustion unit associated with CT operation will be a fuel gas heater, rated at 6.4 MMBtu/hr higher heating value (HHV). The fuel gas heater will operate as necessary to condition the natural gas prior to combustion to prevent condensation.

The Project will use conventional wet cooling towers for ST steam condensation, which will operate continuously when the CT is operated. The cooling towers will emit small amounts of PM emissions associated with wet cooling tower drift losses. Drift loss will be minimized with high-efficiency drift eliminators.

A potential (trivial) source of VOC emissions is the storage and use of turbine lubricating oil. The CT/ST skid will include a lubricating oil sump system. Each CT and ST will also be equipped with lubricating oil vents, which include electrostatic precipitators/demisters

for lubricating oil mist control. As discussed in Section 3.0, use of low-volatility/low-VOC oil and a low consumption rate of lubricating oil in the CT and ST will result in insignificant VOC emissions from these sources.

Other storage tanks associated with the Project will not contain liquids with a potential to emit (PTE) VOC or HAPs. These storage tanks, therefore, are not addressed in this air permit application.

The Project will use electrical circuit breakers insulated with SF_6, a regulated GHG. The circuit breakers will be state-of-the art sealed units, equipped with low-pressure alarms for leak detection and a low-pressure lockout to minimize fugitive losses of SF_6. A BACT analysis addressing fugitive SF_6 emissions and providing further justification of the circuit breaker design and controls is provided in Section 5.0.

Fugitive methane and carbon dioxide (CO_2) emissions due to potential leaks in natural gas piping, valves, flanges, compressors, etc., and from natural gas venting during piping maintenance and startup/shutdown line purging have also been estimated for purposes of evaluating GHG emissions. The GHG BACT analysis in Section 5.0 also addresses fugitive methane and CO_2 emissions from these sources in addition to the combustion emissions.

2.4 CONSTRUCTION ACTIVITIES

Construction of the Project is estimated to take approximately 31 months from the initial release to full commercial operation. Construction onsite is expected to start in the fourth quarter of 2017.

3.0 PROJECT EMISSIONS

This section presents a summary of Project emissions and a discussion of the methodology used to calculate emissions and is organized by emissions sources. Within each emissions source section, the methods used to calculate emissions are discussed, followed by a summary of emissions estimates for the specific source, as well as, in the case of the CT, mode of operation. Total Project annual potential emissions for criteria and other regulated air pollutants are also summarized and used as the basis for classification of the Project with respect to applicable regulatory requirements evaluated in Section 4.0.

The Project consists of the following sources of emissions:

- One CT with auxiliary-fired HRSG arranged in a 1×1 configuration (CT will be GE 7HA.02) (or equivalent).
- One auxiliary boiler, natural gas-fired.
- One fuel gas heater, natural gas-fired.
- One multiple-cell mechanical draft, counter-flow, evaporative cooling tower system.
- One diesel engine-powered emergency generator.
- One diesel engine-powered fire water pump.
- Diesel fuel, lubricating oil, and aqueous ammonia storage tanks.
- SF_6-containing electrical circuit breakers.
- Natural gas piping, flanges, and valves.
- Natural gas venting during maintenance and startup/shutdown line purging.

The emissions calculation procedures used to quantify potential emissions from the Project are based on CT performance and emissions data provided by GE for the CT/HRSG configuration under consideration, other equipment vendor data, engineering estimates, emissions limitations specified in applicable New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP), emissions factors documented in U.S. Environmental Protection Agency's (EPA's) Compilation of Air Pol-

lution Emissions Factors, AP-42, and proposed BACT emissions limits. Proposed operating scenarios, including assumptions about the numbers and types of startups and shutdowns, have also been taken into account to develop reasonable, yet conservatively high annual emissions limits for the Project. Appendix C presents detailed emissions calculations for each emissions source.

3.1 COMBUSTION TURBINE

The main sources of emissions at the Project Site are the CT and auxiliary-fired HRSG duct burners. The following subsections present the maximum hourly emissions during normal operations and startup/shutdown events, as well as the total annual emissions based on worst-case operating scenarios for steady-state operations, startups, and shutdowns.

3.1.1 STEADY-STATE OPERATION

Normal operation of a CT is characterized as continuous operation at loads generally in the 30- to 100-percent range (over the range at which emissions compliance is achieved). The CT may be operated at baseload up to 8,760 hr/yr with up to 8,497 hr/yr with duct burner firing. Heat input and emissions rates vary as a function of ambient temperature. Maximum heat input and emissions rates typically occur at 100-percent load and the minimum design ambient temperature for the Project. Table 3-1 presents the maximum hourly emissions (pounds per hour [lb/hr]) for the CT/HRSG for criteria pollutants for the CT with and without duct burner firing.

3.1.2 STARTUP AND SHUTDOWN OPERATIONS

Table 3-2 presents the duration of startup and shutdown events in minutes and maximum emissions during those periods expressed in pounds (lb) per event. Data presented are based on information provided by GE for the 7HA.02 CT under consideration for the Project. For startup scenarios that take less than an hour, it was assumed the CT is at its maximum potential emissions rate (100-percent load with duct burners) for the balance of the hour. Table 3-3 summarizes maximum short-term average emissions rates for the unit.

Table 3-1. Maximum Hourly Heat Input and Emissions, Normal Operation for CT + Duct Burner—GE 7HA.02

Parameter	Maximum Rated Capacity and Hourly Emissions		
	CT	Duct Burner	Total
Heat input (MMBtu/hr, HHV)	3,509	981	4,490
NO_x (lb/hr)	—	—	34.76
CO (lb/hr)	—	—	21.12
VOC (lb/hr)	—	—	12.10
SO_2 (lb/hr)	—	—	26.98
$PM_{10}/PM_{2.5}$ (lb/hr)	—	—	34.19
H_2SO_4 (lb/hr)	—	—	15.21
Ammonia slip (lb/hr)	—	—	32.12

Note: See Appendix C, Tables C-1 and C-2 for detailed calculations.

Sources: HTEC, 2017.
ECT, 2017.

Table 3-2. CT Startup and Shutdown Scenarios, Durations, and Emissions

	CT Startup to Minimum Compliance Load*					
Event	NO_x (lb/event)	CO (lb/event)	VOC (lb/event)	$PM_{10}/PM_{2.5}$ (lb/event)	SO_2 (lb/event)	Duration (minutes)
Cold start	260	790	55	11.0	1.8	55
Warm start	146	155	10	7.8	1.4	40
Hot start	70	120	9	3.9	0.5	20
Shutdown	7	125	26	2.3	0.21	12

*Fuel consumption and emissions per event based on an ambient range of 1 to 101 degrees Fahrenheit.

Sources: HTEC, 2017.
ECT, 2017.

3.1.3 CT ANNUAL EMISSIONS

Annual emissions from HTEC are based on 8,760 hr/yr of operation, of which 8,497 hours include duct burner firing. Included in the estimate of annual emissions are up to 8,497 hours of natural gas firing and an estimated 263 hr/yr of startup/shutdown operations. Table 3-3 shows annual emissions. Table C-4 in Appendix C provides detailed assumptions and calculations.

Potential emissions of HAPs (listed in or pursuant to Section 112(b) of the Clean Air Act [CAA]) from the CT and duct burner were estimated using emissions factors and other sources for natural gas-fired CT, duct burner, and auxiliary combustion unit. The maximum hourly heat inputs for the CT and duct burner for any operating scenario were assumed to apply for the full 8,760 hr/yr for the CT and for 8,497 hr/yr for the duct burner and multiplied by the HAP emissions factors. Tables C-11 and C-14 present detailed calculations.

3.2 ANCILLARY EQUIPMENT

3.2.1 NATURAL GAS-FIRED AUXILIARY BOILER AND FUEL GAS HEATER

The auxiliary boiler will be natural gas-fired and operate as needed to keep the HRSG warm during periods of CT shutdown and provide sealing steam to the ST during warm and hot starts. The auxiliary boiler will have a maximum input capacity of 42 MMBtu/hr and will have the potential to operate for 8,760 hr/yr at maximum capacity. Potential criteria and HAP emissions are estimated based on vendor-supplied information and natural gas fuel specifications.

The natural gas-fired fuel gas heater will operate as necessary to condition the natural gas prior to combustion to prevent condensation. The maximum rated capacity of the fuel gas heater will be 6.4 MMBtu/hr and will have the potential to operate for 8,760 hr/yr at maximum capacity. Potential criteria and HAP emissions are estimated based on vendor-supplied information and natural gas fuel specifications.

Table 3-3. Potential Annual Emissions for CT + Duct Burner (including Startup/Shutdown)

Pollutant	Emissions (tpy)
NO_x	169.36
CO	151.41
VOC	59.31
SO_2	23.12
PM_{10}	105.28
$PM_{2.5}$	105.28
H_2SO_4	13.04

Note: tpy = ton per year.

Sources: HTEC, 2017.
ECT, 2017.

Table 3-4 summarizes potential hourly and annual criteria pollutant emissions estimates for the auxiliary boiler and fuel gas heater. Tables C-12 and C-13 in Appendix C provide HAP emissions and detailed calculations.

3.2.2 MULTIPLE-CELL MECHANICAL DRAFT EVAPORATIVE COOLING TOWER SYSTEM

The steam condenser cooling system will use a multiple-cell mechanical draft wet cooling tower. In the cooling tower, circulating water is distributed among multiple cells of the cooling tower, where it cascades downward through each cell and then collects in the cooling tower basin. The mechanical draft cooling tower employs electric motor-driven fans to move air through each cooling tower cell. The cascading circulating water is partially evaporated, and the evaporated water is dispersed to the atmosphere as part of the moist air leaving each cooling tower cell. The circulating water is cooled primarily through its partial evaporation. The cooling tower will be equipped with a high-efficiency drift eliminator with a drift rate of 0.0005 percent.

The cooling tower is expected to have a recirculating flow rate of 114,420 gallons per minute and maximum 4,000 milligrams per liter of total dissolved solids based on use of water from the Monongahela River. PM_{10} was calculated based on 66.8 percent of PM emissions from SPX Distribution, and $PM_{2.5}$ was based on 25.5 percent of PM from SPX Distribution. As documented in Appendix C, maximum PM_{10} emissions from the wet mechanical draft cooling tower are 0.77 lb/hr, and $PM_{2.5}$ are 0.29 lb/hr. Assuming continuous operation, the maximum potential annual emissions of PM_{10} from the cooling tower would be 3.35 tons per year (tpy), and $PM_{2.5}$ would be 1.28 tpy.

3.2.3 EMERGENCY DIESEL ENGINES

The Project will include a maximum 2,000-kW diesel engine-powered emergency generator and a 422-hp diesel engine-powered fire water pump. Both diesel engines will exclusively use ULSD fuel (15 ppm weight sulfur) and will only operate for maintenance and testing purposes and during actual emergencies. Operation of the emergency generator and fire pump will each be limited to 100 hr/yr for testing purposes. The fire water pump and emergency generator will meet emissions requirements in EPA's Standards of Performance

Table 3-4. Potential Hourly and Annual Emissions from Natural Gas-Fired Auxiliary Boiler and Fuel Gas Heater

Pollutant	Auxiliary Boiler		Fuel Gas Heater	
	lb/hr	tpy	lb/hr	tpy
NO_x	0.45	1.99	7.04E-02	3.08E-01
CO	1.55	6.81	2.37E-01	1.04E+00
VOC	0.13	0.55	3.42E-02	1.50E-01
SO_2	0.05	0.21	7.47E-03	3.27E-02
$PM_{10}/PM_{2.5}$	0.31	1.36	4.73E-02	2.07E-01

Sources: HTEC, 2017.
ECT, 2017.

for Stationary Compression Ignition Internal Combustion Engines, July 11, 2006 (Title 40, Part 60, Code of Federal Regulations [CFR], Subpart IIII). Emissions of criteria pollutants and HAPs from the emergency engines are based on EPA Tier 2-certified data from representative manufacturers for NO_x, CO, VOC, and PM emissions and EPA AP-42 emissions factors for other criteria pollutants and HAPs. Table 3-5 summarizes annual potential emissions based on these emissions factors and annual operating restrictions. Tables C-7 and C-8 in Appendix C present detailed emissions calculations.

3.2.4 DIESEL FUEL LUBRICATION OIL AND AQUEOUS AMMONIA STORAGE TANKS

The diesel fuel tanks for the emergency generator and fire water pump are contained in the base of the engines. The emergency generator tank size is 3,000 gallons, and the fire water pump tank is a 500-gallon tank. Another potential (trivial) source of VOC emissions is the storage and use of CT lubricating oil. The CT/ST skid will include a lubricating oil sump system. The CT and ST will also be equipped with lubricating oil vents, which include electrostatic precipitators/demisters for lubricating oil mist control. Use of low-volatility/low-VOC oil and a low consumption rate of lubricating oil in the CT and ST will result in insignificant VOC emissions from these sources. Potential annual VOC emissions from Project tanks are expected to be negligible.

The proposed facility will also have a 35,000-gallon tank for storage of 19-percent aqueous ammonia for use in the SCR system. The tank will be equipped with secondary containment sized to accommodate the entire volume of one tank and sufficient freeboard for precipitation. The tanks will be located outdoors within an impermeable containment area, surrounded by a wall. Under normal operations, the emissions from the ammonia storage tanks will be insignificant.

3.3 GHG EMISSIONS FROM COMBUSTION SOURCES

GHG from Project combustion sources were estimated in carbon dioxide equivalents (CO_2e), first by estimating CO2, methane, and nitrous oxide emissions and then multiplying each by the respective global warming potentials as listed in Table A-1 of 40 CFR, 98 Subpart A (Mandatory GHG Reporting Rule). CO_2 emissions from the CTs were estimated

Table 3-5. Potential Emissions for Diesel Fuel Emergency Generator and Fire Water Pump

Pollutant	Emergency Generator*		Fire Water Pump	
	lb/hr	tpy	lb/hr	tpy
NO_x	26.5	1.32	2.60	0.13
CO	15.43	0.77	2.42	0.12
VOC	1.80	0.088	0.19	0.009
SO_2	0.03	0.002	0.87	0.043
$PM_{10}/PM_{2.5}$	0.88	0.044	0.14	0.007

*Emissions based on certification as an EPA Tier II engine.

Sources: HTEC, 2017.
ECT, 2017.

from CT manufacturer exhaust gas composition data. CO_2 emissions from the diesel engines and methane and nitrous oxide emissions from all combustion sources were estimated using EPA AP-42 emissions factors. Table C-15 in Appendix C presents detailed calculations, and Table 3-6 summarizes the CO_2e for each source.

3.4 FUGITIVE SF_6 GHG EMISSIONS FROM ELECTRICAL EQUIPMENT

Annual potential emissions of SF_6 from the circuit breakers and switches were based on a maximum leakage rate of 0.5 percent per year. Based on the calculations for all circuit breakers, the maximum GHG emissions as CO_2e are expected to be no more than 111 tpy. Table C-15 in Appendix C provides detailed calculations of GHG fugitive emissions from the circuit breakers and switches.

3.5 FUGITIVE METHANE AND CO_2 EMISSIONS FROM NATURAL GAS PIPING

GHG emissions calculations for natural gas piping component fugitive emissions are based on emissions factors from Table W-1A of the Mandatory GHG Reporting Rules (40 CFR 98) for components in gas service for the Eastern United States. The concentrations of methane and CO_2 in natural gas are based on the natural gas analysis used as a design basis for the Project, as provided in Table C-1 in Appendix C. The global warming potential factors used to calculate CO_2e emissions are based on Table A-1 of 40 CFR 98. Table C-15 in Appendix C provides assumptions, including the estimated inventory of piping components, and detailed calculations.

GHG emissions calculations for releases of natural gas related to piping maintenance and CT startup/shutdowns are calculated using the same methane and CO_2 concentrations as natural gas piping fugitives and are based on the assumptions and calculations detailed in Table C-15 in Appendix C with regard to the numbers and types of piping component system purges per year and the volume of each piping system.

Table 3-6. GHG Emissions in CO_2e from Project Combustion Sources

Emissions Unit	Fuel	Potential CO_2e (tpy)
CT with duct burner	Natural gas	2,298,774
Auxiliary boiler	Natural gas	21,891
Fuel gas heater	Natural gas	3,336
Diesel engine-powered emergency generator	Diesel	153
Diesel engine-powered fire water pump	Diesel	24
Total		**2,324,178**

Sources: HTEC, 2017.
ECT, 2017.

3.6 TOTAL PROJECT EMISSIONS

Table 3-7 summarizes total annual potential emissions from the Project, including the CT with duct burner and ancillary equipment. As discussed in Section 4.0, based on total premise potential emissions, the Project will be subject to PSD review for NO_x, CO, VOC, PM_{10}, $PM_{2.5}$, H_2SO_4, and GHGs. Total HAP emissions from the Project will not exceed 25 tpy, and individual HAP emissions will not exceed 10 tpy. Therefore, the Project will not be a major stationary source of HAPs.

Table 3-7. Total Project Potential Annual Emissions

	Potential Annual Emissions (tpy)								
Emissions Unit	NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	H_2SO_4	GHGs (CO_2e)	HAPs
CT with duct burner	169.36	151.41	59.31	23.12	105.28	105.28	13.04	2,298,774	18.38
Fuel gas heater	0.31	1.04	0.15	0.03	0.21	0.21	0.003	3,336	0.003
Auxiliary boiler	1.99	6.81	0.55	0.21	1.36	1.36	0.02	21,891	0.022
Fire water pump	0.13	0.12	0.01	0.04	0.007	0.007	0.003	24	0.001
Emergency generator	1.32	0.77	0.09	0.002	0.044	0.044	.0001	153	0.004
Cooling tower					3.35	1.28			
Natural gas piping fugitives								61	
SF_6 circuit breakers								111	
Total Project emissions	**173.10**	**160.14**	**60.11**	**23.42**	**110.25**	**108.18**	**13.06**	**2,324,350**	**18.41**

Sources: HTEC, 2017.
ECT, 2017.

4.0 REGULATORY REVIEW AND APPLICABILITY

4.1 FEDERAL AIR POLLUTION CONTROL REGULATIONS

4.1.1 NEW SOURCE REVIEW

NSR requires preconstruction review and permitting of stationary sources. A source may be subject to one or more of the NSR programs depending on the facility's emissions and NAAQS attainment status of the area. There are three categories of NSR permitting:

- PSD, which applies to new major sources and major modifications in attainment areas.
- Nonattainment new source review (NNSR), which applies to new major sources and major modifications in nonattainment areas.
- Minor NSR, which applies to pollutants that do not trigger PSD or NNSR requirements.

Hill Top is considered a major facility because the emissions of several regulated pollutants will exceed 100 tpy, and the facility is one of the 28 listed major source categories under NSR rules. Hill Top is located in an area classified as attainment for all NSR pollutants; however, the Commonwealth of Pennsylvania is part of the ozone transport region. Therefore, major facilities emitting more than 100 tpy of NO_x or 50 tpy of VOC are subject to NNSR for these pollutants.

Pennsylvania is authorized to administer its NNSR program pursuant to its EPA-approved state implementation plan, and regulations are contained in 25 Pa. Code §127, Subchapter E. 25 Pa. Code §127, Subchapter E, applies to nonattainment pollutants with PTE emissions above major source thresholds and facilities emitting more than 100 tpy of NO_x and 50 tpy of VOCs, as Pennsylvania is part of the ozone transport region. As presented in Table 4-1, the Project's NO_x and VOC emissions exceed applicable thresholds (100 tpy for NO_x and 50 tpy for VOCs) and, therefore, are subject to the requirements of 25 Pa. Code §127, Subchapter E. Facilities subject to NNSR review must employ technology providing for the LAER and acquire emissions offsets. Section 5.0 of this plan approval application includes the LAER analysis.

Table 4-1. Potential Emissions Compared to Permitting Thresholds

Pollutant	Facility PTE (tpy)	Major Source Threshold (tpy)*	PSD Significant Emissions Rate (tpy)†
NO_x	173.10	100	40
CO	160.14	100	100
Total suspended particulates	110.25	100	25
PM_{10}	110.25	100	15
$PM_{2.5}$	108.18	100	10 (or 40 tpy of NO_x or SO_2)
SO_2	23.42	100	40
VOC	60.11	50	40
HAP (total)	18.41	25	Not applicable
HAP (individual)	7.52	10	Not applicable
Lead	0.0001	100	0.6
H_2SO_4	13.06	N/A	7
CO_2e	2,324,350	N/A	75,000

*Major source thresholds defined in 25 Pa. Code §121.1.
†PSD significance levels defined in 40 CFR 52.21

Sources: HTEC, 2017.
ECT, 2017.

PSD regulations are contained in 40 CFR 52.21 and are incorporated by reference in 25 Pa. Code §127.83. For facilities qualifying for PSD review, potential emissions must be compared to PSD significant emissions rates (SERs) for each NSR pollutant. For any pollutant where annual emissions are expected to exceed the SER, a BACT analysis must be performed. As presented in Table 4-1, the Project's emissions of NO_x, CO, PM, PM_{10}, $PM_{2.5}$, VOC, H_2SO_4, and CO_2e will exceed PSD significance levels. Section 5.0 of this document includes the BACT analyses.

4.1.2 40 CFR 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

NSPS are technology-based standards applicable to new and modified stationary sources. The standards relevant to the proposed HTEC are discussed in this subsection.

4.1.2.1 NSPS Subpart A—General Provisions

NSPS Subpart A contains general requirements for notifications, recordkeeping, and performance testing and applies to stationary sources subject to NSPS. The proposed CT, duct burners, auxiliary boiler, emergency generator, and fire water pump engine are subject to the general provisions for NSPS units in 40 CFR 60, Subpart A, as they are subject to another NSPS as further described in the following subsections.

4.1.2.2 NSPS Subpart Da—Standards of Performance for Electric Utility Steam-Generating Units

NSPS Subpart Da does not apply to this facility. Per 40 CFR 60.40Da(e)(l), "Affected facilities (i.e., HRSGs used with duct burners) associated with a stationary CT that are capable of combusting more than 73 MW (250 MMBtu/hr) heat input of fossil fuel are subject to this subpart except in cases when the affected facility (i.e., HRSG) meets the applicability requirements of and is subject to Subpart KKKK of this part." The HRSGs used with steam generators associated with the stationary CTs meet the requirements and will be subject to Subpart KKKK.

4.1.2.3 NSPS Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam-Generating Units

NSPS Subpart Db applies to steam-generating units constructed after June 19, 1989, that have a maximum design heat input capacity greater than 100 MMBtu/hr. The proposed auxiliary boiler has a maximum input capacity of 42 MMBtu/hr and is not subject to the standard. Subpart Db does not contain sulfur dioxide (SO_2) or PM standards applicable to natural gas-fired boilers.

NSPS Subpart Db does not apply to the HRSGs with duct burners associated with the CTs. Per 40 CFR 60.40b(i), the HRSGs with duct burners associated with the CTs are subject to Subpart KKKK and therefore not subject to Subpart Db.

4.1.2.4 NSPS Subpart Dc—Standards of Performance for Small Industrial Commercial Institutional Steam-Generating Units

NSPS Subpart Dc applies to steam generating units that commenced construction after June 9, 1989, and have a maximum design heat input capacity between 10 and 100 MMBtu/hr. The auxiliary boiler, rated at 42 MMBtu/hr, is subject to this subpart, because the boiler is greater than 10 MMBtu/hr and less than 100 MMBtu/hr. Although the 42-MMBtu/hr boiler is subject to Subpart Dc, PM and SO_2 emissions standards under Subpart Dc are not applicable, because the boiler will only burn natural gas. Subpart Dc does not include NO_x emissions standards. HTEC will comply with applicable Subpart Dc monitoring, recordkeeping, and reporting requirements.

4.1.2.5 NSPS Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After July 23, 1984

As part of the proposed Project, the facility will have one 3,000-gallon storage tank that will hold ULSD fuel used in the emergency diesel engine and one 500-gallon storage tank that will hold ULSD fuel used in the fire water pump.

Per 40 CFR 60.11 O(a), the affected facility to which this subpart applies is each storage vessel with a capacity greater than 75 cubic meters used to store volatile organic liquid.

The proposed storage tanks that may store volatile organic liquids are less than 75 cubic meters. NSPS Subpart Kb does not apply to the proposed storage units at this facility.

4.1.2.6 NSPS Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII applies to the proposed emergency generator and fire water pump diesel-fired engines. Per 40 CFR 60.4200(a)(2), the provisions of this subpart are applicable to, "Owners and operators of stationary compression ignition internal combustion engines that commence construction after July 11, 2005, where the stationary compression ignition internal combustion engines are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association fire pump engine after July 1, 2006."

Emergency Generator Engine

The emergency generator engine will commence construction (be ordered) after July 11, 2005, and be manufactured after April 1, 2006; therefore, the emergency generator engine is subject to Subpart IIII. Per 40 CFR 60.4205(b), owners and operators of 2007 model year and later emergency stationary compression ignition internal combustion engines with a displacement of less than 30 liters per cylinder must comply with emissions standards in 40 CFR 60.4202. Per 40 CFR 60.4202(a)(2), engines greater than 50 brake-horsepower (bhp) must be certified to the emissions standards in 40 CFR 89.112 and .113 for all pollutants. Per 40 CFR 89.112, the applicable certification standards for units greater than 560 kW are 6.4 grams per kilowatt-hour (g/kW-hr) NO_x + nonmethane hydrocarbon (NMHC), 3.5 g/kW-hr CO, and 0.20 g/kW-hr PM. HTEC has proposed limits equal to or more stringent than these limits.

Fire Water Pump Engine

The fire water pump engine will commence construction after July 11, 2005, and will be a certified National Fire Protection Association fire water pump engine manufactured after July 1, 2006; therefore, the fire water pump engine is subject to Subpart IIII. Per 40 CFR 60.4205(c), owners and operators of fire water pump engines with a displacement

less than 30 liters per cylinder must comply with the emissions standards in Table 4 of Subpart IIII. For units between 300 and 600 hp, the applicable emissions standards are 7.8 grams per brake-horsepower-hour (g/bhp-hr) NMHC + NO_x, 2.6 g/bhp-hr CO, and 0.40 g/bhp-hr PM for model years 2008 and earlier, and 3.0 g/bhp-hr NMHC + NO_x and 0.15 g/bhp-hr PM for model years 2009. HTEC has proposed limits equal to or more stringent than the 2009+ limits of this subpart.

Per 40 CFR 60.4211(c), HTEC has proposed to comply with the requirements of Subpart IIII by purchasing engines certified to meet applicable emissions standards. Per 40 CFR 60.4207(b), HTEC has proposed using diesel fuel with a sulfur content of no more than 15 ppm and with a minimum cetane index of 40 or maximum aromatic content of 35 volume percent (from 40 CFR 80.510[b]).

4.1.2.7 NSPS Subpart JJJJ—Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ does not apply to any proposed sources at this facility. HTEC has not proposed to install any spark ignition internal combustion engines.

4.1.2.8 NSPS Subpart GG—Standards of Performance for Stationary Gas Turbines

NSPS Subpart GG does not apply to the proposed CTs at this facility. The proposed units will be subject to NSPS Subpart KKKK and are therefore exempt from NSPS Subpart GG per 40 CFR 60.4305(b).

4.1.2.9 NSPS Subpart KKKK—Standards of Performance for Stationary CTs

NSPS Subpart KKKK applies to the proposed CTs at this facility. Per 40 CFR 60.4305, this subpart applies to stationary CTs with a heat input at peak load equal to or greater than 10 MMBtu/hr based on the HHV of the fuel and which commenced construction after February 18, 2005. The proposed CTs will commence construction after February 18, 2005, and have an HHV heat input of approximately 3,509 MMBtu/hr. This subpart also applies to emissions from the associated HRSGs and duct burners. Applicable requirements from

this subpart include emissions limitations; testing, reporting, and recordkeeping requirements; and work practice standards. Since the proposed combined-cycle CTs are subject to Subpart KKKK, they are exempt from the requirements of Subparts GG, Da, Db, and De.

For units, greater than 850 MMBtu/hr, applicable NO_x emissions, including associated HRSG and duct burners, are limited to 15 ppm corrected to 15-percent oxygen or 54 nanograms per joule (ng/J) of useful output (0.43 pound per megawatt-hour [lb/MWh]). HTEC has proposed a more stringent NO_x limit of 2.0 ppm corrected to 15-percent oxygen.

Per 40 CFR 60.4330(a)(2), for SO_2 emissions, each CT must comply with either limiting emissions to less than 110 ng/J gross output or burning fuel that contains total potential sulfur equal or less than 26 ng/J (0.060 pound per million British thermal units [lb/MMBtu] SO_2) heat input. HTEC will comply with the SO_2 emissions limitations by combusting pipeline-quality natural gas with sulfur content less than 0.4 grain per 100 standard cubic feet (gr/100 scf) based an annual averaging period. In addition to keeping records of the current, valid purchase contract, tariff sheet, or transportation contract obtained from the natural gas supplier, HTEC will sample and analyze the sulfur content on an annual basis in accordance with 25 Pa. Code §127.12b.

Per 40 CFR 60.4333(a), HTEC will operate and maintain the stationary CT, 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.

To demonstrate compliance with NO_x emissions limits, HTEC will install continuous emissions monitoring systems (CEMS) for NO_x, thereby satisfying the requirements specified in 40 CFR 60.4340(b)(l). HTEC will comply with CEMS requirements specified in 40 CFR 60.4345 and excess emissions requirements specified in 40 CFR 60.4350.

4.1.2.10 NSPS Subpart TTTT—Standards of Performance for GHG Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units

NSPS Subpart TTTT was finalized on October 23, 2015, and is applicable to fossil fuel-fired power plants that commence construction on or after January 8, 2014; therefore, Subpart TTTT is applicable to the Project. The standard for base load CTs is 1,000 lb/MWh of CO_2 per on a gross-output basis. The HTEC Project's CT and HRSG will have CO_2 emissions below this standard and will comply with the applicable monitoring, reporting, and performance test requirements of the rule.

4.1.3 40 CFR 63—NESHAP

NESHAP are standards for HAPs from stationary sources. In general, the 40 CFR 63 NESHAP are only applicable to major HAP sources (i.e., facilities that have potential emissions of an individual HAP of 10 tpy or more and potential emissions of total HAPs of 25 tpy or more). As shown in Table 4-1, Hill Top will not have the PTE 10 tpy of any one HAP or a total of 25 tpy of all HAPs combined. Therefore, for NESHAP applicability, the Project is considered an area source of HAP emissions. The applicability of relevant NESHAP is discussed in the following subsections.

4.1.3.1 NESHAP Subpart Q—Industrial Process Cooling Towers

NESHAP Subpart Q does not apply to the proposed cooling tower. Per 40 CFR 63.400(a), "The provisions of this subpart apply to all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals and are either major sources or are integral parts of facilities that are major sources as defined in §63.401." The proposed cooling tower will not use chromium-based water treatment chemicals and will be located at an area source of HAPs (less than 10 tpy of a single HAP and less than 25 tpy of total HAPs); therefore, this subpart will not apply.

4.1.3.2 NESHAP Subpart DDDDD—Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

NESHAP Subpart DDDDD applies to boilers and process heaters located at major HAP emissions sources. As HTEC is not a major source of HAPs, this subpart does not apply.

4.1.3.3 NESHAP Subpart YYYY—Stationary CTs

NESHAP Subpart YYYY applies to stationary CTs located at major HAP emissions sources. As HTEC is not a major source of HAPs, this subpart does not apply.

4.1.3.4 NESHAP Subpart JJJJJJ—Industrial, Commercial, and Institutional Boilers Area Sources

NESHAP Subpart JJJJJJ applies to industrial, commercial, or institutional boilers at area sources and was reviewed for applicability to the Project's auxiliary boiler, fuel gas heater, and HRSG. The auxiliary boiler is defined as a gas-fired boiler that is exempt pursuant to 40 CFR 63.11195(e). The fuel gas heater is defined as a process heater excluded from the definition of a boiler. The HRSG is defined as a waste heat boiler, also excluded from the definition of the boiler. Therefore, Subpart JJJJJJ is not applicable to any of the proposed Project's emissions units.

4.1.3.5 NESHAP Subpart ZZZZ—Stationary Reciprocating Internal Combustion Engines

NESHAP Subpart ZZZZ applies to new and existing internal combustion engines located at major and area sources. Subpart ZZZZ contains emissions and operating limits for HAPs emitted from stationary reciprocating internal combustion engines and is applicable to the emergency fire water pump engine and emergency generator. Per 40 CFR 63.6590(c), the requirements of Subpart ZZZZ are met by compliance with 40 CFR 60, Subpart IIII.

4.1.3.6 NESHAP Subpart UUUUU—Mercury and Air Toxics Standards Rule

NESHAP Subpart UUUUU does not apply to this facility. On December 21, 2011, EPA announced standards to limit mercury, acid gases, and other toxic pollution from power plants. The final rule became effective on April 16, 2012. The Mercury and Air Toxics Standards (MATS) Rule reduces emissions of heavy metals, including mercury, arsenic, chromium, and nickel and acid gases, including hydrochloric acid and hydrofluoric acid. The proposed power plant will only burn natural gas. Therefore, the proposed power plant is not subject to the MATS Rule pursuant to 40 CFR 63.9983(b).

4.1.4 40 CFR 72 AND 75—ACID RAIN PROGRAM

Pursuant to 40 CFR 72.6(a)(4), the federal Acid Rain Program (ARP) applies to new (i.e., commenced operation after November 15, 1990) utility units. The Project CT/HRSG unit is subject to the ARP because it is a new unit and will serve as a generator that produces electricity for sale.

Under the ARP, HTEC will submit an ARP application, operate the unit in compliance with the ARP, and comply with monitoring requirements of 40 CFR 75. These provisions require monitoring of NO_x, opacity, SO_2, and CO_2 using CEMS or by alternative methods for certain pollutants. The provisions also contain exemptions from certain monitoring requirements.

A CEMS unit will be required to monitor NO_x emissions. SO_2 emissions may either be monitored using CEMS or estimated following the procedures outlined in Appendix D of 40 CFR 75, which contains an alternate SO_2 emissions data protocol for gas- and oil-fired units. SO_2 emissions will be estimated using 40 CFR 75 Appendix D.

CO_2 emissions may either be monitored using CEMS or estimated following the procedures outlined in Appendix G of 40 CFR 75, which contains an alternate CO_2 emissions data protocol for gas- and oil-fired units.

Gas-fired units are exempt from the opacity monitoring requirements of 40 CFR 75.

4.1.5 40 CFR 64—COMPLIANCE ASSURANCE MONITORING REGULATIONS

Compliance assurance monitoring (CAM) applies to pollutant-specific emissions units at major sources that are required to obtain a Part 70 or 71 (i.e. Title V) permit if the following criteria are met:

1. The unit is subject to an emissions limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emissions limitation or standard that is exempt under paragraph (b)(1) of 40 CFR 64.2.

2. The unit uses a control device to achieve compliance with any such emissions limitation or standard.
3. The unit has potential precontrol device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. For purposes of this paragraph, “potential precontrol device emissions” has the same meaning as PTE as defined in 40 CFR 64.1, except emissions reductions achieved by the applicable control device will not be taken into account.

CAM does not apply to NO_x emissions from the power block (i.e., CT with HRSG and duct burner), per 40 CFR 64.2(b)(1)(i), because NO_x emissions are subject to emissions limitations and standards pursuant to Section 111 of the federal CAA (NSPS Subpart KKKK). CAM does not apply to CO, per 40 CFR 64.2(b)(1)(vi), since CO will be monitored by CEMS. VOC emissions exceed the major source threshold, but VOC emissions do not have a postcombustion control device, so CAM does not apply to VOC per 40 CFR 64.2(a).

Neither of the emergency engines are subject to CAM, because all three criteria specified in 40 CFR 64.2(a)(1) through (3) are not met, specifically, 40 CFR 64.2(a)(2), because these engines will not be equipped with control devices.

4.1.6 40 CFR 68—CAA SECTION 112(R) (OFFSITE CONSEQUENCE ANALYSIS)

CAA Section 112(r) and EPA’s Risk Management Program regulations (40 CFR 68) require modeling a hypothetical catastrophic release of any stored ammonia at 20-percent concentration or above. Aqueous ammonia will be stored at a maximum ammonia concentration of 19 percent; therefore, Section 112(r) is not applicable to the Project.

4.1.7 40 CFR 97—CROSS-STATE AIR POLLUTION RULE

The Cross-State Air Pollution Rule (CSAPR) was finalized on July 6, 2011, and requires states to improve air quality by reducing power plant emissions that contribute to ozone and/or fine particulate pollution in other states. Reduction will be achieved by means of a

regional cap-and-trade program for SO_2 and NO_x emissions. After a number of delays due to court actions, CSAPR took effect January 1, 2015, and is applicable to the Project.

4.1.8 40 CFR 98—MANDATORY GHG REPORTING

The Mandatory GHG Reporting Rule requires facilities that emit greater than 25,000 metric tons per year of CO_2e to report their GHG emissions. As the proposed facility, will exceed this threshold, reporting under 40 CFR 98 will be required. The requirements for the electricity generation category are outlined in Subpart D of 40 CFR 98. The Project will use a CO_2 CEMS or approved alternative monitoring procedure. Methane and nitrous oxide emissions will be calculated based on the methodologies specified in 40 CFR 98, Subpart C.

4.2 PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS

The following list of PADEP regulations were evaluated for their applicability to the proposed emissions units:

- 25 Pa. Code §123.11.
- 25 Pa. Code §123.22.
- 25 Pa. Code §123.41.
- 25 Pa. Code §123.51.
- 25 Pa. Code §129.91.

4.2.1 25 PA. CODE §123.11 (STANDARDS FOR CONTAMINANTS—PM EMISSIONS)

25 Pa. Code §123.11 limits PM emissions from combustion units based on the rated heat input. Table 4-2 summarizes varying PM emissions standards that apply to the fuel gas heater, auxiliary boiler, fire water pump, emergency generator, and CT/HRSG. The Project's emissions units will be in compliance with these standards.

4.2.2 25 PA. CODE §123.22 (STANDARDS FOR CONTAMINANTS—SULFUR COMPOUND EMISSIONS)

25 Pa. Code §123.22 limits SO_2 emissions from combustion units to 4 lb/MMBtu averaged over one hour. The proposed combustion emissions units will be in compliance with this emissions limit.

Additionally, 25 Pa. Code §123.22 limits the maximum allowable percentage of sulfur in No. 2 and lighter fuel oils to 0.5 percent. The maximum percentage of sulfur in the fuel oil will be 15 ppm pursuant to the requirements of NSPS Subpart IIII.

4.2.3 25 PA. CODE §123.41 (STANDARDS FOR CONTAMINANTS—VISIBLE EMISSIONS)

25 Pa. Code §123.41 prohibits visible emissions with an opacity equal to or greater than 20 percent for a period aggregating more than three minutes in any one hour and equal to or greater than 60 percent at all times.

4.2.4 25 PA. CODE §123.51 (STANDARDS FOR CONTAMINANTS—NITROGEN COMPOUND EMISSIONS)

25 Pa. Code §123.51 requires continuous NO_x monitoring systems for combustion units with rated heat input capacities of 250 MMBtu/hr or greater that have an annual average capacity factor of greater than 30 percent. The continuous monitoring systems must be installed, operated, and maintained in accordance with the requirements of 25 Pa. Code §139, Subchapter C. The CT/HRSG will be equipped with a NO_x CEMS that meets the requirements of 25 Pa. Code §139, Subchapter C. NO_x allowance requirements under 25 Pa. Code §123 will not apply.

4.2.5 25 PA. CODE §129.91 (STANDARDS FOR CONTAMINANTS—STATIONARY SOURCES OF NO_X AND VOC)

25 Pa. Code §129.91 requires new major NO_x- and VOC-emitting facilities to submit a reasonably available control technology (RACT) proposal to PADEP. Alternatively, the facility has the option to comply with the presumptive RACT emissions limitations of RACT 25 Pa. Code §129.93. RACT requirements will be met following presumptive RACT emissions limitations through meeting LAER and BACT for NO_x emissions.

Furthermore, combustion units with rated heat inputs of greater than 250 MMBtu/hr and subject to 25 Pa. Code §123.51 must be equipped with a PADEP-approved CEMS to determine the rate of NO_x emissions. The CT/HRSG will be equipped with a NO_x CEMS.

Table 4-2. 25 Pa. Code §123.11 PM Emissions Standards

Heat Input Rate (MMBtu/hr)	Maximum Allowable PM Emissions Rate (lb/MMBtu)*
2.5 to 49	0.4
50 to 599	$3.6E^{-0.56}$
≥ 600	0.1

*E is the heat input to the combustion unit in MMBtu/hr.

Sources: HTEC, 2017.
ECT, 2017.

Combustion units with heat inputs greater than 100 MMBtu/hr are required to use a PADEP-approved periodic source testing program or predictive modeling program to determine the rate of NO_x emissions from the combustion unit unless a PADEP-approved CEMS is employed. The auxiliary boiler is not subject to this requirement.

5.0 CONTROL TECHNOLOGY ANALYSIS LAER/BACT/BAT

5.1 APPLICABLE AIR POLLUTION CONTROL REQUIREMENTS

The proposed Hill Top facility is subject to review with respect to the following control technology requirements:

- LAER for NO_x and VOC. Although Greene County is classified as attainment or unclassifiable/attainment for all pollutants, the facility is subject to NNSR for NO_x and VOC, since the county is located in an ozone transport region. Per 25 PA Code §127.201(c), attainment areas are treated as though the area were a moderate ozone nonattainment area and as if the potential emissions exceed 100 tpy of NO_x or 50 tpy of VOC.
- BACT for pollutants, other than NO_x and VOC, that exceed the PSD SER thresholds specified in 40 CFR 52.21(b)(23) and for which Greene County is classified as attainment.
- BACT for GHG emissions if the total facility CO_2e potential emissions exceed 75,000 tpy and the facility is subject to PSD review for a regulated non-GHG pollutant or if the total facility CO_2e potential emissions exceed 100,000 tpy.
- Pennsylvania requires new sources and modifications to incorporate advances in the art of air pollution by applying best available technology (BAT). The requirements of LAER, BACT, an NSPS, or NESHAP are deemed to represent BAT. For other pollutants and or source types, a case-by-case BAT analysis may be required.

BACT and LAER requirements apply to each air emissions source at the facility that emits that particular pollutant. These analyses are discussed in the following subsections.

5.2 LOWEST ACHIEVABLE EMISSIONS RATE

LAER is defined in 25 PA Code §121.1 as, “The rate of emissions based on the following, whichever is more stringent:

(A) The most stringent emission limitation which is contained in the implementation plan of a state for the class or category of source unless the owner or

operator of the proposed source demonstrates that the limitations are not achievable.

(B) The most stringent emission limitation which is achieved in practice by the class or category of source."

The application of LAER may not allow a new or proposed modified source to emit a pollutant in excess of the amount allowable under an applicable new source standard of performance.

Sources of information that were used to identify control alternatives include:

- EPA's RACT/BACT/LAER Clearinghouse [RBLC] database.
- Vendor information.
- Experience with similar projects.

The following LAER analysis for NO_x and VOC describes the available control technologies and discusses the most stringent emissions limitations that have been achieved in practice.

The LAER analysis conducted in this document follows three steps:

1. Identification of available control technologies.
2. Evaluate technical feasibility of identified technologies and identification of most stringent existing permit limits.
3. Propose LAER based on the feasible technology, most stringent emissions limit that has been achieved in practice.

5.2.1 LAER ANALYSIS FOR NO_X

NO_x emissions from combustion sources such as CT/HRSGs consist of two components: oxidation of combustion air atmospheric nitrogen (thermal NO_x and prompt NO_x) and conversion of chemically bound fuel nitrogen (FBN) (fuel NO_x). Essentially all NO_x emissions originate as nitric oxide (NO). NO generated by CT combustion processes are subsequently further oxidized in the atmosphere to the more stable nitrogen dioxide (NO_2) molecule.

Thermal NO_x results from the oxidation of atmospheric nitrogen under high temperature combustion conditions. The amount of thermal NO_x formed is primarily a function of combustion temperature and residence time, air/fuel ratio, and, to a lesser extent, combustion pressure. Thermal NO_x increases exponentially with increases in temperature and linearly with increases in residence time as described by the Zeldovich mechanism.

Prompt NO_x is formed near the combustion flame front from the oxidation of intermediate combustion products. Prompt NO_x comprises a small portion of total NO_x in conventional near-stoichiometric combustors but increases under fuel-lean conditions. Prompt NO_x, therefore, is an important consideration with respect to low-NO_x combustors that use lean fuel mixtures. Prompt NO_x levels may also become significant with ultra-low-NO_x burners.

Fuel NO_x arises from the oxidation of nonelemental nitrogen contained in the fuel. The conversion of FBN to NO_x depends on the bound nitrogen content of the fuel. In contrast to thermal NO_x, fuel NO_x formation does not vary appreciably with combustion variables such as temperature or residence time. Presently, there are no combustion processes or fuel treatment technologies available to control fuel NO_x emissions. For this reason, the regulations typically contain an allowance for FBN directly or inherently (i.e., part of the emissions limit). NO_x emissions from combustion sources fired with fuel oil are higher than those fired with natural gas due to higher combustion flame temperatures and FBN contents. Natural gas may contain molecular nitrogen (N_2); however, the N_2 found in natural gas does not contribute significantly to fuel NO_x formation. Typically, natural gas contains a negligible amount of FBN.

5.2.1.1 CT/HRSG NO_x LAER Analysis

Step 1—Potential Control technologies

Available technologies for controlling NO_x emissions from CTs and HRSGs include combustion process modifications and postcombustion exhaust gas treatment systems. A listing of available technologies for each of these categories follows:

- Combustion process modifications:
  - Water or steam injection and standard combustor design (CTs).
  - Water or steam injection and advanced combustor design (CTs).

   - Dry low-NO_x combustor design (CTs).
   - Catalytic combustion controls (CTs).
- Postcombustion exhaust gas treatment systems:
   - Selective noncatalytic reduction (SNCR).
   - Nonselective catalytic reduction (NSCR).
   - SCR.
   - SCONO$_x$™

A description of each of the listed control technologies is provided in the following sub-sections.

Water or Steam Injection and Standard Combustor Design

Injection of water or steam into the primary combustion zone of a CT reduces formation of thermal NO_x by decreasing the peak combustion temperature. Water injection decreases the peak flame temperature by diluting the combustion gas stream and acting as a heat sink by absorbing heat necessary to vaporize the water (latent heat of vaporization) and raise the vaporized water temperature to the combustion temperature. High purity water must be employed to prevent turbine corrosion or deposition of solids on the turbine blades. Steam injection employs the same mechanisms to reduce peak flame temperature with exclusion of heat absorbed due to vaporization since the heat of vaporization has been added to the steam prior to injection. Accordingly, a greater amount of steam, on a mass basis, is required to achieve a specified level of NO_x reduction in comparison to water injection. Typical injection rates range from 0.3 to 1.0 and 0.5 to 2.0 lb of water and steam, respectively, per pound of fuel. Water or steam injection will not reduce the formation of fuel NO_x.

The maximum amount of steam or water that can be injected depends on the CT combustor design. Excessive rates of injection will cause flame instability, combustor dynamic pressure oscillations, thermal stress (cold-spots), and increased emissions of CO and VOCs due to combustion inefficiency. Accordingly, the efficiency of steam or water injection to reduce NO_x emissions also depends on turbine combustor design. For a given turbine design, the maximum water-to-fuel ratio (and maximum NO_x reduction) will occur up to the point

where cold-spots and flame instability adversely affect safe, efficient, and reliable operation of the turbine.

The use of water or steam injection and standard turbine combustor design can generally achieve NO_x exhaust concentrations of 42 and 65 ppmvd for gas and oil firing, respectively.

Water or Steam Injection and Advanced Combustor Design

Water or steam injection functions in the same manner for advanced combustor designs as described previously for standard combustors. Advanced combustors, however, have been designed to generate lower levels of NO_x and tolerate greater amounts of water or steam injection. The use of water or steam injection and advanced turbine combustor design can typically achieve NO_x exhaust concentrations of 25 and 42 ppmvd for gas and oil firing, respectively.

Dry Low-NO_x Combustor Design

Dry low-NO_x combustors are designed to premix turbine fuel and air prior to combustion in the primary zone. Use of a premix burner results in a homogeneous air/fuel mixture without an identifiable flame front. This allows a lower flame temperature in the combustion zone, causing a decrease in thermal NO_x emissions.

Currently, premix burners are limited in application to natural gas and loads above approximately 35 to 50 percent of baseline due to flame stability considerations. During oil-firing, water injection is typically employed to control NO_x emissions.

In addition to lean premixed combustion, dry low-NO_x combustors typically incorporate lean combustion and reduced combustor residence time to reduce the rate of NO_x formation. CTs cool the high-temperature CT combustor discharge gas stream with dilution air to lower the exhaust gas to an acceptable temperature prior to entering the CT. By adding additional dilution air, the hot CT combustor gases are rapidly cooled to temperatures

below those needed for NO_x formation. Reduced residence time combustors add the dilution air sooner than do standard combustors. The amount of thermal NO_x is reduced because CT combustion gases are at a higher temperature for a shorter period of time.

Current dry low-NO_x combustor technology can typically achieve NO_x exhaust concentrations of approximately 9 to 25 ppmvd or less using natural gas fuel, depending on the CT vendor.

Catalytic Combustion Controls (XONON™)

Another technology that is potentially capable of reducing gas turbine NO_x emissions to less than 3.5 ppmvd is catalytic combustion. Catalytica, Inc., was the first to commercially develop catalytic combustion controls for certain (mostly smaller) turbine engines and markets this system under the name XONON™. In October 2006, this technology was sold to Kawasaki Heavy Industries Ltd. It is not commercially available for larger CTs. Therefore, catalytic combustion does not represent an available control option for the proposed CT.

Selective Noncatalytic Reduction

The SNCR process involves the gas phase reaction, in the absence of a catalyst, of NO_x in the exhaust gas stream with injected ammonia or urea to yield nitrogen and water vapor. The two commercial applications of SNCR include the Electric Power Research Institute's NO_xOUT™ and Exxon's Thermal DeNO_x™ processes. The two processes are similar in that either ammonia (Thermal DeNO_x™) or urea (NO_xOUT™) is injected into a hot exhaust gas stream at a location specifically chosen to achieve the optimum reaction temperature and residence time. Simplified chemical reactions for the Thermal DeNO_x™ process are as follows:

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6\ H_2O \quad (1)$$

$$4\ NH_3 + 5\ O_2 \rightarrow 4NO + 6\ H_2O \quad (2)$$

The NO_xOUT™ process is similar with the exception that urea is used in place of ammonia. The critical design parameter for both SNCR processes is the reaction temperature. At temperatures below 1,600 degrees Fahrenheit (°F), rates for both reactions decrease allowing unreacted ammonia to exit with the exhaust stream. Temperatures between 1,600 and

2,000°F will favor reaction (1), resulting in a reduction in NO_x emissions. Reaction (2) will dominate at temperatures above approximately 2,000°F, causing an increase in NO_x emissions. Due to reaction temperature considerations, the SNCR injection system must be located at a point in the exhaust duct where temperatures are consistently between 1,600 and 2,000°F.

Nonselective Catalytic Reduction

The NSCR process uses a platinum/rhodium catalyst to reduce NO_x to nitrogen and water vapor under fuel-rich (less than 3-percent oxygen [O_2]) conditions. NSCR technology has only been applied to automobiles and stationary reciprocating engines.

Selective Catalytic Reduction

In contrast to SNCR, SCR reduces NO_x emissions by reacting ammonia with exhaust gas NO_x to yield nitrogen and water vapor in the presence of a catalyst. Ammonia is injected upstream of the catalyst bed where the following primary reactions take place:

$$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O \tag{3}$$

$$4NH_3 + 2NO_2 + O_2 \rightarrow 3N_2 + 6H_2O \tag{4}$$

The catalyst serves to lower the activation energy of these reactions, which allows NO_x conversions to take place at a lower temperature than the exhaust gas. The optimum temperatures range from as low as 350°F to as high as 1,100°F (typically 600 to 750°F), depending on the catalyst. Typical SCR catalysts include metal oxides (titanium oxide and vanadium), noble metals (combinations of platinum and rhodium), zeolite (alumino-silicates), and ceramics.

Factors affecting SCR performance include space velocity (volume per hour of flue gas divided by the volume of the catalyst bed), ammonia/NO_x molar ratio, and catalyst bed temperature. Space velocity is a function of catalyst bed depth. Decreasing the space velocity (increasing catalyst bed depth) will improve NO_x removal efficiency by increasing residence time but will also cause an increase in catalyst bed pressure drop. The reaction of NO_x with ammonia theoretically requires a one-to-one molar ratio. Ammonia/NO_x molar ratios greater than one-to-one are necessary to achieve high NO_x removal efficiencies due

to imperfect mixing and other reaction limitations. However, ammonia/NO_x molar ratios are typically maintained at one-to-one or lower to prevent excessive unreacted ammonia (ammonia slip) emissions. As was the case for SNCR, reaction temperature is critical for proper SCR operation. Below this critical temperature range, reduction reactions (3) and (4) will not proceed. At temperatures exceeding the optimal range, oxidation of ammonia will take place resulting in an increase in NO_x emissions. NO_x removal efficiencies for SCR systems typically range from 80 to 90 percent.

EMx™ (SCONO$_x$™)

EMx™ (formerly referred to as SCONO$_x$™) is a multipollutant reduction catalytic control system offered by EmeraChem. EMx™ is a complex technology designed to simultaneously reduce NO_x, VOC, and CO through a series of oxidation/absorption catalytic reactions.

The EMx™ system employs a single catalyst to simultaneously oxidize CO to CO_2 and NO to NO_2. NO_2 formed by the oxidation of NO is subsequently absorbed onto the catalyst surface through use of a potassium carbonate absorber coating. The EMx™ oxidation/absorption cycle reactions are:

$$CO + \frac{1}{2} O_2 \rightarrow CO_2 \quad (5)$$

$$NO + \frac{1}{2} O_2 \rightarrow NO_2 \quad (6)$$

$$2\ NO_2 + K_2CO_3 \rightarrow CO_2 + KNO_2 + KNO_3 \quad (7)$$

CO_2 produced by reactions (5) and (7) is released to the atmosphere as part of the CT/HRSG exhaust stream. Water vapor and elemental nitrogen are released to the atmosphere as part of the CT/HRSG exhaust stream. Following regeneration, the EMx™ catalyst has a fresh coating of potassium carbonate, allowing the oxidation/absorption cycle to begin again. Since the regeneration cycle must take place in an oxygen-free environment, the section of catalyst undergoing regeneration is isolated from the exhaust gas stream using a set of louvers.

The EMx™ operates at a temperature range of 300 to 700°F and, therefore, must be installed in the appropriate temperature section of a HRSG. For installations below 450°F,

the EMx™ system uses an inert gas generator for the production of hydrogen and CO_2. For installations above 450°F, the EMx™ catalyst is regenerated by introducing a small quantity of natural gas with a carrier gas, such as steam, over a steam reforming catalyst and then to the EMx™ catalyst. The reforming catalyst initiates the conversion of methane to hydrogen, and the conversion is completed over the EMx™ catalyst. Utility materials needed for the operation of the EMx™ control system include ambient air, natural gas, water, steam, and electricity. The primary utility material is natural gas used for regeneration gas production. Steam is used as the carrier/dilution gas for the regeneration gas. Electricity is required to operate the computer control system, control valves, and louver actuators.

Commercial experience to date with the EMx™ control system is limited to several small combined-cycle power plants located in California. Representative of these small power plants is a GE LM2500 turbine, owned by Sunlaw Energy Corporation, equipped with water injection to control NO_x emissions to approximately 25 ppmvd. The low temperature SCONO$_x$™ control system (i.e., located downstream of the HRSG at a temperature between 300 and 400°F) was retrofitted to the Sunlaw Energy facility in December 1996 and has achieved a NO_x exhaust concentration of 3.5 parts per million by volume (ppmv) resulting in an approximate 85-percent NO_x removal efficiency. This facility is no longer operating due to market factors. A high-temperature application of EMx™ (i.e., control system located within the HRSG at a temperature between 600 and 700°F) has been in service since June 1999 on a small, 5-MW solar CT located at the Genetics Institute in Massachusetts. Although considered commercially available for large, natural gas-fired CTs, there are currently no combined-cycle units larger than 43 MW that have demonstrated successful application of the EMx™ control technology.

Step 2—Technical Feasibility

Water/steam injection and standard combustor design, water/steam injection and advanced combustor, and dry low-NO_x combustor design would be feasible combustion process for the Project CT.

The CT is equipped with dry low-NO_x burner technology when firing natural gas.

Of the postcombustion stack gas treatment technologies, SNCR is not feasible because the temperature required for this technology (between 1,600 and 2,000°F) exceeds that which will be found in the CT gas streams (less than 1,500°F). NSCR was also determined to be technically infeasible because the process must take place in a fuel-rich (less than 3-percent oxygen) environment. The oxygen content of the proposed CT exhaust gases is in excess of 12 percent.

EMx™ is desirable in that it, unlike SCR, does not require ammonia. However, as discussed previously, there are many complex technical issues associated with this technology. In addition, this technology has not been proven on the size and model of combined-cycle CT being proposed. Furthermore, the installation of EMx™ technology would also cause an increase in back-pressure amounting to twice that of the SCR system and consume additional water to provide steam for the regeneration process, adding to both capital and operating costs.

SCR catalyst can be subject to deactivation by a number of mechanisms. Loss of catalyst activity can occur from thermal degradation if the catalyst is exposed to excessive temperatures over a prolonged period of time. Catalyst deactivation can also occur due to chemical poisoning. Principal poisons include arsenic, sulfur, potassium, sodium, and calcium. Another consideration with the application of SCR technology is the possibility of fouling (i.e., formation of sticky ammonium sulfates that plug the catalyst bed surfaces over time). This is caused by the use of high sulfur fuels and is especially problematic for combined-cycle operations using HRSGs. The proposed CT will combust pipeline-quality natural gas only. Furthermore, ammonia slip will be limited to 5 ppmvd (three-hour average) during normal operations. Therefore, potential for poisoning or fouling the catalyst from proposed CT operations is expected to be minimal. To ensure optimal performance of the catalyst, HTEC will monitor NO_x emissions, perform periodic ammonia slip testing, closely monitor ammonia inventory and flow rate, and undertake periodic physical inspections of the catalyst bed (e.g., through the placement of “coupons” in the bed that will be monitored and analyzed on an as-needed basis to assess catalyst life).

Step 3—Proposed NO_x LAER Emissions Limit for the CT/HRSG

To determine the most stringent NO_x emissions limit for the CT/HRSG, EPA's RBLC database was queried for large CTs. BACT and LAER determinations were obtained when combusting pipeline-quality natural gas for the past 10 years and are summarized in Appendix D, Table D-1. As shown, the lowest NO_x emissions limit is 2 ppmvd (three-hour average) at 15-percent oxygen for natural gas-fired CTs. The typical control system used to achieve these emissions limits is dry low-NO_x combustors and SCR for natural gas firing.

The proposed NO_x LAER emissions rate for the CT/HRSG when combusting natural gas is 2 ppmvd at 15-percent oxygen based on a three-hour average for base or peak load operating cases with or without duct burner firing and is consistent with the previous LAER and BACT determinations. The proposed control system to achieve these emissions limits is dry low-NO_x combustors and SCR. In all cases, ammonia slip will be limited to 5 ppm (three-hour average) at 15-percent oxygen.

5.2.1.2 Auxiliary Boiler NO_x LAER Analysis

Step 1—Potential Control technologies

- Low-NO_x burners
- SCR
- SNCR
- NSCR
- SCONOx™
- Water injection
- Good combustion practices (GCP)

The technologies mentioned in Step 1 are discussed in Section 5.2.1.1.

Step 2—Technical Feasibility

Of these options, only low-NO_x burners, SCR, and GCP are the most feasible options for the boilers. Due to extremely high temperatures required for operation of the boilers and technical difficulties associated with SNCR process, this is considered not feasible. NSCR

technology has only been applied to automobiles and stationary reciprocating engines. As discussed previously, there are many complex technical issues associated with EMx™. Boilers are designed to operate in a dry mode without water or steam injection. The use of water or steam injection could disrupt the combustion dynamics of the system.

Results from the RBLC database suggest low-NO_x burners and GCP to be the most suitable options for a boiler less than 100 MMBtu/hr.

Step 3—Proposed NO_x LAER Emissions Limit for the Auxiliary Boiler

To determine recent LAER and BACT determinations for the 42-MMBtu/hr auxiliary boiler, the RBLC database was queried for commercial/institutional-sized boilers and furnaces less than 100-MMBtu/hr heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-2. The lowest BACT NO_x limit listed is 0.0035 lb/MMBtu for the Minnesota Steel Industries, LLC, in Minnesota. This unit has a throughput of 99 MMBtu/hr, which is much larger than the proposed boiler. But the permit (No. 06100067-004) has listed the limit for these boilers as 0.035 lb/MMBtu, which appears to be inconsistent with RBLC and is quite possibly a typographical error. The next lowest NO_x limit is 0.0075 lb/MMBtu for a refinery boiler in Oklahoma, but it is draft determination. The next lowest NO_x limit ranges between 0.01 and 0.011 lb/MMBtu listed in the RBLC for boilers with throughput in the range of 24 to 950 MMBtu/hr. Facilities with emissions limits of 0.01 lb/MMBtu have not been constructed yet. An emissions limit of 0.0108 lb/MMBtu is the next closest applicable limit for NO_x at the Harrah's Operating Company in Nevada. HTEC is proposing a NO_x emissions limit of 0.0108 lb/MMBtu for the auxiliary boiler.

5.2.1.3 Fuel Gas Heater NO_x LAER Analysis

Step 1—Potential Control technologies

- Low-NO_X burners and ultra-low-NO_x burners
- SCR
- SNCR
- NSCR
- SCONOx™

- Water injection
- GCP

The technologies mentioned in Step 1 are discussed in Section 5.2.1.1.

Step 2—Technical Feasibility

Of these options, only low-NO_x burners, ultra-low-NO_x burners, SCR, and GCP are the most feasible options for fuel gas heaters. SNCR, NSCR, EMx™ and water injection are all considered technically infeasible based on the same reasons as discussed for auxiliary boilers. Results from the RBLC database suggest low-NO_x burners and GCP to be the most suitable options for heaters less than 10 MMBtu/hr

Step 3—Proposed NO_x LAER Emissions Limit for the Fuel Gas Heater

The fuel gas heater is a relatively small combustion source, rated at 6.4 MMBtu/hr, that will fire natural gas. The RBLC database was queried for industrial-sized boilers and furnaces less than 100-MMBtu/hr heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-3 of the permit application. Two lowest determinations are shown with NO_x BACT limits of 0.009 lb/MMBtu for cracking furnaces and are not relevant, since they are a different category of source and are much larger. The next lowest emissions rate of 0.012 lb/MMBtu shown in the RBLC database are determinations for inlet air and vaporization heaters. Although larger and a somewhat different type of source, the rate is higher than the Hill Top proposed NO_x emissions rate of 0.011 lb/MMBtu. There are no combustion modifications or add-on postcombustion processes typically applied to fuel gas heaters of this capacity. Therefore, the proposed LAER for the fuel gas heater is the exclusive use of natural gas and GCP.

5.2.1.4 Emergency Engines NO_x LAER Analysis

The 422-hp fire water pump engine will meet the limits of 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition Internal Combustion Engines, effective September 11, 2006. Table 4 in 40 CFR 60.4219 lists the emissions limits for stationary fire water pump engines. The combined standard for model year 2009 and later 422-hp engine for NMHC + NO_x of 3.0 g/bhp-hr is proposed as LAER. Although add-on NO_x and VOC controls are

feasible for this size engine, the fact this is an emergency engine limited to 100 hr/yr for maintenance and testing make add-on controls impractical.

The planned new 2,682-hp emergency generator engine will meet the Tier II emissions limits of NSPS Subpart IIII shown in Table 1 of 40 CFR 89.112. The combined NMHC and NO_x Tier II emissions limit of 6.4 g/kW-hr is proposed as LAER.

5.2.2 LAER ANALYSIS FOR VOC

VOC emissions result from incomplete combustion of carbon and organic compounds. Factors affecting VOC emissions include firing temperatures, residence time in the combustion zone, and combustion chamber mixing characteristics. Because higher combustion temperatures will increase oxidation rates, emissions of VOC will generally increase during turbine partial load conditions when combustion temperatures are lower. Generally, decreased combustion zone temperature due to the injection of water or steam for NO_x control will also result in an increase in VOC emissions. An increase in combustion zone residence time and improved mixing of fuel and combustion air will increase oxidation rates and cause a decrease in VOC emissions rates. Emissions of NO_x and VOC are inversely related (i.e., decreasing NO_x emissions will result in an increase in VOC emissions). Accordingly, CT vendors have had to consider the competing factors involved in NO_x and VOC formation to develop units that achieve acceptable emissions levels for both pollutants.

5.2.2.1 CT/HRSG VOC LAER Analysis

Step 1—Potential Control Technologies

There are two available technologies for controlling VOC from gas turbines: combustion process design and oxidation catalyst.

Combustion Process Design

Combustion process controls involve combustion chamber designs and operation practices that improve the oxidation process and minimize incomplete combustion. Due to the high combustion efficiency of CTs, approximately 99 percent, VOC emissions are inherently low.

Oxidation Catalyst

Noble metal (commonly platinum or palladium) oxidation catalysts are used to promote oxidation of VOC to CO_2 and water at temperatures lower than would be necessary for oxidation without a catalyst. The design operating temperature range for oxidation catalysts is between 650 and 1,150°F.

Efficiency of VOC oxidation varies with inlet temperature. Control efficiency will increase with increasing temperature up to a temperature of approximately 1,100°F; further temperature increases will have little effect on control efficiency. Significant VOC oxidation will occur at any temperature above roughly 900°F. Inlet temperature must also be maintained below 1,350 to 1,400°F to prevent thermal aging of the catalyst, which will reduce catalyst activity and pollutant removal efficiencies. Removal efficiency will also vary with gas residence time, which is a function of catalyst bed depth. Increasing bed depth will increase removal efficiencies but will also cause an increase in pressure drop across the catalyst bed.

VOC removal efficiency will vary with the species of hydrocarbon. In general, unsaturated hydrocarbons such as ethylene are more reactive with oxidation catalysts than saturated species such as ethane. A typical VOC control efficiency using oxidation catalyst is in the range of 30 to 50 percent.

Oxidation catalysts are susceptible to deactivation due to impurities present in the exhaust gas stream. Arsenic, iron, sodium, phosphorous, and silica (typically present in fuel oil) will all act as catalyst poisons causing a reduction in catalyst activity and pollutant removal efficiencies. Oxidation catalysts are also nonselective and will oxidize other compounds in addition to VOC. The nonselectivity of oxidation catalysts is important in assessing applicability to exhaust streams containing sulfur compounds. Sulfur compounds that have been oxidized to SO_2 in the combustion process will be further oxidized by the catalyst to sulfur trioxide (SO_3). Higher SO_3 concentrations increase the potential for formation of ammonia salt particles and H_2SO_4 mist. These substances may condense and stick to the ductwork and stack, resulting in corrosion and increased maintenance. Due to the oxidation of sulfur compounds and excessive formation of H_2SO_4 mist emissions, oxidation catalysts

are not considered appropriate for combustion devices fired with fuels containing appreciable amounts of sulfur. The exclusive use of low-sulfur natural gas proposed for the Project.

<u>Step 2—Technical Feasibility</u>

Both combustion process design and oxidation catalysts are considered technically feasible for the facility's CT/HRSG, despite the potential drawbacks cited. However, the application of oxidation catalyst represents the top level of control and, therefore, LAER for the CT/HRSG.

<u>Step 3—Proposed VOC LAER Emissions Limit for the CT/HRSG</u>

To determine the most stringent VOC emissions limit for the CT/HRSG, EPA's RBLC database was queried for large CTs firing natural gas. BACT and LAER determinations were obtained for the past 10 years and are summarized in Appendix D, Table D-4.

The lowest VOC concentration for a natural gas-fired CT without duct burner firing listed in the RBLC is 0.3 ppmvd at 15-percent oxygen for the Chouteau Power Plant in Mayes County, Oklahoma. This facility is equipped with two Siemens KWU Model V84.3A CTs rated at 176 MW each. Each CT/HRSG is equipped with 99 MMBtu/hr duct burners. Their permitted VOC concentration for duct burner firing is 0.344 ppmvd at 15-percent oxygen. The VOC emissions rate for these turbines are estimated at 0.0028 lb/MMBtu VOC with or without duct burner firing. It should be noted the heat input of the Hill Top duct burner is 981 MMBtu/hr, or almost 10 times that of the Chouteay Power Plant. Although the proposed VOC stack gas concentration is higher for the Hill Top facility, its emissions rates are comparable to the Chouteau Power Plant on the basis of heat input.

Although the West Deptford Energy Station is shown as a draft determination, it has been issued a combined PSD and Title V permit. The New Jersey Department of Environmental Protection determined LAER for VOC to be 0.7 ppmvd and 1.0 ppmvd corrected to 15-percent oxygen at 100-percent load without and with duct burner firing, respectively.

Other nondraft determinations listed in the RBLC is 1.0 ppmvd at 15-percent oxygen for natural gas-fired CTs without duct burner firing, which is equivalent to the proposed VOC limit without duct burner firing. However, there are a number of BACT/LAER determinations for CTs with duct burner firing that are lower than the proposed rate of 2 ppmvd at 15-percent oxygen. These range from 1.4 to 1.9 ppmvd at 15-percent oxygen. The lowest determination is for the Polk Power Station in Florida for the conversion of four simple cycle CTs to combined cycle operation. However, this Project is currently under construction, and the limit has not been demonstrated. Several other projects having a limit of 1.5 ppmvd at 15-percent oxygen with duct burner firing are currently operating under Title V permits.

The VOC emissions rate across a wide range of permits varies with the amount of duct burner firing. The amount of duct burner firing varies with each individual project dependent on the amount of electricity the local grid interconnect can accommodate and the anticipated energy demand. As such, there is no single established BACT/LAER level dependent on the size of the duct burner and the amount of fuel burning and associated electrical production it can accommodate. This difference in plant design is considered while evaluating BACT/LAER emissions values for CTs with duct burner firing.

The proposed VOC LAER emissions limit for the CT/HRSG is 1.0 ppmvd (three-hour average) for all natural gas operating cases without duct burner firing, and 2.0 ppmvd (three-hour average) for natural gas operating cases with duct burner firing. This proposed VOC LAER emissions limit is consistent with typical emissions limits for the Project's CT model. Compliance will be achieved through GCP and oxidation catalyst.

5.2.2.2 Auxiliary Boiler VOC LAER Analysis

Step 1—Potential Control Technologies

Efficient combustion, oxidation catalyst, and exclusive use of natural gas are potential control technologies for the auxiliary boilers.

Step 2—Technical Feasibility

Efficient combustion and exclusive use of natural gas are the two technically feasible options for the auxiliary boilers.

Step 3—Proposed VOC LAER Emissions Limit for the Auxiliary Boiler

To determine recent LAER and BACT determinations for the 42-MMBtu/hr auxiliary boiler, the RBLC database was queried for commercial/institutional boilers and furnaces less than 100-MMBtu/hr heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-5. The lowest VOC limit listed in the RBLC database was a BACT determination at 0.0015 lb/MMBtu for a 40-MMBtu/hr auxiliary boiler at the Hickory Run Energy Station in Pennsylvania; this has been eliminated, since the source is not yet constructed. The next lowest limit is a 0.0017 lb/MMBtu BACT determination for the Cheyenne Prairie Generating Station in Wyoming, but this is a draft determination. All other determinations range between 0.002 and 0.003 lb/MMBtu, but these are for facilities that have not been constructed yet. The next applicable VOC limit is 0.003 lb/MMBtu for Klausner Holding USA, Inc., in South Carolina and Suwannee Mill in Florida.

HTEC is proposing a VOC LAER limit of 0.003 lb/MMBtu for Hill Top's 42-MMBtu/hr auxiliary boiler.

5.2.2.3 Fuel Gas Heater VOC LAER Analysis

Step 1— Potential Control Technologies

Efficient combustion, oxidation catalyst, and exclusive use of natural gas are the potential control technologies for the fuel gas heaters.

Step 2—Technical Feasibility

Efficient combustion and exclusive use of natural gas are the two technically feasible options for the fuel gas heaters.

Step 3—Proposed VOC LAER Emissions Limit for the Fuel Gas Heater

The RBLC database was queried for industrial-sized boilers and furnaces less than 100-MMBtu/hr heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-6. The lowest VOC BACT limit for heaters and furnaces listed in the RBLC database is a draft determination of 0.0014 lb/MMBtu for a 58.8-MMBtu/hr fuel heater. Hill Top's proposed 6.4-MMBtu/hr fuel gas heater is nearer in size to other RBLC listings with limits of 0.005 and 0.0054 lb/MMBtu; HTEC is proposing a VOC LAER limit of 0.0054 lb/MMBtu.

5.2.2.4 Emergency Engines VOC LAER Analysis

The fire water pump engine will meet the limits of 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition Internal Combustion Engines, effective September 11, 2006. Table 4 in 40 CFR 60.4219 lists the emissions limits for the 422-hp stationary fire water pump engine. The combined standard for NMHC + NO_x of 3.0 g/bhp-hr is proposed as LAER. Although add-on NO_x and VOC controls are feasible for this size engine, the fact that this is an emergency engine limited to 100 hr/yr for maintenance and testing make add-on controls impractical.

The planned new 2,682-hp emergency generator engine will meet Tier II emissions limits of NSPS subpart IIII shown in Table 1 of 40 CFR 89.112. The combined NMHC and NO_x Tier II emissions limit of 6.4 g/kW-hr is proposed as LAER.

5.3 BEST AVAILABLE CONTROL TECHNOLOGY

Pursuant to 40 CFR 52.21(j)(2), an analysis of BACT is required for each pollutant that will be emitted by the proposed Project in amounts equal to or greater than the PSD SER levels. The proposed Project will potentially emit NO_x, CO, VOC, H_2SO_4, and $PM/PM_{10}/PM_{2.5}$ in amounts that exceed the PSD SER levels. These pollutants, therefore, are each subject to an assessment of BACT. Also, the proposed Project will potentially emit GHG emissions (calculated as CO_2e) in amounts greater than 100,000 tpy; therefore, GHG emissions will be subject to an assessment of BACT.

Note that NO_x and VOC emissions are also subject to NNSR requirements, including the installation of LAER control technology. Because LAER emissions limitations for NO_x and VOC are at least as stringent as those determined as BACT, a BACT analysis for NO_x and VOC is not necessary (i.e., the LAER control technology analyses also serves as the BACT analyses for NO_x and VOC).

A BACT analysis is required for any pollutants subject to PSD regulations. BACT is defined in PSD regulations as "an emissions limitation ... based on the maximum degree of reduction for each pollutant subject to regulation ... which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable... through application of production processes or available methods, systems and techniques... for control of such pollutant."

BACT analyses were performed in accordance with EPA's top-down method. The first step in the top-down BACT procedure is identification of available control technologies. Alternatives considered included process designs and operating practices that reduce the formation of emissions, postprocess stack controls that reduce emissions after they are formed, and combinations of these two control categories. Like the LAER analyses, sources of information used to identify control alternatives include EPA's RBLC database, vendor information, and ECT's experience for similar projects.

Following identification of available control technologies, the next step in the analysis is to determine which technologies may be technically infeasible. Technical feasibility was evaluated using the criteria contained in Chapter B of the draft EPA NSR Workshop Manual (EPA, 1990). The third step in the top-down BACT process is the ranking of the remaining technically feasible control technologies from high to low in order of control effectiveness.

An assessment of energy, environmental, and economic impacts is then performed. The economic analysis procedures can be found in the Office of Air Quality Planning and Standards Control Cost Manual (EPA, 1996). The fifth and final step is the selection of a

BACT emissions limitation or a design, equipment, work practice, operational standard, or combination thereof corresponding to the most stringent, technically feasible control technology that was not eliminated based on adverse energy, environmental, or economic grounds.

If the most stringent or *top* control technology is selected, an assessment of energy and economic impacts is not required. In this case, a review of collateral environmental impacts is conducted to determine if selection of a less stringent alternative control technology is warranted. If there are no issues regarding collateral environmental impacts, the top control technology is proposed as BACT, and the BACT analysis is concluded.

Sections 5.3.1 through 5.3.4 provide control technology analyses using the five-step top-down BACT method for $PM/PM_{10}/PM_{2.5}$, CO, H_2SO_4, and GHG emissions, respectively.

5.3.1 BACT ANALYSIS FOR $PM/PM_{10}/ PM_{2.5}$

Emissions of $PM/PM_{10}/PM_{2.5}$ from the proposed Project will occur due to the combustion of natural gas in the CT/HRSG, combustion of natural gas in the auxiliary boiler and the fuel gas heater, combustion of ULSD fuel in the fire water pump and emergency generator engines, and the operation of the mechanical draft cooling tower. $PM/PM_{10}/PM_{2.5}$ emissions resulting from the combustion of natural gas and ULSD fuel will be low due to the relatively low sulfur content of the fuels.

To estimate hourly and annual emissions rates, HTEC has conservatively used short- and long-term natural gas sulfur content of 2.0 and 0.4 gr/100 scf, respectively, for gas-fired sources. The calculated $PM/PM_{10}/PM_{2.5}$ emissions are based on the natural gas sulfur content, filterable emissions provided by the CT vendor, and use of SCR and oxidation catalyst.

To estimate hourly and annual emissions rates, HTEC has conservatively used sulfur content of 15 ppm for the ultra-low sulfur oil-fired emergency diesel generator and fire water pump.

$PM/PM_{10}/PM_{2.5}$ emissions will result from operation of the cooling tower because of the fine particles formed by crystallization of dissolved solids contained in the recirculated water droplets. Drift eliminators represent the only technically feasible control system for $PM/PM_{10}/PM_{2.5}$ emissions from mechanical draft cooling towers.

5.3.1.1 CT/HRSG $PM/PM_{10}/PM_{2.5}$ BACT Analysis

EPA's RBLC database was queried for large CTs firing natural gas. BACT and LAER determinations were obtained for the past 10 years and are summarized in Appendix D, Table D-7 for natural gas-firing.

Step 1—Potential Control Technologies

Available postcontrol technologies used for controlling PM emissions include the following:

- Centrifugal (cyclone) collectors
- Fabric filters or baghouses
- Electrostatic precipitators
- Wet scrubbers
- Use of pipeline-quality natural gas

There are no postcombustion control systems for $PM/PM_{10}/PM_{2.5}$ emissions that have been applied to CTs, since exhaust gas PM concentrations are inherently low.

Step 2—Technical Feasibility

There are no technically feasible postcombustion control systems that control $PM/PM_{10}/PM_{2.5}$ emissions from CTs. Therefore, it is difficult to make comparisons of numerical BACT emissions limits with respect to $PM/PM_{10}/PM_{2.5}$ emissions for several reasons. First, some of the queried results represent emissions limits based on only the filterable portion of total $PM/PM_{10}/PM_{2.5}$ emissions. If the condensable portion, including sulfates generated during the combustion process, is not included, a lower lb/MMBtu emissions limit will result. Secondly, the emissions limits that do contain both the filterable and condensable portion are based on widely varying natural gas sulfur contents. Sulfur in the fuel is converted to sulfates during the combustion process, and these sulfates add to the

condensable portion of the total $PM/PM_{10}/PM_{2.5}$ emissions. Facilities that have a higher short-term natural gas sulfur content have higher $PM/PM_{10}/PM_{2.5}$ emissions based solely on the condensable portion.

Step 3—Ranking of Controls

As discussed in Step 2, it is difficult to make comparisons of numerical BACT emissions limits. Efficient combustion and the exclusive use of pipeline-quality natural gas are the potential control measures identified.

Step 4—Evaluation of Most Effective Controls

$PM/PM_{10}/PM_{2.5}$ emissions from CTs are dependent on several factors: one, the manufacturer and model of the CT; two, the sulfur content of the fuel; and three, the use of a post-combustion SCR or oxidation catalyst control system. While an SCR and oxidation catalyst controls other pollutants, their use and the introduction of ammonia can increase $PM/PM_{10}/PM_{2.5}$ emissions. In addition, some $PM/PM_{10}/PM_{2.5}$ emissions rates are expressed in terms of filterable particulates only, and some are expressed in terms of filterable and condensable particulates. Therefore, it is difficult to compare $PM/PM_{10}/PM_{2.5}$ emissions rates between facilities as different CT manufacturers, different natural gas sulfur content, and different assumptions used in calculating the conversion of ammonia to ammonium sulfates affects the $PM/PM_{10}/PM_{2.5}$ emissions rate. As determined in Step 1, there are no postcombustion control technologies to be considered.

Step 5—Selection of BACT

The proposed $PM/PM_{10}/PM_{2.5}$ BACT for the CT/HRSG is efficient combustion and the exclusive use of pipeline-quality natural gas.

5.3.1.2 Auxiliary Boiler $PM/PM_{10}/PM_{2.5}$ BACT Analysis

Step 1—Potential Control Technologies

There are no postcombustion control systems for $PM/PM_{10}/PM_{2.5}$ emissions that have been applied to natural gas-fired boilers, since exhaust gas PM concentrations are inherently low. Use of clean, i.e., low-sulfur fuel, is the most common method used to limit $PM/PM_{10}/PM_{2.5}$ emissions.

Step 2—Technical Feasibility

Use of clean fuel is a feasible control measure for $PM/PM_{10}/PM_{2.5}$ emissions.

Step 3—Ranking of Controls

Use of clean fuel is the only control measure identified.

Step 4—Evaluation of Most Effective Controls

As determined in Step 1, there are no postcombustion control technologies to be considered.

Step 5—Selection of BACT

HTEC proposes the exclusive use of pipeline-quality natural gas in the boiler as BACT for $PM/PM_{10}/PM_{2.5}$. To determine recent LAER and BACT determinations for the auxiliary boiler, the RBLC database was queried for commercial/institutional boilers and furnaces less than 100-MMBtu/hr heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-8. The lowest PM limit listed in the RBLC database is a BACT determination at 0.0018 lb/MMBtu filterable PM for a 100- and 95-MMBtu/hr heat input boiler, which is several times larger than the one proposed for the Hill Top facility, and they should not be considered comparable to the Hill Top boiler. The next lowest nondraft BACT determination is 0.0019 lb/MMBtu filterable PM for a 42-MMBtu/hr boiler at the Mattawoman Energy Center in Maryland. The next lowest nondraft BACT determination is 0.002 lb/MMBtu for a 46-MMBtu/hr boiler at Klausner Holding USA, Inc., in South Carolina. Both determinations are for filterable PM, which can be eliminated, since Hill Top's proposed PM emissions account for both the filterable and condensable portion. The next lowest limit is 0.0032 lb/MMBtu for a biomass boiler. The next lowest applicable limit is 0.007 lb/MMBtu but is a draft determination and test protocol. The next values shown in the RBLC database are at 0.0074 lb/MMBtu and above. More stringent listed $PM_{10}/PM_{2.5}$ emissions limits in the RBLC database are generally specific to projects with more stringent natural gas sulfur content specifications that are applicable to the geographic location of those projects. As $PM_{10}/PM_{2.5}$ emissions are directly affected by fuel sulfur content, applicable emissions limitations must also be linked to those

specifications. HTEC is proposing a total PM ($PM/PM_{10}/PM_{2.5}$) emissions rate of 0.0074 lb/MMBtu for the Hill Top auxiliary boiler.

5.3.1.3 Fuel Gas Heater $PM/PM_{10}/PM_{2.5}$ BACT Analysis

Emissions of $PM/PM_{10}/PM_{2.5}$ from the proposed Project will occur due to the combustion of natural gas in the fuel gas heater. $PM/PM_{10}/PM_{2.5}$ emissions resulting from the combustion of natural gas will be low due to the relatively low sulfur content of the fuel, i.e., short- and long-term natural gas sulfur content of 2.0 and 0.4 gr/100 scf, respectively.

Step 1—Potential Control Technologies

There are no postcombustion control systems for $PM/PM_{10}/PM_{2.5}$ emissions that have been applied to natural gas-fired fuel gas heaters, since exhaust gas PM concentrations are inherently low. Use of clean, i.e., low-sulfur, fuel is the most common method used to limit $PM/PM_{10}/PM_{2.5}$ emissions.

Step 2—Technical Feasibility

Use of clean fuel is a feasible control measure for $PM/PM_{10}/PM_{2.5}$ emissions.

Step 3—Ranking of Controls

Use of clean fuel is the only control measure identified.

Step 4—Evaluation of Most Effective Controls

As determined in Step 1, there are no postcombustion control technologies to be considered.

Step 5—Selection of BACT

The lowest PM BACT determinations for a heater listed in the RBLC database is 0.0018 and 0.0019 lb/MMBtu (see Table D-9) for filterable PM. Since the proposed Hill Top emissions rate is based on total PM, comparison with lower rates based on filterable PM is not valid. Also, emissions determinations for much larger units, and nonfuel heater units, are not comparable. The lowest BACT determination for total PM for a comparable unit ranges between 0.007 and 0.0078 lb/MMBtu. Therefore, HTEC's proposed total PM

($PM/PM_{10}/PM_{2.5}$) emissions rate of 0.0074 lb/MMBtu based on a conservative AP-42 calculation is consistent with the lowest comparable BACT determination. HTEC is proposing a BACT limit of 0.0074 lb/MMBtu to be achieved using clean fuel and GCP.

5.3.1.4 Emergency Engines $PM/PM_{10}/PM_{2.5}$ BACT Analysis

The fire water pump engine will meet the limits of 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition Internal Combustion Engines, effective September 11, 2006. Table 4 in 40 CFR 60.4219 lists the emissions limits for the 422-hp stationary fire water pump engine. The standard for PM of 0.15 g/bhp-hr is proposed as BACT. Although add-on PM controls are feasible for this size engine, the fact that this is an emergency engine limited to 100 hr/yr for maintenance and testing make add-on controls impractical.

The planned new 2,682-hp emergency generator engine will meet the Tier II emissions limits of NSPS subpart IIII shown in Table 1 of 40 CFR 89.112. The PM Tier II emissions limit of 0.20 g/kW-hr is proposed as BACT.

5.3.1.5 Cooling Tower $PM/PM_{10}/PM_{2.5}$ BACT Analysis

The only feasible technology for controlling $PM/PM_{10}/PM_{2.5}$ emissions from wet mechanical draft cooling towers is the use of drift eliminators. Drift eliminators control $PM/PM_{10}/PM_{2.5}$ emissions by capturing water droplets from the cooling tower exhaust using inertial separation principles. The high efficiency drift eliminators provide a drift rate of 0.0005 percent of the total recirculating cooling water rate. HTEC proposes to use high efficiency drift eliminators with a drift rate of 0.0005 percent as $PM/PM_{10}/PM_{2.5}$ BACT for the cooling tower.

5.3.2 BACT ANALYSIS FOR CO

CO emissions result from incomplete combustion of carbon and organic compounds. The general factors affecting the formation of VOC described previously in Section 5.2.2 also apply to CO emissions.

5.3.2.1 CT/HRSG CO BACT Analysis

Step 1—Potential Control Technologies

The two technologies available for controlling VOC previously described in Section 5.2.2 also apply to CO (i.e., combustion process design and oxidation catalyst). With respect to oxidation catalyst control technology, lower temperatures (on the order of 500°F) are needed to oxidize CO in comparison to VOC.

Step 2—Technical Feasibility

Both CT combustor/burner design and oxidation catalyst control systems are considered technically feasible for the proposed CT. There are no significant adverse energy or environmental impacts associated with the use of good combustor designs and operating practices to minimize CO emissions. However, the use of oxidation catalysts will, as previously noted, result in increased H_2SO_4 mist and salt emissions if applied to combustion devices fired with fuels containing appreciable amounts of sulfur. Increased H_2SO_4 mist emissions will occur, on a smaller scale, from the proposed CT. The oxidation catalyst does not remove CO but rather simply accelerates the natural atmospheric oxidation of CO to CO_2. Because the use of oxidation catalyst represents top control technology, it is not necessary to conduct detailed energy and economic impact analyses.

Step 3—Ranking of Controls

HTEC intends to use both combustor/burner design and an oxidation catalyst control system, so ranking them is not necessary.

Step 4—Evaluation of Most Effective Controls

HTEC intends to use both combustor/burner design and an oxidation catalyst control system, so evaluating the controls is not necessary.

Step 5—Selection of BACT

To determine the most stringent CO emissions limit for the CT/HRSG, EPA's RBLC database was queried for large CTs firing natural gas. BACT and LAER determinations were obtained for the past 10 years and are summarized in Appendix D, Table D-10.

There are several BACT determinations at levels below those being proposed by HTEC. The two lowest determinations for natural gas firing without duct burner firing are 0.9 ppmvd at 15-percent oxygen at the Kleen Energy Systems facility in Connecticut and at the West Deptford facility in New Jersey. The latter facility has a BACT determination of 1.5 ppmvd at 15-percent oxygen with duct burner firing. Also, there are two determinations for natural gas firing with duct burner firing at 1.5 ppmvd at 15-percent oxygen and one at 1.8 ppmvd at 15-percent oxygen. These facilities have comparatively smaller CT units as compared to the proposed Hill Top CT. The next nondraft and most applicable limit in the RBLC list for the proposed CT is 2 ppmvd at 15-percent oxygen at the Live Oaks Power Plant in Georgia.

The proposed CO BACT emissions limit for the CT/HRSG is 2 ppmvd at 15-percent oxygen (three-hour average) for all natural gas operating cases. These proposed CO BACT emissions limits are consistent with typical emissions limits. Compliance will be achieved through GCP and oxidation catalyst. As is the case for VOC, HTEC plans to inspect the catalyst on an as-needed basis and will place "coupons" in the catalyst bed to analyze as needed the functionality and ensure the performance of the catalyst.

5.3.2.2 Auxiliary Boiler CO BACT Analysis

The rate of CO emissions from natural gas-fired boilers depends on the efficiency of combustion. Maintaining properly tuned boilers and operating the boiler according to the manufacturer's recommendations will lead to maintaining CO level at the design specifications.

Step 1—Potential Control Technologies

Potentially available control options for reducing CO emissions from a natural gas-fired auxiliary boiler include combustion controls and an oxidation catalyst.

Step 2—Technical Feasibility

An oxidation catalyst is technically feasible for controlling CO emissions from the auxiliary boiler, but it is not economical for a small-sized boiler. Therefore, an oxidation catalyst is considered economically infeasible for the auxiliary boiler. The remaining technology of combustion controls is technically feasible for the auxiliary boiler.

Step 3—Ranking of Controls

Combustion controls is the only control technology being considered.

Step 4—Evaluation of Most Effective Controls

Combustion controls is the only control technology being considered.

Step 5—Selection of BACT

To determine recent LAER and BACT determinations for the auxiliary boiler, the RBLC database was queried for commercial/institutional boilers and furnaces less than 100-MMBtu/hr heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-11. The lowest CO BACT limit listed in the RBLC database was a determination between 0.0073 and 0.0075 lb/MMBtu for boilers at Harrah's Operating Company, Inc., in Nevada. These limits and another limit of 0.036 lb/MMBtu at Harrah's Operating Company are for particular project-based manufacturer specification. The next lowest BACT determination is 0.0148 lb/MMBtu for a 44-MMBtu/hr boiler at MGM Mirage in Nevada. Few other CO limits at the same facility are LAER determination; hence, it is not directly comparable. There are other CO limits of 0.0164 and 0.02 lb/MMBtu for auxiliary boilers at Marshalltown Generating Station and CPV St Charles, respectively, but they are not yet constructed. The next set of values range between 0.036 and 0.039 lb/MMBtu at Wildcat Point Generation Facility and Hickory Run Energy Station, respectively, were eliminated, because the source is not yet constructed. The next most applicable limit in the RBLC database for the proposed auxiliary boiler is 0.037 lb/MMBtu. HTEC is proposing a CO rate of 0.037 lb/MMBtu as BACT for the auxiliary boiler.

5.3.2.3 Fuel Gas Heater CO BACT Analysis

The rate of CO emissions from a 6.4-MMBtu/hr natural gas-fired fuel gas heater depends on the efficiency of combustion. Maintaining properly tuned burners and operating the fuel gas heater according to the manufacturer's recommendations will lead to maintaining CO level at the design specifications.

Step 1—Potential Control Technologies

Potentially available control options for reducing CO emissions from natural gas-fired fuel gas heaters include combustion controls and an oxidation catalyst.

Step 2—Technical Feasibility

Although an oxidation catalyst may be technically feasible for controlling CO emissions, HTEC is unaware of this technology being applied to any fuel gas heater. The remaining technology of GCP is technically feasible for the fuel gas heater.

Step 3—Ranking of Controls

GCP is the only control technology being considered.

Step 4—Evaluation of Most Effective Controls

GCP is the only control technology being considered.

Step 5—Selection of BACT

HTEC is proposing the use of GCP to limit CO emissions from the fuel gas heater. To determine recent LAER and BACT determinations for the fuel gas heater, the RBLC database was queried for commercial/institutional-sized furnaces and heaters firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-12 of the permit application. The lowest CO BACT limit listed in the RBLC database was a determination at 0.0084 lb/MMBtu for the Nucor facility in Nebraska for a billet post heater, which is not directly comparable to a fuel gas heater. Also, the determination is "other case-by-case," which does not necessarily use BACT criteria. The next lowest BACT determinations range from 0.0194 to 0.03 lb/MMBtu for heaters ranging from 58.8 to 88.4 MMBtu/hr, which are much larger than the 6.4-MMBtu/hr fuel gas heater being installed at Hill Top and are, therefore, not considered valid comparisons. The next lowest determination is 0.035 lb/MMBtu for the MGM Mirage facility. Since this is a LAER determination, it is not directly comparable. The next lowest BACT determination of 0.037 lb/MMBtu at the Cheyenne Station and is equivalent to the rate being proposed by HTEC.

5.3.2.4 Emergency Engines CO BACT Analysis

The fire water pump engine will meet the limits of 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition Internal Combustion Engines, effective September 11, 2006. Table 4 in 40 CFR 60.4219 lists the emissions limits for the 422-hp stationary fire water pump engine. The NSPS limit of 2.6 g/bhp-hr is proposed as BACT. Although add-on CO controls are feasible for this size engine, the fact this is a fire water pump engine limited to 100 hr/yr for maintenance and testing make add-on controls impractical.

The planned new 2,682-hp emergency generator engine will meet the Tier II emissions limits of NSPS Subpart IIII shown in Table 1 of 40 CFR 89.112. The CO Tier II emissions limit of 3.5 g/kW-hr is proposed as BACT.

5.3.3 BACT ANALYSIS FOR H_2SO_4

Emissions of H_2SO_4 from the proposed Project will occur due to the relatively low sulfur content of the fuel, i.e., combustion of natural gas in the CT/HRSG, exclusive firing of natural gas in the auxiliary boiler and fuel gas heater, and limited hours of operation and ULSD fuel for the emergency engines.

5.3.3.1 CT/HRSG H_2SO_4 BACT Analysis

Step 1—Potential Control Technologies

There are no postcombustion control systems, such as scrubbers or duct sorbent injection, for H_2SO_4 emissions that have been applied to CTs.

Step 2—Technical Feasibility

There are no postcombustion control systems that are technically feasible to control H_2SO_4 emissions from CTs.

Step 3—Ranking of Controls

Use of low-sulfur fuel is the control measure being considered.

Step 4—Evaluation of Most Effective Controls

Use of low-sulfur fuel is the control measure being considered.

Step 5—Proposed H_2SO_4 BACT Emissions Limit for CT/HRSG

Only two nondraft BACT determinations for H_2SO_4 expressed as mass per heat input were found in the RBLC database (see Table D-13). These were 0.0001 lb/MMBtu for the Warren County Power Plant in Virginia and 0.0004 lb/MMBtu for the Caithnes Bellport Energy Center in New York. Most of the BACT determination list use of low sulfur natural gas as the control method.

HTEC proposes the exclusive use of pipeline-quality natural gas in the CT/HRSG as BACT for H_2SO_4.

5.3.3.2 Auxiliary Boiler H_2SO_4 BACT Analysis

Emissions of H_2SO_4 from the auxiliary boiler will occur due to the oxidation of fuel sulfur. H_2SO_4 emissions resulting from the combustion of natural gas will be low due to the relatively low sulfur content of the fuel, i.e., short- and long-term natural gas sulfur content of 2.0 and 0.4 gr/100 scf, respectively.

Step 1—Potential Control Technologies

There are no postcombustion control systems, such as scrubbers or duct sorbent injection, for H_2SO_4 emissions that have been applied to small, natural gas-fired boilers. The only control measure is the use of low-sulfur fuel.

Step 2—Technical Feasibility

The use of low-sulfur fuel is technically feasible to control H_2SO_4 emissions from natural gas-fired boiler.

Step 3—Ranking of Controls

Use of low-sulfur fuel is the only control measure being considered.

Step 4—Evaluation of Most Effective Controls

Use of low-sulfur fuel is the only control measure being considered.

Step 5—Selection of BACT

To determine recent LAER and BACT determinations for the auxiliary boiler, the RBLC database was queried for commercial/institutional boilers and furnaces less than 100-MMBtu/hour heat input firing natural gas only. Determinations were obtained for the last 10 years and are summarized in Table D-14. The lowest H_2SO_4 limit listed in the RBLC database was a BACT determination at 0.0001 lb/MMBtu for a 93-MMBtu/hr auxiliary boiler at the CPV St Charles in Maryland. The next lowest limit was a determination at 0.0005 lb/MMBtu for a 40-MMBtu/hr boiler at the Hickory Run Energy Station in Pennsylvania. HTEC is proposing GCP and use of natural gas and H_2SO_4 rate of 0.0001 lb/MMBtu as BACT for the auxiliary boiler.

5.3.3.3 Fuel Gas Heater H_2SO_4 BACT Analysis

Emissions of H_2SO_4 from the fuel gas heater will occur due to the oxidation of fuel sulfur. H_2SO_4 emissions resulting from the combustion of natural gas will be low due to the relatively low sulfur content of the fuel, i.e., short- and long-term natural gas sulfur content of 2.0 and 0.4 gr/100 scf, respectively.

Step 1—Potential Control Technologies

There are no postcombustion control systems, such as scrubbers or duct sorbent injection, for H_2SO_4 emissions that have been applied to small, natural gas-fired fuel heaters. The only control measure is the use of low sulfur fuel.

Step 2—Technical Feasibility

The use of low-sulfur fuel is technically feasible to control H_2SO_4 emissions from natural gas-fired fuel heater.

Step 3—Ranking of Controls

Use of low-sulfur fuel is the only control measure being considered.

Step 4—Evaluation of Most Effective Controls

Use of low-sulfur fuel is the only control measure being considered.

Step 5—Selection of BACT

Emissions of H_2SO_4 from the small 6.4-MMBtu/hr fuel gas heater will be negligible, i.e., maximum emissions rate of much less than 1.0 lb/hr. HTEC proposes GCP and the use of low sulfur fuel as BACT for the fuel gas heater.

5.3.3.4 Emergency Engine H_2SO_4 BACT Analysis

The fire water pump and emergency generator engines will meet the limits of 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition Internal Combustion Engines, effective September 11, 2006. Although add-on PM controls are feasible for these engines, the fact that they are emergency engines limited to 100 hr/yr for maintenance and testing make add-on controls impractical. The exclusive use of ULSD fuel and limited hours of operation will limit H_2SO_4 emissions and is proposed as BACT for the emergency engines.

5.3.4 BACT ANALYSIS FOR GHGS

On June 3, 2010, EPA published a final rule (effective August 2, 2010) in Volume 75, No. 106, page 31514, of the Federal Register (FR) entitled Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, commonly referred to as the Tailoring Rule. For PSD/Title V purposes, GHGs are a single air pollutant defined as the aggregate group of CO_2, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and SF_6. This final rule established specific applicability thresholds for GHG emissions for new major sources and modifications to existing major sources under the PSD and Title V programs. This was necessary since applying the previous PSD and Title V applicability thresholds of 100 and 250 tpy to GHG emissions would have resulted in a large number of relatively small sources becoming subject to these regulatory programs.

Effective January 2, 2011, a new source or modification, that is a new major stationary source for an NSR pollutant other than GHG, whose GHG emissions exceed 75,000 tpy CO_2e will be subject to PSD review including a BACT analysis for GHG emissions. CO_2e emissions are defined as the sum of the mass emissions of each individual GHG adjusted for its respective global warming potential using Table A-1 of the GHG Reporting Program (40 CFR 98, Subpart A). Effective July 1, 2011, in addition to this major stationary source applicability criterion, a new stationary source that emits more than 100,000 tpy of CO_2e

or an existing source that has the PTE 100,000 tpy of CO_2e or greater and commences a modification that results in emissions increase of 75,000 tpy of CO_2e or greater will be subject to PSD and Title V programs.

Hill Top will be a new major stationary source for an NSR pollutant other than GHG and will have CO_2e emissions greater than 75,000 tpy. The Project will be subject to PSD review for GHG including a BACT analysis effective January 2, 2011.

In March 2011, EPA published an updated version of the guidance document entitled PSD and Title V Permitting Guidance for Greenhouse Gases (EPA, 2011). This guidance document, which was originally published in November 2010, provides, among other issues, guidance on performing BACT analyses for GHG emissions. EPA's guidance reaffirms that a BACT analysis for GHG emissions must be conducted using the same five-step, top-down approach used for other NSR pollutants.

The following subsections provide the BACT analysis for GHG emissions required for the Project.

5.3.4.1 CT/HRSG GHG BACT Analysis

The CT/HRSG will be the predominant source of GHGs emitted by the proposed Project. The following describes the five-step BACT analysis performed for the CT/HRSG.

Step 1—Potential Control Technologies

Step 1 of the top-down BACT analysis is identification of available control technologies or techniques, including inherently lower-emitting processes/practices/designs, add-on controls, and a combination of inherently lower-emitting processes/practices and add-on controls, that have a practical application to the control of GHG emissions. These control technologies must include control technologies for the pollutant under evaluation, GHG, regardless of the source category type. For example, control technologies must be identified not only for those demonstrated on other combined-cycle CT facilities but also for control technologies determined through technology transfer that are applied to source categories with similar exhaust stream characteristics.

Technologies that formed the basis of an applicable NSPS should also be considered in the BACT analysis, since a BACT emissions limit cannot be less stringent than an applicable NSPS emissions limit.

On August 3, 2015, EPA proposed a federal plan to implement emissions guidelines for power plants under Section 111(d) of the CAA, known as the Clean Power Plan. On that date, EPA also finalized the GHG NSPS, which is codified in 40 CFR 60, Subpart TTTT for newly constructed, modified, and reconstructed utility steam electric generating units (EGUs). The final NSPS standards apply to new EGUs constructed after the date of publication of the proposed standards, June 18, 2014. The NSPS defines the best system of emissions reduction and standards of performance for newly constructed base load natural gas-fired combined cycle CTs as follows:

- Best system of emissions reduction equal to efficient natural gas-fired combined-cycle technology for base load natural gas fired units.
- CO_2 emissions rate standards of 1,000 lb/MWh (gross), or 1,030 lb/MWh (net).

It is important to note and must be emphasized that available control technologies should not include inherently lower-emitting processes, practices, or designs that would fundamentally redefine the nature of the proposed Project or source. A BACT analysis should not consider those control technologies that would change or redefine that applicant's goal, objectives, purpose, or basic design. A BACT analysis may consider control technologies that change aspects of the proposed facility but do not redefine the nature of the proposed facility.

The plant configuration consists of one CT/HRSG in a 1×1 combined-cycle configuration. The analysis has determined that BACT for GHG emissions consists of maintaining a high-efficiency plant design inherent to this type of gas-fired power plant. A GHG BACT permit condition has been proposed that sets a net heat rate limit (equivalent to an efficiency limit) of 6,758 British thermal units per kilowatt-hour (Btu/kWh), a heat rate appropriate to the proposed combination of gas turbine, HRSG, and ST. The 6,758-Btu/kWh net heat rate is

based on operation at 101°F with duct burner firing. These two primary plant operating modes account for the majority of the total operating hours of the facility. Small degradation factors have also been applied to account for a design margin, performance degradation of the CT, and degradation of auxiliary equipment between major equipment overhauls. An emissions rate based on electrical output (i.e., lb/MW-h CO_2) will also be proposed.

CT Energy Efficiency Design, Practices, and Procedures

CT Design—CO_2 is a product of combustion of fuel containing carbon, which is inherent in any power generation technology using fossil fuel. The basic theoretical combustion equation for methane (CH_4) is:

$$CH_4 + 2\ O_2 = CO_2 + 2H_2O$$

CO_2 emissions are the essential product of the chemical reaction between the fuel and the oxygen in which it burns, not a byproduct caused by imperfect combustion. Therefore, CO_2 emissions cannot be reduced by improving combustion efficiency, and there is no technology available that can reduce CO_2 generation from the combustion of carbon-based fuels. The only effective means to minimize the amount of CO_2 generated by a fuel-burning power plant is through high-efficiency combustion and plant design resulting in the lowest heat rate in units of Btu/kWh. Minimizing the amount of fuel required (in units of million British thermal units) to produce a given amount of electrical power output (in units of kilowatt-hours) results in the lowest amount of CO_2 generated during the combustion process.

The most efficient way to generate electricity from a natural gas CT plant is the use of a combined-cycle design. For fossil fuel technologies, efficiencies typically range between approximately 30 and 50 percent. A typical coal-fired Rankine cycle power plant has a typical base load efficiency of approximately 30 percent, while a natural gas-fired combined-cycle unit operating under optimal conditions has a base load efficiency of approximately 50 percent or greater.

Combined-cycle units operate based on a combination of two thermodynamic cycles: the Brayton and the Rankine cycles. A CT operates on the Brayton cycle, and the HRSG and ST operate on the Rankine cycle. The combination of the two thermodynamic cycles allows for the high efficiency associated with combined-cycle plants.

The combined-cycle natural gas turbine technology proposed for the Project is the high efficiency GE 7HA.02 CT. In addition to the high-efficiency primary components of the turbine, there are a number of other design features employed within the CT that can improve the overall efficiency of the machine. These additional features include those summarized in the following paragraphs.

Evaporative Inlet Air Cooling or Inlet Fogging—Evaporative inlet air cooling or inlet fogging is used during middle and high ambient air temperature operating cases to lower the temperature of the inlet combustion air and thus increase the density of the combustion air. Increasing the density increases the mass flow rate of the inlet combustion air, which allows more fuel to be combusted in the CT process. This provides greater electrical power output from the CT during certain operating cases and in cases of high electrical power demand. Increasing the electrical power output provides increased overall energy efficiency of the CT.

Periodic Burner Tuning—CTs have regularly scheduled maintenance programs. These maintenance programs are important for the reliable operation of the unit, as well as to maintain optimal efficiency. As the CT is operated, the unit experiences degradation and loss in performance. The CT maintenance program helps restore the recoverable lost performance. The maintenance program schedule is determined by the number of hours of operation and/or turbine starts. There are three basic maintenance levels, combustion inspections, hot gas path inspections, and major overhauls. Combustion inspections are the most frequent of the maintenance cycles. As part of this maintenance activity, the combustors are tuned to restore highly efficient low-emissions operation.

Reduction in Heat Loss—CTs have high operating temperatures, which are a result of the heat of compression in the compressor along with the fuel combustion in the burners. To

minimize heat loss from the CT and protect the personnel and equipment around the machine, insulation blankets are applied to the CT casing. These blankets minimize heat loss through the CT shell and help improve the overall efficiency of the machine.

Instrumentation and Controls—CTs have sophisticated instrumentation and controls to automatically control the operation of the CT. The control system is a digital-type and is supplied with the CT. The distributed control system controls all aspects of the turbine's operation, including the fuel flow rate and burner operations to achieve high efficiency and low-NO_x combustion. The control system monitors the operation of the unit and modulates fuel flow and turbine operation to achieve optimal high-efficiency low-emissions performance under all operating cases.

HRSG Energy Efficiency Design, Practices and Procedures

The HRSG takes waste heat from the CT exhaust and uses the waste heat to convert boiler feed water to steam. Duct burning involves burning additional natural gas in the ducts to the HRSG, which increases the exhaust gas temperature and creates additional steam for the ST.

The combined-cycle HRSG is generally a horizontal natural circulation drum-type heat exchanger designed with three pressure levels of steam generation, reheat, split superheater sections with interstage attemperation, postcombustion emissions control equipment, and condensate recirculation. The HRSG is designed to maximize conversion of the CT exhaust gas waste heat to steam for all plant ambient and load conditions. Maximizing steam generation will increase the ST’s power generation, which maximizes overall plant efficiency.

HRSG Design—HRSGs are heat exchangers designed to capture as much thermal energy as possible from the CT exhaust gases. This is performed at multiple pressure levels. For a drum-type configuration, each pressure level incorporates an economizer section(s), evaporator section, and superheater section(s). These heat transfer sections are made up of many thin-walled tubes to provide surface area to maximize the transfer of heat to the working fluid. Most of the tubes also include extended surfaces (e.g., fins). The extended surface optimizes the heat transfer, while minimizing the overall size of the HRSG. Additionally,

flow guides are used to distribute the exhaust gas flow evenly through the HRSG to allow for efficient use of the heat transfer surfaces and postcombustion emissions control components. Low-temperature economizer sections employ recirculation systems to minimize cold-end corrosion, and stack dampers are sometimes used for cycling operation to conserve the thermal energy within the HRSG when the unit is off line.

Insulation—Temperatures inside the HRSG are nearly equivalent to exhaust gas temperatures of the turbine. For CTs, these temperatures can approach 1,200°F. HRSGs are designed to maximize the conversion of waste heat to steam. One aspect of the HRSG design in maximizing this waste heat conversion is use of insulation on all gas path surfaces exposed to ambient air. Insulation minimizes heat loss to the ambient air, thereby improving overall efficiency of the HRSG. Insulation is applied to the HRSG panels that make up the shell of the unit, to the high-temperature steam and water lines, and typically to the bottom portion of the stack.

Minimizing Fouling of Heat Exchange Surfaces—HRSGs are made up of a number of tubes within the shell of the unit that are used to generate steam from the CT exhaust gas waste heat. To maximize this heat transfer, the tubes and their extended surfaces need to be as clean as possible. Fouling of the tube surfaces impedes the transfer of heat. Fouling occurs from the constituents within the exhaust gas stream. To minimize fouling, filtration of the inlet air to the CT is performed. Additionally, cleaning of the tubes is performed during periodic outages. By reducing the fouling, the heat transfer efficiency of the HRSG tubes is maximized.

Minimizing Vented Steam and Repair of Steam Leaks—Minimizing the number and quantity of steam vents and timely repair of steam leaks is important in maintaining the plant's efficiency. A combined-cycle facility has several locations where steam is vented from the process, including the deaerator vents, blowdown tank vents, and vacuum pumps/steam jet air ejectors. These steam vents are necessary to improve the overall heat transfer within the HRSG and condenser by removing solids and air that potentially reduce the efficiency of the heat transfer surfaces. Minimizing the number and quantity of steam

vents and repairing steam leaks in a timely manner is in the best interest of HTEC and will be performed for this Project.

Plantwide Energy Efficiency Design, Practices, and Procedures

There are a number of other design, practices, and procedures within the combined-cycle plant that help improve overall plant efficiency. These include fuel gas preheating and drain operation.

Fuel Gas Preheating—The overall efficiency of the CT process is increased as the temperature of fuel is increased. For combined-cycle pants, the fuel gas is generally heated with high temperature water from the HRSG. This improves the efficiency of the CT. HTEC will employ fuel gas heating of the primary fuel, pipeline-quality natural gas.

Drain Operation—Drains are required to allow for draining the equipment for maintenance (i.e., maintenance drains) and also to allow condensate to be removed from the steam piping and drains for operation (i.e., operation drains). Operation drains are generally controlled to minimize loss of energy from the cycle. This is accomplished by closing the drains as soon as the appropriate steam conditions are achieved.

The other available control technology for GHG emissions for the CT/HRSG is carbon capture and sequestration (CCS).

Carbon Capture and Sequestration

CCS consists of the separation and capture of CO_2 from the flue gas, pressurization of the captured CO_2, transportation of the CO_2 as a fluid via pipeline, and injection and long-term geologic storage.

The capture technologies applicable for fossil fuel combustion include:

- Precombustion systems designed to separate CO_2 and hydrogen in the high-pressure syngas typically produced at integrated gasification combined-cycle power plants.

- Postcombustion systems designed to separate CO_2 from the flue gas produced by the combustion process.
- Oxy-combustion systems that use high-purity oxygen rather than air in the combustion process to produce a highly concentrated CO_2 stream.

Precombustion systems are not technically feasible for this Project, since they would fundamentally redefine the nature of the proposed source. Both post- and oxy-combustion systems would be considered an available control option, and both are currently in development as demonstration projects at coal-fired power plants using amine and ammonia capture systems to remove CO_2 from flue gas. These capture systems are associated with high energy penalties.

There are several technologies at various stages of development with the potential to separate and capture CO_2. Some have been demonstrated at the pilot scale, while others are at the bench-top or laboratory stage of development. Most of the existing applications, and those in the planning stage, are designed to control CO_2 from the combustion of fossil fuels, primarily coal and natural gas. Several demonstration projects are being supported through the U.S. Department of Energy's Clean Coal Power Initiative, but these facilities will exclusively burn coal (Interagency Task Force, 2010).

Carbon sequestration usually involves the injection of CO_2 into deep geological formations of porous rock that are capped by one or more nonporous layers of rock. Injected at high pressure, CO_2 exists as a liquid that flows through the porous rock to fill the voids. Saline formations, exhausted oil and gas fields, and unmineable coal seams are candidates for CO_2 storage. Also, CO_2 injected for enhanced oil recovery projects can result in long-term sequestration, depending on the geologic conditions. Other schemes include liquid storage in the ocean, solid storage by reactions leading to the creation of carbonates, and terrestrial sequestration.

Clean Fuels

The CAA includes clean fuels in the definition of BACT; therefore, clean fuels should be considered as a potential control technology for GHG emissions. Fuels that reduce GHG

emissions of a new source should be considered in a BACT analysis provided they do not redefine the source. For example, a proposed new coal plant should not have to consider switching fuels from coal to natural gas, as that would redefine the source. However, different types of coal may be considered to evaluate the benefits of combusting various types of coal in reducing GHG emissions.

Step 2—Technical Feasibility

Step 2 of the top-down BACT analysis is the elimination of technically infeasible options. EPA considers a technology to be technically feasible if, one, it has been demonstrated and operated successfully on the same type of source under review, or two, it is available and applicable to the source type under review. A control technology should also be considered technically available or applicable if it has been demonstrated on an exhaust stream with similar physical and chemical characteristics.

CCS technology has not been demonstrated on a full-scale power generation facility, and CCS technology is not currently commercially available for use on CTs and HRSGs. However, it is considered technically feasible, as required by EPA's PSD and Title V Permitting Guidance for Greenhouse Gases (March 2011).

Step 3—Ranking of Controls

Step 3 of the top-down BACT analysis is the ranking of technically feasible options.

The remaining technically feasible options include CCS technology, high thermal or energy efficiency, and exclusive use of clean fuels. The energy efficiency must look at the high thermal efficiency design of the CT/HRSG system as well as various energy efficiency improvements throughout the facility.

The potential control technologies for this Project were ranked for effectiveness based on readily available information obtained from the sources consulted for this BACT analysis. The percent reduction values (where available) are the estimated percent reductions of CO_{2e} from the baseline emissions rate.

- CCS: 80 to 90 percent
- Energy efficiency: 10 to 50 percent
- Clean fuels: 0 percent

Step 4—Evaluation of Most Effective Controls

Step 4 of the top-down BACT analysis is the consideration of economic, energy, and environmental impacts.

The constituents of CCS technology (capture, compression, transport, and storage) have been determined to be technically feasible, but the overall cost per ton of CO_2 removed is not cost effective as demonstrated in the following paragraphs. In addition, there are unresolved issues with respect to CO_2 sequestration, including the legal process for closing and remediating sequestration sites and liability for accidental releases from these sites.

Other projects in Pennsylvania have determined CCS is economically infeasible. The Shell application submitted to PADEP Southwest Regional Office in May 2014 cites, "In making the GHG BACT determination for Copano Processing, U.S. EPA determined that control of GHG emissions at a cost of $54/ton is not BACT because it is 'economically prohibitive.' "[1]

HTEC cannot definitively conclude whether this analysis includes capture, compression, transportation, and/or storage.

The recently approved CPV Fairview, LLC, application that concluded, "because the total Project-wide cost of CCS has been estimated to be approximately $331/ton, which is well above the range of cost effectiveness values considered to be reasonable and acceptable in BACT determinations, CCS is far in excess of reasonable control cost for BACT control of CO_2." This cost was inclusive of capture, compression, transportation, and storage of CCS.

[1] Air Quality Plan Approval Application—Petrochemicals Complex—Shell Appalachia LLC, Beaver County, Pennsylvania (May 2014). (pg. 5- 164).

To estimate the relative cost of implementing the CCS components for Hill Top, the 2012 Analysis of Cost and Benefits of CO_2 Sequestration on the U.S. Outer Continental Shelf prepared under U.S. Department of Energy contract by ICF International was consulted. The report states that the cost of postcombustion capture and compression of CO_2 for a 550-MW, natural gas, combined-cycle plant would increase the capital cost by $340 million, or 80 percent relative to a plant without capture.[2] The cost per ton of CO_2 captured is valued at approximately $95 per ton of CO_2.

The site is located in an area were coal mining and oil and gas extraction is common. The Project has not identified a CO_2 storage option in the area and would need to develop this infrastructure. Thus, estimating the cost for transportation and storage is difficult. Using the estimated cost of capture and compression alone is sufficient to show CCS is not cost effective for this Project.

The cost of CCS is further documented in a 2011 Report Cost and Performance of Carbon Dioxide Capture from Power Generation by the International Energy Agency (IEA) that estimates where CCS has sufficient infrastructure to be developed, the cost for postcombustion capture from natural gas-fired power generation would be between $60 and $128 per ton, with an average of approximately $80 per ton CO_2 avoided[3] where cost avoided is the incremental cost per ton of CO_2 avoided by applying CCS when compared to a similar noncaptured facility. These cost estimates include postcombustion CO_2 capture from natural gas combined-cycle power plants by amines and do not cover CO_2 compression, transportation, and storage.

Based on the cost of CO_2 avoided, from ICF International, IEA, EPA's determination on the Shell Photochemical Complex, and CPV Fairfield; CCS would be cost-prohibitive to implement for Hill Top.

[2] ICF International, Analysis of the Costs and Benefits of CO_2 Sequestration on the U.S. Outer Continental Shelf, page 62.
[3] Finkenrath, Matthias. Cost and Performance of Carbon Dioxide Capture from Power Generation. Table 9. Post-combustion capture from natural gas-fired power generation, page 34.

Energy impacts from CCS implementation for regeneration of the capture medium, cleanup of impurities in the CO_2 gas, compression of the gas, and injection into the ground will be severe and have been included in the economic analysis.

Environmental impacts will include additional construction activities for CO_2 pipelines, injection wells, and monitoring wells. The benefit is the removal of up to 90 percent of the CO_2 produced by the facility from the atmosphere.

The Project employs a modern efficient CT and is committed to the exclusive combustion of pipeline-quality natural gas as the primary fuel in the CT/HRSG. Therefore, energy efficiency and clean fuels will be advanced.

Step 5—Selection of BACT

Step 5 of the top-down BACT analysis is the selection of BACT.

HTEC proposes as BACT for GHG the following energy efficiency designs, practices, and procedures for the proposed facility:

- Use of combined-cycle technology.
- CT energy efficiency design, practices, and procedures:
  - Efficient turbine design.
  - Turbine inlet air cooling.
  - Periodic turbine burner tuning.
  - Reduction in heat loss, i.e., insulation of the CT.
  - Instrumentation and controls.
- HRSG energy efficiency design, practices, and procedures:
  - Efficient heat exchanger design.
  - Reduction in heat loss, i.e., insulation of HRSG.
  - Minimizing fouling of heat exchanger surfaces.
  - Minimizing steam venting and repair of steam leaks.
- Plantwide energy efficiency design, practices, and procedures:
  - Fuel gas preheating.
  - Drain operation.

Proposed GHG BACT Emissions Limit for CT/HRSG

HTEC proposes a GHG BACT emissions limit of 2,298,774 short tons of CO_2e per year for the CT/HRSG for all operating cases including periods of startup and shutdown based on an annual basis. This numerical GHG BACT emissions limit is based on the exclusive use of pipeline-quality natural gas. Compliance with this numerical GHG BACT emissions limit will be demonstrated by measuring and recording the total heat input to the CT/HRSG expressed in million British thermal units per year. CO_2 emissions will be calculated using the methodology for calculating CO_2 emissions under the ARP in accordance with 40 CFR 75, Equation G-4, as described in the following:

$$W_{CO_2} = \frac{F_c \times H \times U_f \times MW_{CO_2}}{2{,}000}$$

where: W_{CO_2} = CO_2 emissions in tpy.

F_c = carbon based F-factor (1,040 standard cubic feet per million British thermal units [scf/MMBtu] for natural gas and 1,420 scf/MMBtu for ULSD fuel).

H = heat input in million British thermal units per year.

U_f = $\frac{1}{385}$ standard cubic foot per pound-mole of CO_2 at 14.7 pounds per square inch absolute and 68°F.

MW_{CO_2} = molecular weight of CO_2, 44 pounds per pound-mole.

Methane and nitrous oxide emissions will be calculated using emissions factors as defined in the Mandatory GHG Reporting Rule, Table C-2. CO_2e emissions will then be calculated using each GHG pollutant's respective global warming potential as defined in the Mandatory GHG Reporting Rule, Table A-1.

To ensure the inherent efficiency of the plant remains high throughout all operating modes, HTEC also proposes a numerical limit on the total facility net heat rate, expressed in units of Btu/kWh on an annual basis. The proposed facility net heat rate is derived using the

CT/HRSG net heat rate at base load with supplemental duct firing at 101°F. The weighted average base load net heat rate is calculated by multiplying the heat rate associated with each operating case listed previously by the corresponding percentage of total operating hours anticipated by that case on an annual basis. Note this net heat rate reflects the *net* electrical power production, meaning the denominator is the amount of electrical power provided to the grid. It does not reflect the total amount of electrical power produced by the plant, or gross electrical power, which also includes the parasitic load consumed by operation of the plant.

The following margins were used to adjust base load heat rates for these operating cases:

- 3.3 percent to account for the potential difference between the calculated plant heat rate and the actual tested plant heat rate.
- 6 percent for CT/HRSG efficiency losses due to degradation prior to CT/HRSG overhaul.
- 3 percent for auxiliary plant equipment losses due to degradation over time.

This results in an average base load net heat rate limit for the CT/HRSG of 7,506 Btu/kWh net on an annual basis. In addition, the GHG BACT emissions limit of 879 lb/MWhCO_2e (net) at base load with duct burner firing is proposed. This value is at the lower end of the range of BACT determinations for natural gas-fired CTs (see Table D-15).

HTEC will demonstrate compliance with this proposed average GHG BACT limit on an annual basis by measuring/monitoring total natural gas consumption and electrical output during base load operations when combusting natural gas without supplemental duct burner firing and during base load operations combusting natural gas with supplemental duct burner firing. Measuring and monitoring is a viable surrogate to ensure efficient operation during all operating periods. CO_2 emissions will be calculated using equation G-4 under the provisions of the ARP, 40 CFR 75 using the heat input of the natural gas combusted during these two operating cases only. Methane and nitrous oxide emissions will be calculated using emissions factors as defined in the Mandatory GHG Reporting Rule, Table C-2. CO_2e emissions will then be calculated using each GHG pollutant's respective global warming potential as defined in the Mandatory GHG Reporting Rule, Table A-1. The total

calculated CO_2e emissions for these two operating cases will be divided by the total net power output in megawatt-hours generated during these two operating cases only for the same 12-month period to obtain a weighted average CO_2e emissions rate expressed in tons per megawatt-hour.

5.3.4.2 Auxiliary Boiler GHG BACT Analysis

Step 1—Potential Control Technologies

There is currently no technically feasible add-on control technology to reduce GHG emissions from the auxiliary boiler. Other methods to reduce GHG emissions from the auxiliary boiler include efficient boiler design, cleaner fuels, and GCP.

Step 2—Technical Feasibility

Efficient boiler design, cleaner fuels, and GCP are all technically feasible to control GHG emissions from natural gas-fired boiler.

Step 3—Ranking of Controls

For the purposes of this BACT analysis, efficient boiler design, cleaner fuels, and GCP are being considered together.

Step 4—Evaluation of Most Effective Controls

Since efficient boiler design, cleaner fuels, and GCP are being considered in concert, ranking the effectiveness of each is not necessary.

Step 5—Selection of BACT

HTEC is proposing the use of efficient boiler design, cleaner fuels, and GCP as BACT for the auxiliary boiler.

5.3.4.3 Fuel Gas Heater GHG BACT Analysis

Step 1—Potential Control Technologies

There is currently no technically feasible add-on control technology to reduce GHG emissions from the fuel gas heater. Other methods to reduce GHG emissions from the fuel gas heater include efficient design, cleaner fuels, and GCP.

Step 2—Technical Feasibility

Efficient design, cleaner fuels, and GCP are all technically feasible to control GHG emissions from natural gas-fired fuel gas heaters.

Step 3—Ranking of Controls

For the purposes of this BACT analysis, efficient fuel gas heater design, cleaner fuels, and GCP are being considered together.

Step 4—Evaluation of Most Effective Controls

Since efficient design, cleaner fuels, and GCP are being considered in concert, ranking the effectiveness of each is not necessary.

Step 5—Selection of BACT

HTEC is proposing the use of efficient design, cleaner fuels, and GCP as BACT for the fuel gas heater.

5.3.4.4 Emergency Engine GHG BACT Analysis

There is currently no technically feasible add-on control technology to reduce GHG emissions from the fire water pump or emergency generator engines. HTEC is proposing to limit GHG emissions from these sources by incorporating GCP and limiting the hours of operation. The emergency engines will be maintained in accordance with the manufacturer's specifications.

5.3.4.5 Switch Equipment GHG BACT Analysis

SF_6 is one of the six pollutants that comprise GHGs. SF_6 emissions are not required to be reported under the Mandatory GHG Reporting Rule for fuel combustion sources, since SF_6 is not a naturally occurring pollutant that results from the combustion process. SF_6 is a synthetic gas that possesses excellent electrical insulating properties. Because of this, SF_6 is used as an insulating gas in many electrical circuit breakers. The main circuit breaker for the Hill Top facility will contain a quantity of SF_6 for the purpose of acting as an electrical insulator.

There may potentially be some small, nonroutine emissions of SF_6 during the operation resulting from opening and closing the circuit breaker. To minimize the emissions of SF_6, HTEC proposes to use state-of-the-art enclosed pressure SF_6 circuit breakers with leak detection as BACT for SF_6. In comparison to older circuit breakers containing SF_6, modern circuit breakers are designed as totally enclosed-pressure systems with a far lower potential for SF_6 emissions. In addition, the effectiveness of the leak-tight closed systems can be enhanced by equipping them with a density alarm that provides a warning if small amounts of gas have escaped. This will prevent any excess SF_6 emissions from being emitted into the atmosphere.

5.3.4.6 Fugitive Equipment Leak GHG BACT Analysis

GHG emissions can occur from leaks in the natural gas piping components (e.g., valves and flanges), and rotary shaft seals, connection interfaces, valve stems, and similar points. Fugitive GHG emissions will be calculated for all natural gas piping components on an annual basis to demonstrate compliance with the annual GHG BACT emissions limit. The CT enclosure is maintained under negative pressure, and any natural gas leaks from piping components within the CT enclosure will be captured and not emitted to atmosphere. GHG emissions will be calculated using emissions factors contained in EPA’s Mandatory GHG Reporting Rule, 40 CFR 98, Table W-1A, Default Whole Gas Emissions Factors for Onshore Petroleum and Natural Gas Production. GHG emissions from natural gas piping components will be calculated on an annual basis. HTEC will institute a leak monitoring program to detect and repair leaks.

5.3.5 STARTUP AND SHUTDOWN BACT ANALYSIS

BACT must be met at all times including during periods of startup and shutdown. Pollutants subject to BACT analysis and review must address BACT emissions limits not only during normal operation but also during startup and shutdown.

NO_x, CO, and VOC emissions are expected to have higher hourly emissions rates during periods of startup and shutdown. This is due, in general, to two factors. One, these pollu-

tants are the products of incomplete combustion; complete combustion does not occur during periods of startup and shutdown. And two, NO_x, CO, and VOC emissions are controlled by SCR and oxidation catalyst, respectively. When the CT exhaust gas is below the minimum catalyst activation temperature, the control system does not permit the flow of ammonia; therefore, the SCR system is not functioning. Additionally, the oxidation catalyst does not function at its peak efficiency due to lower exhaust temperatures that are evident during startup and shutdown.

Other pollutants, such as $PM/PM_{10}/PM_{2.5}$, SO_2, and H_2SO_4 have lower emissions during startup and shutdown, as these emissions are directly proportional to the amount of fuel flow. Since fuel flow is lower during startup and shutdown as compared to normal operation, emissions from these pollutants during startup and shutdown will be lower as compared to normal operation. Therefore, BACT emissions limits proposed for these pollutants will be valid during periods of normal operation as well as during periods of startup and shutdown.

HTEC proposes the BACT emissions limits provided in Table 5-1 for NO_x, CO, and VOC during startup and shutdown. All starts and stops are less than one hour in duration.

5.4 BAT ANALYSIS

Pennsylvania defines BAT as equipment, devices, methods or techniques as determined by PADEP that will prevent, reduce, or control emissions of air contaminants to the maximum degree possible and are available or may be made available. Compliance with BACT, LAER, NSPS, or maximum achievable control technology is assumed to usually satisfy BAT requirements. SO_2 and ammonia will be emitted in quantities sufficient to warrant a BAT analysis. Also, opacity limits for the CT will be compared to BAT performance levels. The BAT determination for each are discussed in the following paragraphs.

5.4.1 SO_2 BAT ANALYSIS

Emissions of SO_2 from the proposed Project will occur due to the combustion of natural gas in the CT/HRSG, auxiliary boiler, and fuel gas heater, as well as ULSD fuel in the

Table 5-1. Proposed BACT Emissions Limits during Startup and Shutdown—Natural Gas

	Cold Start		Warm Start		Hot Start		Shutdown	
Pollutant	Emissions (lb/event)	Duration (minutes)	Emissions (lb/event)	Duration (minutes)	Emissions (lb/event)	Duration (minutes)	Emissions (lb/event)	Duration (minutes)
NO_x	260	55	146	40	70	20	7	12
CO	790	55	155	40	120	20	125	12
VOC	55	55	10	40	9	20	26	12

Source: GE, 2017.

emergency engines. SO_2 emissions resulting from the combustion of natural gas and ULSD fuel will be low due to the relatively low sulfur content of the fuels.

There are no postcombustion control systems, such as scrubbers or duct sorbent injection, for SO_2 emissions that have been applied to CTs. There are no postcombustion control systems that are technically feasible to control SO_2 emissions from an auxiliary boiler or fuel gas heater. In addition, SO_2 controls are not feasible for the emergency engines because of their limited hours of operation and low sulfur content of the fuel.

SO_2 emissions from Hill Top sources are basically dependent on the sulfur content of the fuel. The sulfur content of pipeline-quality natural gas can vary slightly depending on the area of the country and the natural gas supplier. The sulfur content of ULSD fuel is set by regulation at 15 ppm. HTEC proposes the exclusive use of pipeline-quality natural gas in the CT/HRSG, auxiliary boiler, and fuel gas heater and ULSD fuel in the emergency engines as BAT for SO_2.

5.4.2 AMMONIA BAT ANALYSIS

The reaction of NO_x with ammonia in the SCR theoretically requires a 1×1 molar ratio. Ammonia to NO_x molar ratios greater than 1×1 are necessary to achieve high NO_x removal efficiencies due to imperfect mixing and other reaction limitations. However, ratios are typically maintained at less to prevent excessive ammonia slip. HTEC will meet the performance level of 5 ppmvd of ammonia at 15-percent oxygen, which is currently the lowest level in the RBLC database for natural gas fired CTs.

5.4.3 OPACITY BAT ANALYSIS

Pennsylvania's visible emissions rule, 25 Pa. Code §123.41, limits opacity to no more than 20 percent for three minutes in any 1-hour period and no more than 60 percent at any time. Hill Top will comply with this rule. In addition, BACT determinations for natural gas-fired CTs have typically been at 10 percent and some as low as 5 percent. HTEC proposes BAT for the CT/HRSG to be an opacity level of 10 percent during normal operations and 20 percent during startup and shutdown. The opacity limits are exclusive of visible condensed water vapor.

5.5 SUMMARY OF PROPOSED LAER/BACT/BAT LEVELS

Tables 5-2 and 5-3 provide summaries of the LAER/BACT/BAT control technologies proposed for the CT/HRSG and ancillary sources, respectively.

Table 5-2. Summary of Proposed LAER/BACT/BAT Emissions Limits for the CT/HRSG

Pollutant	Fuel/Condition	Emissions Rate		Control Technology	Basis
NO_x	Natural gas	2.0	ppmvd at 15% oxygen	Dry low-NO_x SCR	LAER
	Startup natural gas	260	lb/event		LAER
	Shutdown	7.0	lb/event		LAER
VOC	Natural gas without duct burner	1.0	ppmvd at 15% oxygen	Oxidation catalyst	LAER
	Natural gas with duct burner	2.0	ppmvd at 15% oxygen	Oxidation catalyst	LAER
	Startup natural gas	55.0	lb/event		LAER
	Shutdown	26.0	lb/event		LAER
CO	Natural gas	2.0	ppmvd at 15% oxygen	Oxidation catalyst, GCP	BACT
	Startup natural gas	790	lb/event		BACT
	Shutdown	125	lb/event		BACT
PM	Natural gas without duct burner	0.0071	lb/MMBtu	Low-sulfur fuel, efficient combustion	BACT
	Natural gas with duct burner	0.00718	lb/MMBtu	Low-sulfur fuel, efficient combustion	BACT
H_2SO_4	Natural gas without duct burner	0.00086	lb/MMBtu	Low-sulfur fuel, efficient combustion	BACT
	Natural gas with duct burner	0.00086	lb/MMBtu	Low-sulfur fuel, efficient combustion	BACT
SO_2	Natural gas without duct burner	0.0013	lb/MMBtu	Low-sulfur fuel, efficient combustion	BAT
	Natural gas with duct burner	0.0013	lb/MMBtu	Low-sulfur fuel, efficient combustion	BAT
GHG	Natural gas	879	lb/MWh CO_2e	Efficient combustion	BACT
	Natural gas	2,298,774	tpy CO_2e		BACT
Ammonia	Natural gas, ULSD	5.0	ppmvd at 15% oxygen	Controlling ammonia injection to SCR	BAT
Opacity	Natural gas, ULSD	10%		Use of clean fuels	BAT

Sources: HTEC, 2017.
ECT, 2017.

Table 5-3. Summary of Proposed LAER/BACT/BAT Emissions Limits for the Ancillary Sources

Pollutant	Fuel	Emissions Rate		Control Technology	Basis
Auxiliary boiler					
NO_x	Natural gas	0.0108	lb/MMBtu	GCP	LAER
VOC	Natural gas	0.003	lb/MMBtu	GCP	LAER
CO	Natural gas	0.0370	lb/MMBtu	GCP	BACT
PM	Natural gas	0.0074	lb/MMBtu	Low sulfur fuel, GCP	BACT
H_2SO_4	Natural gas	0.0001	lb/MMBtu	Low sulfur fuel, GCP	BACT
SO_2	Natural gas	0.0058	lb/MMBtu	Low sulfur fuel, natural gas	BAT
GHG	Natural gas	21,545	ton CO_2e per year	GCP, clean fuel, efficient design	BACT
Fuel gas heater					
NO_x	Natural gas	0.0110	lb/MMBtu	GCP	LAER
VOC	Natural gas	0.0054	lb/MMBtu	GCP	LAER
CO	Natural gas	0.0370	lb/MMBtu	GCP	BACT
PM	Natural gas	0.0074	lb/MMBtu	Low sulfur fuel, GCP	BACT
H_2SO_4	Natural gas	negligible		Low sulfur fuel	BACT
SO_2	Natural gas	0.0058	lb/MMBtu	Low sulfur fuel, natural gas	BAT
GHG	Natural gas	3,283	ton CO_2e per year	GCP, clean fuel, efficient design	BACT
Fire water pump engine					
NMHC + NO_x	ULSD	3.0	g/bhp-hr	GCP, compliance with NSPS	LAER
CO	ULSD	2.6	g/bhp-hr	GCP, compliance with NSPS	BACT
PM	ULSD	0.15	g/bhp-hr	ULSD fuel, compliance with NSPS	BACT
GHG	ULSD	24	ton CO_2e per year	Limited hours of operation	BACT
Emergency generator engine					
NMHC + NO_x	ULSD	6.4	g/kW-hr	GCP, compliance with NSPS	LAER
CO	ULSD	3.5	g/kW-hr	GCP, compliance with NSPS	BACT
PM	ULSD	0.20	g/kW-hr	ULSD fuel, compliance with NSPS	BACT
GHG	ULSD	154	ton CO_2e per year	Limited hours of operation	BACT
Cooling tower					
$PM/PM_{10}/PM_{2.5}$	Not applicable	0.0005%	drift rate	Drift eliminators	BACT

Sources: HTEC, 2017.
ECT, 2017.

6.0 ADDITIONAL 25 PA. CODE §127, SUBCHAPTER E, REQUIREMENTS

On May 19, 2007, PADEP adopted revised NSR regulations in 25 Pa. Code §127, Subchapter E. Per 25 Pa. Code §127.201(a), "A person may not cause or permit the construction or modification of an air contamination facility in a nonattainment area or having an impact on a nonattainment area unless the Department... has determined that the requirements of this subchapter have been met."

25 Pa. Code §127.201(c) specifies, "The NSR requirements of this subchapter also apply to a facility located in an attainment area for ozone and within an ozone transport region that emits or has the PTE at least 50 tpy of VOC or 100 tpy of NO_x. A facility within either an unclassifiable/attainment area for ozone or within a marginal or incomplete data nonattainment area for ozone or within a basic nonattainment area and located within an ozone transport region will be considered a major facility and shall be subject to the requirements applicable to a major facility located in a moderate nonattainment area."

To obtain a permit under additional 25 Pa. Code §127, Subchapter E, NNSR, a major source must complete requirements similar to PSD but with a few additional components: (1) emissions control requirements, (2) compliance certification, (3) alternatives analysis, (4) emissions offsets, and (5) public notice. Each of these is described in the following subsections.

6.1 EMISSIONS CONTROL REQUIREMENTS

The control technology requirements are dependent on the pollutant under review, size of the source, and whether internal offsets will be used. New and modified major stationary sources subject to NNSR must comply with LAER for the specific pollutant for which NNSR is being conducted.

To satisfy requirements of LAER, the emissions from the proposed facilities:

- Must not exceed applicable 40 CFR 60 under Section 111 of the CAA. 40 CFR 60 is a minimum requirement of LAER.
- Must meet the most stringent of either of the following:

- o Emissions limitation in any approved state implementation plan for a specific class or category of facility, unless the owner or operator of the proposed facility demonstrates such limitations are not achievable.
- o Emissions limitation that is achieved in practice. It is the responsibility of the applicant to demonstrate LAER. There is no allowance for economic analysis in the definition of LAER. Therefore, cost cannot be the basis for determining any emissions limitation is unattainable. For an applicant to satisfy the requirements of LAER, a nationwide search must be conducted.

LAER supersedes BACT review for those facilities or pollutants where these requirements overlap. Section 5.0 of this document presents the data needed to satisfy this requirement.

6.2 COMPLIANCE CERTIFICATION

All major stationary sources owned or operated by the applicant in the state must be in compliance or on a schedule for compliance with all applicable state and federal emissions limitations and standards. At this time HTEC does not own or operate any other major stationary sources in the state of Pennsylvania. As a result, the compliance certification requirement is satisfied.

6.3 ALTERNATIVES ANALYSIS

Before issuing an NNSR permit for a new source, PADEP requires an analysis to "be conducted of alternative sites, sizes, production processes and environmental control techniques for the proposed facility, which demonstrates that the benefits of the proposed facility significantly outweigh the environmental and social costs imposed within this Commonwealth as a result of its location, construction or modification" (25 Pa. Code §127.205, Paragraph 5). The alternative analysis must address the possible alternative sites, sizes, production processes, and environmental control techniques for the proposed source.

HTEC has conducted an alternatives analysis in accordance with Pennsylvania NNSR regulations. The analysis performed by HTEC demonstrates the benefits from construction of

a new combined-cycle unit as proposed significantly outweigh the associated environmental and social costs because (1) the location of the new plant at the already-developed power plant site will provide electrical generation capacity without impacting a new site or requiring extensive construction of infrastructure, and (2) the NO_x and VOC emissions offsets obtained by HTEC will ensure a net reduction in NO_x and VOC emissions in the ozone transport region in Pennsylvania.

6.3.1 ALTERNATIVE SITE LOCATIONS

The discovery and increasingly widespread use of an economical process to extract natural gas from shale is predicted to make the Marcellus region a major supply basin for natural gas production. Pennsylvania has a high production level of shale-derived natural gas compared to other northeastern states that currently allow shale drilling activities.

Location in the PJM Interconnection LLC (PJM) area closer to the major load centers on the eastern seaboard lessens the transmission line losses and potential need for additional transmission upgrades compared to locations in the more western parts of the PJM system. As transmission line losses increase, the need for more generation increases to serve the same need at the end of the transmission and distribution systems. Likewise, smaller losses mean less generation is needed to meet those needs. HTEC narrowed their search to areas within PJM.

Based on an analysis of environmental, social, and economic impacts, a previously developed power plant site represents the best option for the new combined-cycle plant. The site selection process conducted by HTEC involved the objective evaluation of four sites along the banks of the Monongahela River evaluating specific criteria, such as (1) proximity and availability to large electric transmission lines, (2) sufficient availability of natural gas supply, (3) existing character of the site (zoning and land use criteria) and surrounding area (i.e., developed, industrial), (4) impacts to threatened or endangered species or species of special concern, (5) impacts to wetlands and streams, (6) impacts to cultural resources, (7) feasibility of completing construction at the site in time for the planned commercial operation date of June 2020, and (8) overall environmental impacts, including air quality impacts, of the proposed Project.

Maximizing the search criteria type of infrastructure decreases environmental impacts associated with connecting the power plant to the source of fuel supply and potential need for extensive transmission line work to accommodate the additional electric generation.

The proposed Project Site satisfies all of the criteria described previously. The Project Site was the location of the abandoned LTV coal mine and was later graded for the installation of a 520-MW resource recovery facility. The roughly 40-acre Project Site obtained for the plant was previously graded to a general elevation of 1,122 feet (ft), with erosion control ponds in place. The Project Site is zoned for a power plant. There are no wetlands or streams on the Project Site.

A gas line is located within one mile south of the Project Site at the now-closed Hatfields Ferry Power Plant. The 500-kilovolt substation at the Hatfields Ferry Power Plant will be the point of interconnection to the electrical grid with no additional upgrades required to the grid. With all the other sites, lengthy, new transmission lines and/or gas pipelines would have to be constructed, along with their associated environmental, social, and economic impacts. In addition, the high-voltage transmission lines near the Project Site already have impacted the Project Site, as well as the surrounding area.

Water will be obtained from the Monongahela River. Threatened or endangered species are not present on the Project Site, and no impact is expected along the lineal rights-of-way for the proposed plant. Furthermore, this plan approval application will demonstrate this Project, as proposed, will not cause or contribute to a violation of any health-based standard or impair soil or vegetation in the area.

6.3.2 ALTERNATIVE SIZES

The new NAAQS for CO_2 (clean power plan), MATS rule, Coal Combustion Residuals Rule, and Effluent Guidelines Rule that have been published by EPA may potentially lead to the retirements of numerous older fossil fuel power plants throughout the United States with particular impact on the PJM plants due to age, size, efficiency, and existing pollution control technologies installed on many of the power plants in the region. The region of

PJM includes the movement of electricity in all or part of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Virginia, West Virginia, and the District of Columbia. The predicted requirements, combined with anticipated growth in the region, indicate a need for additional clean power generation sources. These clean power generation sources are to be a combination of future generation fossil fuel-fired plants with greater efficiencies and lower environmental impacts (primarily those powered by natural gas) along with a mix of renewable resources.

HTEC is sized to provide a portion of the electricity needed reliably and efficiently when needed. Considering the capacity of the electrical grid, efficiencies associated with water and natural gas pipeline operations and limiting environmental and social impacts, HTEC is proposing to build a 1×1 combined-cycle unit with a nominal rating of 620 MW. A second unit can be accommodated on the Project Site if needed in the future but is not part of this plan approval application.

6.3.3 ALTERNATIVE PRODUCTION PROCESSES

Electricity may be produced in many different ways. Production processes to be considered include renewable energy technologies (e.g. solar, biomass, and wind power) and fossil fuels. Renewable energy processes were removed from consideration because they could not produce adequate amounts of electrical power needed to meet the expected energy demands resulting from the anticipated coal-fired plant retirements. Furthermore, Pennsylvania does not provide appropriate geographic and climatological conditions necessary to provide electrical power when needed to this capacity.

Plants using fossil fuels (coal or oil) were removed from consideration because the cost to comply with environmental regulations (on a dollar-per-kilowatt basis) was much higher than that of a comparably sized natural gas plant. Further, even with the installation of control technologies on coal or oil plants, the resulting environmental impacts were still greater than a comparably sized natural gas plant.

Other natural gas power generation processes (e.g., reciprocating engines, boilers, CTs) and energy recovery cycles (e.g. simple-cycle, combined-cycle, combined heat and power)

were also considered. CTs in combined-cycle operation were determined to be the most efficient as represented by heat rate in terms of Btu/kWh. They have the lowest cost to construct, operate, and maintain on a dollars-per-megawatt basis. They also have a shorter construction schedule and less acreage needed for the plant footprint.

HTEC considered various CT, HRSG, and control system designs and manufacturers and has chosen a 1×1 configuration with HRSG for the overall efficiency, flexibility, and capacity required.

6.3.4 ALTERNATIVE CONTROL TECHNOLOGIES

A detailed discussion and analysis of alternative control technologies is included in the BACT/LAER/BAT analysis in Section 5.0 of this plan approval application. The Project was required to perform a BACT analysis for criteria pollutants since the proposed Project is subject to PSD. Furthermore, the Project is subject to LAER for NO_x and VOC since the area is in an ozone transport region. LAER is generally considered the most stringent level of control required under the CAA. Based on the results of the analysis, HTEC will employ air pollution control technology equivalent to or more stringent than other similar sources in the United States. The Project will also be fueled exclusively with natural gas, which will result in lower emissions of criteria pollutants, such as NO_x, SO_2, PM, and CO_2, compared to alternative fossil fuels. In addition, the offsets HTEC will obtain to meet NNSR requirements for NO_x and VOCs will ensure a net decrease in NO_x and VOC emissions for the Pennsylvania ozone transport region.

HTEC will provide an advanced CT, equipped with advanced dry low-NO_x combustion technology in the primary mode of operation to prevent emissions of NO_x from forming, combined with efficient combustion design that minimizes the formation of CO and VOC at the same time. The HRSG will be equipped with an SCR system and an oxidation catalyst to control emissions of NO_x, CO, and VOC from the CT and the HRSG duct burners. This system further controls the small amounts of some volatile HAPs, e.g., formaldehyde, that are created in the combustion process.

No other alternative would be more protective of human health and the environment while continuing to achieve HTEC's goal of providing a reliable supply of efficient electricity production for PJM. The use of natural gas to power the unit will result in very low emissions per kilowatt of electricity generated. The proposed combined-cycle unit has been designed to minimize adverse environmental impacts and will meet or exceed all applicable environmental regulations.

6.3.5 CONCLUSION OF ALTERNATIVES ANALYSIS

The alternatives analysis described in the previous subsections demonstrates the benefits of the source significantly outweigh environmental and social costs imposed as a result of its location, construction, or modification. The analysis also demonstrates the construction of a natural gas-fired, combined-cycle unit at the proposed Project Site is the best alternative for meeting the growing electrical generation needs for the region. The proposed facility will be an industrial asset to the community, it will have minimal environmental discharges, and it will have minimal impacts.

6.4 EMISSIONS OFFSETS

In accordance with 25 Pa. Code §127.205(4) and 127.210, HTEC will be required to purchase emissions reduction credits by the time HTEC commences operation to offset NO_x and VOC emissions increases associated with this Project at a ratio of 1.15 to 1.

Project emissions are 173.10 tpy of NO_x and 60.11 tpy of VOC. Therefore, HTEC must obtain 200 NO_x and 70 VOC emissions offsets to achieve a net reduction in air emissions. HTEC will follow the requirements of 25 Pa. Code §127.206 to meet this obligation. 25 Pa. Code §127.206 specifies the emissions reduction credits must be surplus, permanent, quantifiable, federally enforceable, and not relied on by the permitting authority in issuing any other permit nor in any demonstration of attainment or reasonable further progress.

7.0 AIR QUALITY IMPACT ANALYSIS MODELING PROCEDURE AND INPUTS

7.1 INTRODUCTION

As discussed in Section 4.1.1 of this plan approval application, HTEC's proposed Project is subject to PSD review for NO_x, CO, PM_{10}, $PM_{2.5}$, VOC, H_2SO_4, and GHG emissions, since the Project is a major source and has the PTE these pollutants at annual rates above applicable PSD SERs. For NO_x, CO, PM_{10}, and $PM_{2.5}$, PSD review requires, among other things, a demonstration that the allowable emissions will not cause or contribute to air pollution in violation of applicable NAAQS or any applicable maximum allowable increase over baseline concentrations in the area (allowable PSD increments for designated Class I, Class II, or Class III areas). A source subject to PSD review must also demonstrate its air emissions will not adversely impair visibility, soils, or vegetation. While VOC, H_2SO_4, and GHG are subject to PSD review, these pollutants have no associated applicable NAAQS standards; therefore, there is no requirement to demonstrate allowable emissions will not cause or contribute to violations of NAAQS for these pollutants. However, a modeling analysis was conducted for H_2SO_4 mist for comparison to established health standards.

Table 7-1 summarizes NAAQS, Class II increments, significant impact levels (SILs) and significant monitoring concentrations (SMCs). Table 7-1 also summarizes NAAQS, including SO_2, lead, and ozone, which are not subject to the Project air quality impact analysis, because potential emissions of SO_2 and lead are less than SERs and ozone impacts (VOC) are not typically modeled as part of PSD review.

7.2 MODEL SELECTION

The most recent versions of the American Meteorological Society (AMS)/EPA Regulatory Model Improvement Committee (AERMIC) model (AERMOD) system components were used. These include the existing regulatory components (AERMOD, AERMOD meteorological preprocessor program [AERMET], AERMOD terrain preprocessor program [AERMAP], and Building Profile Input Program [BPIP] for Plume Rise Model Enhancement [PRIME] [BPIPPRM]), AERSURFACE, and AERMINUTE.

Table 7-1. Summary of NAAQS, Class II Increments, SILs, and SMCs

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	Class II Increment Standards ($\mu g/m^3$)	Class II SIL ($\mu g/m^3$)	SMC ($\mu g/m^3$)
SO_2	1- hour	196	—	7.8*	—
	3-hour	1,300	512	25	—
	24-hour	—	91	5	13
	Annual	—	20	1	—
PM_{10}	24-hour	150	30	5	10
	Annual	—	17	1	—
$PM_{2.5}$	24-hour	35	9	1.2	—
	Annual	12	4	0.2†	—
NO_2	1-hour	188	—	7.5*	—
	Annual	100	25	1	14
CO	1-hour	40,000	—	2,000	—
	8-hour	10,000	—	500	575
Lead	Rolling 3-month	0.15	—	—	0.1

Note: $\mu g/m^3$ = microgram per cubic meter.

*While there are no EPA-promulgated SILs for 1-hour SO_2 and NO_2 NAAQS, interim values have been provided per EPA's June 29, 2010, memorandum, "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for Prevention of Significant Deterioration Program;" August 23, 2010, memorandum, "Guidance Concerning the Implementation of the 1-hour SO_2 NAAQS for the Prevention of Significant Deterioration Program;" and PADEP's December 1, 2010, memorandum, "Interim 1-hour Significant Impact Levels for Nitrogen Dioxide and Sulfur Dioxide."
†Based on EPA's August 1 and 18, 2016, draft memorandum, "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program."

Source: ECT, 2017.

AERMOD (Version 16216r) was used in the refined modeling analyses for flat, elevated, and complex terrain. AERMOD was run using the most recent version of the Providence Engineering and Environmental Group, LLC, BEEST Suite (BEEST), currently Version 11.07, an interface for EPA's AERMOD. AERMOD is an EPA-approved refined dispersion model for evaluating impacts of land-based stationary sources. AERMOD is one of the listed refined dispersion models in EPA's Guideline on Air Quality Models (GAQM) (40 CFR 51, Appendix W), which are required to be used for state implementation plan revisions for existing sources and for new source review and PSD programs. An equivalency demonstration using the standard EPA version of the AERMOD code and the BEEST version of the AERMOD code was provided by Providence Engineering and Environmental Group, LLC, and is included with the air dispersion modeling data in Appendix G.

AERMOD with PRIME includes building downwash algorithms capable of modeling receptors in both the near-building wake (cavity) and far-building wake regions. The PRIME algorithm takes into account the distance from each building or structure to potentially affected sources in that building's region of influence. The inclusion of the cavity predictions within AERMOD removes a modeling discontinuity that existed with AERMOD without using the PRIME algorithm and removes the need for additional cavity impact analysis using the SCREEN3/AERSCREEN model or other calculation procedures.

7.3 MODEL CONTROL OPTIONS

7.3.1 REGULATORY DEFAULT OPTIONS

Default AERMOD control options were used in the refined modeling analysis consistent with EPA recommendations, including:

- Stack-tip downwash.
- Incorporation of effects of elevated terrain.
- Calm wind processing routine.
- Missing data processing routine.
- Default wind profile exponents.
- Default vertical potential temperature gradients.

7.3.2 AVERAGING PERIODS

Table 7-1 in Section 7.1 provides applicable pollutants and averaging periods relevant to the Project air quality impact analysis. Table 7-1 also summarizes the applicable form of averaging period for determination of ambient background design values and for significant impacts, NAAQS, increment, and significant monitoring concentration analyses.

7.3.3 URBAN/RURAL DISPERSION COEFFICIENTS DETERMINATION

The selection of urban or rural designation for refined modeling input is based on the Auer land use classification procedure. Figure 2-2, Section 2.0, depicts the area circumscribed by a 3-km radius circle centered about the Project CT stacks on a U.S. Geological Survey (USGS) topographical map. In making the urban/rural determinations, areas on the topographic map shaded pink and purple are considered urban, and areas shaded green are considered rural. PADEP recommends National Land Cover Database Code 23 (developed, medium intensity) and Code 24 (developed, high intensity) be considered equivalent to Auer land use types recommended to be urban, according to land use procedures in Subsection 7.2.3(c) of EPA's GAQM. As shown in Figure 7-1, land use is predominantly rural classifications. Therefore, rural dispersion coefficients were used in the dispersion modeling analysis.

7.4 $PM_{2.5}$ PRECURSOR ANALYSIS

Secondary $PM_{2.5}$ is formed from gaseous emissions of NO_x and SO_2. These gases can form fine particulates through chemical reactions or condensation. The Project will have SO_2 emissions below the PSD SER and would not be expected to result in significant secondary $PM_{2.5}$ formation. Project NO_x emissions are above the NO_x SER (i.e., 173.10 tpy). However, chemical transformations would only affect a portion of the NO_x emissions. Also, the secondary $PM_{2.5}$ formation occurs gradually over time as the plume travels downwind while becoming increasingly diffused. The direct $PM_{2.5}$ emissions is approximately 108.18 tpy. EPA recently finalized guidance for $PM_{2.5}$ permit modeling (2014). When direct $PM_{2.5}$ emissions exceed the SER, and emissions of NO_x and/or SO_2 exceed the SER, it is recommended both primary $PM_{2.5}$ impacts and secondary impacts of NO_x and/or SO_2 emissions be assessed. Evaluation of the secondary $PM_{2.5}$ impacts may be qualitative, a

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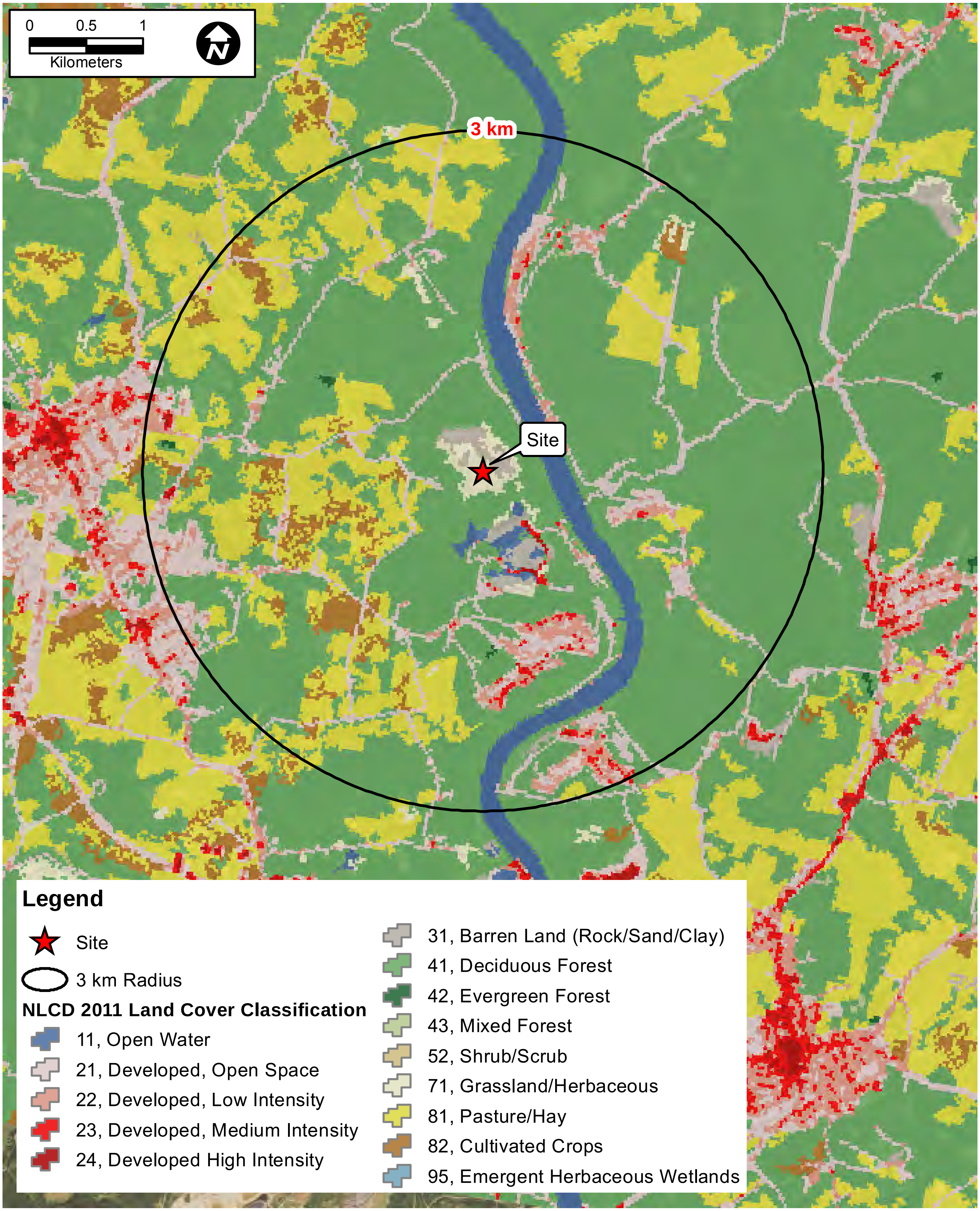

FIGURE 7-1.
PROJECT SITE LAND COVER (NLCD 2011)

Sources: Esri Basemap Imagery, MRLC NLCD 2011, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

hybrid of qualitative and quantitative assessments, or a full quantitative photochemical grid modeling exercise. HTEC is of the opinion that full quantitative photochemical modeling of secondary $PM_{2.5}$ emissions is not necessary to determine $PM_{2.5}$ precursors from the Project will not, together with emissions of primary $PM_{2.5}$, cause or contribute significantly to a violation of 24-hour $PM_{2.5}$ NAAQS. The hybrid qualitative/quantitative approach is suggested to demonstrate compliance with $PM_{2.5}$ NAAQS and PSD increments.

EPA guidance suggests the offset interpollutant trading ratios can be used to estimate total $PM_{2.5}$ secondary emissions and impacts. The interpollutant trading ratio for NO_x is 1 ton of $PM_{2.5}$ to 200 tons of NO_x in the eastern United States (73 FR 28339). The national ratio for SO_2 is 40 (73 FR 28339). Per EPA's guidance, these ratios were used to determine a total equivalent $PM_{2.5}$ emissions rate as follows:

Total equivalent $PM_{2.5}$ = primary $PM_{2.5}$ + (SO_2 ÷ 40) + (NO_x ÷ 200) =
108.18 + (23.42÷ 40) + (173.10 ÷ 200) = 109.63 tpy

Total $PM_{2.5}$ impact (µg/m^3)* = primary $PM_{2.5}$ impact (µg/m3) × A

A = total equivalent $PM_{2.5}$ (tpy) ÷ primary $PM_{2.5}$ (tpy) = 109.63 ÷ 108.18 = 1.013

*µg/m^3 = microgram per cubic meter.

Therefore, to account for secondary $PM_{2.5}$, the primary $PM_{2.5}$ emissions rates were adjusted by multiplying the primary $PM_{2.5}$ emissions rate by 1.013. The equivalent $PM_{2.5}$ emissions rates were modeled to determine primary and secondary $PM_{2.5}$ impacts.

7.5 MODEL SOURCE DATA

7.5.1 PROJECT SOURCES AND OPERATING SCENARIOS

The main sources of NO_x, PM_{10}, $PM_{2.5}$, and CO emissions at the Project are the CT with auxiliary-fired HRSG. Additional ancillary sources are a natural gas-fired auxiliary boiler, natural gas-fired fuel gas heaters, a diesel engine-powered standby generator, and a diesel engine-powered fire water pump. In addition, there is a multiple-cell mechanical draft, counter flow, evaporative cooling tower system that is a minor source of PM_{10} and $PM_{2.5}$ emissions. The diesel engine generator and fire water pump will only be operated during power interruptions to provide emergency power, lighting, and fire protection when the

Project CT is not operating and, at most, once per week for less than 60 minutes for operational testing purposes when the CT is operational. The Project is proposing to accept operating restrictions on the emergency generator and fire water pump through the air permit that would limit annual cumulative nonemergency operation (e.g., engine testing) to less than 52 hours per consecutive 12 months for each engine. The 52-hour operational restriction for each engine would not apply toward operation during actual emergency situations. The modeling, however, was conservatively based on 100 hr/yr of nonemergency operation. The auxiliary boiler will be used primarily to provide high-temperature steam when the CT is offline to accommodate more rapid ST startups after extended shutdowns and potentially provide fuel gas heating. It will not operate once the CT has achieved steady-state operations; however, there will be some overlapping operation during startup and shutdown of the CT. Total operation of the auxiliary boiler was conservatively anticipated to be 8,760 hr/yr at maximum capacity.

The fuel gas heater was modeled assuming it is operating at maximum capacity during any CT operating scenario for up to 8,760 hr/yr. The Project's multiple-cell evaporative cooling tower system will operate continuously when the CT is operated. Additional details on the proposed CT operating scenarios are provided in the following subsections.

7.5.1.1 CT Steady-State Operations

Normal/baseload operation of a CT is characterized as continuous operation at loads in the 30- to 100-percent range. The CT may be operated at baseload up to 8,760 hr/yr with or without duct burner firing. Heat input, emissions rates, exhaust volume rates, and temperatures vary as a function of ambient temperature. Maximum heat input and emissions rates typically occur at 100-percent load and the minimum design ambient temperature. Minimum exhaust volume rates occur at high ambient temperatures. Auxiliary firing in the HRSGs (duct burners) will also affect exhaust volume and emissions rates.

7.5.1.2 CT Startup and Shutdown Operations

Short-term emissions during CT startup and shutdown periods, especially NO_x and CO, are generally higher than during normal steady-state operations, as combustion conditions re-

quire time to stabilize and emissions control equipment become operational. Section 7.5.4.2 provides further discussion on development of stack parameters for startup and shutdown operations.

7.5.2 SOURCE CHARACTERIZATION IN MODEL

Each of the combustion sources and cells of the evaporative cooling tower system were modeled as a separate point source with a vertical stack.

7.5.3 STACK LOCATION DATA

Table 7-2 summarizes the stack coordinates referenced to North American Datum of 1983 (NAD83), Zone 17. The base elevation of the Project Site will be graded to an elevation of 1,122 ft; therefore, base elevations for all stacks was set to the site elevation of 1,122 ft.

7.5.4 EMISSIONS RATES AND STACK PARAMETERS

7.5.4.1 CT Short-Term Stack Parameters

Table 7-3 summarizes emissions data representative of the proposed CT for modeling input parameters. The most conservative (worst-case) emissions rates for the unit were determined using the maximum emissions rates calculated for various scenarios, including firing at full (base) load, at partial loads, and at various air intake temperatures representing the expected range of ambient conditions. Short-term lb/hr emissions rates were determined from the firing rate and ambient condition case that produced the highest hourly rate. Annual tpy emissions rates were determined from the case with the highest hourly rate and accounting for the expected annual operation of the unit in both startup/shutdown and normal operating modes. Short-term $PM_{10}/PM_{2.5}$ emissions were adjusted to be based on a maximum fuel sulfur content of 2.0 gr/100 scf, and annual emissions were based on an average fuel sulfur content of 0.4 gr/100 scf. Particulate emissions were also adjusted based on the assumption that 10 percent of the particulate was being emitted as sulfates. Primary $PM_{2.5}$ emissions (assumed to be equal to PM_{10} emissions) were adjusted to account for secondary $PM_{2.5}$ based on the methodology described in Section 7.4. Finally, a 10-percent margin was added to all short-term emissions rates for all pollutants. Appendix C provides vendor performance data and calculations used to develop the modeling inputs for these operating scenarios.

Table 7-2. Stack Location Data

Description	Base Elevation (ft)	Stack Height (ft)	UTM NAD83, Zone 17 (meter)	
			Northing	Easting
CT/HRSG Stack #1	1,122	220	591,403.38	4,416,431.42
Auxiliary boiler stack	1,122	220	591,399.37	4,416,431.42
Fuel gas heater stack	1,122	20	591,339.13	4,416,372.06
Diesel fire water pump stack	1,122	15	591,432.42	4,416,466.16
Emergency diesel generator stack	1,122	20	591,391.40	4,416,313.35
Cooling tower Cell 1	1,122	55	591,481.26	4,416,416.16
Cooling tower Cell 2	1,122	55	591,494.61	4,416,422.64
Cooling tower Cell 3	1,122	55	591,488.24	4,416,401.77
Cooling tower Cell 4	1,122	55	591,501.59	4,416,408.24
Cooling tower Cell 5	1,122	55	591,495.22	4,416,387.37
Cooling tower Cell 6	1,122	55	591,508.58	4,416,393.85
Cooling tower Cell 7	1,122	55	591,502.20	4,416,372.98
Cooling tower Cell 8	1,122	55	591,515.56	4,416,379.46

Note: UTM = Universal Transverse Mercator.

Source: ECT, 2017.

Table 7-3. Maximum Criteria Pollutant Emissions Rates for Six Loads Enveloped Across Ambient Temperatures

Unit Load (%)	NO_x		CO		PM_{10}		$PM_{2.5}$*	
	lb/hr	g/sec	lb/hr	g/sec	lb/hr	g/sec	lb/hr	g/sec
Base with evaporative cooling and duct burner	34.76	4.38	21.12	2.66	34.19	4.31	34.63	4.36
Base with duct burner	34.10	4.30	20.68	2.61	33.11	4.17	33.54	4.23
Base with evaporative cooling	27.61	3.48	16.83	2.12	17.86	2.25	18.10	2.28
Base	27.94	3.52	16.94	2.13	18.02	2.27	18.25	2.30
75	22.11	2.79	13.53	1.70	17.09	2.15	17.32	2.18
50	14.63	1.84	8.90	1.12	16.02	2.02	16.22	2.04

Note: g/sec = gram per second.
lb/hr = pound per hour.

*Includes secondary $PM_{2.5}$.

Source: ECT, 2017.

7.5.4.2 Startup and Shutdown Stack Parameters

Modeling inputs for cold, warm, and hot startups for the CT were also included in the modeling analysis. Table 7-4 presents the duration of startup and shutdown events in minutes and maximum CT emissions during those periods expressed in pounds per event. Data presented are based on information provided by GE for the proposed Model 7HA.02 CT.

Since emissions are higher for startup operations than shutdown, the more conservative startup cases were modeled. Also, only NO_x and CO emissions were modeled during startup, since emissions of PM_{10} and $PM_{2.5}$ are higher during normal operation. For purposes of modeling ambient impacts from startups, short-term emissions rates (1-hour to 24-hour average) developed for startup operations for the proposed CTs take into account the time from ignition to compliance (typically 50-percent load) is approximately 1 hour or more for cold startups, 40 minutes for warm startups, and less than 30 minutes for hot startups. Therefore, to conservatively quantify short-term average emissions rates for startup events, it has been assumed the CT is at its maximum potential emissions rates (100-percent load with duct burners) for the balance of the averaging period when it is not in startup mode. Table 7-5 summarizes the maximum short-term average emissions rates developed in this manner.

7.5.4.3 CT Annual, 24-Hour, and 8-Hour Average Stack Parameters

CT fuel firing rates and emissions rates vary as a function of operating load, ambient temperature, and whether or not the duct burners are firing to supplement heat input to the HRSG. In addition, emissions rates of some pollutants (e.g., NO_x, and CO) are greatest during startups and shutdowns, while emissions of other pollutants are greatest during normal full power operation (e.g., $PM_{10}/PM_{2.5}$). Annual emissions from the Project are based on 8,760 hr/yr of operation. Included in the estimate of annual emissions are up to 8,497 hr/yr of natural gas firing and an estimated 263 hr/yr of startup/shutdown operations. Normal hours of operation include duct burning to provide a worst-case estimate of annual emissions shown in Table 7-6.

Table 7-4. GE 7HA.02 CT Startup and Shutdown Scenarios, Durations, and Emissions*

	NO_x (lb/event)	CO (lb/event)	$PM_{10}/PM_{2.5}$ (lb/event)	Duration (minutes)
Cold start	260	790	11	55
Warm start	146	155	7.8	40
Hot start	70	120	3.9	20
Shutdown	7	125	2.3	12

*Data provided by GE.

Source: ECT, 2017.

Table 7-5. Summary of Short-Term Average Emissions Rates for CT Startups

		Startup			Maximum Baseload Per Hour	
			Per Hour			
Scenario	Units	One Unit (per event)	1-hour Average	8-hour Average	1-hour Average	8-hour Average
Cold Startup						
Time from ignition until compliance	minutes	55				
Estimated average flow rate	ACFM		841,587	841,587	1,641,544	1,641,544
Estimated average stack temperature	ºF		158.86	158.86	161.57	161.57
NO_x	lb		260.00	—	2.90	—
CO	lb		790.00	98.75	1.76	18.70
Warm Startup						
Time from ignition until compliance	minutes	40				
Estimated average flow rate	ACFM		841,587	841,587	1,641,544	1,641,544
Estimated average stack temperature	ºF		158.86	158.86	161.57	161.57
NO_x	lb		146.00	—	11.59	—
CO	lb		155.00	19.38	7.04	19.36
Hot Startup						
Time from ignition until compliance	minutes	20				
Estimated average flow rate	ACFM		841,587	841,587	1,641,544	1,641,544
Estimated average stack temperature	ºF		158.86	158.86	161.57	161.57
NO_x	lb		70.00	—	23.17	—
CO	lb		120.00	15.00	14.08	20.24

Note: ACFM = actual cubic feet per minute.
°F = degree Fahrenheit.
lb = pound.

Source: ECT, 2017.

Table 7-6. Annual Criteria Pollutant Emissions for CT + Duct Burners

Pollutant	Annual Emissions* (tpy)
NO_x	169.36
CO	151.41
PM_{10}	105.28
$PM_{2.5}$	106.65†

*Annual emissions based on 8,497 hr/yr of natural gas firing and an estimated 263 hr/yr of startup/shutdown operations.
†Includes secondary $PM_{2.5}$.

Source: ECT, 2017.

Short-term emissions rates (1-hour to 24-hour average) developed for startup operations for the proposed CTs take into account the time from ignition to compliance full load. To conservatively quantify short-term average emissions rates for startup and shutdown events, it was assumed the CTs are at their respective maximum potential emissions rates (100-percent load) for the balance of the averaging period that they are not in startup mode:

- Stack flows for startups estimated from vendor data, startup load profiles.
- For 8-hour averages, baseload stack volumetric flow and temperatures conservatively based on 50-percent load condition, which has the lowest flow rate of any operating scenario.

7.5.4.4 Stack Parameters for Emergency Engines

Table 7-7 summarizes emissions rates and other stack parameters for model input.

Following EPA modeling guidance, the emergency generator and fire water pump engine stacks are typically not included in the NO_2 1-hour modeling analyses. However, HTEC included the emergency engines to demonstrate human health would not be endangered by permitting engines that exhaust through short stacks.

HTEC does not consider the emergency engines as part of the normal operation of the facility. The diesel engine generator and fire water pump will only be operated during power interruptions to provide emergency power, lighting, and fire protection when the Project CT is not operating and, at most, once per week for less than 60 minutes for operational readiness testing purposes when the CT is operational. The Project is proposing to accept operating restrictions on the emergency generator and fire water pump through the air permit that would limit annual cumulative nonemergency operation (e.g., engine testing) to less than 52 hours per consecutive 12 months for each engine. The 52-hour operational restriction for each engine would not apply toward operation during actual emergency situations. The modeling, however, will be conservatively based on 100 hr/yr of nonemergency operation.

Table 7-7. Summary of Stack Parameters for Emergency Engines

Parameter		Standby Diesel Generator	Fire Water Pump	Notes
X coordinate (NAD83)		591,391.40	591,432.42	
Y coordinate (NAD83)		4,416,313.35	4,416,466.16	
Stack height (ft)		20	15	
Stack temperature (°F)		752	891	
Stack diameter (ft)		1	0.5	
Stack exit velocity (fps)		324.5	173.8	
Exhaust rate (acfm)		15,292	2,048	
$PM_{10}/PM_{2.5}$	24-hour (lb/hr)	0.88	0.14	Emergency operation – maximum lb/hr
		0.0367	0.0058	1-hour operational test – maximum lb/hr/24-hour
	Annual (tpy)	0.044	0.007	Maximum lb/hr ×100 hr/yr × 1 ton/2,000 lb
NO_2	1-hour (lb/hr)	26.50	2.60	Emergency operation – maximum lb/hr
		0.302	0.030	Maximum lb/hr × 100 hr/yr/ 8,760 hr/yr
	Annual (tpy)	1.32	0.130	Maximum lb/hr ×100 hr/yr × 1 ton/2,000 lb
CO	1-hour (lb/hr)	15.43	2.42	Emergency operation – maximum lb/hr
		15.43	2.42	1-hour operational test – maximum lb/hr
	8-hour (lb/hr)	15.43	2.42	Emergency operation – maximum lb/hr
		1.929	0.302	1-hour operational test – maximum lb/hr/8-hour

Note: °F = degree Fahrenheit.
fps = foot per second.
ft = foot.
ft^3/sec = cubic foot per second.
lb/hr = pound per hour.
NAD83 = North American Datum of 1983.
tpy = ton per year.

Source: ECT, 2017.

For other short-term modeling (e.g., 1- and 8-hour CO and 24-hour PM_{10} and $PM_{2.5}$), modeled emissions rates were based on the routine (60 minutes, once per week) operational testing scenario. Testing scenarios are assumed to not occur during startup or shutdown scenarios and therefore are only included during the normal operation scenarios. Since testing will be limited to 1 hour (60 minutes), the emissions rate for any averaging period longer than 1 hour was normalized by taking the maximum lb/hr and dividing it by the length of the averaging period. In addition, annual average emissions rates were conservatively based on the assumption that annual nonemergency operations will be limited to less than 100 hours per consecutive 12 months for each engine.

7.5.4.5 Stack Parameters for Auxiliary Boiler

The auxiliary boiler will be natural gas-fired and will operate as needed to keep the HRSG warm during periods of CT shutdown and provide sealing steam to the ST during warm and hot starts. The auxiliary boiler will have a maximum input capacity of 42 MMBtu/hr and will have the potential to operate for 8,760 hr/yr at maximum capacity. Table 7-8 summarizes stack parameters for model input for the auxiliary boiler.

7.5.4.6 Stack Parameters for Fuel Gas Heater

The natural gas-fired fuel gas heater will operate as necessary to condition the natural gas prior to combustion to prevent condensation. The maximum rated capacity of the fuel gas heater will be 6.4 MMBtu/hr and will have the potential to operate for 8,760 hr/yr at maximum capacity. Table 7-8 summarizes stack parameters for model input for the fuel gas heater.

7.5.4.7 Stack Parameters for Evaporative Cooling Tower Cells

The cooling tower cells will operate continuously with the CT and will be included in the refined modeling analyses for PM_{10} and $PM_{2.5}$. Table 7-9 summarizes stack parameters for the cooling tower cells.

Table 7-8. Summary of Auxiliary Boiler and Fuel Gas Heater Stack Parameters and Emissions Rates

Parameter		Auxiliary Boiler Stack	Fuel Gas Heater Stack
X coordinate (NAD83)		591,399.37	591,339.13
Y coordinate (NAD83)		4,416,431.42	4,416,372.06
Stack height (ft)		220	20
Stack temperature (°F)		480	925
Stack diameter (ft)		3.33	2.50
Stack exit velocity (fps)		27.23	15.80
Exhaust rate (acfm)		14,259	4,659
$PM_{10}/PM_{2.5}$	24-hour (lb/hr)	0.31	4.73E-02
	Annual (tpy)	1.36	2.07E-01
NO_2	1-hr (lb/hr)	0.45	7.04E-02
	Annual (tpy)	1.99	3.08E-01
CO	1-hour (lb/hr)	1.55	2.37E-01
	8-hour (lb/hr)	1.55	2.37E-01

Note: °F = degree Fahrenheit.
fps = foot per second.
ft = foot.
ft^3/sec = cubic foot per second.
lb/hr = pound per hour.
NAD83 = North American Datum of 1983.
tpy = ton per year.

Source: ECT, 2017.

Table 7-9. Summary of Cooling Tower Stack Parameters and Emissions Rates

Parameter		X Coordinate (NAD83)	Y Coordinate (NAD83)
Cell 1		591,481.26	4,416,416.16
Cell 2		591,494.61	4,416,422.64
Cell 3		591,488.24	4,416,401.77
Cell 4		591,501.59	4,416,408.24
Cell 5		591,495.22	4,416,387.37
Cell 6		591,508.58	4,416,393.85
Cell 7		591,502.20	4,416,372.98
Cell 8		591,515.56	4,416,379.46
Each Cell			
Stack height (ft)		55.00	
Stack temperature (°F)		73.30	
Stack diameter (ft)		32.81	
Stack exit velocity (fps)		24.57	
Exhaust rate (acfm)		1,246,000	
PM_{10}	24-hour (lb/hr)	0.10	
	Annual (tpy)	0.42	
$PM_{2.5}$	24-hour (lb/hr)	0.04	
	Annual (tpy)	0.16	

Note: °F = degree Fahrenheit.
fps = foot per second.
ft = foot.
ft^3/sec = cubic foot per second.
lb/hr = pound per hour.
NAD83 = North American Datum of 1983.
tpy = ton per year.

Source: ECT, 2017.

7.5.5 GOOD ENGINEERING PRACTICE STACK HEIGHT AND BUILDING DOWNWASH EVALUATION

The CAA Amendments of 1990 require the degree of emissions limitation required for control of any pollutant not be affected by a stack height that exceeds good engineering practice (GEP) or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (40 CFR 51). Stack heights for Project emissions sources will comply with EPA stack height regulations.

While the GEP stack height rules address the maximum stack height that can be employed in a dispersion modeling analysis, stacks having heights lower than GEP stack height can potentially result in higher downwind concentrations due to building downwash effects. AERMOD evaluates the effects of building downwash based on PRIME building downwash algorithms. For the Project, ambient impact analysis, the complex downwash analysis implemented by AERMOD was performed using the current version of EPA's BPIPPRM (Version 04274 dated September 30, 2004). EPA's BPIPPRM was used to determine the area of influence for each building/structure, whether a particular stack is subject to building downwash, the area of influence for directionally dependent building downwash, and to generate the specific building dimension data required by the model. BPIPPRM output consists of an array of 36 direction-specific (10- to 360-degree) building heights (BUILDHGT keyword), lengths (BUILDLEN keyword), widths (BUILDWID keyword), and along-flow (XBADJ keyword) and across-flow (YBADJ keyword) distances for each stack suitable for use as input to AERMOD.

Downwash was computed for the Project's source stacks. Since site plans and building dimensions are not readily available for offsite sources, downwash was not determined for modeling offsite sources.

7.6 RECEPTOR DATA

Receptors were placed at locations considered to be ambient air, which is defined as "that portion of the atmosphere, external to buildings, to which the general public has access." The entire perimeter of the Project Site will be fenced. Therefore, the nearest locations of general public access will be at the Project fence line.

Consistent with GAQM, the Project ambient impact analysis used the following receptor grids:

- Fence Line Receptors—Receptors placed on the Project fence line spaced 25 meters apart.
- Tight Receptors—Receptors at 50-meter spacing starting at the fence line and extending to approximately 2,000 meters.
- Near-Field Cartesian Receptors—Receptors at 100-meter spacing starting 2,000 meters from the Project fence line receptors and extending to approximately 2,500 meters.
- Mid-Field Cartesian Receptors—Receptors at 500-meter spacing starting at 2,500 meters and extending to approximately 5,000 meters.
- Far-Field Cartesian Receptors—Receptors at 1,000-meter spacing starting at 5,000 meters and extending to approximately 20,000 meters.

As per the AERMAP User's Guide, the domain was considered sufficiently large to accommodate all the significant nodes such that all terrain features that exceed a 10-percent elevation slope from any given receptor were considered. The "calculate domain" feature of BEEST was used to determine the domain and quads required to ensure all terrain that exceeds the 10-percent slope were included.

Receptor locations were such that the highest ambient impact for each pollutant and averaging person have been identified using a receptor spacing of no more than 100 meters. The extent of the receptor grid (20 km) was sufficient for all pollutants and averaging periods except for the 1-hour NO_2. The receptor grid was extended from 20 km to 50 km to ensure all significant impacts were determined for 1-hour NO_2. Figures 7-2 through 7-5 depict the fence line and near, mid-, and far-field receptors.

For cumulative modeling analyses, receptor grids consisted of only those receptors that exceeded a PSD Class II SIL for a specific pollutant and averaging period. These grids included any receptor for which a concentration was modeled that was equal to or greater than a SIL for any averaging period and any year of meteorological data.

FIGURE 7-2.
FENCE LINE RECEPTOR GRID FOR MODELING ANALYSIS

Sources: Esri Basemap Imagery, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

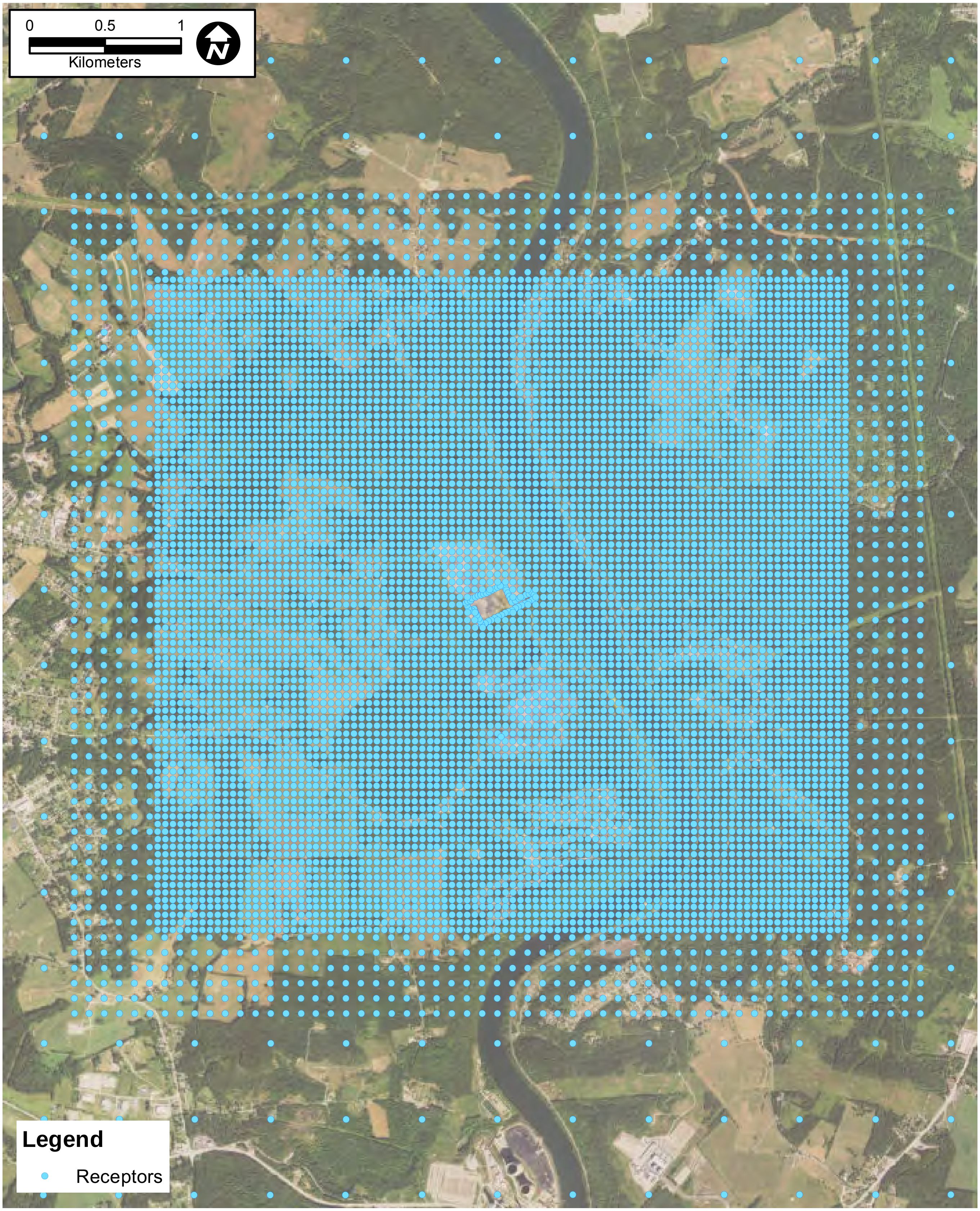

FIGURE 7-3.
NEAR-FIELD RECEPTOR GRID FOR MODELING ANALYSIS

Sources: Esri Basemap Imagery, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

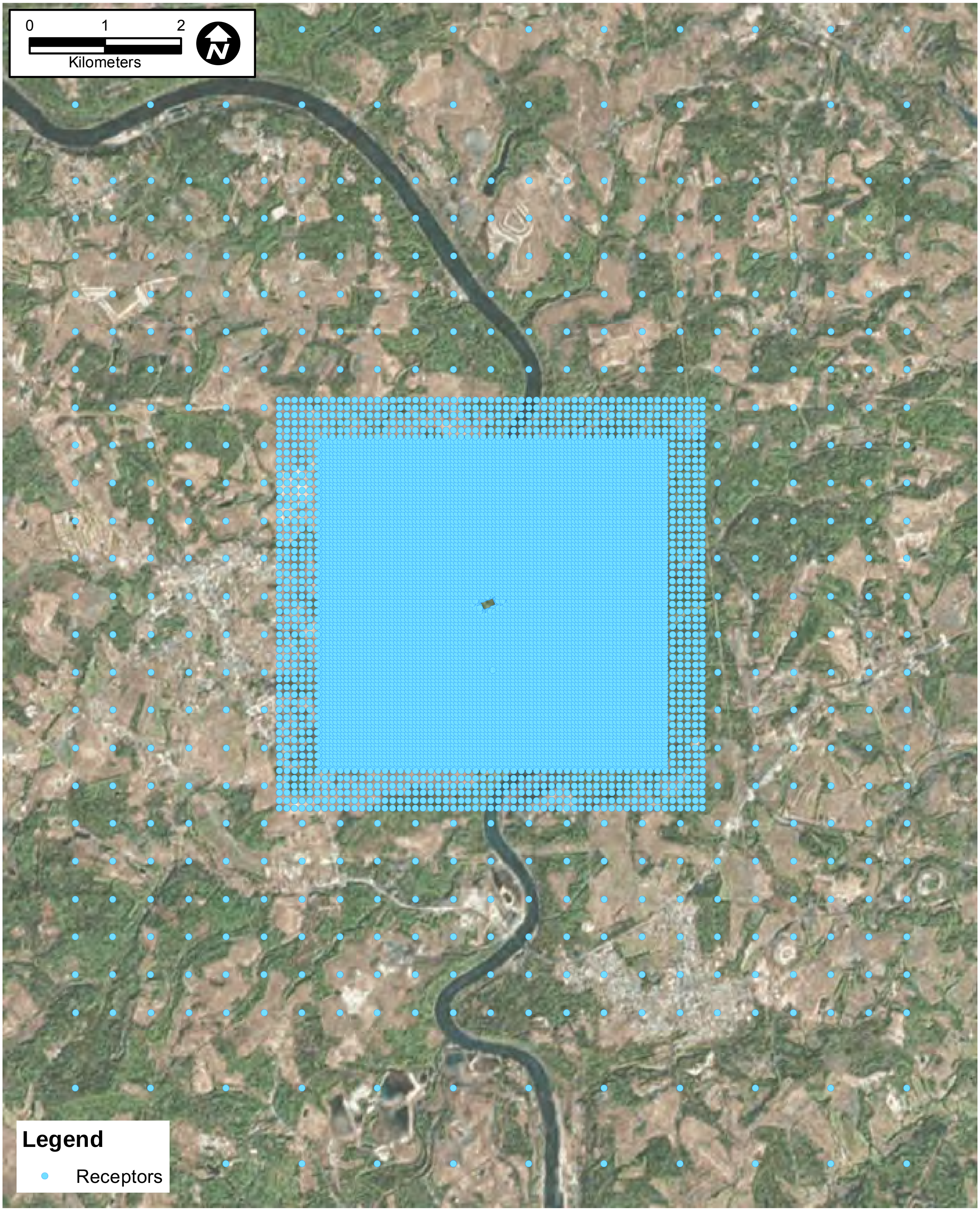

FIGURE 7-4.
MID-FIELD RECEPTOR GRID FOR MODELING ANALYSIS

Sources: Esri Basemap Imagery, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

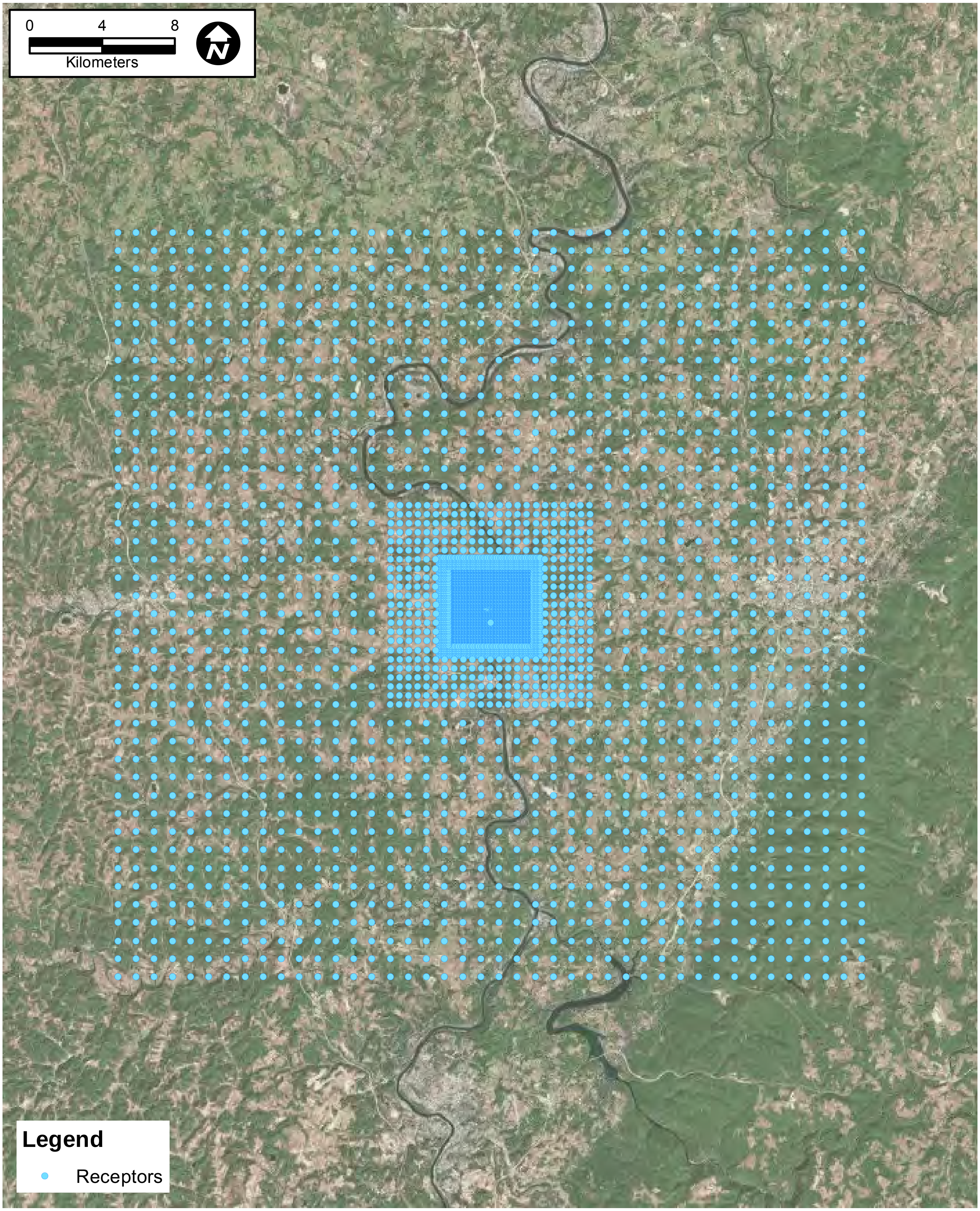

FIGURE 7-5.
FAR-FIELD RECEPTOR GRID FOR MODELING ANALYSIS

Sources: Esri Basemap Imagery, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

Terrain elevations at each of the receptor points will be specified by importing National Elevation Dataset (NED) GeoTIFF terrain data files covering the modeling domain into the BEEST interface. The 1-arc-second (30-meter spatial resolution) NED elevation GeoTiff files are obtained for the modeling domain from the Multi-Resolution Land Characteristics Consortium website (http://www.mrlc.gov/).

The fence line receptors were adjusted to the graded site elevation of 1,122 ft. Additionally, model receptor elevations within the switchyard were adjusted to the graded site elevation of 1,122 feet. A discrete receptor was added manually to represent the peak of the nearby waste coal pile. The coordinate was determined based on the center point of the four grid receptors that encompassed the pile peak. The receptor elevation was determined from Google® Earth.

7.7 METEOROLOGICAL DATA

Appendix H documents the selection of the most representative meteorological data for the AERMOD refined modeling. In consultation with PADEP, five years of data from two meteorological stations nearest to the Project Site were used for input to AERMET, the meteorological preprocessor for AERMOD. Hourly surface meteorological data from the National Weather Service (NWS) Station at Morgantown, West Virginia, and the McClellandtown meteorological site in Pennsylvania were used in addition to upper air meteorological data from NWS stations at Pittsburgh, Pennsylvania, to develop the AERMET data files. The five-calendar-year existing meteorological data sets from the McClellandtown (1991 through 1995) and Morgantown Municipal Airport (KMGW) (2012 through 2016) were identified as representative for the Project modeling domain, located in Greene County, Pennsylvania. Table 7-10 summarizes identifying and location information for McClellandtown and KMGW. Figure 7-6 shows the relative locations of the meteorological sites and Project Site.

Table 7-10. Meteorological Monitoring Site Station Information

Name/Location	County, State	Latitude	Longitude	Elevation (meter)*	Distance (km)
McClellandtown, Pennsylvania	Fayette, Pennsylvania	39.92225	-79.87415	400.8	5.8
KMGW	Monongalia, West Virginia	39.64982	-79.92066	382.0	27.0

*Base elevation used as the PROFBASE keyword in the meteorological pathway of the AERMOD input file.

Source: ECT, 2017.

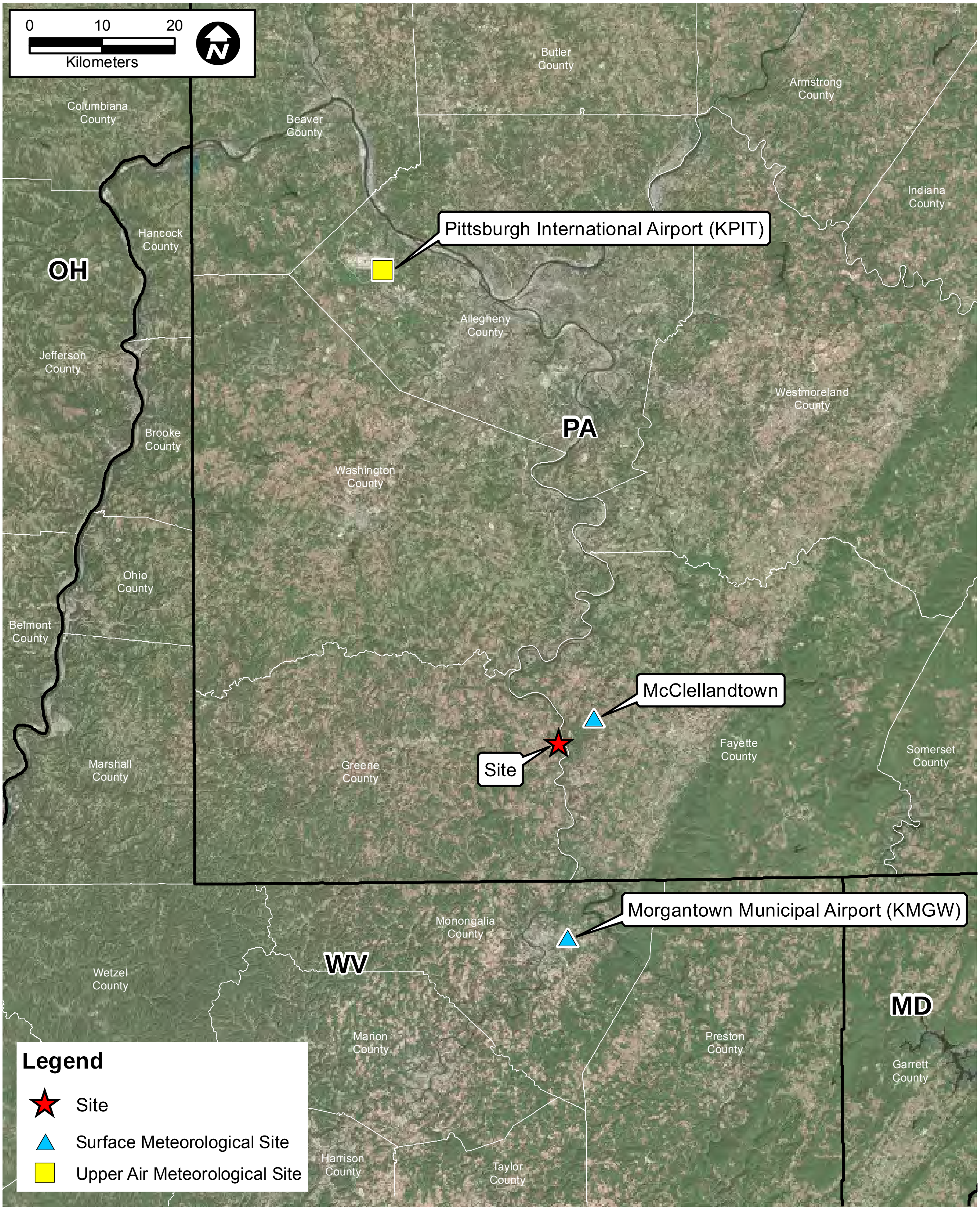

FIGURE 7-6.
LOCATIONS OF METEOROLOGICAL SITES

Sources: Esri Basemap Imagery, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

7.8 REPRESENTATIVE BACKGROUND AMBIENT CONCENTRATIONS

Cumulative impacts of the pollutants and averaging periods required to be included in the multisource analysis were added to monitored background air quality concentrations to estimate total pollutant concentrations. Total concentrations were then compared to the respective NAAQS. Background concentrations representative of the Project modeling domain were obtained from the most recent years of certified monitoring data (2013 through 2015) available from the most representative monitoring sites nearest to the Project Site. The representativeness of each monitoring site for the purpose of determining the monitored background air quality should be justified based on EPA guidance contained in Section 9.2, Background Concentrations, of EPA's GAQM and Section 2.4, Use of Representative Air Quality Data, of the Ambient Monitoring Guidelines for PSD.

To evaluate the representativeness and justify selection of background data from available regional monitoring sites, the closest monitoring site to the Project was identified (none are located in Greene County) and evaluated using EPA's criteria. Background concentrations of CO, NO_2, PM_{10}, and $PM_{2.5}$ were based on the Charleroi data, as it is the closest monitor to the proposed Project Site where these pollutants are measured. The CO 1-hour and 8-hour background concentration is the highest concentration from the three years of monitor values. The NO_2 1-hour background concentration is the average of the three-year 98th percentile monitor value. The NO_2 annual background concentration is the highest concentration from the three years of monitor values. The PM_{10} 24-hour background concentration is the highest concentration from the three years of monitor values. The $PM_{2.5}$ 24-hour background concentration is the three-year average of the 98th percentile. The $PM_{2.5}$ annual background concentration value is the three-year average of the weighted arithmetic mean monitor value. The monitor concentrations from Charleroi would likely be higher than at the Project Site, because the area around the monitor is classified as commercial land use. This type of land use would have moderate traffic and other local sources the proposed Project Site would not have. Table 7-11 summarizes the background ambient data determined to be most representative. Appendix I provides additional information regarding the representativeness and justification of the background monitors.

Table 7-11. Summary of Design Values/Representative Background Concentrations

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	Representative Background/Design Concentration ($\mu g/m^3$)
PM_{10}	24-Hour	150	45
$PM_{2.5}$	24-Hour	35	24.0
	Annual	12	11.7
NO_2	1-Hour	188	67.68
	Annual	100	16.15
CO	1-Hour	40,000	3,314.3
	8-Hour	10,000	1,333.3

Note: $\mu g/m^3$ = microgram per cubic meter.

Source: ECT, 2017.

8.0 CLASS II AREA SIGNIFICANT IMPACT ANALYSIS RESULTS

8.1 SIGNIFICANCE ANALYSIS

8.1.1 JUSTIFICATION OF USE OF SILs

EPA has historically cautioned states that the use of a SIL may not be appropriate when a substantial portion of any NAAQS or PSD increment is known to be consumed. Therefore, justification of the use of SILs is recommended in support of the PSD review record. To provide justification with respect to use of SILs in the NAAQS analysis, the differences between NAAQS and background design concentrations determined to be representative of the Project impact area for applicable pollutants and averaging periods were compared to applicable SIL values. The comparison, summarized in Table 8-1, shows the differences in this case between NAAQS and background design concentrations for the applicable pollutants subject to PSD review are much higher than the corresponding SILs. These differences are sufficient for PADEP to conclude a modeled impact less than the SIL for each of the applicable pollutants will not cause or contribute to a violation of NAAQS. Please note that for the justification of the SIL, per PADEP guidance, a design concentration was used for comparison to NAAQS instead of the highest concentration. As a result, some background concentrations used for the justification may be different than those presented in Table 7-11, which will be used as part of the NAAQS analysis.

In addition, review of the monitored ambient pollutant concentrations representative of Pennsylvania and the Project impact area show improving air quality trends (decreasing concentrations) in the region for each pollutant subject to this PSD analysis, further supporting the use of SILs in this case. Therefore, use of SILs in the PSD increment analysis is justified in this case.

8.1.2 SIGNIFICANCE ANALYSIS MODELING PROCEDURES

The significance analysis involves modeling to determine maximum ambient impacts from the Project in comparison to pollutant-specific SILs. The results of the significance analysis determine the need for further modeling, including nearby interacting sources, to evaluate compliance with NAAQS and PSD increments. Project sources included in the refined

Table 8-1. Comparison of NAAQS, Background Concentrations, and SILs

Pollutant	Averaging Period	NAAQS (μg/m^3)	Representative Design Concentration (μg/m^3)	Difference Between NAAQS and Design Value (μg/m^3)	SIL (μg/m^3)
PM_{10}	24-Hour	150	45	105	5
$PM_{2.5}$	24-Hour	35	24.0	11.0	1.2
	Annual	12	11.7	0.3	0.2
NO_2	1-Hour	188	67.68	120.32	7.5
	Annual	100	16.15	83.9	1.0
CO	1-Hour	40,000	3,314.3	36,685.7	2,000
	8-Hour	10,000	1,333.3	8,666.7	500

Note: μg/m^3 = microgram per cubic meter.

Source: ECT, 2017.

modeling was the CT stack, auxiliary boiler, fuel gas heater, emergency generator and fire water pump stacks, and cooling tower cells.

Based on the operating characteristics and scenarios discussed in Sections 7.5.4.5 and 7.5.4.6, the auxiliary boiler and fuel gas heater will conservatively be modeled as operating when the CT is operating either in startup or normal/steady-state CT operations. Likewise, the cooling tower cells were modeled along with any CT operating scenario (for PM_{10} and $PM_{2.5}$ impact modeling).

As discussed in Section 7.4.4.4, the emergency generator and fire water pump stacks were not included for the startup and shutdown scenarios. For other short-term modeling (e.g., 1- and 8-hour CO and 24-hour PM_{10} and $PM_{2.5}$), modeled emissions rates for the diesel engines were based on the routine (60 minutes, once per week) operational/readiness testing scenario. In addition, annual average emissions rates were based on the assumption that annual operations were limited to a total of less than 100 hours per consecutive 12 months for each engine. The Project will also accept operating restrictions, made enforceable by its air permit, that would limit annual cumulative operation of the emergency generator and fire water pump for readiness testing to less than 52 hr/yr per engine and limit the duration of each test to 60 minutes. The modeling, however, was conservatively based on 100 hr/yr of nonemergency operation.

Modeling for the significance analysis was performed with AERMOD using the model inputs and assumptions (model control options, receptors, terrain elevation, and building downwash inputs) as described in Sections 7.3 and both of the five years of meteorological data documented in Section 7.6 as representative of the Project modeling domain.

The 24-hour and annual $PM_{2.5}$ significance modeling was performed for both NAAQS and the PSD increment. For the 24-hour and annual $PM_{2.5}$ NAAQS significance modeling, modeled concentrations at each receptor was averaged over the five-year meteorological period for comparison to the SIL. Averaging was performed internally by the model by enabling the appropriate keywords.

For the 24-hour and annual $PM_{2.5}$ PSD increment significant modeling, the modeled concentration was the highest concentration over the five-year meteorological period for comparison to the SIL.

Although allowed by EPA guidance, the 1-hour NO_2 significance modeled concentrations at each receptor were not averaged over the five-year meteorological period. Instead, a more conservative highest concentration over the five-year meteorological period was used for comparison to the SIL. Additionally, the SIL modeling was performed using assuming all NO_x emissions were equal to NO_2. The annual NO_2 significance modeling concentrations are the highest concentration over the five-year meteorological period.

The 1- and 8-hour CO significance modeling concentrations are the highest concentrations over the five-year meteorological period.

The results of the modeling of Project sources were compared to the SILs to conservatively estimate the significant impact area (SIA) for each pollutant and averaging period.

8.1.3 SIGNIFICANCE ANALYSIS RESULTS

Tables 8-2 and 8-3 provide maximum modeled impacts from all modeled scenarios for each applicable pollutant for the McClellandtown and Morgantown meteorological data, respectively. If the maximum ambient impact for a particular pollutant and averaging period are less than the respective SIL, the source is presumed not to cause or significantly contribute to a PSD increment or NAAQS violation and is not required to perform multiple-source cumulative impact assessments for that pollutant. Based on the modeling results, predicted impacts for annual NO_x, annual and 24-hour PM_{10}, annual $PM_{2.5}$, and 1- and 8-hour CO are less than applicable SILs for both sets of meteorological data. Therefore, the Project is presumed not to cause or significantly contribute to a PSD increment or NAAQS violation and is not required to perform multiple-source cumulative impact analyses for these pollutants and averaging periods. However, predicted impacts for 1-hour NO_2 are greater than applicable SILs for both sets of meteorological data. Additionally, the 24-hour $PM_{2.5}$ (NAAQS and increment) impacts are greater than the SIL for the

Table 8-2. SIL Analysis Results—McClellandtown Meteorological Data

Pollutant	Averaging Period	Predicted Impact (µg/m^3)	SIL (µg/m^3)	SMC (µg/m^3)
CO	1-Hour	376.52	2,000	—
	8-Hour	29.23	500	575
NO_2	Annual	0.85	1.0	14
	1-Hour	94.16	7.5	—
PM_{10}	Annual	0.26	1.0	—
	24-Hour	2.08	5.0	10
$PM_{2.5}$ (NAAQS)†‡	Annual	0.14	0.2	—
	24-Hour	1.28	1.2	—
$PM_{2.5}$ (increment)‡	Annual	0.18	0.2	—
	24-Hour	1.73	1.2	—

†Maximum of the five-year averages.
‡Accounts for the Project's secondary $PM_{2.5}$ impact due to precursor emissions.

Note: µg/m^3 = microgram per cubic meter.

Source: ECT, 2017.

Table 8-3. SIL Analysis Results—Morgantown Meteorological Data

Pollutant	Averaging Period	Predicted Impact ($\mu g/m^3$)	SIL ($\mu g/m^3$)	SMC ($\mu g/m^3$)
CO	1-Hour	554.67	2,000	—
	8-Hour	41.21	500	575
NO_2	Annual	0.93	1.0	14
	1-Hour	81.45	7.5	—
PM_{10}	Annual	0.20	1.0	—
	24-Hour	1.98	5.0	10
$PM_{2.5}$ (NAAQS)†‡	Annual	0.12	0.2	—
	24-Hour	0.90	1.2	—
$PM_{2.5}$ (increment)‡	Annual	0.12	0.2	—
	24-Hour	1.1975	1.2	—

†Maximum of the five-year averages.
‡Accounts for the Project's secondary $PM_{2.5}$ impact due to precursor emissions.

Note: $\mu g/m^3$ = microgram per cubic meter.

Source: ECT, 2017.

McClellandtown meteorological data. Therefore, HTEC is required to perform multiple-source cumulative impact modeling for these pollutants and averaging periods to demonstrate the Project will not cause or significantly contribute to any violations of PSD increments or NAAQS. Section 8.2 describes the cumulative impact analysis for the identified pollutants. Appendix G contains the air quality modeling files on a DVD.

8.1.4 PRECONSTRUCTION AMBIENT MONITORING REQUIREMENT

A preconstruction ambient air monitoring waiver must be requested for a facility subject to PSD review to be exempt from preconstruction ambient air monitoring requirements. A waiver may be considered based on the modeled impacts of the Project when compared to the SMCs in 40 CFR 52.21. Tables 8-2 and 8-3 summarize applicable SMCs. If a project cannot be exempted from preconstruction monitoring based on modeling results, the applicant may propose for the reviewing authority's consideration use of existing monitoring data if appropriate justification is provided.

Tables 8-2 and 8-3 compare maximum modeled impacts to SMCs. This comparison demonstrates the maximum concentrations for all applicable pollutants and averaging times are below threshold SMC values. Based on modeling results and availability of representative regional background data, the Project is hereby requesting an exemption from preconstruction monitoring for all pollutants. Appendix I provides justification of the representativeness of background data used in the modeling.

8.2 CLASS II NAAQS AND PSD INCREMENT ANALYSIS

Based on results of the significant impact analysis as summarized in Section 8.1, maximum impacts from the Project's sources are predicted to exceed SILs for the NO_2 1-hour and $PM_{2.5}$ 24-hour, averaging periods. Therefore, a cumulative (multisource) impact analysis is required to predict the combined impacts of these pollutants from the Project and potentially interacting ("nearby") sources to demonstrate the Project will not cause or contribute to air pollution in violation of any NAAQS or PSD increment. This section summarizes the cumulative impact assessment methodology and results. Table 8-4 presents the applicable NAAQS and PSD increment values.

Table 8-4. NAAQS and PSD Increment Values

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)	Class II Increments ($\mu g/m^3$)
NO_2	1-Hour	188	—
$PM_{2.5}$	24-Hour	35	9

Source: ECT, 2017.

8.2.1 CUMULATIVE IMPACT MODEL RECEPTORS

AERMOD was used for all multisource model runs. With the exception of receptors, all other AERMOD control options, meteorological input files, and procedures are identical to those used for the significance modeling discussed in Sections 7.0. For cumulative modeling analyses, the receptor grids consisted of only those receptors that exceeded a PSD Class II SIL for a specific pollutant and averaging period. The grids included any receptor for which a concentration was modeled that was equal to or greater than a SIL for any averaging period and any year of meteorological data. A unique receptor grid was created for each pollutant and averaging period for both NAAQS and the PSD increment analyses and for each meteorological data set. Additionally, a unique receptor grid was made for each operating load scenario that exceeded the SIL for NO_2 1-hour for each meteorological data set. This was done so that each load scenario could be run separately for Ambient Ratio Method Version 2 (ARM2).

8.2.2 EMISSIONS AND STACK PARAMETERS—PROJECT SOURCES

Based on results of the Project modeling analysis, only the operating scenarios that resulted in an exceedance of the SIL was included in the multisource modeling. All modeling input parameters for the various operating scenarios are identical to those to be used in the single-source modeling analyses.

McClellandtown:

- NO_2 1-hour
  - Base load with evaporative cooling and duct burners
  - Base load with duct burners
  - Hot startup
  - Warm startup
  - Cold startup
- $PM_{2.5}$ 24-hour—Increment
  - Base load with evaporative cooling and duct burners
  - Base load with duct burners
  - Low load
- $PM_{2.5}$ 24-hour—NAAQS
  - Base load with duct burners

Morgantown:

- NO_2 1-hour
  - Base load with evaporative cooling and duct burners
  - Base load with duct burners
  - Base load with evaporate cooling
  - Base load
  - 75-percent load
  - Low load
  - Hot startup
  - Warm startup
  - Cold startup

8.2.3 EMISSIONS AND STACK PARAMETERS—INTERACTING SOURCE INVENTORY

The following options were used to develop off-property sources to show compliance with NAAQS and PSD Class II increments. The following subsections provide a more detailed explanation for development of the NO_2 and $PM_{2.5}$ inventories. Appendix F includes the cumulative modeling inventory sources:

- An inventory of nearby sources from PADEP and the surrounding states (West Virginia Department of Environmental Protection, Maryland Department of the Environment, and Ohio Environmental Protection Agency) along with the Allegheny County Health Department (ACHD) was obtained. The data consisted of facility name and addresses and actual emissions.
- A request for any previous model inventories submitted in the area was made to PADEP and ACHD. One inventory was made available from ACHD.
- Sources in the screening area (the area up to 50 km beyond the SIA) were screened based on the following procedures:
  - Only those sources designated as a Title V source for the pollutant being considered was included (i.e., only a source that is Title V for particulate matter was included in the particulate matter inventory, a source that is Title V for NO_x will not be included for the particulate matter inventory).
  - Once a list of sources in the screening has been developed, allowable emissions for the sources were obtained from Title V permits, applications, or review memoranda.

8.2.3.1 <u>NO_2 Inventory</u>

An offsite emissions source inventory was developed from agency-supplied emissions source information for NO_x sources within 50 km of the Project Site. Specifically, the data provided was filtered to include only the facilities identified as Title V facilities. Title V facilities were then investigated to determine if the facility was Title V for NO_x. Only facilities that are Title V for NO_x were included in the inventory. Next, stack parameters for the NO_x Title V facilities were taken from the agency-provided data. Finally, allowable

emissions rates for each stack were obtained from the Title V permits, application, or review memoranda. Figure 8-1 shows the location of the nearby NO_2 sources.

8.2.3.2 $PM_{2.5}$ Inventory

A cumulative multisource assessment of NAAQS attainment was required for 24-hour $PM_{2.5}$, impacts. A PSD Class II increment was required for 24-hour $PM_{2.5}$.

An offsite emissions source inventory was developed from agency-supplied emissions source information for $PM_{2.5}$. The inventory was revised to include only those sources within the SIA plus a 50-km radius from the Project. The maximum $PM_{2.5}$ SIA was 1.4 km for the 24-hour $PM_{2.5}$ averaging period. A SIA of 2 km was conservatively used for determining which facilities to include in the screening area (52 km). Next, the data provided was filtered to include only the facilities identified as Title V facilities. Title V facilities were then investigated to determine if the facility was Title V for $PM_{2.5}$. Only facilities that are Title V for $PM_{2.5}$ were included in the inventory. Next, stack parameters for the $PM_{2.5}$ Title V facilities were taken from the agency-provided data. Finally, allowable emissions rates for each stack were obtained from the Title V permits, application, or review memoranda. Figure 8-2 shows the location of the $PM_{2.5}$ nearby sources.

8.2.4 NEARBY SOURCE INVENTORY FOR PSD INCREMENT ANALYSIS

A PSD increment analysis was required for $PM_{2.5}$ 24-hour for the McClellandtown meteorological data. It was verified by PADEP that this Project is the first PSD application after the trigger data for $PM_{2.5}$ PSD increments (October 20, 2010). As a result, Project emissions were the only emissions needed to be included in the $PM_{2.5}$ PSD increment modeling.

8.2.5 MULTISOURCE MODELING ANALYSIS RESULTS

The following subsections present the results of the multisource modeling analyses to demonstrate the Project would not cause or contribute to air pollution in violation of any applicable NAAQS or PSD increment.

N:\PRJ\Hill Top Energy\CC Plant - Hill Top\GIS\MXD\Application\GE\HillTop_Offsite_NO2_Sources.mxd jmarcinkowski 3/8/2017 4:50:17 PM

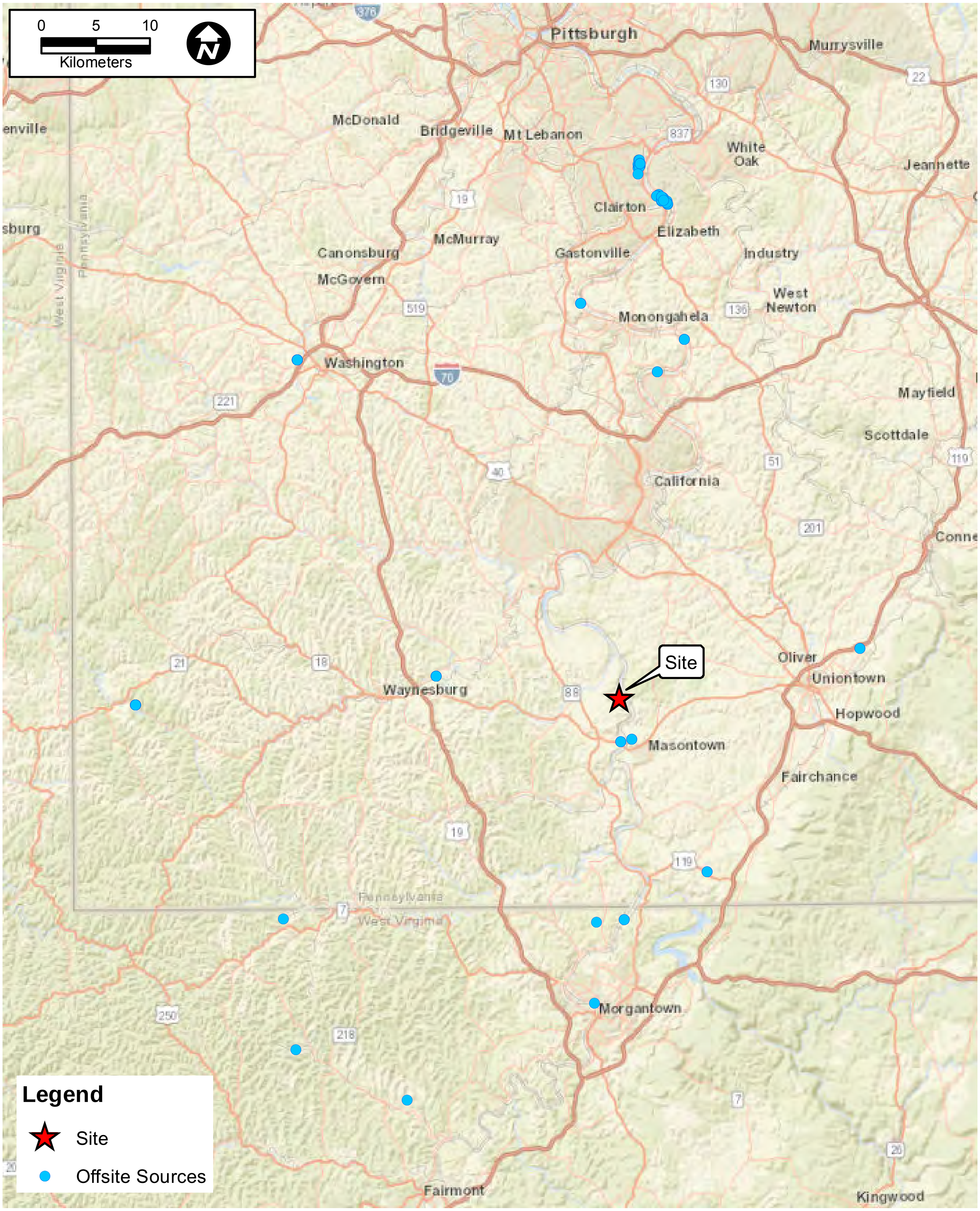

FIGURE 8-1.
LOCATIONS OF NO_2 NEARBY SOURCES

Sources: Esri Basemap, PADEP, Allegheny Cnty Health Dept, WVDEP, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

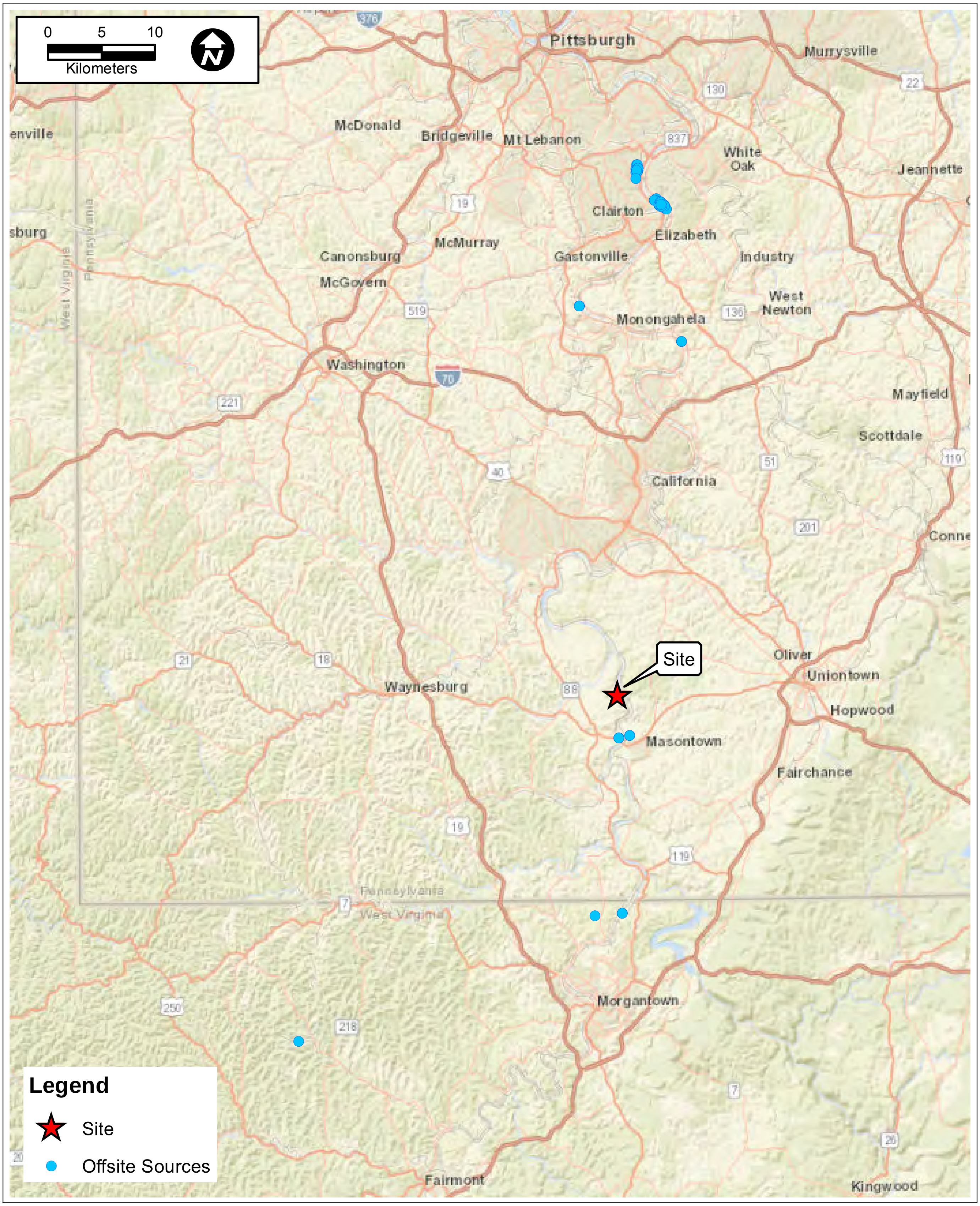

FIGURE 8-2.
LOCATIONS OF $PM_{2.5}$ NEARBY SOURCES

Sources: Esri Basemap, PADEP, Allegheny Cnty Health Dept, WVDEP, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

8.2.5.1 NO_2 1-Hour Average NAAQS Modeling Results

The multisource NO_2 1-hour NAAQS modeling analysis was conducted for the Project scenarios determined from the significant impact modeling that resulted in impacts above the SIL. Modeled receptors included all significant receptors from all operating scenarios from the SIA analysis. Cumulative concentrations were determined from the maximum 8th-highest maximum daily 1-hour results averaged over five years from AERMOD. For the 1-hour average NO_2 refined modeling, the default Tier 2/ARM2 NO_x conversion option was used in accordance with 40 CFR 51, EPA guidance revised in 2016. The national default for ARM2 has a minimum ambient NO_2/NO_x ratio of 0.5 and, a maximum ambient ratio of 0.9 was used as discussed in EPA NO_2 modeling guidance. The monitored NO_2 background concentration was added to the modeled concentrations to obtain a final concentration for comparison to NAAQS.

An initial cumulative model run was performed with the inventory sources included with the Project plus a background concentration by season and hour of the day as described in the US EPA March 1, 2011, memorandum, "Additional Clarification Regarding Applicability of Appendix W Modeling Guidance for the 1-hour NO2 NAAQS", and the results showed there was an exceedance of 1-hour NO_2 NAAQS for both sets of meteorological data. The MAXDCONT postprocessor to AERMOD was used to assess whether the Project's contribution to the predicted violations of NAAQS, paired in time and space, was significant at all receptors where a NAAQS violation has been predicted. The MAXDCONT postprocessor was only run for the cold startup scenario, as this was the only scenario where the Project had the potential to significantly contribute to a potential NAAQS violation.

For the McClellandtown meteorological data, the Project's contribution determined using the MAXDCONT postprocessor was less than the SIL of 7.5 micrograms per cubic meter ($\mu g/m^3$). Further, there were no modeled exceedances of 1-hour NO_2 NAAQS where the contribution of the Project was at or above the SIL; therefore, the analysis demonstrated the Project will not cause or contribute to a violation of 1-hour NO_2 NAAQS. Table 8-5 summarizes the results.

Table 8-5. NO_2 1-Hour Cumulative NAAQS Modeling Results—McClellandtown Meteorological Data

Source Group*:	Cold	Warm	Hot
Total impact† ($\mu g/m^3$)	244.23	179.96	176.29
NAAQS ($\mu g/m^3$)	188	188	188
Exceed NAAQS? (Yes/No)	Yes	No	No
Project contribution to maximum modeled impact violation ($\mu g/m^3$)	0.00003	--	--
Project maximum contribution to any NAAQS violation ($\mu g/m^3$)	0.00007	--	--
SIL ($\mu g/m^3$)	7.5	7.5	7.5
Project significantly contribute to NAAQS violation (Yes/No)	No	No	No
Number NAAQS violation	32	0	0
Number of occurrences where Project significantly contributes to NAAQS violation	0	0	0

*Source group includes the Project operating at the scenario identified plus the nearby source inventory and includes the seasonal hourly background concentration.
†ARM2.

Source: ECT, 2017.

For the Morgantown meteorological data, the Project's contribution determined using the MAXDCONT postprocessor was less than the SIL of 7.5 $\mu g/m^3$. Further, there were no modeled exceedances of 1-hour NO_2 NAAQS where the contribution of the Project was at or above the SIL; therefore, the analysis demonstrated the Project will not cause or contribute to a violation of 1-hour NO_2 NAAQS. Table 8-6 summarizes the results.

8.2.5.2 $PM_{2.5}$ 24-Hour Average NAAQS Modeling Results

The multisource $PM_{2.5}$ 24-hour NAAQS modeling analysis was conducted for Project scenarios determined from the single-source modeling that resulted in impacts above the SIL. As with the significant impact modeling, the CT was also modeled assuming the auxiliary boiler, fuel gas heater, emergency generator, fire water pump engine, and cooling towers were all operating simultaneously. A single five-year model run was conducted for all scenarios with the receptor network, including all significant receptors from all operating scenarios from the SIA analysis.

The cumulative concentrations were determined from the 8th-highest 24-hour results averaged over five years from AERMOD. The appropriate monitored $PM_{2.5}$ 24-hour background concentration was added to the cumulative impact to obtain the final concentration for comparison to NAAQS.

A cumulative model run was performed with the inventory sources included with the Project plus a background, and the results showed there were no exceedances of 24-hour $PM_{2.5}$ NAAQS for the McClellandtown meteorological data. Therefore, the Project will not cause or contribute to a violation of the 24-hour $PM_{2.5}$ NAAQS. Table 8-7 summarize the results.

8.2.5.3 $PM_{2.5}$ 24-Hour Average PSD Increment Modeling Results

As verified by PADEP, the Project is the first PSD application in this air quality control region after the trigger date for the $PM_{2.5}$ PSD increments. In addition, PADEP is not aware of any changes in actual emissions occurring at "nearby" major sources after the $PM_{2.5}$ source baseline date of October 20, 2010. As a result, only Project sources were included in the $PM_{2.5}$ increment modeling.

Table 8-6. NO_2 1-Hour Cumulative NAAQS Modeling Results—Morgantown Meteorological Data Station

Source Group*:	Cold	Warm	Hot
Total impact† (µg/m^3)	356.30	187.94	185.62
NAAQS (µg/m^3)	188	188	188
Exceed NAAQS? (Yes/No)	Yes	No	No
Project contribution to maximum modeled impact violation (µg/m^3)	0.00004	--	--
Project maximum contribution to any NAAQS violation (µg/m^3)	0.05038	--	--
SIL (µg/m^3)	7.5	7.5	7.5
Project significantly contribute to NAAQS violation (Yes/No)	No	No	No
Number NAAQS violation	769	0	0
Number of occurrences where Project significantly contributes to NAAQS violation	0	0	0

*Source group includes the Project operating at the scenario identified plus the nearby source inventory and includes the seasonal hourly background concentration.
†ARM2.

Source: ECT, 2017.

Table 8-7. $PM_{2.5}$ 24-Hour Cumulative NAAQS Modeling Results*—McClellandtown Meteorological Data

Source Group†	Model Maximum Concentration (µg/m^3)	Background (µg/m^3)	Total (µg/m^3)	NAAQS (µg/m^3)
BASEDB_I	1.61	24.00	25.61	35.00

Note: BASEDB = base with evaporative cooler and duct burner.

*Accounts for the Project's secondary $PM_{2.5}$ impact due to precursor emissions.
†Source group includes Project operating at the following scenario plus the nearby source inventory:

Source: ECT, 2017.

The cumulative 24-hour model concentrations due to all modeled Project emissions sources and scenarios were determined from the highest 2nd-high (H2H) impacts over each of the five years of meteorological data (McClellandtown) modeled with AERMOD. Table 8-8 summarizes the results of the $PM_{2.5}$ 24-hour increment analysis, which show the maximum H2H concentrations to be less than the applicable PSD increment. The analysis demonstrates the Project will not cause or contribute to a violation of the 24-hour average $PM_{2.5}$ PSD increment.

Table 8-8. $PM_{2.5}$ 24-Hour Cumulative PSD Increment Modeling Results*—McClellandtown Meteorological Data

Source Group	Model Maximum H2H Concentration (µg/m^3)	Increment (µg/m^3)
Base with evaporative cooling and duct burner	1.47	9.0
Base with duct burner	1.59	9.0
Low load	1.30	9.0

*Accounts for the Project's secondary $PM_{2.5}$ impact due to precursor emissions.

Source: ECT, 2017.

9.0 CLASS I AREA IMPACT ANALYSIS

Under the PSD program, Class I areas are assigned to protect federal wilderness areas such as national parks, wilderness areas, and wildlife refuges, where the least amount of air quality deterioration is allowed. Class I areas are designated as pristine natural areas or areas of natural significance. Figure 9-1 shows the proposed Project location relative to the nearest mandatory Class I areas. The nearest Class I area, Otter Creek Wilderness, is approximately 95 km from the Project Site. Table 9-1 presents identification and distances to all Class I areas within 300 km of the proposed Project.

9.1 PSD CLASS I AREA INCREMENT ANALYSIS

If a proposed source is located within 100 km (62 miles) of a Class I area, the impacts must be evaluated at these areas based on the more stringent Class I PSD increments. Since Otter Creek Wilderness is within 100 km of the Project, a Class I PSD increment analysis was performed.

HTEC used AERMOD as a screening model to evaluate the PSD Class I increments. AERMOD was run with the same meteorological files, model control options, and other inputs as discussed in Section 7.0. Per PADEP guidance, to account for the terrain in the Class I areas, the Class I receptor locations and elevations provided by the Federal Land Manages (FLM) were used. PADEP processed the receptors with AERMAP to calculate the hill height scales for AERMOD input and provided them to ECT in a July 15, 2016, e-mail. Although the Class I receptors are beyond the EPA-recommended range for application of the AERMOD system, EPA's Technical Support Document for AERMOD-Based Assessments of Long-Range Transport Impacts for Primary Pollutants (July 2015) states, "due to variation in meteorology that is expected to occur beyond 50 km and the time required for a plume to travel this distance, steady-state plume models like AERMOD are expected to be overly conservative in the far field."

Tables 9-2 and 9-3 summarize the results of the Class I area modeling analysis in comparison to the applicable Class I SILs. As shown in these tables, the modeled impacts at the

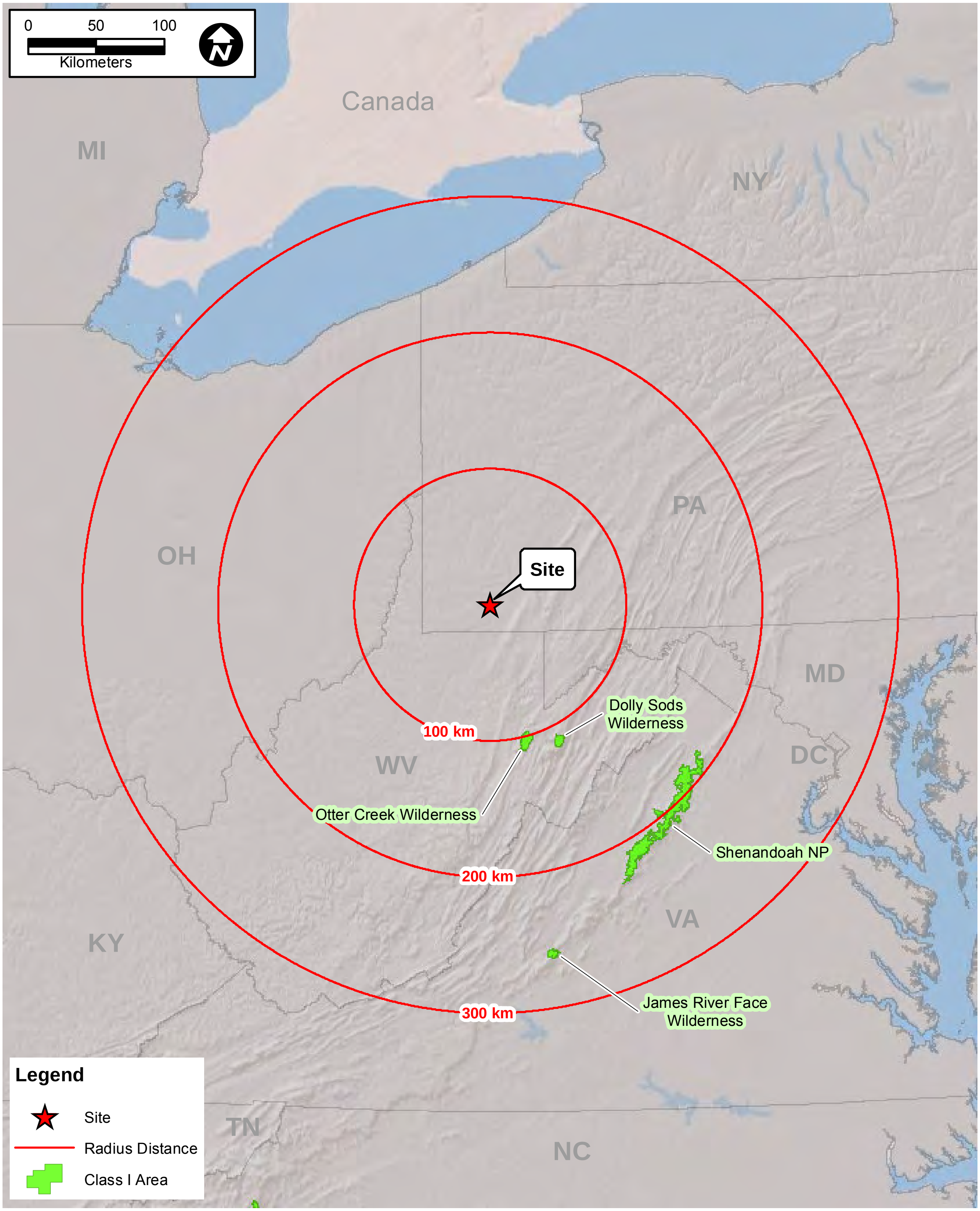

FIGURE 9-1.
LOCATIONS OF NEAREST CLASS I AREAS

Source: NPS, USFS, USFWS, ECT 2017.

ECT Environmental Consulting & Technology, Inc.

Table 9-1. Distance to Class I Areas

Class I Area	Approximate Distance from Project (km)
Otter Creek Wilderness	95
Dolly Sods Wilderness	106
Shenandoah National Park	182
James River Face Wilderness	255

Source: ECT, 2017.

Table 9-2. Class I Area Screening Modeling Results—McClellandtown

Pollutant	Averaging Period	Maximum Modeled Impacts (μg/m^3)	Class I SIL* (μg/m^3)
$PM_{2.5}$†	Annual	0.0017	0.05
	24-hour	0.04	0.27
PM_{10}	Annual	0.0017	0.2
	24-hour	0.04	0.3
NO_2	Annual	0.0026	0.1

*EPA's proposed Class I SILs for NO_2 and PM_{10} were published in 61 FR 38249 on July 23, 1996. $PM_{2.5}$ Class I SILs are based on EPA's August 1 and 18, 2016, draft memorandum, "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program."
†Accounts for the Project's secondary $PM_{2.5}$ impact due to precursor emissions.

Source: ECT, 2017.

Table 9-3. Class I Area Screening Modeling Results—Morgantown

Pollutant	Averaging Period	Maximum Modeled Impacts ($\mu g/m^3$)	Class I SIL* ($\mu g/m^3$)
$PM_{2.5}$†	Annual	0.0021	0.05
	24-hour	0.02	0.27
PM_{10}	Annual	0.0021	0.2
	24-hour	0.02	0.3
NO_2	Annual	0.0034	0.1

*EPA's proposed Class I SILs for NO_2 and PM_{10} were published in 61 FR 38249 on July 23, 1996. $PM_{2.5}$ Class I SILs are based on EPA's August 1 and 18, 2016, draft memorandum, "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program."
†Accounts for the Project's secondary $PM_{2.5}$ impact due to precursor emissions.

Source: ECT, 2017.

receptors are demonstrated to be well below the corresponding SILs. Therefore, the Class I area screening analysis is considered sufficient justification that Project emissions will not cause or contribute significantly to violations of applicable Class I area increment standards.

9.2 FEDERAL LAND MANAGERS' AIR QUALITY-RELATED VALUES ANALYSIS

To evaluate the need for either an air quality-related values (AQRV) analysis or a Class I increment analysis for Hill Top, the 2010 FLM Air Quality-Related Values Work Group (FLAG) guidance methodology (Reference 10-1) using the "Q/D screening method" is used. For this formula, Q is the amount of pollutant (in tons) of combined SO_2, NO_x, PM_{10}, and H_2SO_4 emitted by the Project, while D is the distance in kilometers to the Class I area in question. For this screening method to indicate an analysis is not needed, this Q/D value must be less than 10. Table 9-4 provides the calculation of the total SO_2, NO_x, PM_{10}, and H_2SO_4 annual emissions (based on 24-hour maximum allowable emissions), in accordance with Subsection 3.2 of the FLAG Phase I report. Table 9-5 presents the Q/D ration for each Class I area.

As shown in Tables 9-4 and 9-5, the proposed Project's Q/D is less than 10, the recommended screening exemption level. Therefore, the proposed Class I area analysis addressed only PSD increment consumption at the nearby Class I areas.

It also should be noted that HTEC provided notice to the U.S. Fish & Wildlife Service (USFWS), Forest Service, and National Park Service (NPS) regarding Project location relative the closest Class I areas, Project type, and emissions and soliciting comments on the Project relating to the need to perform any quantitative Class I analyses.

Table 9-4. FLAG Q/D Screening Analysis—Total Annual Emissions

Pollutant	Maximum Allowable Emissions* (lb/hr) Turbine	Auxiliary Boiler	Fuel Gas Heater	Emergency Generator	Fire Water Pump	CWT	Total† (tpy)
NO_x	34.76	0.45	0.07	26.46	2.60		281.8
PM_{10}	34.19	0.31	0.05	0.88	0.14	0.765	159.1
SO_2	26.98	0.05	0.007	0.033	0.87		122.4
H_2SO_4	15.21	3.75E-03	0.0006	0.0025	0.066		67.0
Total							630

*Based on 24-hour maximum allowable emissions.
†Maximum allowable emissions converted to tpy assuming 8,760 hr/yr.

Source: ECT, 2017.

Table 9-5. FLAG Q/D Screening Analysis—Class I Q/D Ratios

Class I Area	Project Emissions* of NO_x, PM_{10}, SO_2, and H_2SO_4 (tpy)	Distance from Proposed Project (km)	Q/D Ratio
Otter Creek Wilderness Area	NO_x = 281.8 PM_{10} = 159.1 SO_2 = 122.4 H_2SO_4 = 67.0 Total = 630	95	6.63
Dolly Sods Wilderness Area		106	5.95
Shenandoah National Park		182	3.46
James River Face Wilderness Area		255	2.47

*Project emissions represent maximum allowable emissions converted to tpy assuming 8,760 hr/yr for the CT at 100-percent load (with duct burners), auxiliary boiler, fuel gas heater, emergency generator, and fire water pump.

Source: ECT, 2017.

10.0 OTHER AIR QUALITY ANALYSES

PSD regulations require additional impact analyses be performed for each pollutant subject to PSD review that will be emitted by the proposed source. The additional analyses are performed to evaluate the potential for impairment to visibility, soils, and vegetation that would occur as a result of a project. Additionally, HTEC must evaluate the potential for air quality impacts due to general commercial, residential, industrial, and other secondary growth associated with this Project.

10.1 ASSOCIATED GROWTH ANALYSIS

The purpose of the growth impact analysis is to quantify growth resulting from the construction and operation of the proposed Project and assess air quality impacts that would result from that growth.

In general, it is anticipated the Project will have a positive impact on regional development. Several hundred temporary construction jobs will be created during the 22-month construction phase of the Project.

Once the Project becomes operational, approximately 25 full-time staff will be employed. It is expected many of these staff will be existing local residents, thereby minimizing the need for additional housing and related commercial services, and an increase in daily traffic should not be noticeable.

Also, the Project's CTs will be fueled with clean, pipeline-quality natural gas with no backup liquid fuel. Since natural gas will be piped to the facility, there will be no routine daily truck deliveries of bulk materials into or out of the facility. Occasional deliveries of parts and supplies will occur. Again, the level of this traffic should not affect the normal flow of traffic in or around the facility.

10.2 VEGETATION AND SOILS IMPACT ANALYSIS

The screening methodology provided in EPA's guidance document for soils and vegetation, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and

Animals (EPA 450/2-81-078), was supplemented with a more robust soils and vegetation analysis for the Project.

10.2.1 VEGETATION ANALYSIS

As an indication of whether emissions from the proposed Project will significantly impact surrounding vegetation (i.e., cause acute or chronic exposure to each evaluated pollutant), modeled emissions concentrations were compared against both a range of injury thresholds found in various peer-reviewed research articles that specifically examine effects of different pollutants on vegetation as well as established NAAQS secondary standards. Since secondary NAAQS were set to protect public welfare, including protection against damage to crops and vegetation, comparing the modeled emissions to these standards provides an indication as to whether potential impacts are likely to be significant. However, given secondary standards for some criteria pollutants are under review, comparison to secondary NAAQS may not be definitive.

For the vegetation analysis, modeled concentrations of SO_2, NO_x, PM_{10}, and CO were compared against vegetation sensitivity thresholds listed in the aforementioned 1980 EPA guidance, secondary NAAQS, and plant injury thresholds found in the literature. Table 10-1 illustrates injury threshold ranges determined through a review of readily available research. The same meteorological data and Cartesian grid (20-km extent) as described in Section 7.0 was used for the vegetation analysis.

As shown in Table 10-2, results clearly indicate no adverse impacts will occur to sensitive vegetation as a result of operation of the proposed Project.

10.2.2 SOIL ASSESSMENT

To determine whether Project emissions could adversely affect the soil in the vicinity of the Project, the type of soil surrounding the Project Site was reviewed. The soil type was determined from data collected from the U.S. Department of Agriculture National Resource Conservation Service’s (NRCS’s) Soil Survey Geographic (SSURGO) database and NRCS’s web soil survey tool.

Table 10-1. Injury Threshold for Vegetation

Pollutants	Injury Threshold (Dose) ($\mu g/m^3$)	Secondary NAAQS ($\mu g/m^3$)	EPA's 1980 Screening Concentration ($\mu g/m^3$)
SO_2	131 to 5,240 (8 hour)	1,300 (3 hour)	18 (annual)
	1,310 (4 hour)		786 (3 hour)
	393 to 3,930 (2 hour)		917 (1 hour)
NO_x (as NO_2)	280 to 38,000 (1 hour to long-term) 940 (1 hour)	100 (annual)	94 (annual) 3,760 (4 hour) 564 (1 month)
PM (as PM_{10})	See NAAQS	150 (24 hour)	None
CO	None		1,800,000 (weekly)

Source: ECT, 2017.

Table 10-2. Comparison to EPA Criteria for Gaseous Pollutant Impacts on Natural Vegetation and Crops

Pollutant	Averaging Period	Maximum Impact of Proposed Facility Impact ($\mu g/m^3$) McClellandtown	Morgantown	Minimum Impact Level for Effects On Sensitive Plants ($\mu g/m^3$)*
SO_2	1-hour†	90.58	104.86	393
	3-hour	20.26	23.26	786
	Annual	0.10	0.05	18
NO_2	1-hour†	9.60	10.84	280
	4-hour	98.21	140.43	3,760
	1-month	0.54	0.28	564
	Annual	0.84	0.93	94
PM_{10}	24-Hour	2.08	1.98	150
CO	1-week‡	7.31	6.99	1,800,000

*Minimum impact level is the lowest threshold found in Table 10-1.
†Note the 1-hour NO_2 and SO_2 concentration are the highest modeled concentrations.
‡24-hour average used to conservatively represent one-week average impact.

Source: ECT, 2017.

Soil types within Greene and Fayette counties were examined using information taken from the SSURGO database. These counties were chosen because the Project Site is within Greene County, and Fayette County is less than 1 mile from the Project Site. Evaluation indicates, for Greene County, the predominate soil types are a mixture of silt and clay loams. In Fayette County, the predominant soil types are a variety of silt and sandy loams.

An area of approximately 10,000 acres around the Project Site using the NRCS web soil survey tool (see red box on Figure 10-1) indicates the predominant soil type is silt loams. Silt loams are considered to have a moderate buffering capacity, thus having decent capacity to absorb acidic deposition without changing the soil pH. Table 10-3 provides the comparison of soil types within the Project Site and shows 94 percent of the soil types in the vicinity of the Project area are classified as having high and moderate buffering capacities. Given the relatively low emissions due to the proposed Project, and because the soil types immediately around the proposed Project Site have moderate to high buffering capacity, no adverse impacts on soils due to Project emissions are anticipated.

10.2.3 NONCRITERIA POLLUTANT IMPACTS ON PLANTS, SOILS, AND ANIMALS

The screening methodology provided in EPA's guidance document, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals (EPA 450/2-81-078), was used to evaluate the potential impact of noncriteria pollutants emitted from the facility. Data is not available for all noncriteria pollutants, but data that is available is presented in Table 10-4 and is compared with the expected emissions of the proposed facility.

The significant emissions rate data available for noncriteria pollutants is well below the emissions rates expected from the new facility. The emissions of noncriteria pollutants are insignificant, and no adverse impacts on plants, soil, or animals due to Project emissions are anticipated.

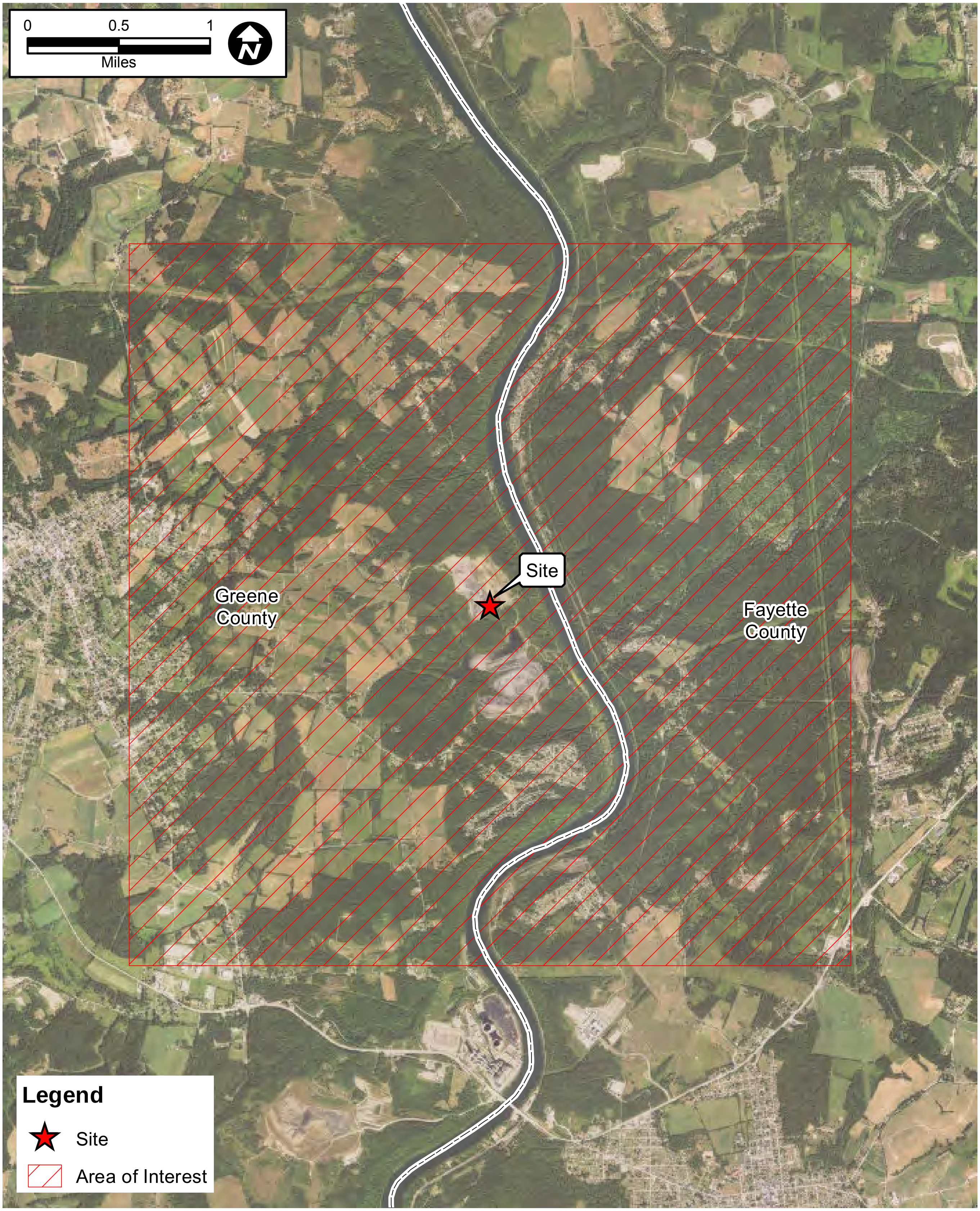

FIGURE 10-1.
SOIL EVALUATION AREA OF INTEREST

Sources: Esri Basemap Imagery, ECT 2017.

Environmental Consulting & Technology, Inc.

Table 10-3. Buffering Capacity of Soils around Project Site

Soil Types	Project Site (% in area of interest)
High buffer capacity	
Clay loams	10.0
Subtotal	**10.0**
Moderate buffer capacity	
Loams	5.9
Silt loams	78.1
Subtotal	**84.0**
Other	
Water	3.6
Urban land	1.3
Dumps, mine	1.1
Subtotal	**6.0**

Source: ECT, 2017.

Table 10-4. Comparison to EPA Noncriteria for Gaseous Pollutant Impacts on Plants, Soils, and Animals

Pollutant	Maximum Emissions Rate of Proposed Facility Noncriteria Pollutant (tpy)	SER of Proposed Facility Noncriteria Pollutant* (tpy)	Multiples Below the SER
Beryllium	0.00005263	0.057	1,083
Cadmium	0.00482461	0.037	8
Chromium	0.00614041	1.1	179
Cobalt	0.00036842	1.2	3,257
Cooper	0.00050965	0.21	412
Manganese	0.00166668	0.33	198
Mercury	0.00114036	61	53,492
Nickel	0.00921061	0.53	58
Selenium	0.00010032	0.67	6,679

*SER is the lowest threshold found in Tables 5.6 and 5.7 of EPA 450/2-81-078.

Source: ECT, 2017.

10.3 VISIBILITY IMPAIRMENT ANALYSIS

As discussed in Section 9.0, the maximum calculated Q/D (ton per year per kilometer [tpy/km]) for the closest identified Class I area is well below the FLAG guideline Q/D of 10 tpy/km. Therefore, the Project is considered to have negligible impacts with respect to Class I AQRVs, including visibility impacts. However, at the discretion of the reviewing agency, a visibility impact analysis for other sensitive areas within 50 km of a project in a Class II area may also be requested. A search for state parks, wilderness areas, or scenic areas within 50 km of the Project Site was conducted. One state park, Ohiopyle State Park, was identified within 50 km of the Project.

A stack plume visibility screening analysis was performed based on the procedures described in EPA's Workbook for Plume Visual Impact Screening and Analysis. The screening procedure involves calculation of plume perceptibility (ΔE) and contrast (C) with EPA's VISCREEN (Version 1.01, dated December 8, 1988) model, using as inputs emissions of NO_2, PM/PM_{10}, and sulfates (SO_4), worst-case meteorological dispersion conditions, and other default parameters. The screening procedure determines the light-scattering impacts of particulates, including sulfates and nitrates, with a mean diameter of 2 micrometers and a standard deviation of 2 micrometers. The VISCREEN model evaluates both plume perceptibility and contrast against two backgrounds, sky and terrain, from an observer located inside and outside the potentially sensitive area.

Visibility impacts are a function of NO_2, SO_4, and particulate matter emissions. Particles are capable of either scattering or absorbing light, while NO_2 absorbs light. These constituents, therefore, can either increase or decrease the light intensity (or contrast) of the plume against its background. VISCREEN plume contrast calculations are performed at three wavelengths within the visible spectrum (blue, green, and red). Plume perceptibility as determined by VISCREEN is determined from plume contrast at all visible wavelengths and is a function of changes in both brightness and color.

The VISCREEN model provides three levels of analysis, the first two of which are screening approaches. The Level-1 assessment uses a series of default criteria values and other input assumptions to conservatively assess the visible impacts. The conservatism results in

part by assuming worst-case meteorological conditions during plume transport and dispersion. Specifically, extremely stable (stability Class F) atmospheric conditions coupled with a low wind speed (1 meter per second [m/sec]) are used in the VISCREEN Level-1 screening analysis. If the source passes the criteria defined for a Level-1 assessment (ΔE less than 2.0 and Cp less than 0.05), potential for visibility impairment is not expected to be significant, and no further analysis is necessary. If a source fails the Level-1 criteria, a Level-2 or -3 analysis may be required.

The analysis was performed assuming all emitted particulate from the Project would be PM_{10}, total NO_x emissions, and the default assumptions for NO_2, soot ,and H_2SO_4 (i.e., VISCREEN default adjustments to approximate NO_2 from potential NO_x, and zero emissions input for soot and H_2SO_4). Table 10-5 presents the emissions rates and other VISCREEN input assumptions.

VISCREEN assesses visibility impacts for two sun angles (light scattering angles of 10 and 140 degrees) and for hypothetical observers located at the closest and furthest sensitive area boundaries (inside and outside surrounding areas).

The Level-1 analysis, with the default worst-case meteorology (F stability, 1-m/sec wind speed) and other assumptions, determined the calculated plume perceptibility and contrast parameters would be below EPA's default criteria for a visibility screening. Therefore, Ohiopyle State Park meets the Level-1 screening criteria and was not evaluated further.

10.4 H_2SO_4 MIST ANALYSIS

As mentioned in Section 7.1, a modeling analysis was performed for H_2SO_4 mist for comparison to existing health limits. A short-term (1-hour) and a chronic (annual) modeling analysis was conducted.

10.4.1 MODEL SOURCE DATA

All AERMOD control options, stack locations, receptors, meteorological input files, and procedures were identical to those used for the significance modeling discussed in Sections 7.0.

Table 10-5. VISCREEN Model Input Data

Parameter	VISCREEN Inputs
Project emissions rates	
Total NO_x as NO_2	173.10 tpy
Primary NO_2	0.00 tpy
PM_{10}	110.25 tpy
Soot (elemental C)	0.00 tpy
Primary SO_4	0.00 tpy
Level I default meteorological conditions	F stability, 1-m/sec wind speed
Background visual range	20 km
Default criteria:	
ΔE	<2.0
Cp	<0.05

Source: ECT, 2017.

10.4.2 H_2SO_4 EMISSIONS RATES

10.4.2.1 Combustion Turbine

Table 10-6 summarizes H_2SO_4 emissions data representative of the proposed CT for modeling input parameters. The most conservative (worst-case) emissions rates for the unit were determined using the maximum emissions rates calculated for various scenarios, including firing at full (base) load, at partial loads, and at various air intake temperatures representing the expected range of ambient conditions. Short-term lb/hr emissions rates were determined from the firing rate and ambient condition case that produced the highest hourly rate.

Annual tpy emissions rates were determined from the case with the highest hourly rate and assumed 8,760 hours of normal operation with or without duct burner firing and did not take into account any hours for startup/shutdown. Table 10-7 provides annual emissions rates.

Short-term emissions were based on a maximum fuel sulfur content of 2.0 gr/100 scf, and annual emissions were based on an average fuel sulfur content of 0.4 gr/100 scf. Finally, a 10-percent margin was added to all short-term emissions rates.

10.4.2.2 Ancillary Equipment

Table 10-8 summarizes H_2SO_4 emissions data representative of the proposed ancillary equipment for modeling input parameters. The most conservative (worst-case) emissions rates for the units were determined using the maximum emissions rates calculated. Annual tpy emissions rates were based the annual operation of the unit. Auxiliary boiler annual emissions were based on 8,760 hours, and fuel gas heater annual emissions were based on 8,760 hours. The emergency generator and fire water pump were based on 100 hours.

Table 10-6. H_2SO_4 Mist Short-Term Emissions Rates

Unit Load (%)	Short-term* Emissions Rates	
	lb/hr	g/sec
Base with evaporative cooling and duct burner	15.21	1.92
Base with duct burner	14.96	1.88
Base with evaporative cooling	12.27	1.55
Base	12.38	1.56
75	9.82	1.24
50	6.49	0.82

*Based on a maximum fuel sulfur content of 2.0 gr/100 scf.

Note: lb/hr = pound per hour.
g/sec = gram per second.

Source: ECT, 2017.

Table 10-7. H_2SO_4 Mist Annual Emissions for Combustion Turbine

Pollutant	Annual* Emissions		
	tpy	lb/hr	g/sec
H_2SO_4	13.33	3.04	0.38

*Based on a maximum fuel sulfur content of 0.4 gr/100 scf

Note: tpy = ton per year.
lb/hr = pound per hour.
g/sec = gram per second.

Source: ECT, 2017.

Table 10-8. H_2SO_4 Emissions Rates for Auxiliary Equipment

Equipment	Short-term Emissions		Annual Emissions		
	lb/hr	g/sec	tpy	lb/hr	g/sec
Auxiliary boiler	3.75E-03	4.72E-04	1.64E-02	3.74E-03	4.72E-04
Fuel gas heater	5.72E-04	7.21E-05	2.50E-03	5.71E-04	7.19E-05
Emergency generator	2.49E-03	3.14E-04	1.25E-04	2.85E-05	3.60E-06
Fire water pump	6.62E-02	8.34E-03	3.31E-03	7.56E-04	9.52E-05

Note: tpy = ton per year.
lb/hr = pound per hour.
g/sec = gram per second.

Source: ECT, 2017.

10.4.3 RESULTS

Table 10-9 provides maximum modeled H_2SO_4 impacts for the McClellandtown and Morgantown meteorological data. Both the 1-hour and annual results are based on the conservative highest concentration over the five-year meteorological data period. Based on the modeling results, predicted impacts for H_2SO_4 are less than health standard for both sets of meteorological data. Therefore, the Project is presumed not to cause a risk to human health.

Table 10-9. H_2SO_4 Analysis Results

Meteorological Data	Averaging Period	Predicted Impact ($\mu g/m^3$)	Health Standard ($\mu g/m^3$)
McClellandtown	Annual	0.01	1.0
	1-Hour	7.09	30.0
Morgantown	Annual	0.01	1.0
	1-Hour	7.98	30.0

Source: ECT, 2017.

APPENDIX A

PADEP PLAN APPROVAL APPLICATION FORMS

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)				DEP USE ONLY
Client ID#		**APS ID#**		Date Received & General Notes
Site ID#		**Auth ID#**	1092053	
Facility ID#				

CLIENT INFORMATION

DEP Client ID#	**Client Type / Code**				
	LLC				
Organization Name or Registered Fictitious Name		**Employer ID# (EIN)**		**Dun & Bradstreet ID#**	
Hill Top Energy Center, LLC		473881930			
Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**	
Radini	Richard	R			
Additional Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**	
Kwok	Raymond	YM		091843700	
Mailing Address Line 1		**Mailing Address Line 2**			
17 Terra Mar Drive					
Address Last Line – City	**State**	**ZIP+4**	**Country**		
Huntington Bay	NY	11743	USA		
Client Contact Last Name	**First Name**	**MI**	**Suffix**		
Radini	Richard	R			
Client Contact Title		**Phone**	**Ext**		
Managing Director		(516)3538702			
Email Address		**FAX**			
rradini@abatisprojects.com					

SITE INFORMATION

DEP Site ID#	**Site Name**					
	Old LTV Steel Nemacolin Coal Mine, Mile Marker 76.5, 1.3 km NE of Nemacolin, PA					
EPA ID#	**Estimated Number of Employees to be Present at Site**	25				
Description of Site						
County Name	**Municipality**		**City**	**Boro**	**Twp**	**State**
Greene	Cumberland		☐	☐	☒	
County Name	**Municipality**		**City**	**Boro**	**Twp**	**State**
			☐	☐	☐	
Site Location Line 1		**Site Location Line 2**				
Undeveloped at this time						
Site Location Last Line – City		**State**	**ZIP+4**			
Nemacolin		PA	15351			

Detailed Written Directions to Site
Directions from Pittsburgh: Rte 79 South; Rte 21 East: Go 13 miles on Rte 21 and take a left onto Rte 88 heading North. Go 0.7 miles and take a right onto SR 1027 and follow it into Nemacolin. The old enterance to the LTV Mine property is on the Southeast corner of Nemacolin and is gated.

Site Contact Last Name	**First Name**	**MI**	**Suffix**
Radini	Richard	R	
Site Contact Title	**Site Contact Firm**		
Managing Director	Hill Top Energy Center LLC		
Mailing Address Line 1	**Mailing Address Line 2**		
17 Terra Mar Drive			

Mailing Address Last Line – City	State	ZIP+4
Huntington Bay	NY	11743

Phone	Ext	FAX	Email Address
(516)3538702			rradini@abatisprojects.com

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
221-Utilities

Client to Site Relationship
OWNOP

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
Main Stack	39	53	**34**	79	55	**51**

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 1122 --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 5/14/04

Source Map Scale Number Inch(es) = Feet
--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
Hill Top Energy Center

Project Description
Development of a nominal 620 MW combined cycle 1 x 1 gas fired power plant.

Project Consultant Last Name	First Name	MI	Suffix
Campbell	William	C	III

Project Consultant Title	Consulting Firm
Principal Engineer	ECT

Mailing Address Line 1	Mailing Address Line 2
6135 Park South Drive, Suite 510	

Address Last Line – City		**State**	**ZIP+4**
Charlotte		NC	28210
Phone	**Ext** **FAX**	**Email Address**	
(704) 749 3134		wcampbell@ectinc.com	

Time Schedules	**Project Milestone (Optional)**
4 th Qtr 2017	Start of Construction
1 st Qtr 2020	**Commercial Operation**

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?** **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: ____________	☐ Yes	☒ No
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)** **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.	☒ Yes	☐ No

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?** **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.	☒ Yes	☐ No
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
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** 167	☒ 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.**	☒	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** The Municipal Authority of The Borough of Carmichaels	☒	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. **<u>Note</u>:** 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. **<u>Note</u>:** 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.	☒ Yes	☐ No
22.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**	Sodium Hypochlorite, 5,000 gallons; Sulfuric Acid, 5,000 gallons; Emergency Diesel Gen. Fuel Tank, 3,000 gallons.	
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.**	1. Service Water / Fire Water Tank, 6,000,000 gallons 2. Demineralized Water Tank, 350,000 gallons 3. 19wt% Aqueous Ammonia 31,000 gallons	
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 Richard R Radini

	Managing Director	3/3/2017
Signature	**Title**	**Date**

CUMBERLAND TOWNSHIP
ZONING/CODE ENFORCEMENT
100 MUNICIPAL ROAD
CARMICHAELS, PA 15320
724-966-8980

February 24, 2016

Mr. Raymond Kwok
Managing Director
Abatis Advisers LLC
747 Third Ave., 2nd Floor
New York, NY 10017

RE: Zoning Status Tax Parcels 05-07-105 & 107

Dear Mr. Kwok:

On August 25, 2003, the Zoning Hearing Board of Cumberland Township granted a special exception to Mather Recovery Systems, LLC and Wellington Development for the operation of a waste coal fired power plant on the above referenced parcels of land, located near the village of Nemacolin, in the Township.

Air Quality permits were secured, but construction of the plant did not take place. Representatives from Wellington Development have inquired about the status of the land in relation to the zoning regulations in our township.

After consulting with the solicitor for the Zoning Hearing Board and careful review of the transcript from the hearing held in2003, it has been determined that no additional zoning hearings will be required should plans proceed to construct a gas fired power plant at this location. The special exception has already been granted. All necessary permitting from relevant regulatory agencies will, of course, also be required prior to granting a permit to construct the facility.

Please feel free to contact me if you have additional questions or require more information regarding the requirements for project construction and completion. I can be reached at the Zoning Office via telephone at 724-966-8980 or by email at annbargerstock@gmail.com. I look forward to working with your development team.

Sincerely yours,

Ann Bargerstock

Ann Bargerstock
Zoning/Code Enforcement Officer

THE MUNICIPAL AUTHORITY OF THE BOROUGH OF CARMICHAELS
104 N. PINE ST.
CARMICHAELS, PA 15320

Phone (724)966-2250 *Fax (724)966-2261*

July 18, 2016

Raymond Kwok
Gas fired power plant-Hilltop Energy Center, LLC

Attn: William Campbell, ECT,Corp.

As stated in the Email on 7/18/16 the Municipal Authority of Carmichaels can provide water service to your development.

If we can be of further assistance please call.

Thank You,

The Municipal Authority of
The Borough of Carmichaels

Lloyd A. Richard, Jr., Manager

LARj:gcb

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: ____/____/____

Type of Submittal

☒ New Plan Approval
☐ Extension of Plan Approval
☐ Other: ________________
☐ New Operating Permit
☐ Change of Ownership
☐ Renewal of Operating Permit
☐ Periodic Submission (@ 6 mos)

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)

Hill Top Energy Center, LLC

Address 17 Terra Mar Drive,
Huntington Bay , NY 11743

Telephone (516)353 8702 **Taxpayer ID#** 473881930

Permit, Plan Approval or Application ID# Unknown

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual
☐ Municipality
☐ Proprietorship
☐ Public Corporation
☒ Private Corporation
☐ Syndicate
☐ Municipal Authority
☐ Fictitious Name
☐ Partnership
☐ Limited Partnership
☐ Government Agency
☐ Joint Venture
☐ Association
☐ Other Type of Business, specify below:

Describe below the type(s) of business activities performed.

The applicant is in the business of developing, constructing and operating a gas fired power generating facility near the town of Nemacolin in Pennsylvania.

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
N/A				
Abatis Hill Top Holding LLC	17 Terra Mar Drive, Huntington Bay, NY 11743	Delaware	474544909	100% owner of Applicant
Abatis Advisors LLC	17 Terra Mar Drive, Huntington Bay, NY 11743	Delaware	274735457	100% owner of Abatis Hill Top Holding LLC

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
N/A				

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
N/A	

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Richard Radini	17 Terra MAr Drive, Huntington Bay, NY , 11743
Raymond Kwok	747 Third Ave, 2nd Floor, NY, NY, 10017
William Derby	3973 Rupp Road, Manchester, MD 21102

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
N/A				

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
N/A						$
						$
						$
						$
						$
						$
						$
						$
						$
						$

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
N/A				

<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.	
	3/10/2017
Signature	Date
Richard R Radini	
Name (Print or Type)	
Managing Director	
Title	

2700-PM-AQ0021 Rev. 6/2004

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Submit in Triplicate

COMBUSTION UNIT

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application and the General Information Form (GIF) must be included in the submittal

Before completing this form, read the instructions provided with this form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: Hill Top Energy Center, LLC

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: $3,400
- Source requiring approval under NSR: $5,300
- Source requiring the establishment of a MACT limitation: .... $________
- Source requiring approval under PSD: $22,700

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

General Information Form (GIF)

Combustion Unit Plan Approval Application

Compliance Review Form or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: __________

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, **Richard R. Radini**, 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): __________ Date: 3/10/2017

Name (Print): Richard R. Radini Title: Managing Director

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 - Combustion Unit Information

1. Combustion Units: ☐ Coal ☐ Oil ☒ Natural Gas Other: ______________________

Description: 42 MMBtu/hr auxiliary boiler

Manufacturer TBD	Model No. TBD		Number of units 1
Maximum heat input (Btu/hr) 42,000,000	Rated heat input (Btu/hr) 42,000,000	Typical heat input (Btu/hr)	Furnace Volume
Grate Area (if applicable) NA		Method of firing NA	

Indicate how combustion air is supplied to boiler
NA

Indicate the Steam Usage:

Mark and describe soot Cleaning Method:

i. Air Blown
ii. Steam Blown
iii. Brushed and Vacuumed
iv. Other ___________
v. Frequency of Cleaning ______________________

Maximum Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions taken or requested, if any (e.g., bottlenecks or voluntary restrictions to limit potential to emit)

Capacity (specify units)

Per hour	Per day	Per week	Per year
42 MMBtu/hr	1,008 MMBtu/day	7,056 MMBtu/week	367,920 MMBtu/yr

Typical Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months): If variations exist, describe them.

Operating using primary fuel: ____________________ From ______________ to ______________
Operating using secondary fuel: ____________________ Form ______________ to ______________
Non-operating: From ____________________ to ______________

2. Specify the primary, secondary and startup fuel. Furnish the details in item 3.
natural gas

Section B - Combustion Unit Information (Continued)

3. Fuel

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
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	40,856 SCFH	X 10^6 Gal	gr/100 SCF		1028 Btu/SCF
Gas (other)	SCFH	X 10^6 Gal	gr/100 SCF		Btu/SCF
Coal					
Other*					

***** Note: Describe and furnish information separately for other fuels in Addendum B.

4. Burner

Manufacturer TBD	Model Number TBD	Type of Atomization (Steam, air, press, mech., rotary cup) NA
Number of Burners NA	Maximum fuel firing rate (all burners)	Normal fuel firing rate

If oil, temperature and viscosity.

Maximum theoretical air requirement

Percent excess air 100% rating

Turndown ratio

Combustion modulation control (on/off, low-high fire, full automatic, manual). Describe.

Main burner flame ignition method (electric spark, auto gas pilot, hand-held torch, other). Describe.

5. Nitrogen Oxides (NO_x) control Options

Mark and describe the NO_x control options adopted

Low excess air (LEA)	Flue gas recirculation	Other.________________________
Over fire air (OFA)	Burner out of service	
Low-NO_x burner	Reburning	
Low NO_x burners with over fire air	Flue gas treatment (SCR / SNCR)	

Section B - Combustion Unit Information (Continued)

6. Miscellaneous Information

Describe fly ash reinjection operation
NA

Describe, in detail, the equipment provided to monitor and to record the source(s) operating conditions, which may affect emissions of air contaminants. Show that they are reasonable and adequate.

Fuel Flow Monitor

Describe each proposed modification to an existing source.

NA

Describe how emissions will be minimized especially during start up, shut down, combustion upsets and/or disruptions. Provide emission estimates for start up, shut down and upset conditions. Provide duration of start up and shut down.

Emissions will be minimized during startup/shutdown by following manufacturer's procedures for such operations.

Describe in detail with a schematic diagram of the control options adopted for SO_2 (if applicable).
NA

Anticipated milestones:

Expected commencement date of construction/reconstruction: 4th Qtr 2017
Expected completion date of construction/reconstruction: 1st Qtr 2020
Anticipated date(s) of start-up: 1st Qtr 2020

Section C - Air Cleaning Device

1. Precontrol Emissions*

Emission Rate

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	0.00739 lb/MMBtu	0.31	8760	1.36	AP-42
PM_{10}	0.00739 lb/MMBtu	0.31	8760	1.36	AP-42
SOx	0.0012 lb/MMBtu	0.05	8760	0.21	AP-42
CO	0.037 lb/MMBtu	1.55	8760	6.81	Vendor Data
NO_x	0.0108 lb/MMBtu	0.45	8760	1.99	BACT
VOC	0.003 lb/MMBtu	0.13	8760	0.55	BACT
Others: (e.g., HAPs)	-----	-----	-----		-----

* 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. See Technical Document

2. Gas Conditioning

Water quenching ☐ YES ☒ NO Water injection rate ______________GPM

Radiation and convection cooling ☐ YES ☒ NO

Air dilution ☐ YES ☒ NO

If YES, _________________ CFM

Forced draft ☐ YES ☒ NO

Water cooled duct work ☐ YES ☒ NO

Other ____

Inlet volume

_______________________ ACFM@ __________ °F

Outlet volume

___________ ACFM@ ______ °F ________ % Moisture

Describe the system in detail.

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

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards

		YES	NO
a.	Prevention of Significant Deterioration permit (PSD), 40 CFR Part 52?	☒ YES	☐ NO
b.	New Source Review, 25 Pa. Code Chapter 127, Subchapter E?	☐ YES	☒ NO
c.	New Source Performance Standards, 40 CFR Part 60? (If Yes, which subpart) Db	☒ YES	☐ NO
d.	National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61? If Yes, which subpart) ______	☐ YES	☒ NO
e.	Maximum Achievable Control Technology (MACT), 40 CFR Part 63? (If Yes, which subpart) ______	☐ YES	☒ NO

Attach a demonstration showing that the emissions from any new source will be the minimum attainable through the use of best available technology (BAT).

See Technical Support Document

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last 5 years for applicable PSD pollutant(s) if the facility is an existing major facility (for PSD purposes)

See Technical Support Document

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 date in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from the 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 Emission increases in potential to emit (tpy)	VOCs Creditable emission decreases in actual emissions (tpy)	NOx Emission increases in potential to emit (tpy)	NOx Creditable emission decreases in actual emissions (tpy)
			See Technical Spport Document				

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. NA

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be implemented (if applicable). NA

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). NA

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of 25 Pa. Code Article III and applicable requirements of the Clean Air Act and regulations adopted there under. The Department may request additional information to evaluate the application such as a stand by plan, a plan for air pollution emergencies, air quality modeling, etc.

See technical support document

Section F - Flue and Air Contaminant Emission

1. Estimated Maximum Emissions*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	0.00739 lb/MMBtu	0.31	1.36	AP-42
PM_{10}	0.00739 lb/MMBtu	0.31	1.36	AP-42
SO_x	0.0012 lb/MMBtu	0.05	0.21	AP-42
CO	0.037 lb/MMBtu	1.55	6.81	Vendor Data
NO_x	0.0108 lb/MMBtu	0.454	1.99	BACT
VOC	0.003 lb/MMBtu	0.13	0.55	BACT
Others: (e.g., HAPs)	-----	-----	-----	-----

* 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 AB1

List Source(s) or source ID exhausted to this stack: Auxiliary Boiler

% of flow exhausted to stack: 100

Stack height above grade (ft.) 220
Grade elevation (ft.) 1122

Stack diameter (ft) or Outlet duct area (sq. ft.) 3.33

Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

See Modeling Files - Appendix G

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.

Location of Stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	39	53	34.9	79	55	51

Stack Exhaust

Volume 14,259 ACFM Temperature 480 °F Moisture ______%

Exhauster (attach fan curves) ________ in. of water ________ HP @ ________RPM.

** If the datum and collection method information and codes differ from those provided on the General Information Form - Authorization Application, provide the additional required by that form on a separate sheet.

Section G - Attachments

Number and list all attachments submitted with this application below:

Technical Support Document

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
One (1) Natural Gas combined cycle turbine with Heat Recovery Steam Generator (HRSG) and duct burners.

Manufacturer General Electric International, Inc.	Model No. GE 7HA.02	Number of Sources 1
Source Designation	Maximum Capacity 4,490,000,000 Btu/hr	Rated Capacity 4,490,000,000 Btu/hr
Type of Material Processed		

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
4,490 MMBtu/hr	107,760 MMBtu/day	754,320 MMBtu/week	39,332,400 MMBtu/yr

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

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	4,367,704 SCFH	X 10^6 SCF	2.0 grain/100 SCF		1028 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

Manufacturer	Type and Model No.	Number of Burners
General Electric International, Inc.	GE 7HA.02	TBD

Description:
One (1) combined cycle turbine with Heat Recovery Steam Generator (HRSG) and duct burners.

Rated Capacity	Maximum Capacity
4,490,000,000 Btu/hr	4,490,000,000 Btu/hrr

4. Process Storage Vessels

A. For Liquids:

Name of material stored

Tank I.D. No.	Manufacturer	Date Installed

Maximum Pressure	Capacity (gallons/Meter^3)

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)

Type of Roof: Describe:

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):

B. For Solids

Type: ☐ Silo ☐ Storage Bin ☐ Other, Describe	Name of Material Stored

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed

State whether the material will be stored in loose or bags in silos	Capacity (Tons)
Turn over per year in tons	Turn over per day in tons

Describe fugitive dust control system for loading and handling operations

Describe material handling system

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.

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.

CEMS - NOx, CO, O2, Fuel Flow Monitor

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.
NA

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

Startups will be performed per manufacturer recommendations. SCR NH3 injection will be brought online as soon as proper temperature is reached in HRSG.

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: 4th Qtr 2017
ii. Expected completion date of construction/reconstruction/installation: 1st Qtr 2020
iii. Anticipated date of start-up: 1st Qtr 2020

Section C - Air Cleaning Device

1. Precontrol Emissions*

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM					
PM_{10}					
SO_x					
CO					
NO_x					
VOC					
Others: (e.g., HAPs)	-----	-----	-----	-----	-----

* 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. Gas Cooling

Water quenching ☐ Yes ☒ No Water injection rate ______________ GPM

Radiation and convection cooling ☐ Yes ☒ No

Air dilution ☐ Yes ☒ No
If yes, ___________CFM

Forced Draft ☐ Yes ☒ No

Water cooled duct work ☐ Yes ☒ No

Other

Inlet Volume ________________ACFM
@ ________°F _________% Moisture

Outlet Volume _______________ACFM
@ ________°F _________% Moisture

Describe the system in detail.

The unit will be equipped with an SCR system to control NOx emissions and a CO catalyst to control CO emissions.

Section C - Air Cleaning Device (Continued)

10. ☒ **Selective Catalytic Reduction (SCR)**
☐ **Selective Non-Catalytic Reduction (SNCR)**
☐ **Non-Selective Catalytic Reduction (NSCR)**

Equipment Specifications

Manufacturer	Type	Model No.
TBD	TBD	

Design Inlet Volume (SCFM)	Design operating temperature (°F)
TBD	

Is the system equipped with process controls for proper mixing/control of the reducing agent in gas stream? If yes, give details.
YES

Attach efficiency and other pertinent information (e.g., ammonia slip)
SCR will reduce NOx emissions to 2.0 ppm with and without duct firing. Ammonia Slip will be limited to 5.0 ppm.

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
19% aqueous ammonia	

State expected range of usage rate and concentration.

Service life of catalyst	Ammonia slip (ppm)
	5

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.

The unit will be equipped with a NOx CEM to ensure NOx emission limitations are being met.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
NOx		2 ppmvd	up to 92%

Section C - Air Cleaning Device (Continued)

11. Oxidizer/Afterburners

Equipment Specifications

Manufacturer TBD	Type ☐ Thermal ☒ Catalytic	Model No.
Design Inlet Volume (SCFM)	Combustion chamber dimensions (length, cross-sectional area, effective chamber volume, etc.)	

Describe design features, which will ensure mixing in combustion chamber.

Describe method of preheating incoming gases (if applicable).	Describe heat exchanger system used for heat recovery (if applicable).

Catalyst used	Life of catalyst	Expected temperature rise across catalyst (°F)	Dimensions of bed (in inches). Height: ___________________ Diameter or Width: _________ Depth: ___________________

Are temperature sensing devices being provided to measure the temperature rise across the catalyst? ☐ Yes ☐ No
If yes, describe.

Describe any temperature sensing and/or recording devices (including specific location of temperature probe in a drawing or sketch.

Burner Information

Burner Manufacturer	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) _________ @ ________°F	Outlet flow rate (ACFM) _____________@ ___________°F
State pressure drop range across catalytic bed (in. of water).	Describe the method adopted for regeneration or disposal of the used catalyst.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
CO		2.0 ppmvd	up to 73%

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
SCR	TBD	TBD	TBD	TBD
Oxidation Catalyst	TBD	TBD	TBD	TBD

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.

NA

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

Vendor for control equipment have not been selected. Once selected manufacturer's data will be provided

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

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.

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

		YES	NO
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) KKKK - Stationary Gas Turbine	☒ 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 part) ________	☐ 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).

See technical support document

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).

See technical support document

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: Emission increases in potential to emit (tpy)	VOCs: Creditable emission decreases in actual emissions (tpy)	NOx: Emission increases in potential to emit (tpy)	NOx: Creditable emission decreases in actual emissions (tpy)
			See Technical Support Document				

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. NA

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable). NA

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). NA

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. See technical support document

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions*

Pollutant	Maximum emission rate specify units	lbs/hr	tons/yr.	Calculation/ Estimation Method
PM				
PM_{10}				
SO_x				
CO				
NO_x				
VOC		See Technical Support Document		
Others: (e.g., HAPs)	-----	-----	-----	-----

* 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 CT1

List Source(s) or source ID exhausted to this stack: combustion turbine/duct burner

% of flow exhausted to stack: 100

Stack height above grade (ft.) 220
Grade elevation (ft.) 1122

Stack diameter (ft) or Outlet duct area (sq. ft.) 23 ft.

f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
See Modeling Files - Appendix G

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.

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	39	53	34.9	79	55	51

Stack exhaust
Volume Varies ACFM Temperature Varies °F Moisture ______ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.

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:

Technical Support Document

Section B - Combustion Unit Information

1. Combustion Units: ☐ Coal ☐ Oil ☒ Natural Gas Other: ____________________

Description: 6.4 MMBtu/hr fuel gas heater

Manufacturer TBD	Model No. TBD		Number of units 1
Maximum heat input (Btu/hr) 6,400,000	Rated heat input (Btu/hr) 6,400,000	Typical heat input (Btu/hr)	Furnace Volume
Grate Area (if applicable) NA		Method of firing NA	

Indicate how combustion air is supplied to boiler
NA

Indicate the Steam Usage:

Mark and describe soot Cleaning Method:

i. Air Blown
ii. Steam Blown
iii. Brushed and Vacuumed
iv. Other ____________
v. Frequency of Cleaning ____________________

Maximum Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Operational restrictions taken or requested, if any (e.g., bottlenecks or voluntary restrictions to limit potential to emit)

Capacity (specify units)

Per hour	Per day	Per week	Per year
6.4 MMBtu/hr	153.6 MMBtu/day	1075.2 MMBtu/week	56,064 MMBtu/yr

Typical Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	7	365	8760

Seasonal variations (Months): If variations exist, describe them.

Operating using primary fuel: ____________________ From ______________ to ______________
Operating using secondary fuel: ____________________ Form ______________ to ______________
Non-operating: From ______________ to ______________

2. Specify the primary, secondary and startup fuel. Furnish the details in item 3.
natural gas

Section B - Combustion Unit Information (Continued)

3. Fuel

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
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	6,226 SCFH	X 10^6 Gal	gr/100 SCF		1028 Btu/SCF
Gas (other)	SCFH	X 10^6 Gal	gr/100 SCF		Btu/SCF
Coal					
Other*					

***** Note: Describe and furnish information separately for other fuels in Addendum B.

4. Burner

Manufacturer	Model Number	Type of Atomization (Steam, air, press, mech., rotary cup)
TBD	TBD	NA

Number of Burners	Maximum fuel firing rate (all burners)	Normal fuel firing rate
NA		

If oil, temperature and viscosity.

Maximum theoretical air requirement

Percent excess air 100% rating

Turndown ratio

Combustion modulation control (on/off, low-high fire, full automatic, manual). Describe.

Main burner flame ignition method (electric spark, auto gas pilot, hand-held torch, other). Describe.

5. Nitrogen Oxides (NO_x) control Options

Mark and describe the NO_x control options adopted

Low excess air (LEA)	Flue gas recirculation	Other.________________________
Over fire air (OFA)	Burner out of service	
Low-NO_x burner	Reburning	
Low NO_x burners with over fire air	Flue gas treatment (SCR / SNCR)	

Section B - Combustion Unit Information (Continued)

6. Miscellaneous Information

Describe fly ash reinjection operation
NA

Describe, in detail, the equipment provided to monitor and to record the source(s) operating conditions, which may affect emissions of air contaminants. Show that they are reasonable and adequate.

Fuel Flow Monitor

Describe each proposed modification to an existing source.

NA

Describe how emissions will be minimized especially during start up, shut down, combustion upsets and/or disruptions. Provide emission estimates for start up, shut down and upset conditions. Provide duration of start up and shut down.

Emissions will be minimized during startup/shutdown by following manufacturer's procedures for such operations.

Describe in detail with a schematic diagram of the control options adopted for SO_2 (if applicable).
NA

Anticipated milestones:

Expected commencement date of construction/reconstruction: 4th Qtr 2017
Expected completion date of construction/reconstruction: 1st Qtr 2020
Anticipated date(s) of start-up: 1st Qtr 2020

Section C - Air Cleaning Device

1. Precontrol Emissions*

Emission Rate

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	0.00739 lb/MMBtu	0.05	8760	0.21	AP-42
PM_{10}	0.00739 lb/MMBtu	0.05	8760	0.21	AP-42
SOx	0.0012 lb/MMBtu	0.01	8760	0.03	AP-42
CO	0.037 lb/MMBtu	0.24	8760	1.04	Vendor Data
NO_x	0.011lb/MMBtu	0.07	8760	0.31	Vendor Data
VOC	0.00535 lb/MMBtu	0.03	8760	0.15	AP-42
Others: (e.g., HAPs)	-----	-----	-----		-----

* 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. See Technical Document

2. Gas Conditioning

Water quenching ☐ YES ☒ NO Water injection rate ____________GPM

Radiation and convection cooling ☐ YES ☒ NO

Air dilution ☐ YES ☒ NO

If YES, _______________ CFM

Forced draft ☐ YES ☒ NO

Water cooled duct work ☐ YES ☒ NO

Other ____

Inlet volume

____________________ ACFM@ _________ °F

Outlet volume

__________ ACFM@ _____ °F _______ % Moisture

Describe the system in detail.

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

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 Part 52? ☒ YES ☐ NO

b. New Source Review, 25 Pa. Code Chapter 127, Subchapter E? ☐ YES ☒ NO

c. New Source Performance Standards, 40 CFR Part 60? ☐ YES ☒ NO
(If Yes, which subpart) ______________________________

d. National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61? ☐ YES ☒ NO
If Yes, which subpart) ______________________________

e. Maximum Achievable Control Technology (MACT), 40 CFR Part 63? ☐ YES ☒ NO
(If Yes, which subpart) ______________________________

Attach a demonstration showing that the emissions from any new source will be the minimum attainable through the use of best available technology (BAT).

See Technical Support Document

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last 5 years for applicable PSD pollutant(s) if the facility is an existing major facility (for PSD purposes)

See Technical Support Document

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 date in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from the 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)
			See Technical Support Document				

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. NA

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be implemented (if applicable). NA

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). NA

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of 25 Pa. Code Article III and applicable requirements of the Clean Air Act and regulations adopted there under. The Department may request additional information to evaluate the application such as a stand by plan, a plan for air pollution emergencies, air quality modeling, etc.

Section F - Flue and Air Contaminant Emission

1. Estimated Maximum Emissions*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	0.00739 lb/MMBtu	0.05	0.21	AP-42
PM_{10}	0.00739 lb/MMBtu	0.05	0.21	AP-42
SO_x	0.0012 lb/MMBtu	0.01	0.03	AP-42
CO	0.037 lb/MMBtu	0.24	1.04	Vendor Data
NO_x	0.011 lb/MMBtu	0.07	0.31	Vendor Data
VOC	0.00535 lb/MMBtu	0.03	0.15	AP-42
Others: (e.g., HAPs)	-----	-----	-----	-----

* 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 FGH1

List Source(s) or source ID exhausted to this stack:
Fuel Gas Heater

% of flow exhausted to stack: 100

Stack height above grade (ft.) 20
Grade elevation (ft.) 1122

Stack diameter (ft) or Outlet duct area (sq. ft.)
2.5

Weather Cap
☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
See Modeling FIles - Appendix G

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.

Location of Stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	39	53	33	79	55	53.9

Stack Exhaust

Volume 4,659 ACFM Temperature 925 °F Moisture ____________%

Exhauster (attach fan curves) ________________ in. of water ____________________ HP @ ______________RPM.

** If the datum and collection method information and codes differ from those provided on the General Information Form - Authorization Application, provide the additional required by that form on a separate sheet.

Section G - Attachments

Number and list all attachments submitted with this application below:

Technical Support Document

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
One (1) Ultra Low Sulfur Diesel (ULSD) 2.95 MMBtu/hr, 422 hp diesel engine powered fire water pump

Manufacturer	Model No.	Number of Sources
TBD	TBD	1
Source Designation	Maximum Capacity 2,950,000 Btu/hr	Rated Capacity 2,950,000 Btu/hr

Type of Material Processed

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
			100

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
2.95 MMBtu/hr	2.95 MMBtu/day	2.95 MMBtu/hr	295 MMBtu/yr

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
1	1	52	100

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number 2	GPH @ 60°F	X 10^3 Gal	0.0015% by wt	NA	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	SCFH	X 10^6 SCF	grain/100 SCF		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

Manufacturer	Type and Model No.	Number of Burners
TBD	TBD	NA

Description:
One (1) Ultra Low Sulfur Diesel (ULSD) 2.95 MMBtu/hr, 422 hp diesel engine powered fire water pump

Rated Capacity	Maximum Capacity
2,950,000 Btu/hr	2,950,000 Btu/hr

4. Process Storage Vessels

A. For Liquids:

Name of material stored

Tank I.D. No.	Manufacturer	Date Installed

Maximum Pressure	Capacity (gallons/Meter^3)

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)

Type of Roof: Describe:

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):

B. For Solids

Type: ☐ Silo ☐ Storage Bin ☐ Other, Describe	Name of Material Stored

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed

State whether the material will be stored in loose or bags in silos	Capacity (Tons)
Turn over per year in tons	Turn over per day in tons

Describe fugitive dust control system for loading and handling operations

Describe material handling system

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.

NA

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.

NA

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.

NA

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

NA

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: 4th Qtr 2017
ii. Expected completion date of construction/reconstruction/installation: 1st Qtr 2020
iii. Anticipated date of start-up: 1st Qtr 2020

Section C - Air Cleaning Device

1. Precontrol Emissions*

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	0.15 g/hp-hr	0.14	100	0.007	NSPS IIII Table 4
PM_{10}	0.15 g/hp-hr	0.14	100	0.007	NSPS IIII Table 4
SO_x	0.00205 lb/hp-hr	0.87	100	0.043	AP-42
CO	2.6 g/hp-hr	2.42	100	0.121	NSPS IIII Table 4
NO_x	2.80 g/hp-hr	2.60	100	0.13	NSPS IIII Table4/EPA420-P-02-016
VOC	0.20 g/hp-hr	0.19	100	0.009	NSPS IIII Table4/EPA420-P-02-016
Others: (e.g., HAPs)	-----	-----	-----	-----	-----

* 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. Gas Cooling

Water quenching ☐ Yes ☒ No Water injection rate ________________ GPM

Radiation and convection cooling ☐ Yes ☒ No	Air dilution ☐ Yes ☒ No If yes, ____________CFM
Forced Draft ☐ Yes ☒ No	Water cooled duct work ☐ Yes ☒ No

Other

Inlet Volume _________________ACFM @ _________°F _________% Moisture	Outlet Volume ________________ACFM @ _________°F _________% Moisture

Describe the system in detail.

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

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? ☒ YES ☐ NO
(If Yes, which subpart) IIII

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? ☒ YES ☐ NO
(If Yes, which part) ZZZZ

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

See Technical Support Document

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).

See Technical Support Document

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)
			See Technical Support Document				

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. NA

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable). NA

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). NA

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. See Technical Support Document

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM	0.15 g/hp-hr	0.14	0.007	NSPS IIII Table 4
PM_{10}	0.15 g/hp-hr	0.14	0.007	NSPS IIII Table 4
SO_x	0.00205 lb/hp-hr	0.87	0.043	AP-42
CO	2.60 g/hp-hr	2.42	0.121	NSPS IIII Table 4
NO_x	2.80 g/hp-hr	2.60	0.13	NSPS IIII Table4/EPA420-P-02-016
VOC	0.20 g/hp-hr	0.19	0.009	NSPS IIII Table4/EPA420-P-02-016
Others: (e.g., HAPs)	-----	-----	-----	-----

* 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 FWP1

List Source(s) or source ID exhausted to this stack:
Fire water pump

% of flow exhausted to stack: 100

Stack height above grade (ft.) 15
Grade elevation (ft.) 1122

Stack diameter (ft) or Outlet duct area (sq. ft.)
0.5

f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
See Modeling Files - Appendix G

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.

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	39	53	36	79	55	49.9

Stack exhaust
Volume 2,048 ACFM   Temperature 891 °F   Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.

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:

Technical Support Document

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
One (1) Ultra Low Sulfur Diesel (ULSD) 18.77 MMBtu/hr, 2682 hp diesel engine powered emergency generator

Manufacturer TBD	Model No. TBD	Number of Sources 1
Source Designation	Maximum Capacity 18,770,000 Btu/hr	Rated Capacity 18,770,000 Btu/hr

Type of Material Processed

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
			100

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
18.77 MMBtu/hr	18.77 MMBtu/day	18.77 MMBtu/week	1,877 MMBtu/yr

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
1	1	52	100

Seasonal variations (Months) From to

If variations exist, describe them

2. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number 2	GPH @ 60°F	X 10^3 Gal	0.0015% by wt	NA	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	SCFH	X 10^6 SCF	grain/100 SCF		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

Manufacturer	Type and Model No.	Number of Burners
TBD	TBD	NA

Description:

Rated Capacity	Maximum Capacity
18,770,000 Btu/hr	18,770,000 Btu/hr

4. Process Storage Vessels

A. For Liquids:

Name of material stored

Tank I.D. No.	Manufacturer	Date Installed

Maximum Pressure	Capacity (gallons/Meter^3)

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)

Type of Roof: Describe:

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):

B. For Solids

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed

State whether the material will be stored in loose or bags in silos	Capacity (Tons)
Turn over per year in tons	Turn over per day in tons

Describe fugitive dust control system for loading and handling operations

Describe material handling system

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.

NA

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.

NA

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.

NA

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

NA

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: 4th Qtr 2017
ii. Expected completion date of construction/reconstruction/installation: 1st Qtr 2020
iii. Anticipated date of start-up: 1st Qtr 2020

Section C - Air Cleaning Device

1. Precontrol Emissions*

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	0.20 g/kw-hr	0.88	100	0.044	40 CFR 89.112
PM_{10}	0.20 g/kw-hr	0.88	100	0.044	40 CFR 89.112
SO_x	0.00001 lb/hp-hr	0.03	100	0.0016	AP-42
CO	3.50 g/kw-hr	15.43	100	0.77	40 CFR 89.112
NO_x	6.00 g/kw-hr	26.50	100	1.32	40 CFR 89.112/EPA420-P-02-016
VOC	0.40 g/kw-hr	1.80	100	0.088	40 CFR 89.112/EPA420-P-02-016
Others: (e.g., HAPs)	-----	-----	-----	-----	-----

* 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. Gas Cooling

Water quenching ☐ Yes ☒ No Water injection rate ______________ GPM

Radiation and convection cooling ☐ Yes ☒ No

Air dilution ☐ Yes ☒ No
If yes, ___________CFM

Forced Draft ☐ Yes ☒ No

Water cooled duct work ☐ Yes ☒ No

Other

Inlet Volume ________________ACFM
@ ________°F _________% Moisture

Outlet Volume _______________ACFM
@ ________°F _________% Moisture

Describe the system in detail.

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

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) IIII	☒ 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 part) 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).

See Technical Support Document

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).

See Technical Support Document

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)
			See Technical Support Document				

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. NA

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable). NA

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). NA

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. See Technical Support Document

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions*

Pollutant	Maximum emission rate: specify units	lbs/hr	tons/yr.	Calculation/ Estimation Method
PM	0.20 g/kw-hr	0.88	0.044	40 CFR 89.112, Table 1
PM_{10}	0.20 g/kw-hr	0.88	0.044	40 CFR 89.112, Table 1
SO_x	0.00001 lb/hp-hr	0.03	0.0016	AP-42
CO	3.50 g/kw-hr	15.43	0.77	40 CFR 89.112
NO_x	6.00 g/kw-hr	26.50	1.32	40 CFR 89.112/EPA420-P-02-016
VOC	0.40 g/kw-hr	1.80	0.088	40 CFR 89.112/EPA420-P-02-016
Others: (e.g., HAPs)	-----	-----	-----	-----

* 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 GEN1

List Source(s) or source ID exhausted to this stack: Emergency Generator

% of flow exhausted to stack: 100

Stack height above grade (ft.) 20
Grade elevation (ft.) 1122

Stack diameter (ft) or Outlet duct area (sq. ft.) 1

f. Weather Cap ☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

See Modeling Files – Appendix G

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.

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	39	53	31	79	55	51.7

Stack exhaust
Volume 15,293 ACFM   Temperature 752 °F   Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.

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:

Technical Support Document

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Citation Number	Citation Limitation	Limitation Used
PA Code 123.11(a)	PM limited to 0.21 lb/MMBtu	
PA Code 123.41(1)	Opacity <20% not more than 3 mintues in any hour	
PA Code 123.41(2)	Opacity <60% at any time	
PA Code 123.22(a)(1)	SO2: 4 lb/MMBtu (1-hr)	Sulfur in fuel limited to 2.0 gr/100 scf on a short-term basis and 0.4 gr/100scf on an annual basis
40 CFR 60.44b	NOx 0.20 lb/MMBtu	LAER: NOx = 0.0108 lb/MMBtu

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 47-3881930 **Firm Name:** Hill Top Energy Center, LLC

Plant Code: **Plant Name:** Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Auxiliary Boiler

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.11(a)

Compliance Method based upon: ☐ **Applicable Requirement** ☒ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:** Auxiliary Boiler

☒ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.41 (1) & 123.41(2)

Compliance Method based upon: ☐ **Applicable Requirement** ☒ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☐ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None

2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

None

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas
Operate equipment per
manufacturer
specification

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Auxiliary Boiler

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.22(a)(1)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None
2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

None

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Auxiliary Boiler

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 60.44b

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☒ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** Stack Test

2. **Monitoring device location:** in stack

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

NOx, O2

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: Initial performance test

2. Reference Test Method Citation: EPA method 7E or 20

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Excess emission,

Semiannually

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Citation Number	Citation Limitation	Limitation Used
PA Code 123.11(a)	PM limited to 0.1 lb/MMBtu	
PA Code 123.41(1)	Opacity <20% not more than 3 mintues in any hour	
PA Code 123.41(2)	Opacity <60% at any time	
PA Code 123.22(a)(1)	SO2: 4 lb/MMBtu (1-hr period)	Sulfur in fuel limited to 2.0 gr/100 scf on a short-term basis and 0.4 gr/100scf on an annual basis
40 CFR 60.4320	NOx 15 ppmvd @ 15% O2 or 0.43 lb/MWh	LAER: NOx = 2.0 ppmvd @ 15% O2
40 CFR 60.4330	SO2: 0.90 lb/MW-hr output or 0.06 lb/MMBtu heat input	Sulfur in fuel limited to 2.0 gr/100 scf on a short-term basis and 0.4 gr/100scf on an annual basis

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Combustion Turbines/Duct Burners

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.11(a)

Compliance Method based upon: ☐ **Applicable Requirement** ☒ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 47-3881930 **Firm Name:** Hill Top Energy Center, LLC

Plant Code: **Plant Name:** Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Combustion Turbine/Duct burner

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.41 (1) & 123.41(2)

Compliance Method based upon: ☐ **Applicable Requirement** ☒ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☐ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None

2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. **Reference Test Method Description:** None
2. **Reference Test Method Citation:**

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

None

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. **Reporting start date:**

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas
Operate equipment per
manufacturer
specification

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Combustion Turbines/Duct Burners

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.22(a)(1)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

None

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Combustion Turbines/Duct Burners

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 60.4320

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☒ **Monitoring** ☒ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** CEM
2. **Monitoring device location:** in stack

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

NOx, O2

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: Initial performance test

2. Reference Test Method Citation: EPA method 7E or 20

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

NOx, O2 concentrations

recorded continuously

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Excess emissions

Semiannual reporting

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 47-3881930 **Firm Name:** Hill Top Energy Center, LLC

Plant Code: **Plant Name:** Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☒ **A group of sources, Group ID:** Combustion Turbines/Duct Burners

☐ **A single source, Unit ID:**

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 60.4330

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None
2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. **Reference Test Method Description:** ____________________

2. **Reference Test Method Citation:** ____________________

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

Excess emissions

Semiannual reporting

1. **Reporting start date:** ____________________

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Citation Number	Citation Limitation	Limitation Used
PA Code 123.11(a)	PM limited to 0.4 lb/MMBtu	
PA Code 123.41(1)	Opacity <20% not more than 3 mintues in any hour	
PA Code 123.41(2)	Opacity <60% at any time	
PA Code 123.22(a)(1)	SO2: 4.0 lb/MMBtu (1-hr)	Sulfur in fuel limited to 2.0 gr/100 scf on a short-term basis and 0.4 gr/100scf on an annual basis

2700-PM-AQ0018 6/2003
Addendum 1

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Fuel Gas Heater

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.11(a)

Compliance Method based upon: ☐ **Applicable Requirement** ☒ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None

2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Fuel Gas Heater

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.41 (1) & 123.41(2)

Compliance Method based upon: ☐ **Applicable Requirement** ☒ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☐ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None
2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

None

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas
Operate equipment per
manufacturer
specification

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Fuel Gas Heater

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.22(a)(1)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None
2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

None

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Use of natural gas

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Citation Number	Citation Limitation	Limitation Used
PA Code 123.21	No person may permit the emission into the outdoor atmosphere of sulfur oxides from a source in a manner that the concentration of the sulfur oxides, expressed as SO2, in the effluent gas exceeds 500 parts per million, by volume, dry basis	
PA Code 123.41(1)	Opacity <20% not more than 3 minutes in any hour	
PA Code 123.41(2)	Opacity <60% at any time	
40 CFR 60.4205(c) and Table 4	NMHC+NOx limited to 4.0 g/kW-hr PM limited to 0.20 g/kW-hr	
40 CFR 63.6590(c)(1)	A new or reconstructed stationary RICE locaed at an area source; must meet the requirements of this part by meeting the requirments of 40 CFR part 60 subpart IIII, for compression ignition engines. No further requirements apply for such engines under this part.	

COMMONWEALTH OF PENNSYLVANIA
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Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Fire Pump

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.21

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None
2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage,
Sulfur content of fuel,
hours of operation,
manufacturer's
emission guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Fire Pump

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.41(1) & 123.41(2)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage,
hours of operation,
manufacturer's
emission guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Fire Pump

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 60.4205 (c) and Table 4

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Manufacturer's emission
guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 47-3881930 **Firm Name:** Hill Top Energy Center, LLC

Plant Code: **Plant Name:** Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Fire Pump

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 63.6590(c)(1)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Manufacturer's emission
guarantee for NSPS

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

None

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Citation Number	Citation Limitation	Limitation Used
PA Code 123.11	PM limited to 0.4 lb/MMBtu	
PA Code 123.21	No person may permit the emission into the outdoor atmosphere of sulfur oxides from a source in a manner that the concentration of the sulfur oxides, expressed as SO2, in the effluent gas exceeds 500 parts per million, by volume, dry basis	
PA Code 123.41(1)	Opacity <20% not more than 3 minutes in any hour	
PA Code 123.41(2)	Opacity <60% at any time	
40 CFR 60.4202(a)(2) and 60.4205(b)	NMHC+NOx limited to 6.4 g/kW-hr CO limited to 3.5 g/kW-hr PM limited to 0.20 g/kW-hr Opacity limited to 20% during acceleration mode, 15% during lugging mode and 50% during the peaks in either acceleration or lugging modes	
40 CFR 63.6590(c)(1)	A new or reconstructed stationary RICE locaed at an area source; must meet the requirements of this part by meeting the requirments of 40 CFR part 60 subpart IIII, for compression ignition engines. No further requirements apply for such engines under this part.	

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Generator

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.11

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage,
hours of operation,
manufacturer's
emission guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id: 47-3881930 **Firm Name:** Hill Top Energy Center, LLC

Plant Code: **Plant Name:** Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Generator

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.41(1) & 123.41(2)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. Monitoring device type (stack test, CEM, etc.): None

2. Monitoring device location:

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. How will data be reported:

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage,
hours of operation,
manufacturer's
emission guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Generator

☐ **Alternative Scenario, Scenario Name:**

Citation #: PA Code 123.21

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None

2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Fuel Type, Fuel Usage,
Sulfur content of fuel,
hours of operation,
manufacturer's
emission guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Generator

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 60.4202(a)(2) and 60.4205(b)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☒ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None
2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Manufacturer's emission
guarantee

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

Follow manufacturer's
operation and
maintenance
specifications

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum 1
Method Of Compliance Worksheet

SECTION 1. APPLICABLE REQUIREMENT

Federal Tax Id:	47-3881930	**Firm Name:**	Hill Top Energy Center, LLC
Plant Code:		**Plant Name:**	Hill Top Energy Center

Applicable Requirement for: (please check only one box below)

☐ **The entire site**

☐ **A group of sources, Group ID:**

☒ **A single source, Unit ID:** Emergency Diesel Generator

☐ **Alternative Scenario, Scenario Name:**

Citation #: 40 CFR 63.6590(c)(1)

Compliance Method based upon: ☒ **Applicable Requirement** ☐ **Gap Filling Requirement**

Method of Compliance Type: (Check all that applies and complete all appropriate sections below)

☐ **Monitoring** ☐ **Testing** ☐ **Reporting**

☒ **Record Keeping** ☐ **Work Practice Standard**

Section 2: Monitoring

1. **Monitoring device type (stack test, CEM, etc.):** None

2. **Monitoring device location:**

Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

3. **How will data be reported:**

Section 3: Testing

1. Reference Test Method Description: None

2. Reference Test Method Citation:

Section 4: Record Keeping

Describe what parameters will be recorded and the frequency of recording:

Manufacturer's emission
guarantee for NSPS

Section 5: Reporting

Describe what is to be reported and the frequency of reporting:

None

1. Reporting start date:

Section 6: Work Practice Standard

Describe any work practice standards:

None

APPENDIX B

ACT 14 NOTIFICATION LETTERS

Environmental Consulting & Technology, Inc.

Certified Mail
Return Receipt Requested

February 28, 2017

Cumberland Township Supervisors
Cumberland Township
100 Municipal Road
Carmichaels, PA 15320

Re: Proposed Nominal 620 MW CC Power Plant
Hill Top Energy Center, LLC
Cumberland Township, Greene County, Pennsylvania
Notification of Air Permit Application Filing

Dear Sirs:

On behalf of Hill Top Energy Center, LLC (HTEC); ECT is notifying you that HTEC is proposing to develop the Hill Top Energy Center (Project) on a portion of the property formally developed by Wellington Development. The Project will be located on a manmade bluff above the Monongahela River in Greene County, PA, approximately 1.3 km north of the Town of Nemacolin, on a brownfield site originally occupied by the LTV coal mine. Please note, a Plan Approval Application (No. 30-00233A) for the above Project was submitted on September 28, 2015. Based on business developments in the PJM market, HTEC decided to increase the output of the facility from approximately 536 Mws to 620 Mws. Proper authorities at the Pennsylvania Department of Environmental Protection (PADEP) were notified and previously submitted application (No. 30-00233A) was withdrawn on January 19, 2017 and will be replaced with a new Plan Approval Application No.30-00233B for the site.

The Hill Top Energy Center will be a state of the art combined cycle facility generating a nominal 620 MW of power using natural gas exclusively. The plant will consist of a single power block using a General Electric International, Inc. (GE) advanced 7HA.02 combustion turbine (CT) coupled with a heat recovery steam generator (HRSG) and steam turbine (ST). The configuration is one of the most efficient configurations available today to generate electricity. The power island will be equipped with the latest pollution control equipment to minimize emissions. Auxiliary equipment will include a cooling tower that will draw water from the Monongahela River.

6135 Park South
Drive, Suite 510
Charlotte, NC
28210

(704) 749-3134

FAX
(704) 945-7101

Construction is expected to begin in the last quarter of 2017 resulting in commercial operation in the second quarter of 2020.

A Special Use permit (Case # 13-2003) was approved for a power plant by the Cumberland Township Zoning Hearing Board on August 25, 2003. We have confirmed with the Board that the approval is appropriate for the proposed CC power plant.

In accordance with 25 PA Code & 127.43a, HTEC is notifying the County and the Township of HTEC's submission to PADEP of a Plan Approval Application to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device (commonly referred to as an Air Permit Application) on March 10, 2017.

By this application HTEC is asking PADEP approval to install and operate the proposed Hill Top Energy Center discussed above. The proposed air pollution control system will meet all air pollution regulatory requirements including the application of the Best Available Control Technology (BACT) and the Lowest Achievable Emission Rate (LAER) requirements of the PADEP.

Growing Smarter Initiative: Acts 67 and 689, which amend the Municipalities Planning Code (MPC) to promote sound land use practices and planning efforts, direct state agencies to consider comprehensive plans and zoning ordinances under certain conditions as described in Section 619.2 and 1105 of the MPC. Enclosed is a General Information Form (GIF) for the project. As part of the growing smarter initiative the PADEP invites you to review the attached GIF and identify any land use concerns or issues related to this project. If you wish to submit comments for the PADEP to consider, you are encouraged to send them to the PADEP's regional office listed below.

Please submit comments concerning this project within thirty (30) days for the date of receipt of this letter to the PADEPs Southwest Regional Office at the address given below:

Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745
Attention: Air Quality Program – NSR Section

If you have any questions call me at (704) 560-5917.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

William C. Campbell III

William C. Campbell, III; P.E.
Principal Engineer

Enclosure

CC: Richard R Radini
Raymond Kwok
Bill Derby

Environmental Consulting & Technology, Inc.

Certified Mail
Return Receipt Requested

February 28, 2017

Greene County Planning Commission
49 South Washington Street
Waynesburg, PA 15370

Re: Proposed Nominal 620 MW CC Power Plant
Hill Top Energy Center, LLC
Cumberland Township, Greene County, Pennsylvania
Notification of Air Permit Application Filing

Dear Sirs:

On behalf of Hill Top Energy Center, LLC (HTEC); ECT is notifying you that HTEC is proposing to develop the Hill Top Energy Center (Project) on a portion of the property formally developed by Wellington Development. The Project will be located on a manmade bluff above the Monongahela River in Greene County, PA, approximately 1.3 km north of the Town of Nemacolin, on a brownfield site originally occupied by the LTV coal mine. Please note, a Plan Approval Application (No. 30-00233A) for the above Project was submitted on September 28, 2015. Based on business developments in the PJM market, HTEC decided to increase the output of the facility from approximately 536 Mws to 620 Mws. Proper authorities at the Pennsylvania Department of Environmental Protection (PADEP) were notified and previously submitted application (No. 30-00233A) was withdrawn on January 19, 2017 and will be replaced with a new Plan Approval Application No.30-00233B for the site.

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Construction is expected to begin in in the last quarter of 2017 resulting in commercial operation in the second quarter of 2020.

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By this application HTEC is asking PADEP approval to install and operate the proposed Hill Top Energy Center discussed above. The proposed air pollution control system will meet all air pollution regulatory requirements including the application of the Best Available Control Technology (BACT) and the Lowest Achievable Emission Rate (LAER) requirements of the PADEP.

Growing Smarter Initiative: Acts 67 and 689, which amend the Municipalities Planning Code (MPC) to promote sound land use practices and planning efforts, direct state agencies to consider comprehensive plans and zoning ordinances under certain conditions as described in Section 619.2 and 1105 of the MPC. Enclosed is a General Information Form (GIF) for the project. As part of the growing smarter initiative the PADEP invites you to review the attached GIF and identify any land use concerns or issues related to this project. If you wish to submit comments for the PADEP to consider, you are encouraged to send them to the PADEP's regional office listed below.

Please submit comments concerning this project within thirty (30) days for the date of receipt of this letter to the PADEPs Southwest Regional Office at the address given below:

Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745
Attention: Air Quality Program – NSR Section

If you have any questions call me at (704) 560-5917.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

William C. Campbell III

William C. Campbell, III; P.E.
Principal Engineer

Enclosure

CC: Richard R Radini
Raymond Kwok
Bill Derby

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#**	1092053
Facility ID#			

DEP USE ONLY
Date Received & General Notes

CLIENT INFORMATION

DEP Client ID#	**Client Type / Code** LLC			
Organization Name or Registered Fictitious Name		**Employer ID#** (EIN)	**Dun & Bradstreet ID#**	
Hill Top Energy Center, LLC		473881930		
Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**
Radini	Richard	R		
Additional Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**
Kwok	Raymond	YM		091843700
Mailing Address Line 1		**Mailing Address Line 2**		
17 Terra Mar Drive				
Address Last Line – City	**State**	**ZIP+4**	**Country**	
Huntington Bay	NY	11743	USA	
Client Contact Last Name	**First Name**	**MI**	**Suffix**	
Radini	Richard	R		
Client Contact Title		**Phone**	**Ext**	
Managing Director		(516)3538702		
Email Address		**FAX**		
rradini@abatisprojects.com				

SITE INFORMATION

DEP Site ID#	**Site Name** Old LTV Steel Nemacolin Coal Mine, Mile Marker 76.5, 1.3 km NE of Nemacolin, PA					
EPA ID#	**Estimated Number of Employees to be Present at Site** 25					
Description of Site						
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**	
Greene	Cumberland	☐	☐	☒		
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**	
		☐	☐	☐		
Site Location Line 1		**Site Location Line 2**				
Undeveloped at this time						
Site Location Last Line – City		**State**	**ZIP+4**			
Nemacolin		PA	15351			

Detailed Written Directions to Site
Directions from Pittsburgh: Rte 79 South; Rte 21 East: Go 13 miles on Rte 21 and take a left onto Rte 88 heading North. Go 0.7 miles and take a right onto SR 1027 and follow it into Nemacolin. The old enterance to the LTV Mine property is on the Southeast corner of Nemacolin and is gated.

Site Contact Last Name	**First Name**	**MI**	**Suffix**
Radini	Richard	R	
Site Contact Title	**Site Contact Firm**		
Managing Director	Hill Top Energy Center LLC		
Mailing Address Line 1	**Mailing Address Line 2**		
17 Terra Mar Drive			

Mailing Address Last Line – City	State	ZIP+4
Huntington Bay	NY	11743

Phone	Ext	FAX	Email Address
(516)3538702			rradini@abatisprojects.com

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
221-Utilities

Client to Site Relationship
OWNOP

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
Main Stack	39	53	**34**	79	55	**51**

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 1122 --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	5/14/04	
Source Map Scale Number	Inch(es) = Feet	
--or--	Centimeter(s) = Meters	

PROJECT INFORMATION

Project Name
Hill Top Energy Center

Project Description
Development of a nominal 620 MW combined cycle 1 x 1 gas fired power plant.

Project Consultant Last Name	First Name	MI	Suffix
Campbell	William	C	III

Project Consultant Title	Consulting Firm
Principal Engineer	ECT

Mailing Address Line 1	Mailing Address Line 2
6135 Park South Drive, Suite 510	

Address Last Line – City			State	ZIP+4
Charlotte			NC	28210
Phone	**Ext**	**FAX**	**Email Address**	
(704) 749 3134			wcampbell@ectinc.com	

Time Schedules	**Project Milestone (Optional)**
4 th Qtr 2017	Start of Construction
1 st Qtr 2020	**Commercial Operation**

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?** **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: ____________	☐ Yes	☒ No
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)** **Note:** If "No" to Question 3, <u>the application is not subject to the Land Use Policy</u>. 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.	☒ Yes	☐ No

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?** **Note:** If the Applicant answers "No" to either Questions 1, 2 <u>or</u> 3, <u>the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below</u>. If the Applicant answers "Yes" to questions 1, 2 <u>and</u> 3, the Applicant should respond to questions 4 and 5 below.	☒ Yes	☐ No
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
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** 167	☒	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.**	☒	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.	☐	Yes	☒	No
	14.0.1 Number of Persons Served				
	14.0.2 Number of Employee/Guests				
	14.0.3 Number of Connections				
	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** The Municipal Authority of The Borough of Carmichaels	☒	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. **<u>Note</u>:** 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. **<u>Note</u>:** 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.	☒ Yes	☐ No
	22.0.1 **Enter all substances & capacity of each; separate each set with semicolons.** Sodium Hypochlorite, 5,000 gallons; Sulfuric Acid, 5,000 gallons; Emergency Diesel Gen. Fuel Tank, 3,000 gallons.		
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.** 1. Service Water / Fire Water Tank, 6,000,000 gallons 2. Demineralized Water Tank, 350,000 gallons 3. 19wt% Aqueous Ammonia 31,000 gallons		
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 Richard R Radini

Signature	Managing Director **Title**	3/3/2017 **Date**

CUMBERLAND TOWNSHIP
ZONING/CODE ENFORCEMENT
100 MUNICIPAL ROAD
CARMICHAELS, PA 15320
724-966-8980

February 24, 2016

Mr. Raymond Kwok
Managing Director
Abatis Advisers LLC
747 Third Ave., 2nd Floor
New York, NY 10017

RE: Zoning Status Tax Parcels 05-07-105 & 107

Dear Mr. Kwok:

On August 25, 2003, the Zoning Hearing Board of Cumberland Township granted a special exception to Mather Recovery Systems, LLC and Wellington Development for the operation of a waste coal fired power plant on the above referenced parcels of land, located near the village of Nemacolin, in the Township.

Air Quality permits were secured, but construction of the plant did not take place. Representatives from Wellington Development have inquired about the status of the land in relation to the zoning regulations in our township.

After consulting with the solicitor for the Zoning Hearing Board and careful review of the transcript from the hearing held in2003, it has been determined that no additional zoning hearings will be required should plans proceed to construct a gas fired power plant at this location. The special exception has already been granted. All necessary permitting from relevant regulatory agencies will, of course, also be required prior to granting a permit to construct the facility.

Please feel free to contact me if you have additional questions or require more information regarding the requirements for project construction and completion. I can be reached at the Zoning Office via telephone at 724-966-8980 or by email at annbargerstock@gmail.com. I look forward to working with your development team.

Sincerely yours,

Ann Bargerstock

Ann Bargerstock
Zoning/Code Enforcement Officer

THE MUNICIPAL AUTHORITY OF THE BOROUGH OF CARMICHAELS
104 N. PINE ST.
CARMICHAELS, PA 15320

Phone (724)966-2250 *Fax (724)966-2261*

July 18, 2016

Raymond Kwok
Gas fired power plant-Hilltop Energy Center, LLC

Attn: William Campbell, ECT,Corp.

As stated in the Email on 7/18/16 the Municipal Authority of Carmichaels can provide water service to your development.

If we can be of further assistance please call.

Thank You,

The Municipal Authority of
The Borough of Carmichaels

Lloyd A. Richard, Jr., Manager

LARj:gcb

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CARMICHAELS, PA 15320

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City, State, ZIP+4® Waynesburg, PA 15370

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

APPENDIX C

EMISSIONS CALCULATIONS

Table C-1: Hill Top Energy Center - Model Enveloping Emissions

		BASE														
		Evap ON and Duct ON					Evap ON/Duct OFF		Evap OFF/Duct ON							
CASE #		15	8	14	13	7	4	3	12	6	11	10	9	5	2	1
GT Load	%	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base	Base
Ambient Dry Bulb Temperature	°F	101	101	90	59	59	101	59	101	101	90	59	0	0	101	0
Relative Humidity	%	31.2	31.2	60	60	60	31.2	60	31.2	31.2	60	60	35	35	31.2	35
Inlet Conditioning	Evaporative Cooler On/Off	On	On	On	On	On	On	On	Off	Off	Off	Off	Off	Off	Off	Off
HRSG Duct Burner Status	Fired/Unfired	Fired	Fired	Fired	Fired	Fired	Unfired	Unfired	Fired	Fired	Fired	Fired	Fired	Fired	Unfired	Unfired
Stack Parameters																
Height	Ft	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Diameter	Ft	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
CC Exhaust Gas Temperature	°F	161.57	176.28	162.17	161.77	172.96	178.98	175.04	158.60	171.63	165.78	161.35	156.65	170.02	174.48	172.71
CC Exhaust velocity	fps	65.90	66.68	65.85	67.63	68.33	66.88	68.25	59.64	60.25	64.12	67.59	68.29	69.23	60.44	69.22
Emissions with 10% margin																
NOx (abated)	lb/hr	34.76	27.28	34.76	33.55	28.6	26.51	27.61	30.91	24.75	30.69	33.55	34.1	28.82	23.87	27.94
CO (abated)	lb/hr	21.12	16.61	21.12	20.35	17.38	16.17	16.83	18.81	15.18	18.70	20.46	20.68	17.60	14.52	16.94
VOC (abated)	lb/hr	12.10	9.49	12.10	11.66	9.93	4.61	4.81	10.76	8.60	10.68	11.66	11.88	10.03	4.16	4.85
SO_2 - LT 0.4 gr/100 scf	lb/hr	5.40	4.29	5.39	5.22	4.48	4.16	4.35	4.81	3.89	4.79	5.23	5.31	4.53	3.76	4.39
SO_2 - ST 2.0 gr/100 scf	lb/hr	26.98	21.44	26.97	26.11	22.42	20.82	21.75	24.03	19.43	23.94	26.15	26.53	22.64	18.81	21.96
Primary PM /$PM_{2.5}$ - LT 0.4 gr/100 scf	lb/hr	24.42	23.54	24.42	21.34	23.65	12.65	12.76	22.33	23.32	20.57	21.45	21.56	23.65	12.43	12.87
Primary PM /$PM_{2.5}$ - ST 2.0 gr/100 scf	lb/hr	34.19	32.96	34.19	29.88	33.11	17.71	17.86	31.26	32.65	28.80	30.03	30.18	33.11	17.40	18.02
Primary and Secondary $PM_{2.5}$ - LT 0.4 gr/100 scf	lb/hr	24.74	23.85	24.74	21.62	23.96	12.81	12.93	22.62	23.62	20.84	21.73	21.84	23.96	12.59	13.04
Primary and Secondary $PM_{2.5}$ - ST 2.0 gr/100 scf	lb/hr	34.63	33.38	34.63	30.26	33.54	17.94	18.10	31.67	33.07	29.17	30.42	30.58	33.54	17.63	18.25
H_2SO_4 0.4 gr/100 scf	lb/hr	3.04	2.42	3.04	2.95	2.53	2.35	2.45	2.71	2.19	2.70	2.95	2.99	2.55	2.12	2.48
H_2SO_4 2.0 gr/100 scf	lb/hr	15.21	12.09	15.21	14.73	12.64	11.74	12.27	13.55	10.95	13.50	14.74	14.96	12.77	10.61	12.38
Ammonia Slip (NH_3)	lb/hr	32.12	25.19	32.12	31.02	26.40	24.42	25.52	28.60	22.88	28.38	31.02	31.46	26.62	22.11	25.74
CO_2	lb/hr	557700	438900	557700	537900	459800	426800	445500	496100	398200	493900	539000	546700	464200	385000	449900
Formaldehyde	lb/hr	1.73	1.30	1.73	1.64	1.36	1.25	1.31	1.53	1.18	1.51	1.65	1.67	1.37	1.13	1.32

		75 % Load											Low Load			
		Evap OFF and Duct OFF														
CASE #		30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
GT Load	%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	40%	30%	30%	40%
Ambient Dry Bulb Temperature	°F	101	95	90	80	70	59	51	40	30	20	1	101	59	20	1
Relative Humidity	%	31.2	60	60	60	60	60	60	60	60	35	35	31.2	60	35	35
Inlet Conditioning	Evaporative Cooler On/Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
HRSG Duct Burner Status	Fired/Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired
Stack Parameters																
Height	Ft	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Diameter	Ft	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
CC Exhaust Gas Temperature	°F	170.71	173.11	172.01	170.01	168.39	167.14	166.74	166.04	167.02	167.60	168.39	167.18	158.86	161.58	167.72
CC Exhaust velocity	fps	49.18	50.69	51.13	51.62	52.05	52.46	52.88	53.28	53.77	54.29	54.96	36.56	33.76	35.41	41.81
Emissions with 10% margin																
NOx (abated)	lb/hr	18.92	19.69	20.02	20.57	21.01	21.45	21.56	21.67	21.78	22	22.11	12.54	11.99	12.43	14.63
CO (abated)	lb/hr	11.55	11.99	12.21	12.54	12.76	12.98	13.09	13.20	13.31	13.31	13.53	7.63	7.27	7.55	8.90
VOC (abated)	lb/hr	3.29	3.42	3.49	3.58	3.65	3.73	3.75	3.77	3.80	3.82	3.85	2.18	2.08	2.16	2.54
SO_2 - LT 0.4 gr/100 scf	lb/hr	2.98	3.10	3.15	3.23	3.31	3.37	3.39	3.41	3.43	3.45	3.48	1.97	1.88	1.95	2.30
SO_2 - ST 2.0 gr/100 scf	lb/hr	14.88	15.48	15.75	16.16	16.53	16.84	16.95	17.04	17.14	17.26	17.41	9.87	9.40	9.76	11.52
Primary PM /$PM_{2.5}$ - LT 0.4 gr/100 scf	lb/hr	11.88	11.99	11.99	12.10	12.10	12.10	12.21	12.21	12.21	12.21	12.21	11.22	11.11	11.22	11.44
Primary PM /$PM_{2.5}$ - ST 2.0 gr/100 scf	lb/hr	16.63	16.79	16.79	16.94	16.94	16.94	17.09	17.09	17.09	17.09	17.09	15.71	15.55	15.71	16.02
Primary and Secondary $PM_{2.5}$ - LT 0.4 gr/100 scf	lb/hr	12.03	12.15	12.15	12.26	12.26	12.26	12.37	12.37	12.37	12.37	12.37	11.37	11.25	11.37	11.59
Primary and Secondary $PM_{2.5}$ - ST 2.0 gr/100 scf	lb/hr	16.85	17.00	17.00	17.16	17.16	17.16	17.32	17.32	17.32	17.32	17.32	15.91	15.76	15.91	16.22
H_2SO_4 0.4 gr/100 scf	lb/hr	1.68	1.75	1.78	1.82	1.86	1.90	1.91	1.92	1.93	1.95	1.96	1.11	1.06	1.10	1.30
H_2SO_4 2.0 gr/100 scf	lb/hr	8.39	8.73	8.88	9.11	9.32	9.50	9.56	9.61	9.66	9.73	9.82	5.57	5.30	5.50	6.49
Ammonia Slip (NH_3)	lb/hr	17.49	18.15	18.48	19.03	19.47	19.80	19.91	20.02	20.13	20.24	20.46	11.55	11.00	11.44	13.53
CO_2	lb/hr	304700	316800	322300	331100	338800	344300	346500	348700	350900	353100	356400	202400	192500	200200	236500
Formaldehyde	lb/hr	0.90	0.93	0.95	0.97	0.99	1.01	1.02	1.03	1.03	1.04	1.05	0.59	0.57	0.59	0.69

	Base with Evap and DB	**Base with DB**	**Base with Evap**	**Base**	**75%**	**Low Load**
Stack Parameters						
Height (ft)	220	220	220	220	220	220
Diameter (ft)	23	23	23	23	23	23
Temperature (deg F)	161.57	156.65	175.04	172.71	166.04	158.86
Velocity (ft/sec)	65.85	59.64	66.88	60.44	49.18	33.76
Emissions Data (lb/hr)						
NOx	34.76	34.10	27.61	27.94	22.11	14.63
CO	21.12	20.68	16.83	16.94	13.53	8.90
VOC	12.10	11.88	4.81	4.85	3.85	2.54
SO_2 - LT 0.4 gr/100 scf	5.40	5.31	4.35	4.39	3.48	2.30
SO_2 - ST 2.0 gr/100 scf	26.98	26.53	21.75	21.96	17.41	11.52
Primary PM /$PM_{2.5}$ - LT 0.4 gr/100 scf	24.42	23.65	12.76	12.87	12.21	11.44
Primary PM /$PM_{2.5}$ - ST 2.0 gr/100 scf	34.19	33.11	17.86	18.02	17.09	16.02
Primary and Secondary $PM_{2.5}$ - LT 0.4 gr/100 scf	24.74	23.96	12.93	13.04	12.37	11.59
Primary and Secondary $PM_{2.5}$ - ST 2.0 gr/100 scf	34.63	33.54	18.10	18.25	17.32	16.22
H_2SO_4 0.4 gr/100 scf	3.04	2.99	2.45	2.48	1.96	1.30
H_2SO_4 2.0 gr/100 scf	15.21	14.96	12.27	12.38	9.82	6.49
Ammonia Slip (NH_3)	32.12	31.46	25.52	25.74	20.46	13.53
CO_2	557700	546700	445500	449900	356400	236500
Formaldehyde	1.73	1.67	1.31	1.32	1.05	0.69

881.130349

Table C-2: Hill Top Energy Center - Facility Potential To Emit Emissions

Source			Operations	Emission Rates																	
				NO_x		CO		VOC		PM_{10}*		$PM_{2.5}$*		SO_2*		H_2SO_4*		Ammonia		Lead	
			(hrs/yr)	(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)
CC - Natural Gas																					
	With Duct Firing	8,760	8,497	34.76	147.68	21.12	89.73	12.10	51.41	34.19	103.75	34.19	103.75	26.98	22.93	15.21	12.93	32.12	136.46		
	Without Duct Firing		0	27.94	0.00	16.94	0.00	4.85	0.00	18.02	0.00	18.02	0.00	21.96	0.00	12.38	0.00	25.74	0.00		
Subtotal - Normal Operations					147.68		89.73		51.41		103.75		103.75		22.93		12.93		136.46		
	events/yr	hrs/event	hrs/yr	(lb/event)	(tpy)	(lb/event)	(tpy)	(lb/event)	(tpy)	(lb/event)	(tpy)	(lb/event)	(tpy)	(lb/event)**	(tpy)	(lb/event)**	(tpy)	(lb/event)	(tpy)	(lb/event)	(tpy)
Startup NG																					
Cold	30	0.92	28	260.00	3.90	790.00	11.85	55.00	0.83	11.00	0.17	11.00	0.165	1.80	0.03	1.02	0.02				
Warm	80	0.67	53	146.00	5.84	155.00	6.20	10.00	0.40	7.80	0.31	7.80	0.312	1.38	0.06	0.78	0.03				
Hot	300	0.33	100	70.00	10.50	120.00	18.00	9.00	1.35	3.90	0.59	3.90	0.585	0.47	0.07	0.27	0.04				
Shutdown - NG	410	0.20	82	7.00	1.44	125.00	25.63	26.00	5.33	2.30	0.47	2.30	0.472	0.21	0.04	0.12	0.02				
Subtotal - Startups/Shutdowns					21.68		61.68		7.91		1.53		1.53		0.20		0.11				
Fuel Gas Heater			8,760	0.07	0.31	0.24	1.04	0.03	0.15	0.05	0.21	0.05	0.21	0.01	0.03	5.72E-04	2.50E-03			3.11E-06	1.36E-05
Auxiliary Boiler			8,760	0.45	1.99	1.55	6.81	0.13	0.55	0.31	1.36	0.31	1.36	0.05	0.21	3.75E-03	1.64E-02			2.04E-05	8.94E-05
Firewater pump			100	2.60	0.13	2.42	0.12	0.19	0.01	0.14	0.007	0.14	0.007	0.87	0.04	6.62E-02	3.31E-03				
Emergency Generator			100	26.46	1.32	15.43	0.77	1.76	0.09	0.88	0.044	0.88	0.044	0.03	0.002	2.49E-03	1.25E-04				
Cooling Tower			8,760							0.765	3.35	0.29	1.28								
Subtotal - Auxiliary Sources				29.58	3.75	19.64	8.74	2.11	0.80	2.14	4.97	1.67	2.90	0.95	0.29		0.02				1.03E-04
Facility Total					173.10		160.14		60.11		110.25		108.18		23.42		13.06		136.46		1.03E-04
PSD Major Source Threshold					100		100		50		100		100		100						100
Major Source					Yes		Yes		Yes		Yes		Yes		No						No
PSD Significant Emission Rate					40		100		40		15		10		40		7				0.60
Subject to PSD					Yes		Yes		Yes		Yes		Yes		No		Yes				No

Notes
*Turbine Short term emissions (lb/hr) based on 2.0 gr/100 scf sulfur, Annual emissions (TPY) based on 0.4 gr/100 scf sulfur
** ECT Calculated

Table C-3: Hill Top Energy Center

GENERAL ELECTRIC INTERNATIONAL, INC.

Combined Cycle Systems Emissions Estimates

COMMERCIAL DATA	
Customer Project Name Manufacturer	**Abatis Capital Greene County, PA. General Electric International, Inc.**
INPUT INFORMATION	
Gas Turbine Type	**GE 7HA.02**
Configuration & Arrangement	**1 x 1 SS**
Fuel Type	**Natural Gas**
Fuel Heat Input LHV	21216.34
Fuel Heat Input HHV	23521.93

		BASE						
		Evap ON and Duct ON					Evap ON/Duct OFF	
CASE #		**15**	**8**	**14**	**13**	**7**	**4**	**3**
Case Description		100% DB Firing	10% DB Firing	100% DB Firing	70% DB Firing	10% DB Firing	Unfired	Unfired
SITE CONDITIONS								
Ambient Dry Bulb Temperature	°F	101	101	90	59	59	101	59
Ambient Pressure	psia	14.12	14.12	14.12	14.12	14.12	14.12	14.12
Relative Humidity	%	31.2	31.2	60	60	60	31.2	60
PLANT STATUS								
SCR		Operating	Operating	Operating	Operating	Operating	Operating	Operating
CO Catalyst		Operating	Operating	Operating	Operating	Operating	Operating	Operating
Inlet Conditioning	Evaporative Cooler On/Off	On	On	On	On	On	On	On
HRSG Duct Burner Status	Fired/Unfired	Fired	Fired	Fired	Fired	Fired	Unfired	Unfired
GT PERFORMANCE (per GT)								
GT Load	%	Base	Base	Base	Base	Base	Base	Base
GT Diluent Injection Type		None	None	None	None	None	None	None
GT Diluent Injection Flow (per GT)	10^3 lb/hr	0	0	0	0	0	0	0
GT Heat Input	MMBtu/hr - HHV	**3316.6**	**3316.6**	**3314.6**	**3473.9**	**3473.9**	**3316.6**	**3464.8**
CC PERFORMANCE								
Number of GT's in Operation		1	1	1	1	1	1	1
Duct Burner Heat Input (per HRSG)	MMBtu/hr - HHV	**981.41**	**98.141**	**981.41**	**685.82**	**98.141**	**0**	**0**
Total Heat Input	MMBtu/hr - HHV	**4298.01**	**3414.741**	**4296.01**	**4159.72**	**3572.041**	**3316.6**	**3464.8**
HRSG EXHAUST CONDITIONS @ Stack (per Stack)								
CC Exhaust Flow	pph	5840500	5801000	5821200	6036300	6010100	5796600	5986600
CC Exhaust Flow	Actual ft^3/hr	98567000	99734000	98486000	101150000	102200000	100030000	102080000
CC Exhaust velocity	fps	65.90	66.68	65.85	67.63	68.33	66.88	68.25
CC Exhaust Gas Temperature	°F	162	176	162	162	173	179	175
CC Exhaust Gas Composition mol %	Ar	0.8540	0.8640	0.8504	0.8713	0.8779	0.8651	0.8789
	CO_2	5.5198	4.3989	5.5269	5.1933	4.4669	4.2728	4.3469
	H_2O	13.5441	11.3734	13.9354	11.3639	9.9453	11.1291	9.7109
	N_2	71.7185	72.5551	71.4186	73.1707	73.7221	72.6493	73.8132
	O_2	8.3636	10.8085	8.2687	9.4008	10.9878	11.0837	11.2501
CC Exhaust Gas Molecular Weight		27.9774	28.1138	27.9353	28.1866	28.2763	28.1292	28.2911

		BASE							
		Evap OFF/Duct ON						Evap and Duct OFF	
CASE #		**12**	**6**	**11**	**10**	**9**	**5**	**2**	**1**
Case Description		85% DB Firing	10% DB Firing	62% DB Firing	73% DB Firing	73% DB Firing	10% DB Firing	Unfired	Unfired
SITE CONDITIONS									
Ambient Dry Bulb Temperature	°F	101	101	90	59	0	0	101	0
Ambient Pressure	psia	14.12	14.12	14.12	14.12	14.12	14.12	14.12	14.12
Relative Humidity	%	31.2	31.2	60	60	35	35	31.2	35
PLANT STATUS									
SCR		Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
CO Catalyst		Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Inlet Conditioning	Evaporative Cooler On/Off	Off	Off	Off	Off	Off	Off	Off	Off
HRSG Duct Burner Status	Fired/Unfired	Fired	Fired	Fired	Fired	Fired	Fired	Unfired	Unfired
GT PERFORMANCE (per GT)									
GT Load	%	Base	Base	Base	Base	Base	Base	Base	Base
GT Diluent Injection Type		None	None	None	None	None	None	None	None
GT Diluent Injection Flow (per GT)	10^3 lb/hr	0	0	0	0	0	0	0	0
GT Heat Input	MMBtu/hr - HHV	**2996.2**	**2996.2**	**3203.1**	**3447.4**	**3508.7**	**3508.7**	**2996.3**	**3497.3**
CC PERFORMANCE									
Number of GT's in Operation		1	1	1	1	1	1	1	1
Duct Burner Heat Input (per HRSG)	MMBtu/hr - HHV	**831.5**	**98.141**	**609.77**	**717.63**	**716.61**	**98.141**	**0**	**0**
Total Heat Input	MMBtu/hr - HHV	**3827.7**	**3094.341**	**3812.87**	**4165.03**	**4225.31**	**3606.841**	**2996.3**	**3497.3**
HRSG EXHAUST CONDITIONS @ Stack (per Stack)									
CC Exhaust Flow	pph	5328200	5295500	5654500	6041600	6174600	6147000	5291100	6123200
CC Exhaust Flow	Actual ft^3/hr	89200000	90118000	95901000	101090000	102140000	103550000	90396000	103540000
CC Exhaust velocity	fps	59.64	60.25	64.12	67.59	68.29	69.23	60.44	69.22
CC Exhaust Gas Temperature	°F	159	172	166	161	157	170	174	173
CC Exhaust Gas Composition mol %	Ar	0.8616	0.8708	0.8576	0.8732	0.8823	0.8892	0.8720	0.8903
	CO_2	5.4040	4.3803	5.0524	5.2016	5.1824	4.4313	4.2418	4.3107
	H_2O	12.6099	10.6199	12.6920	11.1613	10.1702	8.6943	10.3505	8.4573
	N_2	72.3592	73.1292	72.0260	73.3352	74.0942	74.6715	73.2334	74.7642
	O_2	8.7653	10.9998	9.3720	9.4287	9.6709	11.3137	11.3022	11.5775
CC Exhaust Gas Molecular Weight		28.0693	28.1946	28.0285	28.2095	28.3163	28.4100	28.2116	28.4251

		75 % Load										
		Evap and Duct OFF										
CASE #		**30**	**29**	**28**	**27**	**26**	**25**	**24**	**23**	**22**	**21**	**20**
Case Description		Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired
SITE CONDITIONS												
Ambient Dry Bulb Temperature	°F	101	95	90	80	70	59	51	40	30	20	1
Ambient Pressure	psia	14.12	14.12	14.12	14.12	14.12	14.12	14.12	14.12	14.12	14.12	14.12
Relative Humidity	%	31.2	60	60	60	60	60	60	60	60	35	35
PLANT STATUS												
SCR		Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
CO Catalyst		Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Inlet Conditioning	Evaporative Cooler On/Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
HRSG Duct Burner Status	Fired/Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired
GT PERFORMANCE (per GT)												
GT Load	%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
GT Diluent Injection Type		None	None	None	None	None	None	None	None	None	None	None
GT Diluent Injection Flow (per GT)	10^3 lb/hr	0	0	0	0	0	0	0	0	0	0	0
GT Heat Input	MMBtu/hr - HHV	**2369.8**	**2465.5**	**2509.6**	**2574.1**	**2632.6**	**2682.4**	**2699.3**	**2714.3**	**2730.2**	**2749.5**	**2773.8**
CC PERFORMANCE												
Number of GT's in Operation		1	1	1	1	1	1	1	1	1	1	1
Duct Burner Heat Input (per HRSG)	MMBtu/hr - HHV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Heat Input	MMBtu/hr - HHV	**2369.8**	**2465.5**	**2509.6**	**2574.1**	**2632.6**	**2682.4**	**2699.3**	**2714.3**	**2730.2**	**2749.5**	**2773.8**
HRSG EXHAUST CONDITIONS @ Stack (per Stack)												
CC Exhaust Flow	pph	4334000	4427600	4481400	4551400	4610700	4663900	4709200	4755600	4795000	4840200	4895800
CC Exhaust Flow	Actual ft^3/hr	73558000	75818000	76474000	77206000	77849000	78462000	79093000	79698000	80430000	81197000	82205000
CC Exhaust velocity	fps	49.18	50.69	51.13	51.62	52.05	52.46	52.88	53.28	53.77	54.29	54.96
CC Exhaust Gas Temperature	°F	171	173	172	170	168	167	167	166	167	168	168
CC Exhaust Gas Composition mol %	Ar	0.8733	0.8612	0.8654	0.8722	0.8772	0.8812	0.8837	0.8862	0.8878	0.8898	0.8906
	CO_2	4.0992	4.1527	4.1833	4.2366	4.2858	4.3240	4.3140	4.3004	4.2929	4.2867	4.2769
	H_2O	10.0733	11.4282	11.0094	10.3330	9.8424	9.4455	9.1718	8.8884	8.7086	8.4863	8.3931
	N_2	73.3407	72.3239	72.6743	73.2431	73.6637	74.0028	74.2089	74.4197	74.5543	74.7231	74.7884
	O_2	11.6135	11.2339	11.2676	11.3151	11.3309	11.3465	11.4216	11.5053	11.5563	11.6141	11.6511
CC Exhaust Gas Molecular Weight		28.2291	28.0856	28.1342	28.2130	28.2712	28.3181	28.3471	28.3769	28.3959	28.4197	28.4290

		Low Load			
		Evap and Duct OFF			
CASE #		**19**	**18**	**17**	**16**
Case Description		Unfired	Unfired	Unfired	Unfired
SITE CONDITIONS					
Ambient Dry Bulb Temperature	°F	101	59	20	1
Ambient Pressure	psia	14.12	14.12	14.12	14.12
Relative Humidity	%	31.2	60	35	35
PLANT STATUS					
SCR		Operating	Operating	Operating	Operating
CO Catalyst		Operating	Operating	Operating	Operating
Inlet Conditioning	Evaporative Cooler On/Off	Off	Off	Off	Off
HRSG Duct Burner Status	Fired/Unfired	Unfired	Unfired	Unfired	Unfired
GT PERFORMANCE (per GT)					
GT Load	%	40%	30%	30%	40%
GT Diluent Injection Type		None	None	None	None
GT Diluent Injection Flow (per GT)	10^3 lb/hr	0	0	0	0
GT Heat Input	MMBtu/hr - HHV	**1572.2**	**1497.2**	**1554.3**	**1834.4**
CC PERFORMANCE					
Number of GT's in Operation		1	1	1	1
Duct Burner Heat Input (per HRSG)	MMBtu/hr - HHV	**0**	**0**	**0**	**0**
Total Heat Input	MMBtu/hr - HHV	**1572.2**	**1497.2**	**1554.3**	**1834.4**
HRSG EXHAUST CONDITIONS @ Stack (per Stack)					
CC Exhaust Flow	pph	3246600	3050300	3196100	3737900
CC Exhaust Flow	Actual ft^3/hr	54685000	50501000	52961000	62543000
CC Exhaust velocity	fps	36.56	33.76	35.41	41.81
CC Exhaust Gas Temperature	°F	167	159	162	168
CC Exhaust Gas Composition mol %	Ar	0.8774	0.8868	0.8953	0.8957
	CO_2	3.6409	3.7046	3.6838	3.7177
	H_2O	9.1824	8.2345	7.3021	7.2943
	N_2	73.6854	74.4741	75.1861	75.2181
	O_2	12.6138	12.7000	12.9327	12.8742
CC Exhaust Gas Molecular Weight		28.2852	28.3947	28.4949	28.4988

HRSG EXHAUST GAS EMISSIONS (per Stack)																															
NOx	ppmvd @ 15% O_2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NOx	lb/hr as NO_2	31.6	24.8	31.6	30.5	26	24.1	25.1	28.1	22.5	27.9	30.5	31	26.2	21.7	25.4	17.2	17.9	18.2	18.7	19.1	19.5	19.6	19.7	19.8	20	20.1	11.4	10.9	11.3	13.3
CO	ppmvd @ 15% O_2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO	lb/hr	19.2	15.1	19.2	18.5	15.8	14.7	15.3	17.1	13.8	17	18.6	18.8	16	13.2	15.4	10.5	10.9	11.1	11.4	11.6	11.8	11.9	12	12.1	12.1	12.3	6.94	6.61	6.86	8.09
VOC	ppmvd @ 15% O_2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
VOC	lb/hr as methane	11	8.63	11	10.6	9.03	4.19	4.37	9.78	7.82	9.71	10.6	10.8	9.12	3.78	4.41	2.99	3.11	3.17	3.25	3.32	3.39	3.41	3.43	3.45	3.47	3.5	1.98	1.89	1.96	2.31
SO_2																															
SO_2	grains per 100 SCF	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
SOx	lb/MMBTU, HHV	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332	0.001332
SOx	lb/hr as SO_2 (with 20% margin)	5.796	4.56	5.796	5.592	4.776	4.428	4.62	5.16	4.14	5.124	5.604	5.688	4.824	3.996	4.668	3.168	3.288	3.348	3.432	3.516	3.576	3.6	3.624	3.648	3.672	3.696	2.1	2.004	2.076	2.448
SO_2	grains per 100 SCF	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
SO_2	lb/MMBtu	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057	0.0057
SO_2	lb/hr	24.53	19.49	24.52	23.74	20.39	18.93	19.77	21.85	17.66	21.76	23.77	24.11	20.58	17.10	19.96	13.52	14.07	14.32	14.69	15.02	15.31	15.41	15.49	15.58	15.69	15.83	8.97	8.54	8.87	10.47
SO_2	grains per 100 SCF	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
SO_2	lb/MMBtu	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
SO_2	lb/hr	4.91	3.90	4.90	4.75	4.08	3.79	3.95	4.37	3.53	4.35	4.75	4.82	4.12	3.42	3.99	2.70	2.81	2.86	2.94	3.00	3.06	3.08	3.10	3.12	3.14	3.17	1.79	1.71	1.77	2.09
Particulates - Filterable + Condensible, Including Sulfates	lb/MMBTU, HHV	0.0054	0.0066	0.0054	0.0049	0.0063	0.0037	0.0035	0.0055	0.0072	0.0051	0.0049	0.0048	0.0063	0.0040	0.0035	0.0048	0.0046	0.0046	0.0045	0.0044	0.0043	0.0043	0.0043	0.0043	0.0042	0.0042	0.0068	0.0071	0.0069	0.0060
Particulates - Filterable + Condensible, Including Sulfates	lb/hr	22.2	21.4	22.2	19.4	21.5	11.5	11.6	20.3	21.2	18.7	19.5	19.6	21.5	11.3	11.7	10.8	10.9	10.9	11	11	11	11.1	11.1	11.1	11.1	11.1	10.2	10.1	10.2	10.4
Ammonia Slip (NH_3) (GE)	ppmvd@15% O	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Ammonia Slip (NH_3) (GE)	lb/hr	29.2	22.9	29.2	28.2	24	22.2	23.2	26	20.8	25.8	28.2	28.6	24.2	20.1	23.4	15.9	16.5	16.8	17.3	17.7	18	18.1	18.2	18.3	18.4	18.6	10.5	10	10.4	12.3
Sulfuric Acid Mist	lb/MMBTU, HHV	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
Sulfuric Acid Mist	lb/hr	3.73	2.93	3.73	3.6	3.07	2.84	2.97	3.32	2.66	3.3	3.6	3.65	3.1	2.57	3	2.03	2.11	2.15	2.21	2.26	2.3	2.31	2.33	2.34	2.36	2.38	1.35	1.28	1.33	1.57
Formaldehyde (GE)	lb/MMBTU, HHV	0.00038	0.00036	0.00038	0.00037	0.00036	0.00036	0.00036	0.00038	0.00036	0.00037	0.00037	0.00037	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036	0.00036
Formaldehyde (GE)	lb/hr	1.57	1.18	1.57	1.50	1.24	1.14	1.19	1.39	1.07	1.37	1.50	1.52	1.25	1.03	1.20	0.81	0.85	0.86	0.88	0.90	0.92	0.93	0.93	0.94	0.94	0.95	0.54	0.51	0.53	0.63
CO_2 (GE)	lb/hr	507000	399000	507000	489000	418000	388000	405000	451000	362000	449000	490000	497000	422000	350000	409000	277000	288000	293000	301000	308000	313000	315000	317000	319000	321000	324000	184000	175000	182000	215000
CO_2 (GE)	lb/MW-hr, Gross Power	772	730	774	748	720	724	715	768	729	757	749	760	733	723	727	741	744	740	733	728	725	725	725	728	731	738	818	832	847	814
Emissions with 10% margin																															
NOx (abated)	lb/hr	34.76	27.28	34.76	33.55	28.6	26.51	27.61	30.91	24.75	30.69	33.55	34.1	28.82	23.87	27.94	18.92	19.69	20.02	20.57	21.01	21.45	21.56	21.67	21.78	22	22.11	12.54	11.99	12.43	14.63
CO (abated)	lb/hr	21.12	16.61	21.12	20.35	17.38	16.17	16.83	18.81	15.18	18.7	20.46	20.68	17.6	14.52	16.94	11.55	11.99	12.21	12.54	12.76	12.98	13.09	13.2	13.31	13.31	13.53	7.634	7.271	7.546	8.899
VOC (abated)	lb/hr	12.1	9.493	12.1	11.66	9.933	4.609	4.807	10.758	8.602	10.681	11.66	11.88	10.032	4.158	4.851	3.289	3.421	3.487	3.575	3.652	3.729	3.751	3.773	3.795	3.817	3.85	2.178	2.079	2.156	2.541
SO_2 - GE - 0.4 gr/100 scf	lb/hr (with 20% margin)	5.796	4.56	5.796	5.592	4.776	4.428	4.62	5.16	4.14	5.124	5.604	5.688	4.824	3.996	4.668	3.168	3.288	3.348	3.432	3.516	3.576	3.6	3.624	3.648	3.672	3.696	2.1	2.004	2.076	2.448
SO_2 - ST 2.0 gr/100 scf	lb/hr (with 10% margin)	26.982	21.437	26.970	26.114	22.425	20.821	21.752	24.030	19.426	23.937	26.148	26.526	22.643	18.810	21.956	14.877	15.478	15.755	16.160	16.527	16.840	16.946	17.040	17.140	17.261	17.414	9.870	9.399	9.758	11.516
SO2 - LT 0.4 gr/100 scf	lb/hr (with 10% margin)	5.396	4.287	5.394	5.223	4.485	4.164	4.350	4.806	3.885	4.787	5.230	5.305	4.529	3.762	4.391	2.975	3.096	3.151	3.232	3.305	3.368	3.389	3.408	3.428	3.452	3.483	1.974	1.880	1.952	2.303
Primary PM /$PM_{2.5}$ - GE 0.4 gr/100 scf	lb/hr	24.42	23.54	24.42	21.34	23.65	12.65	12.76	22.33	23.32	20.57	21.45	21.56	23.65	12.43	12.87	11.88	11.99	11.99	12.1	12.1	12.1	12.21	12.21	12.21	12.21	12.21	11.22	11.11	11.22	11.44
Primary PM /$PM_{2.5}$ - ST 2.0 gr/100 scf	lb/hr	34.188	32.956	34.188	29.876	33.110	17.710	17.864	31.262	32.648	28.798	30.030	30.184	33.110	17.402	18.018	16.632	16.786	16.786	16.940	16.940	16.940	17.094	17.094	17.094	17.094	17.094	15.708	15.554	15.708	16.016
Primary PM /$PM_{2.5}$ - LT 0.4 gr/100 scf	lb/hr	24.42	23.54	24.42	21.34	23.65	12.65	12.76	22.33	23.32	20.57	21.45	21.56	23.65	12.43	12.87	11.88	11.99	11.99	12.10	12.10	12.10	12.21	12.21	12.21	12.21	12.21	11.22	11.11	11.22	11.44
Ammonia Slip (NH_3)	lb/hr	32.12	25.19	32.12	31.02	26.4	24.42	25.52	28.6	22.88	28.38	31.02	31.46	26.62	22.11	25.74	17.49	18.15	18.48	19.03	19.47	19.8	19.91	20.02	20.13	20.24	20.46	11.55	11	11.44	13.53
CO_2	lb/hr	557700	438900	557700	537900	459800	426800	445500	496100	398200	493900	539000	546700	464200	385000	449900	304700	316800	322300	331100	338800	344300	346500	348700	350900	353100	356400	202400	192500	200200	236500
H_2SO_4 2.0 gr/100 scf	lb/hr	15.215	12.088	15.208	14.725	12.645	11.741	12.265	13.550	10.954	13.498	14.744	14.958	12.768	10.607	12.380	8.389	8.728	8.884	9.112	9.319	9.496	9.555	9.609	9.665	9.733	9.819	5.566	5.300	5.502	6.494
H_2SO_4 0.4 gr/100 scf	lb/hr	3.043	2.418	3.042	2.945	2.529	2.348	2.453	2.710	2.191	2.700	2.949	2.992	2.554	2.121	2.476	1.678	1.746	1.777	1.822	1.864	1.899	1.911	1.922	1.933	1.947	1.964	1.113	1.060	1.100	1.299
Formaldehyde	lb/hr	1.73	1.30	1.73	1.64	1.36	1.25	1.31	1.53	1.18	1.51	1.65	1.67	1.37	1.13	1.32	0.90	0.93	0.95	0.97	0.99	1.01	1.02	1.03	1.03	1.04	1.05	0.59	0.57	0.59	0.69

ECT Calculated

NOTES (Performance notes apply to all cases unless otherwise specified.):

HRSG Emission Notes:

1. Gas turbine(s) and steam plant are in steady-state operation.

2. HRSG Stack Exhaust emissions are reported based on the following conversion rates:

- Gas Turbine: 95% conversion of sulfur to SO_2 and 5% conversion to SO_3.
- Duct Burner: 95% conversion of sulfur to SO_2 and 5% conversion to SO_3.
- For installations that are equipped with a CO catalyst it is expected that 10% to about 35% of the SO_2 in the exhaust gas is converted to SO_3. The actual conversion rate used in these calculations is 30%.
- For installations with an SCR catalyst for NOx abatement it is expected that 1% to 5% of the SO_2 in the exhaust gas will be converted to SO_3. The actual conversion rate used in these calculations is 5%.

3. HRSG Stack NH_3 Emissions are based on assuming no conversion to ammonium salts.

4. Steady State Emissions data above are estimated values based on GE recommended measurements and analysis procedures, per GEK 28172.

5. Reference conditions for exhaust gas SCF are: 68°F, and 14.6959 psia. Reference conditions for exhaust gas fuel SCF are: 60°F, and 14.6959 psia.

6. Reference conditions for exhaust gas Nm3 are: 32°F, and 14.6959 psia. Reference conditions for gas fuel Nm3 are: 60°F, and 14.6959 psia.

7. SO_2 emission values have been estimated by assuming that all the sulfur in the fuel is converted to SO_2 and is based on maximum S content in the fuel of 0.4 grains/100 SCF @ 60°F for gas. SO_2 values are margined by 20% to account for variation in fuel sulfur content and measurement error.

8. The CO_2 estimate derived from the heat rate does not include any margin for measurement errors assuming that the compliance will be demonstrated using the heat rate from the performance test results. If CO_2 compliance is to be demonstrated using actual CO_2 measurements from the HRSG stack, GE recommends adding 10% margin to the estimated values.

9. Sulfur mist emission calculations conservatively assume that all SO_3 combines with water to form sulfur mist. In actuality, some SO_3 may form other chemical species. This would include ammonium sulfates in the presence of NH_3. The maximum sulfur mist is reported to be conservative.

10. The estimated values for heat consumption and the exhaust flows are margined in this document to account for equipment variations, site operating conditions and life-cycle operating parameters. The Plant Performance section does not include permitting margin, for more information on performance please refer to the Heat Balance.

11. Formaldehyde emissions are calculated using the AP-42 Table 3.1-3 formaldehyde emission factor reduced by 50% due to the CO catalyst. Formaldehyde emissions are estimated and not guaranteed.

Additional Notes for Particulate Emissions

1. Particulate Matter estimates over the entire emissions compliance region of GT operation are based on field data obtained at base load for the GT. In reality, particulate matter emissions measured in lb/h are expected to decrease at part load operation and the lb/MMBTU values at part load operation are expected not to exceed the lb/MMBTU value for PM at baseload.

2. PM_{10} and $PM_{2.5}$ are estimated at the same rate as Total Particulates.

3. PM estimates are based on maximum S content in the fuel of 0.4 grains/100 SCF @ 60°F for gas.

Table C-4: Hill Top Energy Center - Startup/Shutdown Emissions

PRELIMINARY / FOR INFORMATION ONLY

Expected Startup Emissions for Combined Cycle 1x1

Customer: Abatis Capital
Project: Greene County, PA
Scope: Combined Cycle 1x1
Fuel: Natural Gas
Total Stack Emissions Per Event

Per GT/HRSG Stack	Duration	NOx	CO	VOC as	PM (Total)	Avg Exhaust	Avg Exhaust Flow	Avg Exhaust Flow
	minutes	lb/event	lb/event	lb/event	lb/event	°F	lb/sec	ACFM
Cold Start, > 72hrs After Shutdown	55	260.0	790.0	55.0	11.0	160	1080	1,031,309
Warm Start, ≤ 48hrs After Shutdown	40	146.0	155.0	10.0	7.8	160	1080	1,031,309
Hot Start, ≤ 8hrs After Shutdown	20	70.0	120.0	9.0	3.9	160	1080	1,031,309
Shutdown	12	7	125	26	2.3			

NOTES:

1. 1. The table above represents the emissions during startup and shutdown events.
2. Emissions assume no contribution from pollutants present in the GT inlet air.
3. An average HRSG stack temperature of 160 deg F may be assumed during starts and shutdown.
4. Emissions assume methane as the fuel.
5. Particulates emissions account for sulfates resulting from 0.4gr/100SCF total fuel sulfur content. Higher fuel sulfur content will increase particulate emissions.
6. During the start-up event, an average HRSG stack flow rate of 1080 lb/second may be assumed.
7. Hot starts are defined as taking place within 8 hours of the previous shutdown. Cold starts are preceded by over 72 hours of shutdown. Warm starts are in between hot and cold starts, defined at 48 hours after shutdown for any test purposes.

ECT Calculated

ISSUED ON: 1/25/2016

Table C-5: Hill Top Energy Center - Fuel Gas Heater

POTENTIAL EMISSION INVENTORY WORKSHEET

EMISSION SOURCE TYPE

FACILITY AND SOURCE DESCRIPTION

Emission Source Description:	Fuel Gas Heater
Emission Control Method(s)/ID No.(s):	None
Emission Point Description:	6.4 MMBTU/hr heat input

EMISSION ESTIMATION EQUATIONS

Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)

Emission (lb/hr) = Emission Factor (lb/MMscf) x Heat Input (MMBtu/hr) / Heating value (Btu/scf)

Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)

INPUT DATA AND EMISSIONS CALCULATIONS

Permitted Hours:	8,760	hrs/yr
Testing Hours:		hrs/yr
Heat Input:	6.40	MMBtu/hr
Heating value	1,028	Btu/scf

Pollutant	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	Potential Emission Rates Per Unit (lb/hr)	Potential Emission Rates Per Unit (tpy)	
NO_x	1.10E-02		7.04E-02	3.08E-01	
CO	3.70E-02		2.37E-01	1.04E+00	
VOC	5.35E-03		3.42E-02	1.50E-01	
SO_2	1.17E-03	1.20E+00	7.47E-03	3.27E-02	
PM	7.39E-03		4.73E-02	2.07E-01	
PM_{10}	7.39E-03		4.73E-02	2.07E-01	*Assume same as PM*
$PM_{2.5}$	7.39E-03		4.73E-02	2.07E-01	*Assume same as PM*
H_2SO_4		9.19E-02	5.72E-04	2.50E-03	
Lead		5.00E-04	3.11E-06	1.36E-05	
CO_2		1.20E+05	7.47E+02	3.27E+03	
TOC		1.10E+01	6.85E-02	3.00E-01	
Methane		2.30E+00	1.43E-02	6.27E-02	

SOURCES OF INPUT DATA

Parameter	Data Source
Emission factors, Heat Input, Heating value and Hours of operation	By Fluor dated 1/16/2017
VOC, PM/PM10/PM2.5, SO2 Emission factors	lb/MMscf converted to lb/MMBtu using 1028 Btu/scf heating value.
H2SO4	Based on 5% conversion of SO2 to SO3 and 100% conversion of SO3 to H2SO4

NOTES AND OBSERVATIONS

Table C-6: Hill Top Energy Center - Auxiliary Boiler

POTENTIAL EMISSION INVENTORY WORKSHEET

EMISSION SOURCE TYPE

FACILITY AND SOURCE DESCRIPTION

Emission Source Description:	Auxiliary Boiler
Emission Control Method(s)/ID No.(s):	None
Emission Point Description:	42 MMBTU/hr heat input

EMISSION ESTIMATION EQUATIONS

Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)

Emission (lb/hr) = Emission Factor (lb/MMscf) x Heat Input (MMBtu/hr) / Heating value (Btu/scf)

Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)

INPUT DATA AND EMISSIONS CALCULATIONS

Permitted Hours:	8,760	hrs/yr
Testing Hours:		hrs/yr
Heat Input:	42.00	MMBtu/hr
Heating value	1,028	Btu/scf

Pollutant	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	Potential Emission Rates Per Unit (lb/hr)	Potential Emission Rates Per Unit (tpy)	
NO_x	1.08E-02		0.454	1.99	
CO	3.70E-02		1.55	6.81	
VOC	3.00E-03		0.13	0.55	
SO_2	1.17E-03	1.20E+00	0.05	0.21	
PM	7.39E-03		0.31	1.36	
PM_{10}	7.39E-03		0.31	1.36	*Assume same as PM*
$PM_{2.5}$	7.39E-03		0.31	1.36	*Assume same as PM*
H_2SO_4		9.19E-02	3.75E-03	1.64E-02	
Lead		5.00E-04	2.04E-05	8.94E-05	
CO_2		1.20E+05	4900.82	21465.58	
TOC		1.10E+01	0.45	1.97	
Methane		2.30E+00	0.09	0.41	

SOURCES OF INPUT DATA

Parameter	Data Source
CO, SO_2, PM/PM_{10}/$PM_{2.5}$, Lead, CO_2, TOC & Methane Emission factors, Heat Input, Heating value and Hours of operation	By Fluor dated 1/16/2017
NOx and VOC Emissions factors	BACT/LAER Analysis
PM/PM10/PM2.5, SO2 Emission factors	lb/MMscf converted to lb/MMBtu using 1028 Btu/scf heating value.
H2SO4	Based on 5% conversion of SO2 to SO3 and 100% conversion of SO3 to H2SO4

NOTES AND OBSERVATIONS

Table C-7: Hill Top Energy Center - Diesel Firewater Pump

POTENTIAL EMISSION INVENTORY WORKSHEET

EMISSION SOURCE TYPE

INTERNAL COMBUSTION ENGINES < 600 HP

FACILITY AND SOURCE DESCRIPTION

Emission Source Description:	Firewater Pump
Emission Control Method(s)/ID No.(s):	None
Emission Point Description:	422 hp Diesel Engine

EMISSION ESTIMATION EQUATIONS

Emission (lb/hr) = Emission Factor (g/hp-hr) x Engine power rating (hp) x (1 lb / 453.6 g)

Emission (lb/hr) = Emission Factor (lb/hp-hr) x Engine power rating (hp)

Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)

Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)

INPUT DATA AND EMISSIONS CALCULATIONS

Permitted Hours:	100	hrs/yr			
No. of Engines:	1		Diesel Sulfur Content	0.0015	weight %
Heat Input:	2.95	MMBtu/hr (HHV)	Diesel Heat Content:	7,000	Btu/hp-hr

Pollutant	Emission Factor		Potential Emission Rates	
	g/hp-hr	lb/-hp-hr	Per Unit (lb/hr)	Per Unit (tpy)
NO_x	2.80E+00		2.60	0.130
CO	2.60E+00		2.42	0.121
VOC	2.00E-01		0.19	0.009
SO_2		2.05E-03	0.87	0.043
PM	1.50E-01		0.14	0.007
PM_{10}	1.50E-01		0.14	0.007
$PM_{2.5}$	1.50E-01		0.14	0.007
CO_2		1.15	485.30	24.265
Highest HAP			7.62E-03	3.81E-04
Total HAPs			0.0185	0.00092
H_2SO_4		1.57E-04	6.62E-02	3.31E-03

Pollutant	Emission Factor (lb/MMBtu)	Potential Emission Rates Per Unit (lb/hr)	Potential Emission Rates Per Unit (tpy)
Acetaldehyde	7.67E-04	2.27E-03	1.13E-04
Acrolein	9.25E-05	2.73E-04	1.37E-05
Benzene	9.33E-04	2.76E-03	1.38E-04
Formaldehyde	1.18E-03	3.49E-03	1.74E-04
Propylene	2.58E-03	7.62E-03	3.81E-04
Toluene	4.09E-04	1.21E-03	6.04E-05
Xylenes	2.85E-04	8.42E-04	4.21E-05

SOURCES OF INPUT DATA

Parameter	Data Source
Emission factors, Power Output, Heat Content and Hours of operation	By Fluor dated 2/6/2017
NOx , CO and VOC emission factor	40 CFR 60, Subpart IIII. NOx and VOC is a combined rate of 3 g/hp-hr. Assumed 93% NOx and 7% VOC
H2SO4	Based on 5% conversion of SO2 to SO3 and 100% conversion of SO3 to H2SO4

NOTES AND OBSERVATIONS

Assume PM = PM_{10} = $PM_{2.5}$

Table C-8: Hill Top Energy Center - Emergency Generator

POTENTIAL EMISSION INVENTORY WORKSHEET

EMISSION SOURCE TYPE	
INTERNAL COMBUSTION ENGINES	
FACILITY AND SOURCE DESCRIPTION	
Emission Source Description:	Emergency Generator
Emission Control Method(s)/ID No.(s):	None
Emission Point Description:	2682 hp Diesel Engine 2000 kW

EMISSION ESTIMATION EQUATIONS

Emission (lb/hr) = Emission Factor (g/hp-hr) x Engine power rating (hp) x (1 lb / 453.6 g)

Emission (lb/hr) = Emission Factor (lb/hp-hr) x Engine power rating (hp)

Emission (lb/hr) = Emission Factor (lb/MMBtu) x Heat Input (MMBtu/hr)

Emission (ton/yr) = Hourly Emissions (lb/hr) x Operating Period (hrs/yr) x (1 ton / 2,000 lb)

INPUT DATA AND EMISSIONS CALCULATIONS

Permitted Hours:	100	hrs/yr		
No. of Engines:	1		Diesel Sulfur Conten	0.0015 weight %
Heat Input:	18.77	MMBtu/hr (HHV)	Diesel Heat Content:	7,000 Btu/hp-hr

Pollutant	Emission Factor (g/kW-hr)	Emission Factor (lb/-hp-hr)	Potential Emission Rates Per Unit (lb/hr)	Potential Emission Rates Per Unit (tpy)	Pollutant	Emission Factor (lb/MMBtu)	Potential Emission Rates Per Unit (lb/hr)	Potential Emission Rates Per Unit (tpy)
NO_x	6.00		26.5	1.32	Acetaldehyde	2.52E-05	4.73E-04	2.37E-05
CO	3.50		15.43	0.77	Acrolein	7.88E-06	1.48E-04	7.40E-06
VOC	0.40		1.8	0.088	Benzene	7.76E-04	1.46E-02	7.28E-04
SO_2		1.21E-05	0.03	0.0016	Formaldehyde	7.89E-05	1.48E-03	7.41E-05
PM	0.20		0.88	0.044	Propylene	2.79E-03	5.24E-02	2.62E-03
PM_{10}	0.20		0.88	0.044	Toluene	2.81E-04	5.28E-03	2.64E-04
$PM_{2.5}$	0.20		0.88	0.044	Xylenes	1.93E-04	3.62E-03	1.81E-04
CO_2		1.16	3111.12	155.56				
Highest HAP			5.24E-02	2.62E-03				
Total HAPs			0.078	0.0039				
H_2SO_4		9.29E-07	2.49E-03	1.25E-04				

SOURCES OF INPUT DATA

Parameter	Data Source
Emission factors, Power Output, Heat Content and Hours of operation	By Fluor dated 1/16/2017
NOx and VOC emission factor	40 CFR 60, Subpart IIII. NOx and VOC is a combined rate of 6.4 g/kW-hr. Assumed 94% NOx and 6% VOC
H2SO4	Based on 5% conversion of SO2 to SO3 and 100% conversion of SO3 to H2SO4

NOTES AND OBSERVATIONS

Fuel sulfur content is applied to the emission factors in the Hourly Emissions calculation as follows:

SO_2 = 8.09e 03 x Fuel Sulfur content = 8.09e 03 x 0.0015

Assume PM = PM_{10} = $PM_{2.5}$

Table C-9: Hill Top Energy Center Cooling Tower

Emissions Data Summary

Hill Top Energy Center
Cooling Tower

Stack Height	55.00	ft
Exit Temp	73.3	F
Exit Flow	1,246,000	acfm
Exit Velocity	24.57	fps
Stack Diameter	32.81	ft
Tower Width	92.00	ft
Tower Length	210.00	ft
Hours	8760	hrs

Water Circulation Rate (a), 8 cells (c)		(GPM)	114,420
Total Liquid Drift (b)		(%)	0.0005
Expected TDS of Circulated Water		(mg/l)	4,000
Emission Rate - Total Cooling Tower			
	Total Suspended Particulate	(Lbs/Hr)	1.15
		(Tons/Yr)	5.02
	PM-10 (d)	(Lbs/Hr)	0.77
		(Tons/Yr)	3.35
	PM-2.5 (e)	(Lbs/Hr)	0.29
		(Tons/Yr)	1.28
Emission Rate - Per Vent (c)			
	Total Suspended Particulate	(Lbs/Hr)	0.14
		(Tons/Yr)	0.63
	PM-10	(Lbs/Hr)	0.10
		(Tons/Yr)	0.42
	PM-2.5	(Lbs/Hr)	0.04
		(Tons/Yr)	0.16

Notes:
(a) Design Water Circulation Rate, Gallons/Minute (gpm)
(b) Design Total Liquid Drift, Percent (%)
(c) Cooling tower has eight cells. Each emits 1/8 of total tower emissions.
(d) PM-10 based on 66.8% of PM from SPX distribution.
(e) PM-2.5 based on 25.5% of PM from SPX distribution.

Equations:
Lbs/Hr = (Water Circulation Rate,GPM) * 60 min/hr * (Drift,%) / 100 * (8.3453 Lbs water/Gal) * (TDS, Lbs PM/1,000,000 Lbs Water)
Tons/Yr = (Lbs/Hr) * (8,760 Hrs/Yr) / (2,000 Lbs/Ton)

Conversion Factors:
1 ton = 2000 lbs

CALCULATIONS AND COMPUTATIONS

Hill Top Energy Center
Cooling Tower

The following table represents the predicted mass distribution of drift particle size for cooling tower drift dispersed from Marley TU12 Xcel Drift

Drop Size Distribution

Mass in Particles (%)		Droplet Size (D_d) (Microns)
0.2	Larger Than	525
1.0	Larger Than	375
5.0	Larger Than	230
10.0	Larger Than	170
20.0	Larger Than	115
40.0	Larger Than	65
60.0	Larger Than	35
80.0	Larger Than	15
88.0	Larger Than	10

$D_d = D_p / [(p_d/p_p) * (TDS) / 1,000,000)]$ ^1/3

Where,
Dd = diameter of drift particles, microns
Dp = diameter of solid particles, microns

pd, density of water	1	g/cm^3
pp, density of NaCl	2.2	g/cm^3
Solids	4,000	mg/l

Table C-10: Hill Top Energy Center - Facility HAPS

Pollutant	Turbine	Duct Burner	Fuel Gas Heater	Aux Boiler	FWP	Emergency Generator	Facility Total
	TPY	TPY	TPY	TPY	TPY	TPY	TPY
1,3-Butadiene	6.61E-03						6.61E-03
2-Methylnaphthalene		1.00E-04	6.54E-07	4.29E-06			1.05E-04
3-Methylchloranthrene		7.52E-06					7.52E-06
7,12-Dimethylbenz(a)anthracene		6.69E-05					6.69E-05
Acenaphthene		7.52E-06					7.52E-06
Acenaphthylene		7.52E-06					7.52E-06
Acetaldehyde	6.15E-01				1.13E-04	2.37E-05	6.15E-01
Acrolein	9.84E-02				1.37E-05	7.40E-06	9.84E-02
Anthracene		1.00E-05					1.00E-05
Benz(a)anthracene		7.52E-06					7.52E-06
Benzene	1.84E-01	8.78E-03	5.72E-05	3.76E-04	1.38E-04	7.28E-04	1.94E-01
Benzo(a)pyrene		5.02E-06					5.02E-06
Benzo(b)fluoranthene		7.52E-06					7.52E-06
Benzo(g,h,i)perylene		5.02E-06					5.02E-06
Benzo(k)fluoranthene		7.52E-06					7.52E-06
Chrysene		7.52E-06					7.52E-06
Dibenzo(a,h)anthracene		5.02E-06					5.02E-06
Dichlorobenzene		5.02E-03					5.02E-03
Ethylbenzene	4.92E-01						4.92E-01
Fluoranthene		1.25E-05					1.25E-05
Fluorene		1.17E-05					1.17E-05
Formaldehyde	5.46E+00	3.13E-01	2.04E-03	1.34E-02	1.74E-04	7.41E-05	5.78E+00
Hexane		7.52E+00					7.52E+00
Indeno(1,2,3-cd)pyrene		7.52E-06					7.52E-06
Naphthalene	2.00E-02	2.55E-03					2.25E-02
PAH	3.38E-02						3.38E-02
Phenanathrene		7.11E-05	4.63E-07	3.04E-06			7.46E-05
Propylene Oxide	4.46E-01				3.81E-04	2.62E-03	4.49E-01
Pyrene		2.09E-05					2.09E-05
Toluene	2.00E+00	1.42E-02	9.27E-05	6.08E-04	6.04E-05	2.64E-04	2.01E+00
Xylenes	9.84E-01				4.21E-05	1.81E-04	9.84E-01
Arsenic		8.36E-04	5.45E-06	3.58E-05			8.77E-04
Barium		1.84E-02	1.20E-04	7.87E-04			1.93E-02
Beryllium		5.02E-05	3.27E-07	2.15E-06			5.26E-05
Cadium		4.60E-03	3.00E-05	1.97E-04			4.82E-03
Chromium		5.85E-03	3.82E-05	2.50E-04			6.14E-03
Cobalt		3.51E-04	2.29E-06	1.50E-05			3.68E-04
Copper		3.55E-04	2.32E-06	1.52E-04			5.10E-04
Manganese		1.59E-03	1.04E-05	6.80E-05			1.67E-03
Mercury		1.09E-03	7.09E-06	4.65E-05			1.14E-03
Molybdenum		4.60E-03	3.00E-05	1.97E-04			4.82E-03
Nickel		8.78E-03	5.72E-05	3.76E-04			9.21E-03
Selenium		1.00E-04					1.00E-04
Vanadium		9.61E-03	6.27E-05	4.11E-04			1.01E-02
Zinc		1.21E-01	7.90E-04	5.19E-03			1.27E-01
Maximum HAP	5.46	7.52	0.002	0.013	0.0004	0.0026	7.52
Facility Total	10.33	8.05	0.003	0.022	0.00092	0.0039	18.41

Table C-11: Hill Top Energy Center

Summary of HAP Emission Rates -Combustion Turbine

NG-Firing: Maximum CT HAP Emissions

Parameter	Units	
Maximum Heat Input (HHV):	MMBtu/hr	3,509
Maximum Annual Hours:	hrs/yr	8,760

Pollutant	CT Emission Factor[1] (lb/MMBtu)	CT Total (lb/hr)	CT Total TPY
1,3-Butadiene	4.3E-07	1.51E-03	6.61E-03
Acetaldehyde	4.0E-05	1.40E-01	6.15E-01
Acrolein	6.4E-06	2.25E-02	9.84E-02
Benzene	1.2E-05	4.21E-02	1.84E-01
Ethylbenzene	3.2E-05	1.12E-01	4.92E-01
Formaldehyde[2]	3.6E-04	1.25E+00	5.46E+00
Naphthalene	1.3E-06	4.56E-03	2.00E-02
Polycyclic Aromatic Hydrocarbons (PAHs)	2.2E-06	7.72E-03	3.38E-02
Propylene Oxide	2.9E-05	1.02E-01	4.46E-01
Toluene	1.3E-04	4.56E-01	2.00E+00
Xylene	6.4E-05	2.25E-01	9.84E-01
Max. individual HAP			5.46
Total HAPs			10.33

Notes:
CT = Combustion Turbine

[1] EPA AP-42, Table 3.1-3, April 2000.

[2] Formaldehyde emission factor is based on EPA documentation. It is 50% of the AP-42 factor.

Table C-12: Hill Top Energy Center - Auxiliary Boiler HAP Emissions

	Heat Input:	42.00	MMBtu/hr			
	Heating value:	1,028	Btu/scf			
	Permitted Hours:	8,760	hrs/yr			

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor (lb/MMBtu)	Emission Factor Rating	Emission Rate (lb/hr)	Emission Rate (tpy)
91-57-6	2-Methylnaphthalene[b, c]	2.40E-05	2.33E-08	D	9.80E-07	4.29E-06
71-43-2	Benzene[b]	2.10E-03	2.04E-06	B	8.58E-05	3.76E-04
50-00-0	Formaldehyde[b]	7.50E-02	7.29E-05	B	3.06E-03	1.34E-02
85-01-8	Phenanathrene[b,c]	1.70E-05	1.65E-08	D	6.94E-07	3.04E-06
108-88-3	Toluene[b]	3.40E-03	3.31E-06	C	1.39E-04	6.08E-04
7440-38-2	Arsenic[b]	2.00E-04	1.94E-07	E	8.17E-06	3.58E-05
7440-38-2	Barium	4.40E-03	4.28E-06	D	1.80E-04	7.87E-04
7440-41-7	Beryllium[b]	1.20E-05	1.17E-08	E	4.90E-07	2.15E-06
7440-43-9	Cadmium[b]	1.10E-03	1.07E-06	D	4.49E-05	1.97E-04
7440-47-3	Chromium[b]	1.40E-03	1.36E-06	D	5.72E-05	2.50E-04
7440-48-4	Cobalt[b]	8.40E-05	8.17E-08	D	3.43E-06	1.50E-05
7440-50-8	Copper	8.50E-04	8.27E-07	C	3.47E-05	1.52E-04
7439-96-5	Manganese[b]	3.80E-04	3.70E-07	D	1.55E-05	6.80E-05
7439-97-6	Mercury[b]	2.60E-04	2.53E-07	D	1.06E-05	4.65E-05
7439-98-7	Molybdenum	1.10E-03	1.07E-06	D	4.49E-05	1.97E-04
7440-02-0	Nickel[b]	2.10E-03	2.04E-06	C	8.58E-05	3.76E-04
7440-62-2	Vanadium	2.30E-03	2.24E-06	D	9.39E-05	4.11E-04
7440-66-6	Zinc	2.90E-02	2.82E-05	E	1.18E-03	5.19E-03
Maximum HAP						0.013
Total						0.022

Emission Factors- EPA AP-42, Tables 1.4-3 and 1.4-4, July 1998 (B,C,D rated parameters)
Heat Input, Heating value and Hours of operation -> By Fluor dated 1/16/2017
(b) - Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act
(c) - HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) ofthe Clean Air Act

Table C-13: Hill Top Energy Center -Fuel Gas Heater HAP Emissions

	Heat Input:	6.40	MMBtu/hr			
	Heating value:	1,028	Btu/scf			
	Permitted Hours:	8,760	hrs/yr			

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor (lb/MMBtu)	Emission Factor Rating	Emission Rate (lb/hr)	Emission Rate (tpy)
91-57-6	2-Methylnaphthalene[b, c]	2.40E-05	2.33E-08	D	1.49E-07	6.54E-07
71-43-2	Benzene[b]	2.10E-03	2.04E-06	B	1.31E-05	5.72E-05
50-00-0	Formaldehyde[b]	7.50E-02	7.29E-05	B	4.67E-04	2.04E-03
85-01-8	Phenanathrene[b,c]	1.70E-05	1.65E-08	D	1.06E-07	4.63E-07
108-88-3	Toluene[b]	3.40E-03	3.31E-06	C	2.12E-05	9.27E-05
7440-38-2	Arsenic[b]	2.00E-04	1.94E-07	E	1.24E-06	5.45E-06
7440-38-2	Barium	4.40E-03	4.28E-06	D	2.74E-05	1.20E-04
7440-41-7	Beryllium[b]	1.20E-05	1.17E-08	E	7.47E-08	3.27E-07
7440-43-9	Cadmium[b]	1.10E-03	1.07E-06	D	6.85E-06	3.00E-05
7440-47-3	Chromium[b]	1.40E-03	1.36E-06	D	8.71E-06	3.82E-05
7440-48-4	Cobalt[b]	8.40E-05	8.17E-08	D	5.23E-07	2.29E-06
7440-50-8	Copper	8.50E-05	8.27E-08	C	5.29E-07	2.32E-06
7439-96-5	Manganese[b]	3.80E-04	3.70E-07	D	2.36E-06	1.04E-05
7439-97-6	Mercury[b]	2.60E-04	2.53E-07	D	1.62E-06	7.09E-06
7439-98-7	Molybdenum	1.10E-03	1.07E-06	D	6.85E-06	3.00E-05
7440-02-0	Nickel[b]	2.10E-03	2.04E-06	C	1.31E-05	5.72E-05
7440-62-2	Vanadium	2.30E-03	2.24E-06	D	1.43E-05	6.27E-05
7440-66-6	Zinc	2.90E-02	2.82E-05	E	1.80E-04	7.90E-04
Maximum HAP						0.002
Total						0.003

Emission Factors- EPA AP-42, Tables 1.4-3 and 1.4-4, July 1998 (B,C,D rated parameters)
Heat Input, Heating value and Hours of operation -> By Fluor dated 1/16/2017
(b) - Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act
(c) - HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) ofthe Clean Air Act

Table C-14: Hill Top Energy Center - Duct Burner HAP Emissions

	Heat Input:	981.41	MMBtu/hr			
	Heating value:	1,028	Btu/scf			
	Permitted Hours:	8,760	hrs/yr			

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor (lb/MMBtu)	Emission Factor Rating	Emission Rate (lb/hr)	Emission Rate (tpy)
91-57-6	2-Methylnaphthalene[b, c]	2.40E-05	2.33E-08	D	2.29E-05	1.00E-04
56-49-5	3-Methylchloranthrene[b, c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
	7,12-Dimethylbenz(a)anthracene[b,c]	1.60E-05	1.56E-08	E	1.53E-05	6.69E-05
83-32-9	Acenaphthene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
203-96-8	Acenaphthylene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
120-12-7	Anthracene[b,c]	2.40E-06	2.33E-09	E	2.29E-06	1.00E-05
56-55-3	Benz(a)anthracene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
71-43-2	Benzene[b]	2.10E-03	2.04E-06	B	2.00E-03	8.78E-03
50-32-8	Benzo(a)pyrene[b,c]	1.20E-06	1.17E-09	E	1.15E-06	5.02E-06
205-99-2	Benzo(b)fluoranthene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
191-24-2	Benzo(g,h,i)perylene[b,c]	1.20E-06	1.17E-09	E	1.15E-06	5.02E-06
207-08-9	Benzo(k)fluoranthene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
218-01-9	Chrysene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
53-70-3	Dibenzo(a,h)anthracene[b,c]	1.20E-06	1.17E-09	E	1.15E-06	5.02E-06
25321-22-6	Dichlorobenzene[b]	1.20E-03	1.17E-06	E	1.15E-03	5.02E-03
206-44-0	Fluoranthene[b,c]	3.00E-06	2.92E-09	E	2.86E-06	1.25E-05
86-73-7	Fluorene[b,c]	2.80E-06	2.72E-09	E	2.67E-06	1.17E-05
50-00-0	Formaldehyde[b]	7.50E-02	7.29E-05	B	7.16E-02	3.13E-01
110-54-3	Hexane[b]	1.80E+00	1.75E-03	E	1.72E+00	7.52E+00
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	1.80E-06	1.75E-09	E	1.72E-06	7.52E-06
91-20-3	Naphthalene[b]	6.10E-04	5.93E-07	E	5.82E-04	2.55E-03
85-01-8	Phenanathrene[b,c]	1.70E-05	1.65E-08	D	1.62E-05	7.11E-05
129-00-0	Pyrene[b, c]	5.00E-06	4.86E-09	E	4.77E-06	2.09E-05
108-88-3	Toluene[b]	3.40E-03	3.31E-06	C	3.24E-03	1.42E-02
7440-38-2	Arsenic[b]	2.00E-04	1.94E-07	E	1.91E-04	8.36E-04
7440-38-2	Barium	4.40E-03	4.28E-06	D	4.20E-03	1.84E-02
7440-41-7	Beryllium[b]	1.20E-05	1.17E-08	E	1.15E-05	5.02E-05
7440-43-9	Cadmium[b]	1.10E-03	1.07E-06	D	1.05E-03	4.60E-03
7440-47-3	Chromium[b]	1.40E-03	1.36E-06	D	1.34E-03	5.85E-03
7440-48-4	Cobalt[b]	8.40E-05	8.17E-08	D	8.02E-05	3.51E-04
7440-50-8	Copper	8.50E-05	8.27E-08	C	8.11E-05	3.55E-04
7439-96-5	Manganese[b]	3.80E-04	3.70E-07	D	3.63E-04	1.59E-03
7439-97-6	Mercury[b]	2.60E-04	2.53E-07	D	2.48E-04	1.09E-03
7439-98-7	Molybdenum	1.10E-03	1.07E-06	D	1.05E-03	4.60E-03
7440-02-0	Nickel[b]	2.10E-03	2.04E-06	C	2.00E-03	8.78E-03
7782-49-2	Selenium[b]	2.40E-05	2.33E-08	E	2.29E-05	1.00E-04
7440-62-2	Vanadium	2.30E-03	2.24E-06	D	2.19E-03	9.61E-03
7440-66-6	Zinc	2.90E-02	2.82E-05	E	2.77E-02	1.21E-01
Maximum HAP						7.52
Total						8.05

EPA AP-42, Tables 1.4-3 and 1.4-4, July 1998

(b) - Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act

(c) - HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) ofthe Clean Air Act

Table C-15: Potential Greenhouse Gas (GHG) Emissions: Hill Top Energy Center

Potential Carbon Dioxide Equivalent (CO_2e) Emissions from the Combustion Sources

Emissions Source	Heat Input (MMBtu/hr) LHV *	Heat Input (MMBtu/hr) HHV *	Maximum Annual Operating Hours (hr/yr)	Maximum Annual Potential Heat Input (MMBtu/yr)	CO_2 Emissions Factor‡ (kg/MMBtu)	CO_2 Potential Emissions (short tpy) CO_2	CO_2 Potential Emissions (short tpy) CO_2e ¥	CH_4 Emissions Factor § (kg/MMBtu)	CH_4 Potential Emissions (short tpy) CH_4	CH_4 Potential Emissions (short tpy) CO_2e ¥	N_2O Emissions Factor § (kg/MMBtu)	N_2O Potential Emissions (short tpy) N_2O	N_2O Potential Emissions (short tpy) CO_2e ¥	CO_2e Potential Emissions (short tpy)
CT - Steady State - NG		3,509	8,497	29,814,009	53.91	1,772,109	1,772,109	1.0E-03	32.87	822	1.0E-04	3.29	980	**1,773,911**
CT- Startup - NG		1,834	263	482,141	53.91	28,658	28,658	1.0E-03	0.53	13	1.0E-04	0.05	16	**28,687**
Duct Burner		981	8,497	8,339,204	53.91	495,672	495,672	1.0E-03	9.19	230	1.0E-04	0.92	274	**496,176**
Fuel Gas Heater		6.40	8,760	56,064	53.91	3,332.4	3,332.4	1.0E-03	0.062	2	1.0E-04	0.006	2	**3,335.8**
Auxiliary Boiler		42.00	8,760	367,920	53.91	21,869	21,869	1.0E-03	0.41	10	1.0E-04	0.04	12	**21,891**
FWP		2.95	100	295	73.61	24	24	3.0E-03	0.001	0.02	6.0E-04	0.0002	0.06	**24**
Emergency Generator		18.77	100	1,877	73.61	152	152	3.0E-03	0.006	0.16	6.0E-04	0.001	0.37	**153**
									Total CO_2e Potential Annual Emissions					**2,324,178**

Potential CO_2e Emissions from Natural Gas Piping Components

Component	Number of Components	Emissions Factor per Component (scf/hr) £	Annual Emissions (tpy) CO_2 ∂	Annual Emissions (tpy) CH_4 ∂	Annual Emissions (tpy) CO_2e ¥
Valve	400	0.027	0.05	1.93	48.2
Connectors	700	0.003	0.01	0.37	9.4
Relief valve	20	0.04	0.004	0.14	3.6
		Total	**0.1**	**2.4**	**61.2**

Potential CO_2e Emissions from Circuit Breakers

Number of Circuit Breakers	Quantity SF_6 Insulating Gas Per Component (lb)	Quantity SF_6 Insulating Gas Total (lb)	Annual Leak Rate (%)	Annual Emissions SF_6 lb/yr	Annual Emissions SF_6 tpy	Annual Emissions CO_2e ¥ tpy
6	324	1944.00	0.50	9.7	0.00486	110.8
					Total	**110.8**

Total Facility Potential CO_2e Emissions

	Annual ¥ (tpy)
CTs	1,802,598
Duct Burner	496,176
Fuel Gas Heater	3,336
Auxiliary Boiler	21,891
FWP	24
Emergency Generator	153
NG piping	61
Circuit breakers	111
Total	**2,324,350**

Total Facility Potential CO_2 Emissions

	Annual (tpy)
CTs	1,800,767
Duct Burner	495,672
Fuel Gas Heater	3,332
Auxiliary Boiler	21,869
FWP	24
Emergency Generator	152
NG piping	0.1
Total	**2,321,817**

Total Facility Potential CH_4 Emissions

	Annual (tpy)
CTs	33.40
Duct Burner	9.19
Fuel Gas Heater	0.06
Auxiliary Boiler	0.41
FWP	0.001
Emergency Generator	0.006
NG piping	2.44
Total	**45.5**

Total Facility Potential N_2O Emissions

	Annual (tpy)
CTs	3.34
Duct Burner	0.92
Fuel Gas Heater	0.01
Auxiliary Boiler	0.04
FWP	0.0002
Emergency Generator	0.001
Total	**4.3**

*Maximum heat input across all loads and temperatures
‡40 CFR 75, Appendix G, Equation G-4;
§Mandatory Reporting of Greenhouse Gases, Final Rule; Federal Register Vol. 74, No. 209, October 30, 2009, Table C-2 to Subpart C of Part 98.
¥Based on global warming potential of 1 for CO_2, 25 for CH_4, 298 for N_2O, and 22,800 for SF_6.
£Based on 40 CFR 98, Table W-1a for Eastern United States.
∂Based on natural gas composition of 98-percent CH_4 and 1-percent CO_2.

Table C-16 Annual CO_2e Emission Rate - GE 7HA.02

Annual CO_{2e} Emission Rate Derivation - GE Unit - Natural Gas	Parameter	Units	7HA	
Operating Mode	Ambient Condition Basis	(°F)	59	mid temperature range for plant expected to run all year
	Low Load Definition	(% of Full Load)	30.0%	GE
	Heat Input (Full/Base Load)	MMBtu/hr	4159.7	GE case 13; CT + DB
	Heat Input (Low Load)	MMBtu/hr	1497.2	GE case 18; CT
	Full/Base Load Annual Avg.	(MW_{net})	631.14	GE case 13; CT + DB
	Low Load Annual Avg.	(MW_{net})	204.11	GE case 18
	Full/Base Load Steady State Operation	(% of annual hours)	70%	assumption
	Low Load Steady State Operation	(% of annual hours)	30%	assumption
	Average MWh per MMBtu	MWh/MMBtu	0.14	((Base Load MWnet/Base Load Heat Input)+(Low Load Mwnet/Low Load Heat input)),
Startup - HOT	Start Time to Compliance	(min)	20	HTEC (hot start)
	Start Time to Compliance Load	(min)	20	HTEC (hot start)
	Estimated Power Generated During Start	($MWhs_{net}$)	51	HTEC (hot start) - Heat Input * Average MWh per MMBtu
	Total Starts per Year	(#)	300	assumption - based on Gas only scenario
	Total Time in Start	(min)	6,000	= 20 min x 300
	Total Power Generated in Start	($MWhs_{net}$)	15,348	power output during event x number of events
	Fuel Use: Turning Gear to Low Load	(MMBtu)	355.2	HTEC (hot start)
	Start CO_2 Emissions to 100% Load	(lb/event)	---	
	Estimated Start CO_2 Emissions to Low Load	(lb/event)	41,550	=fuel used (MMBtu) x 53.06 kg/MMBtu x 2.2046 lb/kg
	Estimated Start N_2O Emissions to Low Load	(lb/event)	0.078	=fuel used (MMBtu) x 0.0001 kg/MMBtu x 2.2046 lb/kg
	Estimated Start CH_4 Emissions to Low Load	(lb/event)	0.783	=fuel used (MMBtu) x 0.001 kg/MMBtu x 2.2046 lb/kg
	Estimated Start CO_{2e} Emissions	(tons/yr)	6,239	=((lb CO2/event x 1)+ (lb N2O/event x 298) + (lb CH4/event x 25)) x events/year x ton,
Startup - Warm	Start Time to Compliance	(min)	40	HTEC (warm start)
	Start Time to Compliance Load	(min)	40	HTEC (warm start)
	Estimated Power Generated During Start	($MWhs_{net}$)	149	HTEC (warm start) - Heat Input * Average MWh per MMBtu
	Total Starts per Year	(#)	80	assumption - based on Gas only scenario
	Total Time in Start	(min)	3,200	= 40 min x 80
	Total Power Generated in Start	($MWhs_{net}$)	11,894	power output during event x number of events
	Fuel Use: Turning Gear to Low Load	(MMBtu)	1032.3	HTEC (warm start)
	Start CO_2 Emissions to 100% Load	(lb/event)	---	
	Estimated Start CO_2 Emissions to Low Load	(lb/event)	120,754	=fuel used (MMBtu) x 53.06 kg/MMBtu x 2.2046 lb/kg
	Estimated Start N_2O Emissions to Low Load	(lb/event)	0.228	=fuel used (MMBtu) x 0.0001 kg/MMBtu x 2.2046 lb/kg
	Estimated Start CH_4 Emissions to Low Load	(lb/event)	2.276	=fuel used (MMBtu) x 0.001 kg/MMBtu x 2.2046 lb/kg
	Estimated Start CO_{2e} Emissions	(tons/yr)	4,835	=((lb CO2/event x 1)+ (lb N2O/event x 298) + (lb CH4/event x 25)) x events/year x ton,
Startup - COLD	Start Time to Compliance	(min)	55	HTEC (cold start)
	Start Time to Compliance Load	(min)	55	HTEC (cold start)
	Estimated Power Generated During Start	($MWhs_{net}$)	195	HTEC (cold start) - Heat Input * Average MWh per MMBtu
	Total Starts per Year	(#)	30	assumption - based on Gas only scenario
	Total Time in Start	(min)	1,650	=55 min x 30
	Total Power Generated in Start	($MWhs_{net}$)	5,851	power output during event x number of events
	Fuel Use: Turning Gear to Low Load	(MMBtu)	1354.2	HTEC (cold start)
	Start CO_2 Emissions to 100% Load	(lb/event)	---	
	Estimated Start CO_2 Emissions to Low Load	(lb/event)	158,409	=fuel used (MMBtu) x 53.06 kg/MMBtu x 2.2046 lb/kg
	Estimated Start N_2O Emissions to Low Load	(lb/event)	0.299	=fuel used (MMBtu) x 0.0001 kg/MMBtu x 2.2046 lb/kg
	Estimated Start CH_4 Emissions to Low Load	(lb/event)	2.985	=fuel used (MMBtu) x 0.001 kg/MMBtu x 2.2046 lb/kg
	Estimated Start CO_{2e} Emissions	(tons/yr)	2,379	=((lb CO2/event x 1)+ (lb N2O/event x 298) + (lb CH4/event x 25)) x events/year x ton,
Shutdown	Shutdown Time from Compliance Load	(min)	12.0	HTEC
	Power Generated during Shutdown	($MWhs_{net}$)	22.38	HTEC (Shutdown) - Heat Input * Average MWh per MMBtu
	Total Shutdowns per Year	(#)	410	assumption - based on Gas only scenario
	Total Time in Shutdown	(min)	4,920	=12 min x 410
	Total Power Generated in Shutdown	($MWhs_{net}$)	9,177	
	Fuel Use: Low Load to Turning Gear	(MMBtu)	155	HTEC
	Shutdown CO_2 Emissions (from 100%)	(lb/event)	---	
	Estimated Shutdown CO_2 Emissions from Low Load	(lb/event)	18,178	=fuel used (MMBtu) x 53.06 kg/MMBtu x 2.2046 lb/kg
	Estimated Shutdown N_2O Emissions from Low Load	(lb/event)	0.034	=fuel used (MMBtu) x 0.0001 kg/MMBtu x 2.2046 lb/kg
	Estimated Shutdown CH_4 Emissions from Low Load	(lb/event)	0.343	=fuel used (MMBtu) x 0.001 kg/MMBtu x 2.2046 lb/kg
	Estimated Shutdown CO_{2e} Emissions	(tons/yr)	3,730	=((lb CO2/event x 1)+ (lb N2O/event x 298) + (lb CH4/event x 25)) x events/year x ton,
Steady State (Balance of Hours)	Remaining Time in 8,760 hr Period	(min)	509,830	= (8760 hr/yr * 60 min/hr) - ((Minutes Hot start +Minutes Warm Start+ Minutes Cold Start+Minutes Shutdown))
		(hrs)	8,497	= steady state time (min) x (hr/60 min)
	Generation at Full/Base Load	($MWhs_{net}$)	3,754,022	= Base Load (MW) x Base Load % x Steady State (hr)
	Generation at Low Load	($MWhs_{net}$)	520,319	
	New & Clean Net Heat Rate at Full/Base Load	(Btu/kWh, HHV)	6,591	
	New & Clean Net Heat Rate at Low Load	(Btu/kWh, HHV)	7,335	
	Assumed CO_{2e} Intensity	(lb CO2e/MMBtu)	117.098	Sum of GHG emission Factors (CO + N2O + CH4)
	New & Clean CO_{2e} Emission Rate at Full/Base Load	(lb/MWh)	772	= Base Load (MMBtu/kWh) x 117.098 lb CO2e/MMBtu
	New & Clean CO_{2e} Emission Rate at Low Load	(lb/MWh)	859	= Min Load (MMBtu/kWh) x 117.098 lb CO2e/MMBtu
	New & Clean Blended Load Steady State Emissions	(tons/yr)	1,672,082	= [Base (MWhs) x (lb/mWh) + Min (MWhr) x (lb/MWh)] x (ton/2,000 lb)
Annual (8,760 hrs) Average Emission Rate Basis	New and Clean	(tons/yr)	1,689,265	Steady State CO2e + Startup CO2e + Shutdown CO2e
		(lb/hr avg)	385,677	= CO2e (ton/yr) x (yr/8,760 hr) x (2,000 lb/ton)
		(MMBtu)	28,852,155	MMBtu for steady state (Full Load & Low Load), startup, and shutdown
		(MWhs)	4,316,612	MWh for steady state (Full Load & Low Load), startup, and shutdown
		(Btu/kWh, HHV)	6,684	= (Annual MMBtu / Annual MWhs) * 1,000
		(lb CO_{2e}/MWh_{net})	**783**	= CO2e (ton/yr) x (2,000 lb/ton) / (Annual MWh)
	CT/HRSG efficiency losses due to degradation prior to CT/HRSG overhaul.	**%**	**6.0**	EPA
	auxiliary plant equipment losses due to degradation over time.	**%**	**3.0**	EPA
	potential difference between the calculated plant heat rate and the actual tested plant heat rate.	**%**	**3.3**	EPA
	Margined	(tons/yr)	1,689,265	New and Clean tons/yr
		(lb/hr avg)	385,677	= CO2e (ton/yr) x (yr/8,760 hr) x (2,000 lb/ton)
		(MMBtu)	28,852,155	MMBtu for steady state, startup, and shutdown
		(MWhs)	3,843,822	margined MWh for steady state, startup, and shutdown
		(Btu/kWh, HHV)	**7,506**	= (margined Annual MMBtu / Annual MWhs) * 1,000
		(lb CO_{2e}/MWhnet)	**879**	= margined CO2e (ton/yr) x (2,000 lb/ton) / (Annual MWh)

APPENDIX D

RBLC DATABASE SEARCH RESULTS

Table D-1. RBLC NOx Summary for Combined Cycle Natural Gas Fired CTs

RBLC ID	FACILITY NAME	PERMIT DATES ISSUANCE	UPDATE	PROCESS DESCRIPTION	THROUGHPUT		CONTROL METHOD DESCRIPTION	EMISSION LIMITS		BASIS
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT I	154	MW	SCR	2	PPMVD	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUC	154	MW	SCR	2	PPMVD	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT I	154	MW	SCR	2	PPMVD	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUC	154	MW	SCR	2	PPMVD	BACT-PSD
CA-1144	BLYTHE ENERGY PROJECT II	4/25/2007	3/17/2008	2 COMBUSTION TURBINES	170	MW	SELECTIVE CATALYTIC REDUCTION	2	PPMVD	BACT-PSD
CA-1177	OTAY MESA ENERGY CENTER LLC	7/22/2009	9/12/2011	Gas turbine combined cycle	171.7	MW	SCR	2	PPMVD@1!	OTHER CASE
CA-1178	APPLIED ENERGY LLC	3/20/2009	4/11/2011	Gas turbine combined cycle	0		SCR	2	PPM	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT I	180	MW	SCR, DRY LOW NOX COMBUSTORS	2	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUC	180	MW	SCR, DRY LOW NOX COMBUSTORS	2	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT I	180	MW	SCR, DRY LOW NOX COMBUSTORS	2	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUC	180	MW	SCR, DRY LOW NOX COMBUSTORS	2	PPMVD	BACT-PSD
CA-1211	COLUSA GENERATING STATION	3/11/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	172	MW	DRY LOW NOX BURNERS (LNB), SELECTI	2	PPMVD	BACT-PSD
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	154	MW	DRY LOW NOX (DLN) COMBUSTORS, SEI	2	PPMVD	BACT-PSD
CA-1213	MOUNTAINVIEW POWER COMPANY LLC	4/21/2006	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	175.7	MW EA.	1991 MMBTU/HR DRY LOW NOX COMB	2	PPMVD	BACT-PSD
FL-0263	FPL TURKEY POINT POWER PLANT	2/8/2005	1/12/2006	170 MW COMBUSTION TURBINE, 4 UNITS	170	MW	NOX EMISSIONS WILL BE REDUCED WIT	2	PPM	BACT-PSD
FL-0265	HINES POWER BLOCK 4	6/8/2005	1/12/2006	COMBINED CYCLE TURBINE	530	MW	SCR	2	PPMVD@ 1	BACT-PSD
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	7/30/2008	1/5/2011	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMENTAF	2333	MMBTU/H	SELECTIVE CATALYST REDUCTION	2	PPMVD @1	BACT-PSD
FL-0304	CANE ISLAND POWER PARK	9/8/2008	4/20/2009	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860	MMBTU/H	SCR	2	PPMVD (GA	BACT-PSD
FL-0337	POLK POWER STATION	10/14/2012	11/7/2014	Combine cycle power block (4 on 1)	1160	MW	SCR/DLN	2	PPMVD	BACT-PSD
GA-0138	LIVE OAKS POWER PLANT	4/8/2010	9/10/2010	COMBINED CYCLE COMBUSTION TURBINE - ELECTRIC GENER/	600	MW	DRY LOW NOx BURNERS, SELECTIVE CA	2	PPMVD @1	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #2 -combined cycle	2258	mmBtu/hr	SCR, Low-NOx burner	2	PPM	BACT-PSD
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	10/5/2010	COMBUSTION TURBINE, COMBINED CYCLE W/ DUCT BURNEF	2375.28	MMBTU/H	(SCR),	2	PPM	BACT-PSD
*IL-0112	NELSON ENERGY CENTER	12/28/2010	4/3/2015	Electric Generation Facility	220	MW each	SCR and Low-NOx Combustors	2	PPMVD	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TUF	2300	MMBTU/H		2	PPMVD	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine gener	2237	MMBTU/H	Dry low NOx (DLN) burner and selective	2	PPM	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine gener	2486	MMBTU/H	Dry low NOx (DLN) burners and selectiv	2	PPM	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine without Duct Burner	20282	MMCF/YR	Selective Catalytic Reduction System (S(	2	PPMVD@1!	LAER
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG AN	306	MW	SELECTIVE CATALYTIC REDUCTION WITI	2	PPM @ 15%	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG AN	306	MW	SELECTIVE CATALYST REDUCTION W/ AI	2	PPM @ 15%	BACT-PSD
NY-0095	CAITHNES BELLPORT ENERGY CENTER	5/10/2006	5/8/2008	COMBUSTION TURBINE	2221	MMBUT/H	SCR	2	PPMVD@1!	BACT-PSD
NY-0098	ATHENS GENERATING PLANT	1/19/2007	8/12/2008	FUEL COMBUSTION (GAS)	3100	MMBTU/H	THE TURBINES EMPLOY DRY LOW NOX	2	PPMVD @ 1	LAER
NY-0100	EMPIRE POWER PLANT	6/23/2005	8/12/2008	FUEL COMBUSTION (NATURAL GAS)	2099	MMBTU/H	DRY LOW NOX COMBUSTION TECHNOL	2	PPMVD AT	LAER
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, without du	515600	F/rolling 12-r	selective catalytic reduction (SCR); dry l	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, with duct b	51560	SCF/rolling 12	selective catalytic reduction (SCR); dry l	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, without	47917	SCF/rolling 12	selective catalytic reduction (SCR); dry l	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, with duc	47917	SCF/rolling 12	selective catalytic reduction (SCR); dry l	2	PPM	BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	1/23/2009	2/18/2010	COMBINED CYCLE COGENERATION >25MW	1882	MMBTU/H	SCR AND DRY LOW-NOX	2	PPM	BACT-PSD
OR-0041	WANAPA ENERGY CENTER	8/8/2005	8/18/2008	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENI	2384.1	MMBTU/H	DRY LOW-NOX BURNERS AND SCR.	2	PPMDV @ 1	BACT-PSD
OR-0048	CARTY PLANT	12/29/2010	8/30/2011	COMBINED CYCLE NATURAL GAS-FIRED ELECTRIC GENERATIN	2866	MMBTU/H	SELECTIVE CATALYTIC REDUCTION (SCR	2	PPM@15%(	BACT-PSD
*OR-0050	TROUTDALE ENERGY CENTER, LLC	3/5/2014	1/6/2015	Mitsubishi M501-GAC combustion turbine, combined cycle co	2988	MMBtu/hr	combusting natural gas;	2	PPMDV AT	BACT-PSD
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	4/3/2015	Combined-cycle Turbines (2) - Natural gas fired	3277	MMBTU/H	Dry low-NOx (DLN) combustor and sele	2	PPMVD	BACT-PSD
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENERATION PL	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0		SCR	2	PPMDV	BACT-PSD
*PA-0291	HICKORY RUN ENERGY STATION	4/23/2013	8/16/2013	COMBINED CYCLE UNITS #1 and #2	3.4	MMCF/HR	SCR	2	PPMVD @ 1	OTHER CASE
TX-0546	PATTILLO BRANCH POWER PLANT	6/17/2009	11/6/2009	ELECTRICITY GENERATION	350	MW	SELECTIVE CATALYTIC REDUCTION	2	PPMVD	BACT-PSD
TX-0547	NATURAL GAS-FIRED POWER GENERATION FA	6/22/2009	11/6/2009	ELECTRICITY GENERATION	250	MW	SELECTIVE CATALYTIC REDUCTION	2	PPMVD	BACT-PSD
TX-0548	MADISON BELL ENERGY CENTER	8/18/2009	11/6/2009	ELECTRICITY GENERATION	275	MW	SELECTIVE CATALYTIC REDUCTION	2	PPMVD	BACT-PSD
TX-0590	KING POWER STATION	8/5/2010	9/14/2011	Turbine	1350	MW	DLN burners and SCR	2	PPMVD AT	LAER
TX-0600	THOMAS C. FERGUSON POWER PLANT	9/1/2011	9/14/2011	Natural gas-fired turbines	390	MW	Dry low NOx burners and Selective Cata	2	PPMVD	BACT-PSD
TX-0618	CHANNEL ENERGY CENTER LLC	10/15/2012	1/6/2014	Combined Cycle Turbine	180	MW	Selective catalytic reduction	2	PPMVD	LAER

TX-0619	DEER PARK ENERGY CENTER	9/26/2012	9/25/2013	Combined Cycle Turbine	180	MW	Selective Catalytic Reduction	2	PPMVD	LAER
TX-0620	ES JOSLIN POWER PLANT	9/12/2012	9/25/2013	Combined cycle gas turbine	195	MW	Selective catalytic reduction	2	PPMVD	BACT-PSD
*TX-0641	PINECREST ENERGY CENTER	11/12/2013	11/21/2013	combined cycle turbine	700	MW	selective catalytic reduction	2	PPMVD	BACT-PSD
*TX-0660	FGE TEXAS POWER I AND FGE TEXAS POWER II	3/24/2014	6/13/2014	Alstom Turbine	230.7	MW	Selective catalytic reduction	2	PPMVD	BACT-PSD
*TX-0678	FREEPORT LNG PRETREATMENT FACILITY	7/16/2014	3/13/2015	Combustion Turbine	87	MW	Selective Catalytic Reduction	2	PPMVD	BACT-PSD
*TX-0689	CEDAR BAYOU ELECTRIC GENERATION STATIO	8/29/2014	3/20/2015	Combined cycle natural gas turbines	225	MW	DLN, SCR	2	PPM	BACT-PSD
*TX-0708	LA PALOMA ENERGY CENTER	2/7/2013	3/20/2015	(2) combined cycle turbines	650	MW	Selective Catalytic Reduction	2	PPMVD	BACT-PSD
*TX-0709	SAND HILL ENERGY CENTER	9/13/2013	3/20/2015	Natural gas-fired combined cycle turbines	173.9	MW	SCR	2	PPM	BACT-PSD
*TX-0710	VICTORIA POWER STATION	12/1/2014	3/20/2015	combined cycle turbine	197	MW	Selective Catalytic Reduction	2	PPMVD	BACT-PSD
*TX-0712	TRINIDAD GENERATING FACILITY	11/20/2014	3/20/2015	combined cycle turbine	497	MW	Selective Catalytic Reduction	2	PPMVD	BACT-PSD
*TX-0713	TENASKA BROWNSVILLE GENERATING STATIO	4/29/2014	3/20/2015	(2) combined cycle turbines	274	MW	Selective Catalytic Reduction	2	PPMVD	BACT-PSD
*TX-0714	S R BERTRON ELECTRIC GENERATING STATION	12/19/2014	3/20/2015	(2) combined cycle turbines	240	MW	Selective Catalytic Reduction	2	PPMVD	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	4/1/2015	4/15/2015	Combined-cycle gas turbine electric generating facility	1100	MW	SCR and oxidation catalyst	2	PPMVD @ 1	BACT-PSD
VA-0315	WARREN COUNTY POWER PLANT - DOMINION	12/17/2010	3/30/2015	COMBINED CYCLE TURBINE & DUCT BURNER, 3	2996	MMBTU/H	Two-stage, lean pre-mix dry low-NOx cc	2	PPMVD@15	BACT-PSD
*VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442	MMBTU/H	Selective catalytic reduction and ultra lc	2	PPMVD @ 1	BACT-PSD
*WV-0025	MOUNDSVILLE COMBINED CYCLE POWER PLAI	11/21/2014	1/6/2015	Combined Cycle Turbine/Duct Burner	2159	mmBtu/Hr	SCR & Dry Low-NOx Burners	2	PPM	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	1/10/2007	3/3/2009	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNITS	2333	MMBTU/H	WATER INJECTION	2	PPMVD @1	BACT-PSD
NJ-0074	WEST DEPTFORD ENERGY	5/6/2009	1/7/2015	TURBINE, COMBINED CYCLE	17298	MMFT3/YR	SELECTIVE CATALYTIC REDUCTION (SCR	2	PPMVD@15	LAER
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282	MMCF/YR	Selective Catalytic reduction (SCR) and u	2	PPMVD@15	LAER
CA-1195	ELK HILLS POWER LLC	1/12/2006	1/14/2014	COMBUSTION TURBINE GENERATOR, 2 units (Normal Operat	166	MW	SCR OR SCONOX, DRY LOW NOX COMBU	2.5	PPMVD	BACT-PSD
CA-1209	HIGH DESERT POWER PROJECT	3/11/2010	1/15/2014	COMBUSTION TURBINE GENERATORS (NORMAL OPERATION	190	MW	DRY LOW NOX BURNERS (LNB), SELECTI	2.5	PPMVD	BACT-PSD
FL-0285	PROGRESS BARTOW POWER PLANT	1/26/2007	6/12/2008	COMBINED CYCLE COMBUSTION TURBINE SYSTEM (4-ON-1)	1972	MMBTU/H	WATER INJECTION	2.5	PPM	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #1 - combined cycle	2258	mmBtu/hr	Low-NOx burners and SCR	2.5	PPM@15%(	BACT-PSD
MI-0366	BERRIEN ENERGY, LLC	4/13/2005	1/4/2006	3 COMBUSTION TURBINES AND DUCT BURNERS	1584	MMBTU/H	DRY LOW NOX BURNERS AND SELECTIV	2.5	PPMDV @ 1	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3	MMBTU/H	SELECTIVE CATALYTIC ?	2.5	PPM @ 15%	BACT-PSD
WA-0328	BP CHERRY POINT COGENERATION PROJECT	1/11/2005	8/14/2007	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY STEA	174	MW	LEAN PRE-MIX DRY LOW-NOX BURNERS	2.5	PPMDV	BACT-PSD
*DE-0023	NRG ENERGY CENTER DOVER	10/31/2012	1/28/2014	UNIT 2- KD1	655	MMBTU/H	Selective Catalytic Reduction	2.5	PPM	OTHER CASE
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	5/2/2006	5/8/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300	MW	LOW NOX BURNERS AND SCR	3	PPM @ 15%	BACT-PSD
*CO-0073	PUEBLO AIRPORT GENERATING STATION	7/22/2010	10/3/2014	Four combined cycle combution turbines	373	mmbtu/hr	Dry Low NOx (DLN) Combustor and Sele	3	PPMVD AT	BACT-PSD
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	2587	H heat input,	Low NOx burners and selective catalytic	3	PPMV	BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5T	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct l	647	/H for each C	SCR with DLNB (selective catalytic reduc	3	PPM	BACT-PSD
MN-0071	FAIRBAULT ENERGY PARK	6/5/2007	5/29/2008	COMBINED CYCLE COMBUSTION TURBINE W/DUCT BURNER	1758	MMBTU/H	DRY LOW NOX COMBUSTION FOR NG; \	3	PPMVD	BACT-PSD
NY-0100	EMPIRE POWER PLANT	6/23/2005	8/12/2008	FUEL COMBUSTION (NATURAL GAS) DUCT BURNING	646	MMBTU/H	DRY LOW NOX COMBUSTION TECHNOL	3	PPMVD AT	LAER
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners Off	172	MW	Dry Low NOx burners and Selective Cata	3	PPM	BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners On	172	MW	Dry Low NOx burners and Selective Cata	3	PPM	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	8/28/2012	8/27/2012	Combined Cycle Turbine (EP01)	40	MW	SCR	3	PPMV AT 1	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	8/28/2012	8/27/2012	Combined Cycle Turbine (EP02)	40	MW	SCR	3	PPMV AT 1	BACT-PSD
LA-0192	CRESCENT CITY POWER	6/6/2005	4/8/2008	GAS TURBINES - 187 MW (2)	2006	MMBTU/H	LOW NOX BURNERS AND SELECTIVE CA	3	PPM	BACT-PSD
OK-0115	LAWTON ENERGY COGEN FACILITY	12/12/2006	3/13/2007	COMBUSTION TURBINE AND DUCT BURNER			SCR W/ DRY LOW NOX BURNERS AND D	3.5	PPMVD	BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	3/20/2008	5/18/2012	TWO COMBINED CYCLE GAS TURBINES	2110	MMBTU/H	LOW NOX TURBINES, DUCT BURNERS C	4	PPMVD@15	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TUI	2300	MMBTU/H	SELECTIVE CATALYTIC REDUCTION AND	4.5	PPMVD @ 1	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	12/20/2010	3/27/2012	GE LM6000PF-25 Turbines (4)	59900	hp ISO	Selective Catalytic Reduction and Dry Lc	5	PPMDV	BACT-PSD
AK-0073	INTERNATIONAL STATION POWER PLANT	12/20/2010	1/8/2014	Fuel Combustion	59900	HP	Turbines EU IDs 5 through 8 shall be eq	5	PPM	BACT-PSD
*TX-0698	BAYPORT COMPLEX	9/5/2013	3/19/2015	(4) cogeneration turbines	90	MW	DLN and Closed Loop Emissions Control	5	PPMVD	BACT-PSD
DE-0024	GARRISON ENERGY CENTER	1/30/2013	1/28/2014	Unit 1	2260	million BTUs	Low NOx Combustors, Selective Catalyti	6	PPM	LAER
*MI-0402	SUMPTER POWER PLANT	11/17/2011	12/16/2013	Combined cycle combustion turbine w/ HRSG	130	' electrical ou	Low NOx burners	9	PPM	BACT-PSD
OK-0117	PSO SOUTHWESTERN POWER PLT	2/9/2007	5/21/2007	GAS-FIRED TURBINES			DRY LOW NOX	9	PPM	BACT-PSD
*TX-0672	CORPUS CHRISTI LIQUEFACTION PLANT	9/12/2014	3/13/2015	Refrigeration compressor turbines	40000	hp	dry low emission combustors	25	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #1 (STARTUP & SHUTDOWN PEI	180	MW	SCR, DRY LOW NOX COMBUSTORS			BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #2 (STARTUP & SHUTDOWN PEI	180	MW	SCR, DRY LOW NOX COMBUSTORS			BACT-PSD
*CO-0076	PUEBLO AIRPORT GENERATING STATION	12/11/2014	12/31/2014	Four combined cycle combution turbines	373	ımbtu/hr eac	SCR and dry low NOx burners			BACT-PSD
CT-0151	KLEEN ENERGY SYSTEMS, LLC	2/25/2008	4/10/2012	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (N/	2.1	MMCF/H	LOW NOX BURNER AND SELECTIVE CAT			LAER
LA-0224	ARSENAL HILL POWER PLANT	3/20/2008	5/18/2012	SCN-4 HOT STARTUP CTG-1 SCN-8 HOT STARTUP CTG-2	2110	MMBTU/H	COMPLETE EVENTS AS QUICKLY AS POS			BACT-PSD
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB: 4 nat gas fired CTG with DB for HRSG: Star	2587	design heat	Low NOx burners and selective catalytic			BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5T	12/4/2013	9/5/2014	FG-CTGHRSG: Startup & Shutdown	647	/H for each C	SCR with DLNB (selective catalytic reduc			BACT-PSD

TX-0497	INEOS CHOCOLATE BAYOU FACILITY	8/29/2006	10/2/2007	COGENERATION TRAIN 2 AND 3 (TURBINE AND DUCT BURNE	35	MW	BP AMOCO PROPOSES TO USE SCR TO C	BACT-PSD
TX-0502	NACOGDOCHES POWER STERNE GENERATING	6/5/2006	4/28/2009	WESTINGHOUSE/SIEMENS MODEL SW501F GAS TURBINE W,	190	MW	STEAG POWER LLC IS PROPOSING THE U	BACT-PSD
TX-0542	PEARSALL POWER PLANT	1/23/2009	11/6/2009	ELECTRICAL GENERATION	8.44	MW	SELECTIVE CATALYTIC REDUCTION	BACT-PSD
*VA-0322	GREEN ENERGY PARTNERS/ STONEWALL, LLC	4/30/2013	1/6/2015	Large combustion turbines (>25MW) CCT1 and CCT2	2.23	MMBTU/hr	Selective Catalytic Reduction (SCR), with	LAER
TX-0516	CITY PUBLIC SERVICE JK SPRUCE ELECTRICE GE	12/28/2005	11/20/2007	SPRUCE POWER GENERATOR UNIT NO 2				BACT-PSD
LA-0136	PLAQUEMINE COGENERATION FACILITY	7/23/2008	4/28/2009	(4) GAS TURBINES/DUCT BURNERS	2876	MMBTU/H	CATALYTIC	BACT-PSD
LA-0257	SABINE PASS LNG TERMINAL	12/6/2011	5/11/2012	Combined Cycle Refrigeration Compressor Turbines (8)	286	MMBTU/H	water injection	BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAU	12/17/2013	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046	MMBtu/hr	SCR	BACT-PSD
*PA-0298	FUTURE POWER PA/GOOD SPRINGS NGCC FAC	3/4/2014	5/5/2015	Turbine, COMBINED CYCLE UNIT (Siemens 5000)	2267	MMBtu/hr	SCR	BACT-PSD

Table D-2. RBLC NOx Summary for Commercial/Institutional Sized Boilers and Furnaces

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE _DATE	DATE_LAST_ UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION _LIMIT	UNIT	EMISSION_LIMIT_1_AVG _TIME_CONDITION	BASIS
SC-0113	PYRAMAX CERAMICS, LLC	SC	0160-0023	02/08/2012 ACT	10/17/2012	BOILERS	5	MMBTU/H	GOOD DESIGN AND COMBUSTION PRACTICES, LOW NOX BURNERS, COMBUSTION OF NATURAL GAS/PROPANE.	0			BACT-PSD
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	SMALL BOILERS & HEATERS(<100 MMBTU/H)	99	MMBTU/H		0.0035	LB/MMBTU	3 HOUR AVERAGE	BACT-PSD
*OK-0156	NORTHSTAR AGRI IND ENID	OK	2013-0109-C PSD	07/31/2013 ACT	12/6/2016	Refinery Boiler	5	MMBTUH	Good Combustion	0.0075	LB/MMBTU	3-HOUR AVG	N/A
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Three (3) Package Boilers	243	MMBTU/H	Ultra Low NOx Burners	0.01	LB/MMBTU	30-DAY AVERAGE	BACT-PSD
LA-0229	SHINTECH PLAQUEMINE PLANT 2	LA	PSD-LA-731	07/10/2008 ACT	4/20/2009	EQT112, EQT113 - TWO UTIL. BOILERS (2U-1, 2U-2)	250	MMBTU/H	LOW NOX BURNERS (LNB) IN COMBINATION WITH SELECTIVE CATALYTIC REDUCTION (SCR)	0.01	LB/MMBTU	30 DAY ROLLING AVERAGE	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.01	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS, ULTRA LOW-NOX BURNERS, AND GOOD COMBUSTION PRACTICES	0.01	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0046	KEYS ENERGY CENTER	MD	PSC CASE NO. 9297	10/31/2014 ACT	5/13/2016	AUXILIARY BOILER	93	MMBTU/H	EFFICIENT BOILER DESIGN WITH ULTRA LOW NOX BURNER, EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS, AND APPLICATION OF GOOD COMBUSTION PRACTICES	0.01	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Boiler	950	MMBTU/H	SCR	0.01	LB/MMBTU		BACT-PSD
TX-0751	EAGLE MOUNTAIN STEAM ELECTRIC STATION	TX	117026, PSDTX1390, N194	06/18/2015 ACT	7/6/2016	Commercial/Institutional Size Boilers (<100 MMBtu) â€" natural gas	73.3	MMBTU/H		0.01	MMBTU/H	ROLLING 3-HR AVERAGE	LAER
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP26	24	MMBTU/H	LOW NOX BURNER	0.0108	LB/MMBTU		BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC026, CC027 AND CC028 AT CITY CENTER	44	MMBTU/H	LOW NOX BURNER AND GOOD COMBUSTION PRACTICES	0.0109	LB/MMBTU		Other Case-by-Case
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	MA	NE-12-022	01/30/2014 ACT	5/5/2016	Auxiliary Boiler	80	MMBTU/H	ultra low NOx burners	0.011	LB/MMBTU	1 HR BLOCK AVG, DOES NOT APPLY DURING SS	LAER
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H	LOW NOX WITH FGR	0.011	LB/MMBTU	3-HR AVERAGE	BACT-PSD
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	AUXILLARY BOILER	93	MMBTU/H	EXCLUSIVE USE OF NATURAL GAS, ULTRA LOW-NOX BURNERS, AND FLUE GAS RECIRCULATION (FGR)	0.011	LB/MMBTU	3-HOUR AVERAGE	LAER
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC001, CC002, AND CC003 AT CITY CENTER	41.64	MMBTU/H	LOW NOX BURNER AND FLUE GAS RECIRCULATION	0.011	LB/MMBTU		Other Case-by-Case
PA-0291	HICKORY RUN ENERGY STATION	PA	37-337A	04/23/2013 ACT	5/27/2016	AUXILIARY BOILER	40	MMBTU/H		0.011	LB/MMBTU		OTHER CASE-BY-CASE
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	118901, GHGPSDTX108 AND PSDTX1	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	95.7	MMBTU/H	Low NOx burners and flue gas recirculation	0.011	LB/MMBTU		BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	BOILERS C & D (U-3 & U-4)	250	MMBTU/H	LOW NOX BURNERS AND FLUE GAS RECIRCULATION	0.012	LB/MMBTU	24-H ROLLING AV BASED ON A 1-H AV	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS BE102 THRU BE105 AT BELLAGIO	2	MMBTU/H	LOW-NOX BURNER AND GOOD COMBUSTION PRACTICES	0.0123	LB/MMBTU		Other Case-by-Case
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	auxiliary boiler	60.1	mmBtu/hr		0.013	LB/MMBTU	AVERAGE OF 3 ONE-HOUR TEST RUNS	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT MB090 AT MANDALAY BAY	4.3	MMBTU/H	ULTRA-LOW NOX BURNER AND FLUE GAS RECIRCULATION	0.014	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC004, CC005, AND CC006 AT CITY CENTER	4.2	MMBTU/H	LOW-NOX BURNER AND FLUE GAS RECIRCULATION	0.0143	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT HA08	8.37	MMBTU/H	EQUIPPED WITH A LOW-NOX BURNER	0.0146	LB/MMBTU		BACT-PSD
DE-0020	VALERO DELAWARE CITY REFINERY	DE	AQM-003/00016	02/26/2010 ACT	8/2/2010	PACKAGE BOILERS (2009)	99.9	MMBtu per hour	SCR AND LOW NOX BURNERS	0.015	LB/MMBTU		RACT
DE-0020	VALERO DELAWARE CITY REFINERY	DE	AQM-003/00016	02/26/2010 ACT	8/2/2010	DCPP BOILER 1	618	MMBTU/H	SCR WITH MODIFICATIONS TO EXISTING BURNERS AND AIR DISTRIBUTION TO BURNERS, OPTIMIZATION TO OVER-FIRE AIR SYSTEMS, INSTALLATION OF INDUCED FLUE GAS RECIRCULATION SYSTEMS, AND OTHER IMPROVEMENTS.	0.015	LB/MMBTU	24-HOUR ROLLING AVERAGE	BACT-PSD
DE-0020	VALERO DELAWARE CITY REFINERY	DE	AQM-003/00016	02/26/2010 ACT	8/2/2010	DCPP BOILER 3	618	MMBTU/H	SCR WITH MODIFICATIONS TO EXISTING BURNERS AND AIR DISTRIBUTION TO BURNERS, OPTIMIZATION TO OVER-FIRE AIR SYSTEMS, INSTALLATION OF INDUCED FLUE GAS RECIRCULATION SYSTEMS AND OTHER IMPROVEMENTS.	0.015	LB/MMBTU	24-HOUR ROLLING AVERAGE	BACT-PSD
*WY-0075	CHEYENNE PRAIRIE GENERATING STATION	WY	MD-16173	07/16/2014 ACT	6/16/2014	Auxiliary Boiler	25.06	MMBtu/h	Ultra low NOx burners and flue gas recirculation	0.0175	LB/MMBTU	3 HOUR AVERAGE	BACT-PSD
DE-0020	VALERO DELAWARE CITY REFINERY	DE	AQM-003/00016	02/26/2010 ACT	8/2/2010	PACKAGE BOILERS (2004)	216	MMBtu per hour		0.02	LB/MMBTU	3-HR AVERAGE	RACT
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	IA	57-01-080	06/29/2007 ACT	10/9/2007	NATURAL GAS BOILER (292.5 MMBTU/H)	292.5	MMBTU/H	ADVANCED ULTRA LOW NOX BURNERS WITH FLUE GAS RECIRCULATIONS AND GOOD COMBUSTION PRACTICES.	0.02	LB/MMBTU	30-DAY ROLLING AVERAGE/ EXCEPT SSM	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT BE111 AT BELLAGIO	2.1	MMBTU/H	LOW NOX BURNER	0.024	MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS NY42, NY43, AND NY44 AT NEW YORK - NEW YORK	2	MMBTU/H	LOW NOX BURNER AND GOOD COMBUSTION PRACTICES	0.025	LB/MMBTU		Other Case-by-Case
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			LOW-NOX BURNER AND FLUE GAS RECIRCULATION	0.03	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA01	16.8	MMBTU/H	LOW-NOX BURNER AND BLUE GAS RECIRCULATION	0.03	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA03	31.38	MMBTU/H	LOW-NOX BURNER	0.0306	LB/MMBTU		BACT-PSD
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	141-31003-00579	12/03/2012 ACT	5/4/2016	TWO (2) NATURAL GAS AUXILIARY BOILERS	80	MMBTU/H	LOW NOX BURNER WITH FLUE GAS RECIRCULATION	0.032	LB/MMBTU	3 HOURS	BACT-PSD
NH-0015	CONCORD STEAM CORPORATION	NH	TP-0014	02/27/2009 ACT	1/23/2014	BOILER 3 (AUXILIARY)	76.8	MMBTU/H	LOW NOX BURNERS, FLUE GAS RECIRCULATION, AND LESS THAN 700 HOURS OF OPERATION PER CONSECUTIVE 12 MONTH PERIOD.	0.032	LB/MMBTU	AVERAGE OF 3 1-HOUR TEST RUNS	LAER
NH-0015	CONCORD STEAM CORPORATION	NH	TP-0014	02/27/2009 ACT	1/23/2014	BOILER 2 (AUXILIARY)	76.8	MMBTU/H	LOW NOX BURNERS, FLUE GAS RECIRCULATION, AND LESS THAN 700 HOURS OPERATION PER CONSECUTIVE 12 MONTH PERIOD.	0.032	LB/MMBTU	AVERAGE OF 3 1-HOUR TEST RUNS	LAER
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	3 NATURAL GAS-FIRED BOILERS WITH ULNB & EGR (537-539)	64.9	MMBTU each	ULNB & EGR (ULTRA-LOW NOX BURNERS (ULNB)(EXHAUST GAS RECIRCULATION (EGR) Â¿ SAME FLUE GAS RECIRCULATION (FGR)	0.035	LB/MMBTU		BACT-PSD
AL-0231	NUCOR DECATUR LLC	AL	712-0037	06/12/2007 ACT	8/31/2009	VACUUM DEGASSER BOILER	95	MMBTU/H	ULTRA LOW NOX BURNERS	0.035	LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, VACUUM DEGASSER	51.2	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE LOW NOX BURNERS	0.035	LB/MMBTU	3 HR	BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, PICKLE LINE	67	MMBTU/H	LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.035	LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILERS SN-26 AND 27, GALVANIZING LINE	24.5	MMBTU/H	LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.035	LB/MMBTU		BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	FG-AUXBOILER1-2; Two (2) natural gas-fired auxiliary boilers.	40	MMBTU/H	Good combustion practices.	0.035	LB/MMBTU	TEST PROTOCOL; EACH UNIT.	BACT-PSD
NV-0044	HARRAH'S OPERATING COMPANY, INC.	NV	257	01/04/2007 ACT	4/26/2007	COMMERCIAL/INSTITUTIONAL-SIZE BOILERS	35.4	MMBTU/H	LOW-NOX BURNER AND FLUE GAS RECIRCULATION	0.035	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP01	35.4	MMBTU/H	LOW NOX BURNER	0.035	LB/MMBTU		BACT-PSD
OR-0050	TROUTDALE ENERGY CENTER, LLC	OR	26-0235	03/05/2014 ACT	5/5/2016	Auxiliary boiler	39.8	MMBTU/H	Utilize Low-NOx burners and FGR.	0.035	LB/MMBTU	3-HR BLOCK AVERAGE	BACT-PSD
SC-0112	NUCOR STEEL - BERKELEY	SC	0420-0060-DO	05/05/2008 ACT	10/30/2013	VACUUM DEGASSER BOILER	50.21	MMBTU/H	ULTRA-LOW NOX NATURAL GAS FIRED BURNERS	0.035	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT FL01	14.34	MMBTU/H	LOW NOX BURNER AND FLUE GAS RECIRCULATION	0.0353	LB/MMBTU		BACT-PSD
FL-0335	SUWANNEE MILL	FL	1210468-001-AC(PSD-FL-417)	09/05/2012 ACT	5/30/2013	Four(4) Natural Gas Boilers - 46 MMBtu/hour	46	MMBTU/H	Low NOx Burner and Flue Gas Recirculation	0.036	LB/MMBTU		BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.036	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.036	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.036	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.036	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
TX-0714	S R BERTRON ELECTRIC GENERATING STATION	TX	102731 PSDTX1294	12/19/2014 ACT	5/9/2016	boiler	80	MMBTU/H	low-NOx burners	0.036	LB/MMBTU	3-HR ROLLING	BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	118901, GHGPSDTX108 AND PSDTX1	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	40	MMBTU/H	Low NOx burners	0.036	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT PA15	21	MMBTU/H	LOW NOX BURNER	0.0366	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP03	33.48	MMBTU/H	LOW NOX BURNER	0.0367	LB/MMBTU		BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	BOILERS A & B (U-1 & U-2)	250	MMBTU/H	LOW NOX BURNERS AND FLUE GAS RECIRCULATION	0.04	LB/MMBTU	24-H ROLLING AVG BASED ON A 1-H AVG	BACT-PSD
LA-0246	ST. CHARLES REFINERY	LA	PSD-LA-619(M6)	12/31/2010 ACT	7/6/2011	EQT0323 - Boiler 401F	99	MMBTU/H	Ultra low NOX burners and/or CSR	0.04	LB/MMBTU		BACT-PSD
*OK-0148	BUFFALO CREEK PROCESSING PLANT	OK	2012-1026-C PSD	09/12/2012 ACT	9/16/2016	Commercial/Institutional Boilers (<100 MMBTUH)	11.04	MMBTUH	Low-NOx burners	0.045	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT IP04	16.7	MMBTU/H	LOW NOX BURNER	0.049	LB/MMBTU		BACT-PSD

FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	PSD-FL-354 AND 0990646-001-AC	01/10/2007 ACT	3/3/2009	TWO 99.8 MMBTU/H GAS-FUELED AUXILIARY BOILERS	99.8	MMBTU/H		0.05	LB/MMBTU		BACT-PSD
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	FL	0930117-001-AC	03/09/2016 ACT	7/6/2016	Auxiliary Boiler, 99.8 MMBtu/hr	99.8	MMBtu/hr	Low-NOx burners	0.05	LB/MMBTU		BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	ЗTU/H heat input	Low NOx burners and flue gas recirculation.	0.05	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler B (EUAUXBOILERB)	95	MMBTU/H	Dry low NOx burners, flue gas recirculation and good combustion practices.	0.05	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler A (EUAUXBOILERA)	55	MMBTU/H	Low NOx burners and good combustion practices	0.05	LB/MMBTU	TEST PROTOCOL	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	AUXILIARY BOILER	66	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
OH-0350	REPUBLIC STEEL	OH	P0109191	07/18/2012 ACT	5/4/2016	Steam Boiler	65	MMBtu/H		0.07	LB/MMBTU		N/A
OK-0129	CHOUTEAU POWER PLANT	OK	2007-115-C(M-1)PSD	01/23/2009 ACT	2/18/2010	AUXILIARY BOILER	33.5	MMBTU/H	LOW-NOX BURNERS	0.07	LB/MMBTU		BACT-PSD
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Reboiler (dehydrator with reboiler)	4.8	MMBTU/H		0.098	LB/MMBTU	TEST METHOD	BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	118901, GHGPSDTX108 AND PSDTX1	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	13.2	MMBTU/H		0.1	LB/MMBTU		BACT-PSD
FL-0335	SUWANNEE MILL	FL	1210468-001-AC(PSD-FL-417)	09/05/2012 ACT	5/30/2013	Two(2) Biomass-Fuel Boilers - 120 MMBtu/hr each	120	MMBTU/H	SNCR - Seletive Non-Catalytic Reduction	0.14	MMBTU/H		BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			LOW-NOX BURNER	0.14	LB/MMBTU		BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H	SNCR	0.14	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H	SNCR	0.14	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.15	LB/MMBTU	TEST PROTOCOL	BACT-PSD
LA-0240	FLOPAM INC.	LA	PSD-LA-747/1280-00141-V0	06/14/2010 ACT	7/22/2010	Boilers	25.1	MMBTU/H	Ultra Low NOx Burners	0.38	LB/H	HOURLY MAXIMUM	LAER
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Auxiliary Boiler	12.25	MMBTU/H	Low NOx burner.	0.43	LB/H	TEST METHOD	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NATURAL GAS	20.4	MMBTU/H	LOW NOX BURNERS AND FLUE GAS RECIRCULATION	0.72	LB/H		LAER
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Auxiliary Boiler	40	MMBTU/H		1.01	T/YR	12-MONTH ROLLING TOTAL	OTHER CASE-BY-CASE
SC-0111	FLAKEBOARD AMERICA LIMITED - BENNETTSVILLE MDF	SC	1680-0046-CU	12/22/2009 ACT	10/16/2012	SANDERDUST BOILER	99	MMBTU/H	LOW-NOX BURNERS AND STAGED COMBUSTION	1.23	LB/MMBTU	3-HOURS	BACT-PSD
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Dehydrator (with reboiler)	0			1.3	LB/H	TEST METHOD	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NO. 2 FUEL OIL	20.4	MMBTU/H	LOW NOX BURNERS AND FLUE GAS RECIRCULATION	1.5	LB/H		LAER
OH-0352	OREGON CLEAN ENERGY CENTER	OH	P0110840	06/18/2013 ACT	5/4/2016	Auxillary Boiler	99	MMBtu/H	low NOx burners and flue gas recirculation	1.98	LB/H		BACT-PSD
OH-0323	TITAN TIRE CORPORATION OF BRYAN	OH	03-17392	06/05/2008 ACT	2/3/2009	BOILER	50.4	MMBTU/H		2.47	LB/H		BACT-PSD
OK-0137	PONCA CITY REFINERY	OK	2007-042-C PSD	02/09/2009 ACT	12/17/2010	TB-1 Leased Boiler No. 1	95	MMBTU/H	Ultra-low NOx burners (0.036lb/mmbtu)	3.42	LB/H	365 DAY ROLLING AVERAGE	BACT-PSD
OK-0137	PONCA CITY REFINERY	OK	2007-042-C PSD	02/09/2009 ACT	12/17/2010	TB-2 Leased Boiler No.2	95	MMBTU/H	ULNB- Ultra-low NOx burners , 0.036lb/mmbtu	3.42	LB/H	365 DAY ROLLING AVERAGE	BACT-PSD
OK-0136	PONCA CITY REFINERY	OK	2007-042-C PSD	02/09/2009 ACT	2/18/2010	NH-1 NEW NAPTHA SPLITTER REBOILER	131.3	MMBTU/H	ULTRA-LOW NOX BURNERS; 0.03 LB/MMBTU.	3.94	LB/H	365-DAY ROLLING AVERAGE	BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	BOILERS #1 AND #2	80	MMBTU/H	LOW-NOX BURNERS AND GOOD COMBUSTION PRACTICES	4	LB/H	3-H/168-H ROLLING CUMMULATIVE	BACT-PSD
OR-0048	CARTY PLANT	OR	25-0016-ST-02	12/29/2010 ACT	8/30/2011	NATURAL GAS-FIRED BOILER	91	MMBTU/H	LOW NOX BURNERS	4.5	LB/H		BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H	Selective Catalytic Reduction	7	PPMV	3-HR AVG @ 15 % O2	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY BOILER	35	MMBTU/H	OPERATIONAL RESTRICTION OF 500 HR/YR	9	PPMVD	1-HR AVG, @3% O2	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	CA	SJ 08-01	06/21/2011 ACT	1/10/2014	AUXILIARY BOILER	37.4	MMBTU/H	ULTRA LOW NOX BURNER, USE PUC QUALITY NATURAL GAS, OPERATIONAL RESTRICTION OF 46, 675 MMBTU/YR	9	PPMVD	3-HR AVG, @3% O2	BACT-PSD
MD-0037	MEDIMMUNE FREDERICK CAMPUS	MD	NSR-2007-01	01/28/2008 ACT	12/27/2010	FOUR (4) NATURAL GAS BOILERS EACH RATED AT 29.4 MILLION BTU PER HOUR	29.4	MMBTU/H	ULTRA LOW NOX BURNERS ON EACH OF THE FOUR IDENTICAL BOILERS	9	PPM	VOL., DRY BASIS, CORR. TO 3% O2	LAER
TX-0713	TENASKA BROWNSVILLE GENERATING STATION	TX	108411 PSDTX1350	04/29/2014 ACT	5/9/2016	boiler	90	MMBTU/H	ultra low-NOx burners, limited use	9	PPMVD	@15% O2	BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	COMMISSIONING BOILERS 1 & 2 (CB-1 & CB-2)	217.5	MM BTU/HR	FLUE GAS RECIRCULATION, LOW NOX BURNERS, AND GOOD COMBUSTION PRACTICES (I.E., PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE).	11.92	LB/H	HOURLY MAXIMUM	BACT-PSD
CA-1185	SANTA BARBARA AIRPORT	CA	ATC 13623	06/07/2011 ACT	9/6/2012	Boiler, Forced Dratf	3	MMBTU/H	Forced draft, full modulation, flue gas recirculation	12	PPMVD@3% O2	40 MINUTES	OTHER CASE-BY-CASE
CA-1189	PETROROCK- TUNNELL LEASE	CA	ATC- 12949-01 (2)	01/24/2012 ACT	9/6/2012	Boiler	2	MMBTU/H	Low NOx Burner	20	PPMVD@3% O2	40 MINUTES	OTHER CASE-BY-CASE
*AL-0307	ALLOYS PLANT	AL	701-0007-X121-X126	10/09/2015 ACT	7/7/2016	PACKAGE BOILER	17.5	MMBTU/H	LOW NOX BURNER FLUE GAS RECIRCULATION GCP	30	PPMVD	3% O2	BACT-PSD
*AL-0307	ALLOYS PLANT	AL	701-0007-X121-X126	10/09/2015 ACT	7/7/2016	2 CALP LINE BOILERS	24.59	MMBTU/H	LOW NOX BURNER FLUE GAS RECIRCULATION (FGR) GOOD COMBUSTION PRACTICES (GCP)	30	PPMVD	3% O2	BACT-PSD
GA-0130	KIA MOTORS MANUFACTURING GEORGIA	GA	3711-285-0084-P-01-0	07/27/2007 ACT	10/27/2008	BOILERS AND HEATERS			LOW NOX BURNERS ON BOILER BURNERS	30	PPM @ 3%O2	BOILERS	BACT-PSD
TN-0160	VOLKSWAGEN GROUP OF AMERICA, CHATTANOOGA OPERATIONS	TN	47065612508	10/10/2008 ACT	5/4/2016	NATURAL GAS-FIRED BOILERS (3)	24	MMBTU/H	LOW-NOX BURNERS, FLUE GAS RECIRCULATION	30	PPM	3% O2 DRY BASIS	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	AUXILIARY BOILER	938.3	MMBTU/H	ULTRA LOW NOX BURNERS	32.84	MMBTU/H	MAXIMUM	BACT-PSD
MD-0037	MEDIMMUNE FREDERICK CAMPUS	MD	NSR-2007-01	01/28/2008 ACT	12/27/2010	FOUR (4) DIESEL FIRED (BACK-UP FUEL) BOILERS EACH RATED AT 29.4 MILLION BTU PER HOUR.	29.4	MMBTU/H		58	PPM	VOL., DRY BASIS, CORR. TO 3% O2	OTHER CASE-BY-CASE

Table D-3. RBLC NOx Summary for Commercial/Institutional-Size Furnaces and Heaters - Natural Gas Fired

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_DATE	DATE_LAST_UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION_LIMIT	UNIT	EMISSION_LIMIT_1_AVG_TIME_CONDITION	BASIS
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	LADLE/TUNDISH PREHEATER			LOW NOX BURNER	0		SEE NOTE	BACT-PSD
NE-0043	NATUREWORKS, LLC	NE	CP07-0018	04/29/2008 ACT	5/11/2009	HOT OIL HEATER	75	MMBTU/H	LOW-NOX BURNERS & FGR	0		SEE NOTE	BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	17	MMBTU/H		0			BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	10	MMBTU/H	Flue Gas Recirculation	0			BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	3	MMBTU/H	Flue Gas recirculation	0			BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	CRACKING FURNACES A-D	90	VIMBTU/H EA	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION (SCR)	0.009	LB/MMBTU	THREE ONE-HOUR TEST AVERAGE	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	WY	CT-12636	08/28/2012 ACT	7/6/2016	Inlet Air Heater (EP06)	16.1	MMBTU/H	Ultra Low-NOx Burners	0.012	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	WY	CT-12636	08/28/2012 ACT	7/6/2016	Inlet Air Heater (EP07)	16.1	MMBTU/H	Ultra Low NOx Burners	0.012	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	WY	CT-12636	08/28/2012 ACT	7/6/2016	Inlet Air Heater (EP08)	16.1	MMBTU/H	Ultra Low NOx Burners	0.012	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	WY	CT-12636	08/28/2012 ACT	7/6/2016	Inlet Air Heater (EP09)	16.1	MMBTU/H	Ultra Low NOx Burners	0.012	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	WY	CT-12636	08/28/2012 ACT	7/6/2016	Inlet Air Heater (EP10)	16.1	MMBTU/H	Ultra Low NOx Burners	0.012	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	WY	CT-12636	08/28/2012 ACT	7/6/2016	Inlet Air Heater (EP11)	16.1	MMBTU/H	Ultra Low NOx Burners	0.012	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	dew point heater	13.32	mmBtu/hr		0.013	LB/MMBTU	3-HOUR AVERAGE	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	WATER HEATERS - UNITS NY037 AND NY038 AT NEW YORK - NEW YORK	2	MMBTU/H	LOW-NOX BURNERS AND GOOD COMBUSTION PRACTICES	0.025	LB/MMBTU		Other Case-by-Case
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			LOW-NOX BURNER AND FLUE GAS RECIRCULATION	0.03	LB/MMBTU		Other Case-by-Case
WY-0067	ECHO SPRINGS GAS PLANT	WY	MD-7837	04/01/2009 ACT	4/16/2009	HOT OIL HEATER S38	84	MMBTU/H	LOW NOX BURNERS WITH FLUE GAS RECIRCULATION	0.03	LB/MMBTU		BACT-PSD
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	FUEL GAS HEATER	9.5	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.035	LB/MMBTU		LAER
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	FUEL GAS HEATER	13.8	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.035	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Fuel Preheater	8.5	MMBTU/H		0.035	LB/MMBTU		OTHER CASE-BY-CASE
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Heaters	45	MMBTU/H	ultra low NOx burners	0.036	LB/MMBTU		BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	heaters (5)	24.3	MMBTU/H	ultra low NOx burners	0.036	LB/MMBTU		BACT-PSD
TX-0693	ANTELOPE ELK ENERGY CENTER	TX	109148 PSDTX1358	04/22/2014 ACT	7/29/2016	heater	5.5	MMBTU/H		0.036	LB/MMBTU	1 HOUR	BACT-PSD
DE-0020	VALERO DELAWARE CITY REFINERY	DE	AQM-003/00016	02/26/2010 ACT	8/2/2010	CRUDE UNIT ATMOSPHERIC HEATER 21-H-701			SCR	0.04	LB/MMBTU	3-HR ROLLING AV	RACT
DE-0020	VALERO DELAWARE CITY REFINERY	DE	AQM-003/00016	02/26/2010 ACT	8/2/2010	CRUDE UNIT VACUUM HEATER 21-H-2	240	MMBTU/H	SCR	0.04	LB/MMBTU	3-HR ROLLING AV	RACT
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	PROCESS HEATERS	606	MMBTU/H		0.04	LB/MMBTU	24 HOUR ROLLING AVERAGE	BACT-PSD
OK-0153	ROSE VALLEY PLANT	OK	2012-1393-C PSD	03/01/2013 ACT	7/29/2016	REGENERATION HEATERS	5.61	MMBTUH	LOW-NOx BURNERS	0.045	LB/MMBTU	3-HR	BACT-PSD
OK-0153	ROSE VALLEY PLANT	OK	2012-1393-C PSD	03/01/2013 ACT	7/29/2016	HOT OIL HEATER	17.4	MMBTUH	LOW-NOx BURNERS.	0.045	LB/MMBTU	3-HR	BACT-PSD
TX-0755	RAMSEY GAS PLANT	TX	117323 AND PSDTX1392,O-3546	05/21/2015 ACT	7/6/2016	Hot Oil Heaters and Regeneration Heaters	60	MMBTU/H	low NOx burners	0.045	LB/MMBTU		BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	DEW POINT HEATER	5	MMBTU/H	USE OF EFFICIENT DESIGN OF THE HEATER, EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS ONLY, AND APPLICATION OF GOOD COMBUSTION PRACTICES	0.049	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	U/H heat inp	Low NOx burners and flue gas recirculation.	0.05	LB/MMBTU	TEST PROTOCOL	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	GASIFICATION PREHEATER 2	21	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	GASIFICATION PREHEATER 3	21	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	GASIFICATION PREHEATER 4	21	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	GASIFICATION PREHEATER 5	21	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	REACTIVATION HEATER	12.45	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	HGT REACTOR CHARGE HEATER	2.22	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	GASIFICATION PREHEATER 1	21	MMBTU/H	LOW NOX BURNERS	0.05	LB/MMBTU	HOURLY	BACT-PSD
*AL-0307	ALLOYS PLANT	AL	701-0007-X121-X126	10/09/2015 ACT	7/7/2016	TWO HEAT TREAT FURNACES	25.45	MMBTU/H	LOW NOX BURNERS	0.06	LB/MMBTU		BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FG-FUELHTRS: 2 natural gas fuel heaters, 12 MMBTU/H each	12	eat input eac	Low NOx burners	0.06	LB/MMBTU	30-D ROLL AVG EACH DAY IN OPERA	BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	SMALL HEATERS AND DRYERS SN-05 THROUGH 19	0		LOW NOX BURNERS COMBUSTION OF CLEAN FUEL GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU		BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.085	LB/MMBTU		BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H	ULTRA LOW NOX AND LOW NOX BURNERS	0.085	LB/MMBTU		BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	PSD-FL-354 AND 0990646-001-AC	01/10/2007 ACT	3/3/2009	TWO GAS-FUELED 10 MMBTU/H PROCESS HEATERS	10	MMBTU/H		0.095	LB/MMBTU		BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Startup Heater	101	MMBTU/H	Limited Use (200 hr/yr)	0.098	LB/MMBTU		BACT-PSD
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	FL	0930117-001-AC	03/09/2016 ACT	7/6/2016	Two natural gas heaters	10	MMBtu/hr	Must have NOx emission design value less than 0.1 lb/MMBtu	0.1	LB/MMBTU		BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	HEATER	1.7	MMBTU/H		0.1	LB/MMBTU		BACT-PSD
OK-0128	MID AMERICAN STEEL ROLLING MILL	OK	2003-106-C(M-1) PSD	09/08/2008 ACT	12/17/2010	Ladle pre-heater and refractory drying	0		natural gas fuel	0.1	LB/MMBTU		BACT-PSD
OK-0173	CMC STEEL OKLAHOMA	OK	2015-0643-C PSD	01/19/2016 ACT	7/7/2016	Heaters (Gas-Fired)	0		Natural Gas Fuel	0.1	LB/MMBTU		BACT-PSD
TX-0680	SONORA GAS PLANT	TX	106139 PSDTX1316	06/14/2013 ACT	5/9/2016	2 Heaters	5	MMBTU/H		0.1	LB/MMBTU		BACT-PSD
TX-0691	PH ROBINSON ELECTRIC GENERATING STATION	TX	108182 PSDTX1346	05/20/2014 ACT	5/9/2016	fuel gas heater	18	MMBTU/H		0.1	LB/MMBTU		BACT-PSD
TX-0694	INDECK WHARTON ENERGY CENTER	TX	111724 PSDTX1374	02/02/2015 ACT	5/9/2016	heater	3	MMBTU/H		0.1	LB/MMBTU	1 HOUR	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H	UNLB WITH EGR	0.11	LB/MMBTU		BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			LOW-NOX BURNER	0.14	LB/MMBTU		BACT-PSD
OH-0355	GENERAL ELECTRIC AVIATION, EVENDALE PLANT	OH	P0112127	05/07/2013 ACT	5/4/2016	4 Indirect-Fired Air Preheaters	0			0.14	LB/MMBTU	OPERATING AT 60% TO 100% CAPAC	LAER
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.15	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Fuel pre-heater (EUFUELHTR)	3.7	MMBTU/H	Good combustion practices.	0.55	LB/H	TEST PROTOCOL	BACT-PSD
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Pipeline heaters	18	MMBTU/H	Low NOx burners	0.9	LB/H	TEST METHOD	BACT-PSD
OK-0134	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	8/30/2011	Nitric Acid Preheaters No. 1 (EU 401, EUG 4)	20	MMBTUH	Low NOx burners/good combustion practices	0.98	LB/H	168-HR ROLLING AVERAGE	BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	NITRIC ACID PREHEATERS #1, #3, AND #4	20	MMBTU/H	LOW-NOX BURNERS AND GOOD COMBUSTION PRACTICES.	0.98	LB/H	168-H ROLLING CUMMULATIVE	BACT-PSD
OK-0136	PONCA CITY REFINERY	OK	2007-042-C PSD	02/09/2009 ACT	2/18/2010	NH-3 NEW NO. 4 CTU VACUUM HEATER	45	MMBTU/H	ULTRA-LOW NOX BURNERS. 0.03 LB/MMBTU	1.39	LB/H	365-DAY ROLLING AVERAGE	BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 18)	20.89	MMBTU/H		1.99	LB/H		BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 17)	20.89	MMBTU/H		1.99	LB/H		BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	OK	2007-115-C(M-1)PSD	01/23/2009 ACT	2/18/2010	FUEL GAS HEATER (H2O BATH)	18.8	MMBTU/H		2.7	LB/H		BACT-PSD
LA-0244	LAKE CHARLES CHEMICAL COMPLEX - LAB UNIT	LA	PSD-LA-291(M3)	11/29/2010 ACT	7/6/2011	EQT0028 - PACOL STARTUP HEATER H-202	21	MMBTU/H	low nox burners	2.71	LB/H	HOURLY MAXIMUM	BACT-PSD
OK-0136	PONCA CITY REFINERY	OK	2007-042-C PSD	02/09/2009 ACT	2/18/2010	NH-5 NEW NO. 1 CTU TAR STRIPPER HEATER	98	MMBTU/H	ULTRA-LOW NOX BURNERS. 0.03 LB/MMBTU	2.94	LB/H	365-DAY ROLLING AVERAGE	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	SHIFT REACTOR STARTUP HEATER	34.2	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	3.35	LB/H	MAXIMUM	BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H	LOW NOX BURNERS WILL BE USED AS CONTROLS FOR NOX EMISSIONS.	3.57	LB/H		BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H	THE USE OF LOW NOX BURNERS WILL BE USED AS CONTROL FOR NOX EMISSIONS FROM THE THERMAL OIL HEATER	3.57	LB/H		BACT-PSD
OK-0136	PONCA CITY REFINERY	OK	2007-042-C PSD	02/09/2009 ACT	2/18/2010	NH-4 NEW NO. 4 CTU CRUDE HEATER	125	MMBTU/H	ULTRA-LOW NOX BURNERS. 0.03 LB/MMBTU	3.75	LB/H	365-DAY ROLLING AVERAGE	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	GASIFIER STARTUP PREHEATER BURNERS (5)	35	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	3.85	LB/H	MAXIMUM (EACH)	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	METHANATION STARTUP HEATERS	56.9	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	5.58	LB/H	MAXIMUM	BACT-PSD

AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H	Selective Catalytic Reduction	7	PPMV	3-HR AVG @ 15 % O2	BACT-PSD
LA-0244	LAKE CHARLES CHEMICAL COMPLEX - LAB UNIT	LA	PSD-LA-291(M3)	11/29/2010 ACT	7/6/2011	EQT0027 - PACOL CHARGE HEATER H-201	87.3	MMBTU/H	Low NOX Burners	7.15	LB/H	HOURLY MAXIMUM	BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	48	MMBTU/H	Flue Gas Recirculation	7.62	TON	YEAR	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY HEATER	40	MMBTU/H	OPERATIONAL RESTRICTION OF 1000 HR/YR	9	PPMVD	1-HR AVG, @3% O2	BACT-PSD
PA-0262	CARPENTER TECH CORP	PA	06-05007D	10/01/2007 ACT	12/27/2010	REHEATING FURNACES (8)				9.6	LB/H		Other Case-by-Case
CA-1190	PETROROCK- TUNNELL LEASE	CA	ATC- 12949-01 (3)	01/24/2012 ACT	9/6/2012	Heater	3	MMBTU/H	Low NOx burner	12	PPMVD@3% O2	40 MINUTES	OTHER CASE-BY-CASE
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	STEAM SUPERHEATERS (A & B)	415	MMBTU/H	ULTRA LOW NOX BURNERS (ULNB)	14.53	LB/H	TOTAL	BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	AMMONIA START-UP HEATER (102-B)	59.4	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE.	14.65	LB/H	HOURLY MAXIMUM	BACT-PSD
LA-0244	LAKE CHARLES CHEMICAL COMPLEX - LAB UNIT	LA	PSD-LA-291(M3)	11/29/2010 ACT	7/6/2011	EQT0029 - Hot Oil Heater H-601	170	MMBTU/H	low nox burners	19.69	LB/H	HOURLY MAXIMUM	BACT-PSD
GA-0130	KIA MOTORS MANUFACTURING GEORGIA	GA	3711-285-0084-P-01-0	07/27/2007 ACT	10/27/2008	BOILERS AND HEATERS			LOW NOX BURNERS ON BOILER BURNERS	30	PPM @ 3%O2	BOILERS	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	AK	AQ0164CPT01	12/20/2010 ACT	3/27/2012	Sigma Thermal Auxiliary Heater (1)	12.5	MMBTU/H	Low NOx Burners and Flue Gas Recirculation	32	LB/MMSCF	3-HOUR AVERAGE	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H	SCR	100	PPMVD	PARTS PER MILLION, VOLUMETRIC D	BACT-PSD

Table D-4. RBLC VOC Summary for Combined Cycle Natural Gas Fired CTs

RBLC ID	FACILITY NAME	PERMIT DATES ISSUANCE	UPDATE	PROCESS DESCRIPTION	THROUGHPUT		CONTROL METHOD DESCRIPTION	EMISSION LIMITS		BASIS
OK-0129	CHOUTEAU POWER PLANT	1/23/2009	2/18/2010	COMBINED CYCLE COGENERATION >25MW	1882	MMBTU/H	GOOD COMBUSTION	0.3	PPM	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine without Duct Bur	20282	MMCF/YR	Oxidation catalysts and use of Natu	0.7	PPMVD215%O2	LAER
*VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442	MMBTU/H	Oxidation catalyst; good combustic	0.7	PPMVD	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #1 - combined cycle	2258	mmBtu/hr	catalytic oxidizer	1	PPM	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #2 -combined cycle	2258	mmBtu/hr		1	PPM	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTIC	2300	MMBTU/H	OXIDIZED CATALYST	1	PPMVD	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282	MMCF/YR	Oxidation catalyst and use of natur	1	PPMVD@15%C	LAER
NY-0100	EMPIRE POWER PLANT	6/23/2005	8/12/2008	FUEL COMBUSTION (NATURAL GAS)	2099	MMBTU/H	OXIDATION CATALYST	1	PPMVD AT 15%	LAER
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, with	515600	MMSCF/rolli	oxidation catalyst	1	PPM	BACT-PSD
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	4/3/2015	Combined-cycle Turbines (2) - Natural gas fired	3277	MMBTU/H	Oxidation Catalyst	1	PPMVD	LAER
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENERATION PLT	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0		CO Catalyst	1	PPMDV	BACT-PSD
*TX-0714	S R BERTRON ELECTRIC GENERATING STATION	12/19/2014	3/20/2015	(2) combined cycle turbines	240	MW	oxidation catalyst	1	PPMVD	BACT-PSD
LA-0192	CRESCENT CITY POWER	6/6/2005	4/8/2008	GAS TURBINES - 187 MW (2)	2006	MMBTU/H	CO OXIDATION CATALYST AND GO(	1.1	PPM @ 15% O2	BACT-PSD
FL-0285	PROGRESS BARTOW POWER PLANT	1/26/2007	6/12/2008	COMBINED CYCLE COMBUSTION TURBINE SYSTEM (4-(	1972	MMBTU/H	GOOD COMBUSTION	1.2	PPMVD	BACT-PSD
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	7/30/2008	1/5/2011	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEM	2333	MMBTU/H		1.2	PPMVD	BACT-PSD
FL-0263	FPL TURKEY POINT POWER PLANT	2/8/2005	1/12/2006	170 MW COMBUSTION TURBINE, 4 UNITS	170	MW	VOC EMISSIONS WILL BE MINIMIZE	1.3	PPMVD @ 15 % O2	
FL-0337	POLK POWER STATION	10/14/2012	11/7/2014	Combine cycle power block (4 on 1)	1160	MW	fuel Sulfur limits	1.4	PPMVD @15%	BACT-PSD
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	8/16/2011	12/12/2011	COMBINED CYCLE TURBINE GENERATORS (UNITS 6A &	7146	MMBTU/H	GOOD COMBUSTION PRACTICES	1.4	PPMVD @ 15%	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	1/10/2007	3/3/2009	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UN	2333	MMBTU/H		1.5	PPMVD @ 15 %	BACT-PSD
MN-0071	FAIRBAULT ENERGY PARK	6/5/2007	5/29/2008	COMBINED CYCLE COMBUSTION TURBINE W/DUCT BU	1758	MMBTU/H		1.5	PPMVD	BACT-PSD
*PA-0291	HICKORY RUN ENERGY STATION	4/23/2013	8/16/2013	COMBINED CYCLE UNITS #1 and #2	3.4	MMCF/HR	Oxidation Catalyst	1.5	PPMVD @ 15%	OTHER CASE-
GA-0127	PLANT MCDONOUGH COMBINED CYCLE	1/7/2008	10/9/2008	COMBINED CYCLE COMBUSTION TURBINE	254	MW	OXIDATION CATALYST	1.8	PPM @ 15% O2	LAER
TX-0590	KING POWER STATION	8/5/2010	9/14/2011	Turbine	1350	MW	DLN burners in combination with a	1.8	PPMVD AT 15%	LAER
NJ-0074	WEST DEPTFORD ENERGY	5/6/2009	1/7/2015	TURBINE, COMBINED CYCLE	17298	MMFT3/YR	CO OXIDATION CATALYST AND GO(	1.9	PPMVD@15%C	LAER
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, with	51560	MMSCF/rolli	oxidation catalyst	1.9	PPM	BACT-PSD
CA-1177	OTAY MESA ENERGY CENTER LLC	7/22/2009	9/12/2011	Gas turbine combined cycle	171.7	MW		2	PPMVD@15% (	OTHER CASE-
CA-1178	APPLIED ENERGY LLC	3/20/2009	4/11/2011	Gas turbine combined cycle	0		Oxidation catalyst	2	PPM	BACT-PSD
CA-1211	COLUSA GENERATING STATION	3/11/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	172	MW		2	PPMVD	BACT-PSD
GA-0138	LIVE OAKS POWER PLANT	4/8/2010	9/10/2010	COMBINED CYCLE COMBUSTION TURBINE - ELECTRIC (	600	MW	GOOD COMBUSTION PRACTICES, C.	2	PPM@15%02	BACT-PSD
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	10/5/2010	COMBUSTION TURBINE, COMBINED CYCLE W/ DUCT B	2375.28	MMBTU/H	DRY LOW NOX (DLN),	2	PPMVD	BACT-PSD
MN-0060	HIGH BRIDGE GENERATING PLANT	8/12/2005	5/2/2006	2 COMBINED-CYCLE COMBUSTION TURBINES	330	MEGAWATTS	GOOD COMBUSTION PRACTICES.	2	PPM @ 15% O2	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, wi	47917	MMSCF/rolli	oxidation catalyst	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, wi	47917	MMSCF/rolli	oxidation catalyst	2	PPM	BACT-PSD
*OR-0050	TROUTDALE ENERGY CENTER, LLC	3/5/2014	1/6/2015	Mitsubishi M501-GAC combustion turbine, combined (	2988	MMBtu/hr	Limit the time in startup or	2	PPMDV AT 15%	BACT-PSD
*PA-0298	FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	3/4/2014	5/5/2015	Turbine, COMBINED CYCLE UNIT (Siemens 5000)	2267	MMBtu/hr	CO Catalyst	2	PPMVD	BACT-PSD
TX-0546	PATTILLO BRANCH POWER PLANT	6/17/2009	11/6/2009	ELECTRICITY GENERATION	350	MW	OXIDATION CATALYST	2	PPMVD	BACT-PSD
TX-0600	THOMAS C. FERGUSON POWER PLANT	9/1/2011	9/14/2011	Natural gas-fired turbines	390	MW	Natural gas, good combustion prac	2	PPMVD	BACT-PSD
TX-0618	CHANNEL ENERGY CENTER LLC	10/15/2012	1/6/2014	Combined Cycle Turbine	180	MW	Good combustion	2	PPMVD	BACT-PSD
TX-0619	DEER PARK ENERGY CENTER	9/26/2012	9/25/2013	Combined Cycle Turbine	180	MW	good combustion, use of natural ga	2	PPMVD	BACT-PSD
TX-0620	ES JOSLIN POWER PLANT	9/12/2012	9/25/2013	Combined cycle gas turbine	195	MW	good combustion and natural gas a	2	PPMVD	BACT-PSD
*TX-0641	PINECREST ENERGY CENTER	11/12/2013	11/21/2013	combined cycle turbine	700	MW	oxidation catalyst	2	PPMVD	BACT-PSD
*TX-0660	FGE TEXAS POWER I AND FGE TEXAS POWER II	3/24/2014	6/13/2014	Alstom Turbine	230.7	MW	Oxidation catalyst, good combustic	2	PPMVD	BACT-PSD
*TX-0678	FREEPORT LNG PRETREATMENT FACILITY	7/16/2014	3/13/2015	Combustion Turbine	87	MW	oxidation catalyst	2	PPMVD	BACT-PSD
*TX-0708	LA PALOMA ENERGY CENTER	2/7/2013	3/20/2015	(2) combined cycle turbines	650	MW	oxidation catalyst	2	PPMVD	BACT-PSD
*TX-0709	SAND HILL ENERGY CENTER	9/13/2013	3/20/2015	Natural gas-fired combined cycle turbines	173.9	MW		2	PPM	BACT-PSD
*TX-0713	TENASKA BROWNSVILLE GENERATING STATION	4/29/2014	3/20/2015	(2) combined cycle turbines	274	MW	oxidation catalyst	2	PPMVD	BACT-PSD
*WV-0025	MOUNDSVILLE COMBINED CYCLE POWER PLANT	11/21/2014	1/6/2015	Combined Cycle Turbine/Duct Burner	2159	mmBtu/Hr	Oxidation Catalyst & Good Combus	2	PPM	BACT-PSD
TX-0548	MADISON BELL ENERGY CENTER	8/18/2009	11/6/2009	ELECTRICITY GENERATION	275	MW	GOOD COMBUSTION PRACTICES	2.5	PPMVD	BACT-PSD

*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	8/28/2012	8/27/2012	Combined Cycle Turbine (EP01)	40	MW	Oxidation Catalyst	3	PPMV AT 15% (	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	8/28/2012	8/27/2012	Combined Cycle Turbine (EP02)	40	MW	Oxidation Catalyst	3	PPMV AT 15% (	BACT-PSD
*CO-0073	PUEBLO AIRPORT GENERATING STATION	7/22/2010	10/3/2014	Four combined cycle combution turbines	373	mmbtu/hr	good combustion control and catal	4	PPMVD AT 15%	BACT-PSD
*IL-0112	NELSON ENERGY CENTER	12/28/2010	4/3/2015	Electric Generation Facility	220	MW each		4	PPMVD @ 15%	BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STF	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with	647	MMBTU/H fc	Oxidation catalyst technology and g	4	PPM	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HI	306	MW	OXIDATION CATALYST FOR CO ALSC	4	PPM @ 15% O2	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HI	306	MW	OXIDATION CATALYST FOR CO ALSC	4	PPM @ 15% O2	BACT-PSD
NY-0098	ATHENS GENERATING PLANT	1/19/2007	8/12/2008	FUEL COMBUSTION (GAS)	3100	MMBTU/H	GOOD COMBUSTION CONTROL	4	PPMVD @ 15%	LAER
TX-0547	NATURAL GAS-FIRED POWER GENERATION FACILITY	6/22/2009	11/6/2009	ELECTRICITY GENERATION	250	MW	GOOD COMBUSTION PRACTICES	4	PPMVD	BACT-PSD
*TX-0710	VICTORIA POWER STATION	12/1/2014	3/20/2015	combined cycle turbine	197	MW	oxidation catalyst	4	PPMVD	BACT-PSD
*TX-0712	TRINIDAD GENERATING FACILITY	11/20/2014	3/20/2015	combined cycle turbine	497	MW	oxidation catalyst	4	PPMVD	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	4/1/2015	4/15/2015	Combined-cycle gas turbine electric generating facility	1100	MW	SCR and oxidation catalyst	4	PPMVD @ 15%	BACT-PSD
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENERGY -	5/16/2006	10/2/2006	TURBINE, COMBINED CYCLE (2)	1885	mmbtu/h	GOOD COMBUSTION PRACTICES	4.6	PPMVD 15% O2	BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	3/20/2008	5/18/2012	TWO COMBINED CYCLE GAS TURBINES	2110	MMBTU/H	PROPER OPERATING PRACTICES	4.9	PPMVD@15%C	BACT-PSD
CT-0151	KLEEN ENERGY SYSTEMS, LLC	2/25/2008	4/10/2012	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND	2.1	MMCF/H	SOME REDUCTIONS OF VOC ARE GA	5	PPMVD @ 15%	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE & DUCT BURNER, COMBINED CYCLE, NA	1844.3	MMBTU/H	AND EFFICIENT PROCESS	5.7	PPM @ 15% O2	BACT-PSD
NY-0100	EMPIRE POWER PLANT	6/23/2005	8/12/2008	FUEL COMBUSTION (NATURAL GAS) DUCT BURNING	646	MMBTU/H	OXIDATION CATALYST	7	PPMDV AT 15 %	LAER
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	5/2/2006	5/8/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300	MW	NATURAL GAS QUALITY GAS ONLY			BACT-PSD
*DE-0023	NRG ENERGY CENTER DOVER	10/31/2012	1/28/2014	UNIT 2- KD1	655	MMBTU/H	Oxidation catalyst system			OTHER CASE-
LA-0257	SABINE PASS LNG TERMINAL	12/6/2011	5/11/2012	Combined Cycle Refrigeration Compressor Turbines (8)	286	MMBTU/H	Good combustion practices and fue			BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine	2237	MMBTU/H	Good combustion practices			BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine	2486	MMBTU/H	Good combustion practices			BACT-PSD
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	2587	MMBTU/H h	Efficient combustion control plus ca			BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners On	172	MW	Using efficient combustion technol			BACT-PSD
TX-0497	INEOS CHOCOLATE BAYOU FACILITY	8/29/2006	10/2/2007	COGENERATION TRAIN 2 AND 3 (TURBINE AND DUCT E	35	MW	BP AMOCO PROPOSES PROPER CON			BACT-PSD
TX-0502	NACOGDOCHES POWER STERNE GENERATING FACII	6/5/2006	4/28/2009	WESTINGHOUSE/SIEMENS MODEL SW501F GAS TURB	190	MW	STEAG POWER LLC REPRESENTS GC			BACT-PSD
*TX-0672	CORPUS CHRISTI LIQUEFACTION PLANT	9/12/2014	3/13/2015	Refrigeration compressor turbines	40000	hp	good combustion practices			BACT-PSD
VA-0315	WARREN COUNTY POWER PLANT - DOMINION	12/17/2010	3/30/2015	COMBINED CYCLE TURBINE & DUCT BURNER, 3	2996	MMBTU/H	Oxidation catalyst and good combu			BACT-PSD
WA-0328	BP CHERRY POINT COGENERATION PROJECT	1/11/2005	8/14/2007	GE 7FA COMBUSTION TURBINE & HEAT RECOVER	174	MW	LEAN PRE-MIX CT BURNER & OXIDA			BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners Off	172	MW	Using efficient combustion technol			BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTIC	2300	MMBTU/H	IZER PROVIDES			BACT-PSD
MI-0366	BERRIEN ENERGY, LLC	4/13/2005	1/4/2006	3 COMBUSTION TURBINES AND DUCT BURNERS	1584	MMBTU/H	SOME CONTROL FOR			BACT-PSD
OR-0041	WANAPA ENERGY CENTER	8/8/2005	8/18/2008	COMBUSTION TURBINE & HEAT RECOVERY STEAM	2384.1	MMBTU/H	OXIDATION CATALYST			BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	12/17/2013	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046	MMBtu/hr				OTHER CASE-
TX-0516	CITY PUBLIC SERVICE JK SPRUCE ELECTRICE GENERAT	12/28/2005	11/20/2007	SPRUCE POWER GENERATOR UNIT NO 2						BACT-PSD

Table D-5. RBLC VOC Summary for Commercial/Institutional Sized Boilers and Furnaces

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_DATE	DATE_LAST_UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION_LIMIT	UNIT	EMISSION_LIMIT_1_AVG_TIME_CONDITION	BASIS
SC-0113	PYRAMAX CERAMICS, LLC	SC	0160-0023	02/08/2012 ACT	10/17/2012	BOILERS	5	MMBTU/H	GOOD COMBUSTION PRACTICES. CONSUMPTION OF NATURAL GAS AND PROPANE AS FUEL.	0			BACT-PSD
PA-0291	HICKORY RUN ENERGY STATION	PA	37-337A	04/23/2013 ACT	5/27/2016	AUXILIARY BOILER	40	MMBTU/H		0.0015	LB/MMBTU		OTHER CASE-BY-CASE
*WY-0075	CHEYENNE PRAIRIE GENERATING STATION	WY	MD-16173	07/16/2014 ACT	6/16/2014	Auxiliary Boiler	25.06	MMBtu/h	good combustion practices	0.0017	LB/MMBTU	3 HOUR AVERAGE	BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H		0.002	LB/MMBTU	3-HR AVERAGE	LAER
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	AUXILLARY BOILER	93	MMBTU/H	EXCLUSIVE USE OF NATURAL GAS, AND GOOD COMBUSTION PRACTICES	0.002	LB/MMBTU	3-HOUR AVERAGE BLOCK	LAER
MD-0046	KEYS ENERGY CENTER	MD	PSC CASE NO. 9297	10/31/2014 ACT	5/13/2016	AUXILIARY BOILER	93	MMBTU/H	EFFICIENT BOILER DESIGN, EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS, THE USE OF ULTRA-LOW NOX BURNERS, AND GOOD COMBUSTION PRACTICES	0.002	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC001, CC002, AND CC003 AT CITY CENTER	41.64	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0024	LB/MMBTU		Other Case-by-Case
AL-0231	NUCOR DECATUR LLC	AL	712-0037	06/12/2007 ACT	8/31/2009	VACUUM DEGASSER BOILER	95	MMBTU/H		0.0026	LB/MMBTU		BACT-PSD
SC-0112	NUCOR STEEL - BERKELEY	SC	0420-0060-DO	05/05/2008 ACT	10/30/2013	VACUUM DEGASSER BOILER	50.21	MMBTU/H	NATURAL GAS COMBUSTION WITH GOOD COMBUSTION PRACTICES PER MANUFACTURER'S GUIDANCE	0.0026	LB/MMBTU		BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.003	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.003	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.003	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.003	LB/MMBTU	3-HOUR AVERAGE	OTHER CASE-BY-CASE
FL-0335	SUWANNEE MILL	FL	1210468-001-AC(PSD-FL-417)	09/05/2012 ACT	5/30/2013	Four(4) Natural Gas Boilers - 46 MMBtu/hour	46	MMBTU/H	Good Combustion Practice	0.003	LB/MMBTU		BACT-PSD
LA-0240	FLOPAM INC.	LA	PSD-LA-747/1280-00141-V0	06/14/2010 ACT	7/22/2010	Boilers	25.1	MMBTU/H	Good equipment design and proper combustion techniques	0.003	LB/MMBTU	NATURAL GAS FIRED	LAER
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	EXCLUSIVE USE OF NATURAL GAS, AND GOOD COMBUSTION PRACTICES	0.003	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	THE EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS, LIMITED HOURS OF OPERATION, AND GOOD COMBUSTION PRACTICES	0.0033	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC004, CC005, AND CC006 AT CITY CENTER	4.2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0048	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT BE111 AT BELLAGIO	2.1	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0048	LB/MMBTU		Other Case-by-Case
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	141-31003-00579	12/03/2012 ACT	5/4/2016	TWO (2) NATURAL GAS AUXILIARY BOILERS	80	MMBTU/H	GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU	3 HOURS	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	FG-AUXBOILER1-2; Two (2) natural gas-fired auxiliary boilers.	40	MMBTU/H	Good combustion practices.	0.005	LB/MMBTU	TEST PROTOCOL; EACH UNIT.	BACT-PSD
NV-0044	HARRAH'S OPERATING COMPANY, INC.	NV	257	01/04/2007 ACT	4/26/2007	COMMERCIAL/INSTITUTIONAL-SIZE BOILERS	35.4	MMBTU/H	GOOD COMBUSTION DESIGN	0.005	LB/MMBTU		BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS NY42, NY43, AND NY44 AT NEW YORK - NEW YORK	2	MMBTU/H	GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU		Other Case-by-Case
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	auxiliary boiler	60.1	mmBtu/hr		0.005	LB/MMBTU	AVERAGE OF 3 ONE-HOUR TEST	BACT-PSD
OR-0050	TROUTDALE ENERGY CENTER, LLC	OR	26-0235	03/05/2014 ACT	5/5/2016	Auxiliary boiler	39.8	MMBTU/H	Utilize Low-NOx burners and FGR.	0.005	LB/MMBTU	3-HR BLOCK AVERAGE	BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT IP04	16.7	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0053	LB/MMBTU		Other Case-by-Case
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Three (3) Package Boilers	243	MMBTU/H		0.0054	LB/MMBTU	3-HR AVG	BACT-PSD
*OK-0156	NORTHSTAR AGRI IND ENID	OK	2013-0109-C PSD	07/31/2013 ACT	12/6/2016	Refinery Boiler	5	MMBTUH	Good Combustion	0.0054	LB/MMBTU	3-HOUR AVG	N/A
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Reboiler (dehydrator with reboiler)	4.8	MMBTU/H	Thermal oxidizer	0.0054	LB/MMBTU	TEST METHOD	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	IA	57-01-080	06/29/2007 ACT	10/9/2007	NATURAL GAS BOILER (292.5 MMBTU/H)	292.5	MMBTU/H	GOOD COMBUSTION PRACTICES	0.0054	LB/MMBTU	AVERAGE OF 3 TEST RUNS	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		0.0054	LB/MMBTU	3-HR AVG	BACT-PSD
*OK-0148	BUFFALO CREEK PROCESSING PLANT	OK	2012-1026-C PSD	09/12/2012 ACT	9/16/2016	Commercial/Institutional Boilers (<100 MMBTUH)	11.04	MMBTUH		0.0054	LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILERS SN-26 AND 27, GALVANIZING LINE	24.5	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU		BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS BE102 THRU BE105 AT BELLAGIO	2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0054	LB/MMBTU		Other Case-by-Case
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, VACUUM DEGASSER	51.2	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU		BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT MB090 AT MANDALAY BAY	4.3	MMBTU/H	FLUE GAS RECIRCULATION AND GOOD COMBUSTION PRACTICES	0.0054	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT HA08	8.37	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0054	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT FL01	14.34	MMBTU/H	FLUE GAS RECIRCULATION	0.0054	LB/MMBTU		OTHER CASE-BY-CASE
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP26	24	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0054	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP03	33.48	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0054	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP01	35.4	MMBTU/H	FLUE GAS RECIRCULATION AND OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0054	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA03	31.38	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0054	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA01	16.8	MMBTU/H	FLUE GAS RECIRCULATION	0.0054	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC026, CC027 AND CC028 AT CITY CENTER	44	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0055	LB/MMBTU		Other Case-by-Case
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	3 NATURAL GAS-FIRED BOILERS WITH ULNB & EGR (537-539)	64.9	MMBTU each		0.0055	LB/MMBTU		BACT-PSD
*AL-0307	ALLOYS PLANT	AL	701-0007-X121-X126	10/09/2015 ACT	7/7/2016	PACKAGE BOILER	17.5	MMBTU/H	GCP	0.006	LB/MMBTU		BACT-PSD
*OK-0156	NORTHSTAR AGRI IND ENID	OK	2013-0109-C PSD	07/31/2013 ACT	12/6/2016	Gas-fired Boiler	95	MMBTUH	Good Combustion	0.006	LB/MMBTU	3-HOUR	BACT-PSD
*AL-0307	ALLOYS PLANT	AL	701-0007-X121-X126	10/09/2015 ACT	7/7/2016	2 CALP LINE BOILERS	24.59	MMBTU/H	GCP	0.006	LB/MMBTU		BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			FLUE GAS RECIRCULATION	0.0062	LB/MMBTU		Other Case-by-Case
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	TU/H heat inpu	Efficient combustion; natural gas fuel.	0.008	LB/MMBTU	HEAT INPUT; TEST PROTOCOL \	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler B (EUAUXBOILERB)	95	MMBTU/H	Good combustion practices	0.008	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler A (EUAUXBOILERA)	55	MMBTU/H	Good combustion control	0.008	LB/MMBTU	TEST PROTOCOL	BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			GOOD COMBUSTION PRACTICE	0.0094	LB/MMBTU		Other Case-by-Case
FL-0335	SUWANNEE MILL	FL	1210468-001-AC(PSD-FL-417)	09/05/2012 ACT	5/30/2013	Two(2) Biomass-Fuel Boilers - 120 MMBtu/hr each	120	MMBTU/H	Efficient combustion practice	0.017	LB/MMBTU		BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H		0.017	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H		0.017	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NO. 2 FUEL OIL	20.4	MMBTU/H		0.03	LB/H		LAER

MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.05	LB/MMBTU	TEST PROTOCOL	BACT-PSD
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Auxiliary Boiler	12.25	MMBTU/H		0.05	LB/H	TEST METHOD	BACT-PSD
SC-0111	FLAKEBOARD AMERICA LIMITED - BENNETTSVILLE MDF	SC	1680-0046-CU	12/22/2009 ACT	10/16/2012	SANDERDUST BOILER	99	MMBTU/H	GOOD COMBUSTION PRACTICES	0.1	LB/MMBTU	3-HOURS	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NATURAL GAS	20.4	MMBTU/H		0.11	LB/H		LAER
NJ-0079	WOODBRIDGE ENERGY CENTER	NJ	18940 - BOP110003	07/25/2012 ACT	1/24/2014	Commercial/Institutional size boilers less than 100 MMBtu/hr	2000	hours/year	Use of Natural Gas	0.14	LB/H	AVERAGE OF THREE TESTS	LAER
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Auxiliary Boiler	40	MMBTU/H		0.14	T/YR	BASED ON 12-MONTH ROLLING	N/A
NJ-0080	HESS NEWARK ENERGY CENTER	NJ	08857/BOP110001	11/01/2012 ACT	3/14/2016	Boiler less than 100 MMBtu/hr	51.9	mmcubic ft/yea	use of natural gas a clean fuel	0.27	LB/H	AVERAGE OF THREE TESTS	LAER
OH-0323	TITAN TIRE CORPORATION OF BRYAN	OH	03-17392	06/05/2008 ACT	2/3/2009	BOILER	50.4	MMBTU/H		0.27	LB/H		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	8901, GHGPSDTX108 AND PSDT	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	13.2	MMBTU/H	Good combustion practice to ensure complete combustion.	0.3	T/YR		BACT-PSD
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	NJ	18068/BOP150001	03/10/2016 ACT	7/25/2016	Auxiliary Boiler firing natural gas	687	MMCFT/YR	Use of good combustion practices and use of natural gas a clean burning fuel	0.32	LB/H	AV OF THREE ONE H STACK TES	LAER
OH-0350	REPUBLIC STEEL	OH	P0109191	07/18/2012 ACT	5/4/2016	Steam Boiler	65	MMBtu/H	Proper burner design and good combustion practices	0.35	LB/H		BACT-PSD
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	NJ	19149/PCP150001	07/19/2016 ACT	11/3/2016	AUXILIARY BOILER	4000	H/YR	USE OF NATURAL GAS A CLEAN BURNING FUEL AND GOOD COMBUSTION PRACTICES	0.488	LB/H	AV OF THREE ONE H STACK TES	LAER
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	BOILERS #1 AND #2	80	MMBTU/H		0.5	LB/H		BACT-PSD
LA-0246	ST. CHARLES REFINERY	LA	PSD-LA-619(M6)	12/31/2010 ACT	7/6/2011	EQT0323 - Boiler 401F	99	MMBTU/H	Proper design and operation, good combustion practices and gaseous fuels	0.53	LB/H	HOURLY MAXIMUM	BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	OK	2007-115-C(M-1)PSD	01/23/2009 ACT	2/18/2010	AUXILIARY BOILER	33.5	MMBTU/H	GOOD COMBUSTION	0.54	LB/H		BACT-PSD
OH-0352	OREGON CLEAN ENERGY CENTER	OH	P0110840	06/18/2013 ACT	5/4/2016	Auxillary Boiler	99	MMBtu/H	Good combustion practices and using combustion optimization technologies	0.59	LB/H		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	8901, GHGPSDTX108 AND PSDT	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	40	MMBTU/H	Good combustion practice to ensure complete combustion.	0.94	T/YR		BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	COMMISSIONING BOILERS 1 & 2 (CB-1 & CB-2)	217.5	MM BTU/HR	FLUE GAS RECIRCULATION AND GOOD COMBUSTION PRACTICES (I.E., PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE).	1.41	LB/H	HOURLY MAXIMUM	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	'SD-FL-354 AND 0990646-001-A	01/10/2007 ACT	3/3/2009	TWO 99.8 MMBTU/H GAS-FUELED AUXILIARY BOILERS	99.8	MMBTU/H		2	GS/100 SCF GAS		BACT-PSD
TX-0751	EAGLE MOUNTAIN STEAM ELECTRIC STATION	TX	117026, PSDTX1390, N194	06/18/2015 ACT	7/6/2016	Commercial/Institutional Size Boilers (<100 MMBtu) â€“ natural gas	73.3	MMBTU/H		4	PPM	1-HR AVG	LAER
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Dehydrator (with reboiler)	0		Thermal oxidizer	4.2	LB/H	TEST METHOD	BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	8901, GHGPSDTX108 AND PSDT	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	95.7	MMBTU/H	Good combustion practice to ensure complete combustion.	5.42	T/YR		BACT-PSD
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	MA	NE-12-022	01/30/2014 ACT	5/5/2016	Auxiliary Boiler	80	MMBTU/H	oxidation catalyst	11.8	PPMVD@3% O2	1 HR BLOCK AVG, DOES NOT AF	OTHER CASE-BY-CASE
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Boiler	950	MMBTU/H	clean fuel and good combustion practices	14	T/YR		BACT-PSD

Table D-6. RBLC VOC Summary for Commercial/Institutional-Size Furnaces and Heaters - Natural Gas Fired

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_DATE	DATE_LAST_UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION_LIMIT	UNIT	EMISSION_LIMIT_1_AVG_TIME_CONDITION	BASIS
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	17	MMBTU/H	Good combustion practices	0			BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	48	MMBTU/H	Good combustion practices	0			BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	10	MMBTU/H	Good combustion practices	0			BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	3	MMBTU/H	Good combustion practice	0			BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	HEATER	1.7	MMBTU/H		0.005	LB/MMBTU		LAER
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	FUEL GAS HEATER	9.5	MMBTU/H	EXCLUSIVE USE OF NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU		LAER
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	DEW POINT HEATER	5	MMBTU/H	USE OF EFFICIENT DESIGN OF THE HEATER, EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS ONLY, AND APPLICATION OF GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
OH-0355	GENERAL ELECTRIC AVIATION, EVENDALE PLANT	OH	P0112127	05/07/2013 ACT	5/4/2016	4 Indirect-Fired Air Preheaters	0			0.005	LB/MMBTU		N/A
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	WATER HEATERS - UNITS NY037 AND NY038 AT NEW YORK - NEW YORK	2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0054	LB/MMBTU		Other Case-by-Case
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Startup Heater	101	MMBTU/H	Limited Use (200 hr/yr)	0.0054	LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	SMALL HEATERS AND DRYERS SN-05 THROUGH 19	0		COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU		BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	FUEL GAS HEATER	13.8	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0054	LB/MMBTU	3-HOUR BLOCK AVERAGE	LAER
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		0.0054	LB/MMBTU	3-HR AVG	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.0055	LB/MMBTU		BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.0055	LB/MMBTU		BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.0055	LB/MMBTU		BACT-PSD
OK-0128	MID AMERICAN STEEL ROLLING MILL	OK	2003-106-C(M-1) PSD	09/08/2008 ACT	12/17/2010	Ladle pre-heater and refractory drying	0		Natural gas fuel	0.0055	LB/MMBTU		BACT-PSD
OK-0173	CMC STEEL OKLAHOMA	OK	2015-0643-C PSD	01/19/2016 ACT	7/7/2016	Heaters (Gas-Fired)	0		Natural Gas Fuel.	0.0055	LB/MMBTU		BACT-PSD
*AL-0307	ALLOYS PLANT	AL	701-0007-X121-X126	10/09/2015 ACT	7/7/2016	TWO HEAT TREAT FURNACES	25.45	MMBTU/H	GCP	0.006	LB/MMBTU		BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			FLUE GAS RECIRCULATION	0.0062	LB/MMBTU		Other Case-by-Case
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FG-FUELHTRS: 2 natural gas fuel heaters, 12 MMBTU/H each	12	eat input eac	Efficient combustion; natural gas fuel.	0.008	LB/MMBTU	TEST PROTOCOL WILL SPECIFY /	BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	U/H heat inp	Efficient combustion; natural gas fuel.	0.008	LB/MMBTU	HEAT INPUT; TEST PROTOCOL \	BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			GOOD COMBUSTION PRACTICE	0.0094	LB/MMBTU		Other Case-by-Case
WY-0067	ECHO SPRINGS GAS PLANT	WY	MD-7837	04/01/2009 ACT	4/16/2009	HOT OIL HEATER S38	84	MMBTU/H	GOOD COMBUSTION PRACTICES	0.02	LB/MMBTU		BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Fuel pre-heater (EUFUELHTR)	3.7	MMBTU/H	Good combustion practices	0.03	LB/H	TEST PROTOCOL	BACT-PSD
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Fuel Preheater	8.5	MMBTU/H		0.05	LB/MMBTU		OTHER CASE-BY-CASE
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.05	LB/MMBTU	TEST PROTOCOL	BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	OK	2007-115-C(M-1)PSD	01/23/2009 ACT	2/18/2010	FUEL GAS HEATER (H2O BATH)	18.8	MMBTU/H		0.1	LB/H		BACT-PSD
OK-0134	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	8/30/2011	Nitric Acid Preheaters No. 1 (EU 401, EUG 4)	20	MMBTUH	good combustion	0.11	LB/H		BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	NITRIC ACID PREHEATERS #1, #3, AND #4	20	MMBTU/H		0.11	LB/H		BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 18)	20.89	MMBTU/H		0.11	LB/H		BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 17)	20.89	MMBTU/H		0.11	LB/H		BACT-PSD
PA-0262	CARPENTER TECH CORP	PA	06-05007D	10/01/2007 ACT	12/27/2010	REHEATING FURNACES (8)			COMBUSTION CONTROL	0.28	LB/H		Other Case-by-Case
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	AMMONIA START-UP HEATER (102-B)	59.4	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE.	0.38	LB/H	HOURLY MAXIMUM	BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H	GOOD COMBUSTION PRACTICES WILL BE USED AS CONTROL FOR VOC EMISSIONS	0.39	LB/H		BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H	GOOD COMBUSTION PRACTICES WILL BE USED AS CONTROL FOR VOC EMISSIONS.	0.39	LB/H		BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Heaters	45	MMBTU/H	clean fuel and good combustion practices	0.59	T/YR		BACT-PSD
*MI-0393	RAY COMPRESSOR STATION	MI	206-09	10/14/2010 ACT	3/28/2014	Pipeline heaters	18	MMBTU/H		0.9	LB/H	TEST METHOD	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	PSD-FL-354 AND 0990646-001-AC	01/10/2007 ACT	3/3/2009	TWO GAS-FUELED 10 MMBTU/H PROCESS HEATERS	10	MMBTU/H		2	GR S/100 SCF GAS		BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	heaters (5)	24.3	MMBTU/H	clean fuel and good combustion practices	2.44	T/YR		BACT-PSD

Table D-7. RBLC PM Summary for Combined Cycle Natural Gas Fired CTs

RBLC ID	FACILITY NAME	PERMIT DATES ISSUANCE	UPDATE	PROCESS DESCRIPTION	THROUGHPUT		CONTROL METHOD DESCRIPTION	EMISSION LIMITS		BASIS
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	2587	MMBTU/H he	Combustion air filters; efficient combustion	0.0033	LB/MMBTU	BACT-PSD
*VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442	MMBTU/H	Low sulfur/carbon fuel and good combustic	0.0033	LB/MMBTU	BACT-PSD
*VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442	MMBTU/H	Low sulfur/carbon fuel and good combustic	0.0033	LB/MMBTU	BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	1/23/2009	2/18/2010	COMBINED CYCLE COGENERATION >25MW	1882	MMBTU/H	NATURAL GAS FUEL	0.0035	LB/MMBTU	N/A
*WV-0025	MOUNDSVILLE COMBINED CYCLE POWER P	11/21/2014	1/6/2015	Combined Cycle Turbine/Duct Burner	2159	mmBtu/Hr	Good Combustion Practices, Inlet Air Filtrat	0.0035	LB/MMBTU	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine g	2486	MMBTU/H	Good combustion practices	0.004	LB/MMBTU	BACT-PSD
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	4/3/2015	Combined-cycle Turbines (2) - Natural gas fired	3277	MMBTU/H	Using fuel with little or no ash and sulfur cc	0.004	LB/MMBTU	BACT-PSD
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	154	MW	USE PUC QUALITY NATURAL GAS	0.0048	LB/MMBTU	BACT-PSD
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	154	MW	USE PUC QUALITY NATURAL GAS	0.0048	LB/MMBTU	BACT-PSD
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	154	MW	USE PUC QUALITY NATURAL GAS	0.0048	LB/MMBTU	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282	MMCF/YR	Use of Natural gas a clean burning fuel	0.0048	LB/MMBTU	BACT-PSD
NY-0095	CAITHNES BELLPORT ENERGY CENTER	5/10/2006	5/8/2008	COMBUSTION TURBINE	2221	MMBUT/H	LOW SULFUR FUEL	0.0055	LB/MMBTU	BACT-PSD
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENERATION	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0			0.0057	LB/MMBTU	OTHER CASE-E
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENERATION	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0			0.0057	LB/MMBTU	OTHER CASE-E
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENERATION	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0			0.0057	LB/MMBTU	OTHER CASE-E
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine g	2237	MMBTU/H	Good combustion practices	0.006	LB/MMBTU	BACT-PSD
*IL-0112	NELSON ENERGY CENTER	12/28/2010	4/3/2015	Electric Generation Facility	220	MW each		0.006	LB/MMBTU	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine g	2237	MMBTU/H	Good combustion practices	0.006	LB/MMBTU	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine g	2237	MMBTU/H	Good combustion practices	0.006	LB/MMBTU	BACT-PSD
AK-0073	INTERNATIONAL STATION POWER PLANT	12/20/2010	1/8/2014	Fuel Combustion	59900	HP	Combustion Turbines EU IDs 5-8 use good c	0.0066	LB/MMBTU	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	12/20/2010	3/27/2012	GE LM6000PF-25 Turbines (4)	59900	hp ISO	Good Combustion Practices	0.0066	LB/MMBTU	BACT-PSD
*MI-0402	SUMPTER POWER PLANT	11/17/2011	12/16/2013	Combined cycle combustion turbine w/ HRSG	130	MW electrical output		0.0066	LB/MMBTU	OTHER CASE-E
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	2587	MMBTU/H he	Combustion air filters; efficient combustion	0.0066	LB/MMBTU	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	12/20/2010	3/27/2012	GE LM6000PF-25 Turbines (4)	59900	hp ISO	Good Combustion Practices	0.0066	LB/MMBTU	BACT-PSD
*MI-0402	SUMPTER POWER PLANT	11/17/2011	12/16/2013	Combined cycle combustion turbine w/ HRSG	130	MW electrical output		0.0066	LB/MMBTU	BACT-PSD
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	2587	MMBTU/H he	Combustion air filters, efficient combustion	0.0066	LB/MMBTU	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	12/20/2010	3/27/2012	GE LM6000PF-25 Turbines (4)	59900	hp ISO	Good Combustion Practices	0.0066	LB/MMBTU	BACT-PSD
OK-0115	LAWTON ENERGY COGEN FACILITY	12/12/2006	3/13/2007	COMBUSTION TURBINE AND DUCT BURNER			GOOD COMBUSTION PRACTICES	0.0067	LB/MMBTU	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282	MMCF/YR	Use of Natural gas a clean burning fuel	0.0069	LB/MMBTU	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282	MMCF/YR	Use of Natural Gas a clean burning fuel	0.0069	LB/MMBTU	BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with c	647	MMBTU/H foi	Good combustion practices and the use of		0.007	LB/MMBTU	BACT-PSD
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	5/2/2006	5/8/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300	MW	NATURAL GAS QUALITY FUEL ONLY AND G(	0.0074	LB/MMBTU	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION	2300	MMBTU/H	GOOD CUMBUSTION PRACTICE AND FUEL S	0.0078	LB/MMBTU	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION	2300	MMBTU/H	GOOD COMBUSTION PRACTICE AND FUEL S	0.0078	LB/MMBTU	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION	2300	MMBTU/H	GOOD CUMBUSTION PRACTICE AND FUEL S	0.0078	LB/MMBTU	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine g	2486	MMBTU/H	Good combustion practices	0.008	LB/MMBTU	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine g	2486	MMBTU/H	Good combustion practices	0.008	LB/MMBTU	BACT-PSD
OK-0117	PSO SOUTHWESTERN POWER PLT	2/9/2007	5/21/2007	GAS-FIRED TURBINES			USE OF LOW ASH FUEL (NATURAL GAS) ANI	0.0093	LB/MMBTU	BACT-PSD
MN-0071	FAIRBAULT ENERGY PARK	6/5/2007	5/29/2008	COMBINED CYCLE COMBUSTION TURBINE W/DUCT BURI	1758	MMBTU/H		0.01	LB/MMBTU	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #1 - combined cycle	2258	mmBtu/hr		0.01	LB/MMBTU	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #2 -combined cycle	2258	mmBtu/hr		0.01	LB/MMBTU	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRS	306	MW	BEST COMBUSTION PRACTICES.	0.011	LB/MMBTU	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRS	306	MW	BEST COMBUSTION PRACTICES.	0.011	LB/MMBTU	BACT-PSD
*IL-0112	NELSON ENERGY CENTER	12/28/2010	4/3/2015	Electric Generation Facility	220	MW each		0.012	LB/MMBTU	BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with c	647	MMBTU/H foi	Good combustion practices and the use of		0.014	LB/MMBTU	BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with c	647	MMBTU/H foi	Good combustion practices and the use of		0.014	LB/MMBTU	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3	MMBTU/H	SULFUR	0.019	LB/MMBTU	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE & DUCT BURNER, COMBINED CYCLE, NAT	1844.3	MMBTU/H	GOOD	0.021	LB/MMBTU	BACT-PSD
FL-0263	FPL TURKEY POINT POWER PLANT	2/8/2005	1/12/2006	170 MW COMBUSTION TURBINE, 4 UNITS	170	MW	PM/PM10 WILL BE MINIMIZED BY THE EFFI			BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	3/20/2008	5/18/2012	TWO COMBINED CYCLE GAS TURBINES	2110	MMBTU/H	GOOD COMBUSTION DESIGN/ PROPER OPE			BACT-PSD
TX-0542	PEARSALL POWER PLANT	1/23/2009	11/6/2009	ELECTRICAL GENERATION	8.44	MW	TCEQÂ¿S CURRENT BACT GUIDELINES PROV			BACT-PSD

CA-1144	BLYTHE ENERGY PROJECT II	4/25/2007	3/17/2008	2 COMBUSTION TURBINES	170	MW	USE PUBLIC UTILITY COMMISSION QUALITY	BACT-PSD
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	10/5/2010	COMBUSTION TURBINE, COMBINED CYCLE W/ DUCT BUI	2375.3	MMBTU/H	GOOD COMBUSTION PRACTICES (GCP)	BACT-PSD
LA-0192	CRESCENT CITY POWER	6/6/2005	4/8/2008	GAS TURBINES - 187 MW (2)	2006	MMBTU/H	USE OF CLEAN BURNING FUEL AND GOOD (	BACT-PSD
NJ-0074	WEST DEPTFORD ENERGY	5/6/2009	1/7/2015	TURBINE, COMBINED CYCLE	17298	MMFT3/YR	CLEAN FUELS - NATURAL GAS AND ULTRA L	Other Case-by
TX-0497	INEOS CHOCOLATE BAYOU FACILITY	8/29/2006	10/2/2007	COGENERATION TRAIN 2 AND 3 (TURBINE AND DUCT BU	35	MW	THE USE OF PROPER COMBUSTION CONTR(	BACT-PSD
TX-0502	NACOGDOCHES POWER STERNE GENERATII	6/5/2006	4/28/2009	WESTINGHOUSE/SIEMENS MODEL SW501F GAS TURBIN	190	MW	STEAG POWER LLC REPRESENTS THE FIRING	BACT-PSD
WA-0328	BP CHERRY POINT COGENERATION PROJECT	1/11/2005	8/14/2007	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY !	174	MW	LIMIT FUEL TYPE TO NATURAL GAS	BACT-PSD
NJ-0074	WEST DEPTFORD ENERGY	05/06/2009 &nb	1/7/2015	TURBINE, COMBINED CYCLE	17298	MMFT3/YR	USE OF CLEAN FUELS, NATURAL GAS AND U	Other Case-by
*TX-0689	CEDAR BAYOU ELECTRIC GENERATION STAT	08/29/2014 &nb	3/20/2015	Combined cycle natural gas turbines	225	MW	Good combustion practices, natural gas	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	07/18/2014 &nb	4/27/2015	Combined Cycle Combustion Turbine without Duct Burne	20282	MMCF/YR	Use of natural gas a clean burning fuel	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DU	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DU	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1198	MORRO BAY POWER PLANT	09/25/2008 &nb	1/14/2014	COMBUSTION TURBINE GENERATOR	180	MW	USE PIPELINE QUALITY NATURAL GAS, OPEI	BACT-PSD
CA-1198	MORRO BAY POWER PLANT	09/25/2008 &nb	1/14/2014	COMBUSTION TURBINE GENERATOR	180	MW	USE PIPELINE QUALITY NATURAL GAS, OPEI	BACT-PSD
*CO-0073	PUEBLO AIRPORT GENERATING STATION	07/22/2010 &nb	10/3/2014	Four combined cycle combution turbines	373	mmbtu/hr	Use of pipeline quality natural gas and good	BACT-PSD
FL-0304	CANE ISLAND POWER PARK	09/08/2008 &nb	4/20/2009	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860	MMBTU/H	FUEL SPECIFICATIONS : 2 GR S/100 SCF OF (	BACT-PSD
LA-0256	COGENERATION PLANT	12/06/2011 &nb	4/3/2012	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	475	MMBTU/H	USE OF NATURAL GAS AS FUEL AND GOOD	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	07/18/2014 &nb	4/27/2015	Combined Cycle Combustion Turbine without Duct Burne	20282	MMCF/YR	Use of natural gas a clean burning fuel	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &nb	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, withou	515600	MMSCF/rollin	clean burning fuel, only natural gas	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &nb	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, with du	51560	MMSCF/rollin	clean burning fuel, only natural gas	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &nb	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, with	47917	MMSCF/rollin	clean burning fuel, only natural gas	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &nb	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, with	47917	MMSCF/rollin	clean burning fuel, only natural gas	BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012 &nb	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners Off	172	MW	Burning natural gas in an efficient combusti	BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012 &nb	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners On	172	MW	Burning natural gas in an efficient combusti	BACT-PSD
*OR-0050	TROUTDALE ENERGY CENTER, LLC	03/05/2014 &nb	1/6/2015	Mitsubishi M501-GAC combustion turbine, combined cyc	2988	MMBtu/hr	Utilize only natural gas or ULSD fuel; Limit t	BACT-PSD
TX-0590	KING POWER STATION	08/05/2010 &nb	9/14/2011	Turbine	1350	MW	use of low ash fuel (natural gas or low sulfu	BACT-PSD
TX-0618	CHANNEL ENERGY CENTER LLC	10/15/2012 &nb	1/6/2014	Combined Cycle Turbine	180	MW	good combustion and the use of gaseous fu	BACT-PSD
TX-0619	DEER PARK ENERGY CENTER	09/26/2012 &nb	9/25/2013	Combined Cycle Turbine	180	MW	good combustion and the use of natural ga:	BACT-PSD
TX-0620	ES JOSLIN POWER PLANT	09/12/2012 &nb	9/25/2013	Combined cycle gas turbine	195	MW	good combustion and natural gas as fuel	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	04/01/2015 &nb	4/15/2015	Combined-cycle gas turbine electric generating facility	1100	MW	efficient combustion, natural gas fuel	BACT-PSD
VA-0315	WARREN COUNTY POWER PLANT - DOMINI	12/17/2010 &nb	3/30/2015	COMBINED CYCLE TURBINE & DUCT BURNER, 3	2996	MMBTU/H	Natural Gas only, fuel has maximum sulfur	BACT-PSD
*VA-0319	GATEWAY COGENERATION 1, LLC - SMART \	08/27/2012 &nb	5/2/2013	COMBUSTION TURBINES, (2)	593	MMBTU/H	Clean-burning fuels and good combustion p	BACT-PSD
LA-0256	COGENERATION PLANT	12/06/2011 &nb	4/3/2012	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	475	MMBTU/H	USE OF NATURAL GAS AS FUEL AND GOOD	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	07/18/2014 &nb	4/27/2015	Combined Cycle Combustion Turbine without Duct Burne	20282	MMCF/YR	Use of natural gas a clean burning fuel	BACT-PSD
TX-0590	KING POWER STATION	08/05/2010 &nb	9/14/2011	Turbine	1350	MW	use of low ash fuel (natural gas or low sulfu	BACT-PSD
TX-0618	CHANNEL ENERGY CENTER LLC	10/15/2012 &nb	1/6/2014	Combined Cycle Turbine	180	MW	good combustion and the use of gaseous fu	BACT-PSD
*TX-0641	PINECREST ENERGY CENTER	11/12/2013 &nb	11/21/2013	combined Cycle turbine	700	MW	pipeline quality natural gas and good comb	BACT-PSD
*TX-0660	FGE TEXAS POWER I AND FGE TEXAS POWE	03/24/2014 &nb	6/13/2014	Alstom Turbine	230.7	MW	Low sulfur fuel, good combustion practices	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	04/01/2015 &nb	4/15/2015	Combined-cycle gas turbine electric generating facility	1100	MW	efficient combustion, natural gas fuel	BACT-PSD
VA-0315	WARREN COUNTY POWER PLANT - DOMINI	12/17/2010 &nb	3/30/2015	COMBINED CYCLE TURBINE & DUCT BURNER, 3	2996	MMBTU/H	Natural Gas only, fuel has maximum sulfur	BACT-PSD
*VA-0319	GATEWAY COGENERATION 1, LLC - SMART \	08/27/2012 &nb	5/2/2013	COMBUSTION TURBINES, (2)	593	MMBTU/H	Clean burning fuels and good combustion p	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH	154	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DU	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DU	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	06/21/2011 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH	180	MW	USE PUC QUALITY NATURAL GAS	BACT-PSD
CA-1198	MORRO BAY POWER PLANT	09/25/2008 &nb	1/14/2014	COMBUSTION TURBINE GENERATOR	180	MW	USE PIPELINE QUALITY NATURAL GAS, OPEI	BACT-PSD
CA-1198	MORRO BAY POWER PLANT	09/25/2008 &nb	1/14/2014	COMBUSTION TURBINE GENERATOR	180	MW	USE PIPELINE QUALITY NATURAL GAS, OPEI	BACT-PSD
*CO-0073	PUEBLO AIRPORT GENERATING STATION	07/22/2010 &nb	10/3/2014	Four combined cycle combution turbines	373	mmbtu/hr	Use of pipeline quality natural gas and good	BACT-PSD
DE-0024	GARRISON ENERGY CENTER	01/30/2013 &nb	1/28/2014	Unit 1	2260	million BTUs	Fuel Usage Restriction to natural gas and lo	BACT-PSD

LA-0257	SABINE PASS LNG TERMINAL	12/06/2011 &nb	5/11/2012	Combined Cycle Refrigeration Compressor Turbines (8)	286	MMBTU/H	Good combustion practices and fueled by r	BACT-PSD
TX-0590	KING POWER STATION	08/05/2010 &nb	9/14/2011	Turbine	1350	MW	use low ash fuel (natural gas or low sulfur d	BACT-PSD
TX-0618	CHANNEL ENERGY CENTER LLC	10/15/2012 &nb	1/6/2014	Combined Cycle Turbine	180	MW	Good combustion and the use of gaseous fu	BACT-PSD
TX-0619	DEER PARK ENERGY CENTER	09/26/2012 &nb	9/25/2013	Combined Cycle Turbine	180	MW	good combustion and use of natural gas	BACT-PSD
TX-0620	ES JOSLIN POWER PLANT	09/12/2012 &nb	9/25/2013	Combined cycle gas turbine	195	MW	good combustion and natural gas as fuel	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	04/01/2015 &nb	4/15/2015	Combined-cycle gas turbine electric generating facility	1100	MW	efficient combustion, natural gas fuel	BACT-PSD
LA-0256	COGENERATION PLANT	12/06/2011 &nb	4/3/2012	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	475	MMBTU/H	USE OF NATURAL GAS AS FUEL AND GOOD	BACT-PSD
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	07/30/2008 &nb	1/5/2011	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMEN	2333	MMBTU/H		BACT-PSD
OR-0041	WANAPA ENERGY CENTER	08/08/2005 &nb	8/18/2008	COMBUSTION TURBINE & HEAT RECOVERY STEAM (	2384.1	MMBTU/H		BACT-PSD
TX-0516	CITY PUBLIC SERVICE JK SPRUCE ELECTRICE	12/28/2005 &nb	11/20/2007	SPRUCE POWER GENERATOR UNIT NO 2				BACT-PSD
CT-0151	KLEEN ENERGY SYSTEMS, LLC	02/25/2008 &nb	4/10/2012	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2	2.1	MMCF/H		BACT-PSD
FL-0265	HINES POWER BLOCK 4	06/08/2005 &nb	1/12/2006	COMBINED CYCLE TURBINE	530	MW	CLEAN FUELS	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	01/10/2007 &nb	3/3/2009	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNIT	2333	MMBTU/H		BACT-PSD
FL-0337	POLK POWER STATION	10/14/2012 &nb	11/7/2014	Combine cycle power block (4 on 1)	1160	MW	work practices	BACT-PSD
LA-0136	PLAQUEMINE COGENERATION FACILITY	07/23/2008 &nb	4/28/2009	(4) GAS TURBINES/DUCT BURNERS	2876	MMBTU/H	USE OF CLEAN BURNING FUELS	BACT-PSD
MI-0366	BERRIEN ENERGY, LLC	04/13/2005 &nb	1/4/2006	3 COMBUSTION TURBINES AND DUCT BURNERS	1584	MMBTU/H	TECHNIQUES AND USE ⍰	BACT-PSD
OR-0048	CARTY PLANT	12/29/2010 &nb	8/30/2011	COMBINED CYCLE NATURAL GAS-FIRED ELECTRIC GENER	2866	MMBTU/H	CLEAN FUEL	BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTEL	12/17/2013 &nb	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046	MMBtu/hr		BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (COLD STARTUP PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
*PA-0298	FUTURE POWER PA/GOOD SPRINGS NGCC I	03/04/2014 &nb	5/5/2015	Turbine, COMBINED CYCLE UNIT (Siemens 5000)	2267	MMBtu/hr		BACT-PSD
*PA-0291	HICKORY RUN ENERGY STATION	04/23/2013 &nb	8/16/2013	COMBINED CYCLE UNITS #1 and #2	3.4	MMCF/HR		OTHER CASE-E
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (WARM STARTUP PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (HOT STARTUP PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (SHUTDOWN PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (COLD STARTUP PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
LA-0254	NINEMILE POINT ELECTRIC GENERATING PL	08/16/2011 &nb	12/12/2011	COMBINED CYCLE TURBINE GENERATORS (UNITS 6A &an	7146	MMBTU/H	PIPELINE QUALITY NATURAL GAS AND	BACT-PSD
*PA-0298	FUTURE POWER PA/GOOD SPRINGS NGCC I	03/04/2014 &nb	5/5/2015	Turbine, COMBINED CYCLE UNIT (Siemens 5000)	2267	MMBtu/hr		BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DU	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DU	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
LA-0254	NINEMILE POINT ELECTRIC GENERATING PL	08/16/2011 &nb	12/12/2011	COMBINED CYCLE TURBINE GENERATORS (UNITS 6A &an	7146	MMBTU/H	PIPELINE QUALITY NATURAL GAS AND	BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTEL	12/17/2013 &nb	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046	MMBtu/hr		BACT-PSD
TX-0600	THOMAS C. FERGUSON POWER PLANT	09/01/2011 &nb	9/14/2011	Natural gas-fired turbines	390	MW	pipeline quality natural gas	BACT-PSD
TX-0619	DEER PARK ENERGY CENTER	09/26/2012 &nb	9/25/2013	Combined Cycle Turbine	180	MW		BACT-PSD
TX-0620	ES JOSLIN POWER PLANT	09/12/2012 &nb	9/25/2013	Combined cycle gas turbine	195	MW		BACT-PSD
*TX-0672	CORPUS CHRISTI LIQUEFACTION PLANT	09/12/2014 &nb	3/13/2015	Refrigeration compressor turbines	40000	hp		BACT-PSD
*TX-0678	FREEPORT LNG PRETREATMENT FACILITY	07/16/2014 &nb	3/13/2015	Combustion Turbine	87	MW		BACT-PSD
*TX-0698	BAYPORT COMPLEX	09/05/2013 &nb	3/19/2015	(4) cogeneration turbines	90	MW		BACT-PSD
*TX-0708	LA PALOMA ENERGY CENTER	02/07/2013 &nb	3/20/2015	(2) combined cycle turbines	650	MW		BACT-PSD
*TX-0709	SAND HILL ENERGY CENTER	09/13/2013 &nb	3/20/2015	Natural gas-fired combined cycle turbines	173.9	MW		BACT-PSD
*TX-0710	VICTORIA POWER STATION	12/01/2014 &nb	3/20/2015	combined cycle turbine	197	MW		BACT-PSD
*TX-0712	TRINIDAD GENERATING FACILITY	11/20/2014 &nb	3/20/2015	combined cycle turbine	497	MW		BACT-PSD
*TX-0713	TENASKA BROWNSVILLE GENERATING STAT	04/29/2014 &nb	3/20/2015	(2) combined cycle turbines	274	MW		BACT-PSD
*TX-0714	S R BERTRON ELECTRIC GENERATING STATI	12/19/2014 &nb	3/20/2015	(2) combined cycle turbines	240	MW		BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DU	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	03/11/2010 &nb	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DU	154	MW	PUC QUALITY NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (WARM STARTUP PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (HOT STARTUP PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
CA-1211	COLUSA GENERATING STATION	03/11/2011 &nb	1/27/2014	COMBUSTION TURBINES (SHUTDOWN PERIODS)	172	MW	USE NATURAL GAS	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	08/28/2012 &nb	8/27/2012	Combined Cycle Turbine (EP01)	40	MW	good combustion practices	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	08/28/2012 &nb	8/27/2012	Combined Cycle Turbine (EP02)	40	MW	good combustion practices	BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTEL	12/17/2013 &nb	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046	MMBtu/hr		OTHER CASE-E

Table D-8. RBLC PM Summary for Commercial/Institutional Sized Boilers and Furnaces

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_DATE	DATE_LAST_UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION_LIMIT	UNIT	NOTES	EMISSION_LIMIT_1_AVG_TIME_CONDITION	BASIS
OR-0050	TROUTDALE ENERGY CENTER, LLC	OR	26-0235	03/05/2014 ACT	5/5/2016	Auxiliary boiler	39.8	MMBTU/H	Good combustion practices; Utilize only natural gas.	0				BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	TU/H heat inpu	Efficient combustion; natural gas fuel.	0.0018	LB/MMBTU	Filterable PM	HEAT INPUT; TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler B (EUAUXBOILERB)	95	MMBTU/H	Good combustion practices	0.0018	LB/MMBTU	Filterable PM	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler A (EUAUXBOILERA)	55	MMBTU/H	Good combustion practices	0.0018	LB/MMBTU	Filterable PM	TEST PROTOCOL	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0019	LB/MMBTU	Not constructed	3-HOUR BLOCK AVERAGE	BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.002	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.002	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.002	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.002	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	SMALL BOILERS & HEATERS(<100 MMBTU/H)	99	MMBTU/H		0.0025	GR/DSCF	Larger boiler size	3 HOUR AVERAGE	BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H	ESP	0.0032	LB/MMBTU	Different type unit	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H	ESP	0.0032	LB/MMBTU	Different type unit	3-HOUR	OTHER CASE-BY-CASE
CA-1192	AVENAL ENERGY PROJECT	CA	SJ 08-01	06/21/2011 ACT	1/10/2014	AUXILIARY BOILER	37.4	MMBTU/H	USE PUC QUALITY NATURAL GAS, OPERATIONAL LIMIT OF 46,675 MMBTU/YR	0.0034	GR/DSCF	Not constructed		BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	CA	SJ 08-01	06/21/2011 ACT	1/10/2014	AUXILIARY BOILER	37.4	MMBTU/H	USE PUC QUALITY NATURAL GAS, OPERATIONAL LIMIT OF 46,675 MMBTU/YR	0.0034	GR/DSCF	Not constructed		BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	IA	57-01-080	06/29/2007 ACT	10/9/2007	NATURAL GAS BOILER (292.5 MMBTU/H)	292.5	MMBTU/H	NATURAL GAS FUEL ONLY	0.005	LB/MMBTU	Larger boiler size	AVERATE OF 3 TEST RUNS	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	IA	57-01-080	06/29/2007 ACT	10/9/2007	NATURAL GAS BOILER (292.5 MMBTU/H)	292.5	MMBTU/H	NATURAL GAS FUEL ONLY	0.005	LB/MMBTU	Larger boiler size	AVERAGE OF 3 TEST RUNS	BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	BOILERS A & B (U-1 & U-2)	250	MMBTU/H	GOOD COMBUSTION PRACTICES AND USE OF GASEOUS FUEL	0.005	LB/MMBTU	Larger boiler size	THREE ONE-HOUR TEST AVERA	BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	BOILERS C & D (U-3 & U-4)	250	MMBTU/H	GOOD COMBUSTION PRACTICES AND USE OF NATURAL GAS AS FUEL	0.005	LB/MMBTU	Larger boiler size	THREE ONE-HOUR TEST AVERA	BACT-PSD
LA-0229	SHINTECH PLAQUEMINE PLANT 2	LA	PSD-LA-731	07/10/2008 ACT	4/20/2009	EQT112, EQT113 - TWO UTIL. BOILERS (2U-1, 2U-2)	250	MMBTU/H	GOOD COMBUSTION PRACTICES AND CLEAN BURNING FUELS	0.005	LB/MMBTU	Larger boiler size		BACT-PSD
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	MA	NE-12-022	01/30/2014 ACT	5/5/2016	Auxiliary Boiler	80	MMBTU/H		0.005	LB/MMBTU	Larger boiler size	1 HR AVG, DOES NOT APPLY DI	BACT-PSD
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	MA	NE-12-022	01/30/2014 ACT	5/5/2016	Auxiliary Boiler	80	MMBTU/H		0.005	LB/MMBTU	Larger boiler size	1 HR BLOCK AVG, DOES NOT A	BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H		0.005	LB/MMBTU	Larger boiler size	3-HR AVERAGE	BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H		0.005	LB/MMBTU	Larger boiler size	3-HR AVERAGE	BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H		0.005	LB/MMBTU	Larger boiler size	3-HR AVERAGE	LAER
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	AUXILLARY BOILER	93	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU	Larger boiler size	3-HOUR AVERAGE	BACT-PSD
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	AUXILLARY BOILER	93	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU	Larger boiler size	3-HOUR AVERAGE	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	FG-AUXBOILER1-2; Two (2) natural gas-fired auxiliary boilers.	40	MMBTU/H	Good combustion practices.	0.005	LB/MMBTU	Filterable PM	TEST PROTOCOL; EACH UNIT.	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	FG-AUXBOILER1-2; Two (2) natural gas-fired auxiliary boilers.	40	MMBTU/H	Good combustion practices.	0.005	LB/MMBTU	Filterable PM	TEST PROTOCOL; EACH UNIT.	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	FG-AUXBOILER1-2; Two (2) natural gas-fired auxiliary boilers.	40	MMBTU/H	Good combustion practices.	0.005	LB/MMBTU	Filterable PM	TEST PROTOCOL; EACH UNIT.	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS NY42, NY43, AND NY44 AT NEW YORK - NEW YORK	2	MMBTU/H	GOOD COMBUSTION PRACTICES	0.005	LB/MMBTU	Filterable PM		LAER
PA-0291	HICKORY RUN ENERGY STATION	PA	37-337A	04/23/2013 ACT	5/27/2016	AUXILIARY BOILER	40	MMBTU/H		0.005	LB/MMBTU	Not constructed		OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM		OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.005	LB/MMBTU	Filterable PM	3-HOUR	OTHER CASE-BY-CASE
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	TU/H heat inpu	Efficient combustion; natural gas fuel.	0.007	LB/MMBTU	Larger boiler size	HEAT INPUT; TEST PROTOCOL	BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	TU/H heat inpu	Efficient combustion; natural gas fuel.	0.007	LB/MMBTU	Larger boiler size	HEAT INPUT; TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler B (EUAUXBOILERB)	95	MMBTU/H	Good combustion practices	0.007	LB/MMBTU	Larger boiler size	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler B (EUAUXBOILERB)	95	MMBTU/H	Good combustion practices	0.007	LB/MMBTU	Larger boiler size	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler A (EUAUXBOILERA)	55	MMBTU/H	Good combustion practices	0.007	LB/MMBTU	Draft & Test protocol	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler A (EUAUXBOILERA)	55	MMBTU/H	Good combustion practices	0.007	LB/MMBTU	Draft & Test protocol	TEST PROTOCOL	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT MB090 AT MANDALAY BAY	4.3	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND FLUE GAS RECIRCULATION	0.007	LB/MMBTU	Boiler size not comparable		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC004, CC005, AND CC006 AT CITY CENTER	4.2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0071	LB/MMBTU	Boiler size not comparable		Other Case-by-Case
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Three (3) Package Boilers	243	MMBTU/H		0.0074	LB/MMBTU	Larger boiler size	3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Three (3) Package Boilers	243	MMBTU/H		0.0074	LB/MMBTU	Larger boiler size	3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Three (3) Package Boilers	243	MMBTU/H		0.0074	LB/MMBTU	Larger boiler size	3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		0.0074	LB/MMBTU		3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H	Limited Use (200 hr/yr)	0.0074	LB/MMBTU		3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		0.0074	LB/MMBTU		3-HR AVG	BACT-PSD
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	141-31003-00579	12/03/2012 ACT	5/4/2016	TWO (2) NATURAL GAS AUXILIARY BOILERS	80	MMBTU/H	GOOD COMBUSTION PRACTICES AND FUEL SPECIFICATIONS	0.0075	LB/MMBTU		3 HOURS	BACT-PSD
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	141-31003-00579	12/03/2012 ACT	5/4/2016	TWO (2) NATURAL GAS AUXILIARY BOILERS	80	MMBTU/H	GOOD COMBUSTION PRACTICES AND FUEL SPECIFICATIONS	0.0075	LB/MMBTU		3 HOURS	BACT-PSD
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	141-31003-00579	12/03/2012 ACT	5/4/2016	TWO (2) NATURAL GAS AUXILIARY BOILERS	80	MMBTU/H	GOOD COMBUSTION PRACTICES AND FUEL SPECIFICATIONS	0.0075	LB/MMBTU		3 HOURS	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0046	KEYS ENERGY CENTER	MD	PSC CASE NO. 9297	10/31/2014 ACT	5/13/2016	AUXILIARY BOILER	93	MMBTU/H	EFFICIENT BOILER DESIGN, EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS, AND APPLICATION OF GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0046	KEYS ENERGY CENTER	MD	PSC CASE NO. 9297	10/31/2014 ACT	5/13/2016	AUXILIARY BOILER	93	MMBTU/H	EFFICIENT BOILER DESIGN, EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS, AND APPLICATION OF GOOD COMBUSTION PRACTICES.	0.0075	LB/MMBTU		3-HOUR AVERAGE	BACT-PSD
NV-0044	HARRAH'S OPERATING COMPANY, INC.	NV	257	01/04/2007 ACT	4/26/2007	COMMERCIAL/INSTITUTIONAL-SIZE BOILERS	35.4	MMBTU/H	USE OF NATURAL GAS AS THE ONLY FUEL	0.0075	LB/MMBTU			BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT HA08	8.37	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0075	LB/MMBTU			OTHER CASE-BY-CASE
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT FL01	14.34	MMBTU/H	FLUE GAS RECIRCULATION AND OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0075	LB/MMBTU			Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP03	33.48	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0075	LB/MMBTU			Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP26	24	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0075	LB/MMBTU			Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS BE102 THRU BE105 AT BELLAGIO	2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU			Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC026, CC027 AND CC028 AT CITY CENTER	44	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU			LAER
*OK-0148	BUFFALO CREEK PROCESSING PLANT	OK	2012-1026-C PSD	09/12/2012 ACT	9/16/2016	Commercial/Institutional Boilers (<100 MMBTUH)	11.04	MMBTUH		0.0075	LB/MMBTU			BACT-PSD

AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	:03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	3 NATURAL GAS-FIRED BOILERS WITH ULNB & EGR (537-539)	64.9	MMBTU each		0.0076	LB/MMBTU		BACT-PSD
AL-0231	NUCOR DECATUR LLC	AL	712-0037	06/12/2007 ACT	8/31/2009	VACUUM DEGASSER BOILER	95	MMBTU/H		0.0076	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA03	31.38	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0076	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP01	35.4	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0076	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT PA15	21	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0076	LB/MMBTU		BACT-PSD
SC-0112	NUCOR STEEL - BERKELEY	SC	0420-0060-DO	05/05/2008 ACT	10/30/2013	VACUUM DEGASSER BOILER	50.21	MMBTU/H	GOOD COMBUSTION PRACTICES PER MANUFACTURER'S GUIDANCE	0.0076	LB/MMBTU		BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			FLUE GAS RECIRCULATION	0.0077	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA01	16.8	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0077	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC001, CC002, AND CC003 AT CITY CENTER	41.64	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0077	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT IP04	16.7	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0078	LB/MMBTU		Other Case-by-Case
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	auxiliary boiler	60.1	mmBtu/hr		0.008	LB/MMBTU	AVERAGE OF 3 ONE-HOUR TES	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.009	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.009	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.009	LB/MMBTU	TEST PROTOCOL	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT BE111 AT BELLAGIO	2.1	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0095	LB/MMBTU		LAER
*OK-0156	NORTHSTAR AGRI IND ENID	OK	2013-0109-C PSD	07/31/2013 ACT	12/6/2016	Gas-fired Boiler	95	MMBTUH	Good Combustion	0.0126	LB/MMBTU		BACT-PSD
*OK-0156	NORTHSTAR AGRI IND ENID	OK	2013-0109-C PSD	07/31/2013 ACT	12/6/2016	Gas-fired Boiler	95	MMBTUH	Good Combustion	0.013	LB/MMBTU	3-HOUR AVG	BACT-PSD
FL-0335	SUWANNEE MILL	FL	:10468-001-AC(PSD-FL-4:	09/05/2012 ACT	5/30/2013	Two(2) Biomass-Fuel Boilers - 120 MMBtu/hr each	120	MMBTU/H	ESP - Electrostatic Precipitator	0.015	LB/MMBTU	(SEE NOTE BELOW)	RACT
*WY-0075	CHEYENNE PRAIRIE GENERATING STATION	WY	MD-16173	07/16/2014 ACT	6/16/2014	Auxiliary Boiler	25.06	MMBtu/h	good combustion practices	0.0175	LB/MMBTU	3 HOUR AVERAGE	BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			GOOD COMBUSTION PRACTICE	0.019	LB/MMBTU		Other Case-by-Case
OH-0323	TITAN TIRE CORPORATION OF BRYAN	OH	03-17392	06/05/2008 ACT	2/3/2009	BOILER	50.4	MMBTU/H		0.02	LB/MMBTU		N/A
SC-0111	FLAKEBOARD AMERICA LIMITED - BENNETTSVILLE MDF	SC	1680-0046-CU	12/22/2009 ACT	10/16/2012	SANDERDUST BOILER	99	MMBTU/H	DRY ESP WITH MULTICLONE	0.025	LB/MMBTU	3-HOURS	BACT-PSD
FL-0335	SUWANNEE MILL	FL	:10468-001-AC(PSD-FL-4:	09/05/2012 ACT	5/30/2013	Two(2) Biomass-Fuel Boilers - 120 MMBtu/hr each	120	MMBTU/H	ESP Electrostatic Precipitator	0.032	LB/MMBTU		BACT-PSD
FL-0335	SUWANNEE MILL	FL	:10468-001-AC(PSD-FL-4:	09/05/2012 ACT	5/30/2013	Two(2) Biomass-Fuel Boilers - 120 MMBtu/hr each	120	MMBTU/H	ESP Electrostatic Precipitator	0.032	LB/MMBTU		BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H	ESP	0.032	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H	ESP	0.032	LB/MMBTU	3-HOUR AVERAGE	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H	ESP	0.032	LB/MMBTU	3-HOUR AVERAGE	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H	ESP	0.032	LB/MMBTU		OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H	ESP	0.032	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H	ESP	0.032	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NATURAL GAS	20.4	MMBTU/H		0.04	LB/H		BACT-PSD
OH-0323	TITAN TIRE CORPORATION OF BRYAN	OH	03-17392	06/05/2008 ACT	2/3/2009	BOILER	50.4	MMBTU/H		0.094	LB/H		N/A
LA-0240	FLOPAM INC.	LA	SD-LA-747/1280-00141-\	06/14/2010 ACT	7/22/2010	Boilers	25.1	MMBTU/H	Good equipment design and proper combustion practices, fueled by natural gas/alcohol	0.1	LB/H	HOURLY MAXIMUM	BACT-PSD
LA-0240	FLOPAM INC.	LA	SD-LA-747/1280-00141-\	06/14/2010 ACT	7/22/2010	Boilers	25.1	MMBTU/H	Good equipment design and proper combustion practices, fueled by natural gas/alcohol	0.13	LB/H	HOURLY MAXIMUM	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NATURAL GAS	20.4	MMBTU/H		0.15	LB/H		BACT-PSD
NJ-0079	WOODBRIDGE ENERGY CENTER	NJ	18940 - BOP110003	07/25/2012 ACT	1/24/2014	Commercial/Institutional size boilers less than 100 MMBtu/hr	2000	hours/year	use of Natural gas	0.17	LB/H	AVERAGE OF THREE TESTS	OTHER CASE-BY-CASE
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	NJ	19149/PCP150001	07/19/2016 ACT	11/3/2016	AUXILIARY BOILER	4000	H/YR	USE OF NATURAL GAS A CLEAN BURNING FUEL	0.181	LB/H	AV OF THREE ONE H STACK TE:	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY BOILER	35	MMBTU/H	OPERATIONAL RESTRICTION OF 500 HR/YR, USE PUC QUALITY NATURAL GAS	0.2	AINS PER 100 DSCF		BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY BOILER	35	MMBTU/H	OPERATIONAL RESTRICTION OF 500 HR/YR	0.2	AINS PER 100 DSCF		BACT-PSD
NJ-0080	HESS NEWARK ENERGY CENTER	NJ	08857/BOP110001	11/01/2012 ACT	3/14/2016	Boiler less than 100 MMBtu/hr	51.9	nmcubic ft/yea	use of natural gas a clean fuel	0.22	LB/H	AVERAGE OF THREE TESTS	N/A
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	NJ	18068/BOP150001	03/10/2016 ACT	7/25/2016	Auxiliary Boiler firing natural gas	687	MMCFT/YR	Use of natural gas a clean burning	0.26	LB/H	AV OF THREE ONE HOUR STAC	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NO. 2 FUEL OIL	20.4	MMBTU/H		0.31	LB/H		BACT-PSD
NJ-0080	HESS NEWARK ENERGY CENTER	NJ	08857/BOP110001	11/01/2012 ACT	3/14/2016	Boiler less than 100 MMBtu/hr	51.9	nmcubic ft/yea	use of natural gas a clean fuel	0.33	LB/H	AVERAGE OF THREE TESTS	BACT-PSD
NJ-0080	HESS NEWARK ENERGY CENTER	NJ	08857/BOP110001	11/01/2012 ACT	3/14/2016	Boiler less than 100 MMBtu/hr	51.9	nmcubic ft/yea	use of natural gas a clean fuel	0.33	LB/H	AVERAGE OF THREE TESTS	N/A
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	NJ	18068/BOP150001	03/10/2016 ACT	7/25/2016	Auxiliary Boiler firing natural gas	687	MMCFT/YR	use of natural gas a clean burning fuel	0.4	LB/H	AV OF THREE ONE HOUR STAC	BACT-PSD
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	NJ	18068/BOP150001	03/10/2016 ACT	7/25/2016	Auxiliary Boiler firing natural gas	687	MMCFT/YR	use of natural gas a clean burning fuel	0.4	LB/H	AV OF THREE ONE HOUR STAC	BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	)1, GHGPSDTX108 AND P	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	13.2	MMBTU/H	Good combustion practice to ensure complete combustion.	0.4	T/YR		BACT-PSD
NJ-0079	WOODBRIDGE ENERGY CENTER	NJ	18940 - BOP110003	07/25/2012 ACT	1/24/2014	Commercial/Institutional size boilers less than 100 MMBtu/hr	2000	hours/year		0.46	LB/H	AVERAGE OF THREE TESTS	OTHER CASE-BY-CASE
NJ-0079	WOODBRIDGE ENERGY CENTER	NJ	18940 - BOP110003	07/25/2012 ACT	1/24/2014	Commercial/Institutional size boilers less than 100 MMBtu/hr	2000	hours/year	Use of Natural gas	0.46	LB/H	AVERAGE OF THREE TESTS	OTHER CASE-BY-CASE
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Auxiliary Boiler	40	MMBTU/H		0.46	T/YR		OTHER CASE-BY-CASE
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Auxiliary Boiler	40	MMBTU/H		0.46	T/YR	BASED ON 12-MONTH ROLLIN(	N/A
OH-0350	REPUBLIC STEEL	OH	P0109191	07/18/2012 ACT	5/4/2016	Steam Boiler	65	MMBtu/H		0.48	LB/H		N/A
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	NJ	19149/PCP150001	07/19/2016 ACT	11/3/2016	AUXILIARY BOILER	4000	H/YR	USE OF NATURAL GAS A CLEAN BURNING FUEL	0.488	LB/H	AV OF THREE ONE H STACK TE:	BACT-PSD
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	NJ	19149/PCP150001	07/19/2016 ACT	11/3/2016	AUXILIARY BOILER	4000	H/YR	USE OF NATURAL GAS A CLEAN BURNING FUEL	0.488	LB/H	AV OF THREE ONE H STACK TE:	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NO. 2 FUEL OIL	20.4	MMBTU/H		0.5	LB/H		BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	BOILERS #1 AND #2	80	MMBTU/H		0.5	LB/H	24-HOUR	BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	BOILERS #1 AND #2	80	MMBTU/H		0.6	LB/H		BACT-PSD
LA-0246	ST. CHARLES REFINERY	LA	PSD-LA-619(M6)	12/31/2010 ACT	7/6/2011	EQT0323 - Boiler 401F	99	MMBTU/H	Proper design and operation, good combustion practices and gaseous fuels	0.74	LB/H	HOURLY MAXIMUM	BACT-PSD
OH-0352	OREGON CLEAN ENERGY CENTER	OH	P0110840	06/18/2013 ACT	5/4/2016	Auxiliary Boiler	99	MMBtu/H	Clean burning fuel, only burning natural gas	0.79	LB/H		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	)1, GHGPSDTX108 AND P	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	40	MMBTU/H	Good combustion practice to ensure complete combustion. gaseous fuel	1.31	T/YR		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	)1, GHGPSDTX108 AND P	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	40	MMBTU/H	Good combustion practice to ensure complete combustion. gaseous fuel	1.31	T/YR		BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	COMMISSIONING BOILERS 1 & 2 (CB-1 & CB-2)	217.5	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE.	1.94	LB/H	HOURLY MAXIMUM	BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	COMMISSIONING BOILERS 1 & 2 (CB-1 & CB-2)	217.5	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE.	1.94	LB/H	HOURLY MAXIMUM	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	-FL-354 AND 0990646-00	01/10/2007 ACT	3/3/2009	TWO 99.8 MMBTU/H GAS-FUELED AUXILIARY BOILERS	99.8	MMBTU/H		2	GS/100 SCF GAS		BACT-PSD
FL-0335	SUWANNEE MILL	FL	:10468-001-AC(PSD-FL-4:	09/05/2012 ACT	5/30/2013	Four(4) Natural Gas Boilers - 46 MMBtu/hour	46	MMBTU/H	Good Combustion Practice	2	GR OF S/100 SCF		BACT-PSD
FL-0335	SUWANNEE MILL	FL	:10468-001-AC(PSD-FL-4:	09/05/2012 ACT	5/30/2013	Four(4) Natural Gas Boilers - 46 MMBtu/hour	46	MMBTU/H	Good Combustion Practice	2	GR OF S/100 SCF		BACT-PSD
FL-0335	SUWANNEE MILL	FL	:10468-001-AC(PSD-FL-4:	09/05/2012 ACT	5/30/2013	Four(4) Natural Gas Boilers - 46 MMBtu/hour	46	MMBTU/H	Good Combustion Practice	2	GR OF S/100 SCF		BACT-PSD
OR-0048	CARTY PLANT	OR	25-0016-ST-02	12/29/2010 ACT	8/30/2011	NATURAL GAS-FIRED BOILER	91	MMBTU/H	CLEAN FUEL	2.5	LB/MMCF		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	)1, GHGPSDTX108 AND P	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	13.2	MMBTU/H	Good combustion practice to ensure complete combustion.	4	T/YR		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, VACUUM DEGASSER	51.2	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, VACUUM DEGASSER	51.2	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, VACUUM DEGASSER	51.2	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, PICKLE LINE	67	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, PICKLE LINE	67	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, PICKLE LINE	67	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILERS SN-26 AND 27, GALVANIZING LINE	24.5	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	X10^-4 GR/DSCF		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILERS SN-26 AND 27, GALVANIZING LINE	24.5	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILERS SN-26 AND 27, GALVANIZING LINE	24.5	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	AUXILIARY BOILER	938.3	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	6.99	LB/H	MAXIMUM	BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	)1, GHGPSDTX108 AND P	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	95.7	MMBTU/H	Use of gaseous fuel with efficient combustion.	7.49	T/YR		BACT-PSD

TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	)1, GHGPSDTX108 AND P	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	95.7	MMBTU/H	Use of gaseous fuel with efficient combustion.	7.49	T/YR	BACT-PSD
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	FL	0930117-001-AC	03/09/2016 ACT	7/6/2016	Auxiliary Boiler, 99.8 MMBtu/hr	99.8	MMBtu/hr	Use of clean fuels	10	% OPACITY	BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Boiler	950	MMBTU/H	clean fuel and good combustion practices	17.08	T/YR	BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Boiler	950	MMBTU/H	clean fuel and good combustion practices	22.77	T/YR	BACT-PSD

Table D-9. RBLC Particulate Matter Summary for Commercial/Institutional-Size Furnaces and Heaters - Natural Gas Fired

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_ DATE	DATE_LAST_U PDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION _LIMIT	UNIT	NOTES	EMISSION_LIMIT_1_AV G_TIME_CONDITION	BASIS
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	17	MMBTU/H	Good combustion practices and fuel selection	0				BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	48	MMBTU/H	Best Combustion Practices	0				BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	10	MMBTU/H	Good combustion practices and fuel selection	0				BACT-PSD
*TX-0663	JACKSON COUNTY GAS PLANT	TX	PSDTX1264	05/25/2012 ACT	9/30/2014	Heaters	3	MMBTU/H	Good combustion practices and fuel selection	0				BACT-PSD
TX-0691	PH ROBINSON ELECTRIC GENERATING STATION	TX	108182 PSDTX1346	05/20/2014 ACT	5/9/2016	fuel gas heater	18	MMBTU/H		0				BACT-PSD
TX-0694	INDECK WHARTON ENERGY CENTER	TX	111724 PSDTX1374	02/02/2015 ACT	5/9/2016	heater	3	MMBTU/H		0				BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FG-FUELHTRS: 2 natural gas fuel heaters, 12 MMBTU/H each	12	MMBTU/H	Efficient combustion; natural gas fuel.	0.0018	LB/MMBTU	Filterable PM	TEST PROTOCOL WILL SPECIFY	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	FUEL GAS HEATER	13.8	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0019	LB/MMBTU	Filterable PM		BACT-PSD
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	SMALL BOILERS & HEATERS(<100 MMBTU/H)	99	MMBTU/H		0.0025	GR/DSCF	Larger Heater size	3 HOUR AVERAGE	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	-03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H	WET SCRUBBER & CYCLONE	0.0044	GR/DSCF	Larger Heater size		BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	-03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H	WET SCRUBBER & CYCLONE	0.0044	GR/DSCF	Larger Heater size		BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	-03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H	BAGHOUSE	0.005	GR/DSCF	Larger Heater size		BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	HEATER	1.7	MMBTU/H		0.007	LB/MMBTU	Filterable PM		BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	HEATER	1.7	MMBTU/H		0.007	LB/MMBTU	Filterable PM		BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	HEATER	1.7	MMBTU/H		0.007	LB/MMBTU	Filterable PM		LAER
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	FUEL GAS HEATER	9.5	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.007	LB/MMBTU	Filterable PM		BACT-PSD
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	FUEL GAS HEATER	9.5	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.007	LB/MMBTU	Filterable PM		BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	IMBTU/H heat input ea	Efficient combustion; natural gas fuel.	0.007	LB/MMBTU	Larger Heater size	HEAT INPUT; TEST PROTOCOL	BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	IMBTU/H heat input ea	Efficient combustion; natural gas fuel.	0.007	LB/MMBTU	Larger Heater size	HEAT INPUT; TEST PROTOCOL	BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FG-FUELHTRS: 2 natural gas fuel heaters, 12 MMBTU/H each	12	J/H heat input each fue	Efficient combustion; natural gas fuel.	0.007	LB/MMBTU	Larger Heater size	TEST PROTOCOL WILL SPECIFY	BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FG-FUELHTRS: 2 natural gas fuel heaters, 12 MMBTU/H each	12	J/H heat input each fue	Efficient combustion; natural gas fuel.	0.007	LB/MMBTU	Larger Heater size	TEST PROTOCOL WILL SPECIFY	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Fuel pre-heater (EUFUELHTR)	3.7	MMBTU/H	Good combustion practices.	0.007	LB/MMBTU	Filterable PM	TEST PROTOCOL	BACT-PSD
OH-0355	GENERAL ELECTRIC AVIATION, EVENDALE PLANT	OH	P0112127	05/07/2013 ACT	5/4/2016	4 Indirect-Fired Air Preheaters	0			0.007	LB/MMBTU	Different Unit Type		N/A
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Fuel Preheater	8.5	MMBTU/H		0.007	LB/MMBTU	Filterable PM		OTHER CASE-BY-CASE
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		0.0074	LB/MMBTU		3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H	Limited Use (200 hr/yr)	0.0074	LB/MMBTU		3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		0.0074	LB/MMBTU		3-HR AVG	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Startup Heater	101	MMBTU/H	Limited Use (200 hr/yr)	0.0074	LB/MMBTU			BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Startup Heater	101	MMBTU/H		0.0074	LB/MMBTU			BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Startup Heater	101	MMBTU/H	Limited Use (200 hr/yr)	0.0074	LB/MMBTU			BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	DEW POINT HEATER	5	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRA(	0.0075	LB/MMBTU		3-HOUR AVERAGE BASIS	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	DEW POINT HEATER	5	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRA(	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	DEW POINT HEATER	5	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRA(	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	FUEL GAS HEATER	13.8	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	FUEL GAS HEATER	13.8	MMBTU/H	USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU		3-HOUR BLOCK AVERAGE	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Fuel pre-heater (EUFUELHTR)	3.7	MMBTU/H	Good combustion practices	0.0075	LB/MMBTU		TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Fuel pre-heater (EUFUELHTR)	3.7	MMBTU/H	Good combustion pracitces.	0.0075	LB/MMBTU		TEST PROTOCOL	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	WATER HEATERS - UNITS NY037 AND NY038 AT NEW YORK - NEW YORK	2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU			Other Case-by-Case
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	-03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.0076	LB/MMBTU			BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	-03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.0076	LB/MMBTU			BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	-03-0095-X001 THRU X02	08/17/2007 ACT	11/15/2013	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	169	MMBTU/H		0.0076	LB/MMBTU			BACT-PSD
OK-0128	MID AMERICAN STEEL ROLLING MILL	OK	2003-106-C(M-1) PSD	09/08/2008 ACT	12/17/2010	Ladle pre-heater and refractory drying	0		natural gas fuel	0.0076	LB/MMBTU			BACT-PSD
OK-0173	CMC STEEL OKLAHOMA	OK	2015-0643-C PSD	01/19/2016 ACT	7/7/2016	Heaters (Gas-Fired)	0		Natural Gas Fuel.	0.0076	LB/MMBTU			BACT-PSD
OK-0173	CMC STEEL OKLAHOMA	OK	2015-0643-C PSD	01/19/2016 ACT	7/7/2016	Heaters (Gas-Fired)	0		Natural Gas Fuel.	0.0076	LB/MMBTU			BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			FLUE GAS RECIRCULATION	0.0077	LB/MMBTU			Other Case-by-Case
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	dew point heater	13.32	mmBtu/hr		0.008	LB/MMBTU		3-HOUR AVERAGE	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.009	LB/MMBTU		TEST PROTOCOL	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.009	LB/MMBTU		TEST PROTOCOL	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.009	LB/MMBTU		TEST PROTOCOL	BACT-PSD
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	PROCESS HEATERS	606	MMBTU/H		0.015	LB/MMBTU			BACT-PSD
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	PROCESS HEATERS	606	MMBTU/H		0.015	LB/MMBTU			BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			GOOD COMBUSTION PRACTICE	0.019	LB/MMBTU			Other Case-by-Case
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	GASIFIER STARTUP PREHEATER BURNERS (5)	35	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	0.03	LB/H		MAXIMUM (EACH)	BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	OK	2007-115-C(M-1)PSD	01/23/2009 ACT	2/18/2010	FUEL GAS HEATER (H2O BATH)	18.8	MMBTU/H		0.1	LB/H			N/A
OK-0134	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	8/30/2011	Nitric Acid Preheaters No. 1 (EU 401, EUG 4)	20	MMBTUH	Natural gas combustion	0.15	LB/H			
OK-0134	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	8/30/2011	Nitric Acid Preheaters No. 1 (EU 401, EUG 4)	20	MMBTUH	Natural gas combustion	0.15	LB/H		24-HR	BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	NITRIC ACID PREHEATERS #1, #3, AND #4	20	MMBTU/H		0.15	LB/H		24-H	BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	NITRIC ACID PREHEATERS #1, #3, AND #4	20	MMBTU/H		0.15	LB/H		24-H	BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 18)	20.89	MMBTU/H		0.15	LB/H			BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 18)	20.89	MMBTU/H		0.15	LB/H			BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 17)	20.89	MMBTU/H		0.15	LB/H			BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	NATURAL GAS SPACE HEATERS - 14 UNITS (ID 17)	20.89	MMBTU/H		0.15	LB/H			BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY HEATER	40	MMBTU/H	OPERATIONAL RESTRICTION OF 1000 HR/YR, USE PUC QUALITY NATURAL GAS	0.2	AINS PER 100 DSCF			BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY HEATER	40	MMBTU/H	OPERATIONAL RESTRICTION OF 1000 HR/YR	0.2	AINS PER 100 DSCF			BACT-PSD
LA-0244	LAKE CHARLES CHEMICAL COMPLEX - LAB UNIT	LA	PSD-LA-291(M3)	11/29/2010 ACT	7/6/2011	EQT0028 - PACOL STARTUP HEATER H-202	21	MMBTU/H	No additional Control	0.21	LB/H		HOURLY MAXIMUM	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	SHIFT REACTOR STARTUP HEATER	34.2	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	0.25	LB/H		MAXIMUM	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	METHANATION STARTUP HEATERS	56.9	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	0.42	LB/H		MAXIMUM	BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	AMMONIA START-UP HEATER (102-B)	59.4	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPC	0.53	LB/H		HOURLY MAXIMUM	BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	AMMONIA START-UP HEATER (102-B)	59.4	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPC	0.53	LB/H		HOURLY MAXIMUM	BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H		0.54	LB/H			BACT-PSD
SC-0114	GP ALLENDALE LP	SC	0160-0020-CB	11/25/2008 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H		0.54	LB/H			BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H	GOOD COMBUSTION PRACTICES WILL BE USED AS CONTROL FOR PM EMISSIONS.	0.54	LB/H			BACT-PSD
SC-0115	GP CLARENDON LP	SC	0680-0046-CB	02/10/2009 ACT	10/16/2012	75 MILLION BTU/HR BACKUP THERMAL OIL HEATER	75	MMBTU/H	GOOD COMBUSTION PRACTICES WILL BE USED AS CONTROL FOR PM10 EMISSIONS.	0.54	LB/H			BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Heaters	45	MMBTU/H	clean fuel and good combustion practices	0.81	T/YR			BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Heaters	45	MMBTU/H	clean fuel and good combustion practices	0.81	T/YR			BACT-PSD
LA-0244	LAKE CHARLES CHEMICAL COMPLEX - LAB UNIT	LA	PSD-LA-291(M3)	11/29/2010 ACT	7/6/2011	EQT0027 - PACOL CHARGE HEATER H-201	87.3	MMBTU/H		0.86	LB/H		HOURLY MAXIMUM	BACT-PSD
LA-0244	LAKE CHARLES CHEMICAL COMPLEX - LAB UNIT	LA	PSD-LA-291(M3)	11/29/2010 ACT	7/6/2011	EQT0029 - Hot Oil Heater H-601	170	MMBTU/H	No additional control	1.71	LB/H		HOURLY MAXIMUM	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	-FL-354 AND 0990646-00	01/10/2007 ACT	3/3/2009	TWO GAS-FUELED 10 MMBTU/H PROCESS HEATERS	10	MMBTU/H		2	GR S/100 SCF GAS			BACT-PSD

LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	STEAM SUPERHEATERS (A & B)	415	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	3.09	LB/H	TOTAL	BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	heaters (5)	24.3	MMBTU/H	clean fuel and good combustion practices	3.38	T/YR		BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	heaters (5)	24.3	MMBTU/H	clean fuel and good combustion practices	3.38	T/YR		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	SMALL HEATERS AND DRYERS SN-05 THROUGH 19	0		COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	SMALL HEATERS AND DRYERS SN-05 THROUGH 19	0		COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	SMALL HEATERS AND DRYERS SN-05 THROUGH 19	0		COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	5.2	10^-4 LB/MMBTU		BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	AK	AQ0164CPT01	12/20/2010 ACT	3/27/2012	Sigma Thermal Auxiliary Heater (1)	12.5	MMBTU/H	Good Combustion Practices	7.6	LB/MMSCF	3-HOUR AVERAGE	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	AK	AQ0164CPT01	12/20/2010 ACT	3/27/2012	Sigma Thermal Auxiliary Heater (1)	12.5	MMBTU/H	Good Combustion Practices	7.6	LB/MMSCF	3-HOUR AVERAGE	BACT-PSD
AK-0071	INTERNATIONAL STATION POWER PLANT	AK	AQ0164CPT01	12/20/2010 ACT	3/27/2012	Sigma Thermal Auxiliary Heater (1)	12.5	MMBTU/H	Good Combustion Practices	7.6	LB/MMSCF	3-HOUR AVERAGE	BACT-PSD

Table D-10. RBLC CO Summary for Combined Cycle Natural Gas Fired CTs

RBLC ID	FACILITY NAME	PERMIT DATES		PROCESS DESCRIPTION	THROUGHPUT		CONTROL METHOD DESCRIPTION	EMISSION LIMITS		BASIS
		ISSUANCE	UPDATE							
CT-0151	KLEEN ENERGY SYSTEMS, LLC	2/25/2008	4/10/2012	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NAT	2.1	MMCF/H	CO CATLYST	0.9	PPMVD @ 15	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine without Duct Burner	20282	MMCF/YR	Oxidation Catalyst and Use of Natural g	0.9	PPMVD@15%	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BI	180	MW	OXIDATION CATALYST SYSTEM	1.5	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BI	180	MW	OXIDATION CATALYST SYSTEM	1.5	PPMVD	BACT-PSD
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	154	MW	OXIDATION CATALYST SYSTEM	1.5	PPMVD	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282	MMCF/YR	Oxidation catalyst and use of natural ga	1.5	PPMVD@15%	BACT-PSD
VA-0315	WARREN COUNTY POWER PLANT - DOMINION	12/17/2010	3/30/2015	COMBINED CYCLE TURBINE & DUCT BURNER, 3	2996	MMBTU/H	Oxidation catalyst and good combustion	1.5	PPMVD	BACT-PSD
*VA-0321	BRUNSWICK COUNTY POWER STATION	3/12/2013	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442	MMBTU/H	Oxidation catalyst; good combustion pr	1.5	PPMVD	BACT-PSD
GA-0127	PLANT MCDONOUGH COMBINED CYCLE	1/7/2008	10/9/2008	COMBINED CYCLE COMBUSTION TURBINE	254	MW	OXIDATION CATALYST	1.8	PPM @ 15% (	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BI	154	MW	OXIDATION CATALYST SYSTEM	2	PPMVD	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BI	154	MW	OXIDATION CATALYST SYSTEM	2	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT	180	MW	OXIDATION CATALYST SYSTEM	2	PPMVD	BACT-PSD
CA-1192	AVENAL ENERGY PROJECT	6/21/2011	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT	180	MW	OXIDATION CATALYST SYSTEM	2	PPMVD	BACT-PSD
GA-0138	LIVE OAKS POWER PLANT	4/8/2010	9/10/2010	COMBINED CYCLE COMBUSTION TURBINE - ELECTRIC GENERA	600	MW	GOOD COMBUSTION PRACTICES AND C	2	PPM@15%02	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #1 - combined cycle	2258	mmBtu/hr	catalytic oxidizer	2	PPM	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #2 -combined cycle	2258	mmBtu/hr	CO catalyst	2	PPM	BACT-PSD
ID-0018	LANGLEY GULCH POWER PLANT	6/25/2010	10/5/2010	COMBUSTION TURBINE, COMBINED CYCLE W/ DUCT BURNER	2375.3	MMBTU/H	DRY LOW NOX (DLN),	2	PPMVD	BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURI	2300	MMBTU/H	OXIDATION CATALYST	2	PPMVD	BACT-PSD
MI-0366	BERRIEN ENERGY, LLC	4/13/2005	1/4/2006	3 COMBUSTION TURBINES AND DUCT BURNERS	1584	MMBTU/H	CATALYTIC OXIDATION.	2	PPMDV @ 15	BACT-PSD
NJ-0074	WEST DEPTFORD ENERGY	5/6/2009	1/7/2015	TURBINE, COMBINED CYCLE	17298	MMFT3/YR	CO OXIDATION CATALYST	2	PPMVD@15%	BACT-PSD
NY-0095	CAITHNES BELLPORT ENERGY CENTER	5/10/2006	5/8/2008	COMBUSTION TURBINE	2221	MMBUT/H	OXIDATION CATALYST	2	PPMVD@15%	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, without duct	515600	MMSCF/rollir	oxidation catalyst	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemens, with duct bu	51560	MMSCF/rollir	oxidation catalyst	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, without du	47917	MMSCF/rollir	oxidation catalyst	2	PPM	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsubishi, with duct I	47917	MMSCF/rollir	oxidation catalyst	2	PPM	BACT-PSD
OR-0041	WANAPA ENERGY CENTER	8/8/2005	8/18/2008	COMBUSTION TURBINE & HEAT RECOVERY STEAM GENEI	2384.1	MMBTU/H	OXIDATION CATALYST.	2	PPMDV @ 15	BACT-PSD
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL T	10/10/2012	4/3/2015	Combined-cycle Turbines (2) - Natural gas fired	3277	MMBTU/H	Oxidation Catalyst	2	PPMVD	BACT-PSD
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENERATION PL	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0		CO Catalyst	2	PPMDV	BACT-PSD
*PA-0291	HICKORY RUN ENERGY STATION	4/23/2013	8/16/2013	COMBINED CYCLE UNITS #1 and #2	3.4	MMCF/HR	CO catalyst	2	PPMVD @ 15	OTHER CASE-B
TX-0546	PATTILLO BRANCH POWER PLANT	6/17/2009	11/6/2009	ELECTRICITY GENERATION	350	MW	OXIDATION CATALYST	2	PPMVD	BACT-PSD
TX-0590	KING POWER STATION	8/5/2010	9/14/2011	Turbine	1350	MW	good combustion practices with an oxic	2	PPMVD AT 15	BACT-PSD
*TX-0641	PINECREST ENERGY CENTER	11/12/2013	11/21/2013	combined cycle turbine	700	MW	oxidation catalyst	2	PPMVD	BACT-PSD
*TX-0660	FGE TEXAS POWER I AND FGE TEXAS POWER II	3/24/2014	6/13/2014	Alstom Turbine	230.7	MW	Oxidation catalyst	2	PPMVD	BACT-PSD
*TX-0689	CEDAR BAYOU ELECTRIC GENERATION STATIO	8/29/2014	3/20/2015	Combined cycle natural gas turbines	225	MW	OC	2	PPM	BACT-PSD
*TX-0708	LA PALOMA ENERGY CENTER	2/7/2013	3/20/2015	(2) combined cycle turbines	650	MW	oxidation catalyst	2	PPMVD	BACT-PSD
*TX-0709	SAND HILL ENERGY CENTER	9/13/2013	3/20/2015	Natural gas-fired combined cycle turbines	173.9	MW	OC	2	PPM	BACT-PSD
*TX-0713	TENASKA BROWNSVILLE GENERATING STATIO	4/29/2014	3/20/2015	(2) combined cycle turbines	274	MW	oxidation catalyst	2	PPMVD	BACT-PSD
WA-0328	BP CHERRY POINT COGENERATION PROJECT	1/11/2005	8/14/2007	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY STEAN	174	MW	LEAN PRE-MIX CT BURNER & OXIDATIO	2	PPMDV	BACT-PSD
*WV-0025	MOUNDSVILLE COMBINED CYCLE POWER PLA	11/21/2014	1/6/2015	Combined Cycle Turbine/Duct Burner	2159	mmBtu/Hr	Oxidation Catalyst + Combustion Contr	2	PPM	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT	154	MW	OXIDATION CATALYST SYSTEM	3	PPMVD	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	3/11/2010	1/10/2014	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT	154	MW	OXIDATION CATALYST SYSTEM	3	PPMVD	BACT-PSD
CA-1211	COLUSA GENERATING STATION	3/11/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION)	172	MW	CATALYTIC OXIDATION SYSTEM	3	PPMVD	BACT-PSD
CO-0056	ROCKY MOUNTAIN ENERGY CENTER, LLC	5/2/2006	5/8/2006	NATURAL-GAS FIRED, COMBINED-CYCLE TURBINE	300	MW	USE GOOD COMBUSTION CONTROL PR	3	PPM @ 15% (	BACT-PSD
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLAN	8/16/2011	12/12/2011	COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B	7146	MMBTU/H	OXIDATION CATALYST AND GOOD CON	3	PPMVD @ 15	BACT-PSD
*PA-0298	FUTURE POWER PA/GOOD SPRINGS NGCC FAC	3/4/2014	5/5/2015	Turbine, COMBINED CYCLE UNIT (Siemens 5000)	2267	MMBtu/hr	CO Catalyst	3	PPMVD	BACT-PSD
*OR-0050	TROUTDALE ENERGY CENTER, LLC	3/5/2014	1/6/2015	Mitsubishi M501-GAC combustion turbine, combined cycle cor	2988	MMBtu/hr	Limit the time in startup or shutdown.	3.3	PPMDV AT 15	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG ANI	306	MW	OXIDATION CATALYST SYSTEM	3.5	PPM @ 15% (	BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG ANI	306	MW	OXIDATION CATALYST	3.5	PPM @ 15% (	BACT-PSD

CA-1144	BLYTHE ENERGY PROJECT II	4/25/2007	3/17/2008	2 COMBUSTION TURBINES	170	MW		4	PPMVD	BACT-PSD
CA-1195	ELK HILLS POWER LLC	1/12/2006	1/14/2014	COMBUSTION TURBINE GENERATOR, 2 units (Normal Operatio	166	MW	SCR OR SCONOX	4	PPMVD	BACT-PSD
CA-1209	HIGH DESERT POWER PROJECT	3/11/2010	1/15/2014	COMBUSTION TURBINE GENERATORS (NORMAL OPERATION)	190	MW	OXIDATION CATALYST SYSTEM	4	PPMVD	BACT-PSD
*CO-0073	PUEBLO AIRPORT GENERATING STATION	7/22/2010	10/3/2014	Four combined cycle combution turbines	373	mmbtu/hr	Good combustion control and catalytic	4	PPMVD AT 15	BACT-PSD
LA-0192	CRESCENT CITY POWER	6/6/2005	4/8/2008	GAS TURBINES - 187 MW (2)	2006	MMBTU/H	CO OXIDATION CATALYST AND GOOD C	4	PPM @ 15%C	BACT-PSD
*MI-0410	THETFORD GENERATING STATION	7/25/2013	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	2587	MMBTU/H he	Efficient combustion control plus cataly	4	PPMV	BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5T	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct bu	647	MMBTU/H fo	Oxidation catalyst technology and good	4	PPM	BACT-PSD
TX-0600	THOMAS C. FERGUSON POWER PLANT	9/1/2011	9/14/2011	Natural gas-fired turbines	390	MW	Good combustion practices and oxidati	4	PPMVD	BACT-PSD
TX-0618	CHANNEL ENERGY CENTER LLC	10/15/2012	1/6/2014	Combined Cycle Turbine	180	MW	Good combustion	4	PPMVD	BACT-PSD
TX-0619	DEER PARK ENERGY CENTER	9/26/2012	9/25/2013	Combined Cycle Turbine	180	MW	good combustion	4	PPMVD	BACT-PSD
TX-0620	ES JOSLIN POWER PLANT	9/12/2012	9/25/2013	Combined cycle gas turbine	195	MW	good combustion	4	PPMVD	BACT-PSD
*TX-0678	FREEPORT LNG PRETREATMENT FACILITY	7/16/2014	3/13/2015	Combustion Turbine	87	MW	oxidation catalyst	4	PPMVD	BACT-PSD
*TX-0710	VICTORIA POWER STATION	12/1/2014	3/20/2015	combined cycle turbine	197	MW	oxidation catalyst	4	PPMVD	BACT-PSD
*TX-0712	TRINIDAD GENERATING FACILITY	11/20/2014	3/20/2015	combined cycle turbine	497	MW	oxidation catalyst	4	PPMVD	BACT-PSD
*TX-0714	S R BERTRON ELECTRIC GENERATING STATION	12/19/2014	3/20/2015	(2) combined cycle turbines	240	MW	oxidation catalyst	4	PPMVD	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	4/1/2015	4/15/2015	Combined-cycle gas turbine electric generating facility	1100	MW	SCR and oxidation catalyst	4	PPMVD @ 15	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	8/28/2012	8/27/2012	Combined Cycle Turbine (EP02)	40	MW	Oxidation Catalyst	4	PPMV AT 15%	BACT-PSD
*IL-0112	NELSON ENERGY CENTER	12/28/2010	4/3/2015	Electric Generation Facility	220	MW each		5	PPMVD @ 15	BACT-PSD
FL-0303	FPL WEST COUNTY ENERGY CENTER UNIT 3	7/30/2008	1/5/2011	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMENTARY	2333	MMBTU/H	GOOD COMBUSTION	6	PPMVD (GAS)	BACT-PSD
FL-0304	CANE ISLAND POWER PARK	9/8/2008	4/20/2009	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860	MMBTU/H	GOOD COMBUSTION PRACTICES	6	PPMVD	BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners Off	172	MW	Good combustion practices burning nat	6	PPM	BACT-PSD
FL-0263	FPL TURKEY POINT POWER PLANT	2/8/2005	1/12/2006	170 MW COMBUSTION TURBINE, 4 UNITS	170	MW	CO WILL BE MINIMIZED BY THE EFFICIE	8	PPMVD @ 15	BACT-PSD
FL-0265	HINES POWER BLOCK 4	6/8/2005	1/12/2006	COMBINED CYCLE TURBINE	530	MW	GOOD COMBUSTION	8	PPM	BACT-PSD
FL-0285	PROGRESS BARTOW POWER PLANT	1/26/2007	6/12/2008	COMBINED CYCLE COMBUSTION TURBINE SYSTEM (4-ON-1)	1972	MMBTU/H	GOOD COMBUSTION	8	PPMVD	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	1/10/2007	3/3/2009	COMBINED CYCLE COMBUSTION GAS TURBINES - 6 UNITS	2333	MMBTU/H		8	PPMVD @15%	BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENERGY	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners On	172	MW	Good combustion practices burning nat	8	PPM	BACT-PSD
OK-0129	CHOUTEAU POWER PLANT	1/23/2009	2/18/2010	COMBINED CYCLE COGENERATION >25MW	1882	MMBTU/H	GOOD COMBUSTION	8	PPMV	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine generat	2237	MMBTU/H	Good combustion practices	9	PPM	BACT-PSD
MN-0071	FAIRBAULT ENERGY PARK	6/5/2007	5/29/2008	COMBINED CYCLE COMBUSTION TURBINE W/DUCT BURNER	1758	MMBTU/H	GOOD COMBUSTION	9	PPMVD	BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	3/20/2008	5/18/2012	TWO COMBINED CYCLE GAS TURBINES	2110	MMBTU/H	PROPER OPERATING PRACTICES	10	PPMVD@15%	BACT-PSD
MN-0060	HIGH BRIDGE GENERATING PLANT	8/12/2005	5/2/2006	2 COMBINED-CYCLE COMBUSTION TURBINES	330	MEGAWATTS	GOOD COMBUSTION PRACTICES	10	PPM @ 15% (	BACT-PSD
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENE	5/16/2006	10/2/2006	TURBINE, COMBINED CYCLE (2)	1885	mmbtu/h	GOOD COMBUSTION PRACTICES	10	PPMVD @ 15	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion turbine generat	2486	MMBTU/H	Good combustion practices	10.5	PPM	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3	MMBTU/H	EFFICIENT PROCESS DESIGN.	11.6	PPM @ 15% (	BACT-PSD
TX-0547	NATURAL GAS-FIRED POWER GENERATION FA	6/22/2009	11/6/2009	ELECTRICITY GENERATION	250	MW	GOOD COMBUSTION PRATICES	15	PPMVD	BACT-PSD
*TX-0698	BAYPORT COMPLEX	9/5/2013	3/19/2015	(4) cogeneration turbines	90	MW	DLN and Closed Loop Emissions Control	15	PPMVD	BACT-PSD
*TX-0727	CEDAR BAYOU ELECTRIC GENERATING STATIO	3/31/2015	4/7/2015	Combined cycle turbines	187	MW/turbine	Oxidation catalysts	15	PPMVD	BACT-PSD
OK-0115	LAWTON ENERGY COGEN FACILITY	12/12/2006	3/13/2007	COMBUSTION TURBINE AND DUCT BURNER			GOOD COMBUSTION PRACTICES	16.38	PPMVD	BACT-PSD
TX-0548	MADISON BELL ENERGY CENTER	8/18/2009	11/6/2009	ELECTRICITY GENERATION	275	MW	GOOD COMBUSTION PRACTICES	17.5	PPMVD	BACT-PSD
LA-0136	PLAQUEMINE COGENERATION FACILITY	7/23/2008	4/28/2009	(4) GAS TURBINES/DUCT BURNERS	2876	MMBTU/H	GOOD COMBUSTION PRACTICES	25	PPMVD @ 15	BACT-PSD
OK-0117	PSO SOUTHWESTERN POWER PLT	2/9/2007	5/21/2007	GAS-FIRED TURBINES			COMBUSTION CONTROL	25	PPMVD	BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE & DUCT BURNER, COMBINED CYCLE, NAT GAS, 3	1844.3	MMBTU/H	EFFICIENT PROCESS	25.9	PPM @ 15% (	BACT-PSD
*TX-0672	CORPUS CHRISTI LIQUEFACTION PLANT	9/12/2014	3/13/2015	Refrigeration compressor turbines	40000	hp	dry low emission combustors	29	PPMVD	BACT-PSD
*TX-0687	WEST PLANT AND EAST PLANT CENTRAL HEAT	10/13/2014	3/20/2015	Two Combustion Turbine-Generators	13	MW	Good combustion practices	50	PPM	BACT-PSD
LA-0257	SABINE PASS LNG TERMINAL	12/6/2011	5/11/2012	Combined Cycle Refrigeration Compressor Turbines (8)	286	MMBTU/H	Good combustion practices and fueled	58.4	PPMV	BACT-PSD
*CO-0076	PUEBLO AIRPORT GENERATING STATION	12/11/2014	12/31/2014	Four combined cycle combution turbines	373	mmbtu/hr ea	Catalytic Oxidation.			BACT-PSD
*DE-0023	NRG ENERGY CENTER DOVER	10/31/2012	1/28/2014	UNIT 2- KD1	655	MMBTU/H	Oxidation Catalyst System			OTHER CASE-B
TX-0497	INEOS CHOCOLATE BAYOU FACILITY	8/29/2006	10/2/2007	COGENERATION TRAIN 2 AND 3 (TURBINE AND DUCT BURNER	35	MW	BP AMOCO PROPOSES PROPER COMBU			BACT-PSD
TX-0502	NACOGDOCHES POWER STERNE GENERATING	6/5/2006	4/28/2009	WESTINGHOUSE/SIEMENS MODEL SW501F GAS TURBINE W/	190	MW	STEAG POWER LLC REPRESENTS GOOD			BACT-PSD
*MI-0402	SUMPTER POWER PLANT	11/17/2011	12/16/2013	Combined cycle combustion turbine w/ HRSG	130	MW electrical output				OTHER CASE-B
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAU	12/17/2013	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046	MMBtu/hr	CO Catalyst			BACT-PSD
TX-0516	CITY PUBLIC SERVICE JK SPRUCE ELECTRICE GE	12/28/2005	11/20/2007	SPRUCE POWER GENERATOR UNIT NO 2						BACT-PSD
*VA-0322	GREEN ENERGY PARTNERS/ STONEWALL, LLC	4/30/2013	1/6/2015	Large combustion turbines (>25MW) CCT1 and CCT2	2.23	MMBTU/hr	Catalytic Oxidizer			BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATION	8/28/2012	8/27/2012	Combined Cycle Turbine (EP01)	40	MW	Oxidation Catalyst			BACT-PSD

Table D-11. RBLC CO Summary for Commercial/Institutional Sized Boilers and Furnaces

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_ DATE	DATE_LAST_ UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION_ LIMIT	UNIT	EMISSION_LIMIT_1_AVG_ TIME_CONDITION	BASIS
SC-0113	PYRAMAX CERAMICS, LLC	SC	0160-0023	02/08/2012 ACT	10/17/2012	BOILERS	5	MMBTU/H	GOOD COMBUSTION PRACTICES. CONSUMPTION OF NATURAL GAS AND PROPANE.	0			BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP01	35.4	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0073	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT IP04	16.7	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0074	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP03	33.48	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.0075	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC026, CC027 AND CC028 AT CITY CENTER	44	MMBTU/H	GOOD COMBUSTION PRACTICES INCLUDING THE USE OF PROPER AIR TO FUEL RATIO	0.0148	LB/MMBTU		LAER
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	auxiliary boiler	60.1	mmBtu/hr	CO catalytic oxidizer	0.0164	LB/MMBTU	AVERAGE OF 3 ON-HOUR TEST RUN	BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA03	31.38	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION.	0.0172	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT BA01	16.8	MMBTU/H	FLUE GAS RECIRCULATION	0.0173	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC001, CC002, AND CC003 AT CITY CENTER	41.64	MMBTU/H	GOOD COMBUSTION PROACTICES AND LIMITING THE FUEL TO NATURAL GAS ONLY	0.0184	LB/MMBTU		LAER
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H		0.02	LB/MMBTU	3-HR AVERAGE	BACT-PSD
*MD-0041	CPV ST. CHARLES	MD	PSC CASE NO. 9280	04/23/2014 ACT	7/29/2016	AUXILLARY BOILER	93	MMBTU/H	GOOD COMBUSTION PRACTICES	0.02	LB/MMBTU	3-HOUR AVERAGE BLOCK	BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS CC004, CC005, AND CC006 AT CITY CENTER	4.2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.0214	LB/MMBTU		LAER
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS NY42, NY43, AND NY44 AT NEW YORK - NEW YORK	2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.035	LB/MMBTU		LAER
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	BOILERS A & B (U-1 & U-2)	250	MMBTU/H	GOOD COMBUSTION PRACTICES AND USE OF GASEOUS FUEL	0.036	LB/MMBTU	THREE ONE-HOUR TEST AVERAGE	BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	LA	PSD-LA-709(M-1)	02/27/2009 ACT	8/6/2009	BOILERS C & D (U-3 & U-4)	250	MMBTU/H	GOOD COMBUSTION PRACTICES AND USE OF NATURAL GAS AS FUEL	0.036	LB/MMBTU	THREE ONE-HOUR TEST AVERAGE	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.036	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	FG-AUXBOILER1-2; Two (2) natural gas-fired auxiliary boilers.	40	MMBTU/H	Good combustion practices	0.036	LB/MMBTU	TEST PROTOCOL; EACH UNIT.	BACT-PSD
NV-0044	HARRAH'S OPERATING COMPANY, INC.	NV	257	01/04/2007 ACT	4/26/2007	COMMERCIAL/INSTITUTIONAL-SIZE BOILERS	35.4	MMBTU/H	GOOD COMBUSTION DESIGN	0.036	LB/MMBTU		BACT-PSD
PA-0291	HICKORY RUN ENERGY STATION	PA	37-337A	04/23/2013 ACT	5/27/2016	AUXILIARY BOILER	40	MMBTU/H		0.036	LB/MMBTU		OTHER CASE-BY-CASE
LA-0229	SHINTECH PLAQUEMINE PLANT 2	LA	PSD-LA-731	07/10/2008 ACT	4/20/2009	EQT112, EQT113 - TWO UTIL. BOILERS (2U-1, 2U-2)	250	MMBTU/H	GOOD COMBUSTION PRACTICES	0.0362	LB/MMBTU		BACT-PSD
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT MB090 AT MANDALAY BAY	4.3	MMBTU/H	FLUE GAS RECIRCULATION AND GOOD COMBUSTION PRACTICES	0.0362	LB/MMBTU		LAER
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	GOOD COMBUSTION PRACTICES	0.037	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - NATURAL GAS-FIRED			FLUE GAS RECIRCULATION	0.037	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT HA08	8.37	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.037	LB/MMBTU		Other Case-by-Case
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT CP26	24	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.037	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILERS - UNITS BE102 THRU BE105 AT BELLAGIO	2	MMBTU/H	GOOD COMBUSTION PRACTICES AND PROPER MAINTENANCE	0.037	LB/MMBTU		LAER
TX-0714	S R BERTRON ELECTRIC GENERATING STATION	TX	102731 PSDTX1294	12/19/2014 ACT	5/9/2016	boiler	80	MMBTU/H	low-NOx burners	0.037	LB/MMBTU	3-HR ROLLING AVERAGE	BACT-PSD
*WY-0075	CHEYENNE PRAIRIE GENERATING STATION	WY	MD-16173	07/16/2014 ACT	6/16/2014	Auxiliary Boiler	25.06	MMBtu/h	good combustion	0.0375	LB/MMBTU	3 HOUR AVERAGE	BACT-PSD
NV-0047	NELLIS AIR FORCE BASE	NV	114	02/26/2008 ACT	10/21/2008	BOILERS/HEATERS - DIESEL OIL-FIRED			GOOD COMBUSTION PRACTICE	0.038	LB/MMBTU		Other Case-by-Case
NV-0050	MGM MIRAGE	NV	825	11/30/2009 ACT	3/15/2010	BOILER - UNIT BE111 AT BELLAGIO	2.1	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND GOOD COMBUSTION PRACTICES	0.038	LB/MMBTU		LAER
FL-0335	SUWANNEE MILL	FL	1210468-001-AC(PSD-FL-417)	09/05/2012 ACT	5/30/2013	Four(4) Natural Gas Boilers - 46 MMBtu/hour	46	MMBTU/H	Good Combustion Practice	0.039	LB/MMBTU		BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU003	46	MMBTU/H		0.039	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU004	46	MMBTU/H		0.039	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU005	46	MMBTU/H		0.039	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	NATURAL GAS BOILER EU006	46	MMBTU/H		0.039	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	503-0095-X001 THRU X026	08/17/2007 ACT	11/15/2013	3 NATURAL GAS-FIRED BOILERS WITH ULNB & EGR (537-539)	64.9	MMBTU each		0.04	LB/MMBTU		BACT-PSD
OH-0350	REPUBLIC STEEL	OH	P0109191	07/18/2012 ACT	5/4/2016	Steam Boiler	65	MMBtu/H	Proper burner design and good combustion practices	0.04	LB/MMBTU		BACT-PSD
OR-0050	TROUTDALE ENERGY CENTER, LLC	OR	26-0235	03/05/2014 ACT	5/5/2016	Auxiliary boiler	39.8	MMBTU/H	Utilize Low-NOx burners and FGR.	0.04	LB/MMBTU	3-HR BLOCK AVERAGE	BACT-PSD
SC-0112	NUCOR STEEL - BERKELEY	SC	0420-0060-DO	05/05/2008 ACT	10/30/2013	VACUUM DEGASSER BOILER	50.21	MMBTU/H	NATURAL GAS COMBUSTION WITH GOOD COMBUSTION PRACTICES PER MANUFACTURER'S GUIDANCE	0.061	LB/MMBTU		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT FL01	14.34	MMBTU/H	FLUE GAS RECIRCULATION	0.0705	LB/MMBTU		Other Case-by-Case
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	IA	57-01-080	06/29/2007 ACT	10/9/2007	NATURAL GAS BOILER (292.5 MMBTU/H)	292.5	MMBTU/H	ADVANCES ULTRA LOW NOX BURNERS WITH FLUE GAS RECIRCULATION AND GOOD COMBUSTION PRACTICES	0.072	LB/MMBTU	30-DAY ROLLING AVERAGE/ EXCEPT	BACT-PSD
*OK-0148	BUFFALO CREEK PROCESSING PLANT	OK	2012-1026-C PSD	09/12/2012 ACT	9/16/2016	Commercial/Institutional Boilers (<100 MMBTUH)	11.04	MMBTUH		0.074	LB/MMBTU		BACT-PSD
MI-0410	THETFORD GENERATING STATION	MI	191-12	07/25/2013 ACT	5/4/2016	FGAUXBOILERS: Two auxiliary boilers < 100 MMBTU/H heat input each	100	TU/H heat inpu	Efficient combustion.	0.075	LB/MMBTU	HEAT INPUT. TEST PROTOCOL WIL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler B (EUAUXBOILERB)	95	MMBTU/H	Good combustion practices.	0.077	LB/MMBTU	TEST PROTOCOL	BACT-PSD
MI-0412	HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	MI	107-13	12/04/2013 ACT	5/5/2016	Auxiliary Boiler A (EUAUXBOILERA)	55	MMBTU/H	Good combustion practices	0.077	LB/MMBTU	TEST PROTOCOL	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	PSD-FL-354 AND 0990646-001-AC	01/10/2007 ACT	3/3/2009	TWO 99.8 MMBTU/H GAS-FUELED AUXILIARY BOILERS	99.8	MMBTU/H		0.08	LB/MMBTU		BACT-PSD
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	FL	0930117-001-AC	03/09/2016 ACT	7/6/2016	Auxiliary Boiler, 99.8 MMBtu/hr	99.8	MMBtu/hr	Proper combustion prevents CO	0.08	LB/MMBTU		BACT-PSD
MD-0046	KEYS ENERGY CENTER	MD	PSC CASE NO. 9297	10/31/2014 ACT	5/13/2016	AUXILIARY BOILER	93	MMBTU/H	EFFICIENT BOILER DESIGN AND APPLICATION OF GOOD COMBUSTION PRACTICES.	0.08	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	MN	06100067-001	09/07/2007 ACT	10/30/2008	SMALL BOILERS & HEATERS(<100 MMBTU/H)	99	MMBTU/H		0.08	LB/MMBTU	1 HOUR AVERAGE	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	WY	CT-5873	03/04/2009 ACT	4/20/2009	AUXILIARY BOILER	66	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	HOURLY	BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, VACUUM DEGASSER	51.2	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824	LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILER, PICKLE LINE	67	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824	LB/MMBTU		BACT-PSD
AR-0140	BIG RIVER STEEL LLC	AR	2305-AOP-R0	09/18/2013 ACT	12/13/2016	BOILERS SN-26 AND 27, GALVANIZING LINE	24.5	MMBTU/H	COMBUSTION OF NATURAL GAS AND GOOD COMBUSTION PRACTICE	0.0824	LB/MMBTU		BACT-PSD
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	141-31003-00579	12/03/2012 ACT	5/4/2016	TWO (2) NATURAL GAS AUXILIARY BOILERS	80	MMBTU/H	GOOD COMBUTSTION PRACTICES	0.083	LB/MMBTU	3 HOURS	BACT-PSD
MI-0406	RENAISSANCE POWER LLC	MI	51-13	11/01/2013 ACT	7/7/2016	EU-HEATERSC: Natural gas-fired fuel heater used for heating natural gas prior to combustion in the CTGs. Misc. boilers, furnaces, and heaters	20	MMBTU/H	Good combustion practices	0.09	LB/MMBTU	TEST PROTOCOL	BACT-PSD
SC-0111	FLAKEBOARD AMERICA LIMITED - BENNETTSVILLE MDF	SC	1680-0046-CU	12/22/2009 ACT	10/16/2012	SANDERDUST BOILER	99	MMBTU/H	GOOD COMBUSTION PRACTICES	0.3	LB/MMBTU	3-HOURS	BACT-PSD
FL-0335	SUWANNEE MILL	FL	1210468-001-AC(PSD-FL-417)	09/05/2012 ACT	5/30/2013	Two(2) Biomass-Fuel Boilers - 120 MMBtu/hr each	120	MMBTU/H	Efficient Combustion	0.4	LB/MMBTU	BACT (SEE NOTE BELOW)	BACT-PSD
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU001	120	MMBTU/H		0.4	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
SC-0149	KLAUSNER HOLDING USA, INC	SC	1860-0128-CA	01/03/2013 ACT	8/27/2014	BIOMASS BOILER EU002	120	MMBTU/H		0.4	LB/MMBTU	3-HOUR	OTHER CASE-BY-CASE
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NO. 2 FUEL OIL	20.4	MMBTU/H		0.73	LB/H		BACT-PSD
NV-0049	HARRAH'S OPERATING COMPANY, INC.	NV	257	08/20/2009 ACT	12/1/2009	BOILER - UNIT PA15	21	MMBTU/H	OPERATING IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION	0.848	LB/MMBTU		Other Case-by-Case
LA-0240	FLOPAM INC.	LA	PSD-LA-747/1280-00141-V0	06/14/2010 ACT	7/22/2010	Boilers	25.1	MMBTU/H	Good equipment design and proper combustion practices	0.93	LB/H	HOURLY MAXIMUM	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	OH	04-01358	05/03/2007 ACT	8/16/2007	BOILER (2), NATURAL GAS	20.4	MMBTU/H		1.7	LB/H		BACT-PSD
NJ-0080	HESS NEWARK ENERGY CENTER	NJ	08857/BOP110001	11/01/2012 ACT	3/14/2016	Boiler less than 100 MMBtu/hr	51.9	mmcubic ft/yea	use of natural gas a clean fuel	2.45	LB/H	AVERAGE OF THREE TESTS	BACT-PSD
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	NJ	18068/BOP150001	03/10/2016 ACT	7/25/2016	Auxiliary Boiler firing natural gas	687	MMCFT/YR	Use of good combustion practices and use of natural gas a clean burning fuel	2.88	LB/H	AV OF THREE ONE H STACK TESTS	BACT-PSD
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Auxiliary Boiler	40	MMBTU/H		3.31	T/YR	12-MONTH ROLLING TOTAL	OTHER CASE-BY-CASE
NJ-0079	WOODBRIDGE ENERGY CENTER	NJ	18940 - BOP110003	07/25/2012 ACT	1/24/2014	Commercial/Institutional size boilers less than 100 MMBtu/hr	2000	hours/year	Use of natural gas and good combustion practices	3.44	LB/H	AVERAGE OF THREE TESTS	BACT-PSD
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	NJ	19149/PCP150001	07/19/2016 ACT	11/3/2016	AUXILIARY BOILER	4000	H/YR	USE OF NATURAL GAS A CLEAN BURNING FUEL AND GOOD COMBUSTION PRACTICES	3.61	LB/H	AV OF THREE ONE H STACK TESTS II	BACT-PSD
OH-0323	TITAN TIRE CORPORATION OF BRYAN	OH	03-17392	06/05/2008 ACT	2/3/2009	BOILER	50.4	MMBTU/H		4.15	LB/H		BACT-PSD
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	MA	NE-12-022	01/30/2014 ACT	5/5/2016	Auxiliary Boiler	80	MMBTU/H	Oxidation catalyst	4.7	PPMVD@3% O2	1 HR BLOCK AVG, DOES NOT APPLY	OTHER CASE-BY-CASE
OK-0129	CHOUTEAU POWER PLANT	OK	2007-115-C(M-1)PSD	01/23/2009 ACT	2/18/2010	AUXILIARY BOILER	33.5	MMBTU/H	GOOD COMBUSTION	5.02	LB/H		N/A
OH-0352	OREGON CLEAN ENERGY CENTER	OH	P0110840	06/18/2013 ACT	5/4/2016	Auxillary Boiler	99	MMBtu/H	Good combustion practices and using combustion optimization technology	5.45	LB/H		BACT-PSD
OK-0135	PRYOR PLANT CHEMICAL	OK	2008-100-C PSD	02/23/2009 ACT	2/18/2010	BOILERS #1 AND #2	80	MMBTU/H	GOOD COMBUSTION PRACTICES	6.6	LB/H	1-HOUR/8-HOUR	BACT-PSD
LA-0246	ST. CHARLES REFINERY	LA	PSD-LA-619(M6)	12/31/2010 ACT	7/6/2011	EQT0323 - Boiler 401F	99	MMBTU/H	Proper design and operation, good combustion practices and gaseous fuels	8.15	LB/H	HOURLY MAXIMUM	BACT-PSD
LA-0272	AMMONIA PRODUCTION FACILITY	LA	PSD-LA-768	03/27/2013 ACT	5/4/2016	COMMISSIONING BOILERS 1 & 2 (CB-1 & CB-2)	217.5	MM BTU/HR	GOOD COMBUSTION PRACTICES: PROPER DESIGN OF BURNER AND FIREBOX COMPONENTS; MAINTAINING THE PROPER AIR-TO-FUEL RATIO, RESIDENCE TIME, AND COMBUSTION ZONE TEMPERATURE.	10.87	LB/H	HOURLY MAXIMUM	BACT-PSD
LA-0231	LAKE CHARLES GASIFICATION FACILITY	LA	PSD-LA-742	06/22/2009 ACT	5/17/2010	AUXILIARY BOILER	938.3	MMBTU/H	GOOD DESIGN AND PROPER OPERATION	33.78	LB/H	MAXIMUM	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Three (3) Package Boilers	243	MMBTU/H		50	PPMV	3-HR AVG @ 3% O2	BACT-PSD
AK-0083	KENAI NITROGEN OPERATIONS	AK	AQ0083CPT06	01/06/2015 ACT	2/19/2016	Five (5) Waste Heat Boilers	50	MMBTU/H		50	PPMV	3-HR AVG @ 15 % O2	BACT-PSD
CA-1191	VICTORVILLE 2 HYBRID POWER PROJECT	CA	SE 07-02	03/11/2010 ACT	1/10/2014	AUXILIARY BOILER	35	MMBTU/H	OPERATIONAL RESTRICTION OF 500 HR/YR	50	PPMVD	1-HR AVG, @3% O2	BACT-PSD

CA-1192	AVENAL ENERGY PROJECT	CA	SJ 08-01	06/21/2011 ACT	1/10/2014	AUXILIARY BOILER	37.4	MMBTU/H	ULTRA LOW NOX BURNER, USE PUC QUALITY NATURAL GAS, OPERATIONAL RESTRICTION OF 46, 675 MMBTU/YR	50	PPMVD	3-HR AVG, @3% O2	BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	18901, GHGPSDTX108 AND PSDT)	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	40	MMBTU/H	Good combustion practice to ensure complete combustion.	50	PPMVD @ 3% O2		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	18901, GHGPSDTX108 AND PSDT)	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	95.7	MMBTU/H	Good combustion practice to ensure complete combustion.	50	PPMVD @ 3% O2		BACT-PSD
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	18901, GHGPSDTX108 AND PSDT)	11/06/2015 ACT	7/6/2016	Commercial/Institutional-Size Boilers/Furnaces	13.2	MMBTU/H	Good combustion practice to ensure complete combustion.	50	PPMVD @ 3% O2		BACT-PSD
TX-0656	GAS TO GASOLINE PLANT	TX	PSDTX1340 AND 107764	05/16/2014 ACT	5/12/2016	Boiler	950	MMBTU/H	clean fuel and good combustion practices	96.4	T/YR		BACT-PSD
*OK-0156	NORTHSTAR AGRI IND ENID	OK	2013-0109-C PSD	07/31/2013 ACT	12/6/2016	Gas-fired Boiler	95	MMBTUH	Economizer, Insulation, O2 train control, Energy recapture from blowdowns, and Condensate return system	146	CO2/1000 LB STI	30-DAY AVG	BACT-PSD

Table D-12. RBLC CO Summary for Commercial/Institutional-Size Frunaces and Heaters - Natural Gas Fired

RBLC ID	Facility Name	Permit Dates		Process Description	Throughput Rate		Control Method	Carbon Monoxide		Basis
		Issuance	Update				Description	Emissions	Limit	
NE-0026	NUCOR STEEL DIVISION	6/22/2004	7/23/2004	NNII BILET POST-HEATER	6.8	MMBTU/H		0.0084	LB/MMBTU	Other Case-by-Case
*IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT I	7/12/2013	7/18/2013	Startup Heater	58.8	MMBTU/hr	good operating practices & use of natural gas	0.0194	LB/MMBTU	BACT-PSD
WY-0067	ECHO SPRINGS GAS PLANT	4/1/2009	4/16/2009	HOT OIL HEATER S38	84	MMBTU/H	GOOD COMBUSTION PRACTICES	0.02	LB/MMBTU	BACT-PSD
MD-0035	DOMINION	8/12/2005	5/10/2007	VAPORIZATION HEATER	88.4	MMBTU/H	EACH VAPORIZATION HEATER SHALL ONLY USE N	0.03	LB/MMBTU	BACT-PSD
NV-0050	MGM MIRAGE	11/30/2009	3/15/2010	WATER HEATERS - UNITS NY037 AND	2	MMBTU/H	LIMITING THE FUEL TO NATURAL GAS ONLY AND	0.035	LB/MMBTU	LAER
CO-0058	CHEYENNE STATION	6/12/2004	8/15/2006	HEATERS	45	MMBTU/H	GOOD COMBUSTION PRACTICES	0.037	LB/MMBTU	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATIO	4/14/2014	5/16/2014	dew point heater	13.32	mmBtu/hr		0.041	LB/MMBTU	BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	2/27/2009	8/6/2009	CRACKING FURNACES A-D	90	MMBTU/H EA	GOOD COMBUSTION PRACTICES AND USE OF NA	0.046	LB/MMBTU	BACT-PSD
LA-0229	SHINTECH PLAQUEMINE PLANT 2	7/10/2008	4/20/2009	EQT122-EQT125 - FOUR VCM CRACKI	90	MMBTU/H	GOOD COMBUSTION PRACTICES	0.046	LB/MMBTU	BACT-PSD
WI-0227	PORT WASHINGTON GENERATING STA	10/13/2004	8/31/2006	GAS HEATER (P06, S06)	10	MMBTU/H	NATURAL GAS FUEL	0.047	LB/MMBTU	BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ON	12/17/2013	4/17/2014	Fuel Preheater	8.5	MMBtu/hr		0.05	LBS/MMBTU	
NE-0026	NUCOR STEEL DIVISION	6/22/2004	7/23/2004	NNII REHEAT FURNACE	143	MMBTU/H		0.066	LB/MMBTU	Other Case-by-Case
*WY-0070	CHEYENNE PRAIRIE GENERATING STATI	8/28/2012	8/27/2012	Inlet Air Heater (EP06)	16.1	MMBtu/hr	good combustion practices	0.08	LB/MMBTU	BACT-PSD
MD-0040	CPV ST CHARLES	11/12/2008	2/20/2009	HEATER	1.7	MMBTU/H		0.08	LB/MMBTU	BACT-PSD
MN-0070	MINNESOTA STEEL INDUSTRIES, LLC	9/7/2007	10/30/2008	SMALL BOILERS & HEATERS(<	99	MMBTU/H		0.08	LB/MMBTU	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	3/4/2009	4/20/2009	GASIFICATION PREHEATER 2	21	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	3/4/2009	4/20/2009	GASIFICATION PREHEATER 3	21	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	3/4/2009	4/20/2009	GASIFICATION PREHEATER 4	21	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	3/4/2009	4/20/2009	GASIFICATION PREHEATER 5	21	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
WY-0066	MEDICINE BOW IGL PLANT	3/4/2009	4/20/2009	GASIFICATION PREHEATER 1	21	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATI	8/28/2012	8/27/2012	Inlet Air Heater (EP07)	16.1	MMBtu/hr	good combustion practices	0.08	LB/MMBTU	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATI	8/28/2012	8/27/2012	Inlet Air Heater (EP08)	16.1	MMBtu/hr	good combustion practices	0.08	LB/MMBTU	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATI	8/28/2012	8/27/2012	Inlet Air Heater (EP09)	16.1	MMBtu/hr	good combustion practices	0.08	LB/MMBTU	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATI	8/28/2012	8/27/2012	Inlet Air Heater (EP10)	16.1	MMBtu/hr	good combustion practices	0.08	LB/MMBTU	BACT-PSD
*WY-0070	CHEYENNE PRAIRIE GENERATING STATI	8/28/2012	8/27/2012	Inlet Air Heater (EP11)	16.1	MMBtu/hr	good combustion practices	0.08	LB/MMBTU	BACT-PSD
LA-0229	SHINTECH PLAQUEMINE PLANT 2	7/10/2008	4/20/2009	EQT126, EQT127 - TWO THERMAL OX	72	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
LA-0240	FLOPAM INC.	6/14/2010	7/22/2010	Thermal Oxidizers	0		Good equipment design and proper combustion	0.08	LB/MMBTU	BACT-PSD
FL-0285	PROGRESS BARTOW POWER PLANT	1/26/2007	6/12/2008	FIVE 3 MM BTU/HR GASEOUS-FUELEI	3	MMBTU/H		0.08	LB/MMBTU	BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	1/10/2007	3/3/2009	TWO GAS-FUELED 10 MMBTU/H PRO	10	MMBTU/H		0.08	LB/MMBTU	BACT-PSD
LA-0192	CRESCENT CITY POWER	6/6/2005	4/8/2008	FUEL GAS HEATERS (3)	19	MMBTU/H	GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	5/3/2007	8/16/2007	AIR SUPPLY MAKE UP UNITS (6)	14	MMBTU/H		0.083	LB/MMBTU	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	5/3/2007	8/16/2007	AIR SUPPLY MAKE UP UNITS (24)	20	MMBTU/H		0.083	LB/MMBTU	BACT-PSD
OH-0309	TOLEDO SUPPLIER PARK- PAINT SHOP	5/3/2007	8/16/2007	AIR SUPPLY MAKE UP UNITS	28.95	MMBTU/H		0.083	LB/MMBTU	BACT-PSD
AL-0231	NUCOR DECATUR LLC	6/12/2007	8/31/2009	GALVANIZING LINE FURNACE	98.7	MMBTU/H		0.084	LB/MMBTU	BACT-PSD
OK-0128	MID AMERICAN STEEL ROLLING MILL	9/8/2008	12/17/2010	Ladle pre-heater and refractory drying	0		natural gas fuel	0.084	LB/MMBTU	BACT-PSD
SC-0112	NUCOR STEEL - BERKELEY	5/5/2008	10/30/2013	TUNNEL FURNACE BURNERS	58	MMBTU/H	NATURAL GAS COMBUSTION WITH GOOD COMB	0.084	LB/MMBTU	BACT-PSD
WI-0223	LOUISIANA-PACIFIC HAYWARD	6/17/2004	10/11/2005	THERMAL OIL HEATER, GTS ENERGY,	32	MMBTU/H	USE OF NATURAL GAS / DISTILLATE OIL, W/ REST	0.084	LB/MMBTU	BACT-PSD
WI-0223	LOUISIANA-PACIFIC HAYWARD	6/17/2004	10/11/2005	THERMAL OIL HEATER, GTS ENERGY,	32	MMBTU/H	USE OF NATURAL GAS / DISTILLATE OIL, W/ REST	0.084	LB/MMBTU	BACT-PSD
WA-0301	BP CHERRY POINT REFINERY	4/20/2005	5/16/2006	PROCESS HEATER, IHT	13	MMBTU/H	GOOD COMBUSTION PRACTICES	0.085	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS	8/17/2007	11/15/2013	NATURAL GAS-FIRED BATCH ANNEAL	33.4	MMBTU each		0.09	LB/MMBTU	BACT-PSD

RBLC ID	Facility Name	Permit Dates Issuance	Update	Process Description	Throughput Rate		Control Method Description	Carbon Monoxide Emissions	Limit	Basis
AL-0230	THYSSENKRUPP STEEL AND STAINLESS U	8/17/2007	11/15/2013	NATURAL GAS-FIRED PASSIVE ANNEA	27.2	MMBTU/H		0.09	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS U	8/17/2007	11/15/2013	NATURAL GAS-FIRED BATCH ANNEALI	99	MMBTU/H		0.09	LB/MMBTU	BACT-PSD
WV-0021	OHIO RIVER PLANT	6/9/2004	9/20/2004	DRYER HEATER, UNIT #2, 40.00 MMBT	365	MMSCF/YR		0.09	LB/MMBTU	BACT-PSD
LA-0203	OAKDALE OSB PLANT	6/13/2005	8/7/2007	AUXILIARY THERMAL OIL HEATER	66.5	MMBTU/H	USE OF NATURAL GAS AS FUEL AND GOOD COMB	0.099	LB/MMBTU	BACT-PSD
AK-0062	BADAMI DEVELOPMENT FACILITY	8/19/2005	7/15/2010	NATCO PRODUCTION HEATER	34	MMBTU/H	GOOD OPERATIONAL PRACTICES	0.1	LB/MMBTU	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPII	6/29/2007	10/9/2007	INDIRECT-FIRED DDGS DRYER	93.7	MMBTU/H	LOW NOX BURNERS AND FLUE GAS RECIRCULATI	0.1	LB/MMBTU	BACT-PSD
AL-0191	HYUNDAI MOTOR MANUFACTURING O	3/23/2004	4/30/2004	OVENS, PAINT CURING			NATURAL GAS ONLY	0.1	LB/MMBTU	BACT-PSD
LA-0204	PLAQUEMINE PVC PLANT	2/27/2009	8/6/2009	GAS THERMAL OXIDIZERS A & B	72	MMBTU/H	GOOD COMBUSTION PRACTICES AND USE OF GAS	0.11	LB/MMBTU	BACT-PSD
*MI-0410	THETFORD GENERATING STATION	7/25/2013	8/11/2014	FG-FUELHTRS: 2 natural gas fuel heat	12	MMBTU/H hea	Efficient combustion	0.11	LB/MMBTU	BACT-PSD
WI-0207	ACE ETHANOL - STANLEY	1/21/2004	8/16/2005	DDGS DRYER, COOLING CYCLONE, P4(	55	mmbtu/h	THERMAL OXIDIZER (REGENERATIVE)	0.11	LB/MMBTU	BACT-PSD
AK-0062	BADAMI DEVELOPMENT FACILITY	8/19/2005	7/15/2010	NATCO MISCIBLE INJECTION HEATER	14.87	MMBTU/H	GOOD OPERATIONAL PRACTICES	0.12	LB/MMBTU	BACT-PSD
AK-0062	BADAMI DEVELOPMENT FACILITY	8/19/2005	7/15/2010	NATCO TEG REBOILER	1.34	MMBTU/H	GOOD OPERATIONAL PRACTICES	0.15	LB/MMBTU	BACT-PSD
*OH-0355	GENERAL ELECTRIC AVIATION, EVENDA	5/7/2013	9/27/2013	4 Indirect-Fired Air Preheaters	0			0.15	LB/MMBTU	N/A
AR-0077	BLUEWATER PROJECT	7/22/2004	10/25/2004	FURNACES, HEATERS, & DRYERS	11	MMBTU/H	GOOD COMBUSTION PRACTICE	0.84	LB/MMBTU	BACT-PSD

Table D-13. RBLC H2SO4 Summary for Combined Cycle Natural Gas Fired CTs

RBLC ID	FACILITY NAME	PERMIT DATES						
		ISSUANCE	UPDATE	PROCESS DESCRIPTION	THROUGHPUT	CONTROL METHOD DESCRIPTION	EMISSION LIMITS	BASIS
VA-0315	WARREN COUNTY POWER PLANT - D(	12/17/2010	3/30/2015	COMBINED CYCLE TURBINE & DUCT BURNER, 3	2996 MMBTU/H	Natural Gas burning.	0.0001 LB/MMBTU	BACT-PSD
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER	10/10/2012	4/3/2015	Combined-cycle Turbines (2) - Natural gas fired	3277 MMBTU/H		0.0002 LB/MMBTU	OTHER CA!
NY-0095	CAITHNES BELLPORT ENERGY CENTEF	5/10/2006	5/8/2008	COMBUSTION TURBINE	2221 MMBUT/H	LOWSULFUR FUEL	0.0004 LB/MMBTU	BACT-PSD
*PA-0286	MOXIE ENERGY LLC/PATRIOT GENER/	1/31/2013	4/2/2013	Combined Cycle Power Blocks 472 MW - (2)	0		0.0005 LB/MMBTU	OTHER CA!
*VA-0321	BRUNSWICK COUNTY POWER STATIO	3/12/2013	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442 MMBTU/H	Low sulfur fuel	0.0006 LB/MMBTU	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STAT	4/14/2014	5/16/2014	Combustion turbine #1 - combined cycle	2258 mmBtu/hr		0.0032 LB/MMBTU	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STAT	4/14/2014	5/16/2014	Combustion turbine #2 -combined cycle	2258 mmBtu/hr		0.0032 LB/MMBTU	BACT-PSD
LA-0192	CRESCENT CITY POWER	6/6/2005	4/8/2008	GAS TURBINES - 187 MW (2)	2006 MMBTU/H	USE OF LOW SULFUR NATURAL G/		BACT-PSD
LA-0224	ARSENAL HILL POWER PLANT	3/20/2008	5/18/2012	TWO COMBINED CYCLE GAS TURBINES	2110 MMBTU/H	USE OF LOW-SULFUR PIPELINE QU		BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE & DUCT BURNER, COMBINED CYCLE, NAT G/	1844.3 MMBTU/H	USE OF LOW SULFUR FUEL (NATU		BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine without Duct Burner	20282 MMCF/YR	Use of natural gas a clean burning		OTHER CA!
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct Burner	20282 MMCF/YR	Use of natural gas a clean burning		OTHER CA!
*OH-0356	DUKE ENERGY HANGING ROCK ENER(	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners Off	172 MW	Burning natural gas in an efficient		BACT-PSD
*OH-0356	DUKE ENERGY HANGING ROCK ENER(	12/18/2012	10/1/2013	Turbines (4) (model GE 7FA) Duct Burners On	172 MW	Burning natural gas in an efficient		BACT-PSD
*OR-0050	TROUTDALE ENERGY CENTER, LLC	3/5/2014	1/6/2015	Mitsubishi M501-GAC combustion turbine, combined cycle	2988 MMBtu/hr	Utilize only natural gas or ULSD fu		BACT-PSD
TX-0497	INEOS CHOCOLATE BAYOU FACILITY	8/29/2006	10/2/2007	COGENERATION TRAIN 2 AND 3 (TURBINE AND DUCT BURI	35 MW	THE TURBINES WILL FIRE NATURA		BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	4/1/2015	4/15/2015	Combined-cycle gas turbine electric generating facility	1100 MW	efficient combustion, natural gas		BACT-PSD
*DE-0023	NRG ENERGY CENTER DOVER	10/31/2012	1/28/2014	UNIT 2- KD1	655 MMBTU/H			OTHER CA!
DE-0024	GARRISON ENERGY CENTER	1/30/2013	1/28/2014	Unit 1	2260 million BTUs			BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION T	2300 MMBTU/H	FUEL SPECIFICATION		BACT-PSD
NC-0101	FORSYTH ENERGY PLANT	9/29/2005	8/30/2006	TURBINE, COMBINED CYCLE, NATURAL GAS, (3)	1844.3 MMBTU/H	(NATURAL GAS) OR NO. 2 FUEL		BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PRO.	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #2 WITH HRSG /	306 MW	BEST COMBUSTION PRACTICES.		BACT-PSD
NV-0035	TRACY SUBSTATION EXPANSION PRO.	8/16/2005	6/26/2008	TURBINE, COMBINED CYCLE COMBUSTION #1 WITH HRSG /	306 MW	BEST COMBUSTION PRACTICES.		BACT-PSD
*PA-0291	HICKORY RUN ENERGY STATION	4/23/2013	8/16/2013	COMBINED CYCLE UNITS #1 and #2	3.4 MMCF/HR			OTHER CA!
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/(	12/17/2013	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046 MMBtu/hr			OTHER CA!
*PA-0298	FUTURE POWER PA/GOOD SPRINGS I	3/4/2014	5/5/2015	Turbine, COMBINED CYCLE UNIT (Siemens 5000)	2267 MMBtu/hr			BACT-PSD
TX-0502	NACOGDOCHES POWER STERNE GEN	6/5/2006	4/28/2009	WESTINGHOUSE/SIEMENS MODEL SW501F GAS TURBINE	190 MW			BACT-PSD
TX-0516	CITY PUBLIC SERVICE JK SPRUCE ELEC	12/28/2005	11/20/2007	SPRUCE POWER GENERATOR UNIT NO 2				BACT-PSD
TX-0600	THOMAS C. FERGUSON POWER PLANT	9/1/2011	9/14/2011	Natural gas-fired turbines	390 MW	pipeline quality natural gas		BACT-PSD
*TX-0714	S R BERTRON ELECTRIC GENERATING S	12/19/2014	3/20/2015	(2) combined cycle turbines	240 MW			BACT-PSD
WA-0328	BP CHERRY POINT COGENERATION PRO	1/11/2005	8/14/2007	GE 7FA COMBUSTION TURBINE & HEAT RECOVERY ST	174 MW	LIMIT FUEL TYPE TO NATURAL GAS		BACT-PSD
FL-0304	CANE ISLAND POWER PARK	9/8/2008	4/20/2009	300 MW COMBINED CYCLE COMBUSTION TURBINE	1860 MMBTU/H	FUEL SPECIFICATIONS		BACT-PSD

Table D-14. RBLC H_2SO_4 Summary for Commercial/Institutional Sized Boilers and Furnaces

RBLCID	FACILITY_NAME	STATE	PERMIT_NUM	PERMIT_ISSUANCE_DATE	DATE_LAST_UPDATED	PROCESS_NAME	THROUGHPUT	UNIT	CONTROL_METHOD_DESCRIPTION	EMISSION_LIMIT	UNIT	EMISSION_LIMIT_1_AVG_TIME_CONDITION	BASIS
OR-0050	TROUTDALE ENERGY CENTER, LLC	OR	26-0235	03/05/2014 ACT	5/5/2016	Auxiliary boiler	39.8	MMBTU/H	Good combustion practices; Utilize only natural gas.	0			BACT-PSD
MD-0040	CPV ST CHARLES	MD	CPCN CASE NO. 9129	11/12/2008 ACT	2/20/2009	BOILER	93	MMBTU/H		0.0001	LB/MMBTU	3-HR AVERAGE	BACT-PSD
PA-0291	HICKORY RUN ENERGY STATION	PA	37-337A	04/23/2013 ACT	5/27/2016	AUXILIARY BOILER	40	MMBTU/H		0.0005	LB/MMBTU		OTHER CASE-BY-CASE
MA-0039	SALEM HARBOR STATION REDEVELOPMENT	MA	NE-12-022	01/30/2014 ACT	5/5/2016	Auxiliary Boiler	80	MMBTU/H		0.0009	LB/MMBTU	1 HR BLOCK AVG, DOES NOT APP	BACT-PSD
*MD-0042	WILDCAT POINT GENERATION FACILITY	MD	CPCN CASE NO. 9327	04/08/2014 ACT	7/29/2016	AUXILLARY BOILER	45	MMBTU/H	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS	0.004	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
MD-0045	MATTAWOMAN ENERGY CENTER	MD	PSC CASE. NO. 9330	11/13/2015 ACT	5/13/2016	AUXILIARY BOILER	42	MMBTU/H	EXCLUSIVE USE OF NATURAL GAS, AND GOOD COMBUSTION PRACTICES	0.004	LB/MMBTU	3-HOUR BLOCK AVERAGE	BACT-PSD
IA-0107	MARSHALLTOWN GENERATING STATION	IA	13-A-499-P	04/14/2014 ACT	5/4/2016	auxiliary boiler	60.1	mmBtu/hr		0.0055	LB/H	AVERAGE OF 3 ONE-HOUR TEST F	BACT-PSD
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	NJ	19149/PCP150001	07/19/2016 ACT	11/3/2016	AUXILIARY BOILER	4000	H/YR	USE OF NATURAL GAS A CLEAN BURNING AND LOW SULFUR FUEL	0.01	LB/H		BACT-PSD
OH-0352	OREGON CLEAN ENERGY CENTER	OH	P0110840	06/18/2013 ACT	5/4/2016	Auxillary Boiler	99	MMBtu/H	only burning natural gas 0.5 GR/100 SCF	0.011	LB/H		BACT-PSD
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	NJ	18068/BOP150001	03/10/2016 ACT	7/25/2016	Auxiliary Boiler firing natural gas	687	MMCFT/YR	Use of natural gas a low sulfur fuel	0.02	LB/H		BACT-PSD
PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	PA	06-05150A	12/17/2013 ACT	5/4/2016	Auxiliary Boiler	40	MMBTU/H		0.04	T/YR	BASED ON 12-MONTH ROLLING T	N/A

Table D-15. RBLC GHG Summary for Combined Cycle Natural Gas Fired CTs

RBLC ID	FACILITY NAME	PERMIT DATES ISSUANCE	UPDATE	PROCESS DESCRIPTION	THROUGHPUT	CONTROL METHOD DESCRIPTION	EMISSION LIMITS	BASIS
CA-1212	PALMDALE HYBRID POWER PROJECT	10/18/2011	1/27/2014	COMBUSTION TURBINES (NORMAL OPERATION	154 MW		774 LB/MW-H	BACT-PSD
*WV-0025	MOUNDSVILLE COMBINED CYCLE POWE	11/21/2014	1/6/2015	Combined Cycle Turbine/Duct Burner	2159 mmBtu/Hr	Low Carbon Fuel	793 LB/MW/HR	BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	6/18/2013	8/5/2013	2 Combined Cycle Combustion Turbines-Siemer	515600 MMSCF/rollir	state-of-the-art high efficiency combustion technology	840 LB/MW-H	BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	4/1/2015	4/15/2015	Combined-cycle gas turbine electric generating	1100 MW	efficient processes, practices, and designs	879 LB/MWH	BACT-PSD
*NJ-0082	WEST DEPTFORD ENERGY STATION	7/18/2014	4/27/2015	Combined Cycle Combustion Turbine with Duct	20282 MMCF/YR	Turbine efficiency and Use of Natural gas a clean burning fue	947 LB/MW-H	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #1 - combined cycle	2258 mmBtu/hr		951 LB/MW-H	BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	4/14/2014	5/16/2014	Combustion turbine #2 -combined cycle	2258 mmBtu/hr		951 LB/MW-HR GR	BACT-PSD
*MI-0402	SUMPTER POWER PLANT	11/17/2011	12/16/2013	Combined cycle combustion turbine w/ HRSG	130 MW electrical output		954 LB/MW-H	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion	2237 MMBTU/H	Good combustion practices and energy efficiency.	995 LB/MW-H	BACT-PSD
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ON	12/17/2013	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046 MMBtu/hr		1000 LB/MW-H	BACT-PSD
*OR-0050	TROUTDALE ENERGY CENTER, LLC	3/5/2014	1/6/2015	Mitsubishi M501-GAC combustion turbine, com	2988 MMBtu/hr	Clean fuels	1000 PER GROSS MV	BACT-PSD
*MI-0405	MIDLAND COGENERATION VENTURE	4/23/2013	4/17/2015	Natural gas fueled combined cycle combustion	2486 MMBTU/H	Good combustion practices and energy efficiency	1071 LB/MW-H	BACT-PSD
*DE-0023	NRG ENERGY CENTER DOVER	10/31/2012	1/28/2014	UNIT 2- KD1	655 MMBTU/H		1085 LB/GROSS MW	BACT-PSD
DE-0024	GARRISON ENERGY CENTER	1/30/2013	1/28/2014	Unit 1	2260 million BTUs	Fuel Usage Restriction to natural gas and low sulfur distillate		BACT-PSD
*IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	12/3/2012	11/15/2013	FOUR (4) NATURAL GAS COMBINED CYCLE CON	2300 MMBTU/H	HIGH THERMAL EFFICIENCY DESIGN		BACT-PSD
LA-0256	COGENERATION PLANT	12/6/2011	4/3/2012	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	475 MMBTU/H	USE OF NATURAL GAS AS FUEL AND GOOD COMBUSTION PI		BACT-PSD
LA-0257	SABINE PASS LNG TERMINAL	12/6/2011	5/11/2012	Combined Cycle Refrigeration Compressor Turk	286 MMBTU/H	Good combustion/operating practices and fueled by natural		BACT-PSD
*MI-0412	HOLLAND BOARD OF PUBLIC WORKS - E.	12/4/2013	9/5/2014	FG-CTGHRSG: 2 Combined cycle CTGs with HRS	647 MMBTU/H fo	Energy efficiency measures and the use of a low carbon fuel		BACT-PSD
*TX-0679	CORPUS CHRISTI LIQUEFACTION PLANT	02/27/2015 &ı	3/13/2015	Refrigeration Compressor Turbine	40000 hp	install efficient turbines, follow the turbine manufacturerâ€		BACT-PSD
*VA-0319	GATEWAY COGENERATION 1, LLC - SMA	08/27/2012 &ı	5/2/2013	COMBUSTION TURBINES, (2)	593 MMBTU/H	Controlled by the use of low carbon fuels and high efficiency		BACT-PSD
TX-0632	DEER PARK ENERGY CENTER LLC	11/29/2012 &ı	1/6/2014	CTG5/HRSG5(FD3-Series)	0			BACT-PSD
TX-0632	DEER PARK ENERGY CENTER LLC	11/29/2012 &ı	1/6/2014	CTG5/ HRSG5 (FD2- Series)	0			BACT-PSD
TX-0633	CHANNEL ENERGY ENERGY CENTER, LLC	11/29/2012 &ı	1/7/2014	CTG3/HRSG3(FD2-Series) -Initial Phase	0			BACT-PSD
TX-0633	CHANNEL ENERGY ENERGY CENTER, LLC	11/29/2012 &ı	1/7/2014	CTG3/HRSG3(FD3-Series) -Final Phase	0			BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	04/14/2014 &ı	5/16/2014	Combustion turbine #1 - combined cycle	2258 mmBtu/hr			BACT-PSD
*IA-0107	MARSHALLTOWN GENERATING STATION	04/14/2014 &ı	5/16/2014	Combustion turbine #2 -combined cycle	2258 mmBtu/hr			BACT-PSD
*MI-0410	THETFORD GENERATING STATION	07/25/2013 &ı	4/17/2015	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB fo	2587 MMBTU/H heat input, each CTG			BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &ı	8/5/2013	2 Combined Cycle Combustion Turbines-Siemer	51560 MMSCF/rollir	state-of-the-art high efficiency combustion technology		BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &ı	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsub	47917 MMSCF/rollir	state-of-the-art high efficiency combustion technology		BACT-PSD
*OH-0352	OREGON CLEAN ENERGY CENTER	06/18/2013 &ı	8/5/2013	2 Combined Cycle Combustion Turbines-Mitsub	47917 MMSCF/rollir	state-of-the-art high efficiency combustion technology		BACT-PSD
PA-0278	MOXIE LIBERTY LLC/ASYLUM POWER PL	10/10/2012 &ı	4/3/2015	Combined-cycle Turbines (2) - Natural gas fired	3277 MMBTU/H	Good combustion practices.		BACT-PSD
*PA-0291	HICKORY RUN ENERGY STATION	04/23/2013 &ı	8/16/2013	COMBINED CYCLE UNITS #1 and #2	3.4 MMCF/HR			OTHER CASE-
*PA-0296	BERKS HOLLOW ENERGY ASSOC LLC/ON	12/17/2013 &ı	5/5/2015	Turbine, Combined Cycle, #1 and #2	3046 MMBtu/hr			BACT-PSD
TX-0612	THOMAS C. FERGUSON POWER PLANT	11/10/2011 &ı	9/25/2013	COMBINED CYCLE TURBINE GENERATOR U1-ST	1746 MMBTU/H	Good Combustion Practices		BACT-PSD
*VA-0321	BRUNSWICK COUNTY POWER STATION	03/12/2013 &ı	1/12/2015	COMBUSTION TURBINE GENERATORS, (3)	3442 MMBTU/H	Energy efficient combustion practices and low GHG fuels.		BACT-PSD
TX-0612	THOMAS C. FERGUSON POWER PLANT	11/10/2011 &ı	9/25/2013	COMBINED CYCLE TURBINE GENERATOR U1-ST	1746 MMBTU/H			BACT-PSD
TX-0632	DEER PARK ENERGY CENTER LLC	11/29/2012 &ı	1/6/2014	CTG5/HRSG5(FD3-Series)	0			BACT-PSD
TX-0632	DEER PARK ENERGY CENTER LLC	11/29/2012 &ı	1/6/2014	CTG5/ HRSG5 (FD2- Series)	0			BACT-PSD
TX-0633	CHANNEL ENERGY ENERGY CENTER, LLC	11/29/2012 &ı	1/7/2014	CTG3/HRSG3(FD2-Series) -Initial Phase	0			BACT-PSD
TX-0633	CHANNEL ENERGY ENERGY CENTER, LLC	11/29/2012 &ı	1/7/2014	CTG3/HRSG3(FD3-Series) -Final Phase	0			BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	04/01/2015 &ı	4/15/2015	Combined-cycle gas turbine electric generating	1100 MW	efficient processes, practices, and designs		BACT-PSD
TX-0612	THOMAS C. FERGUSON POWER PLANT	11/10/2011 &ı	9/25/2013	COMBINED CYCLE TURBINE GENERATOR U1-ST	1746 MMBTU/H			BACT-PSD
TX-0632	DEER PARK ENERGY CENTER LLC	11/29/2012 &ı	1/6/2014	CTG5/HRSG5(FD3-Series)	0			BACT-PSD
TX-0632	DEER PARK ENERGY CENTER LLC	11/29/2012 &ı	1/6/2014	CTG5/ HRSG5 (FD2- Series)	0			BACT-PSD
TX-0633	CHANNEL ENERGY ENERGY CENTER, LLC	11/29/2012 &ı	1/7/2014	CTG3/HRSG3(FD2-Series) -Initial Phase	0			BACT-PSD
TX-0633	CHANNEL ENERGY ENERGY CENTER, LLC	11/29/2012 &ı	1/7/2014	CTG3/HRSG3(FD3-Series) -Final Phase	0			BACT-PSD
*TX-0730	COLORADO BEND ENERGY CENTER	04/01/2015 &ı	4/15/2015	Combined-cycle gas turbine electric generating	1100 MW	efficient processes, practices, and designs		BACT-PSD

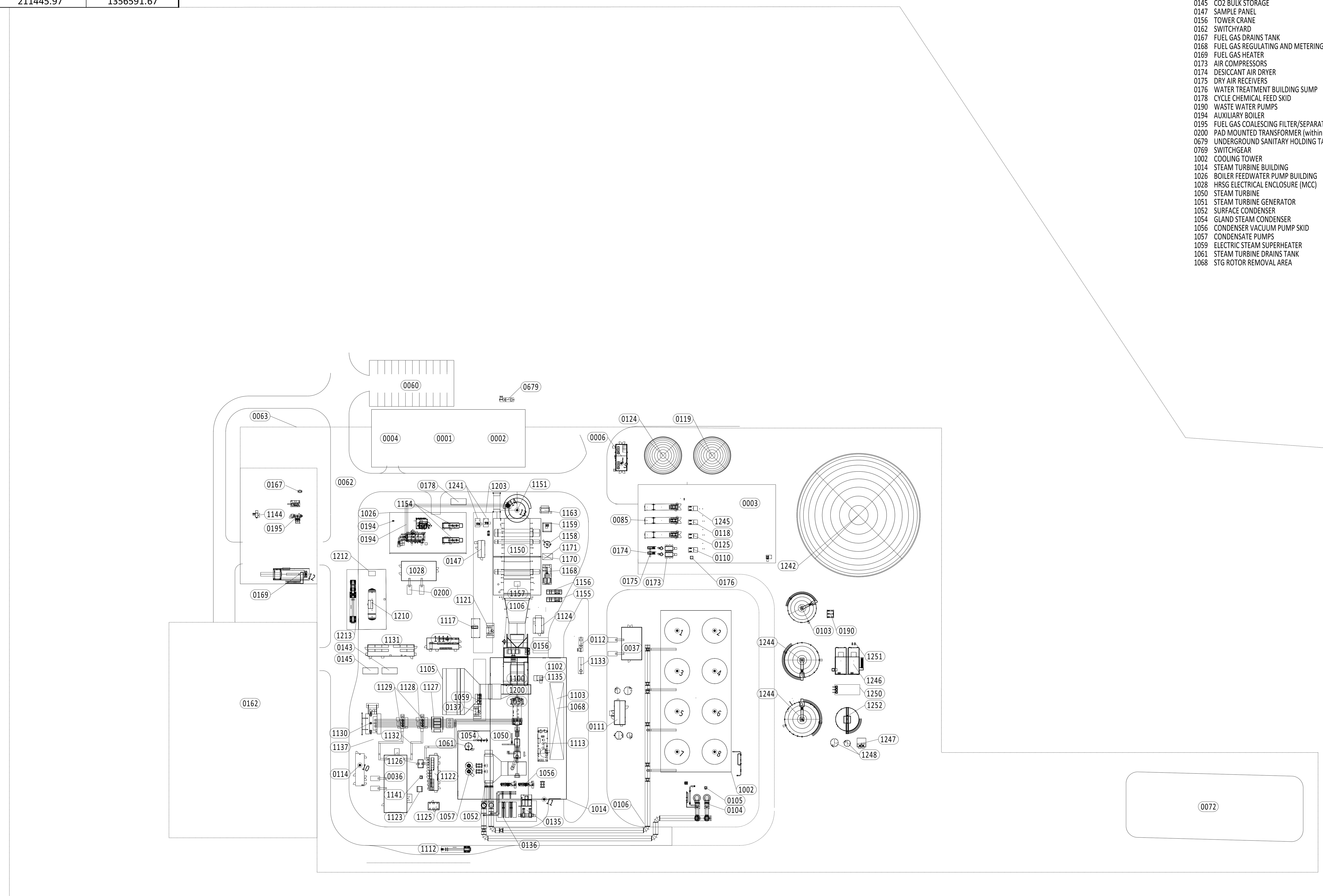
APPENDIX E

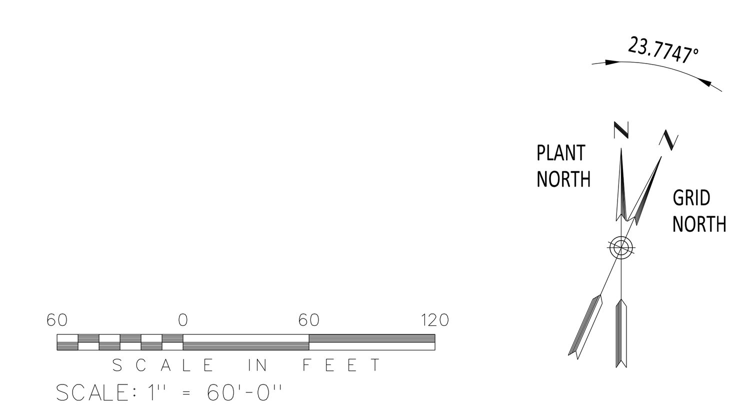
LAYOUT DRAWINGS

POINT NO.	EQUIPMENT DESCRIPTION	STATE PLANE COORDINATES (PENNSYLVANIA SOUTH ZONE, NAD83, U.S. SURVEY FOOT)	
		NORTHING	EASTING
1	COOLING TOWER CELL 1	211385.84	1356858.88
2	COOLING TOWER CELL 2	211405.47	1356903.45
3	COOLING TOWER CELL 3	211337.79	1356880.05
4	COOLING TOWER CELL 4	211357.43	1356924.61
5	COOLING TOWER CELL 5	211289.75	1356901.21
6	COOLING TOWER CELL 6	211309.38	1356945.78
7	COOLING TOWER CELL 7	211241.70	1356922.37
8	COOLING TOWER CELL 8	211261.34	1356966.94
9	DIESEL FIRE PUMP	211555.70	1356704.72
10	EDG	211059.46	1356551.79
11	CTG AND STG LUBE OIL VENT	211115.40	1356789.01
12	FUEL GAS HEATER	211258.30	1356387.43
13	HRSG	211445.24	1356605.30
14	AUX BOILER	211445.97	1356591.67

LEGEND:

0001 ADMINISTRATION BUILDING
0002 CONTROL BUILDING
0003 WATER TREATMENT BUILDING
0004 WAREHOUSE BUILDING
0006 FIREWATER PUMP BUILDING
0036 MEDIUM VOLTAGE ELECTRICAL ENCLOSURE
0037 COOLING TOWER ELECTRICAL ENCLOSURE
0060 PARKING AREA
0062 ROADWAY
0063 SITE FENCE
0072 EXISTING RETENTION POND
0085 DEMIN TRAILERS
0103 WASTE WATER STORAGE TANK
0104 CIRCULATING WATER PUMPS
0105 AUXILIARY CIRCULATING WATER PUMP
0106 CIRCULATING WATER PIPING
0110 COOLING TOWER MAKEUP PUMPS
0111 COOLING TOWER CHEMICAL FEED PUMP SKID
0112 OIL/WATER SEPARATOR
0114 EMERGENCY DIESEL GENERATOR
0118 DEMIN WATER PUMPS
0119 DEMIN WATER STORAGE TANK
0124 SERVICE/FIREWATER STORAGE TANK
0125 SERVICE WATER PUMPS
0135 CLOSED COOLING WATER PUMPS
0136 CLOSED COOLING WATER HEAT EXCHANGERS
0137 CLOSED COOLING WATER HEAD TANK
0143 NITROGEN STORAGE AREA
0145 CO2 BULK STORAGE
0147 SAMPLE PANEL
0156 TOWER CRANE
0162 SWITCHYARD
0167 FUEL GAS DRAINS TANK
0168 FUEL GAS REGULATING AND METERING AREA
0169 FUEL GAS HEATER
0173 AIR COMPRESSORS
0174 DESICCANT AIR DRYER
0175 DRY AIR RECEIVERS
0176 WATER TREATMENT BUILDING SUMP
0178 CYCLE CHEMICAL FEED SKID
0190 WASTE WATER PUMPS
0194 AUXILIARY BOILER
0195 FUEL GAS COALESCING FILTER/SEPARATOR
0200 PAD MOUNTED TRANSFORMER (within power block area)
0679 UNDERGROUND SANITARY HOLDING TANK
0769 SWITCHGEAR
1002 COOLING TOWER
1014 STEAM TURBINE BUILDING
1026 BOILER FEEDWATER PUMP BUILDING
1028 HRSG ELECTRICAL ENCLOSURE (MCC)
1050 STEAM TURBINE
1051 STEAM TURBINE GENERATOR
1052 SURFACE CONDENSER
1054 GLAND STEAM CONDENSER
1056 CONDENSER VACUUM PUMP SKID
1057 CONDENSATE PUMPS
1059 ELECTRIC STEAM SUPERHEATER
1061 STEAM TURBINE DRAINS TANK
1068 STG ROTOR REMOVAL AREA
1100 COMBUSTION TURBINE
1102 TURBINE ROTOR REMOVAL AREA
1103 GENERATOR REMOVAL AREA
1105 AIR INLET FILTER
1106 FUEL GAS SCRUBBER
1112 HYDROGEN STORAGE
1113 LUBE OIL, HYDRAULIC AND SEAL OIL MODULE
1114 PACKAGED ELECTRICAL ELECTRONIC CONTROL CENTER (PEECC)
1116 FUEL GAS FILTER/SEPARATOR
1117 FUEL GAS PERFORMANCE HEATER
1121 CT FUEL FALSE START DRAINS TANK
1122 CTG LCI AND EXCITATION COMPARTMENT
1123 DC LINK REACTOR
1124 FIREWATER MIST SKID
1125 CTG ISOLATION TRANSFORMER
1126 CTG EXCITATION TRANSFORMER
1127 CTG GENERATOR BREAKER
1128 ISO PHASE BUS DUCT
1129 CTG AUXILIARY TRANSFORMER
1130 CTG STEP-UP TRANSFORMER
1131 CTG BATTERY COMPARTMENT
1132 NON-SEG BUS DUCT
1133 CT DRAINS TANK(WATER WASH)
1135 WATER WASH SKID
1137 PLANT EQUIPMENT FIRE WALL
1141 AC LINK REACTOR
1144 FUEL GAS CHROMATOGRAPH
1150 HRSG
1151 STACK
1154 BOILER FEEDWATER PUMPS
1155 DUCT BURNER PRESSURE REDUCING SKID
1156 DUCT BURNER VALVE SKID
1157 SCANNER COOLING AIR BLOWER
1158 BLOWDOWN TANK
1159 BLOWDOWN TANK DRAIN SUMP
1160 BLOWDOWN TANK DRAIN SUMP PUMPS
1163 CONTINUOUS EMISSIONS MONITORING SYSTEMS BUILDING (CEMS)
1168 AMMONIA INJECTION SKID
1170 SCR SKID
1171 SCR REMOVAL AREA
1200 SINGLE SHAFT POWER TRAIN
1203 PIPE RACK
1210 AMMONIA STORAGE TANK
1212 AMMONIA FORWARDING PUMPS
1213 AMMONIA CONTAINMENT AREA
1241 HRSG LTE RECIRCULATING PUMPS
1242 COOLING TOWER MAKEUP TANK
1243 ESSENTIAL SERVICES ELECTRICAL MODULE/BOP BATTERY ROOM
1244 RAW WATER CLARIFIERS
1245 DEMINERALIZED WATER MAKEUP PUMPS
1246 WASTE WATER CLARIFIERS
1247 CLEARWELL SUMP
1248 CHEMICAL STORAGE
1250 RAW WATER TRANSFER PUMPS
1251 SLUDGE FORWARDING PUMPS
1252 SLUDGE HOLDING TANK
1253 RAW WATER PUMPS (OFF PAGE)





- PRELIMINARY -
NOT FOR CONSTRUCTION

REV	DESIGN BY	DRAWN BY	CHECKED BY	DATE
A	PRELIMINARY A. HIEBNER	A. CAMPBELL	A. HIEBNER	OPEN

KIEWIT POWER CONSTRUCTORS

HILL TOP ENERGY CENTER

1x1 COMBINED CYCLE
SINGLE SHAFT

KIEWIT ENGINEERING GROUP INC.
9401 Renner Boulevard
Lenexa, Kansas 66219

PLOT PLAN

ENGINEER/DESIGN ORIGINATOR A. CAMPBELL
LEAD ENG A. HIEBNER
ENG MGR L. DROUHARD
PROJ MGR C. ANDERSON

DRAWING NUMBER
P0017664-PP-001 OPT2B

2/28/2017 3:10:46 PM andrew.j.campbell

APPENDIX F

CUMULATIVE SOURCE MODELING INVENTORY

Table F- 1 PA NO2 Modeled Inventory

Facility Name	PF ID	Stack ID	Model ID	UTM EAST (m)	UTM NORTH (m)	Base Elevation (ft)	Stack Height (ft)	Exit Temp (F)	Exit Vel (ft/s)	Stack Diameter (ft)	NO2 Emission Rate (lb/hr)	Notes	
TEXAS EASTERN TRANS LP/HOLBROOK STA	253404	ST01	PA101	546,861.27	4,415,760.06	977.62	32.00	661.00	467.06	1.30	34.93	Cooper-Bessemer GMV-10 Unit 1 Stack	
		ST02	PA102	546,861.27	4,415,760.06	977.62	32.00	661.00	467.06	1.30	34.93	Cooper-Bessemer GMV-10 Unit 2 Stack	
		ST06	PA103	546,861.27	4,415,760.06	977.62	32.00	661.00	467.06	1.30	34.93	Cooper-Bessemer GMV-10 Unit 6 Stack	
		S08	PA104	546,861.27	4,415,760.06	977.62	32.00	661.00	467.06	1.30	34.93	Cooper-Bessemer GMV-10 Unit 8 Stack	
		S09	PA105	546,861.27	4,415,760.06	977.62	32.00	661.00	467.06	1.30	13.47	Cooper-Bessemer GMVA-10 Unit 1 Stack	
		S10	PA106	546,861.27	4,415,760.06	977.62	32.00	661.00	352.00	1.50	13.47	Cooper-Bessemer GMVA-10 Unit 2 Stack	Calculated using acfm from PADEP AQM Source Data Report
		S11	PA107	546,861.27	4,415,760.06	977.62	32.00	661.00	352.00	1.50	13.47	Cooper-Bessemer GMVA-10 Unit 3 Stack	Calculated using acfm from PADEP AQM Source Data Report
		S12	PA108	546,861.27	4,415,760.06	977.62	32.00	661.00	352.00	1.50	13.47	Cooper-Bessemer GMVA-10 Unit 4 Stack	Calculated using acfm from PADEP AQM Source Data Report
		S14	PA109	546,861.27	4,415,760.06	977.62	31.00	730.00	188.98	1.20	14.84	Ingersol-Rand KVS-412 Unit 2 Stack	
		S15	PA110	546,861.27	4,415,760.06	977.62	31.00	730.00	188.98	1.20	14.84	Ingersol-Rand KVS-412 Unit 3 Stack	
		S16	PA111	546,861.27	4,415,760.06	977.62	32.00	730.00	189.07	1.20	14.84	Ingersol-Rand KVS-412 Unit 4 Stack	
		S17	PA112	546,861.27	4,415,760.06	977.62	31.00	730.00	188.98	1.20	14.84	Ingersol-Rand KVS-412 Unit 5 Stack	
		S18	PA113	546,861.27	4,415,760.06	977.62	43.00	894.00	88.81	6.00	11.42	Mars Turbine #1 Stack	
		S25	PA114	546,861.27	4,415,760.06	977.62	56.00	862.00	144.91	5.50	7.33	Mars Turbine #2 Stack	
		S28	PA115	546,861.27	4,415,760.06	977.62	56.00	862.00	144.91	5.50	6.88	Mars Turbine #3 Stack	
JESSOP STEEL LLC/WASHINGTON PLT	278317	W110A	PA201	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		W110B	PA202	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		W110C	PA203	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		W110D	PA204	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		W110E	PA205	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		W110F	PA206	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		W110G	PA207	561,750.02	4,447,539.04	1,023.26	50.00	600.00	3.48	5.00	2.99	Heat Furnace	
		S127	PA208	561,750.02	4,447,539.04	1,023.26	20.00	70.00	330.10	1.50	0.05	Powder Burning Benches	Calculated using acfm from PADEP AQM Source Data Report
		X21	PA209	561,750.02	4,447,539.04	1,023.26	20.00	70.00	330.10	1.50	0.05	Powder Burning Benches	Calculated using acfm from PADEP AQM Source Data Report
		X22	PA210	561,750.02	4,447,539.04	1,023.26	20.00	70.00	330.10	1.50	0.05	Powder Burning Benches	Calculated using acfm from PADEP AQM Source Data Report
		S181	PA211	561,750.02	4,447,539.04	1,023.26	60.00	300.00	47.15	1.50	2.17	Mill Reheat Furnace Stack	
		S180	PA212	561,750.02	4,447,539.04	1,023.26	35.00	600.00	27.16	2.50	3.29	Olson Reheat Furnace	Calculated using acfm from PADEP AQM Source Data Report
		S031A	PA213	561,750.02	4,447,539.04	1,023.26	20.00	200.00	47.79	1.00	0.25	Mura Boilers 1 & 2	Calculated using acfm from PADEP AQM Source Data Report
ALLEGHENY ENERGY SUPPLY CO/MITCHELL POWER STA	557833	S01	PA301	587,820.66	4,452,722.18	755.05	193.00	375.00	25.98	14.00	168.20	B&W Oil Unit - Boiler Stack 1-3	
		S02	PA302	587,820.66	4,452,722.18	755.05	193.00	375.00	25.98	14.00	168.20	B&W Oil Unit - Boiler Stack 1-3	
		S03	PA303	587,820.66	4,452,722.18	755.05	193.00	375.00	25.98	14.00	168.20	B&W Oil Unit - Boiler Stack 1-3	
		S05	PA304	587,820.66	4,452,722.18	755.05	150.00	385.00	22.90	3.50	3.70	Auxiliary Boiler 1 & 2 Stack (2 stacks, same parameters, diff emissions)	
DYNO NOBEL INC/DONORA	275869	S01	PA401	597,348.36	4,449,426.75	762.14	107.00	386.00	76.35	3.80	90.75	AOP Process	
		S031	PA402	597,348.36	4,449,426.75	762.14	50.00	325.00	32.02	3.00	7.10	Murray Boiler Stack	
		S033	PA403	597,348.36	4,449,426.75	762.14	45.00	525.00	35.07	3.30	7.10	Cleaver Brooks No.1	
ARCELORMITTAL MONESSEN LLC/MONESSEN COKE PLT	256899	S06	PA501	594,918.31	4,446,450.36	763.32	261.00	600.00	26.12	8.00	81.5/59.4	Coke Batteries - Combust Stack	
		S11	PA502	594,918.31	4,446,450.36	763.32	126.00	325.00	23.92	5.70	143.00	Two Tampella Boilers (no emissions reported in source data report for 2013)	
TEXAS EASTERN TRANS LP/UNIONTOWN STA	258165	S02	PA601	613,538.11	4,420,948.17	1,156.20	55.00	500.00	7.22	2.10	12.60	Solar Turbine 1 Stack	Stack info for S01 appears to be for S02 based on S03 stack info
		S03	PA602	613,538.11	4,420,948.17	1,156.20	55.00	894.00	107.61	5.50	12.60	Solar Turbine 2 Stack	Stack info for S02 appears to be for S01 based on S03 stack info
EQUITRANS INC/PRATT COMP STA	521487	S01	PA701	574,523.94	4,418,439.60	906.33	35.00	575.00	2.83	1.50	4.76	Cooper Bessemer Engine 1 Stack	Stack parameters taken from Equitrans LP/Hartson
		S02	PA702	574,523.94	4,418,439.60	906.33	35.00	575.00	2.83	1.50	4.76	Cooper Bessemer Engine 2 Stack	Stack parameters taken from Equitrans LP/Hartson
		S03	PA703	574,523.94	4,418,439.60	906.33	35.00	575.00	2.83	1.50	4.31	Cooper Bessemer Engine 3 Stack	Stack parameters taken from Equitrans LP/Hartson
		S04	PA704	574,523.94	4,418,439.60	906.33	35.00	575.00	2.83	1.50	4.31	Cooper Bessemer Engine 4 Stack	Stack parameters taken from Equitrans LP/Hartson
		S05	PA705	574,523.94	4,418,439.60	906.33	35.00	575.00	2.83	1.50	4.31	Cooper Bessemer Engine 5 Stack	Stack parameters taken from Equitrans LP/Hartson
ALLEGHENY ENERGY SUPPLY CO/GANS POWER STA	552958	S01	PA801	599,459.19	4,400,399.92	1,150.13	75.00	816.00	142.09	9.00	41.00	Unit 8 Stack	
		S02	PA802	599,459.19	4,400,399.92	1,150.13	75.00	816.00	142.09	9.00	41.00	Unit 9 Stack	
DUKE ENERGY FAYETTE II LLC/FAYETTE ENERGY CTR	563600	S01	PA901	592,539.05	4,412,654.92	1,073.49	200.00	200.00	56.14	20.00	21.60	CGT Stack 1	
		S02	PA902	592,539.05	4,412,654.92	1,073.49	200.00	200.00	56.14	20.00	21.60	CGT Stack 2	
ALLEGHENY ENERGY SUPPLY CO/HATFIELDS FERRY POWER STA	280920	S01	PA1001	591,485.18	4,412,418.68	883.14	700.00	310.00	137.53	22.50	3,344.28	Babcock & Wilcox Boiler 1 - Boiler 1 Stack	
		S02	PA1002	591,485.18	4,412,418.68	883.14	700.00	310.00	137.53	22.50	3,344.28	Babcock & Wilcox Boiler 3 - Boiler 2 Stack	
		S01 & S02	PA1003	591,485.18	4,412,418.68	883.14	700.00	310.00	137.53	22.50	3,344.28	Babcock & Wilcox Boiler 2 - Boiler 1 & 2 Stacks	

Table F-2 WV NO2 Modeled Inventory

Facility Name	Facility ID	Stack ID	Model ID	UTM EAST (m)	UTM NORTH (m)	Base Elevation (ft)	Stack Height (ft)	Exit Temp (F)	Exit Vel (ft/s)	Stack Diameter (ft)	NO2 Emission Rate (lb/hr)	Notes
MARION COUNTY MINE PREPARATION PLANT (Consolidation Coal Company Loveridge)	049-00019	Thermal Dryer	WV101	561,638.14	4,384,107.03	1,067.52	124.00	129.99	45.00	10.00	63.60	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Loveridge Title V Permit Renewal Application March 2013
AMERICAN BITUMINOUS POWER-GRANT TOWN PLT	049-00026	Boiler 1A/Boiler 1B	WV201	571,866.50	4,379,449.98	1,238.09	327.00	324.77	4.00	13.00	441.50	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Grant Town Title V Permit Renewal Application May 2008
MONONGALIA COUNTY MINE PREPARATION PLANT (Consolidation Coal Company Blacksville No. 2)	061-00016	Thermal Dryer	WV301	560,472.51	4,396,119.53	1,010.66	90.00	119.93	47.00	8.00	46.60	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Blackville Title V Permit July 2013
MORGANTOWN ENERGY FACILITY	061-00027	Stack 1	WV401	589,101.68	4,388,310.70	825.39	388.00	335.93	79.00	8.00	300.00	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Morgantown Title V Permit Renewal Application May 2013
LONGVIEW POWER	061-00134	Stack 1 (PC Boiler)	WV501	589,287.19	4,395,806.61	1,105.18	554.00	134.33	49.93	25.75	489.00	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Longview Title V Permit Application April 2012
MONONGAHELA POWER CO.- FORT MARTIN POWER	061-00001	Unit 1	WV601	591,841.93	4,396,041.95	806.76	550.00	299.75	57.60	24.75	1,744.40	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Ft. Martin Title V Permit Renewal Application December 2013
		Unit 2	WV602	591,841.93	4,396,041.95	806.76	550.00	299.75	57.60	24.75	1,744.40	

Table F-3 ACHD NO2 Modeled Inventory

Facility Name	Process	Stack ID	Model ID	UTM EAST (m)	UTM NORTH (m)	Base Elevation (ft)	Stack Height (ft)	Exit Temp (F)	Exit Vel (ft/s)	Stack Diameter (ft)	NO2 Emission Rate (lb/hr)
US STEEL CORPORATION - CLAIRTON	BATTERY 1 UNDERFIRING	P001	AC101	595,865.00	4,461,841.00	758.96	225.00	487.67	24.93	8.01	123.41
	BATTERY 2 UNDERFIRING	P002	AC102	595,858.00	4,461,849.00	758.10	225.00	501.71	25.30	8.01	123.41
	BATTERY 3 UNDERFIRING	P003	AC103	595,742.00	4,461,989.00	759.84	225.00	510.53	24.15	8.01	123.41
	BATTERY 13 UNDERFIRING	P007	AC104	595,392.00	4,462,162.00	758.50	225.07	523.67	22.64	8.53	76.11
	BATTERY 14 UNDERFIRING	P008	AC105	595,386.00	4,462,173.00	758.20	225.07	523.67	22.64	8.53	76.11
	BATTERY 15 UNDERFIRING	P009	AC106	595,263.00	4,462,315.00	757.74	225.07	523.67	22.64	8.53	76.11
	BATTERY 19 UNDERFIRING	P010	AC107	595,273.00	4,462,117.00	757.58	250.00	540.59	21.00	12.47	315.14
	BATTERY 20 UNDERFIRING	P011	AC108	595,258.00	4,462,134.00	758.10	250.00	516.65	19.36	12.47	315.14
	B BATTERY UNDERFIRING	P012	AC109	595,475.00	4,462,405.00	758.27	314.96	425.75	12.47	18.04	150.55
	C BATTERY UNDERFIRING	P013	AC110	595,769.00	4,462,126.00	759.94	321.85	445.73	19.36	12.14	105.30
	BOILER 1	B001	AC111	595,036.00	4,462,717.00	724.74	189.99	364.73	97.08	8.86	410.40
	BOILER 2	B002	AC112	595,021.00	4,462,720.00	724.74	189.99	302.81	72.21	6.89	259.74
	BOILER R1/R2	B005/B006	AC113	594,902.00	4,462,606.00	757.78	163.98	432.77	24.61	8.50	247.32
	BOILER T1	B007	AC114	594,855.00	4,462,561.00	758.33	89.01	432.77	29.89	4.92	84.24
	BOILER T2	B008	AC115	594,845.00	4,462,569.00	758.53	89.01	432.77	29.89	4.92	84.24
	PEC BAGHOUSE 1-3	P050	AC116	595,848.00	4,461,870.00	756.86	81.99	249.71	23.43	4.00	5.95
	PEC BAGHOUSE 13-15	P052	AC117	595,299.00	4,462,223.00	758.46	82.02	118.13	55.77	2.95	5.95
	PEC BAGHOUSE 19-20	P053	AC118	595,294.00	4,462,218.00	758.01	82.02	105.53	51.18	2.95	5.95
	PEC BAGHOUSE B	P054	AC119	595,404.00	4,462,447.00	758.99	51.51	98.33	45.28	3.94	4.68
	PEC BAGHOUSE C	P055	AC120	595,698.00	4,462,020.00	760.83	98.43	130.73	49.54	8.20	36.00
	WASTEWTR TREATMNT/FLARE	B010	AC121	595,271.00	4,462,517.00	757.15	26.25	1,925.33	1,994.75	3.61	19.80
	Ammonia Flare		AC122	595,437.00	4,462,191.00	758.37	26.25	1,925.33	1,994.75	3.61	37.70
US STEEL CORPORATION - IRVIN	#1 GALV. LINE PREHEAT	P012	AC201	593,294.00	4,465,375.00	941.96	83.99	1,239.71	0.10	4.66	4.80
	#2 GALV. LINE PREHEAT	P013	AC202	593,294.00	4,465,375.00	941.96	87.99	1,239.71	0.10	4.49	7.20
	80 INCH MILL REHEAT	P001 - P005	AC203	593,151.00	4,465,906.00	942.26	69.98	454.73	96.59	6.50	251.30
	BOILER #1	B001	AC204	593,084.00	4,465,172.00	942.68	69.00	464.81	33.60	3.61	12.77
	BOILER #2	B002	AC205	593,105.00	4,465,517.00	940.98	75.00	464.81	26.21	4.27	13.54
	BOILER #3-4	B003,B004	AC206	593,316.00	4,465,586.00	941.77	98.00	699.71	31.79	10.17	13.32
	CONTINUOUS ANNEALING	P011	AC207	593,202.00	4,465,895.00	942.45	85.01	400.73	13.81	3.61	18.00
	HPH ANNEALING FCES	P009	AC208	593,291.00	4,465,575.00	941.67	54.99	699.71	8.01	2.49	22.94
	MISCELLANEOUS NATURAL GAS		AC209	593,192.00	4,465,385.00	941.73	50.00	71.69	25.79	2.69	3.33
	OPEN COIL ANNEALING	P010	AC210	593,227.00	4,465,241.00	941.08	66.01	400.73	1.31	9.84	41.52
	TERNE LINE PROCESS	P014	AC211	593,291.00	4,465,575.00	941.67	77.99	268.79	27.20	4.49	1.40
	TERNE LINE, NATURAL GAS	P014	AC212	593,291.00	4,465,575.00	941.67	110.99	391.73	34.51	4.40	1.00
	COG FLARES	P015	AC213	593,109.00	4,464,643.00	941.86	18.04	1,399.73	85.37	0.89	9.56

Table F-4 PA PM2.5 Modeled Inventory

Facility Name	PF ID	Stack ID	Model ID	UTM EAST (m)	UTM NORTH (m)	Base Elevation (ft)	Stack Height (ft)	Exit Temp (F)	Exit Vel (ft/s)	Stack Diameter (ft)	PM2.5 Emission Rate (lb/hr)	Notes
ALLEGHENY ENERGY SUPPLY CO/MITCHELL POWER STA	557833	S01	PA101	587,820.66	4,452,722.18	755.05	193.00	375.00	25.98	14.00	6.10	B&W Oil Unit - Boiler Stack 1
		S02	PA102	587,820.66	4,452,722.18	755.05	193.00	375.00	25.98	14.00	6.10	B&W Oil Unit - Boiler Stack 2
		S03	PA103	587,820.66	4,452,722.18	755.05	193.00	375.00	25.98	14.00	6.10	B&W Oil Unit - Boiler Stack 3
		S04	PA105	587,820.66	4,452,722.18	755.05	150.00	385.00	22.90	3.50	0.61	Auxiliary Boiler 1 & 2 Stack (2 stacks, same parameters, diff emissions)
DYNO NOBEL INC/DONORA	275869	S031	PA201	597,348.36	4,449,426.75	762.14	50.00	325.00	32.02	3.00	19.24	Murray Boiler Stack (no emissions reported in source data report for 2013)
		S033	PA202	597,348.36	4,449,426.75	762.14	45.00	525.00	35.07	3.30	19.32	Cleaver Brooks No.1 (no emissions reported in source data report for 2013)
DUKE ENERGY FAYETTE II LLC/FAYETTE ENERGY CTR	563600	S01	PA301	592,539.05	4,412,654.92	1,073.49	200.00	200.00	56.14	20.00	34.80	CGT Stack 1
		S02	PA302	592,539.05	4,412,654.92	1,073.49	200.00	200.00	56.14	20.00	34.80	CGT Stack 2
ALLEGHENY ENERGY SUPPLY CO/HATFIELDS FERRY POWER STA	280920	S01	PA401	591,485.18	4,412,418.68	883.14	700.00	310.00	137.53	22.50	432.45	Babcock & Wilcox Boiler 1 - Boiler 1 Stack
		S02	PA402	591,485.18	4,412,418.68	883.14	700.00	310.00	137.53	22.50	432.45	Babcock & Wilcox Boiler 3 - Boiler 2 Stack
		S01 & S02	PA403	591,485.18	4,412,418.68	883.14	700.00	310.00	137.53	22.50	432.45	Babcock & Wilcox Boiler 2 - Boiler 1 & 2 Stacks
		S04	PA404	591,485.18	4,412,418.68	883.14	233.00	650.00	61.58	6.50	57.59	Auxiliary Boiler 1 & 2 Stack (2 stacks, same parameters, diff emissions)

Table F-5 WV PM2.5 Modeled Inventory

Facility Name	Facility ID	Stack ID	Model ID	UTM EAST (m)	UTM NORTH (m)	Base Elevation (ft)	Stack Height (ft)	Exit Temp (F)	Exit Vel (ft/s)	Stack Diameter (ft)	PM2.5 Emission Rate (lb/hr)	Notes
MARION COUNTY MINE PREPARATION PLANT (Consolidation Coal Company Loveridge)	049-00019	Thermal Dryer	WV101	561,638.14	4,384,107.03	1,067.52	124.00	129.99	45.00	10.00	40.00	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Loveridge Title V Permit Renewal Application March 2013
LONGVIEW POWER	061-00134	Stack 1 (PC Boiler)	WV201	589,287.19	4,395,806.61	1,105.18	554.00	134.33	49.93	25.75	55.03	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Longview Title V Permit Application April 2012
MONONGAHELA POWER CO.- FORT MARTIN POWER	061-00001	Unit 1	WV301	591,841.93	4,396,041.95	806.76	550.00	299.75	57.60	24.75	72.30	Stack exit temp from Green Energy Project Appendix D-2 Table D-3; Height, velocity, diameter from WVDEP; Emission Rate from Ft. Martin Title V Permit Renewal Application December 2013
		Unit 2	WV302	591,841.93	4,396,041.95	806.76	550.00	299.75	57.60	24.75	72.30	

Table F-6 ACHD PM2.5 Modeled Inventory

Facility Name	Process	Stack ID	Model ID	UTM EAST (m)	UTM NORTH (m)	Base Elevation (ft)	Stack Height (ft)	Exit Temp (F)	Exit Vel (ft/s)	Stack Diameter (ft)	PM2.5 Emission Rate (lb/hr)
US STEEL CORPORATION - CLAIRTON	BATTERY 1 UNDERFIRING	P001	AC101	595,865.00	4,461,841.00	758.96	225.00	487.67	24.93	8.01	14.47
	BATTERY 2 UNDERFIRING	P002	AC102	595,858.00	4,461,849.00	758.10	225.00	501.71	25.30	8.01	14.47
	BATTERY 3 UNDERFIRING	P003	AC103	595,742.00	4,461,989.00	759.84	225.00	510.53	24.15	8.01	14.47
	BATTERY 13 UNDERFIRING	P007	AC104	595,392.00	4,462,162.00	758.50	225.07	523.67	22.64	8.53	8.30
	BATTERY 14 UNDERFIRING	P008	AC105	595,386.00	4,462,173.00	758.20	225.07	523.67	22.64	8.53	8.33
	BATTERY 15 UNDERFIRING	P009	AC106	595,263.00	4,462,315.00	757.74	225.07	523.67	22.64	8.53	8.33
	BATTERY 19 UNDERFIRING	P010	AC107	595,273.00	4,462,117.00	757.58	250.00	540.59	21.00	12.47	25.20
	BATTERY 20 UNDERFIRING	P011	AC108	595,258.00	4,462,134.00	758.10	250.00	516.65	19.36	12.47	13.40
	B BATTERY UNDERFIRING	P012	AC109	595,475.00	4,462,405.00	758.27	314.96	425.75	12.47	18.04	12.40
	C BATTERY UNDERFIRING	P013	AC110	595,769.00	4,462,126.00	759.94	321.85	445.73	19.36	12.14	3.90
	BOILER 1	B001	AC111	595,036.00	4,462,717.00	724.74	189.99	364.73	97.08	8.86	15.20
	BOILER 2	B002	AC112	595,021.00	4,462,720.00	724.74	189.99	302.81	72.21	6.89	9.62
	BOILER R1/R2	B005/B006	AC113	594,902.00	4,462,606.00	757.78	163.98	432.77	24.61	8.50	9.16
	BOILER T1	B007	AC114	594,855.00	4,462,561.00	758.33	89.01	432.77	29.89	4.92	3.12
	BOILER T2	B008	AC115	594,845.00	4,462,569.00	758.53	89.01	432.77	29.89	4.92	3.12
	COOLING TOWER	P020	AC116	595,463.00	4,462,329.00	759.65	72.51	99.59	31.17	33.01	9.92
	PEC BAGHOUSE 1-3	P050	AC117	595,848.00	4,461,870.00	756.86	81.99	249.71	23.43	4.00	1.98
	PEC BAGHOUSE 13-15	P052	AC118	595,299.00	4,462,223.00	758.46	82.02	118.13	55.77	2.95	5.80
	PEC BAGHOUSE 19-20	P053	AC119	595,294.00	4,462,218.00	758.01	82.02	105.53	51.18	2.95	1.67
	PEC BAGHOUSE B	P054	AC120	595,404.00	4,462,447.00	758.99	51.51	98.33	45.28	3.94	5.28
	PEC BAGHOUSE C	P055	AC121	595,698.00	4,462,020.00	760.83	98.43	130.73	49.54	8.20	3.40
	QUENCH TOWER 1	P013	AC122	595,956.00	4,461,738.00	759.48	100.07	170.33	11.81	10.50	7.94
	QUENCH TOWER 5	P015	AC123	595,494.00	4,462,071.00	758.89	100.07	170.33	11.81	17.06	7.62
	QUENCH TOWER 7	P016	AC124	595,448.00	4,462,040.00	760.01	122.05	170.33	11.81	28.87	9.52
	QUENCH TOWER B	P017	AC125	595,452.00	4,462,373.00	757.02	134.84	170.33	11.81	31.50	7.22
	QUENCH TOWER C	P018	AC126	595,638.00	4,462,195.00	757.81	164.04	220.73	12.14	41.67	24.10
	Coke Screening Station No. 4	P037	AC127	595,764.00	4,462,065.00	759.58	40.03	71.33	2.00	2.46	2.00
	VEHICLE & TUG EXHAUST		AC128	595,493.00	4,462,083.00	759.02	29.00	71.69	78.22	1.31	1.50
	Ammonia Flare		AC129	595,437.00	4,462,191.00	758.37	26.25	1,925.33	1,994.75	3.61	0.01
US STEEL CORPORATION - IRVIN	#1 GALV. LINE PREHEAT	P012	AC201	593,294.00	4,465,375.00	941.96	83.99	1,239.71	0.10	4.66	0.54
	#2 GALV. LINE PREHEAT	P013	AC202	593,294.00	4,465,375.00	941.96	87.99	1,239.71	0.10	4.49	0.14
	64 INCH PICKLING LINE	P002	AC203	593,291.00	4,465,575.00	941.67	50.98	130.73	40.68	2.49	0.41
	Tension Leveler/Scale Breaker Dust Collecter	SP023	AC204	593,291.00	4,465,575.00	941.67	50.98	130.73	40.68	2.49	0.02
	80 INCH MILL REHEAT	P001 - P005	AC205	593,151.00	4,465,906.00	942.26	69.98	454.73	96.59	6.50	35.00
	84 INCH PICKLING LINE	P007	AC206	593,291.00	4,465,575.00	941.67	114.99	129.65	50.23	4.49	2.90
	BOILER #1	B001	AC207	593,084.00	4,465,172.00	942.68	69.00	464.81	33.60	3.61	1.60
	BOILER #2	B002	AC208	593,105.00	4,465,517.00	940.98	75.00	464.81	26.21	4.27	1.69
	BOILER #3-4	B003,B004	AC209	593,316.00	4,465,586.00	941.77	98.00	699.71	31.79	10.17	1.66
	COLD REDUCTION MILL	P008	AC210	593,291.00	4,465,575.00	941.67	85.99	228.65	17.68	4.40	13.12
	CONTINUOUS ANNEALING	P011	AC211	593,202.00	4,465,895.00	942.45	85.01	400.73	13.81	3.61	0.90
	COOLING TOWER		AC212	593,192.00	4,465,385.00	941.73	29.99	71.69	29.69	14.21	0.47
	HPH ANNEALING FCES	P009	AC213	593,291.00	4,465,575.00	941.67	54.99	699.71	8.01	2.49	3.10
	MISCELLANEOUS NATURAL GAS		AC214	593,192.00	4,465,385.00	941.73	50.00	71.69	25.79	2.69	0.25
	OPEN COIL ANNEALING	P010	AC215	593,227.00	4,465,241.00	941.08	66.01	400.73	1.31	9.84	1.98
	PAVED ROADS		AC216	593,192.00	4,465,385.00	941.73	121.00	71.69	18.31	3.90	0.05
	TERNE LINE PROCESS	P014	AC217	593,291.00	4,465,575.00	941.67	77.99	268.79	27.20	4.49	7.00
	TERNE LINE, NATURAL GAS	P014	AC218	593,291.00	4,465,575.00	941.67	110.99	391.73	34.51	4.40	0.08
	UNPAVED ROADS		AC219	593,192.00	4,465,385.00	941.73	131.99	71.69	16.31	5.41	0.46
	COG FLARES	P015	AC220	593,109.00	4,464,643.00	941.86	18.04	1,399.73	85.37	0.89	1.22

APPENDIX G

AIR DISPERSION MODELING DATA

Modeling Files provided electronically via FTP Site

APPENDIX H

METEOROLOGICAL JUSTIFICATION

H. METEOROLOGICAL JUSTIFICATION

Representative hourly meteorological data (surface and upper air) are required for input to the American Meteorological Society (AMS)/U.S. Environmental Protection Agency (EPA) Regulatory Model Improvement Committee model (AERMOD). For refined modeling, EPA's Guideline on Air Quality Models (GAQM) recommends one year of onsite data or five years of offsite representative data. With regard to representativeness of the data, EPA's GAQM states, "the meteorological data used as input to a dispersion model should be selected on the basis of spatial and climatological (temporal) representativeness as well as the ability of the individual parameters selected to characterize the transport and dispersion conditions in the area of concern. The representativeness of the data is dependent on: (1) the proximity of the meteorological monitoring site to the area under consideration; (2) the complexity of the terrain; (3) the exposure of the meteorological monitoring site; and (4) the period of time during which data are collected." Other sources consulted for evaluating the representativeness of meteorological data include EPA's AERMOD Implementation Guide and Meteorological Monitoring Guidance for Regulatory Applications.

According to the AERMOD Implementation Guide, "the determination of representativeness of site-specific data for AERMOD applications should include an assessment of surface characteristics of the measurement and source locations and cannot be based solely on proximity." In addition, the AERMOD Implementation Guide states, "the degree to which predicted pollutant concentrations are influenced by surface parameter differences between the application site and the meteorological measurement site depends on the nature of the application (i.e., release height, plume buoyancy, terrain influences, downwash considerations, design metric, etc.)." These may be relevant and important considerations for the Hill Top Energy Center (HTEC or the Project).

The representative factors outlined in EPA's Meteorological Monitoring Guidance for Regulatory Applications are as follows:

- Representativeness is a function of the height of the measurement. For example, one can expect more site-to-site variability in measurements taken close

to the surface compared to measurements taken aloft. As a consequence, measurements from anemometers well above the ground or in better exposed locations are generally representative of much larger spatial domains than are near-surface measurements.

- Factors that should be considered in selecting a monitoring site in complex terrain include the aspect ratio and slope of the terrain, ratios of terrain height to stack height and plume height, distance of the source from the terrain feature, and effects of terrain features on meteorological conditions, especially wind speed and wind direction.
- The selected meteorological site should have surface characteristics consistent with the area near the source and throughout the modeling domain. Characteristics of interest are ground cover, surface roughness, and presence or absence of water bodies, etc. These will ensure wind speeds are likely to be consistent between measurement and application sites, and radiative properties of the measurement area are consistent with the application area for specification of ambient temperature and atmospheric stability.

In consultation with the Pennsylvania Department of Environmental Protection (PADEP), five years of data from two meteorological stations nearest the Project Site were used for input to the AERMOD meteorological preprocessor program (AERMET). Hourly surface meteorological data from the National Weather Service (NWS) station at Morgantown, West Virginia, and the McClellandtown meteorological site in Pennsylvania were used in addition to upper air meteorological data from NWS stations at Pittsburgh, Pennsylvania, to develop AERMET data files. The five-calendar-year existing meteorological data sets from the McClellandtown station (1991 through 1995) and Morgantown Municipal Airport (KMGW) (2012 through 2016) station were identified as representative for the Project modeling domain, located in Greene County, Pennsylvania. Table H-1 summarizes identifying and location information for the McClellandtown and KMGW stations.

Figure H-1 shows the relative locations of the meteorological sites and Project Site.

Table H-1. Meteorological Monitoring Site Station Information

Name/Location	County, State	Latitude	Longitude	Elevation (meter)*	Distance (km)
McClellandtown, Pennsylvania	Fayette, Pennsylvania	39.92225	-79.87415	400.8	5.8
KMGW	Monongalia, West Virginia	39.64982	-79.92066	382.0	27.0

*Base elevation used as the PROFBASE keyword in the meteorological pathway of the AERMOD input file.

Source: ECT, 2017.

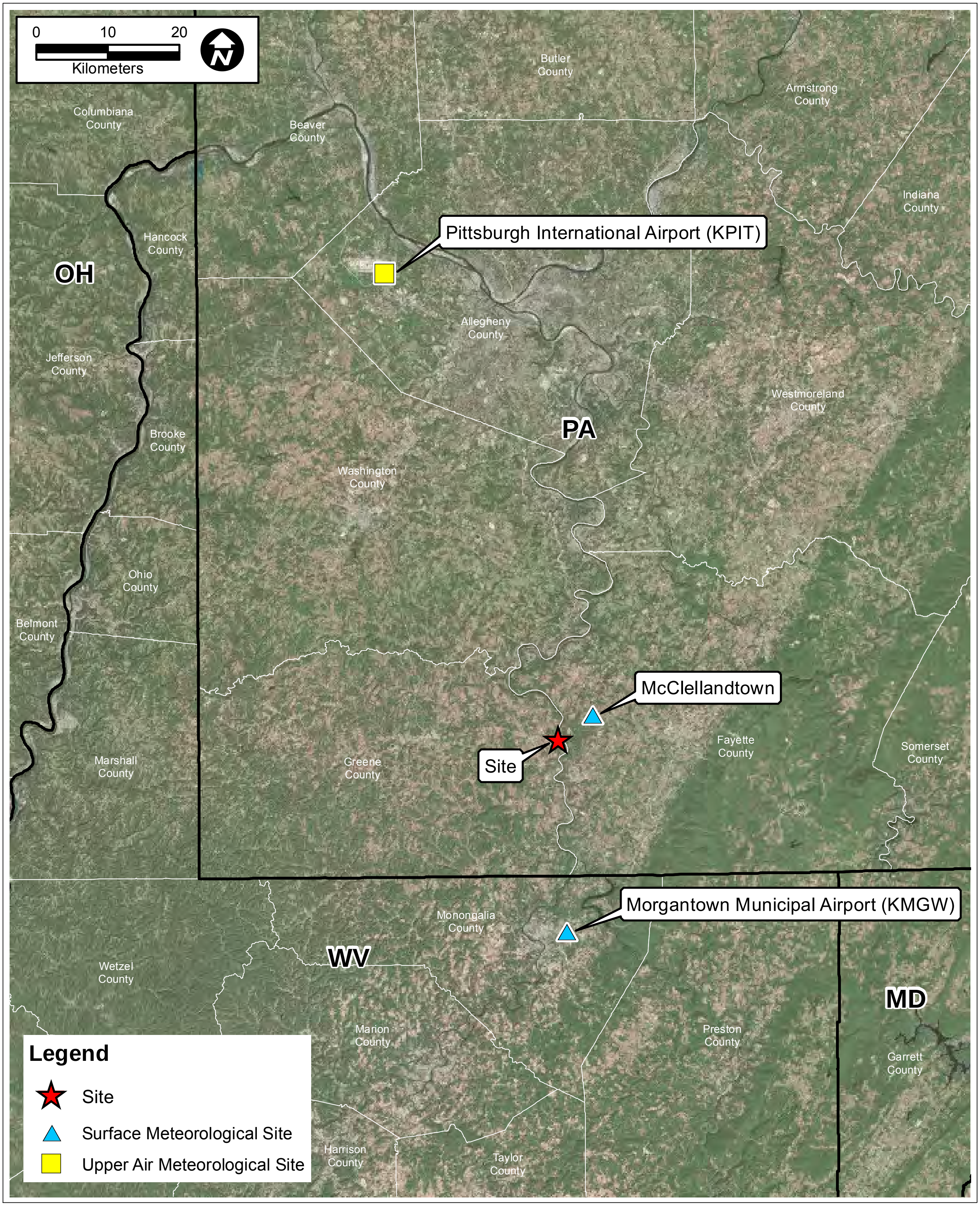


FIGURE H-1.
LOCATIONS OF METEOROLOGICAL SITES

Sources: Esri Basemap Imagery, ECT 2017.

Environmental Consulting & Technology, Inc.

Next, the meteorological sites were evaluated with respect to other EPA-recommended representativeness criteria in comparison to the Project Site. Data used for this evaluation include:

- Topographic maps illustrating terrain features in the vicinity of the Project and meteorological sites.
- Wind roses and wind frequency distributions.
- U.S. Geological Survey (USGS) National Land Cover data.
- Aerial photography (Google® Earth).
- Meteorological data completeness.

Figure H-2 depicts terrain features surrounding the proposed Project Site. Figure H-3 presents a wind rose for the McClellandtown meteorological site based on wind speed and direction data for calendar years 1991 through 1995. Figure H-4 illustrates the terrain features surrounding McClellandtown.

Figure H-5 presents a wind rose for the KMGW meteorological site based on wind speed and direction data for calendar years 2012 through 2016. Figure H-6 depicts the terrain features surrounding KMGW.

The following paragraphs summarize the evaluation of the effects of nearby topographical features on local meteorology, focusing on EPA's criteria of the complexity of the terrain and the exposure of the meteorological monitoring site.

H.1 PROJECT SITE TERRAIN FEATURES

Local topography plays an important role in the selection of the appropriate dispersion model. Available dispersion models can be divided into two general categories: those applicable to terrain below stack top (simple terrain) and those applicable to terrain above stack top (complex terrain). The terrain near the facility and throughout southwestern Pennsylvania can be described as hilly.

The Project Site elevation is approximately 1,122 feet (342 meters) above mean sea level (ft msl) in the vicinity of the proposed stack. To review topographical features in the area,

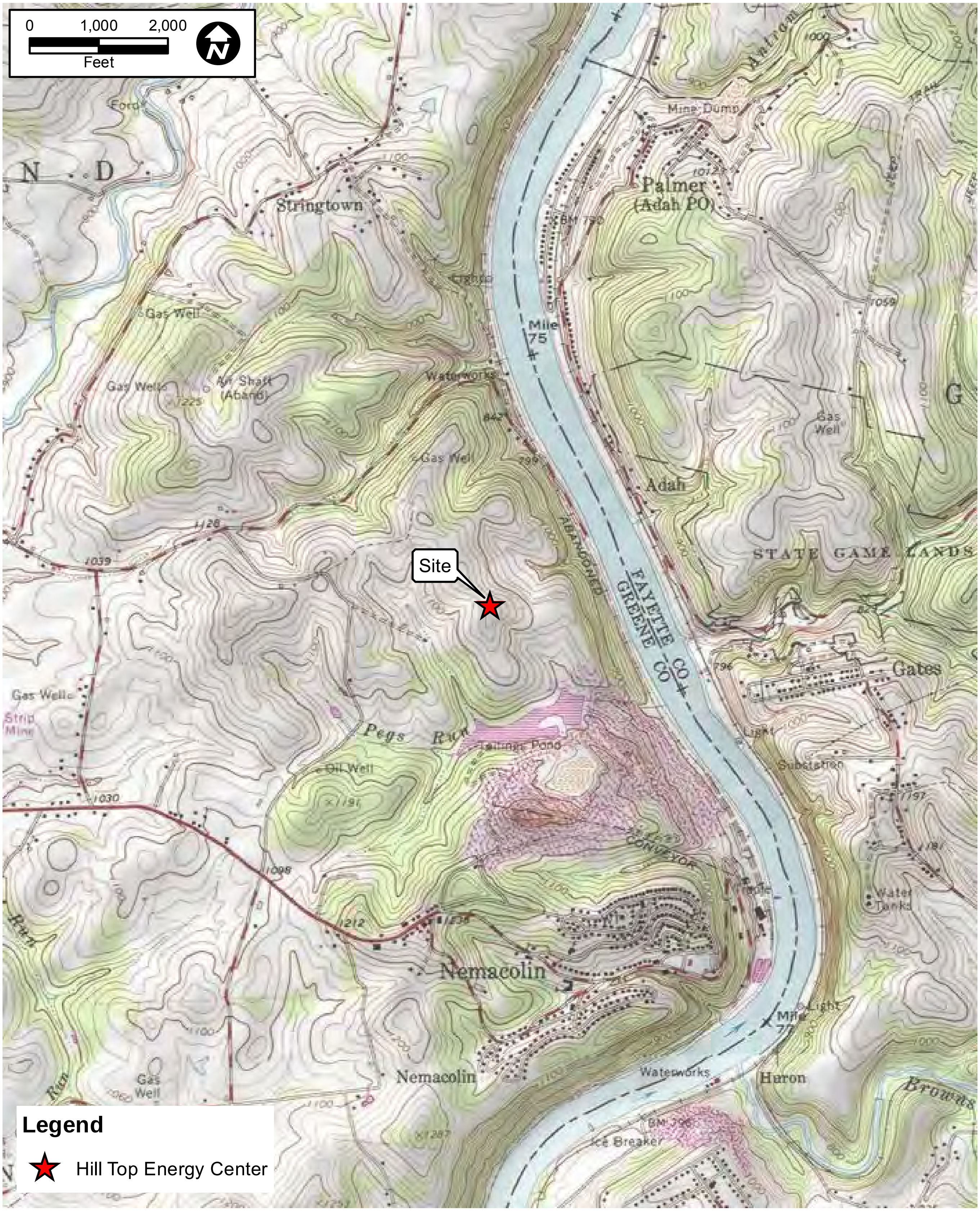
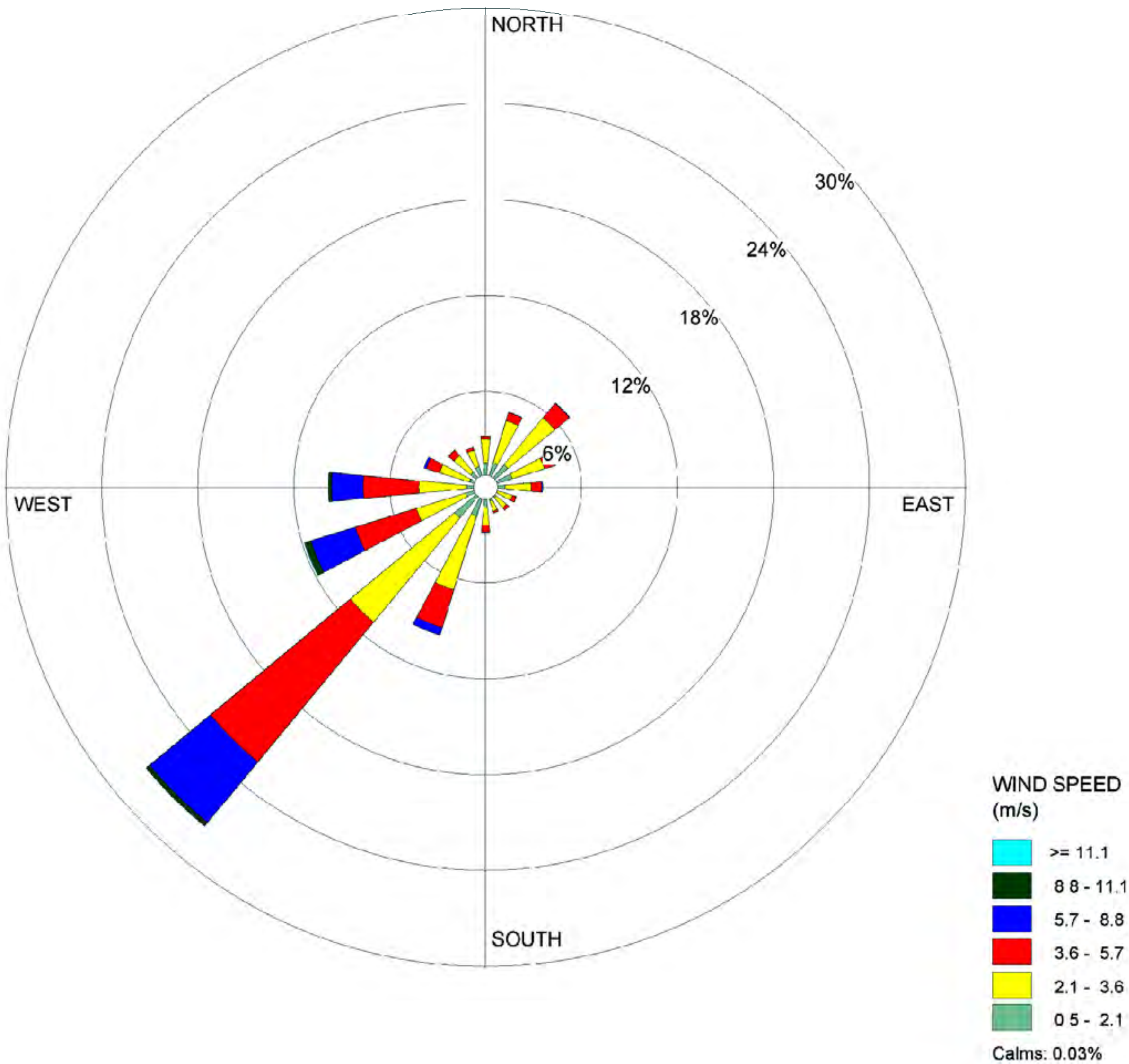


FIGURE H-2.
TERRAIN FEATURES IN THE VICINITY OF THE PROJECT

Sources: Esri Basemap USGS Topographic Quadrangle, ECT 2017.

ECT Environmental Consulting & Technology, Inc.



Note: Wind Direction (Blowing From)

FIGURE H-3.
MCCLELLANDTOWN WIND ROSE (1991-1995)

Sources: PADEP.

ECT Environmental Consulting & Technology, Inc.

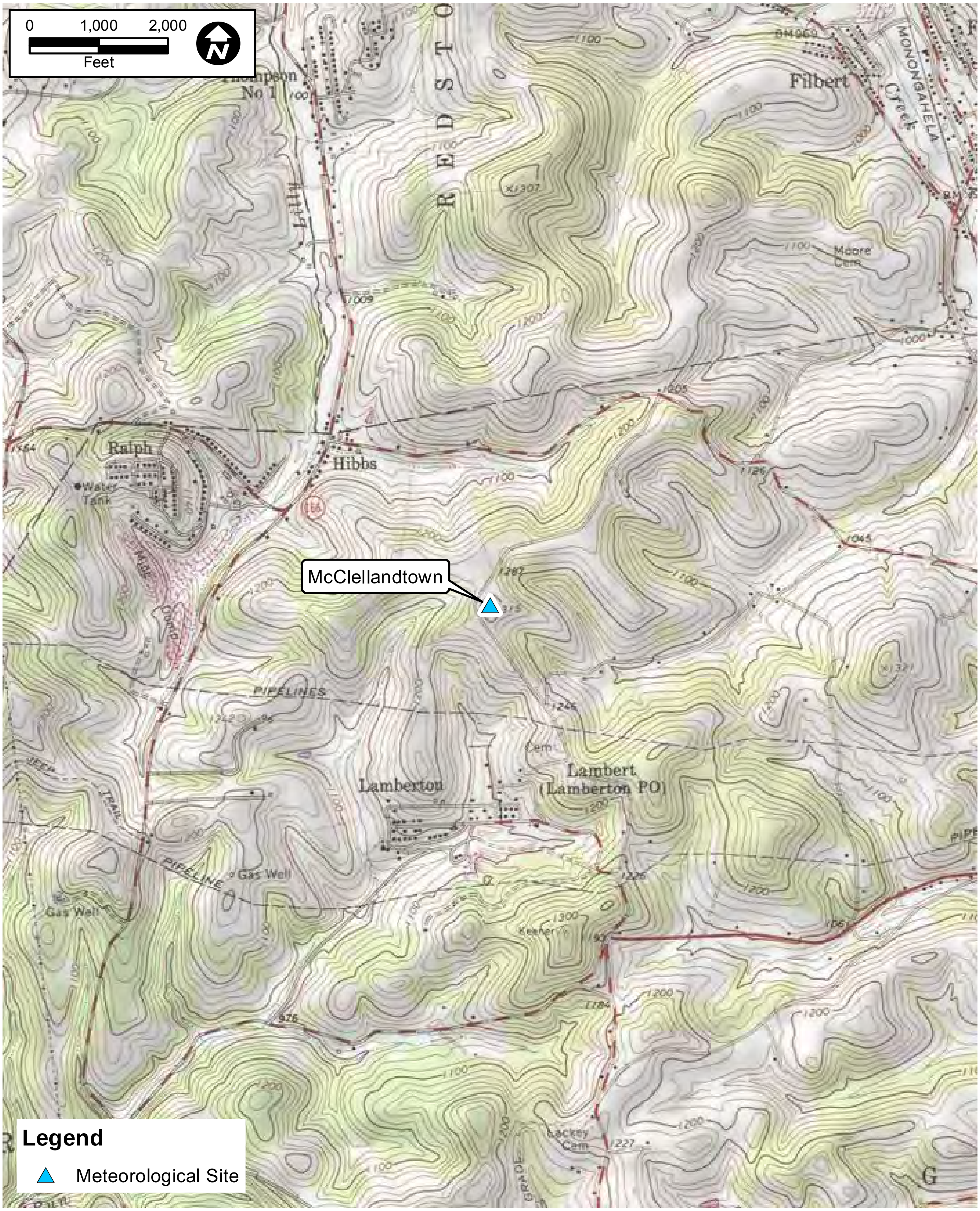
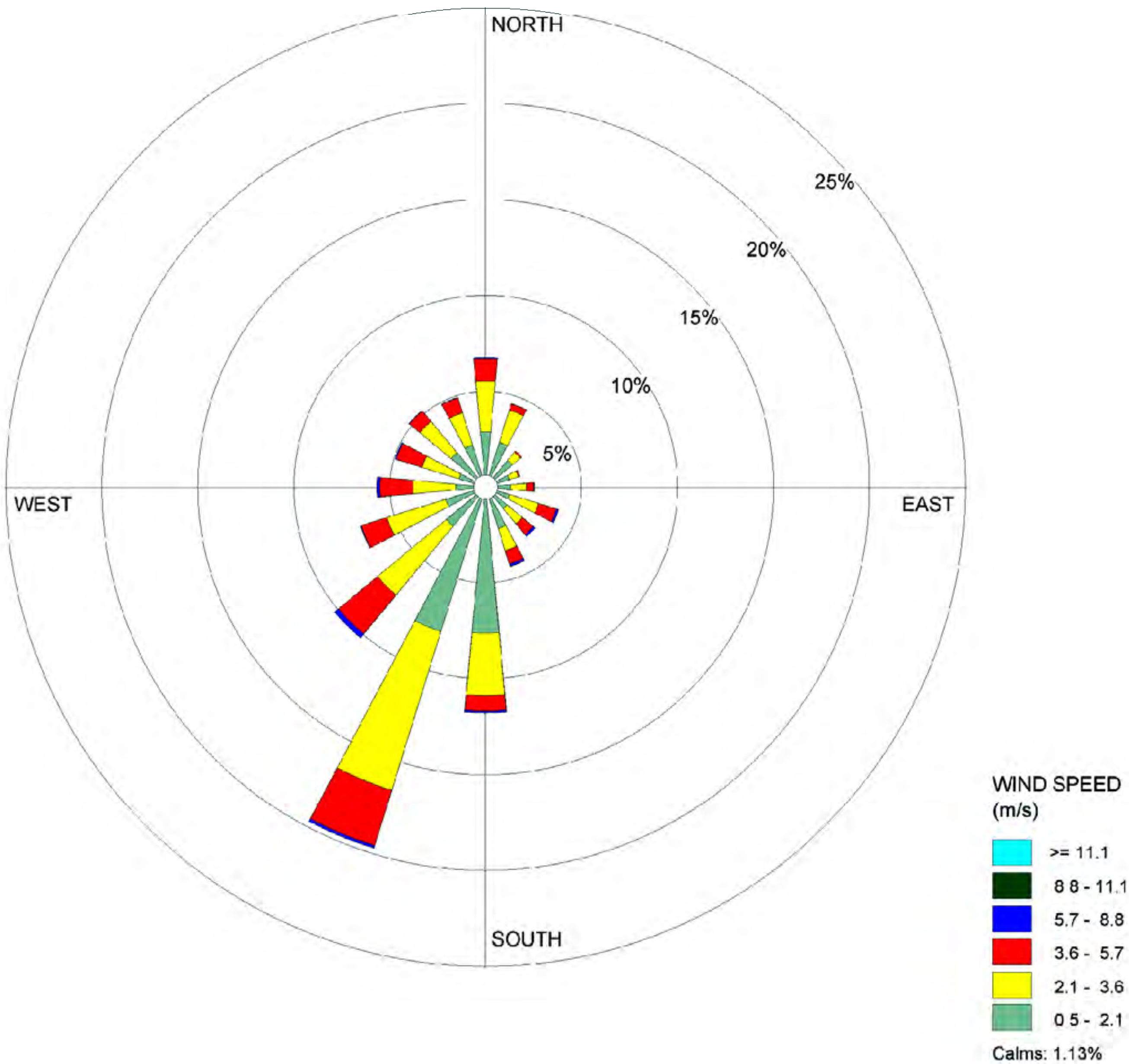


FIGURE H-4.
TERRAIN FEATURES IN THE VICINITY OF THE
MCCLELLANDTOWN METEOROLOGICAL SITE

Sources: Esri Basemap USGS Topographic Quadrangle, ECT 2017.



Note: Wind Direction (Blowing From)

FIGURE H-5.
KMGW WIND ROSE (2012-2016)

Sources: PADEP.

ECT Environmental Consulting & Technology, Inc.

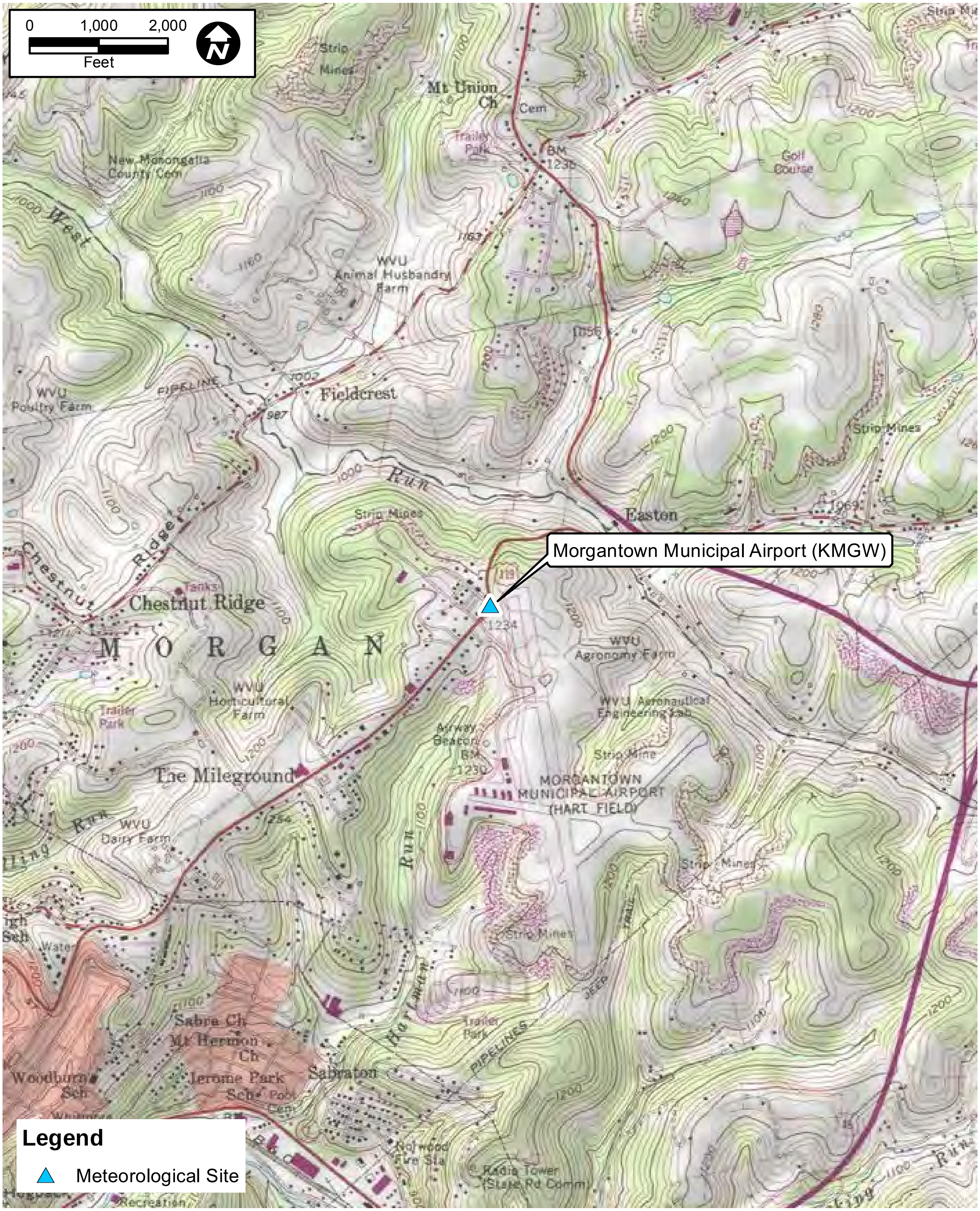


FIGURE H-6.
TERRAIN FEATURES IN THE VICINITY OF THE
MORGANTOWN METEOROLOGICAL SITE

Sources: Esri Basemap USGS Topographic Quadrangle, ECT 2017.

the National Elevation Dataset (NED), which was used to generate receptor elevation in the modeling domain, was visually inspected using geographic information system software. Review of the NED indicates terrain elevations vary from approximately 755 feet (ft) (230 meters) to 1,355 ft (413 meters) within 3 kilometers (km) of the proposed stack location. The highest terrain within 3 km is located at the nearby coal waste pile approximately 1 km south of the Project stack. The highest terrain in the modeling domain (2,800 ft) occurs approximately 23.5 km to the southeast along Chestnut Ridge.

The height of the coal waste pile (approximately 413 meters) is similar to the physical height of the combustion turbine (CT) stack (409 meters). Therefore, the stack plume, which will be well above the physical stack height (see further discussion in Section H.4), will be well exposed to prevailing wind patterns in the region.

H.2 MCCLELLANDTOWN METEOROLOGICAL STATION

The McClellandtown meteorological station is located approximately 5.8 km northeast of the Project Site in Fayette County, Pennsylvania. The base elevation of the meteorological station is approximately 1,315 ft msl (400.8 meters), and the terrain surrounding the station is generally hilly, with varying peaks and valleys and terrain ranging between 290 to 411 meters within 3 km in all directions. The location of the McClellandtown meteorological monitoring station is well exposed to prevailing winds, as is the case with the Project Site, due to its surrounding topographical features.

H.3 KMGW METEOROLOGICAL STATION (#13736)

KMGW is located approximately 27.0 km south of the Project Site in Monongalia County, West Virginia. The base elevation at KMGW is approximately 1,253ft msl (382 meters), and the terrain surrounding the airport is generally hilly, with varying peaks and valleys. Terrain ranges between 250 to 420 meters, with lower elevations typically to the west and south of the airport and higher elevations to the east. The location of the KMGW meteorological monitoring station is well exposed to prevailing winds, as is the case with the Project Site, due to its surrounding topographical features.

H.4 CT STACKS PLUME RISE CONSIDERATIONS

The release height and plume buoyancy of a specific application may offset influences of surface characteristics and terrain on wind patterns and pollutant dispersion. For example, large CT exhaust stacks have characteristically large momentum and buoyancy plume rise, resulting in high effective plume heights. In such cases, meteorological data recorded at a well-exposed monitoring site may better represent wind conditions aloft over the facility (at plume height) than low-level winds monitored at lower elevations that are affected by surrounding terrain. Review of terrain elevations in the vicinity of the Project indicates the final plume rise over the range of atmospheric conditions should not be affected by nearby terrain. Moreover, as discussed previously herein, the location of the meteorological monitoring sites are well exposed based on their locations. Based on this analysis, the meteorological sites are considered an appropriate choice for representative winds for modeling the Project's plume transport and pollutant dispersion.

H.5 SURFACE CHARACTERISTICS CONSIDERATIONS

Figures H-7 through H-9 provide the 1-km radius land cover plots (National Land Cover Database [NLCD] 1992) for the Project Site, McClellandtown meteorological site, and KMGW, respectively, as obtained from the Multi-Resolution Land Characteristics Consortium (MRLC) website. The digitized data files were used by the AERSURFACE utility to calculate surface roughness, the albedo and Bowen ratios. Section H.6 discusses the procedure further. Figures H-10 and H-11 compared graphically the seasonal albedo, Bowen ratio, and surface roughness lengths generated from AERSURFACE. As seen from these comparisons, the albedo and Bowen ratios calculated for the airport and Project Site are similar, and the surface roughness is also relatively close.

Based on the analyses presented in this section, the use of McClellandtown meteorological site and KMGW surface meteorological data is considered representative of the Project Site for this modeling analysis.

H.6 METEOROLOGICAL DATA PROCESSING

The five consecutive calendar years of processed meteorological data for each meteorological monitoring site was obtained from Andrew Fleck of PADEP on January 13, 2017.

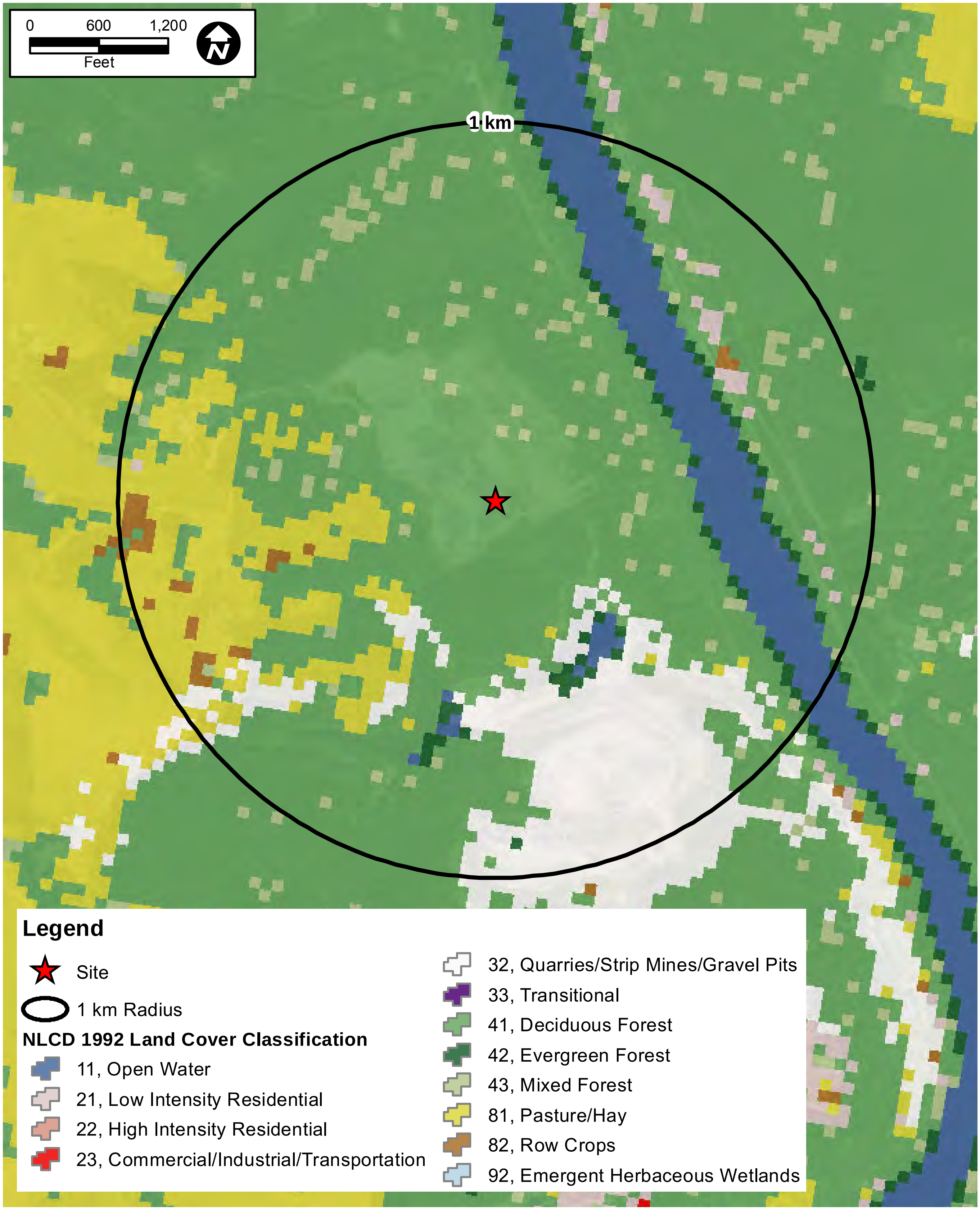


FIGURE H-7.
PROJECT SITE LAND COVER (NLCD 1992)

Sources: Esri Basemap, MRLC NLCD 1992, ECT 2017.

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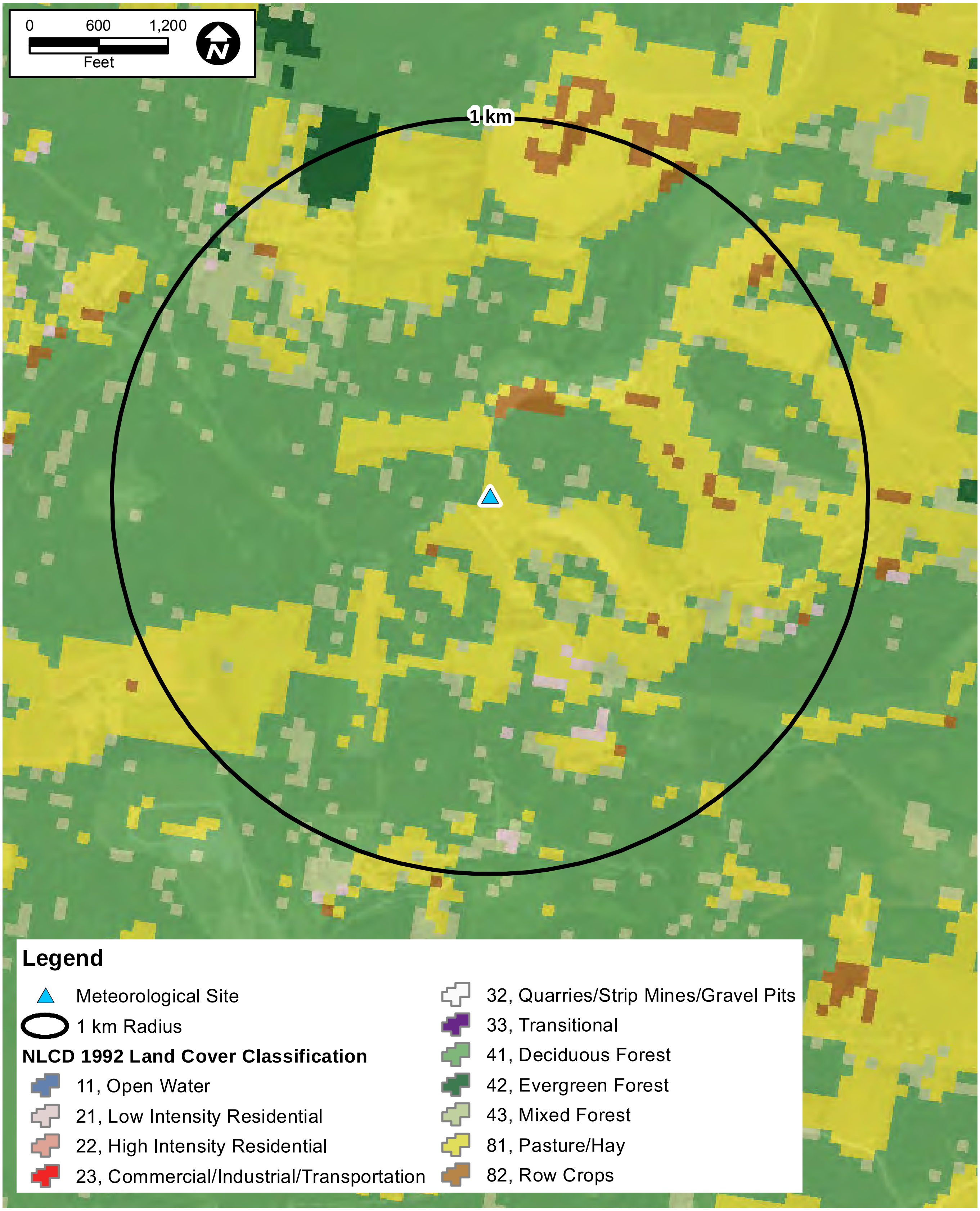

FIGURE H-8.
MCCLELLANDTOWN METEOROLOGICAL STATION
LAND COVER (NLCD 92)

Sources: Esri Basemap, MRLC NLCD 1992, ECT 2017.

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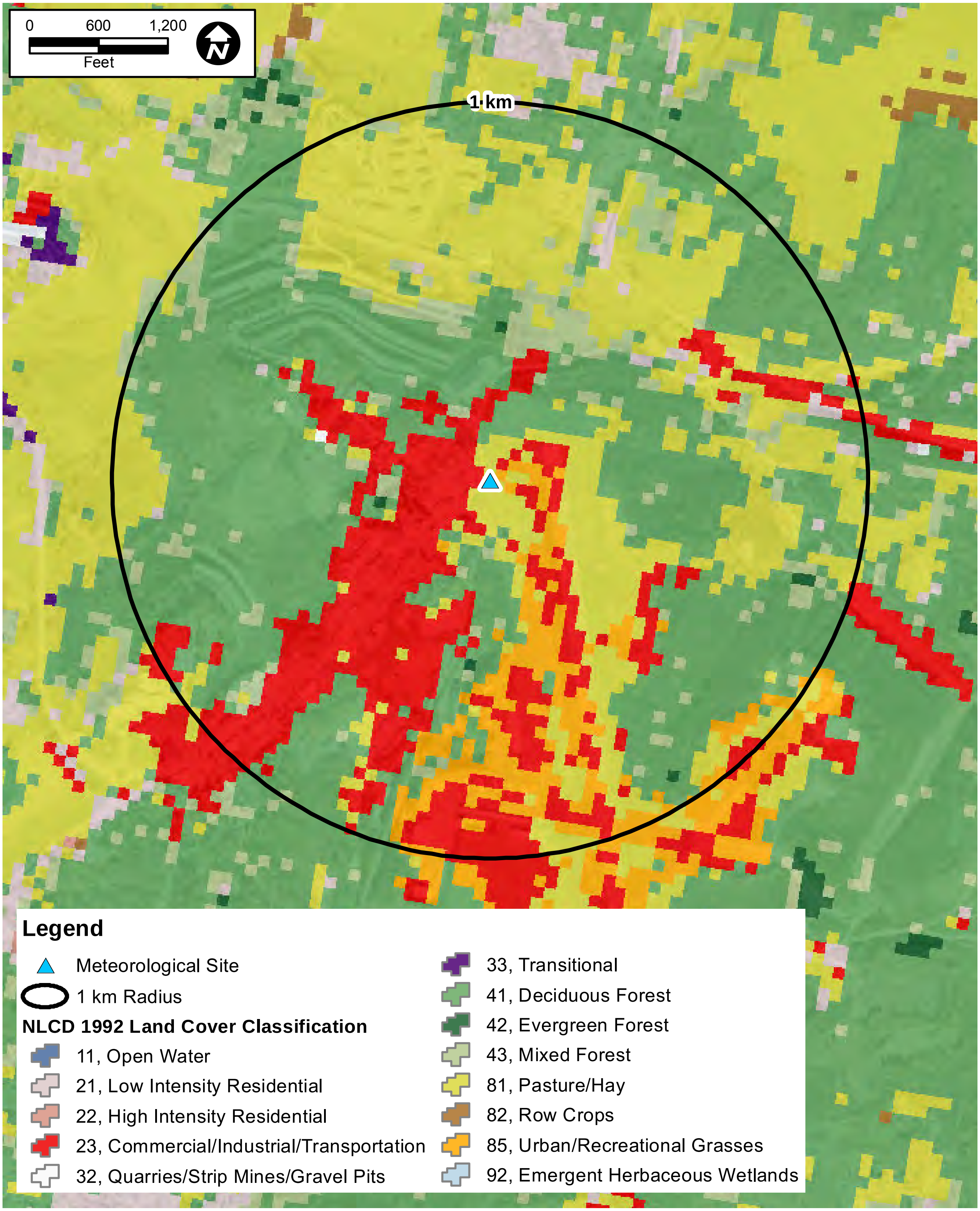

FIGURE H-9.
MORGANTOWN METEOROLOGICAL STATION LAND COVER (NLCD 1992)

Sources: Esri Basemap, MRLC NLCD 1992, ECT 2017.

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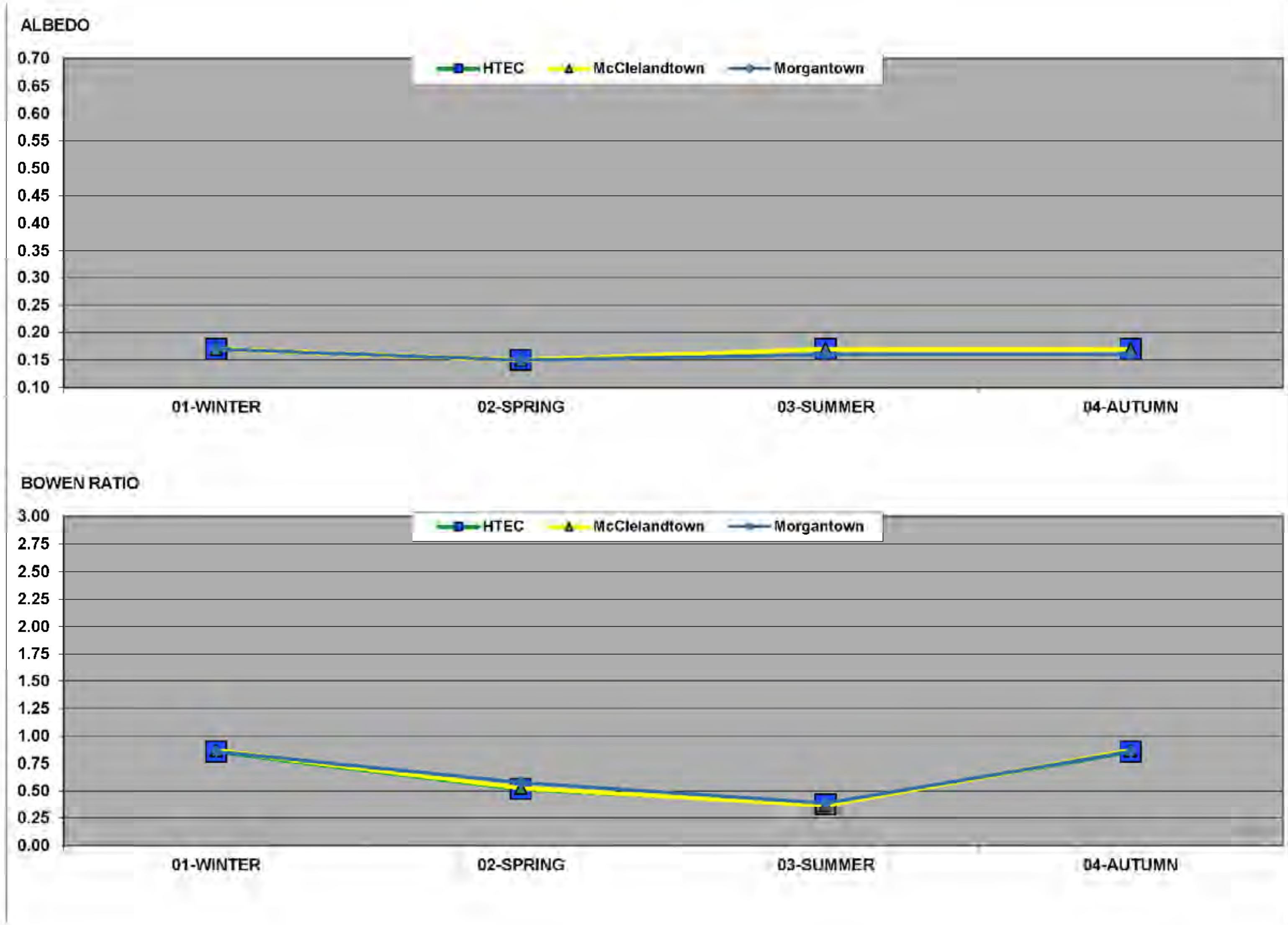

FIGURE H-10.
COMPARISON OF ALBEDO AND BOWEN RATIO VALUES BETWEEN THE METEOROLOGICAL SITES AND PROJECT SITE

Sources: ECT 2017.

ECT Environmental Consulting & Technology, Inc.

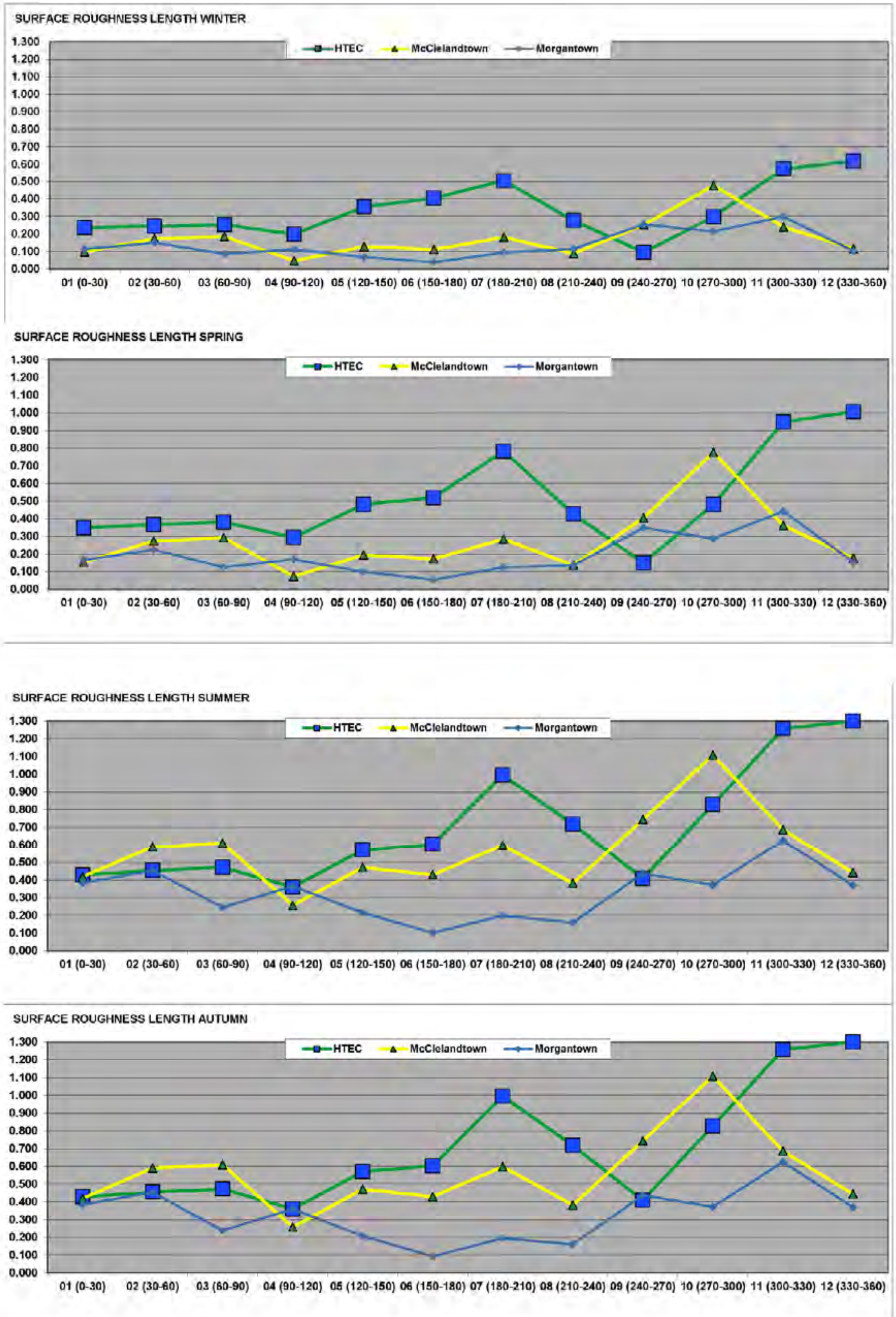

FIGURE H-11.
COMPARISON OF SURFACE ROUGHNESS VALUES
BETWEEN THE METEOROLOGICAL SITES
AND PROJECT SITE

Sources: ECT 2017.

ECT Environmental Consulting & Technology, Inc.

Raw meteorological data was obtained from NWS for years 1991 through 1995 (McClellandtown) and 2012 through 2016 (Morgantown) and processed by PADEP with AERMET (Version 16216).

Season- and sector-specific surface characteristics (albedo, Bowen ratio, and surface roughness length) for input into AERMET were developed by PADEP using EPA's AERSURFACE tool, which incorporates the methods recommended in EPA's latest AERMOD Implementation Guide. In accordance with these recommendations, surface characteristics are determined from digitized USGS NLCD (1992) land use classification data for the surface meteorological measurement site. Surface roughness length is based on the inverse-distance weighted geometric mean for an upwind distance of 1 km relative to the measurement site. The determination of Bowen ratio and albedo are based on a simple unweighted geometric mean over a 10-km by 10-km region centered on the measurement site. A total of twelve 30-degree sectors were used to account for variations in land cover near the measurement site.

Upper air sounding data are also required for the refined AERMOD analysis. To estimate convective mixing heights, AERMET requires an early morning sounding each day, typically obtained at a limited number of NWS sites. The nearest NWS upper air station is the Pittsburgh International Airport (KPIT). The raw upper air data from KPIT for the model years concurrent with the surface data 1991 through 1995 (McClellandtown) and 2012 through 2016 (Morgantown) were obtained by PADEP in the standard Forecast Systems Laboratory TD6201 series format and processed with the McClellandtown and Morgantown surface data to create surface and profile meteorological data files necessary to conduct the AERMOD refined analysis.

PADEP performed meteorological completeness tests on the data set to demonstrate the processed surface and upper air data satisfy EPA minimum data completeness criteria for performing PSD modeling analyses. Appendix G contains the supporting processing files.

APPENDIX I

BACKGROUND MONITOR JUSTIFICATION

I. BACKGROUND MONITOR JUSTIFICATION

Cumulative impacts of the pollutants and averaging periods required to be included in the multisource analysis are added to monitored background air quality concentrations to estimate total pollutant concentrations. Total concentrations are then compared to the respective national ambient air quality standards (NAAQS) to evaluate whether the Hill Top Energy Center (HTEC or the Project) would not cause or contribute air pollution in violation of any NAAQS. Background concentrations representative of the Project modeling domain must be obtained from the most recent years of certified monitoring data (2013 through 2015) available from the most representative monitoring sites nearest to the Project Site. The representativeness of each monitoring site for the purpose of determining the monitored background air quality should be justified based on U.S. Environmental Protection Agency (EPA) guidance contained in Section 8.3 (Background Concentrations) of their Guideline on Air Quality Models (GAQM) and Section 2.4 (Use of Representative Air Quality Data) of the Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD).

To evaluate the representativeness and justify selection of background data from available regional monitoring sites, the closest monitoring site to the Project was identified (none are located in Greene County) and evaluated using EPA's criteria. Background concentrations of carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than or equal to 10 micrometers (PM_{10}), and particulate matter less than or equal to 2.5 micrometers ($PM_{2.5}$) will be based on the Charleroi data, as it is the closest monitor to the proposed site where these pollutants are measured. The CO 1-hour and 8-hour background concentration will be the three-year average of the second highest monitor values. The NO_2 1-hour background concentration will be the average of the three-year 98th percentile monitor value. The NO_2 annual background concentration will be the three-year average of the annual mean monitor value. The PM_{10} 24-hour background concentration will be the three-year average of the second highest monitor value. The $PM_{2.5}$ 24-hour background concentration will be the three-year average of the 98th percentile. The $PM_{2.5}$ annual background concentration value will be the three-year average of the weighted arithmetic mean monitor value. The monitor concentrations from Charleroi would likely be higher than at the Project Site,

because the area around the monitor is classified as commercial land use. This type of land use would have moderate traffic and other local sources the proposed site would not have. Figure I-1 shows the location of the potential monitoring site relative to the Project Site.

In general, three criteria were considered in evaluating the representativeness of ambient background data from the air quality monitoring site: topography, population density, and countywide emissions data

I.1 TOPOGRAPHY

The Project and monitor locations share similar topography. The area surrounding each location (within several kilometers) is similar. Both the Project and monitor are located along the west shore of the Monongahela River.

I.2 POPULATION DENSITY

Population estimates were obtained from the United States Census Bureau for year 2010.

The Project is to be located toward the east side of Greene County, near the city of Nemacolin. As shown on Figure I-1, the location of Project is close to Fayette County (less than 1 kilometer [km] from the county line). The two closest large populated areas in Greene County and Fayette County are Carmichaels and Uniontown, respectively. As shown on Figure I-1, the Project is located between these two populated areas.

The population of Nemacolin was compared to the population of the city where the proposed monitor station is located. Table I-1 presents the comparison of population data for the cities of Nemacolin and Charleroi. As shown on Table I-1, population of the city where the proposed monitoring station is located has more or significantly more population than Nemacolin.

Hence, air emissions associated with population density (e.g., automobile traffic) and corresponding ambient air concentrations monitored by the stations will be greater than emissions associated with population density expected to exist near the Project.

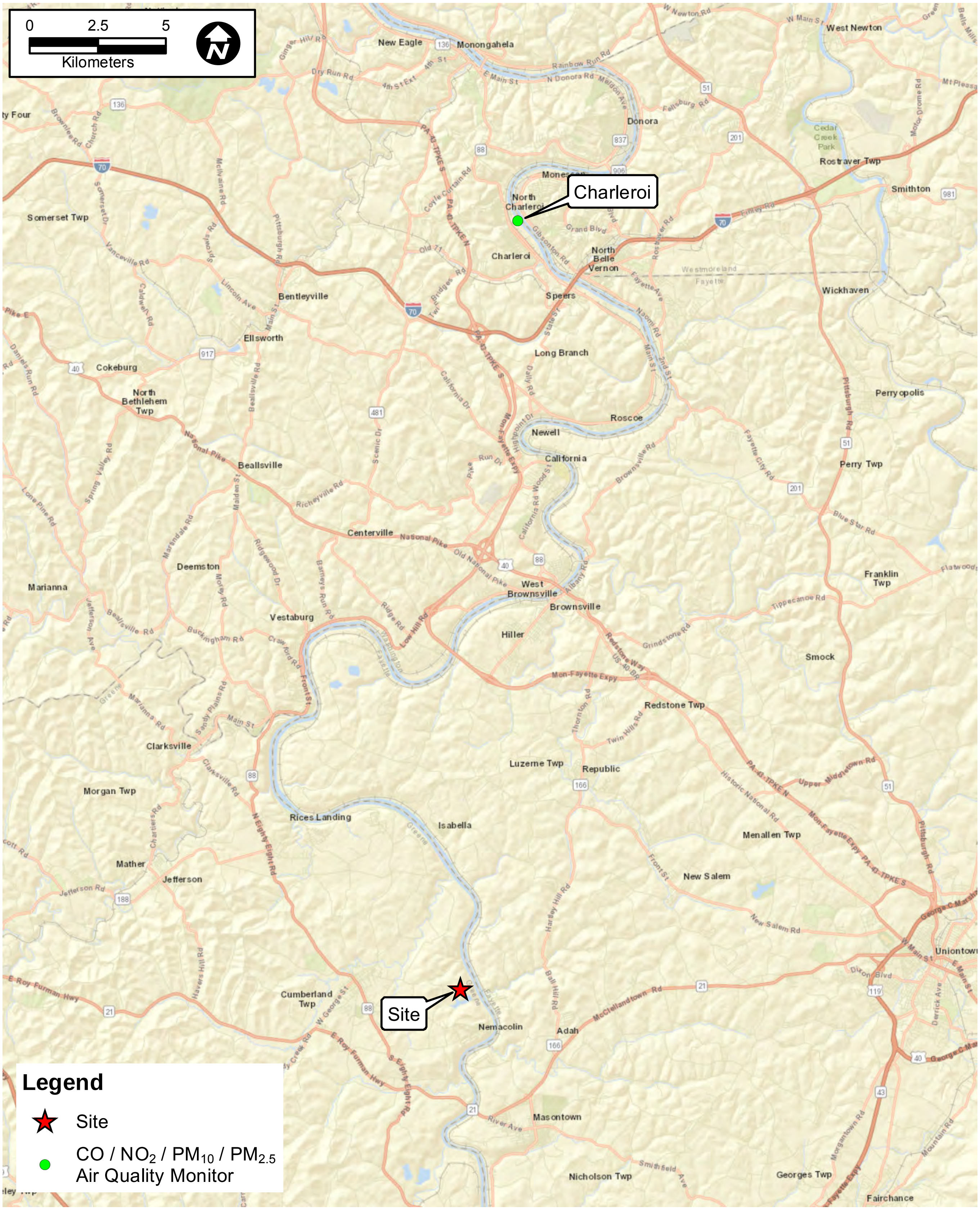

FIGURE I-1.
LOCATION OF NEARBY MONITOR SITE

Sources: Esri Basemap, EPA Air Data, ECT 2017.

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Table I-1. Population Comparison Analysis

Nearby City	County	City Population Estimate for Year 2010
Nemacolin*	Greene	937
Charleroi*	Washington	4,120

*Esri® data United States Census block centroid population.

Source: ECT, 2017.

Therefore, the proposed monitoring station offers a conservative estimate for emissions associated with population density in Greene County.

I.3 COUNTYWIDE AND STATIONARY SOURCE EMISSIONS

Air emissions rate data for each of the counties of interest were obtained from the Pennsylvania Department of Environmental Protection's (PADEP's) eFACTS website (http://www.ahs.dep.pa.gov/eFACTSWeb/default.aspx). These data correspond to point source emissions for 2015. Table I-2 summarizes the total air emissions for each county.

As shown on Table I-2,the PADEP database air emissions for Washington County are greater than those found in Greene County for all pollutants except for PM_{10}.

Table I-2. Comparison of Countywide Emissions

Location	Monitor Type	County	County Area (mi^2)	Countywide Air Emissions Estimates							
				NO_x		PM_{10}		$PM_{2.5}$		CO	
				tpy	ton/mi^2	tpy	ton/mi^2	tpy	ton/mi^2	tpy	ton/mi^2
Project Site	Not applicable	Greene	575.95	778.54	1.35	110.92	0.19	48.87	0.08	327.74	0.57
Charleroi	CO, NO_2, PM_{10}, $PM_{2.5}$	Washington	856.99	1116.6	1.30	102.88	0.12	70.86	0.08	639.07	0.75

Note: mi^2 = square mile.
ton/mi^2 = ton per square mile.
tpy = ton per year.

Source: ECT, 2017.