TETRA TECH

MEMO

To: James Grillo, Connecticut Department of Energy and Environmental Protection (DEEP)

From: Steven Babcock, Lynn Gresock

Date: November 2, 2016

Subject: Additional Killingly Energy Center Updates

An application for a permit to construct and operate for the proposed Killingly Energy Center (KEC) located in Killingly, Connecticut, submitted by NTE Connecticut, LLC (NTE), is under technical review by the Connecticut Department of Energy and Environmental Protection (DEEP). This memo describes emission reductions that have been incorporated as well as minor changes to KEC's configuration and grading in order to ensure DEEP is incorporating the most updated information into completion of its review. The changes are:

- Siemens has agreed to lower their emissions guarantee for carbon monoxide (CO) emissions when firing ultra-low sulfur distillate (ULSD) from 2.0 parts per million by volume corrected to 15% oxygen (ppmvdc) to 1.8 ppmvdc to reflect more closely Best Available Control Technology (BACT).
- Reduction of combustion turbine nitrogen oxide (NO_x) emission rates when firing ULSD from 5.0 ppmvdc to 4.0 ppmvdc to reflect the Lowest Achievable Emission Rate (LAER) based on the recent addition of two projects to the United States Environmental Protection Agency's (USEPA's) RACT/BACT/LAER Clearinghouse (RBLC) with this lower limit. The Middlesex Energy Center and the Sewaren Generating Station (both in New Jersey) each have a permitted NO_x emission rate of 4.0 ppmvdc for ULSD firing. Siemens has determined that it can provide a NO_x emissions guarantee of 4.0 ppmvdc during ULSD firing for the proposed Model SGT6-8000H combustion turbine. Therefore, the proposed NO_x LAER emission rate for ULSD firing has been revised to reflect the lowest approved limit for any known large combined cycle generating project.
- Lowering of the maximum heat input rating for the natural gas heater from 12 million British thermal units per hour (MMBtu/hr) to 5 MMBtu/hr to reflect KEC's current design.
- Minor equipment shifts and grading changes associated with updates to the site layout in response to local comments on other aspects of KEC raised during the Connecticut Siting Council (CSC) process (see Figure 1), primarily associated with increasing separation distance between KEC and wetlands and use of a ULSD tank with a steel containment, enabling removal of the ULSD tank's containment berm. As a result, the fuel metering and natural gas heater have been relocated, along with other minor shifts of on-site features.
- Minor changes to the stack parameters for the ancillary emission units, including increasing the stack height of the emergency generator engine to 45 feet, and updates to the exhaust flow characteristics for the emergency generator engine, emergency fire pump engine, and natural gas heater.

The dispersion modeling analyses have been updated to assess these project refinements. Siemens has also provided minor updates to heat input, exhaust flow, and emissions data for the combustion turbine for both fuels, to reflect the vendor's expected turbine performance for KEC. Therefore, these changes have been incorporated throughout the permit application documents including the emission calculations, application forms, summary tables in the application text, and the air quality impact analyses.

These changes have decreased the overall potential to emit for some pollutants for KEC. As a result, the required amount of Emission Reduction Credits (ERCs) to offset NO_x emissions is now lower. Based upon

the updated potential NO_x emissions of 135.1 tons per year (tpy), (reduced from the previous 139.1 tpy), KEC will require 162.1 NO_x ERCs (reduced from the previous 167.3 ERCs).

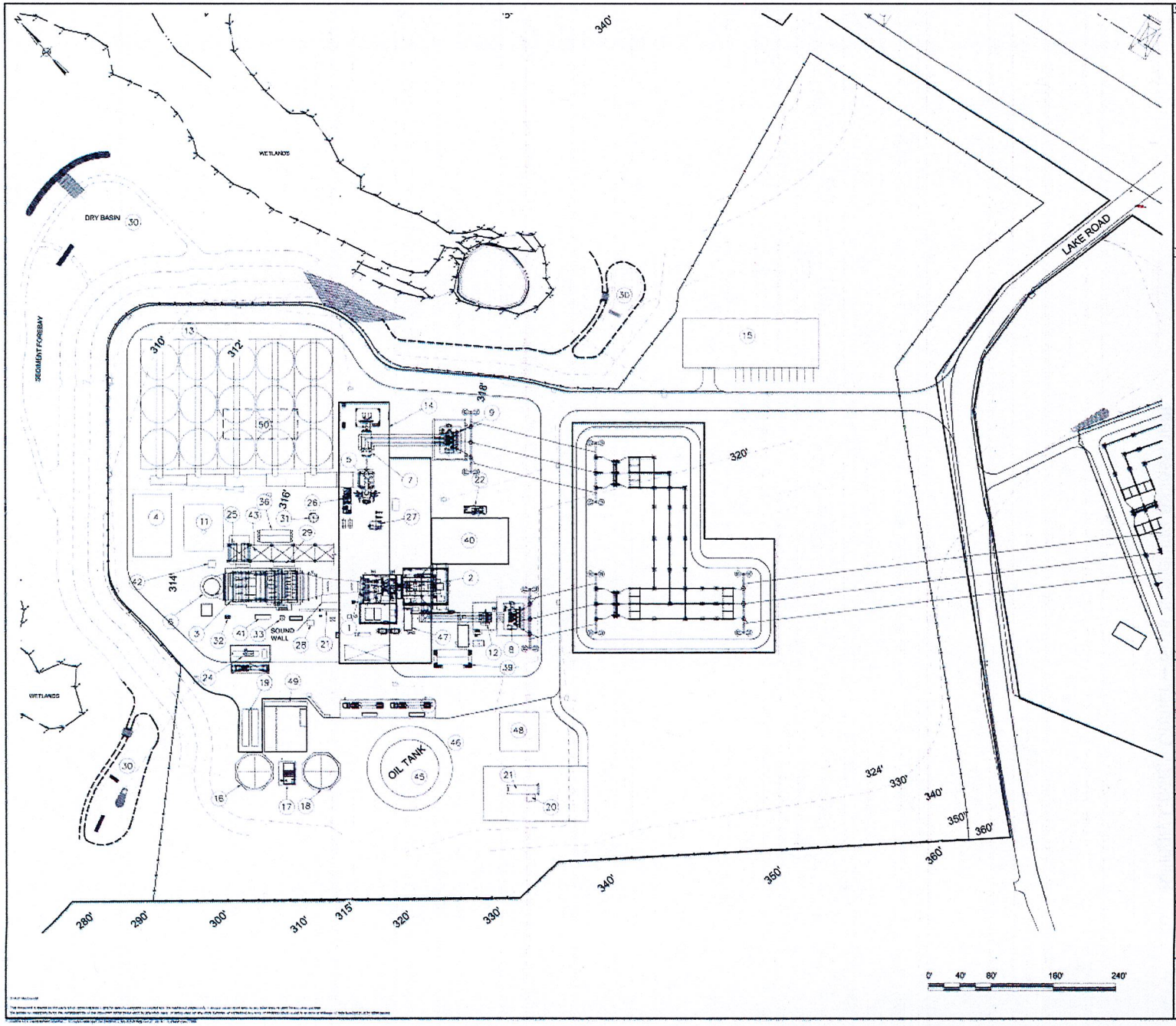
Updated information is attached to this memo reflecting the resulting updates to proposed operating restrictions and emission limits in the air permit application and a revised air dispersion modeling analysis. Updated electronic modeling files will be provided to Jude Catalano of DEEP. Attached to this memo is the following revised information to reflect the proposed changes:

- Page L-4 (showing revised lower heat input rate for natural gas heater)
- Table E-1: Maximum Short-Term Emission Rates for the CTG and Duct Burners
- Table E-2: Maximum Steady-State Emission for the CTG and Duct Burners
- Table E-6: Facility-Wide Annual Potential Emissions (tons per year [tpy])
- Revised application forms:
    - Att. E202 CT & DB
    - Att. E212 CT & DB
    - Att. E212 GH
    - Att. F
    - Att. G3
    - Att. 215-D
- Appendix A: Supporting Emission Calculations
- Appendix B: Revised Ambient Air Quality Analysis report pages

No changes to the modeling procedures documented in the modeling report dated May 25, 2016 have been made. Therefore, the revised air dispersion modeling analysis presents only the revised inputs and results, as applicable, to account for the changes described above, as well as those described in prior memos to DEEP dated July 14, 2016 and August 5, 2016. The revised pages for the Ambient Air Quality Analysis report include the following:

- Table L-2: PSD Regulatory Threshold Evaluation
- Table L-4: Stack Characteristics
- Table L-6: Load Scenarios and Emission Rates - Combined Cycle Combustion Turbine Firing ULSD
- Table L-7: Startup Condition Stack Parameters for Each Fuel
- Table L-10: Maximum Predicted Impact Concentrations
- Table L-11: Cumulative NAAQS Compliance Assessment
- Table L-12: Cumulative PSD Increment Compliance Assessment
- Table L-13: Predicted Air Quality Impacts Compared to NO2 Vegetation Impact Thresholds
- Table L-14: Predicted Air Quality Impacts Compared to CO Vegetation Impact Thresholds
- Table L-15: Predicted Air Quality Impacts Compared to SO_2 and PM_{10} Vegetation Impact Thresholds
- Table L-16: Soils Impact Screening Assessment
- Appendix L-A: DETAILED SOURCE PARAMETER DATA,
    - Combined Cycle Combustion Turbine and Ancillary Equipment Emissions Estimates
- Appendix L-B: FACILITY LAYOUT DIAGRAMS AND BPIP DATA
    - Figure L-B: Buildings, Structures, and Stacks Input to AERMOD
    - BPIP Input
    - BPIP Output
- Appendix L-C: DETAILED AERMOD RESULTS SUMMARY
    - Combined Cycle Combustion Turbine Emissions Estimates
    - AERMOD Scaled Impacts – turbine only (µg/m3) – 150 ft. turbine stack
    - Combined Cycle Combustion Turbine – Start-up/Shutdown (SU/SD) Emissions Estimates
    - AERMOD SU/SD Scaled Impacts – turbine only (µg/m3) – 150 ft. turbine stack
    - Killingly Energy Center – Detailed Results Table

- Killingly Energy Center – Cumulative Impacts
- Appendix L-E: VISCREEN ANALYSIS
  - Visual Effects Screening Analysis for KEC at Lye Brook NWA
- DETAILED CALCULATIONS FOR IMPACTS TO SOILS
  - Killingly Energy Center – Soils Screening Assessment



1. COMBUSTION TURBINE (GT)
2. COMBUSTION TURBINE GENERATOR (GTG)
3. HEAT RECOVERY STEAM GENERATOR (HRSG)
4. CLOSED COOLING WATER
5. STEAM TURBINE (ST)
6. EXHAUST STACK
7. STEAM TURBINE GENERATOR (STG)
8. GENERATOR STEP-UP TRANSFORMER (GSU)
9. STG STEP-UP TRANSFORMER
10. AIR INLET FILTER HOUSE (NOT SHOWN)
11. AUXILIARY BOILER
12. UNIT AUXILIARY TRANSFORMER
13. AIR COOLED CONDENSER (ACC) & CONDENSATE COLLECTION ENCLOSURE
14. TURBINE BUILDING
15. ADMIN/ WAREHOUSE BUILDING
16. RAW / FIRE WATER STORAGE TANK & RW PUMPS
17. FIRE PUMPS ENCLOSURE
18. DEMINERALIZED WATER STORAGE TANK
19. DEMINERALIZED WATER TRAILERS AREA
20. FUEL GAS METERING
21. FUEL GAS HEATER
22. DIESEL GENERATOR
23. PLANT SWITCHYARD
24. AMMONIA STORAGE TANK, PUMPS & UNLOADING AREA
25. BOILER FEED PUMPS
26. STG LUBE OIL SKID
27. AIR COMPRESSORS, RECEIVERS & DRYERS SKID
28. FUEL GAS FINAL FILTER
29. DUCT BURNER SKID
30. DETENTION POND
31. STG DRAINS TANK & SUMP
32. HRSG BLOW OFF TANK & DRAINS PUMPS
33. HRSG BLOWDOWN SUMP
34. STORM WATER RETENTION POND
35. CIVIL OIL WATER SEPARATOR (NOT SHOWN)
36. BOP MOTOR CONTROL CENTER (MCC)
37. PLANT GATE (NOT SHOWN)
38. NOT USED
39. CTG ELECTRICAL PACKAGE
40. CENTRAL CONTROL ROOM / ELECTRICAL
41. AMMONIA INJECTION SKID
42. CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS)
43. PIPE RACK
44. FUEL OIL UNLOADING
45. FUEL OIL TANK
46. STEEL CONTAINMENT
47. GT LUBE OIL SKID
48. FUEL GAS COMPRESSORS
49. WATER TREATMENT BUILDING
50. ACC MECHANICAL/ELECTRICAL EQUIPMENT ENCLOSURE

Rev	Date	Drawn	Description	Ch'kd	Appv'd
K	11/20/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
J	10/29/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
I	09/27/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
H	07/24/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
G	06/28/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
F	06/04/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
E	05/28/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
D	05/14/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
C	04/10/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
B	04/01/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW
A	03/27/19	AF	ISSUED FOR PERMIT REVIEW	KP	JW

Matt MacDonald

NTE ENERGY

KILLINGLY ENERGY CENTER
KILLINGLY CONNECTICUT

Figure 1

PRELIMINARY
NOT FOR CONSTRUCTION

Drawing Number: 334954CT-GA-203

Table E-1: Maximum Short-Term Emission Rates for the CTG and Duct Burners

Pollutant	Case	Emission Rate (lb/MMBtu)[b]	Emission Rate (ppmvdc)
NO_x	CTG Only on Gas	0.0075	2.0
	CTG Gas with DB[c]	0.0075	2.0
	CTG on ULSD	0.0155	4.0
VOC	CTG Only on Gas	0.0013	1.0
	CTG Gas with DB[c]	0.0026	2.0
	CTG on ULSD	0.0027	2.0
CO	CTG Only on Gas	0.0020	0.9
	CTG Gas with DB[c]	0.0038	1.7
	CTG on ULSD	0.0043	1.8
$PM/PM_{10}/PM_{2.5}$	CTG Only on Gas	0.0055[d]	n/a
	CTG Gas with DB[c]	0.0059[d]	n/a
	CTG on ULSD	0.0155[d]	n/a
SO_2	CTG Only on Gas	0.0015	n/a
	CTG Gas with DB[c]	0.0015	n/a
	CTG on ULSD	0.0015	n/a
H_2SO4	CTG Only on Gas	0.00056	n/a
	CTG Gas with DB[c]	0.00053	n/a
	CTG on ULSD	0.00054	n/a
GHG	CTG Only on Gas	7,273 Btu/kW-hr[e]	n/a

[a] CTG may exceed these limits during defined periods of start-up and shutdown.
[b] lb/MMBtu = pounds per million British thermal units. Emission rates are based on HHV of fuel.
[c] DB = duct burner; duct burner in operation (during CTG gas firing only).
[d] $PM/PM_{10}/PM_{2.5}$ lb/MMBtu emission rates cover all operating loads at or above the MECL.
[e] BACT for GHGs is expressed as an efficiency based limit (British thermal units per net kilowatt-hour [Btu/net kW-hr], net) at ISO conditions (natural gas firing) without duct firing.

Table E-2: Maximum Steady State Emission Rates for the CTG and Duct Burners

Pollutant	100% Load Natural Gas Firing with Duct Burner (maximum lb/hr)	100% Load Natural Gas Firing without Duct Burner (lb/hr)	100% Load ULSD Firing without Duct Burner (lb/hr)
NO_x	29.7	22.5	40.9
VOC	10.5	4.00	7.20
CO	15.4	6.20	11.2
$PM_{10}/PM_{2.5}$	23.4	13.0	30.0
SO_2	5.91	4.49	4.00
H_2SO_4	2.00	1.60	1.50
NH_3	11.0	8.40	18.8
CO_2	468,535	355,858	426,811
CO_{2e} [a]	469,011	356,220	428,283

[a] Carbon dioxide equivalents. CO_{2e} incorporates emissions of methane (CH_4) and nitrous oxide (N_2O) weighted by their respective global warming potentials.

Table E-6: Facility-Wide Annual Potential Emissions (tons per year [tpy])

Pollutant	CTG & Duct Burners	Auxiliary Boiler	Natural Gas Heater	Emergency Generator	Fire Pump	Facility Total
NO_x[a]	130.1	1.64	0.12	2.92	0.30	135.1
CO[a]	134.6	7.14	0.37	1.60	0.26	144.0
VOC[a]	48.3	0.78	0.03	0.15	0.02	49.3
SO_2	25.1	0.29	0.02	0.003	0.0005	25.4
$PM_{10}/PM_{2.5}$	101.7	0.97	0.05	0.09	0.02	102.8
GHG (as CO_2e)	1,989,650	22,610	1,170	308	49	2,014,335[b]
H_2SO_4	8.76	0.02	0.001	0.0002	0.00003	8.8
Lead (Pb)	0.0018	$9.5x10^{-5}$	$4.9x10^{-6}$	$1.4x10^{-6}$	$2.3x10^{-7}$	0.002
NH_3	49.8	N/A	N/A	N/A	N/A	49.8
Max Individual HAP (hexane)	7.17	0.35	0.02	N/A	N/A	7.5
Total HAPs	14.3	0.37	0.02	0.01	0.003	14.7

[a] Includes incremental emissions due to start-up and shutdown.
[b] Includes 547 tpy of fugitive GHG emissions from circuit breakers and natural gas handling.

REVISED APPLICATION FORMS

Attachment E202: Fuel Burning Equipment Supplemental Application Form

Applicant Name: **NTE Connecticut, LLC**
Unit No.: **CT**

DEEP USE ONLY
App. No.:

Complete this form in accordance with the instructions (DEEP-NSR-INST-202) to ensure the proper handling of your application. Print or type unless otherwise noted.

Note: Certain external combustion units may be operated pursuant to RCSA section 22a-174-3b or -3c in lieu of a permit to construct and operate pursuant to RCSA section 22a-174-3a.

Complete a separate form for *each* fuel burning source.

Questions? Visit the Air Permitting web page or contact the Air Permitting Engineer of the Day at 860-424-4152.

Part I: General

Type of Unit *(check one)*	☐ Boiler ☐ Heater/Furnace ☐ IC Engine ☒ Turbine ☐ Duct Burner ☐ Other (specify):	
Manufacturer and Model Number	SGT6-8000H, Mitsubishi M501GAC, or equivalent	
Construction Date	Sept. 2017	
Manufacture Date	TBD	
Is this unit subject to Title 40 CFR Part 60, NSPS?	☐ No ☒ Yes, Subpart(s) **KKKK & TTTT**	
Is this unit subject to Title 40 CFR Part 63, MACT?	☒ No ☐ Yes, Subpart(s)	
Maximum Design Heat Input	2,999 @ -10F MMBtu/hr	
Typical Heat Input	2,859 @ ISO MMBtu/hr	
Maximum Operating Schedule	**24** hours/day	**8,760** hours/year
Percentage of Annual Use in Each Category	Space Heat:	%
	Process Heat:	%
	Power:	**100%**

Part II: Fuel Information

Fuel Type	% Sulfur by weight	Higher Heating Value (BTU)	Maximum Hourly Firing Rate	Maximum Annual Fuel Usage	Units (gal or ft^3)
Natural Gas	0.0016	1,028	2.917E06	2.44E10	ft3
ULSD	0.0015	138,000	18,862	1.36E7	gal

Note: Parts III and IV are unit specific. Complete only that section which applies to the subject unit.

Part III: External Combustion Unit Information (Boiler or Heater/Furnace)

Burner Manufacturer and Model Number	
Number of Burners	
Burner Maximum Rated Capacity (per burner)	MMBtu/hr
Firing Type and Method Information *(Choose all that apply)*	
Oil/Gas Fired Unit	☐ Tangentially Fired ☐ Horizontally Opposed (normal) Fired ☐ Other (specify):
Pulverized Coal Fired Unit	☐ Dry Bottom ☐ Wet Bottom ☐ Wall Fired ☐ Tangentially Fired ☐ Horizontally Fired ☐ Vertically Fired ☐ Other (specify):
Coal/Wood Fired Stoker Unit	☐ Overfeed ☐ Underfeed ☐ Spreader ☐ Hand Fed ☐ IGCC (Integrated Gasification Combined Cycle) ☐ Other (specify):
Coal/Wood Fired Fluidized Bed Combustor	☐ Circulating Bed ☐ Bubbling Bed ☐ Cyclone Furnace ☐ Other (specify):
Other Coal/Wood Fired Unit	☐ Suspension Firing ☐ Dutch Oven/Fuel Cell Oven ☐ Over Fire Air ☐ Other (specify):

Part IV: Internal Combustion (IC) Unit Information (IC Engine or Turbine)

IC Engine Information	
IC Engine Operation *(check one)*	☐ Emergency Only ☐ Emergency/Non-Emergency
IC Engine Ignition *(check one)*	☐ Compression ☐ Spark
IC Engine Type *(check one)*	☐ 4-Stroke Rich Burn (4SRB) ☐ 4-Stroke Lean Burn (4SLB) ☐ 2-Stroke Lean Burn (2SLB)
IC Engine Brake Horsepower	HP
IC Engine Power Output	MW
Turbine Information	
Turbine Operation *(check one)*	☐ Emergency Only ☐ Emergency/Non-Emergency
Turbine Type *(check one)*	☐ Simple Cycle ☒ Combined Cycle
Turbine Power Output	296 MW

Part V: Combustion Controls Information (Check all that apply)

Type of Combustion Control(s) or Modifications(s)	☒ Low NOx Burners ☐ Flue Gas Recirculation ☒ Selective Catalytic Reduction ☐ Coal Reburn ☐ Gas Reburn ☐ Lean Burn ☐ Rich Burn ☐ Low Excess Air ☐ Other (specify):	☐ Fly Ash Reinjection ☐ Reburn ☐ Selective Non-Catalytic Reduction ☒ Oxidation Catalyst ☐ 3-way Catalyst ☐ Over Fire Air ☐ Biased Burner Firing ☐ Burners Out of Service ☐ None

Part VI: Attachments

Please check the attachments being submitted as verification that all applicable attachments have been submitted with this application form. When submitting such documents, please label the documents as indicated in this Part (e.g., Attachment E202-A, etc.) and be sure to include the applicant's name.

☒ Attachment E202-A:	*Process Information and Flow Diagram* – Submit a process flow diagram indicating all related equipment, air pollution control equipment and stacks, as applicable. Identify all materials entering and leaving each such device indicating quantities and parameters relevant to the proper operation of the device. Indicate all monitoring devices and controls. **REQUIRED**
☒ Attachment E202-B:	*Manufacturer Information* - Submit copies of the manufacturer specification sheets for the unit, the air pollution control equipment and the monitoring systems. **REQUIRED**
☒ Attachment E202-C:	*Turbine Emissions Profiles* - Submit copies of manufacturer's emissions profile data for steady state and transient operation of the turbine. **IF APPLICABLE**

Attachment E202: Fuel Burning Equipment Supplemental Application Form

Applicant Name: **NTE Connecticut, LLC**
Unit No.: **DB**

DEEP USE ONLY
App. No.:

Complete this form in accordance with the instructions (DEEP-NSR-INST-202) to ensure the proper handling of your application. Print or type unless otherwise noted.

Note: Certain external combustion units may be operated pursuant to RCSA section 22a-174-3b or -3c in lieu of a permit to construct and operate pursuant to RCSA section 22a-174-3a.

Complete a separate form for *each* fuel burning source.

Questions? Visit the Air Permitting web page or contact the Air Permitting Engineer of the Day at 860-424-4152.

Part I: General

Type of Unit *(check one)*	☐ Boiler ☐ Heater/Furnace ☐ IC Engine ☐ Turbine ☒ Duct Burner ☐ Other (specify):	
Manufacturer and Model Number	TBD	
Construction Date	Sept. 2017	
Manufacture Date		
Is this unit subject to Title 40 CFR Part 60, NSPS?	☐ No ☒ Yes, Subpart(s) **KKKK & TTTT**	
Is this unit subject to Title 40 CFR Part 63, MACT?	☒ No ☐ Yes, Subpart(s)	
Maximum Design Heat Input	943 MMBtu/hr	
Typical Heat Input	909 MMBtu/hr	
Maximum Operating Schedule	**24** hours/day	**8,760** hours/year
Percentage of Annual Use in Each Category	Space Heat:	%
	Process Heat:	%
	Power:	**100%**

Part II: Fuel Information

Fuel Type	% Sulfur by weight	Higher Heating Value (BTU)	Maximum Hourly Firing Rate	Maximum Annual Fuel Usage	Units (gal or ft^3)
Natural Gas	0.0016	1028	917,315	7.75E09	ft3

Note: Parts III and IV are unit specific. Complete only that section which applies to the subject unit.

Part III: External Combustion Unit Information (Boiler or Heater/Furnace)

Burner Manufacturer and Model Number	
Number of Burners	
Burner Maximum Rated Capacity (per burner)	MMBtu/hr
Firing Type and Method Information *(Choose all that apply)*	
Oil/Gas Fired Unit	☐ Tangentially Fired ☐ Horizontally Opposed (normal) Fired ☐ Other (specify):
Pulverized Coal Fired Unit	☐ Dry Bottom ☐ Wet Bottom ☐ Wall Fired ☐ Tangentially Fired ☐ Horizontally Fired ☐ Vertically Fired ☐ Other (specify):
Coal/Wood Fired Stoker Unit	☐ Overfeed ☐ Underfeed ☐ Spreader ☐ Hand Fed ☐ IGCC (Integrated Gasification Combined Cycle) ☐ Other (specify):
Coal/Wood Fired Fluidized Bed Combustor	☐ Circulating Bed ☐ Bubbling Bed ☐ Cyclone Furnace ☐ Other (specify):
Other Coal/Wood Fired Unit	☐ Suspension Firing ☐ Dutch Oven/Fuel Cell Oven ☐ Over Fire Air ☐ Other (specify):

Part IV: Internal Combustion (IC) Unit Information (IC Engine or Turbine)

IC Engine Information	
IC Engine Operation *(check one)*	☐ Emergency Only ☐ Emergency/Non-Emergency
IC Engine Ignition *(check one)*	☐ Compression ☐ Spark
IC Engine Type *(check one)*	☐ 4-Stroke Rich Burn (4SRB) ☐ 4-Stroke Lean Burn (4SLB) ☐ 2-Stroke Lean Burn (2SLB)
IC Engine Brake Horsepower	HP
IC Engine Power Output	MW
Turbine Information	
Turbine Operation *(check one)*	☐ Emergency Only ☐ Emergency/Non-Emergency
Turbine Type *(check one)*	☐ Simple Cycle ☐ Combined Cycle
Turbine Power Output	MW

Part V: Combustion Controls Information (Check all that apply)

Type of Combustion Control(s) or Modifications(s)	☒ Low NOx Burners ☐ Flue Gas Recirculation ☒ Selective Catalytic Reduction ☐ Coal Reburn ☐ Gas Reburn ☐ Lean Burn ☐ Rich Burn ☐ Low Excess Air ☐ Other (specify):	☐ Fly Ash Reinjection ☐ Reburn ☐ Selective Non-Catalytic Reduction ☒ Oxidation Catalyst ☐ 3-way Catalyst ☐ Over Fire Air ☐ Biased Burner Firing ☐ Burners Out of Service ☐ None

Part VI: Attachments

Please check the attachments being submitted as verification that all applicable attachments have been submitted with this application form. When submitting such documents, please label the documents as indicated in this Part (e.g., Attachment E202-A, etc.) and be sure to include the applicant's name.

☒ Attachment E202-A:	*Process Information and Flow Diagram* – Submit a process flow diagram indicating all related equipment, air pollution control equipment and stacks, as applicable. Identify all materials entering and leaving each such device indicating quantities and parameters relevant to the proper operation of the device. Indicate all monitoring devices and controls. **REQUIRED**
☒ Attachment E202-B:	*Manufacturer Information* - Submit copies of the manufacturer specification sheets for the unit, the air pollution control equipment and the monitoring systems. **REQUIRED**
☐ Attachment E202-C:	*Turbine Emissions Profiles* - Submit copies of manufacturer's emissions profile data for steady state and transient operation of the turbine. **IF APPLICABLE**

Attachment E212: Unit Emissions Supplemental Application Form

Applicant Name: NTE Connecticut, LLC
Unit No.: CT & DB

DEEP USE ONLY
App. No.:

Complete this form in accordance with the instructions (DEEP-NSR-INST-212) to ensure the proper handling of your application. Print or type unless otherwise noted.

Complete a separate form for *each* unit.

Questions? Visit the Air Permitting web page or contact the Air Permitting Engineer of the Day at 860-424-4152.

Part I: Unit Emission Information

Pollutant	Potential Emissions at Maximum Capacity		Proposed Allowable Emissions		
	lb/hr	tpy	lb/hr	Other Units *(specify)*	tpy
Criteria Air Pollutants					
PM	30.0	131.4	30.0	See Attached	101.7
PM_{10}	30.0	131.4	30.0	Text and Tables	101.7
$PM_{2.5}$ Total (filterable + condensable)	30.0	131.4	30.0		101.7
SO_x	5.9	25.8	5.8		25.1
NO_x	40.9	179.1	44.0		130.1
CO	15.4	67.5	15.2		134.6
VOC	10.5	46.0	10.3		49.0
Pb	3.0E-03	1.3E-02	3.0E-03		1.8E-03
GHG	469,011	2.1E06	460,328		1,989,650
Hazardous or Other Air Pollutants					
See Appendix A					

Potential Emissions Calculation Basis: Vendor Data

Proposed Allowable Emissions Calculation Basis: Vendor Data/operating restrictions in attached text

Part II: Regulatory Standards

Enter the regulatory standard(s) and the proposed allowable emissions for each pollutant emitted by the unit using the same units (e.g., ppmvd, lb/MMBTU, lb/hour, lb/day, etc.). More than one regulatory standard will often apply to a unit for a particular pollutant, list all that apply. Enter the regulatory citation(s) for the standard(s).

NOTE: The applicant should be aware of any existing regulatory standard applicable to the unit and should not propose allowable emissions in excess of the regulatory standard(s).

Pollutant	Regulatory Standard(s) *(specify units)*	Proposed Allowable Emissions *(specify units)*	Regulatory Citation(s)
Criteria Air Pollutants			
PM			
PM_{10}			
$PM_{2.5}$ Total (filterable + condensable)			
SO_x	0.06 lb/MMBtu	0.0015 lb/MMBtu	40 CFR 60.4320(a)
NO_x	15 ppmvd @15% O2	2.0 ppmvdc (gas) 4.0 ppmvdc (ULSD)	40 CFR 60.4330(a)(2)
CO			
VOC			
Pb			
GHG			
Hazardous or Other Air Pollutants *(Standards other than RCSA §22a-174-29)*			

Part III: Attachments

Please check the attachment being submitted as verification that all applicable attachments have been submitted with this application form. When submitting such documents, please label the documents as indicated in this Part (e.g., Attachment E212-A, etc.) and be sure to include the applicant's name.

☒	Attachment E212-A:	*Sample Calculations*- Submit sample calculations used to determine all emissions rates, excluding GHG. See Attachment E212-C for GHG emissions. **REQUIRED**
☒	Attachment E212-B:	*RCSA section 22a-174-29 Hazardous Air Pollutants Compliance* – Submit a completed CTMASC spreadsheet, or equivalent, to demonstrate compliance with RCSA section 22a-174-29. **REQUIRED**
☒	Attachment E212-C:	*Greenhouse Gas Emissions* – Submit a completed CO_2 Equivalents Calculator Spreadsheet, or equivalent, used to quantify Greenhouse Gas emissions, **REQUIRED**

Attachment E212: Unit Emissions Supplemental Application Form

Applicant Name: NTE Connecticut, LLC
Unit No.: GH

DEEP USE ONLY
App. No.:

Complete this form in accordance with the instructions (DEEP-NSR-INST-212) to ensure the proper handling of your application. Print or type unless otherwise noted.

Complete a separate form for *each* unit.

Questions? Visit the Air Permitting web page or contact the Air Permitting Engineer of the Day at 860-424-4152.

Part I: Unit Emission Information

Pollutant	Potential Emissions at Maximum Capacity		Proposed Allowable Emissions		
	lb/hr	tpy	lb/hr	Other Units *(specify)*	tpy
Criteria Air Pollutants					
PM	0.03	0.13	0.03	0.005 lb/MMBtu	0.05
PM_{10}	0.03	0.13	0.03	0.005 lb/MMBtu	0.05
$PM_{2.5}$ Total (filterable + condensable)	0.03	0.13	0.03	0.005 lb/MMBtu	0.05
SO_x	0.008	0.03	0.008	0.0015 lb/MMBtu	0.02
NO_x	0.06	0.26	0.06	0.012 lb/MMBtu	0.12
CO	0.19	0.81	0.19	0.037 lb/MMBtu	0.37
VOC	0.02	0.09	0.02	0.0034 lb/MMBtu	0.03
Pb	2.5E-06	1.1E-05	2.5E-06	4.9E-07 lb/MMBtu	4.9E-06
GHG	585	2,562	585	119 lb/MMBtu	1,170
Hazardous or Other Air Pollutants					
See Appendix A					

Potential Emissions Calculation Basis: Vendor Data

Proposed Allowable Emissions Calculation Basis: Vendor Data and 4,000 hrs/yr of operation

Part II: Regulatory Standards

Enter the regulatory standard(s) and the proposed allowable emissions for each pollutant emitted by the unit using the same units (e.g., ppmvd, lb/MMBTU, lb/hour, lb/day, etc.). More than one regulatory standard will often apply to a unit for a particular pollutant, list all that apply. Enter the regulatory citation(s) for the standard(s).

NOTE: The applicant should be aware of any existing regulatory standard applicable to the unit and should not propose allowable emissions in excess of the regulatory standard(s).

Pollutant	Regulatory Standard(s) *(specify units)*	Proposed Allowable Emissions *(specify units)*	Regulatory Citation(s)
Criteria Air Pollutants			
PM			
PM_{10}			
$PM_{2.5}$ Total (filterable + condensable)			
SO_x			
NO_x			
CO			
VOC			
Pb			
GHG			
Hazardous or Other Air Pollutants *(Standards other than RCSA §22a-174-29)*			

Part III: Attachments

Please check the attachment being submitted as verification that all applicable attachments have been submitted with this application form. When submitting such documents, please label the documents as indicated in this Part (e.g., Attachment E212-A, etc.) and be sure to include the applicant's name.

☒ Attachment E212-A: *Sample Calculations*- Submit sample calculations used to determine all emissions rates, excluding GHG. See Attachment E212-C for GHG emissions. **REQUIRED**

☒ Attachment E212-B: *RCSA section 22a-174-29 Hazardous Air Pollutants Compliance* – Submit a completed CTMASC spreadsheet, or equivalent, to demonstrate compliance with RCSA section 22a-174-29. **REQUIRED**

☒ Attachment E212-C: *Greenhouse Gas Emissions* – Submit a completed CO_2 Equivalents Calculator Spreadsheet, or equivalent, used to quantify Greenhouse Gas emissions, **REQUIRED**

Attachment F: Premises Information Form

Applicant Name: NTE Connecticut, LLC

DEEP USE ONLY
App. No.:

Complete this form in accordance with the instructions (DEEP-NSR-INST-217) to ensure the proper handling of your application. Print or type unless otherwise noted.

Complete Parts I through VI of this form, as applicable, for only the equipment which is located at the premises prior to the submittal of this application package. Unit(s) or modifications that are the subject of this application package are addressed in Part VII of this form.

Questions? Visit the Air Permitting web page or contact the Air Permitting Engineer of the Day at 860-424-4152

Note: This form is not required if you indicated in Part IV.8 of the *Permit Application for Stationary Sources of Air Pollution New Source Review Form (DEEP-NSR-APP-200) that* the premises is operating under the General Permit to Limit Potential to Emit.

Part I: Premises Information Summary

Answer each question unless directed to do otherwise. Complete the Part(s) indicated as well as Part VII.

Question	Check One	If Yes....
A. Is this a new premises? (i.e. no air pollution emitting equipment on site)	☒ Yes ☐ No	Skip Questions B through G and continue on to Part VII of this form.
B. Is the premises operating under a Title V permit?	☐ Yes ☐ No	Permit Number: Issue Date: Skip Questions C through G and continue on to Part VII of this form.
C. Is there any equipment operating under a New Source Review Permit (permit) or Air Registration (registration) at the premises?	☐ Yes ☐ No	Complete Part II of this form.
D. Are there any external combustion units, automotive refinishing operations, nonmetallic mineral processing equipment, emergency engines or surface coating operations operating under RCSA section 22a-174-3b at the premises?	☐ Yes ☐ No	Complete Part III of this form.
E. Are there any external combustion units, automotive refinishing operations, nonmetallic mineral processing equipment, emergency engines or surface coating operations operating under RCSA section 22a-174-3c at the premises?	☐ Yes ☐ No	Complete Part IV of this form.
F. Are there any emissions units operating at the premises that have potential emissions of any air pollutant below the permitting thresholds of RCSA section 22a-174-3a which have not been captured in Question E?	☐ Yes ☐ No	Complete Part V of this form.
G. Is the premises operating under a premises-wide annual limitation (other than GPLPE or RCSA section 22a-174-3c) for any air pollutant?	☐ Yes ☐ No	Complete Part VI of this form.

Part II: Permits and Registrations

Complete this part, if "Yes" was answered to Question C in Part I of this form. List each piece of equipment operating under a permit or registration located at this premises. Provide the potential emissions for each pollutant as limited by such permit or registration in tons per year for each unit. Calculate the total potential emissions from equipment operating under permits or registrations for the premises.

Permit / Registration Number	Equipment Description	Permit/Registration Issuance Date	Potential Emissions from Permit or Registration (tpy)								
			PM	PM_{10}	$PM_{2.5}$*	SO_x	NO_x	VOC	CO	Pb	GHG
Totals											

* $PM_{2.5}$ should include filterable $PM_{2.5}$ plus condensable $PM_{2.5}$

Part III: Units Operating Under RCSA section 22a-174-3b

Complete this part, if "Yes" was answered to Question D in Part I of this form. Enter the following information for each unit operating under RCSA section 22a-174-3b. Such units may include external combustion units, automotive refinishing operations, nonmetallic mineral processing equipment, emergency engines or surface coating operations. Calculate the total potential emissions from the equipment as limited by RCSA section 22a-174-3b.

Equipment Type	Const. Date	Maximum Rated Capacity of Equipment	Potential Emissions as Limited by RCSA section 22a-174-3b (tpy)								
			PM	PM_{10}	$PM_{2.5}$*	SO_x	NO_x	VOC	CO	Pb	GHG
Totals											

* $PM_{2.5}$ should include filterable $PM_{2.5}$ plus condensable $PM_{2.5}$

Emissions Calculation Basis: _____

Part IV: Units Operating Under RCSA section 22a-174-3c

Complete this part, if "Yes" was answered to Question E in Part I of this form. Check off the types of equipment that is operating at the premises under RCSA section 22a-174-3c. Check all that apply. Calculate the total potential emissions from the equipment limited by RCSA section 22a-174-3c for each pollutant.

Equipment Operating Under RCSA section 22a-174-3c (Check all that apply)		Fuels Used (Check all that apply)	Number of Fuels Used	Potential Emissions for Each Pollutant (tpy)	Total Potential Emissions for Each Pollutant (tpy)
External Combustion Unit	☐	☐ Gaseous Fuel ☐ Distillate Oil or a blend of distillate oil and biodiesel fuel ☐ Residual Oil or a blend of residual oil and biodiesel fuel (boiler only) ☐ Propane		**15**	
Emergency Engine	☐				
Nonmetallic Mineral Processing Equipment	☐	**N/A**	**N/A**	**15**	
Automotive Refinishing Operation	☐	**N/A**	**N/A**	**15**	
Surface Coating Operation	☐	**N/A**	**N/A**	**15**	
			Totals for Each Pollutant (tpy)		

Potential emissions of any individual air pollutant for a stationary source operating under RCSA section 22a-174-3c is less than 15 tons per year unless otherwise determined by a permit or order. Please be aware that if different units are operating with the same fuel, the most stringent limitation for that fuel applies to the premises.

Part V: Other Equipment

Complete this part, if "Yes" was answered to Question F in Part I of this form. Only include units which have not been captured elsewhere on this form and have potential emissions between 5 and 15 tons per year of any individual pollutant. If it is determined that premises-wide annual emissions of a pollutant are within 90% of major source thresholds, include all units with potential emissions greater than one ton per year on this table. Calculate the total potential emissions.

Equipment Description	Const. Date	Maximum Rated Capacity of Equipment	Potential Emissions as Defined in RCSA section 22a-174-1(91) (tpy)								
			PM	PM_{10}	$PM_{2.5}$*	SO_x	NO_x	VOC	CO	Pb	GHG
Totals											

* $PM_{2.5}$ should include filterable $PM_{2.5}$ plus condensable $PM_{2.5}$

Emissions Calculation Basis: _____

Part VI: Premises-Wide Annual Limitations

Complete this part, if "Yes" was answered to Question G in Part I of this form. List all premises-wide annual limitations applicable to this premises that appear in a permit or order. **Do not include limitations under RCSA section 22a-174-3c.**

Permit or Order Number	Pollutant Limited	Enforceable Premises-Wide Limitation (tpy)

Part VII: Premises Summary

Ozone Non-Attainment Status: ☒ **Serious** ☐ **Severe**

$PM_{2.5}$ Attainment Status: ☒ **Attainment** ☐ **Non-Attainment**

A. Current Premises Potential Emissions

List the applicable potential emissions totals from Parts II through VI, if required to complete those sections. Calculate the *Total Current Premises Potential Emissions* applying any applicable premise-wide limitations. A source that answered "Yes" to Question A or B in Part I of this form would only complete the last three rows of the table below.

Form Part	Part Description	Potential Emissions (tpy)								
		PM	PM_{10}	$PM_{2.5}$*	SO_x	NO_x	VOC	CO	Pb	GHG
Part II	Total Potential Emissions as Limited by Permit or Registration									
Part III	Total Potential Emissions as Limited by RCSA section 22a-174-3b									
Part IV	Total Potential Emissions as Limited by RCSA section 22a-174-3c									
Part V	Total Potential Emissions from Other Sources									
Part VI	Applicable Premises-Wide Annual Limitations									
Total Current Premises Potential Emissions		0	0	0	0	0	0	0	0	0
Major Source Thresholds (severe/serious)		**100**	**100**	**100**	**100**	**25/50**	**25/50**	**100**	**100**	**100,000**
Existing Major Stationary Source?		☐	☐	☐	☐	☐	☐	☐	☐	☐

* $PM_{2.5}$ should include filterable $PM_{2.5}$ plus condensable $PM_{2.5}$

If any pollutant is checked above, this premises **is** an existing major stationary source.

If no pollutants are checked above, this premises **is not** an existing major stationary source.

Go on to Part VII.B.

B. Proposed Project Allowable Emissions

List the proposed allowable emissions from the proposed project for the equipment or modifications included in this application package from *Attachment E: Unit Emissions (DEEP-AIR-APP-212)*.

Totals	Pollutant Emissions (tpy)								
	PM	**PM_{10}**	**$PM_{2.5}$***	**SO_x**	**NO_x**	**VOC**	**CO**	**Pb**	**GHG**
Proposed Allowable Emissions	102.8	102.8	102.8	25.4	135.1	49.3	144.0	0.002	2,014,335
Major Source Thresholds (severe/serious)	**100**	**100**	**100**	**100**	**25/50**	**25/50**	**100**	**100**	**100,000**
Project Major Source?	☒	☒	☒	☐	☒	☐	☒	☐	☒

* $PM_{2.5}$ should include filterable $PM_{2.5}$ plus condensable $PM_{2.5}$

If any pollutant is checked above, the proposed project **is** major in and of itself.

If no pollutants are checked above, the project **is not** major in and of itself.

Go on to Part VII.C.

C. New Premises Total Emissions

List the *Current Premises Potential Emissions* and the *Proposed Allowable Emissions* values from Parts VII.A and B. Calculate the *New Premises Total Emissions.*

Totals	Pollutant Emissions (tpy)								
	PM	PM_{10}	$PM_{2.5}$*	SO_x	NO_x	VOC	CO	Pb	GHG
Total Current Premises Potential Emissions (Part VII.A)	0	0	0	0	0	0	0	0	0
Proposed Allowable Emissions (Part VII.B)	102.8	102.8	102.8	25.4	135.1	49.3	144.0	0.002	2,014,335
New Premises Total Emissions	102.8	102.8	102.8	25.4	135.1	49.3	144.0	0.002	2,014,335
Major Source Thresholds (severe/serious)	**100**	**100**	**100**	**100**	**25/50**	**25/50**	**100**	**100**	**100,000**
Premises Major Source After Project?	☒	☒	☒	☐	☒	☐	☒	☐	☒

* $PM_{2.5}$ should include filterable $PM_{2.5}$ plus condensable $PM_{2.5}$

If any pollutant is checked above, the premises **will be** considered a major stationary source after the approval of the proposed project.

If no pollutants are checked above, the premises **will not be** considered a major stationary source after the approval of the proposed project.

Go on to Part VII.D.

D. Form Requirements

Based on the results in Parts VII.A through VII.C of this form the following forms are required to be completed for each pollutant:

Premises Major Stationary Source?	Project Itself Major Stationary Source?	Premises After Project is Major Stationary Source?	Forms Required to Be Completed
Part VII.A	Part VII.B	Part VII.C	
Yes	Yes	--	• Attachment H: Major Modification Determination Form • Attachment I: Prevention of Significant Deterioration of Air Quality (PSD) Program Form • Attachment J: Non-Attainment Review Form (for NOx, VOC or $PM_{2.5}$ only)
Yes	No	--	• Attachment H: Major Modification Determination Form (This form will direct you to complete Attachments I or J, if required.)
No	Yes	--	• Attachment I: Prevention of Significant Deterioration of Air Quality (PSD) Program Form • Attachment J: Non-Attainment Review Form (for NOx, VOC or $PM_{2.5}$ only)
No	No	--	Attachments H, I and J are not required.
--	--	Yes	If not already operating under one, the applicant is required to apply for a Title V permit within 12 months of becoming a major stationary source or the applicant must limit premises potential emissions by obtaining an approval of registration to operate under the General Permit to Limit Potential to Emit (GPLPE).

Attachment G3: Summary of Best Available Control Technology Reviews

Complete this form in accordance with the instructions (DEEP-NSR-INST-214) to ensure the proper handling of your application. Print or type unless otherwise noted.

List each emissions unit subject to the BACT requirements. For each emissions unit listed, indicate the Emissions Unit number and all pollutants that are subject to the BACT requirements. *Attachment G: Analysis of Best Available Control Technology* (DEEP-NSR-APP-214a) should be completed for each emissions unit-pollutant combination listed in this table.

		Pollutants Subject to BACT									
Unit Description	**Unit Number**	**PM**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NO_X**	**CO**	**VOC**	**GHG**	**Other** (please specify)	
Combustion Turbine	CT	☒	☒	☒	☒	☒	☒	☒	☒	☒	H2SO4 & NH3
Duct Burner	DB	☒	☒	☒	☒	☒	☒	☒	☒	☒	H2SO4 & NH3
Auxliary Boiler	DB1	☒	☒	☒	☒	☒	☒	☒	☒	☒	H2SO4
Emergency Generator Engine	DB2	☒	☒	☒	☒	☒	☒	☒	☒	☒	H2SO4
Emergency Fire Pump Engine	AB	☒	☒	☒	☒	☒	☒	☒	☒	☒	H2SO4
Natural Gas Heater	GH	☒	☒	☒	☒	☒	☒	☒	☒	☒	H2SO4
Fugitive Emissions	FG	☐	☐	☐	☐	☐	☐	☐	☒	☐	H2SO4
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
Baseline Project Emissions Total in tons per year (tpy):		102.8	102.8	102.8	25.4	135.1	144.0	49.3	2014335	58.6	**Comments:**
Allowable Project Emissions Total in tons per year (tpy):		102.8	102.8	102.8	25.4	135.1	144.0	49.3	2014335	58.6	

ATTACHMENT 215-D - OFFSETTING EMISSION REDUCTIONS OR EMISSION REDUCTION CREDITS DETERMINATION

Documentation is required to be provided for each non-attainment pollutant demonstrating that the planned use of any internal offsets comply with the requirements of RCSA Section 22a-174-3a(*l*)(4)(B) and that certified emission reduction credits comply with the requirements of RCSA Section 22a-174-3a(*l*)(5).

In accordance with the requirements of RCSA Section 22a-174-3a(l)(5), the emission reduction credits (ERCs) must satisfy the following requirements:

A. *Created and used in accordance with 40 CFR 51;*

B. *Real, that is, resulting in a reduction of actual emissions, net of any consequential increase in actual emissions resulting from shifting demand. The emission reductions shall be measured, recorded and reported to the commissioner;*

C. *Quantifiable, based on either stack testing approved by the commissioner in writing, conducted pursuant to an appropriate, reliable, and replicable protocol approved by the commissioner, or continuous emissions monitoring certified by the commissioner. Such quantification shall be in terms of the rate and total mass amount of non-attainment pollutant emission reduction;*

D. *Surplus, not required by any Connecticut General Statute or regulation adopted thereunder, or mandated by the State Implementation Plan, and not currently relied upon for any attainment plan, any Reasonable Further Progress plan or milestone demonstration;*

E. *Permanent, in that at the source of the emission reduction, the emission reduction system shall be in place and operating, and an appropriate record keeping system is maintained to collect and record the data required to verify and quantify such emissions reductions; and*

F. *Enforceable and approved by the commissioner in writing after the submission to the commissioner of documents satisfactory to the commissioner or incorporated into a permit as a restriction on emissions.*

The Project is required to hold 162.1 ERCs to offset the 135.1 tons per year of NO_X emissions from the Project in accordance with the requirements of RCSA Section 22a-174-3a(l)(5). The NO_X ERCs will be created prior to the date the Project becomes operational, and will come from an area in Connecticut or New York that is designated as an equal or higher nonattainment classification than the Project area. Prior to operation of the Project, NTE will provide documentation to DEEP that it has acquired the additional ERCs, along with the documentation necessary to verify that the ERCs meet all of the requirements of RCSA Section 22a-174-3a(l)(5).

APPENDIX A: SUPPORTING EMISSION CALCULATIONS

NTE Connecticut, LLC - Killingly Energy Center

Facility-Wide Potential Annual Emissions (TPY)

Pollutant	CTG & Duct Burners	Auxiliary Boiler	Natural Gas Heater	Emergency Generator	Fire Pump	Fugitive Emissions	Facility Total
NO_x	130.1	1.64	0.12	2.92	0.30	N/A	135.1
CO	134.6	7.14	0.37	1.60	0.26	N/A	144.0
VOC	48.3	0.78	0.03	0.15	0.02	N/A	49.3
SO_2	25.1	0.29	0.02	0.003	0.0005	N/A	25.4
PM	101.7	0.97	0.05	0.09	0.02	N/A	102.8
PM_{10}	101.7	0.97	0.05	0.09	0.02	N/A	102.8
$PM_{2.5}$	101.7	0.97	0.05	0.09	0.02	N/A	102.8
CO_2e	1,989,650	22,610	1,170	308	49	547	2,014,335
H_2SO_4	8.76	0.02	0.0011	0.0002	0.00003	N/A	8.8
Lead (Pb)	1.8E-03	9.5E-05	4.9E-06	1.4E-06	2.3E-07	N/A	1.9E-03
NH_3	49.8	N/A	N/A	N/A	N/A	N/A	49.8
Total HAPS	14.33	0.36	0.02	0.01	0.003	N/A	14.7

NTE Connecticut, LLC - Killingly Energy Center
CTG Potential To Emit

Potential To Emit Operating Scenario

The CTG will operate at full rated load for 8,760 hours per year.
Higher emission rates occur during gas firing with duct firing and ULSD firing without duct firing
Duct firing will be unlimited
ULSD firing will be limited to 720 hours per year per turbine without duct firing
Over the course of 8,760 operating hours, the average annual temperature will be 59°F
ULSD firing expected to occur during cold winter months
ULSD emission rate for 720 hrs/yr applied when the lb/hr rate is greater than the duct firing lb/hr rate
The potential to emit is the sum of the steady state potential to emit plus the net increase due to startup/shutdown operation

Operating Condition	Operating Load	Fuel	Ambient Temp. (°F)	Duct Firing	Maximum Annual Hours
Case #36	100%	Nat. Gas	59	On	8,760
Case #65	100%	ULSD	-10	Off	720
Total					**8,760**

Pollutant	Case #36	Case #69	8760 PTE	SU/SD	PTE
	lb/hr	lb/hr	tpy	tpy	tpy
NO_x	28.7	40.9	130.1	0.0	130.1
CO	14.9	11.2	65.3	69.3	134.6
VOC	9.9	7.2	43.4	4.9	48.3
$PM_{10}/PM_{2.5}$	22.6	30.0	101.7	0	101.7
SO_2	5.7	4.0	25.1	0	25.1
H_2SO_4	2.0	1.5	8.76	0	8.76
CO_2e	454,258	428,283	1,989,650	0	1,989,650
NH_3	10.7	18.9	49.8	0	49.8

NTE Connecticut, LLC - Killingly Energy Center

Siemens Model SGT6-8000H (or equivalent) Combined Cycle Combustion Turbine Emissions Estimates

Ambient Temperature (°F):	100					59					-10			
Case #:	1	2	3	4	5	36	37	38	39	40	32	33	34	35
Fuel	Natural Gas													
Number of GTs Operating														
GT Operating Load	100%	100%	100%	75%	45%	100%	100%	100%	75%	34%	100%	100%	75%	40%
Fuel Heating Value, Btu/lb (HHV)	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160
Evaporative Cooler Status (On or Off)	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Inlet Fogger State (On or Off)														
Ambient Relative Humidity, %	45	45	45	45	45	60	60	60	60	60	100	100	100	100
Baromteric Pressure, psia	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52
GT Heat Input (MMBtu/hr/unit, HHV)	2,700	2,700	2,517	1,987	1,359	2,909	2,904	2,859	2,272	1,381	2,999	2,994	2,368	1,428
DB Heat Input (MMBtu/hr/unit, HHV)	848					909					943			
Net Power (kW)						532,724		433,008						
Gross Power (kW)						549,200		446,400						
Heat Rate (Btu/kW-hr, net, HHV)						7,167		6,603						
HRSG Stack Exhaust Gas														
Exhaust Flow, lb/hr	4,837,058	4,798,769	4,544,105	3,839,554	2,931,643	5,187,478	5,146,271	5,096,974	4,208,294	2,925,405	5,291,266	5,249,041	4,237,321	2,929,652
Stack Temperature, °F	188.0	188.0	186.0	186.0	186.0	194.0	177.0	176.0	176.0	176.0	188.0	177.0	176.0	175.0
Exhaust Flow, acfm	1,380,500	1,361,909	1,282,886	1,082,305	825,091	1,481,606	1,423,262	1,407,572	1,159,971	804,854	1,490,388	1,446,558	1,164,686	803,230
O_2, Vol. %	8.41	11.11	11.35	11.93	12.79	8.73	11.46	11.56	11.90	12.99	8.77	11.56	11.75	12.90
CO_2, Vol. %	5.60	4.33	4.27	4.00	3.59	5.67	4.38	4.36	4.20	3.68	5.76	4.44	4.35	3.81
H_2O, Vol. %	13.82	11.48	10.79	10.28	9.53	11.78	9.38	9.11	8.81	7.84	10.83	8.36	8.20	7.18
N_2, Vol. %	71.32	72.24	72.73	72.93	73.23	72.96	73.91	74.11	74.23	74.61	73.77	74.76	74.82	75.23
Ar, Vol. %	0.84	0.85	0.85	0.86	0.86	0.86	0.87	0.87	0.87	0.87	0.87	0.88	0.88	0.88
MW, lb/lb-mole	27.96	28.11	28.18	28.21	28.25	28.19	28.34	28.37	28.39	28.45	28.30	28.46	28.47	28.53
HRSG Stack Exhaust Gas Emissions														
NOx, ppmvd @ 15% O2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NOx, lb/MMBtu as NO2 (Siemens)	0.0075	0.0075	0.0075	0.0075	0.0076	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0075	0.0076
NOx, lb/MMBtu as NO2 (EPA Method 19)	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074
NOx, lb/hr as NO2 (Siemens)	26.70	20.30	19.00	15.00	10.30	28.70	21.90	21.50	17.10	10.40	29.70	22.50	17.80	10.80
NOx, lb/hr as NO2 (Method 19)	26.14	19.90	18.55	14.64	10.01	28.13	21.40	21.07	16.74	10.18	29.04	22.06	17.45	10.52
VOC, ppmvd @ 15% O2 as CH4	2.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0
VOC ppm (Method 19)	2.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	1.0
VOC, lb/MMBtu (Siemens)	0.0026	0.0013	0.0013	0.0013	0.0013	0.0026	0.0013	0.0013	0.0013	0.0014	0.0027	0.0013	0.0013	0.0013
VOC, lb/MMBtu as CH4 (EPA Method 19)	0.0026	0.0013	0.0013	0.0013	0.0013	0.0026	0.0013	0.0013	0.0013	0.0013	0.0026	0.0013	0.0013	0.0013
VOC, lb/hr as CH4 (Siemens)	9.40	3.60	3.30	2.60	1.80	9.90	3.90	3.80	3.00	1.90	10.50	4.00	3.10	1.90
VOC, lb/hr as CH4 (Method 19)	9.11	3.47	3.23	2.55	1.74	9.80	3.73	3.67	2.92	1.77	10.12	3.84	3.04	1.83
CO, ppmvd @ 15% O2	1.7	0.9	0.9	0.9	0.9	1.7	0.9	0.9	0.9	0.9	1.7	0.9	0.9	0.9
CO, lb/MMBtu (Siemens)	0.0039	0.0021	0.0021	0.0021	0.0021	0.0039	0.0021	0.0021	0.0021	0.0021	0.0039	0.0021	0.0021	0.0021
CO, lb/MMBtu (EPA Method 19)	0.0038	0.0020	0.0020	0.0020	0.0020	0.0038	0.0020	0.0020	0.0020	0.0020	0.0038	0.0020	0.0020	0.0020
CO, lb/hr (Siemens)	13.90	5.60	5.20	4.10	2.80	14.90	6.00	5.90	4.70	2.90	15.40	6.20	4.90	3.00
CO, lb/hr (Method 19)	13.53	5.45	5.08	4.01	2.74	14.56	5.86	5.77	4.59	2.79	15.03	6.04	4.78	2.88
SO2 ppm (Method 19)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
SO2, lb/hr (Siemens)	5.10	3.90	3.60	2.90	2.00	5.50	4.20	4.10	3.30	2.00	5.60	4.30	3.40	2.10
SO2, lb/hr (calculated)	5.32	4.05	3.78	2.98	2.04	5.73	4.36	4.29	3.41	2.07	5.91	4.49	3.55	2.14
SO2, lb/MMBtu	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
H2SO4, lb/hr	1.80	1.40	1.30	1.10	0.70	2.00	1.50	1.50	1.20	0.70	2.00	1.60	1.20	0.80
H2SO4, lb/MMBtu	0.00051	0.00052	0.00052	0.00055	0.00052	0.00052	0.00052	0.00052	0.00053	0.00051	0.00051	0.00053	0.00051	0.00056
PM/PM_{10}/$PM_{2.5}$, lb/hr	21.00	11.70	11.10	9.30	8.00	22.60	12.70	12.60	10.30	7.10	23.40	13.00	10.50	7.20
PM/PM_{10}/$PM_{2.5}$, lb/MMBtu	0.0059	0.0043	0.0044	0.0047	0.0059	0.0059	0.0044	0.0044	0.0045	0.0051	0.0059	0.0043	0.0044	0.0050
NH_3, ppmvd @ 15% O2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NH_3, lb/MMBtu (EPA Method 19)	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
NH_3, lb/hr (Siemens)	9.90	7.60	7.00	5.60	3.80	10.70	8.10	8.00	6.40	3.90	11.00	8.40	6.60	4.00
NH_3, lb/hr (Method 19)	9.66	7.35	6.85	5.41	3.70	10.40	7.91	7.78	6.19	3.76	10.73	8.15	6.45	3.89
CO_2, lb/hr (40 CFR 75, App. G, Eq. G-4)	421,705	320,914	299,163	236,169	161,527	453,797	345,161	339,813	270,043	164,142	468,535	355,858	281,454	169,728
CH_4, lb/hr (40 CFR 98, Subpart C, Table 2)	7.82	5.95	5.55	4.38	3.00	8.42	6.40	6.30	5.01	3.05	8.69	6.60	5.22	3.15
N_2O, lb/hr (40 CFR 98, Subpart C, Table 2)	0.78	0.60	0.55	0.44	0.30	0.84	0.64	0.63	0.50	0.30	0.87	0.66	0.52	0.31
CO_2e, lb/hr (CH4 GWP = 25, N2O GWP = 298)	422,134	321,241	299,468	236,409	161,691	454,258	345,512	340,158	270,318	164,309	469,011	356,220	281,740	169,901
CO_2e, lb/MMBtu	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0	119.0
CO_2e, lb/MW-hr (gross)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HCOH (lb/hr)	0.776	0.591	0.551	0.435	0.297	0.835	0.635	0.626	0.497	0.302	0.863	0.655	0.518	0.312

NTE Connecticut, LLC - Killingly Energy Cen
Siemens Model SGT6-8000H (or equivalent)

Ambient Temperature (°F):	100				59				-10		
Case #:	41	42	43	44	68	69	70	71	65	66	67
Fuel	ULSD										
Number of GTs Operating											
GT Operating Load	100%	100%	75%	65%	100%	100%	75%	60%	100%	75%	60%
Fuel Heating Value, Btu/lb (HHV)	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453
Evaporative Cooler Status (On or Off)	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	---	---	---	---	---	---	---	---	---	---	---
Inlet Fogger State (On or Off)											
Ambient Relative Humidity, %	45	45	45	45	60	60	60	60	100	100	100
Baromteric Pressure, psia	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52
GT Heat Input (MMBtu/hr/unit, HHV)	2,561	2,414	1,913	1,736	2,630	2,618	2,071	1,791	2,625	2,107	1,857
DB Heat Input (MMBtu/hr/unit, HHV)											
Net Power (kW)											
Gross Power (kW)											
Heat Rate (Btu/kW-hr, net, HHV)											
HRSG Stack Exhaust Gas											
Exhaust Flow, lb/hr	4,885,623	4,674,882	3,876,493	3,614,061	5,212,570	5,167,900	4,278,143	3,835,075	5,491,876	4,517,413	4,064,394
Stack Temperature, °F	207.0	206.0	200.0	199.0	195.0	194.0	191.0	190.0	205.0	200.0	198.0
Exhaust Flow, acfm	1,414,471	1,349,732	1,107,648	1,029,025	1,467,838	1,451,602	1,194,464	1,067,379	1,558,200	1,270,698	1,140,195
O_2, Vol. %	11.52	11.72	12.18	12.42	12.30	12.29	12.75	13.08	13.07	13.31	13.48
CO_2, Vol. %	5.27	5.20	4.98	4.86	5.13	5.15	4.93	4.77	4.89	4.78	4.69
H_2O, Vol. %	10.73	10.22	9.50	9.14	7.96	7.85	7.09	6.61	5.81	5.40	5.20
N_2, Vol. %	71.63	72.01	72.49	72.72	73.74	73.84	74.36	74.67	75.34	75.62	75.74
Ar, Vol. %	0.84	0.84	0.85	0.85	0.87	0.87	0.87	0.88	0.88	0.89	0.89
MW, lb/lb-mole	28.35	28.40	28.45	28.48	28.64	28.65	28.71	28.75	28.85	28.88	28.89
HRSG Stack Exhaust Gas Emissions											
NOx, ppmvd @ 15% O2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
NOx, lb/MMBtu as NO2 (Siemens)	0.0155	0.0155	0.0154	0.0154	0.0154	0.0154	0.0155	0.0155	0.0154	0.0154	0.0155
NOx, lb/MMBtu as NO2 (EPA Method 19)	0.0155	0.0155	0.0155	0.0155	0.0155	0.0155	0.0155	0.0155	0.0155	0.0155	0.0155
NOx, lb/hr as NO2 (Siemens)	39.6	37.3	29.5	26.8	40.6	40.4	32.0	27.7	40.5	32.5	28.7
NOx, lb/hr as NO2 (Method 19)	39.8	37.5	29.7	27.0	40.9	40.7	32.2	27.8	40.8	32.8	28.9
VOC, ppmvd @ 15% O2 as CH4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
VOC ppm (Method 19)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
VOC, lb/MMBtu (Siemens)	0.0027	0.0027	0.0027	0.0028	0.0027	0.0028	0.0027	0.0028	0.0027	0.0028	0.0027
VOC, lb/MMBtu as CH4 (EPA Method 19)	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
VOC, lb/hr as CH4 (Siemens)	7.00	6.60	5.20	4.80	7.20	7.20	5.60	5.00	7.20	5.80	5.00
VOC, lb/hr as CH4 (Method 19)	6.94	6.54	5.18	4.70	7.12	7.09	5.61	4.85	7.11	5.71	5.03
CO, ppmvd @ 15% O2	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
CO, lb/MMBtu (Siemens)	0.0043	0.0043	0.0042	0.0043	0.0043	0.0042	0.0042	0.0042	0.0042	0.0042	0.0043
CO, lb/MMBtu (EPA Method 19)	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043	0.0043
CO, lb/hr (Siemens)	10.90	10.30	8.10	7.40	11.20	11.10	8.80	7.60	11.10	8.90	7.90
CO, lb/hr (Method 19)	10.91	10.28	8.15	7.39	11.20	11.15	8.82	7.63	11.18	8.97	7.91
SO2 ppm (Method 19)	0.17	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
SO2, lb/hr (Siemens)	3.90	3.70	2.90	2.70	4.00	4.00	3.20	2.80	4.00	3.20	2.90
SO2, lb/hr (calculated)	3.84		2.87	2.60	3.95	3.93	3.11	2.69	3.94	3.16	2.79
SO2, lb/MMBtu	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
H2SO4, lb/hr	1.40	1.40	1.10	1.00	1.50	1.50	1.20	1.00	1.50	1.20	1.10
H2SO4, lb/MMBtu	0.00055	0.00058	0.00058	0.00058	0.00057	0.00057	0.00058	0.00056	0.00057	0.00057	0.00059
PM/PM_{10}/$PM_{2.5}$, lb/hr	30.0	30.0	30.0	30.0	30.00	30.0	30.0	30.0	30.0	30.0	30.0
PM/PM_{10}/$PM_{2.5}$, lb/MMBtu	0.0117	0.0124	0.0157	0.0173	0.0114	0.0115	0.0145	0.0168	0.0114	0.0142	0.0162
NH_3, ppmvd @ 15% O2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
NH_3, lb/MMBtu (EPA Method 19)	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072
NH_3, lb/hr (Siemens)	18.30	17.30	13.70	12.40	18.80	18.70	14.80	12.80	18.80	15.10	13.30
NH_3, lb/hr (Method 19)	18.39	17.34	13.74	12.47	18.89	18.80	14.87	12.86	18.85	15.13	13.34
CO_2, lb/hr (40 CFR 75, App. G, Eq. G-4)	415,614	391,758	310,453	281,728	426,811	424,864	336,094	290,654	426,000	341,936	301,365
CH_4, lb/hr (40 CFR 98, Subpart C, Table 2)	16.94	15.97	12.65	11.48	17.40	17.32	13.70	11.85	17.36	13.94	12.28
N_2O, lb/hr (40 CFR 98, Subpart C, Table 2)	3.39	3.19	2.53	2.30	3.48	3.46	2.74	2.37	3.47	2.79	2.46
CO_2e, lb/hr (CH4 GWP = 25, N2O GWP = 298)	417,047	393,109	311,523	282,700	428,283	426,329	337,253	291,656	427,469	343,115	302,404
CO_2e, lb/MMBtu	162.8	162.8	162.8	162.8	162.8	162.8	162.8	162.8	162.8	162.8	162.8
CO_2e, lb/MW-hr (gross)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HCOH (lb/hr)	0.591	0.557	0.442	0.401	0.607	0.604	0.478	0.414	0.606	0.486	0.429

NTE Connecticut, LLC - Killingly Energy Center
Summary of Startup and Shutdown Emissions - Siemens Model SGT6-8000H (or equivalent)

Startup/Shutdown Operating Data

hot starts/unit/gas	208	number/yr	0.50	hrs/event	6	Avg. hrs downtime	6.50	hrs/event
warm starts/unit/gas	42	number/yr	0.58	hrs/event	16	Avg. hrs downtime	16.58	hrs/event
cold starts/unit/gas	0	number/yr	0.58	hrs/event	64	Avg. hrs downtime	64.58	hrs/event
shutdowns/unit/gas	250	number/yr	0.30	hrs/event	N/A	Avg. hrs downtime	N/A	hrs/event
hot starts/unit/ULSD	0	number/yr	0.53	hrs/event	6	Avg. hrs downtime	6.53	hrs/event
warm starts/unit/ULSD	10	number/yr	0.58	hrs/event	16	Avg. hrs downtime	16.58	hrs/event
cold starts/unit/ULSD	0	number/yr	0.58	hrs/event	64	Avg. hrs downtime	64.58	hrs/event
shutdowns/unit/ULSD	10	number/yr	0.30	hrs/event	N/A	Avg. hrs downtime	N/A	hrs/event

Startup/Shutdown Emissions Self-Correcting Analysis

		Natural Gas Start				ULSD Start			
		NOx	CO	VOC	PM	NOx	CO	VOC	PM
Emissions per cold start	lbs	100	470	40	6.8	150	2200	240	20.3
Emissions per warm start	lbs	130	430	40	8.1	170	2300	260	20.4
Emissions per hot start	lbs	110	370	40	6.9	150	1970	260	18.5
Emissions per shutdown	lbs	60	200	60	3.3	130	420	170	11.3
Shutdown/Cold start - duration (w/ downtime)	hrs	64.88	64.88	64.88	64.88	64.88	64.88	64.88	64.88
Shutdown/Warm start - duration (w/ downtime)	hrs	16.88	16.88	16.88	16.88	16.88	16.88	16.88	16.88
Shutdown/Hot start - duration (w/ downtime)	hrs	6.80	6.80	6.80	6.80	6.83	6.83	6.83	6.83
Shutdown/Cold start - avg hourly emissions[1]	lb/hr	2.47	10.33	1.54	0.15	4.32	40.38	6.32	0.49
Shutdown/Warm start - avg hourly emissions[1]	lb/hr	11.25	37.31	5.92	0.67	17.77	161.11	25.47	1.87
Shutdown/Hot start - avg hourly emissions[1]	lb/hr	25.00	83.82	14.71	1.49	40.98	349.76	62.93	4.35
Steady state average hourly (annual)[2]	lb/hr	28.70	14.90	9.90	22.60	40.89	11.20	7.20	30.00
Cold Start Net increase	lb/event	0.0	0.0	0.0	0.0	0.0	1893.2	0.0	0.0
Warm Start Net increase	lb/event	0.0	378.4	0.0	0.0	0.0	2530.9	308.4	0.0
Hot Start Net increase	lb/event	0.0	468.7	32.7	0.0	0.6	2313.5	380.8	0.0
Cold start - self correcting?	lb/hr	yes	yes	yes	yes	yes	no	yes	yes
Warm start - self correcting?	lb/hr	yes	no	yes	yes	yes	no	no	yes
Hot start - self correcting?	lb/hr	yes	no	no	yes	no	no	no	yes

[1] Includes balance of the hour at the steady state annual average hourly rate
[2] Based upon average annual hourly emissions with 4,250 hr/yr gas with duct firing, 720 hr/yr oil firing and gas without duct firing balance of the year.

Startup/Shutdown Potential Emissions Increase (tpy/unit)

SUSD Type	Gas NOx	Gas CO	Gas VOC	Oil NOx	Oil CO	Oil VOC
Shutdown/Cold Start	-	-	-	-	0.00	-
Shutdown/Warm Start	-	7.95	-	-	12.65	1.54
Shutdown/Hot Start	-	48.74	3.40	0.00	0.00	0.00
TOTAL	**0.00**	**56.69**	**3.40**	**0.00**	**12.65**	**1.54**

Note: Maximum of hot start/warm start/transition used for worst case hot start

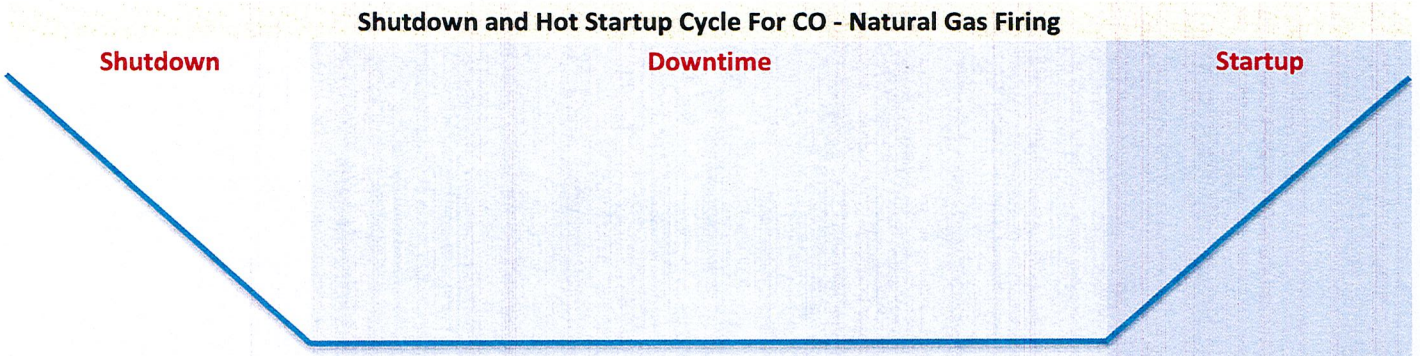
NTE Connecticut, LLC - Killingly Energy Center
Summary of Startup and Shutdown Emissions - Siemens Model SGT6-8000H (or equivalent)

Startup/Shutdown Parameters (per turbine)

Type	Operating Condition	Exhaust Flow (ACFM)	Temp (°F)	Temp (°K)	NOx (lb/hr)	CO (lb/hr)	VOC (lb/hr)	PM (lb/hr)	Stack Diameter (ft)	Exit Velocity (m/s)
Hot Start - gas	Startup	1,105,782	175	352.4	124.4	377.5	45.0	18.2	22.5	14.13
Warm Start - gas	Startup	1,161,532	177	353.6	142.0	436.2	44.1	17.5	22.5	14.84
Cold Start - gas	Startup	952,830	174	351.9	112.0	476.2	44.1	16.2	22.5	12.17
Shutdown - gas	Shutdown	807,358	176	353.0	80.1	210.4	66.9	19.1	22.5	10.32
Hot Start - ULSD	Startup	794,409	267	403.6	169.1	1975.2	263.4	32.5	22.5	10.15
Warm Start - ULSD	Startup	862,055	268	404.1	187.0	2304.7	263.0	32.9	22.5	11.01
Cold Start - ULSD	Startup	781,795	267	403.6	167.0	2204.7	243.0	32.8	22.5	9.99
Shutdown - ULSD	Shutdown	778,466	263	401.3	158.6	427.8	175.0	32.3	22.5	9.95

Notes
1.) Data is from vendor estimates with 25% compliance margin applied
2.) Cold startup (SU) data are based on CTG shutdown (SD) >64 hours
3.) Warm SU data CTG SD between 16 and 64 hours
4.) Hot SU data CTG SD <16 hours, 6 hour average presumed based upon daily cycling of CTG
5.) ULSD starts presumed to be Warm starts

Example Calculation of Net Increase in Emissions Due To Shutdown and Startup Operation



				SUSD Totals	
Duration (hrs)	0.30	6.00	0.50	6.80	A
Emissions (lbs)	200	0	370	570.0	B

Shutdown and Startup Cycle Emission Rate (lb/hr) =	83.82	**C** = B / A
Full Load Steady State Emission Rate (lb/hr) =	14.90	**D** (Case #36, full load on gas with duct firing at 59°F)
Net Increase in Emissions Due To Shutdown/Startup (lb/hr) =	68.92	**E** = C - D (avg over the shutdown/downtime/startup cycle)

If "E" is less than or equal to zero then there is no net increase in emissions over steady state from shutdown and startup operation.
If "E" is greater than zero, then there is a net increase in emissions over steady state from shutdown and startup operation.
If there is a net increase in emissions, then the impact on potential annual emissions from shutdown and startup must be quantifed.

Calculation of Impact on Potential Annual Emissions Due to a Net Increase in Emissions From Shutdown and Startup Operation

Net Increase in Emissions Due To Shutdown/Startup (lb/event)	468.68	**F** = E x A
Number of Shutdown and Startup Cycles Per Year =	208	**G**
Net Increase in Annual Emissions (tpy) =	48.74	**H** = F x G / 2000

The net increase in emissions resulting from shutdown and startup operation is added to the steady state potential annual emissions to determine the total potential to emit from the CTG.

NTE Connecticut, LLC - Killingly Energy Center
Emissions From Ancillary Equipment

Pollutant	Auxiliary Boiler	Natural Gas Heater	Emergency Generator	Fire Pump
			kW	kW
	84.0 MMBtu/hr	5.0 MMBtu/hr	1,380 (mechanical)	227.5 (mechanical)
NO_x	7 ppmvd @ 3% O_2	10 ppmvd @ 3% O_2	6.40 g/kW-hr	4.0 g/kW-hr
	0.0085 lb/MMBtu	0.012 lb/MMBtu	1.55 lb/MMBtu	1.00 lb/MMBtu
	0.71 lb/hr	0.061 lb/hr	19.46 lb/hr	2.01 lb/hr
	1.64 TPY	0.12 TPY	2.92 TPY	0.30 TPY
CO	50 ppmvd @ 3% O_2	50 ppmvd @ 3% O_2	3.5 g/kW-hr	3.5 g/kW-hr
	0.037 lb/MMBtu	0.037 lb/MMBtu	0.85 lb/MMBtu	0.87 lb/MMBtu
	3.11 lb/hr	0.185 lb/hr	10.64 lb/hr	1.76 lb/hr
	7.14 TPY	0.37 TPY	1.60 TPY	0.263 TPY
VOC	9.6 ppmvd @ 3% O_2	8 ppmvd @ 3% O_2	0.32 g/kW-hr	0.20 g/kW-hr
	0.0041 lb/MMBtu	0.0034 lb/MMBtu	0.078 lb/MMBtu	0.050 lb/MMBtu
	0.34 lb/hr	0.02 lb/hr	0.97 lb/hr	0.100 lb/hr
	0.78 TPY	0.03 TPY	0.15 TPY	0.015 TPY
$PM_{10}/PM_{2.5}$	N/A ppmvd @ 3% O_2	N/A ppmvd @ 3% O_2	0.20 g/kW-hr	0.20 g/kW-hr
	0.005 lb/MMBtu	0.005 lb/MMBtu	0.048 lb/MMBtu	0.050 lb/MMBtu
	0.42 lb/hr	0.03 lb/hr	0.61 lb/hr	0.10 lb/hr
	0.97 TPY	0.05 TPY	0.091 TPY	0.015 TPY
SO_2	0.0015 lb/MMBtu	0.0015 lb/MMBtu	0.0015 lb/MMBtu	0.0015 lb/MMBtu
	0.13 lb/hr	0.0075 lb/hr	0.02 lb/hr	0.0030 lb/hr
	0.29 TPY	0.02 TPY	0.003 TPY	0.0005 TPY
H_2SO_4	0.00011 lb/MMBtu	0.00011 lb/MMBtu	0.00011 lb/MMBtu	0.00011 lb/MMBtu
	0.010 lb/hr	0.00057 lb/hr	0.0014 lb/hr	0.00023 lb/hr
	0.02 TPY	0.00 TPY	0.0002 TPY	0.00003 TPY
Pb	4.9E-07 lb/MMBtu	4.9E-07 lb/MMBtu	1.1E-06 lb/MMBtu	1.1E-06 lb/MMBtu
	4.1E-05 lb/hr	2.5E-06 lb/hr	1.3E-05 lb/hr	2.1E-06 lb/hr
	9.5E-05 TPY	4.90E-06 TPY	2.0E-06 TPY	3.2E-07 TPY
CO_2	116.9 lb/MMBtu	116.9 lb/MMBtu	163.1 lb/MMBtu	163.1 lb/MMBtu
	9,820 lb/hr	585 lb/hr	2,046 lb/hr	329 lb/hr
	22,587 TPY	1,169 TPY	307 TPY	49 TPY
CH_4	0.0022 lb/MMBtu	0.0022 lb/MMBtu	0.0066 lb/MMBtu	0.0066 lb/MMBtu
	0.1852 lb/hr	0.0110 lb/hr	0.083 lb/hr	0.013 lb/hr
	0.43 TPY	0.02 TPY	0.0124 TPY	0.0020 TPY
N_2O	0.00022 lb/MMBtu	0.0 lb/MMBtu	0.0013 lb/MMBtu	0.0013 lb/MMBtu
	0.0185 lb/hr	0.0011 lb/hr	1.7E-02 lb/hr	0.0027 lb/hr
	0.043 TPY	0.002 TPY	2.5E-03 TPY	4.0E-04 TPY
CO_2e	9,831 lb/hr	585 lb/hr	2,053 lb/hr	330 lb/hr
	22,610 TPY	1,170 TPY	308 TPY	49 TPY

NOTES:

Natural Gas SO2 emissions based upon a sulfur content of 0.5 gr/100 dscf

ULSD SO_2 emissions based upon a sulfur content of 15 ppmw

Aux Boiler and Gas Heater criteria pollutant emission factors from BACT analysis

Emergency Generator criteria pollutant emission factors based on Tier 2 emission standards in 40 CFR 89.

Fire Pump criteria pollutant emission factors based on post -2009 emission standards in 40 CFR 60 Subpart IIII.

H_2SO_4 emissions assume a 5% conversion of SO2 --> SO3 (on a molar basis)

Fuel specific CO_2, CH_4 and N_2O emission factors from 40 CFR 98, Subpart C

Pb emission factor for ULSD from "Survey of Ultra-Trace Metals in Gas Turbine Fuels"

Potential HAP Emissions (tpy)

HAP	Potential Annual Emissions (tpy)					TOTALS
	CTGs & Duct Burners	Auxiliary Boiler	Nat. Gas Heater	Em. Generator	Fire Pump	
Organic Compounds						
Acetaldehyde	5.10E-01			4.74E-05	2.32E-04	5.10E-01
Acrolein	8.15E-02			1.48E-05	2.80E-05	8.16E-02
Benzene	1.48E-01	4.06E-04	2.10E-05	1.46E-03	2.82E-04	1.50E-01
1,3-Butadiene	5.03E-03				1.18E-05	5.04E-03
Dichlorobenzene	4.78E-03	2.32E-04	1.20E-05			5.02E-03
Ethylbenzene	4.08E-01					4.08E-01
Formaldehyde	3.09E+00	1.43E-02	7.40E-04	1.48E-04	3.57E-04	3.10E+00
Hexane	7.17E+00	3.48E-01	1.80E-02			7.53E+00
Propylene oxide	3.70E-01			7.24E-03	1.08E-03	3.78E-01
Toluene	1.67E+00	6.38E-04	3.30E-05	5.29E-04	1.24E-04	1.67E+00
Xylene	8.15E-01			3.63E-04	3.66E-04	8.16E-01
PAHs						
Acenaphthene	7.17E-06	3.48E-07	1.80E-08	8.81E-06	4.29E-07	1.68E-05
Acenaphthylene	7.17E-06	4.64E-07	2.40E-08	1.74E-05	1.53E-05	4.03E-05
Anthracene	9.56E-06	3.48E-07	1.80E-08	2.31E-06	5.65E-07	1.28E-05
Benzo(a)anthracene	7.17E-06	3.48E-07	1.80E-08	1.17E-06	5.08E-07	9.21E-06
Benzo(a)pyrene	4.78E-06	2.32E-07	1.20E-08	4.84E-07	5.68E-08	5.56E-06
Benzo(b)fluoranthene	7.17E-06	3.48E-07	1.80E-08	4.10E-07	3.00E-08	7.97E-06
Benzo(g,h,i)perylene	4.78E-06	2.32E-07	1.20E-08	1.05E-06	1.48E-07	6.22E-06
Benzo(k)fluoranthene	7.17E-06	3.48E-07	1.80E-08	2.09E-06	4.68E-08	9.67E-06
Chrysene	7.17E-06	3.48E-07	1.80E-08	2.88E-06	1.07E-07	1.05E-05
Dibenz(a,h)anthracene	4.78E-06	2.32E-07	1.20E-08	6.51E-07	1.76E-07	5.85E-06
7,12-Dimethylbenz(a) an	6.37E-05	3.09E-06	1.60E-07			6.70E-05
Fluoranthene	1.19E-05	5.60E-07	2.90E-08	7.58E-06	2.30E-06	2.24E-05
Fluorene	1.11E-05	5.22E-07	2.70E-08	2.41E-05	8.82E-06	4.46E-05
Indeno(1,2,3-cd)pyrene	7.17E-06	3.48E-07	1.80E-08	7.79E-07	1.13E-07	8.42E-06
3-Methylchloranthrene	7.17E-06	3.48E-07	1.80E-08			7.53E-06
2-Methylnaphthalene	9.56E-05	4.64E-06	2.40E-07			1.00E-04
Naphthalene	1.74E-02	1.20E-04	6.20E-06	2.45E-04	2.56E-05	1.78E-02
Phenanthrene	6.77E-05	3.28E-06	1.70E-07		8.89E-06	8.00E-05
Pyrene	1.99E-05	9.47E-07	4.90E-08	6.98E-06	1.44E-06	2.93E-05
TOTAL PAH	2.83E-02	1.31E-04	6.80E-06	3.99E-04	5.08E-05	2.89E-02
Metals						
Arsenic	7.96E-04	3.86E-05	2.00E-06	8.69E-08	1.40E-08	8.37E-04
Beryllium	4.40E-05	2.32E-06	1.20E-07			4.64E-05
Cadmium	4.38E-03	2.13E-04	1.10E-05	9.65E-09	1.55E-09	4.60E-03
Chromium	5.12E-03	2.70E-04	1.40E-05	2.33E-05	3.75E-06	5.43E-03
Chromium VI	9.22E-04	4.83E-05	2.50E-06	4.21E-06	6.77E-07	9.77E-04
Cobalt	3.26E-04	1.58E-05	8.20E-07			3.43E-04

Potential HAP Emissions (tpy)

HAP	Potential Annual Emissions (tpy)					TOTALS
	CTGs & Duct Burners	Auxiliary Boiler	Nat. Gas Heater	Em. Generator	Fire Pump	
Lead	1.80E-03	9.47E-05	4.90E-06	1.45E-06	2.32E-07	1.90E-03
Manganese	1.64E-03	7.15E-05	3.70E-06	5.31E-07	8.52E-08	1.71E-03
Mercury	9.95E-04	4.83E-05	2.50E-06	1.94E-08	3.11E-09	1.05E-03
Nickel	7.68E-03	4.06E-04	2.10E-05	2.78E-06	4.47E-07	8.11E-03
Selenium	9.67E-05	4.64E-06	2.40E-07	4.82E-07	7.74E-08	1.02E-04
Max. Single HAP						**7.53**
Total All HAPs	**1.43E+01**	**3.65E-01**	**1.89E-02**	**1.06E-02**	**2.60E-03**	**14.73**

NTE Connecticut, LLC - Killingly Energy Center
CTG and Duct Burner Potential HAP Emissions

HAP	CTG and Duct Burner HAP Emissions						
	CTG (gas)		CTG (ULSD)		Duct Burners		Potential To Emit
	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	tpy
Organic Compounds							
Acetaldehyde	4.00E-05	1.16E-01					5.10E-01
Acrolein	6.40E-06	1.86E-02					8.15E-02
Benzene	1.20E-05	3.49E-02	5.50E-05	1.45E-01	2.10E-06	1.91E-03	1.48E-01
1,3-Butadiene	4.30E-07	1.25E-03	1.60E-05	4.21E-02			5.03E-03
Dichlorobenzene					1.20E-06	1.09E-03	4.78E-03
Ethylbenzene	3.20E-05	9.31E-02					4.08E-01
Formaldehyde	2.19E-04	6.37E-01	2.31E-04	6.07E-01	7.50E-05	6.82E-02	3.09E+00
Hexane					1.80E-03	1.64E+00	7.17E+00
Propylene oxide	2.90E-05	8.44E-02					3.70E-01
Toluene	1.30E-04	3.78E-01			3.40E-06	3.09E-03	1.67E+00
Xylene	6.40E-05	1.86E-01					8.15E-01
PAHs							
Acenaphthene					1.80E-09	1.64E-06	7.17E-06
Acenaphthylene					1.80E-09	1.64E-06	7.17E-06
Anthracene					2.40E-09	2.18E-06	9.56E-06
Benzo(a)anthracene					1.80E-09	1.64E-06	7.17E-06
Benzo(a)pyrene					1.20E-09	1.09E-06	4.78E-06
Benzo(b)fluoranthene					1.80E-09	1.64E-06	7.17E-06
Benzo(g,h,i)perylene					1.20E-09	1.09E-06	4.78E-06
Benzo(k)fluoranthene					1.80E-09	1.64E-06	7.17E-06
Chrysene					1.80E-09	1.64E-06	7.17E-06
Dibenz(a,h)anthracene					1.20E-09	1.09E-06	4.78E-06
7,12-Dimethylbenz(a) anthracene					1.60E-08	1.45E-05	6.37E-05
Fluoranthene					3.00E-09	2.73E-06	1.19E-05
Fluorene					2.80E-09	2.55E-06	1.11E-05
Indeno(1,2,3-cd)pyrene					1.80E-09	1.64E-06	7.17E-06
3-Methylchloranthrene					1.80E-09	1.64E-06	7.17E-06
2-Methylnaphthalene					2.40E-08	2.18E-05	9.56E-05
Naphthalene	1.30E-06	3.78E-03	3.50E-05	9.21E-02	6.10E-07	5.54E-04	1.74E-02
Phenanthrene					1.70E-08	1.55E-05	6.77E-05
Pyrene					5.00E-09	4.55E-06	1.99E-05
TOTAL PAH	2.20E-06	6.40E-03	4.00E-05	1.05E-01	6.98E-07	6.35E-04	2.83E-02
Metals							
Arsenic			4.60E-08	1.21E-04	2.00E-07	1.82E-04	0.0007963
Beryllium			3.10E-07	8.15E-04	1.20E-08	1.09E-05	4.396E-05
Cadmium			5.11E-09	1.34E-05	1.10E-06	1.00E-03	0.0043796
Chromium			1.24E-05	3.26E-02	1.40E-06	1.27E-03	0.0051198
Chromium VI			2.23E-06	5.86E-03	2.52E-07	2.29E-04	0.0009216
Cobalt					8.20E-08	7.45E-05	0.0003265

NTE Connecticut, LLC - Killingly Energy Center
CTG and Duct Burner Potential HAP Emissions

HAP	CTG and Duct Burner HAP Emissions						
	CTG (gas)		CTG (ULSD)		Duct Burners		Potential To Emit
	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	tpy
Lead			1.05E-06	2.77E-03	4.90E-07	4.45E-04	0.0017956
Manganese			1.80E-07	4.74E-04	3.70E-07	3.36E-04	0.0016364
Mercury			1.02E-08	2.69E-05	2.50E-07	2.27E-04	0.0009954
Nickel			1.48E-06	3.88E-03	2.10E-06	1.91E-03	0.0076754
Selenium			2.55E-07	6.72E-04	2.40E-08	2.18E-05	9.67E-05
Max. Single HAP							
Total All HAPs	**5.36E-04**		**3.95E-04**		**1.89E-03**		**1.43E+01**

Notes:
1. Blank entry indicates no emission factor reported in the reference cited.
2. Organic HAP emission factors for CTGs are from Tables 3.1-3 and 3.1.4 of AP-42 except gas-firing for formaldehyde which is based on the NESHAP Subpart YYYY MACT floor limit of 91 ppb at 15% O2.
3. Emission factors for the HRSG and auxiliary boiler are from AP-42 Tables 1.4-3 and 1.4-4.
4. Emission factors for organics from the emergency diesel generator are from AP-42 Tables 3.4-3 and 3.4-4, for the fire pump from AP-42 Table 3.3-2.
5. Metal emission factors for ULSD firing are based on the paper "Survey of Ultra-Trace Metals in Gas Turbine Fuels", 11th Annual International Petroleum Conference, Oct 12-15, 2004. Where trace metals were detected in any of 13 samples, the average result is used. Where no metals were detected in any of 13 samples, the detection limit was used.
6. Hexavalent chrome is based on 18% of the total chrome emissions per EPA 453/R-98-004a.
7. No reduction by oxidation catalysts presumed for organic HAPs.
8. lb/hr values are at 59°F and do not represent maximum values at higher firing rates at colder temperatures.

NTE Connecticut, LLC - Killingly Energy Center
Ancillary Source Potential HAP Emissions (lb/hr)

HAP	Auxiliary Boiler		Natural Gas Heater		Em. Generator		Fire Pump	
	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr
Organic Compounds								
Acetaldehyde					2.52E-05	3.16E-04	7.67E-04	1.55E-03
Acrolein					7.88E-06	9.88E-05	9.25E-05	1.86E-04
Benzene	2.10E-06	1.76E-04	2.10E-06	1.05E-05	7.76E-04	9.73E-03	9.33E-04	1.88E-03
1,3-Butadiene							3.91E-05	7.88E-05
Dichlorobenzene	1.20E-06	1.01E-04	1.20E-06	6.00E-06				
Ethylbenzene								
Formaldehyde	7.40E-05	6.22E-03	7.40E-05	3.70E-04	7.89E-05	9.90E-04	1.18E-03	2.38E-03
Hexane	1.80E-03	1.51E-01	1.80E-03	9.00E-03				
Propylene oxide					3.85E-03	4.83E-02	3.56E-03	7.17E-03
Toluene	3.30E-06	2.77E-04	3.30E-06	1.65E-05	2.81E-04	3.52E-03	4.09E-04	8.24E-04
Xylene					1.93E-04	2.42E-03	2.85E-04	2.44E-03
PAHs								
Acenaphthene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	4.68E-06	5.87E-05	1.42E-06	2.86E-06
Acenaphthylene	2.40E-09	2.02E-07	2.40E-09	1.20E-08	9.23E-06	1.16E-04	5.06E-05	1.02E-04
Anthracene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	1.23E-06	1.54E-05	1.87E-06	3.77E-06
Benzo(a)anthracene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	6.22E-07	7.80E-06	1.68E-06	3.38E-06
Benzo(a)pyrene	1.20E-09	1.01E-07	1.20E-09	6.00E-09	2.57E-07	3.22E-06	1.88E-07	3.79E-07
Benzo(b)fluoranthene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	2.18E-07	2.73E-06	9.91E-08	2.00E-07
Benzo(g,h,i)perylene	1.20E-09	1.01E-07	1.20E-09	6.00E-09	5.56E-07	6.97E-06	4.89E-07	9.85E-07
Benzo(k)fluoranthene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	1.11E-06	1.39E-05	1.55E-07	3.12E-07
Chrysene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	1.53E-06	1.92E-05	3.53E-07	7.11E-07
Dibenz(a,h)anthracene	1.20E-09	1.01E-07	1.20E-09	6.00E-09	3.46E-07	4.34E-06	5.83E-07	1.17E-06
7,12-Dimethylbenz(a) anthracene	1.60E-08	1.34E-06	1.60E-08	8.00E-08				
Fluoranthene	2.90E-09	2.44E-07	2.90E-09	1.45E-08	4.03E-06	5.06E-05	7.61E-06	1.53E-05
Fluorene	2.70E-09	2.27E-07	2.70E-09	1.35E-08	1.28E-05	1.61E-04	2.92E-05	5.88E-05
Indeno(1,2,3-cd)pyrene	1.80E-09	1.51E-07	1.80E-09	9.00E-09	4.14E-07	5.19E-06	3.75E-07	7.56E-07
3-Methylchloranthrene	1.80E-09	1.51E-07	1.80E-09	9.00E-09				
2-Methylnaphthalene	2.40E-08	2.02E-06	2.40E-08	1.20E-07				
Naphthalene	6.20E-07	5.21E-05	6.20E-07	3.10E-06	1.30E-04	1.63E-03	8.48E-05	1.71E-04
Phenanthrene	1.70E-08	1.43E-06	1.70E-08	8.50E-08			2.94E-05	5.92E-05
Pyrene	4.90E-09	4.12E-07	4.90E-09	2.45E-08	3.71E-06	4.65E-05	4.78E-06	9.63E-06
TOTAL PAH	6.80E-07	5.71E-05	6.80E-07	3.40E-06	2.12E-04	2.66E-03	1.68E-04	3.38E-04
Metals								
Arsenic	2.00E-07	1.68E-05	2.00E-07	1.00E-06	4.62E-08	5.80E-07	4.62E-08	9.31E-08
Beryllium	1.20E-08	1.01E-06	1.20E-08	6.00E-08				
Cadmium	1.10E-06	9.24E-05	1.10E-06	5.50E-06	5.13E-09	6.44E-08	5.13E-09	1.03E-08
Chromium	1.40E-06	1.18E-04	1.40E-06	7.00E-06	1.24E-05	1.56E-04	1.24E-05	2.50E-05
Chromium VI	2.50E-07	2.10E-05	2.50E-07	1.25E-06	2.24E-06	2.81E-05	2.24E-06	4.51E-06
Cobalt	8.20E-08	6.89E-06	8.20E-08	4.10E-07				
Lead	4.90E-07	4.12E-05	4.90E-07	2.45E-06	7.69E-07	9.65E-06	7.69E-07	1.55E-06
Manganese	3.70E-07	3.11E-05	3.70E-07	1.85E-06	2.82E-07	3.54E-06	2.82E-07	5.68E-07
Mercury	2.50E-07	2.10E-05	2.50E-07	1.25E-06	1.03E-08	1.29E-07	1.03E-08	2.08E-08
Nickel	2.10E-06	1.76E-04	2.10E-06	1.05E-05	1.48E-06	1.86E-05	1.48E-06	2.98E-06
Selenium	2.40E-08	2.02E-06	2.40E-08	1.20E-07	2.56E-07	3.21E-06	2.56E-07	5.16E-07
Max. Single HAP								
Total All HAPs	**1.89E-03**	**1.59E-01**	**1.89E-03**	**9.44E-03**	**5.61E-03**	**7.04E-02**	**7.66E-03**	**1.73E-02**

NTE Connecticut, LLC - Killingly Energy Center
CTG and Duct Burner Maximum Potential MASC Toxic Emissions

HAP	CTG and Duct Burner MASC Toxic Emissions						
	CTG (gas)		Duct Burners		CTG + Duct Burners	CTG (ULSD)	
	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	lb/hr	lb/MMBtu	lb/hr
Organic Compounds							
Acetaldehyde	4.00E-05	1.20E-01			1.20E-01		
Acrolein	6.40E-06	1.92E-02			1.92E-02		
Benzene	1.20E-05	3.60E-02	2.10E-06	1.98E-03	3.80E-02	5.50E-05	1.44E-01
Dichlorobenzene			1.20E-06	1.13E-03	1.13E-03		
Ethylbenzene	3.20E-05	9.60E-02			9.60E-02		
Formaldehyde	2.19E-04	6.56E-01	7.50E-05	7.07E-02	7.27E-01	2.31E-04	6.06E-01
Hexane			1.80E-03	1.70E+00	1.70E+00		
Toluene	1.30E-04	3.90E-01	3.40E-06	3.21E-03	3.93E-01		
Xylene	6.40E-05	1.92E-01			1.92E-01		
PAHs							
Naphthalene	1.30E-07	3.90E-04	6.10E-08	5.75E-05	4.47E-04	3.50E-06	9.19E-03
TOTAL PAH	2.20E-07	6.60E-04	6.98E-08	6.58E-05	7.26E-04	4.00E-06	1.05E-02
Metals							
Arsenic			2.00E-07	1.89E-04	1.89E-04	4.60E-08	1.21E-04
Cadmium			1.10E-06	1.04E-03	1.04E-03	5.11E-09	1.34E-05
Chromium			1.40E-06	1.32E-03	1.32E-03	1.24E-05	3.25E-02
Cobalt			8.20E-08	7.73E-05	7.73E-05		
Lead			4.90E-07	4.62E-04	4.62E-04	1.05E-06	2.76E-03
Manganese			3.70E-07	3.49E-04	3.49E-04	1.80E-07	4.73E-04
Mercury			2.50E-07	2.36E-04	2.36E-04	1.02E-08	2.68E-05
Nickel			2.10E-06	1.98E-03	1.98E-03	1.48E-06	3.87E-03
Selenium						2.55E-07	6.72E-04

Notes:
1. Only emission factors reported above their detection limited in AP-42 used in the analysis.
2. Organic HAP emission factors for CTGs are from Tables 3.1-3 and 3.1.4 of AP-42 except gas-firing for formaldehyde which is based on the NESHAP Subpart YYYY MACT floor limit of 91 ppb at 15% O2.
3. Emission factors for the HRSG and auxiliary boiler are from AP-42 Tables 1.4-3 and 1.4-4.
4. Emission factors for organics from the emergency diesel generator are from AP-42 Tables 3.4-3 and 3.4-4, for the fire pump from AP-42 Table 3.3-2.
5. Metal emission factors for ULSD firing are based on the paper "Survey of Ultra-Trace Metals in Gas Turbine Fuels", 11th Annual International Petroleum Conference, Oct 12-15, 2004. Where trace metals were detected in any of 13 samples, the average result is used. Where no metals were detected in any of 13 samples, the detection limit was used.
6. Hexavalent chrome is based on 18% of the total chrome emissions per EPA 453/R-98-004a.
7. No reduction by oxidation catalysts presumed for organic HAPs except for PAHs where a 90% efficiency is taken into account for polycyclic compounds.
8. lb/hr values are at 59°F and do not represent maximum values at higher firing rates at colder temperatures.

NTE Connecticut, LLC - Killingly Energy Center
Summary of Estimated Fugitive GHG Emissions

Circuit Breaker SF6 Emissions

SF6 Storage Capacity	111	lbs
SF6 Leak Rate	0.5%	per year
SF6 emissions	0.555	lbs/year
GHG emissions (CO2e)	**6.3**	**tons per year**

Natural Gas Handling Fugitive Emissions

Component Type	Component Count	Emission factor (scfh/component)[1]	CH4 Emissions (tpy)[2]	GHG Emissions (tpy)
Connector	10	1.69	3.08	77.04
Flanges, Regulator, Other	10	0.772	1.41	35.19
Control Valves	10	9.34	17.03	425.76
Orifice Meter	3	0.212	0.12	2.90
TOTALS			**21.64**	**540.9**

[1] Emission factors are from 40 CFR 98, Subpart W, Table W-7

[2] Conservatively assumes 100% CH4

NTE Connecticut, LLC - Killingly Energy Center
Summary of Baseline Emissions

SUMMARY OF BASELINE EMISSION RATES AND REDUCTIONS

Pollutant	Combustion Turbine				Auxiliary Boiler			
	Baseline Emission Rate (lb/MMBtu)[2]	Baseline (tpy)[3]	BACT (tpy)[4]	Reduction (tpy)	Baseline Emission Rate (lb/MMBtu)[5]	Baseline (tpy)[6]	BACT (tpy)[7]	Reduction (tpy)
NO_x	0.32	5351	130.1	5221	0.10	16.8	1.6	15.2
CO	0.082	1371.3	65.3	1306.0	0.084	14.1	7.1	7.0
VOC	0.0021	35.1	4.9	30.2	0.0055	0.92	0.78	0.1
GHGs[8]	119	2,866,710	1,989,650	877,060	N/A	N/A	N/A	N/A

[1] Emissions presented are on a per turbine basis

[2] From AP-42 Section 3.1 for uncontrolled natural gas fired combustion turbines except for GHGs

[3] Baseline calculated from gas firing at 59F of 2,827 MMBtu/hr (CT) and 895 MMBtu/hr (DB) for 8,760 hr/yr

[4] Proposed ton per year emissions excluding contribution from startup and shutdown emissions.

[5] From AP-42 Section 1.4 for uncontrolled natural gas fired boilers <100 MMBtu/hr.

[6] Based upon the rated heat input of the auxiliary boiler of 84 MMBtu/hr for 4,000 hr/yr

[7] Proposed ton per year emissions.

[8] Baseline based upon conventional steam generation with a heat rate of 10,000 Btu/kWh for 550MW firing gas

CT DEEP Maximum Allowable Stack Concentration (MASC) Calculator

Company Name:	NTE Killingly Energy Center, LLC
Source Description:	Combined Cycle Combustion Turbine Facility - Gas Firing

Instructions

Stack Parameter Units:	English	
Stack Height =	150	ft
Minimum Distance from Stack to Property Line =	425	ft
Exhaust Stack Flow Rate =	1,490,388	acfm
Hazard Limiting Values (HLV) Averaging Times =	8-Hour	
Adjustments to the MASC for Time Periods < 8 hrs =	No	

Notes:
Maximum gas firing rate and duct firing rate at -10 F. Stack height is an estimate pending completion of ambient air quality impact analysis.

Additional HAPs | Clear All | Print | Footnotes

Hazardous Air Pollutant(s)	CAS No.	HLV (µg/m^3)	Proposed Allowable Emission Rate (lb/hr)	MASC (µg/m^3)	ASC (µg/m^3)	Complies?
Acetaldehyde	75-07-0	3600	1.20E-01	8.86E+04	2.15E+01	yes
Acrolein	107-02-8	5	1.92E-02	1.23E+02	3.44E+00	yes
Benzene	71-43-2	150	3.80E-02	3.69E+03	6.80E+00	yes
Butadiene (1,3-butadiene)	106-46-7	9000	1.11E-03	2.22E+05	2.00E-01	yes
Ethyl benzene	100-41-4	8700	9.60E-02	2.14E+05	1.72E+01	yes
Formaldehyde	50-00-0	12	7.27E-01	2.95E+02	1.30E+02	yes
Hexane, other isomers	110-54-3	36000	1.70E+00	8.86E+05	3.04E+02	yes
Toluene	108-88-3	7500	3.93E-01	1.85E+05	7.04E+01	yes
o-Xylene	1330-20-7	8680	1.92E-01	2.14E+05	3.44E+01	yes
Naphthalene	91-20-3	1000	4.47E-04	2.46E+04	8.01E-02	yes
Polynuclear aromatic hydrocarbons (PAH) *	50-32-8	0.1	7.26E-04	2.46E+00	1.30E-01	yes
Sulfuric acid	7664-93-9	20	2.00E+00	4.92E+02	3.58E+02	yes
Arsenic & compounds (as As)	7440-38-2	0.05	1.89E-04	1.23E+00	3.38E-02	yes
Beryllium	7440-41-7	0.01	1.11E-05	2.46E-01	2.00E-03	yes
Cadmium	7440-43-9	0.4	1.04E-03	9.84E+00	1.86E-01	yes
Chromium, metal	7440-47-3	2.5	1.32E-03	6.15E+01	2.36E-01	yes
Cobalt metal, dust & fume (as Co)	7440-48-4	2	7.73E-05	4.92E+01	1.38E-02	yes
Lead, inorg., fumes & dusts (as Pb)	7439-92-1	3	4.62E-04	7.38E+01	8.27E-02	yes
Manganese fume (as Mn)	7439-96-5	20	3.49E-04	4.92E+02	6.25E-02	yes

Company Name:	NTE Killingly Energy Center, LLC
Source Description:	Combined Cycle Combustion Turbine Facility - Gas Firing

Hazardous Air Pollutant(s)	CAS No.	HLV (µg/m^3)	Proposed Allowable Emission Rate (lb/hr)	MASC (µg/m^3)	ASC (µg/m^3)	Complies?
Mercury vapor	--	1	2.36E-04	2.46E+01	4.22E-02	yes
Nickel (metal)	7440-02-0	5	1.98E-03	1.23E+02	3.55E-01	yes
Ammonia	7664-41-7	360	1.10E+01	8.86E+03	1.97E+03	yes

CT DEEP Maximum Allowable Stack Concentration (MASC) Calculator

Company Name:	NTE Killingly Energy Center, LLC
Source Description:	Combined Cycle Combustion Turbine Facility - Gas Firing

Instructions

Stack Parameter Units:	English	
Stack Height =	150	ft
Minimum Distance from Stack to Property Line =	425	ft
Exhaust Stack Flow Rate =	1,490,388	acfm
Hazard Limiting Values (HLV) Averaging Times =	30-Minute	
	No	

Notes:
Maximum gas firing rate and duct firing rate at -10 F. Stack height is an estimate pending completion of ambient air quality impact analysis.

Additional HAPs | Clear All | Print | Footnotes

Hazardous Air Pollutant(s)	CAS No.	HLV (µg/m³)	Proposed Allowable Emission Rate (lb/hr)	MASC (µg/m³)	ASC (µg/m³)	Complies?
Acetaldehyde	75-07-0	18000	1.20E-01	4.43E+05	2.15E+01	yes
Acrolein	107-02-8	25	1.92E-02	6.15E+02	3.44E+00	yes
Benzene	71-43-2	750	3.80E-02	1.85E+04	6.80E+00	yes
Butadiene (1,3-butadiene)	106-46-7	45000	1.11E-03	1.11E+06	2.00E-01	yes
Ethyl benzene	100-41-4	43500	9.60E-02	1.07E+06	1.72E+01	yes
Formaldehyde	50-00-0	60	7.27E-01	1.48E+03	1.30E+02	yes
Hexane, other isomers	110-54-3	180000	1.70E+00	4.43E+06	3.04E+02	yes
Toluene	108-88-3	37500	3.93E-01	9.23E+05	7.04E+01	yes
o-Xylene	1330-20-7	43400	1.92E-01	1.07E+06	3.44E+01	yes
Naphthalene	91-20-3	5000	4.47E-04	1.23E+05	8.01E-02	yes
Polynuclear aromatic hydrocarbons (PAH) *	50-32-8	0.5	7.26E-04	1.23E+01	1.30E-01	yes
Sulfuric acid	7664-93-9	100	2.00E+00	2.46E+03	3.58E+02	yes
Arsenic & compounds (as As)	7440-38-2	0.25	1.89E-04	6.15E+00	3.38E-02	yes
Beryllium	7440-41-7	0.05	1.11E-05	1.23E+00	2.00E-03	yes
Cadmium	7440-43-9	2	1.04E-03	4.92E+01	1.86E-01	yes
Chromium, metal	7440-47-3	12.5	1.32E-03	3.08E+02	2.36E-01	yes
Cobalt metal, dust & fume (as Co)	7440-48-4	10	7.73E-05	2.46E+02	1.38E-02	yes
Lead, inorg., fumes & dusts (as Pb)	7439-92-1	15	4.62E-04	3.69E+02	8.27E-02	yes
Manganese fume (as Mn)	7439-96-5	100	3.49E-04	2.46E+03	6.25E-02	yes

Company Name:	NTE Killingly Energy Center, LLC
Source Description:	Combined Cycle Combustion Turbine Facility - Gas Firing

Hazardous Air Pollutant(s)	CAS No.	HLV ($\mu g/m^3$)	Proposed Allowable Emission Rate (lb/hr)	MASC ($\mu g/m^3$)	ASC ($\mu g/m^3$)	Complies?
Mercury vapor	--	5	2.36E-04	1.23E+02	4.22E-02	yes
Nickel (metal)	7440-02-0	25	1.98E-03	6.15E+02	3.55E-01	yes
Ammonia	7664-41-7	1800	1.10E+01	4.43E+04	1.97E+03	yes

CT DEEP Maximum Allowable Stack Concentration (MASC) Calculator

Company Name:	NTE Killingly Energy Center, LLC
Source Description:	Combined Cycle Combustion Turbine Facility - Oil Firing

Instructions

Stack Parameter Units:	English	
Stack Height =	150	ft
Minimum Distance from Stack to Property Line =	425	ft
Exhaust Stack Flow Rate =	1,467,838	acfm
Hazard Limiting Values (HLV) Averaging Times =	8-Hour	
Adjustments to the MASC for Time Periods < 8 hrs =	No	

Notes:
Maximum oil firing rate at -10 F. Stack height is an estimate pending completion of ambient air quality impact analysis.

Additional HAPs | Clear All | Print | Footnotes

Hazardous Air Pollutant(s)	CAS No.	HLV (µg/m³)	Proposed Allowable Emission Rate (lb/hr)	MASC (µg/m³)	ASC (µg/m³)	Complies?
Ammonia	7664-41-7	360	1.89E+01	8.99E+03	3.43E+03	yes
Benzene	71-43-2	150	1.44E-01	3.75E+03	2.63E+01	yes
Formaldehyde	50-00-0	12	6.06E-01	3.00E+02	1.10E+02	yes
Sulfuric acid	7664-93-9	20	1.50E+00	4.99E+02	2.73E+02	yes
Naphthalene	91-20-3	1000	9.19E-03	2.50E+04	1.67E+00	yes
Polynuclear aromatic hydrocarbons (PAH) *	50-32-8	0.1	1.05E-02	2.50E+00	1.91E+00	yes
Arsenic & compounds (as As)	7440-38-2	0.05	1.21E-04	1.25E+00	2.19E-02	yes
Cadmium	7440-43-9	0.4	1.34E-05	9.99E+00	2.44E-03	yes
Chromium, metal	7440-47-3	2.5	3.25E-02	6.24E+01	5.91E+00	yes
Lead, inorg., fumes & dusts (as Pb)	7439-92-1	3	2.76E-03	7.49E+01	5.02E-01	yes
Manganese fume (as Mn)	7439-96-5	20	4.73E-04	4.99E+02	8.61E-02	yes
Mercury vapor	--	1	2.68E-05	2.50E+01	4.88E-03	yes
Nickel (metal)	7440-02-0	5	3.87E-03	1.25E+02	7.05E-01	yes
Selenium compounds (as Se)	--	4	6.72E-04	9.99E+01	1.22E-01	yes

CT DEEP Maximum Allowable Stack Concentration (MASC) Calculator

Company Name:	NTE Killingly Energy Center, LLC
Source Description:	Combined Cycle Combustion Turbine Facility - Oil Firing

Instructions

Stack Parameter Units:	English	
Stack Height =	150	ft
Minimum Distance from Stack to Property Line =	425	ft
Exhaust Stack Flow Rate =	1,467,838	acfm
Hazard Limiting Values (HLV) Averaging Times =	30-Minute	
	No	

Notes:
Maximum oil firing rate at -10 F. Stack height is an estimate pending completion of ambient air quality impact analysis.

Additional HAPs | Clear All | Print | Footnotes

Hazardous Air Pollutant(s)	CAS No.	HLV (µg/m³)	Proposed Allowable Emission Rate (lb/hr)	MASC (µg/m³)	ASC (µg/m³)	Complies?
Ammonia	7664-41-7	1800	1.89E+01	4.49E+04	3.43E+03	yes
Benzene	71-43-2	750	1.44E-01	1.87E+04	2.63E+01	yes
Formaldehyde	50-00-0	60	6.06E-01	1.50E+03	1.10E+02	yes
Sulfuric acid	7664-93-9	100	1.50E+00	2.50E+03	2.73E+02	yes
Naphthalene	91-20-3	5000	9.19E-03	1.25E+05	1.67E+00	yes
Polynuclear aromatic hydrocarbons (PAH) *	50-32-8	0.5	1.05E-02	1.25E+01	1.91E+00	yes
Arsenic & compounds (as As)	7440-38-2	0.25	1.21E-04	6.24E+00	2.19E-02	yes
Cadmium	7440-43-9	2	1.34E-05	4.99E+01	2.44E-03	yes
Chromium, metal	7440-47-3	12.5	3.25E-02	3.12E+02	5.91E+00	yes
Lead, inorg., fumes & dusts (as Pb)	7439-92-1	15	2.76E-03	3.75E+02	5.02E-01	yes
Manganese fume (as Mn)	7439-96-5	100	4.73E-04	2.50E+03	8.61E-02	yes
Mercury vapor	--	5	2.68E-05	1.25E+02	4.88E-03	yes
Nickel (metal)	7440-02-0	25	3.87E-03	6.24E+02	7.05E-01	yes
Selenium compounds (as Se)	--	20	6.72E-04	4.99E+02	1.22E-01	yes

APPENDIX B: REVISED AMBIENT AIR QUALITY ANALYSIS REPORT PAGES

less). The HRSG will be equipped with SCR to reduce emissions of nitrogen oxides (NO_x), and an oxidation catalyst to reduce emissions of carbon monoxide (CO) and volatile organic compounds (VOC). The SCR system will utilize 19% aqueous NH_3 as the reagent. A continuous emissions monitoring system (CEMS) will continuously sample, analyze, and record exhaust gas concentrations of NO_x, CO, and NH_3 from the 150-foot tall HRSG exhaust stack. The CEMS will be installed and operated in accordance with United States Environmental Protection Agency (USEPA) and DEEP requirements and will generate emissions data reports that will confirm compliance with permit requirements and send alarm signals to plant supervisory and control systems should emissions approach or exceed permitted limits.

Ancillary equipment at the proposed Project will include four additional fuel combustion emission units:

- One 84.0-million British thermal units per hour (MMBtu/hr) natural gas-fired auxiliary boiler equipped with ultra-low NO_x burners;
- One 5.0-MMBtu/hr natural gas-fired gas dew point heater;
- One 1,250-kilowatt (kW) emergency generator firing ULSD; and
- One 227.5-kW emergency fire pump engine firing ULSD.

To support the SCR systems, a 12,000-gallon aboveground storage tank will contain 19% aqueous NH_3. The tank will be located within a concrete containment structure along with the ammonia transfer pumps, valves, and piping. A 1 million-gallon aboveground storage tank located within a containment structure will store ULSD.

The Project will interconnect with the existing 345-kilovolt (kV) transmission line that crosses the smaller portion of the site south of Lake Road via a new switchyard. Natural gas will be delivered via a new connection to the existing pipeline located approximately 2 miles to the north of the site.

2.3 AMBIENT AIR QUALITY REGULATORY CRITERIA

The USEPA and the DEEP have promulgated regulations that establish ambient air quality standards and PSD increments. These standards and increments provide the basis for an evaluation of the potential impacts of the Project on ambient air quality.

2.3.1 National Ambient Air Quality Standards

The USEPA has developed National Ambient Air Quality Standards (NAAQS) for six air contaminants, known as criteria pollutants, for the protection of public health and welfare. These criteria pollutants are sulfur dioxide (SO_2), particulate matter,[1] nitrogen dioxide (NO_2), CO, ozone (O_3), and lead (Pb). The DEEP has also adopted these limits. The NAAQS have been developed for various durations of exposure. The NAAQS for short-term periods (24 hours or less) typically refer to pollutant levels that cannot be exceeded except for a limited number of cases per year. The NAAQS for long-term levels typically refer to pollutant levels that cannot be exceeded for exposures averaged over one year. As shown on Table L-1, the NAAQS include both "primary" and "secondary" standards. The primary standards are intended to protect human health and the secondary standards are intended to protect public welfare from any known or anticipated adverse effects associated with the presence of air pollutants.

[1] Particulate matter (PM) is characterized according to size. PM having an effective aerodynamic diameter of 10 microns or less is referred to as PM_{10}, or "respirable particulate." PM having an effective aerodynamic diameter of 2.5 microns or less is referred to as $PM_{2.5}$, or "fine particulate." $PM_{2.5}$ is a subset of PM_{10}. All particulate matter from the Project is conservatively assumed to be $PM_{2.5}$.

Table L-2. PSD Regulatory Threshold Evaluation

Pollutant	Project Annual Potential Emissions (tpy)	PSD Major Source Threshold (tpy)	PSD Significant Emission Rate (tpy)	PSD Review Applies
CO[a]	144.0	100	100	Yes
NO_x[a]	135.1	100	40	Yes
SO_2	25.4	100	40	No
PM	102.8	100	25	Yes
PM_{10}	102.8	100	15	Yes
$PM_{2.5}$	102.8	100	10	Yes
Pb	0.002	100	0.6	No
H_2SO_4	8.8	100	7	Yes
GHGs (as CO_2e)	2,014,335[b]	N/A	75,000	Yes

[a] Includes incremental emissions due to startup and shutdown.
[b] Incudes 547 tpy of fugitive GHG emissions from circuit breakers and natural gas handling.
CO_2e = carbon dioxide equivalents

Table L-4. Stack Characteristics

Source	UTM* E (m)	UTM N (m)	Base Elevation (feet)	Stack Height (feet)	Stack Diameter (feet)
HRSG Stack	257865.36	4638681.24	316	150	22.0
Auxiliary Boiler	257878.36	4638699.29	316	90	4.0
Emergency Generator	257960.11	4638628.58	319	45	1.17
Fire Pump	257834.02	4638606.61	314	20	1.0
Gas Dew Point Heater	257892.87	4638542.40	320	20	1.0

*UTM = Universal Transverse Mercator

Table L-5. Load Scenarios and Emission Rates - Combined Cycle Combustion Turbine Firing Natural Gas

Parameter	Units	Natural Gas													
		100 °F					59°F					-10°F			
		1	2	3	4	5	36	37	38	39	40	32	33	34	35
GT Operating Load		100%	100%	100%	75%	45%	100%	100%	100%	75%	34%	100%	100%	75%	40%
Fuel Higher Heating Value (HHV)	Btu/lb	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160
Evaporative Cooler Status	On or Off	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	On or Off	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Exhaust velocity	m/s	17.64	17.40	16.39	13.83	10.54	18.93	18.18	17.98	14.82	10.28	19.04	18.48	14.88	10.26
Exhaust temperature	K	359.82	359.82	358.71	358.71	358.71	363.15	353.71	353.15	353.15	353.15	359.82	353.71	353.15	352.59
NO_X	g/s	3.36	2.56	2.39	1.89	1.30	3.62	2.76	2.71	2.15	1.31	3.74	2.84	2.24	1.36
CO	g/s	1.75	0.71	0.66	0.52	0.35	1.88	0.76	0.74	0.59	0.37	1.94	0.78	0.62	0.38
PM	g/s	2.65	1.47	1.40	1.17	1.01	2.85	1.60	1.59	1.30	0.89	2.95	1.64	1.32	0.91
SO_2	g/s	0.67	0.51	0.48	0.38	0.26	0.72	0.55	0.54	0.43	0.26	0.75	0.57	0.45	0.27
Btu/lb = British thermal units per pound; g/s = grams per second; K = degrees Kelvin															

Table L-6. Load Scenarios and Emission Rates - Combined Cycle Combustion Turbine Firing ULSD

Parameter	Units	ULSD										
		100°F				59°F				-10°F		
		41	42	43	44	68	69	70	71	65	66	67
GT Operating Load		100%	100%	75%	65%	100%	100%	75%	60%	100%	75%	60%
Fuel Heating Value, HHV	Btu/lb	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453
Evaporative Cooler Status	On or Off	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	On or Off	---	---	---	---	---	---	---	---	---	---	---
Exhaust velocity	m/s	18.07	17.24	14.15	13.15	18.75	18.55	15.26	13.64	19.91	16.23	14.57
Exhaust temperature	K	370.37	369.82	366.48	365.93	363.71	363.15	361.48	360.93	369.26	366.48	365.37
NO_X	g/s	5.02	4.73	3.75	3.40	5.15	5.13	4.06	3.51	5.14	4.13	3.64
CO	g/s	1.37	1.30	1.03	0.93	1.41	1.41	1.11	0.96	1.41	1.13	1.00
PM	g/s	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78
SO_2	g/s	0.49	0.47	0.37	0.34	0.50	0.50	0.40	0.35	0.50	0.40	0.37

Table L-7. Startup Condition Stack Parameters for Each Fuel

Parameter	Units	Startup / Shutdown							
		Natural Gas				ULSD			
		Hot Start	Warm Start	Cold Start	Shutdown	Hot Start	Warm Start	Cold Start	Shutdown
Exhaust velocity	m/s	14.13	14.84	12.17	10.32	10.15	11.01	9.99	9.95
Exhaust temperature	K	352.44	353.56	351.89	353.00	403.56	404.11	403.56	401.33
NO_X	g/s	15.67	17.89	14.11	10.09	21.30	23.56	21.04	19.98
CO	g/s	47.56	54.96	60.00	26.51	248.88	290.39	277.79	53.91
PM	g/s	2.29	2.21	2.04	2.40	4.10	4.14	4.13	4.06
SO_2	g/s	2.42E-01	2.95E-01	4.05E-01	2.01E-01	2.42E-01	2.95E-01	4.05E-01	2.01E-01
m/s = meters per second									

Table L-8. Stack Parameters for Ancillary Equipment

Parameter	Time	Auxiliary Boiler	Emergency Generator	Fire Pump	Natural Gas Heater
Exhaust velocity (m/s)		8.28	49.99	9.06	3.03
Exhaust temperature (K)		422.04	722.04	789.26	394.26
NO_X (g/s)	1-hour	9.00E-02	2.45	2.53E-01	7.65E-03
	Annual	4.72E-02	8.40E-02	8.66E-03	3.49E-03
CO (g/s)	1-hour	3.91E-01	1.34	2.21E-01	2.33E-02
	8-hour	3.91E-01	1.68E-01	2.76E-02	2.33E-02
PM (g/s)	1-hour	5.29E-02	7.66E-02	1.26E-02	3.15E-03
	24-hour	5.29E-02	3.19E-03	5.27E-04	3.15E-03
	Annual	2.78E-02	2.62E-03	4.33E-04	1.44E-03
SO_2 (g/s)	1-hour	1.59E-02	2.37E-03	3.81E-04	9.45E-04
	3-hour	1.59E-02	7.90E-04	1.27E-04	9.45E-04
	24-hour	1.59E-02	9.88E-05	1.59E-05	9.45E-04
	Annual	8.34E-03	8.12E-05	1.30E-05	4.32E-04

Table L-10. Maximum Predicted Impact Concentrations

Pollutant	Averaging Period	Rank Basis for SIL Assessment	Impact Concentration ($\mu g/m^3$)	SIL ($\mu g/m^3$)	Extent of SIA (km)	NAAQS ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)
NO_2 (Normal Load)	1-hour	H1H (5-year Average)	16.04	7.5	12.9	188	NA
	Annual	H1H	0.87	1	NA	100	25
NO_2 (SUSD)	1-hour	H1H (5-year Average)	81.46	NA	NA	188	NA
	Annual	H1H	0.87	NA	NA	100	25
CO	1-hour	H1H	1,418	2,000	NA	40,000	NA
	8-hour	H1H	133	500	NA	10,000	NA
PM_{10}	24-hour	H1H	4.04	5	NA	150	30
	Annual	H1H	0.24	1	NA	NA	17
$PM_{2.5}$	24-hour	H1H (5-year Average)	2.39	1.2	8.1	35	9
	Annual	H1H (5-year Average)	0.18	0.3	NA	12	4
SO_2	1-hour	H1H (5-year Average)	2.94	7.8	NA	196	NA
	3-hour	H1H	1.72	25	NA	1300	512
	24-hour	H1H	0.75	5	NA	365	91
	Annual	H1H	0.05	1	NA	80	20

Notes:

- Maximum highest first highest (H1H) concentrations are used for comparison with the SILs. Impact concentrations are based on maximum predicted across the range of 5 years modeled for all pollutants except $PM_{2.5}$ (both annual and 24-hour), NO_2 (1-hour only), and SO_2 (1-hour only), which are based on the maximum 5-year average H1H values. NO_2 concentrations assume NO_x to NO_2 conversion at 80% (short term) and 75% (annual). $PM_{2.5}$ SIL assessment relative to PSD increment compliance is based on H1H concentrations prediction over the range of 5 years modeled, rather than the 5-year average concentrations that are used for the NAAQS assessment.
- SIA = Significant Impact Area, defined as a circle with a radius equal to the distance to the furthest receptor for which the maximum predicted impact exceeds the SIL.

Table L-11. Cumulative NAAQS Compliance Assessment

Pollutant	Averaging Period	Cumulative Impact Concentration ($\mu g/m^3$)	Ambient Background ($\mu g/m^3$)	Total Impact Plus Background ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2 (Normal Load)	1-Hour	67.5	79	146.5	188
NO_2 (SUSD)	1-Hour	60.3	79	139.3	188
$PM_{2.5}$	24-hour	8.4	20	28.4	35

Notes:

- Total cumulative impact concentrations based on consideration of all receptors and time periods where the Project has a predicted significant impact concentration (based on 5-year average maximum H1H for 1-hour NO_2 and 24-hour $PM_{2.5}$).
- NO_2 concentrations conservatively assume 80% NO_X to NO_2 conversion.
- Assessment of the 1-hour NO_2 NAAQS for the transient turbine SUSD conditions consists of adding ambient background to Project-only concentrations.

Table L-12. Cumulative PSD Increment Compliance Assessment

Pollutant	Averaging Period	Total Increment Consumption[1] ($\mu g/m^3$)	Maximum Allowable PSD Increment ($\mu g/m^3$)
$PM_{2.5}$	24-hour	3.1	9

[1] Impact concentrations are conservatively based on the maximum highest second highest (H2H) concentration predicted across the range of modeled years.

Table L-13. Predicted Air Quality Impacts Compared to NO_2 Vegetation Impact Thresholds

Averaging Period	Maximum Project Impacts ($\mu g/m^3$)	Threshold for Impact to Vegetation ($\mu g/m^3$)	Applicability
1-hour	81.5	66,000[a]	Leaf Injury to plant
2-hour	81.5	1,130[b]	Affects to alfalfa
Annual	0.87	100[c]	Protects all vegetation
		190[d]	Metabolic and growth impact to plants

[a] "Diagnosing Injury Caused by Air Pollution", EPA-68-02-1344, Prepared by Applied Science Associates, Inc. under contract to the Air Pollution Training Institute, Research Triangle Park, North Carolina. 1976.

[b] "Synergistic Inhibition of Apparent Photosynthesis Rate of Alfalfa by Combinations of SO_2 and NO_2" Environmental Science and Technology, vol. 8(6): p.574-576, 1975. The limit is based on a concentration in ambient air of 0.6 ppm NO_2
(U 1,130 $\mu g/m^3$) which was found to depress the photosynthesis rate of alfalfa during a 2-hour exposure.

[c] "Secondary National Ambient Air Quality Standard ($\mu g/m^3$) which is a limit set to avoid damage to vegetation resulting in economic losses in commercial crops, aesthetic damage to cultivated trees, shrubs, and other ornamentals, and reductions in productivity, species richness, and diversity in natural ecosystems to protect public welfare (Section 109 of the Clean Air Act). These thresholds are the most stringent of those found in the literature survey.

[d] "Air Quality Criteria for Oxides of Nitrogen," EPA/600/8-91/049aF-cF.3v, Office of Health and Environment Assessment, Environmental Criteria and Assessment Office, USEPA, Research Triangle Park, NC. 1993.

Table L-14. Predicted Air Quality Impacts Compared to CO Vegetation Impact Thresholds

Averaging Period	Maximum Project Impacts ($\mu g/m^3$)	Threshold for Impact to Vegetation ($\mu g/m^3$)	Applicability
1-hour	1,418	40,000[a]	Protects all vegetation
8-hour	133	10,000[a]	Protects all vegetation
Multiple day		10,000[b]	No known effects to vegetation
1-week		115,000[c]	Effects to some vegetation
Multiple week		115,000[d]	No effect on various plant species

[a] Secondary NAAQS ($\mu g/m^3$) which is a limit set to avoid damage to vegetation resulting in economic losses in commercial crops, aesthetic damage to cultivated trees, shrubs, and other ornamentals, and reductions in productivity, species richness, and diversity in natural ecosystems to protect public welfare (Section 109 of the Clean Air Act). These thresholds are the most stringent of those found in the literature survey.

[b] "Air Quality Criteria for Carbon Monoxide," EPA/600/8-90/045F (NTIS PB93-167492), Office of Health and Environment Assessment, Environmental Criteria and Assessment Office, USEPA, Research Triangle Park, NC. 1991. Various CO concentrations were examined the lowest of these was 10,000 $\mu g/m^3$. Concentrations this low had no effects to various plant species. For many plant species, concentrations as high as 230,000 $\mu g/m^3$ caused no effects. The exception was legume seedlings which were found to experience abnormal leaf growth when exposed to CO concentrations of only 27,000 $\mu g/m^3$. Also related to this family of plants, CO concentrations in the soil of 113,000 $\mu g/m^3$ were found to inhibit nitrogen fixation. It is clear that ambient CO concentrations as low as 10,000 $\mu g/m^3$ will not affect vegetation.

[c] "Diagnosing Injury Caused by Air Pollution", EPA-68-02-1344, Prepared by Applied Science Associates, Inc. under contract to the Air Pollution Training Institute, Research Triangle Park, North Carolina. 1976. A CO concentration of 115,000 $\mu g/m^3$ was found to affect certain plant species.

[d] "Polymorphic Regions in Plant Genomes Detected by an M13 Probe" Zimmerman, P.A., et al. 1989. Genome 32: 824-828. 115,000 $\mu g/m^3$ was the lowest CO concentration included in this study. This concentration was not found to cause a reduction in growth rate to a variety of plant species.

Table L-15. Predicted Air Quality Impacts Compared to SO_2 and PM_{10} Vegetation Impact Thresholds

Averaging Period	Maximum Project Impacts ($\mu g/m^3$)	Threshold for Impact to Vegetation ($\mu g/m^3$)	Applicability
SO_2			
1-hour SO_2	2.9	131[a]	Suggested worst-case limit
3-hour SO_2	1.7	390[b]	Protects SO_2 sensitive species
3-hour SO_2		1,300[c]	Protects all vegetation
24-hour SO_2	0.8	63[d]	Insignificant effect to wheat and barley
Annual SO_2	0.1	130[b]	Protects SO_2 sensitive species
PM_{10}			
24-hour PM_{10}	4.0	150[c]	Protects all vegetation
Annual PM_{10}	0.24	50[c]	Protects all vegetation
Annual PM_{10}		579[e]	Damage to sensitive species (fir tree)

a. "Crop and Forest Losses due to Current and Projected Emissions from Coal-Fired Power Plants in the Ohio River Basin" Loucks, O.L., R.W. Miller, et al. 1980. The Institute of Ecology. In this publication, the authors propose 1-hour thresholds from 131 to 262 $\mu g/m^3$.

b. "Impacts of Coal-fired Power Plants on Fish, Wildlife, and their Habitats" Dvorak, A.J., et al. Argonne National Laboratory. Argonne, Illinois. Fish and Wildlife Service Publication No. FWS/OBS-78/29. March 1978. This document indicates the lowest 3-hour SO_2 concentration expected to cause injury to sensitive plants growing under compromised conditions is approximately 390 $\mu g/m^3$. Similarly, a threshold of 130 $\mu g/m^3$ is suggested for chronic exposure.

c. Secondary National Ambient Air Quality Standard ($\mu g/m^3$) which is a limit set to avoid damage to vegetation resulting in economic losses in commercial crops, aesthetic damage to cultivated trees, shrubs, and other ornamentals, and reductions in productivity, species richness, and diversity in natural ecosystems to protect public welfare (Section 109 of the Clean Air Act). These thresholds are the most stringent of those found in the literature survey.

d. "Concurrent Exposure to SO_2 and/or NO_2 Alters Growth and Yield Responses of Wheat and Barley to Low Concentrations of O_3" (New Phytologist, 118 (4). 1991. pp. 581-592). This paper indicates exposure to 63 $\mu g/m^3$ of SO_2 during the growing season had insignificant effects to wheat but did affect the weight of Barley seeds.

e. "Responses of Plants to Air Pollution" Lerman, S.L., and E.F. Darley. 1975. "Particulates," pp. 141-158 (Chap. 7). In J.B. Mudd and T.T. Kozlowski (eds.). Academic Press. New York, NY. Results of studies conducted indicated concluded that particulate deposition rates of 365 $g/m^2/yr$ caused damage to fir trees, but rates of 274 g/m^2/year and 400 to 600 $g/m^2/yr$ did not cause damage to vegetation. 365 $g/m^2/yr$ translates to W579 $\mu g/m^3$, using a worst-case deposition velocity of 2 centimeters per second.

Table L-16. Soils Impact Screening Assessment

Pollutant	Maximum Project Deposited Soil Concentration (ppmw)	Soil Screening Criteria (ppmw)	Percent of Soil Screening Criteria	Plant Tissue Concentration (ppmw)	Plant Screening Criteria (ppmw)	Percent of Plant Screening Criteria
Arsenic	2.12E-04	3	0.01%	2.97E-05	0.25	0.01%
Cadmium	1.17E-03	2.5	0.05%	1.25E-02	3	0.42%
Chromium	3.98E-02	8.4	0.47%	7.96E-04	1	0.08%
Lead	3.38E-03	1000	0.00%	1.52E-03	126	0.00%
Manganese	5.80E-04	2.5	0.02%	3.83E-05	400	0.00%
Mercury	2.65E-04	455	0.00%	1.32E-04	NA	NA
Nickel	4.75E-03	500	0.00%	2.14E-04	60	0.00%
Selenium	8.21E-04	13	0.01%	8.21E-04	100	0.00%

Note: Based on screening procedures described in Chapter 5 of the USEPA guidance document for soils and vegetation, *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals* (USEPA 1980).

APPENDIX L-A: DETAILED SOURCE PARAMETER DATA

NTE Killingly Energy Center

Siemens Model SGT6-8000H (or equivalent) Combined Cycle Combustion Turbine and Ancillary Equipment Emissions Estimates

	Combustion Turbines													
Case #:	**1**	**2**	**3**	**4**	**5**	**36**	**37**	**38**	**39**	**40**	**32**	**33**	**34**	**35**
Fuel	**Natural Gas**													
Ambient Temperature (°F):	100	100	100	100	100	59	59	59	59	59	-10	-10	-10	-10
GT Operating Load	100%	100%	100%	75%	45%	100%	100%	100%	75%	34%	100%	100%	75%	40%
Fuel Heating Value, Btu/lb (HHV)	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160
Evaporative Cooler Status (On or Off	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Ambient Relative Humidity, %	45	45	45	45	45	60	60	60	60	60	100	100	100	100
Baromteric Pressure, psia	15	15	15	15	15	15	15	15	15	15	15	15	15	15
GT Heat Input (MMBtu/hr/unit, HHV	2,700	2,700	2,517	1,987	1,359	2,909	2,904	2,859	2,272	1,381	2,999	2,994	2,368	1,428
DB Heat Input (MMBtu/hr/unit, HHV)	848	0	0	0	0	909	0	0	0	0	943	0	0	0
Exhaust velocity (m/s)	17.64	17.40	16.39	13.83	10.54	18.93	18.18	17.98	14.82	10.28	19.04	18.48	14.88	10.26
Exhaust temperature (K)	359.82	359.82	358.71	358.71	358.71	363.15	353.71	353.15	353.15	353.15	359.82	353.71	353.15	352.59
NOx (g/s)	3.36	2.56	2.39	1.89	1.30	3.62	2.76	2.71	2.15	1.31	3.74	2.84	2.24	1.36
CO (g/s)	1.75	0.71	0.66	0.52	0.35	1.88	0.76	0.74	0.59	0.37	1.94	0.78	0.62	0.38
PM (g/s)	2.65	1.47	1.40	1.17	1.01	2.85	1.60	1.59	1.30	0.89	2.95	1.64	1.32	0.91
SO2 (g/s)	0.67	0.51	0.48	0.38	0.26	0.72	0.55	0.54	0.43	0.26	0.75	0.57	0.45	0.27

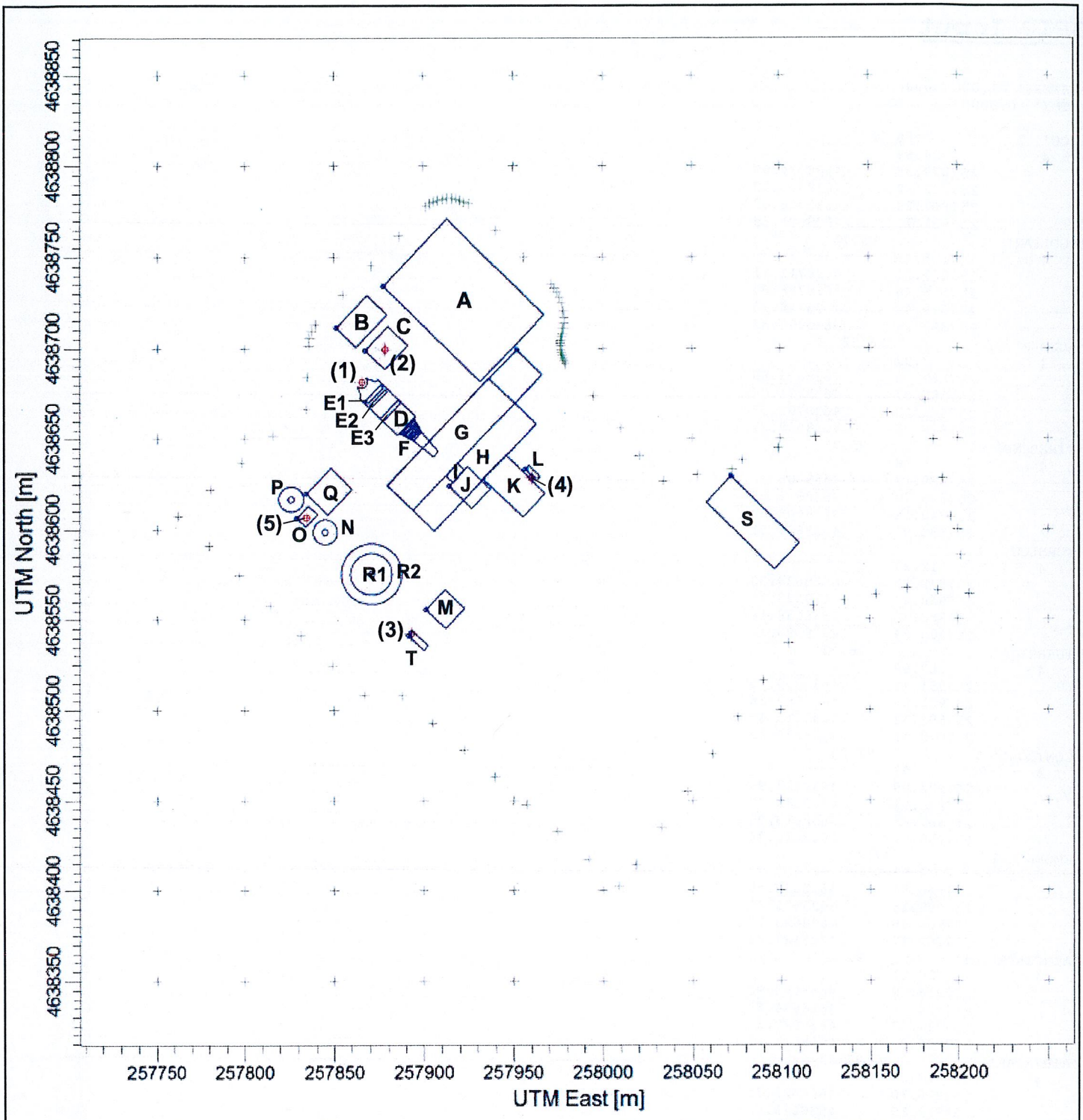
	Combustion Turbines										
Case #:	**41**	**42**	**43**	**44**	**68**	**69**	**70**	**71**	**65**	**66**	**67**
Fuel	**ULSD**										
Ambient Temperature (°F):	100	100	100	100	59	59	59	59	-10	-10	-10
GT Operating Load	100%	100%	75%	65%	100%	100%	75%	60%	100%	75%	60%
Fuel Heating Value, Btu/lb (HHV)	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453
Evaporative Cooler Status (On or Off	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	---	---	---	---	---	---	---	---	---	---	---
Ambient Relative Humidity, %	45	45	45	45	60	60	60	60	100	100	100
Baromteric Pressure, psia	15	15	15	15	15	15	15	15	15	15	15
GT Heat Input (MMBtu/hr/unit, HHV	2561	2414	1913	1736	2630	2618	2071	1791	2625	2107	1857
DB Heat Input (MMBtu/hr/unit, HHV)	0	0	0	0	0	0	0	0	0	0	0
Exhaust velocity (m/s)	18.07	17.24	14.15	13.15	18.75	18.55	15.26	13.64	19.91	16.23	14.57
Exhaust temperature (K)	370.37	369.82	366.48	365.93	363.71	363.15	361.48	360.93	369.26	366.48	365.37
NOx (g/s)	5.02	4.73	3.75	3.40	5.15	5.13	4.06	3.51	5.14	4.13	3.64
CO (g/s)	1.37	1.30	1.03	0.93	1.41	1.41	1.11	0.96	1.41	1.13	1.00
PM (g/s)	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78
SO2 (g/s)	0.49	0.47	0.37	0.34	0.50	0.50	0.40	0.35	0.50	0.40	0.37

NTE Killingly Energy Center

Combined Cycle Combustion Turbine - Start-up/Shutdown (SU/SD) Emissions Estimates

Fuel	**Natural Gas**				**ULSD**				**Ancillary Equipment**			
Case #:	**Hot Start**	**Warm Start**	**Cold Start**	**Shutdown**	**Hot Start**	**Warm Start**	**Cold Start**	**Shutdown**	**Boiler**	**Gas Heater**	**Generator**	**Fire Pump**
Exhaust velocity (m/s)	14.128	14.840	12.174	10.315	10.150	11.014	9.989	9.946	8.285	3.025	49.987	9.055
Exhaust temperature (K)	352.444	353.556	351.889	353.000	403.556	404.111	403.556	401.333	422.039	394.261	722.039	789.261
NOx (g/s)	15.668	17.887	14.107	10.091	21.300	23.563	21.043	19.980	0.090	0.008	2.453	0.253
CO (g/s)	47.559	54.962	60.002	26.514	248.877	290.387	277.787	53.906	0.391	0.023	1.341	0.221
PM (g/s)	2.290	2.210	2.037	2.403	4.095	4.142	4.127	4.064	0.053	0.003	0.077	0.013
SO2 (g/s)	0.242	0.295	0.405	0.201	0.242	0.295	0.405	0.201	0.016	0.001	0.002	0.000

APPENDIX L-B: FACILITY LAYOUT DIAGRAMS AND BPIP DATA



Legend

	Building / Structure Name	Grade Elevation (ft)	Height above Grade (ft)
A	Air Cooled Condenser	316	81
B	Closed Cooling Water Fan Array	314	22
C	Auxiliary Boiler	316	26
D	Heat Recovery Steam Generator (HRSG)	316	96
E1	HRSG Drum 1	316	106
E2	HRSG Drum 2	316	103
E3	HRSG Drum 3	316	105
F	Turbine Exhaust Diffuser (9 tiers)	316	33 - 96
G	Turbine Building High Bay	318	91.5
H	Turbine Building Low Bay	318	40.5
I	Air Inlet Filter Housing Duct	319	64
J	Air Inlet Filter Housing	319	86
K	Control/Maintenance Building	319	26
L	Emergency Generator	319	16
M	Fuel Gas Compressor	318	21
N	Demineralized Water Storage Tank	314	38
O	Fire Pump Enclosure	314	16
P	Service Water Storage Tank	314	43
Q	Water Treatment Building	318	25.5
R	Fuel Oil Tank	318	45
R2	Fuel Oil Tank Outer Wall	318	21
S	Administration	318	26
T	Gas Heater Enclosure	320	18

	Exhaust Stack	Grade Elevation (ft)	Height
1	HRSG	316	150
2	Auxiliary Boiler	316	90
3	Gas Heater	320	20
4	Emergency Generator	319	45
5	Fire Pump	314	20

TETRA TECH

Figure 1
Buildings, Structures and Stacks Input to AERMOD

Killingly Energy Center
NTE Connecticut, LLC
Killingly, CT

BPIP Input

```
'P'
'METERS'  1.00000000
'UTMY'  0.0000
23
'ACC'  1          96.32
    4          24.69
            257877.35       4638734.09
            257912.92       4638770.92
            257967.28       4638718.42
            257931.71       4638681.59
'COOLFAN'  1          95.71
    4           6.71
            257851.31       4638711.11
            257868.46       4638728.87
            257879.41       4638718.30
            257862.26       4638700.54
'AUXBLR'  1          96.32
    4           7.92
            257867.36       4638698.80
            257880.07       4638711.96
            257891.03       4638701.37
            257878.32       4638688.21
'FIREPUMP'  1          95.71
    4           4.88
            257829.13       4638606.19
            257835.70       4638612.99
            257840.54       4638608.32
            257833.97       4638601.51
'TURBLOW'  1          96.93
    4          12.34
            257879.75       4638624.30
            257936.44       4638683.19
            257962.71       4638658.16
            257905.89       4638599.16
'TURBHIGH'  1          96.93
    4          27.89
            257951.73       4638699.13
            257965.99       4638685.36
            257893.82       4638610.63
            257879.56       4638624.40
'CONTROL'  1          97.23
    4           7.92
            257933.09       4638627.94
            257945.91       4638640.98
            257967.88       4638619.95
            257955.17       4638606.74
'EMGEN'  1          97.23
    4           4.88
            257956.50       4638633.16
            257958.58       4638635.32
            257964.95       4638629.17
            257962.87       4638627.01
'AIRFILTR'  1          97.23
    4          26.21
            257914.22       4638623.90
            257924.55       4638634.60
            257937.27       4638622.32
            257926.94       4638611.62
'AIRINTAK'  1          97.23
    4          19.51
            257916.10       4638625.74
            257912.19       4638629.48
            257918.79       4638636.39
            257922.78       4638632.73
'HRSG'  1          96.32
   14          29.26
            257864.23       4638672.30
            257865.35       4638673.46
            257862.99       4638678.95
            257864.39       4638678.07
            257865.91       4638678.02
            257867.15       4638678.53
            257868.25       4638679.68
            257868.63       4638681.10
            257868.37       4638682.58
            257867.54       4638683.70
            257873.12       4638681.55
            257874.25       4638682.71
            257895.39       4638662.42
            257885.34       4638651.97
'CTDIFF1'  1          96.32
```

```
    4          10.05
             257894.21       4638648.89
             257898.81       4638653.71
             257908.27       4638642.95
             257905.39       4638639.94
'CTDIFF2'  8            96.32
    4          12.45
             257886.31       4638653.03
             257894.30       4638661.36
             257898.81       4638653.71
             257894.19       4638648.89
    4          14.85
             257886.31       4638653.03
             257894.30       4638661.36
             257898.24       4638654.67
             257893.20       4638649.41
    4          17.25
             257886.31       4638653.03
             257894.30       4638661.36
             257897.68       4638655.62
             257892.22       4638649.92
    4          19.65
             257886.31       4638653.03
             257894.30       4638661.36
             257897.12       4638656.58
             257891.23       4638650.44
    4          22.06
             257886.31       4638653.03
             257894.30       4638661.36
             257896.55       4638657.53
             257890.25       4638650.96
    4          24.46
             257886.32       4638653.03
             257894.31       4638661.36
             257896.00       4638658.49
             257889.27       4638651.48
    4          26.86
             257886.32       4638653.03
             257894.31       4638661.36
             257895.43       4638659.45
             257888.29       4638651.99
    4          29.26
             257886.33       4638653.04
             257894.32       4638661.37
             257894.88       4638660.41
             257887.31       4638652.52
'DRUM1'  1            96.32
    10          32.31
             257867.62       4638671.04
             257875.65       4638679.45
             257876.23       4638679.42
             257876.77       4638679.11
             257877.09       4638678.54
             257877.11       4638678.05
             257869.08       4638669.64
             257868.52       4638669.64
             257867.98       4638669.97
             257867.64       4638670.48
'DRUM3'  1            96.32
    14          31.39
             257876.54       4638662.04
             257885.01       4638670.94
             257885.44       4638671.18
             257886.09       4638671.23
             257886.65       4638670.87
             257886.94       4638670.36
             257886.93       4638669.82
             257886.63       4638669.37
             257878.20       4638660.49
             257877.80       4638660.21
             257877.10       4638660.15
             257876.54       4638660.43
             257876.25       4638660.98
             257876.23       4638661.53
'DRUM2'  1            96.32
    10          32.00
             257870.11       4638668.68
             257878.10       4638677.07
             257878.50       4638677.04
             257878.97       4638676.84
             257879.24       4638676.39
             257879.29       4638676.01
             257871.27       4638667.60
             257870.86       4638667.51
```

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            257870.33       4638667.85
            257870.08       4638668.26
'ADMIN'  1           96.93
    4            7.92
            258072.14       4638629.26
            258110.50       4638592.21
            258096.73       4638577.96
            258058.37       4638615.00
'DEMINTNK'  1           95.71
    8           11.58
            257845.09       4638605.41
            257840.24       4638603.40
            257838.23       4638598.55
            257840.24       4638593.70
            257845.09       4638591.69
            257849.94       4638593.70
            257851.95       4638598.55
            257849.94       4638603.40
'SVCTANK'  1           95.71
    8           13.11
            257826.19       4638623.58
            257821.34       4638621.57
            257819.33       4638616.72
            257821.34       4638611.87
            257826.19       4638609.86
            257831.04       4638611.87
            257833.05       4638616.72
            257831.04       4638621.57
'WWTRTMT'  1           96.93
    4            7.77
            257834.50       4638619.77
            257848.21       4638633.97
            257860.27       4638622.33
            257846.56       4638608.13
'GASCOMP'  1           96.93
    4            6.40
            257901.10       4638555.71
            257911.70       4638566.69
            257922.67       4638556.09
            257912.07       4638545.12
'OILTANKE'  2           96.93
    8            6.40
            257870.88       4638592.06
            257859.03       4638587.15
            257854.12       4638575.30
            257859.03       4638563.45
            257870.88       4638558.54
            257882.73       4638563.45
            257887.64       4638575.30
            257882.73       4638587.15
    8           13.72
            257870.83       4638586.68
            257862.75       4638583.33
            257859.40       4638575.25
            257862.75       4638567.17
            257870.83       4638563.82
            257878.91       4638567.17
            257882.26       4638575.25
            257878.91       4638583.33
'GASHTR'  1           97.54
    4            5.49
            257891.27       4638541.33
            257893.78       4638543.93
            257902.37       4638535.63
            257899.87       4638533.03
5
'OIL_CST'           96.32       45.72       257865.36       4638681.24
'AUXBLR'            96.32       27.43       257878.36       4638699.29
'GASHEATR'          97.54        6.10       257892.87       4638542.40
'EGEN'              97.23       13.72       257960.11       4638628.58
'FIREPUMP'          95.71        6.10       257834.02       4638606.61
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BPIP OUTPUT

```
SO BUILDHGT OIL_CST    29.26   29.26   29.26   29.26   29.26   29.26
SO BUILDHGT OIL_CST    29.26   29.26   29.26   29.26   27.89   27.89
SO BUILDHGT OIL_CST    27.89   27.89   27.89   27.89   29.26   29.26
SO BUILDHGT OIL_CST    29.26   29.26   29.26   29.26   29.26   29.26
SO BUILDHGT OIL_CST    29.26   29.26   29.26   29.26   27.89   27.89
SO BUILDHGT OIL_CST    27.89   27.89   27.89   27.89   29.26   29.26
SO BUILDWID OIL_CST    34.78   36.10   36.32   35.45   35.75   36.38
SO BUILDWID OIL_CST    35.90   34.34   31.73   28.35  102.97  105.60
SO BUILDWID OIL_CST   105.02  105.39  105.33  102.07   29.04   32.40
SO BUILDWID OIL_CST    34.78   36.10   36.32   35.45   35.75   36.38
SO BUILDWID OIL_CST    35.90   34.34   31.73   28.35  102.97  105.60
SO BUILDWID OIL_CST   105.02  105.39  105.33  102.07   29.04   32.40
SO BUILDLEN OIL_CST    28.35   25.09   21.08   16.42   17.52   22.05
SO BUILDLEN OIL_CST    25.90   29.04   32.40   34.78   60.37   44.37
SO BUILDLEN OIL_CST    27.02   30.57   47.69   63.36   34.34   31.73
SO BUILDLEN OIL_CST    28.35   25.09   21.08   16.42   17.52   22.05
SO BUILDLEN OIL_CST    25.90   29.04   32.40   34.78   60.37   44.37
SO BUILDLEN OIL_CST    27.02   30.57   47.69   63.36   34.34   31.73
SO XBADJ    OIL_CST   -25.36  -20.67  -15.36   -9.58   -6.61   -5.45
SO XBADJ    OIL_CST    -4.12   -2.73   -2.37   -1.94   32.78   40.72
SO XBADJ    OIL_CST    47.41   41.81   27.69   12.73   -2.04   -2.46
SO XBADJ    OIL_CST    -2.99   -4.42   -5.72   -6.84  -10.91  -16.60
SO XBADJ    OIL_CST   -21.78  -26.31  -30.03  -32.84  -93.15  -85.09
SO XBADJ    OIL_CST   -74.44  -72.38  -75.38  -76.09  -32.29  -29.27
SO YBADJ    OIL_CST   -15.45  -16.61  -17.25  -17.38  -17.39  -17.15
SO YBADJ    OIL_CST   -16.39  -15.13  -13.40  -11.18   -5.13    5.88
SO YBADJ    OIL_CST    16.71   27.04   36.54   44.94   11.79   13.83
SO YBADJ    OIL_CST    15.45   16.61   17.25   17.38   17.39   17.15
SO YBADJ    OIL_CST    16.39   15.13   13.40   11.18    5.13   -5.88
SO YBADJ    OIL_CST   -16.71  -27.04  -36.54  -44.94  -11.79  -13.83


SO BUILDHGT AUXBLR     29.26   29.26   29.26   29.26   29.26   29.26
SO BUILDHGT AUXBLR     29.26   29.26   27.89   27.89   27.89   27.89
SO BUILDHGT AUXBLR     27.89   27.89   27.89   27.89   29.26   29.26
SO BUILDHGT AUXBLR     29.26   29.26   29.26   29.26   29.26   29.26
SO BUILDHGT AUXBLR     29.26   29.26   27.89   27.89   27.89   27.89
SO BUILDHGT AUXBLR     27.89   27.89   27.89   27.89   29.26   29.26
SO BUILDWID AUXBLR     34.78   36.10   36.32   35.45   35.75   36.38
SO BUILDWID AUXBLR     35.90   34.34   88.50   97.21  102.97  105.60
SO BUILDWID AUXBLR    105.02  105.39  105.33  102.07   29.04   32.40
SO BUILDWID AUXBLR     34.78   36.10   36.32   35.45   35.75   36.38
SO BUILDWID AUXBLR     35.90   34.34   88.50   97.21  102.97  105.60
SO BUILDWID AUXBLR    105.02  105.39  105.33  102.07   29.04   32.40
SO BUILDLEN AUXBLR     28.35   25.09   21.08   16.42   17.52   22.05
SO BUILDLEN AUXBLR     25.90   29.04   86.43   74.53   60.37   44.37
SO BUILDLEN AUXBLR     27.02   30.57   47.69   63.36   34.34   31.73
SO BUILDLEN AUXBLR     28.35   25.09   21.08   16.42   17.52   22.05
SO BUILDLEN AUXBLR     25.90   29.04   86.43   74.53   60.37   44.37
SO BUILDLEN AUXBLR     27.02   30.57   47.69   63.36   34.34   31.73
SO XBADJ    AUXBLR    -45.39  -42.08  -37.49  -31.76  -28.17  -25.73
SO XBADJ    AUXBLR    -22.51  -18.67    1.20   14.19   26.74   38.48
SO XBADJ    AUXBLR     49.06   47.28   36.82   25.24   13.47   15.59
SO XBADJ    AUXBLR     17.04   16.99   16.41   15.34   10.65    3.69
SO XBADJ    AUXBLR     -3.39  -10.37  -87.63  -88.72  -87.11  -82.85
SO XBADJ    AUXBLR    -76.08  -77.86  -84.51  -88.60  -47.81  -47.32
SO YBADJ    AUXBLR     -5.78  -10.56  -15.02  -19.02  -22.86  -26.28
SO YBADJ    AUXBLR    -28.90  -30.64  -44.41  -36.02  -26.54  -16.25
SO YBADJ    AUXBLR     -5.47    5.48   16.26   26.55   -4.15    0.83
SO YBADJ    AUXBLR      5.78   10.56   15.02   19.02   22.86   26.28
SO YBADJ    AUXBLR     28.90   30.64   44.41   36.02   26.54   16.25
SO YBADJ    AUXBLR      5.47   -5.48  -16.26  -26.55    4.15   -0.83


SO BUILDHGT GASHEATR    5.49    6.40    6.40    5.49    5.49    5.49
SO BUILDHGT GASHEATR    6.40    6.40    6.40    5.49    5.49   13.72
SO BUILDHGT GASHEATR   13.72   13.72   13.72   13.72   29.26   29.26
SO BUILDHGT GASHEATR   27.89   27.89   27.89    6.40    6.40    6.40
SO BUILDHGT GASHEATR    6.40    6.40    6.40    5.49    5.49   13.72
SO BUILDHGT GASHEATR   13.72    5.49    5.49    5.49   13.72    5.49
SO BUILDWID GASHEATR   11.92   20.14   18.49   12.17   12.26   12.48
SO BUILDWID GASHEATR   20.40   21.31   21.57    9.68    8.16   22.07
SO BUILDWID GASHEATR   22.77   22.77   22.07   21.48   29.04   32.40
SO BUILDWID GASHEATR   74.53   60.37   44.37   16.28   16.76   18.87
SO BUILDWID GASHEATR   20.40   21.31   21.57    9.68    8.16   22.07
SO BUILDWID GASHEATR   22.77    4.84    6.76    8.48   22.51   11.10
SO BUILDLEN GASHEATR    9.68   20.14   18.50    4.44    4.84    6.76
SO BUILDLEN GASHEATR   20.40   21.31   21.57   11.92   12.38   22.07
SO BUILDLEN GASHEATR   22.77   22.77   22.07   21.48   34.34   31.73
SO BUILDLEN GASHEATR   97.21  102.97  105.60   16.29   16.77   18.87
```

SO	BUILDLEN	GASHEATR	20.40	21.31	21.57	11.92	12.38	22.07
SO	BUILDLEN	GASHEATR	22.77	12.26	12.48	12.33	22.51	10.90
SO	XBADJ	GASHEATR	-8.01	9.12	11.96	-2.68	-1.91	-1.92
SO	XBADJ	GASHEATR	12.29	10.42	8.23	-1.39	-1.14	-46.55
SO	XBADJ	GASHEATR	-49.38	-50.71	-50.51	-49.15	-143.55	-141.30
SO	XBADJ	GASHEATR	-164.57	-167.41	-165.16	-30.71	-31.63	-32.65
SO	XBADJ	GASHEATR	-32.69	-31.72	-29.80	-10.53	-11.24	24.47
SO	XBADJ	GASHEATR	26.62	-11.68	-11.61	-11.20	24.92	-9.37
SO	YBADJ	GASHEATR	-4.57	-13.25	-9.72	-5.55	-5.55	-5.37
SO	YBADJ	GASHEATR	6.19	10.00	13.51	-3.17	-2.33	17.43
SO	YBADJ	GASHEATR	11.00	4.23	-2.66	-9.48	8.80	-13.68
SO	YBADJ	GASHEATR	9.92	-10.37	-30.34	5.89	1.88	-2.19
SO	YBADJ	GASHEATR	-6.19	-10.00	-13.51	3.17	2.33	-17.43
SO	YBADJ	GASHEATR	-11.00	-0.51	-1.46	-2.37	16.00	-3.95

SO	BUILDHGT	EGEN	27.89	27.89	7.92	7.92	26.21	26.21
SO	BUILDHGT	EGEN	27.89	27.89	27.89	27.89	27.89	27.89
SO	BUILDHGT	EGEN	27.89	27.89	27.89	27.89	27.89	27.89
SO	BUILDHGT	EGEN	27.89	27.89	7.92	7.92	26.21	26.21
SO	BUILDHGT	EGEN	27.89	27.89	27.89	27.89	27.89	27.89
SO	BUILDHGT	EGEN	27.89	27.89	27.89	27.89	27.89	27.89
SO	BUILDWID	EGEN	74.53	60.37	34.12	31.79	51.10	63.39
SO	BUILDWID	EGEN	63.36	77.10	88.50	70.50	102.97	105.60
SO	BUILDWID	EGEN	105.02	105.39	105.33	102.07	95.70	86.43
SO	BUILDWID	EGEN	74.53	60.37	34.12	31.79	51.10	63.39
SO	BUILDWID	EGEN	63.36	77.10	88.50	97.21	102.97	105.60
SO	BUILDWID	EGEN	105.02	105.39	105.33	102.07	95.70	86.43
SO	BUILDLEN	EGEN	97.21	102.97	25.02	20.28	105.39	105.33
SO	BUILDLEN	EGEN	102.07	95.70	86.43	34.78	60.37	44.37
SO	BUILDLEN	EGEN	27.02	30.57	47.69	63.36	77.10	88.50
SO	BUILDLEN	EGEN	97.21	102.97	25.02	20.28	105.39	105.33
SO	BUILDLEN	EGEN	102.07	95.70	86.43	74.53	60.37	44.37
SO	BUILDLEN	EGEN	27.02	30.57	47.69	63.36	77.10	88.50
SO	XBADJ	EGEN	-29.19	-39.54	-21.38	-19.91	-64.39	-71.85
SO	XBADJ	EGEN	-77.12	-80.05	-80.55	-104.39	-74.26	-67.67
SO	XBADJ	EGEN	-59.02	-59.43	-65.29	-69.16	-70.93	-70.55
SO	XBADJ	EGEN	-68.02	-63.43	-3.64	-0.37	-41.00	-33.48
SO	XBADJ	EGEN	-24.95	-15.65	-5.88	4.07	13.89	23.30
SO	XBADJ	EGEN	31.99	28.86	17.60	5.80	-6.17	-17.95
SO	YBADJ	EGEN	41.33	44.08	6.02	4.39	33.88	33.59
SO	YBADJ	EGEN	37.48	32.38	26.30	24.22	11.94	4.11
SO	YBADJ	EGEN	-3.85	-11.69	-19.18	-26.09	-32.20	-37.34
SO	YBADJ	EGEN	-41.33	-44.08	-6.02	-4.39	-33.88	-33.59
SO	YBADJ	EGEN	-37.48	-32.38	-26.30	-19.42	-11.94	-4.11
SO	YBADJ	EGEN	3.85	11.69	19.18	26.09	32.20	37.34

SO	BUILDHGT	FIREPUMP	13.11	27.89	27.89	27.89	27.89	27.89
SO	BUILDHGT	FIREPUMP	27.89	27.89	27.89	13.11	13.11	13.11
SO	BUILDHGT	FIREPUMP	13.11	13.11	13.11	13.11	13.11	13.11
SO	BUILDHGT	FIREPUMP	13.11	29.26	29.26	29.26	29.26	29.26
SO	BUILDHGT	FIREPUMP	27.89	27.89	27.89	13.11	13.72	13.72
SO	BUILDHGT	FIREPUMP	13.72	13.72	13.72	13.11	13.11	13.11
SO	BUILDWID	FIREPUMP	13.51	94.60	86.00	74.78	30.57	47.69
SO	BUILDWID	FIREPUMP	63.36	77.10	88.50	13.51	12.89	13.25
SO	BUILDWID	FIREPUMP	13.67	13.67	13.25	12.89	13.51	13.72
SO	BUILDWID	FIREPUMP	13.51	36.10	36.32	35.45	35.75	36.38
SO	BUILDWID	FIREPUMP	63.36	77.10	88.50	13.51	21.48	22.07
SO	BUILDWID	FIREPUMP	22.77	22.77	22.07	12.89	13.51	13.72
SO	BUILDLEN	FIREPUMP	13.51	102.97	105.60	105.02	105.39	105.33
SO	BUILDLEN	FIREPUMP	102.07	95.70	86.43	13.51	12.89	13.25
SO	BUILDLEN	FIREPUMP	13.67	13.67	13.25	12.89	13.51	13.72
SO	BUILDLEN	FIREPUMP	13.51	25.09	21.08	16.42	17.52	22.05
SO	BUILDLEN	FIREPUMP	102.07	95.70	86.43	13.51	21.48	22.07
SO	BUILDLEN	FIREPUMP	22.77	22.77	22.07	12.89	13.51	13.72
SO	XBADJ	FIREPUMP	1.84	24.23	33.38	41.52	46.32	48.33
SO	XBADJ	FIREPUMP	48.88	47.94	45.54	-16.22	-17.26	-18.46
SO	XBADJ	FIREPUMP	-19.33	-19.61	-19.30	-18.62	-18.07	-16.97
SO	XBADJ	FIREPUMP	-15.35	-85.27	-86.02	-84.16	-82.89	-81.05
SO	XBADJ	FIREPUMP	-150.95	-143.64	-131.97	2.71	-56.06	-58.60
SO	XBADJ	FIREPUMP	-59.74	-59.07	-56.60	5.73	4.56	3.25
SO	YBADJ	FIREPUMP	9.47	-49.78	-31.92	-13.08	-20.07	-2.57
SO	YBADJ	FIREPUMP	15.00	32.12	48.27	8.60	6.82	4.84
SO	YBADJ	FIREPUMP	2.71	0.50	-1.73	-3.90	-5.96	-7.83
SO	YBADJ	FIREPUMP	-9.47	20.53	7.08	-6.58	-19.63	-31.81
SO	YBADJ	FIREPUMP	-15.00	-32.12	-48.27	-8.60	16.88	8.75
SO	YBADJ	FIREPUMP	0.36	-8.04	-16.20	3.90	5.96	7.83

APPENDIX L-C: DETAILED AERMOD RESULTS SUMMARY

NTE Killingly Energy Center

Siemens Model SGT6-8000H (or equivalent) Combined Cycle Combustion Turbine Emissions Estimates

Ambient Temperature (°F):	100					59					-10				100				59				-10		
Case #:	1	2	3	4	5	36	37	38	39	40	32	33	34	35	41	42	43	44	68	69	70	71	65	66	67
Fuel	Natural Gas														ULSD										
Number of GTs Operating																									
GT Operating Load	100%	100%	100%	75%	45%	100%	100%	100%	75%	34%	100%	100%	75%	40%	100%	100%	75%	65%	100%	100%	75%	60%	100%	75%	60%
Fuel Heating Value, Btu/lb (HHV)	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	22,160	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453	20,453
Evaporative Cooler Status (On or Off)	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Duct Burner Status	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	---	---	---	---	---	---	---	---	---	---	---
Ambient Relative Humidity, %	45	45	45	45	45	60	60	60	60	60	100	100	100	100	45	45	45	45	60	60	60	60	100	100	100
Barometric Pressure, psia	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52
GT Heat Input (MMBtu/hr/unit, HHV)	2,700	2,700	2,517	1,987	1,359	2,909	2,904	2,859	2,272	1,381	2,999	2,994	2,368	1,428	2,561	2,414	1,913	1,736	2,630	2,618	2,071	1,791	2,625	2,107	1,857
DB Heat Input (MMBtu/hr/unit, HHV)	848	0	0	0	0	909	0	0	0	0	943	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Power (kW)	0	0	0	0	0	532,724	0	433,008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Power (kW)	0	0	0	0	0	549,200	0	446,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heat Rate (Btu/kW-hr, net, HHV)	0	0	0	0	0	7,167	0	6,603	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heat Rate (Btu/kW-hr, net)																									
Exhaust velocity (m/s)	17.638	17.400	16.391	13.828	10.542	18.930	18.184	17.984	14.820	10.283	19.042	18.482	14.881	10.262	18.072	17.245	14.152	13.147	18.754	18.546	15.261	13.637	19.908	16.235	14.568
Exhaust temperature (K)	359.817	359.817	358.706	358.706	358.706	363.150	353.706	353.150	353.150	353.150	359.817	353.706	353.150	352.594	370.372	369.817	366.483	365.928	363.706	363.150	361.483	360.928	369.261	366.483	365.372
NOx (g/s)	3.364	2.558	2.394	1.890	1.298	3.616	2.759	2.709	2.155	1.310	3.742	2.835	2.243	1.361	5.017	4.729	3.748	3.401	5.152	5.129	4.057	3.509	5.142	4.128	3.638
CO (g/s)	1.751	0.706	0.655	0.517	0.353	1.877	0.756	0.743	0.592	0.365	1.940	0.781	0.617	0.378	1.374	1.298	1.027	0.932	1.411	1.405	1.111	0.961	1.409	1.131	0.997
PM (g/s)	2.646	1.474	1.399	1.172	1.008	2.848	1.600	1.588	1.298	0.895	2.948	1.638	1.323	0.907	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780	3.780
SO2 (g/s)	0.671	0.510	0.476	0.376	0.257	0.722	0.549	0.540	0.429	0.261	0.745	0.566	0.448	0.270	0.491	0.466	0.365	0.340	0.504	0.504	0.403	0.353	0.504	0.403	0.365

AERMOD Impacts - turbine only (ug/m3 per g/s) - 150 ft. turbine stack height

1-HR	1ST	4.725	4.743	4.883	5.307	6.108	4.534	4.818	4.866	5.316	6.621	4.607	4.781	5.305	6.678	4.446	4.552	4.978	5.211	4.538	4.572	4.957	5.270	4.259	4.717	4.945
3-HR	1ST	2.365	2.382	2.470	2.675	2.998	2.232	2.408	2.429	2.663	3.091	2.267	2.387	2.658	3.100	2.206	2.274	2.557	2.651	2.237	2.259	2.522	2.665	2.085	2.388	2.533
8-HR	1ST	1.250	1.260	1.311	1.564	2.130	1.173	1.275	1.288	1.474	2.256	1.193	1.263	1.468	2.268	1.158	1.197	1.444	1.597	1.176	1.189	1.343	1.568	1.090	1.264	1.396
24-HR	1ST	0.652	0.664	0.730	0.920	1.294	0.570	0.653	0.667	0.870	1.380	0.580	0.638	0.865	1.387	0.580	0.625	0.842	0.938	0.576	0.587	0.788	0.923	0.502	0.698	0.817
1-HR	2ND	4.493	4.540	4.788	4.987	6.050	4.107	4.659	4.722	5.000	6.520	4.225	4.603	4.984	6.560	4.031	4.180	4.852	4.866	4.117	4.179	4.847	4.935	3.803	4.514	4.843
3-HR	2ND	2.209	2.226	2.315	2.525	2.853	2.078	2.252	2.274	2.513	2.931	2.112	2.232	2.507	2.938	2.052	2.119	2.403	2.500	2.083	2.104	2.368	2.514	1.944	2.232	2.379
8-HR	2ND	0.992	1.011	1.105	1.366	1.874	0.923	1.012	1.023	1.311	2.021	0.944	1.005	1.306	2.031	0.905	0.956	1.254	1.376	0.923	0.932	1.182	1.366	0.858	1.054	1.219
24-HR	2ND	0.447	0.457	0.506	0.676	1.007	0.391	0.453	0.463	0.639	1.095	0.397	0.441	0.636	1.102	0.397	0.427	0.597	0.682	0.394	0.402	0.558	0.675	0.352	0.479	0.578
24-HR	6TH	0.365	0.364	0.411	0.507	0.699	0.299	0.367	0.369	0.503	0.754	0.306	0.343	0.495	0.761	0.306	0.349	0.474	0.516	0.304	0.312	0.448	0.521	0.252	0.399	0.457
ANNUAL (5-Year Max.)	1ST	0.035	0.035	0.039	0.050	0.072	0.030	0.036	0.037	0.049	0.080	0.031	0.035	0.049	0.081	0.030	0.032	0.044	0.049	0.030	0.031	0.042	0.050	0.026	0.036	0.043
ANNUAL Y1		0.035	0.035	0.039	0.050	0.072	0.030	0.036	0.037	0.049	0.080	0.031	0.035	0.049	0.081	0.030	0.032	0.044	0.049	0.030	0.031	0.042	0.050	0.026	0.036	0.043
ANNUAL Y2		0.024	0.025	0.027	0.033	0.044	0.021	0.025	0.026	0.032	0.050	0.022	0.025	0.032	0.051	0.021	0.022	0.029	0.032	0.022	0.022	0.028	0.032	0.019	0.025	0.029
ANNUAL Y3		0.031	0.032	0.035	0.043	0.059	0.028	0.032	0.033	0.042	0.065	0.028	0.032	0.042	0.066	0.027	0.029	0.038	0.042	0.028	0.028	0.037	0.043	0.025	0.032	0.037
ANNUAL Y4		0.024	0.025	0.029	0.039	0.059	0.020	0.025	0.026	0.037	0.066	0.021	0.024	0.037	0.067	0.020	0.022	0.033	0.038	0.020	0.021	0.031	0.038	0.016	0.026	0.032
ANNUAL Y5		0.023	0.023	0.026	0.035	0.052	0.019	0.024	0.024	0.034	0.058	0.020	0.023	0.034	0.059	0.019	0.021	0.030	0.034	0.019	0.020	0.028	0.035	0.016	0.024	0.029

AERMOD Scaled Impacts - turbine only (ug/m3) - 150 ft. turbine stack

Fuel		Natural Gas														ULSD										
Case #:	**Averaging Period**	1	2	3	4	5	36	37	38	39	40	32	33	34	35	41	42	43	44	68	69	70	71	65	66	67
NO2	1-hour H1H	10.95	8.39	8.14	6.97	5.76	11.03	9.18	9.10	7.91	6.22	11.65	9.36	8.22	6.51	15.04	14.67	13.13	12.41	15.76	15.86	14.04	12.88	14.49	13.52	12.62
	1-hour H8H	7.82	5.98	5.90	5.17	3.99	7.97	6.50	6.47	5.90	4.19	8.39	6.63	6.14	4.38	10.87	10.60	9.77	9.23	11.38	11.45	10.35	9.56	10.73	9.66	9.34
	Annual	0.12	0.09	0.09	0.09	0.09	0.11	0.10	0.10	0.11	0.10	0.12	0.10	0.11	0.11	0.15	0.15	0.16	0.17	0.16	0.16	0.17	0.17	0.14	0.15	0.16
CO	1-hour H1H	8.28	3.35	3.20	2.74	2.15	8.51	3.64	3.62	3.15	2.42	8.94	3.74	3.28	2.52	6.11	5.91	5.11	4.86	6.41	6.42	5.51	5.07	6.00	5.33	4.93
	1-hour H2H	7.87	3.20	3.14	2.58	2.13	7.71	3.52	3.51	2.96	2.38	8.20	3.60	3.08	2.48	5.54	5.42	4.98	4.54	5.81	5.87	5.39	4.74	5.36	5.10	4.83
	8-hour H1H	2.19	0.89	0.86	0.81	0.75	2.20	0.96	0.96	0.87	0.82	2.32	0.99	0.91	0.86	1.59	1.55	1.48	1.49	1.66	1.67	1.49	1.51	1.54	1.43	1.39
	8-hour H2H	1.74	0.71	0.72	0.71	0.66	1.73	0.77	0.76	0.78	0.74	1.83	0.79	0.81	0.77	1.24	1.24	1.29	1.28	1.30	1.31	1.31	1.31	1.21	1.19	1.22
PM10	24-hour H1H	1.72	0.98	1.02	1.08	1.30	1.62	1.04	1.06	1.13	1.23	1.71	1.05	1.14	1.26	2.19	2.36	3.18	3.55	2.18	2.22	2.98	3.49	1.90	2.64	3.09
	24-hour H2H	1.18	0.67	0.71	0.79	1.01	1.11	0.72	0.74	0.83	0.98	1.17	0.72	0.84	1.00	1.50	1.61	2.26	2.58	1.49	1.52	2.11	2.55	1.33	1.81	2.19
	24-hour H6H	0.97	0.54	0.58	0.59	0.70	0.85	0.59	0.59	0.65	0.67	0.90	0.56	0.65	0.69	1.16	1.32	1.79	1.95	1.15	1.18	1.69	1.97	0.95	1.51	1.73
	Annual	0.09	0.05	0.05	0.06	0.07	0.09	0.06	0.06	0.06	0.07	0.09	0.06	0.06	0.07	0.11	0.12	0.17	0.19	0.11	0.12	0.16	0.19	0.10	0.14	0.16
PM2.5	24-hour H1H	0.93	0.53	0.57	0.61	0.78	0.86	0.57	0.57	0.65	0.75	0.90	0.56	0.66	0.76	1.16	1.27	1.81	2.01	1.15	1.18	1.68	2.00	1.01	1.46	1.74
	24-hour H8H	0.45	0.25	0.25	0.28	0.35	0.45	0.28	0.28	0.30	0.34	0.47	0.28	0.30	0.35	0.59	0.61	0.79	0.89	0.60	0.60	0.73	0.89	0.55	0.65	0.76
	Annual	0.07	0.04	0.04	0.05	0.06	0.06	0.04	0.04	0.05	0.06	0.07	0.04	0.05	0.06	0.08	0.09	0.13	0.14	0.09	0.09	0.12	0.15	0.07	0.10	0.13
SO2	1-hour H1H	2.73	2.09	2.02	1.73	1.42	2.75	2.28	2.27	1.97	1.55	2.90	2.33	2.05	1.61	1.84	1.81	1.60	1.55	1.93	1.95	1.74	1.62	1.77	1.65	1.58
	1-hour H4H	2.29	1.77	1.71	1.51	1.17	2.28	1.94	1.93	1.72	1.25	2.41	1.97	1.79	1.29	1.53	1.50	1.36	1.34	1.59	1.62	1.48	1.41	1.51	1.40	1.35
	3-hour H1H	1.59	1.22	1.18	1.00	0.77	1.61	1.32	1.31	1.14	0.81	1.69	1.35	1.19	0.84	1.08	1.06	0.93	0.90	1.13	1.14	1.02	0.94	1.05	0.96	0.93
	3-hour H2H	1.48	1.14	1.10	0.95	0.73	1.50	1.24	1.23	1.08	0.77	1.57	1.26	1.12	0.79	1.01	0.99	0.88	0.85	1.05	1.06	0.95	0.89	0.98	0.90	0.87
	24-hour H1H	0.44	0.34	0.35	0.35	0.33	0.41	0.36	0.36	0.37	0.36	0.43	0.36	0.39	0.37	0.28	0.29	0.31	0.32	0.29	0.30	0.32	0.33	0.25	0.28	0.30
	24-hour H2H	0.30	0.23	0.24	0.25	0.26	0.28	0.25	0.25	0.27	0.29	0.30	0.25	0.28	0.30	0.19	0.20	0.22	0.23	0.20	0.20	0.23	0.24	0.18	0.19	0.21
	Annual	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02

NTE Killingly Energy Center

Combined Cycle Combustion Turbine - Start-up/Shutdown (SU/SD) Emissions Estimates

Fuel		Natural Gas				ULSD			
Case #:		Hot Start	Warm Start	Cold Start	Shutdown	Hot Start	Warm Start	Cold Start	Shutdown
Exhaust velocity (m/s)		14.128	14.840	12.174	10.315	10.150	11.014	9.989	9.946
Exhaust temperature (K)		352.444	353.556	351.889	353.000	403.556	404.111	403.556	401.333
NOx (g/s)		15.668	17.887	14.107	10.091	21.300	23.563	21.043	19.980
CO (g/s)		47.559	54.962	60.002	26.514	248.877	290.387	277.787	53.906
PM (g/s)		2.290	2.210	2.037	2.403	4.095	4.142	4.127	4.064
SO2 (g/s)		0.242	0.295	0.405	0.201	0.242	0.295	0.405	0.201

AERMOD SU/SD Impacts - turbine only (ug/m3 per g/s) - 150 ft. turbine stack height

Unit	1-hour H1H	5.465	5.297	5.819	6.617	5.033	4.759	5.082	5.140
	1-hour H2H	2.730	2.657	2.913	3.089	2.634	2.530	2.654	2.675
	3-hour H1H	1.582	1.469	1.900	2.251	1.785	1.625	1.817	1.840
	3-hour H2H	0.934	0.865	1.143	1.376	1.055	0.950	1.077	1.095
	8-hour H1H	5.194	4.973	5.813	6.515	4.927	4.758	4.987	5.047
	8-hour H2H	2.581	2.506	2.770	2.929	2.483	2.377	2.504	2.525
	24-hour H1H	1.399	1.305	1.667	2.016	1.473	1.340	1.496	1.520
	24-hour H2H	0.698	0.636	0.882	1.093	0.744	0.654	0.760	0.776
	24-hour H6H	0.530	0.489	0.623	0.752	0.553	0.497	0.555	0.572
	Annual	0.053	0.048	0.065	0.080	0.049	0.044	0.050	0.052

AERMOD SU/SD Scaled Impacts - turbine only (ug/m3) - 150 ft. turbine stack

NO2	1-hour H1H	59.62	65.52	59.60	47.88	76.97	81.26	76.65	73.39
	1-hour H8H	44.14	48.90	42.31	32.26	57.47	60.10	57.40	54.73
	Annual	0.83	0.87	0.92	0.80	1.05	1.03	1.06	1.03
CO	1-hour H1H	259.92	291.14	349.13	175.44	1252.62	1381.84	1411.77	277.05
	1-hour H2H	247.04	273.34	348.76	172.73	1226.23	1381.53	1385.39	272.05
	8-hour H1H	75.24	80.75	113.98	59.68	444.29	471.79	504.86	99.20
	8-hour H2H	66.53	71.74	100.02	53.46	366.56	389.09	415.56	81.95
PM10	24-hour H1H	2.14	1.91	2.33	3.31	4.32	3.93	4.44	4.45
	24-hour H2H	1.60	1.41	1.80	2.63	3.05	2.71	3.13	3.15
	24-hour H6H	1.21	1.08	1.27	1.81	2.26	2.06	2.29	2.32
	Annual	0.12	0.11	0.13	0.19	0.20	0.18	0.21	0.21
PM2.5	24-hour H1H	1.23	1.09	1.37	2.00	2.45	2.20	2.50	2.52
	24-hour H8H	0.56	0.50	0.62	0.90	1.00	0.90	1.03	1.04
	Annual	0.09	0.08	0.10	0.15	0.16	0.14	0.16	0.16
SO2	1-hour H1H	1.15	1.35	2.14	1.19	1.09	1.27	1.84	0.92
	1-hour H4H	1.00	1.18	1.80	0.96	0.94	1.09	1.58	0.79
	3-hour H1H	0.66	0.78	1.18	0.62	0.64	0.75	1.07	0.54
	3-hour H2H	0.62	0.74	1.12	0.59	0.60	0.70	1.01	0.51
	24-hour H1H	0.23	0.25	0.46	0.28	0.26	0.28	0.44	0.22
	24-hour H2H	0.17	0.19	0.36	0.22	0.18	0.19	0.31	0.16
	Annual	0.01	0.01	0.03	0.02	0.01	0.01	0.02	0.01

NTE Killingly Energy Center - Detailed Results Table

Pollutant	Averaging Period	Rank for SIL	Project Maximum Impact (SIL) (µg/m³)	Maximum Impact Receptor Location		Elevation (m)	Maximum Impact Date (YRMODDHR)	Worst Case Turbine Load Scenario	SIL (µg/m³)	NAAQS (µg/m³)	PSD (µg/m³)
				UTM-E (m)	UTM-N (m)						
NO2 (SS)	1-hour	H1H	16.04	263450.00	4637200.00	207.60	5-year average	Oil Case 69	7.5	188	NA
	Annual	H1H	0.87	257979.55	4638691.41	96.93	2013.00	Oil Case 71	1	100	25
NO2 (SU/SD)	1-hour	H1H	81.46	263450.00	4637250.00	206.19	5-year average	Oil Warm Start	7.5	188	NA
	Annual	H1H	0.87	257979.55	4638691.41	96.93	2013.00	Oil Case 71, Oil Cold Start	1	100	25
CO	1-hour	H1H	1418.29	263450.00	4637200.00	207.60	14022506.00	Oil Cold Start	2000	40,000	NA
	8-hour	H1H	132.68	258100.00	4638200.00	113.77	10030116.00	Gas Case 32, Oil Cold Start	500	10,000	NA
PM10	24-hour	H1H	4.04	258100.00	4638150.00	117.45	14110224.00	Oil Case 44, Oil Shutdown	5	150	30
	Annual	H1H	0.24	258400.00	4638250.00	97.04	2010.00	Oil Case 71, Oil Shutdown	1	NA	17
PM2.5	24-hour	H1H (5YA)	2.39	258050.00	4638200.00	116.84	5-year average	Oil Case 44, Oil Shutdown	1.2	35	9
	Annual	H1H (5YA)	0.18	258400.00	4638250.00	97.04	5-year average	Oil Case 71, Oil Shutdown	0.3	12	4
SO2	1-hour	H1H	2.94	263450.00	4637200.00	207.60	5-year average	Gas Case 32	7.9	196	NA
	3-hour	H1H	1.72	263400.00	4637050.00	201.78	10120206.00	Gas Case 32	25	1300	512
	24-hour	H1H	0.75	257904.98	4638492.85	104.68	14033124.00	Gas Case 1, Gas Cold Start	5	365	91
	Annual	H1H	0.05	258020.62	4638640.70	96.93	2013.00	Gas Case 1, Gas Cold Start	1	80	20

NTE Killingly Energy Center - Cumulative Impacts

Pollutant	Averaging Period	Rank for NAAQS Assessment	Cumulative Maximum Impact (NAAQS) (µg/m³)	Ambient Background (µg/m³)	Cumulative Impact + Ambient Background (µg/m³)	Maximum Impact Receptor Location		Elevation (m)	Maximum Impact Date (YRMODDHR)	NAAQS (µg/m³)	PSD (µg/m³)
						UTM-E (m)	UTM-N (m)				
NO2 (Steady-State)	1-hour	H8H (5YA)	67.51	79.0	146.5	268000.00	4640000.00	227.46	5-year average	188	NA
NO2 (Start-up/Shutdown)	1-hour	H8H (5YA)	60.26	79.0	141.5	263450.00	4637250.00	206.19	5-year average	188	NA
PM2.5 (NAAQS)	24-hour	H8H (5YA)	8.42	20.0	28.4	263450.00	4637250.00	206.19	5-year average	35	NA
PM2.5 (PSD)	24-hour	H2H	3.08	NA	NA	258100.00	4638250.00	112.45	10012924	NA	9

Note: Cumulative Impacts reported for all pollutants and averaging periods for which the Project has a significant impact

APPENDIX L-E: VISCREEN ANALYSIS

Visual Effects Screening Analysis for
Source: Killingly Energy Center
Class I Area: Lye Brook NWA

*** Level-1 Screening ***

Input Emissions for

Particulates	32.90	LB /HR
NOx (as NO2)	187.00	LB /HR
Primary NO2	0.00	LB /HR
Soot	0.00	LB /HR
Primary SO4	0.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	0.04 ppm
Background Visual Range:	40.00 km
Source-Observer Distance:	160.00 km
Min. Source-Class I Distance:	160.00 km
Max. Source-Class I Distance:	170.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	6
Wind Speed:	1.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	160.0	84.	2.00	0.022	0.05	0.000
SKY	140.	84.	160.0	84.	2.00	0.006	0.05	0.000
TERRAIN	10.	84.	160.0	84.	2.00	0.002	0.05	0.000
TERRAIN	140.	84.	160.0	84.	2.00	0.000	0.05	0.000

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	75.	154.9	94.	2.00	0.023	0.05	0.000

SKY	140.	75.	154.9	94.	2.00	0.006	0.05	0.000
TERRAIN	10.	60.	146.3	109.	2.00	0.002	0.05	0.000
TERRAIN	140.	60.	146.3	109.	2.00	0.001	0.05	0.000

APPENDIX L-F: DETAILED CALCULATIONS FOR IMPACTS TO SOILS

NTE Killingly Energy Center
Soils Screening Assessment

Run Case	1	2	3	4	5	36	37	38	39	40	32	33	34	35	41	42	43	44	68	69	70	71	65	66	67
	Natural Gas														ULSD										
Ambient Temperature (deg F)	100	100	100	100	100	59	59	59	59	59	-10	-10	-10	-10	100	100	100	100	59	59	59	59	-10	-10	-10
Relative Humidity (%)	45	45	45	45	45	60	60	60	60	60	100	100	100	100	45	45	45	45	60	60	60	60	100	100	100
CTG Load	100%	100%	100%	75%	45%	100%	100%	100%	75%	34%	100%	100%	75%	40%	100%	100%	75%	65%	100%	100%	75%	60%	100%	75%	60%
Evaporative Cooler Status	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Duct Firing Status	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	---	---	---	---	---	---	---	---	---	---	---
Fuel Type	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	OIL	OIL	OIL	OIL	OIL	OIL	OIL	OIL	OIL	OIL	OIL

Modeling Inputs	1	2	3	4	5	36	37	38	39	40	32	33	34	35	41	42	43	44	68	69	70	71	65	66	67
	Natural Gas														ULSD										
Exhaust Velocity (m/s)	17.64	17.40	16.39	13.83	10.54	18.93	18.18	17.98	14.82	10.28	19.04	18.48	14.88	10.26	18.07	17.24	14.15	13.15	18.75	18.55	15.26	13.64	19.91	16.23	14.57
Temp (K)	359.82	359.82	358.71	358.71	358.71	363.15	353.71	353.15	353.15	353.15	359.82	353.71	353.15	352.59	370.37	369.82	366.48	365.93	363.71	363.15	361.48	360.93	369.26	366.48	365.37
EMISSION RATES (g/s)																									
Ammonia																									
Arsenic	2.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.38E-05	0.00E+00	0.00E+00	0.00E+00	1.48E-05	1.40E-05	1.11E-05	1.01E-05	1.52E-05	1.52E-05	1.20E-05	1.04E-05	1.52E-05	1.22E-05	1.08E-05
Beryllium	1.28E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-06	0.00E+00	0.00E+00	0.00E+00	1.00E-04	9.43E-05	7.47E-05	6.78E-05	1.03E-04	1.02E-04	8.09E-05	7.00E-05	1.03E-04	8.23E-05	7.25E-05
Boron																									
Cadmium	1.18E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.31E-04	0.00E+00	0.00E+00	0.00E+00	1.65E-06	1.55E-06	1.23E-06	1.12E-06	1.69E-06	1.68E-06	1.33E-06	1.15E-06	1.69E-06	1.36E-06	1.20E-06
Chromium	1.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.66E-04	0.00E+00	0.00E+00	0.00E+00	4.00E-03	3.77E-03	2.98E-03	2.71E-03	4.10E-03	4.08E-03	3.23E-03	2.79E-03	4.10E-03	3.29E-03	2.90E-03
Cobalt	8.76E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.39E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.74E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper																									
Fluoride																									
Formaldehyde	8.25E-02	7.44E-02	6.94E-02	5.48E-02	3.75E-02	8.88E-02	8.01E-02	7.88E-02	6.26E-02	3.81E-02	9.16E-02	8.26E-02	6.53E-02	3.94E-02	7.45E-02	7.02E-02	5.57E-02	5.05E-02	7.65E-02	7.62E-02	6.03E-02	5.21E-02	7.64E-02	6.13E-02	5.40E-02
H2SO4																									
Lead	5.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.61E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.82E-05	0.00E+00	0.00E+00	0.00E+00	3.39E-04	3.20E-04	2.54E-04	2.30E-04	3.49E-04	3.47E-04	2.74E-04	2.37E-04	3.48E-04	2.79E-04	2.46E-04
Manganese	3.95E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-05	0.00E+00	0.00E+00	0.00E+00	5.82E-05	5.48E-05	4.35E-05	3.94E-05	5.98E-05	5.95E-05	4.71E-05	4.07E-05	5.96E-05	4.79E-05	4.22E-05
Mercury	2.67E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.97E-05	0.00E+00	0.00E+00	0.00E+00	3.30E-06	3.11E-06	2.46E-06	2.23E-06	3.39E-06	3.37E-06	2.67E-06	2.31E-06	3.38E-06	2.71E-06	2.39E-06
Nickel	2.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E-04	0.00E+00	0.00E+00	0.00E+00	4.76E-04	4.49E-04	3.56E-04	3.23E-04	4.89E-04	4.87E-04	3.85E-04	3.33E-04	4.88E-04	3.92E-04	3.45E-04
Selenium	2.56E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.85E-06	0.00E+00	0.00E+00	0.00E+00	8.24E-05	7.77E-05	6.16E-05	5.59E-05	8.46E-05	8.42E-05	6.66E-05	5.76E-05	8.45E-05	6.78E-05	5.98E-05
Toluene	4.46E-02	4.42E-02	4.12E-02	3.25E-02	2.23E-02	4.80E-02	4.76E-02	4.68E-02	3.72E-02	2.26E-02	4.95E-02	4.90E-02	3.88E-02	2.34E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium																									
Xylene	2.18E-02	2.18E-02	2.03E-02	1.60E-02	1.10E-02	2.35E-02	2.34E-02	2.31E-02	1.83E-02	1.11E-02	2.42E-02	2.41E-02	1.91E-02	1.15E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc																									
MODELING RESULTS																									
AERMOD Unit Impacts (ug/m3 per g/s)																									
Annual	0.035	0.035	0.039	0.050	0.072	0.030	0.036	0.037	0.049	0.080	0.031	0.035	0.049	0.081	0.030	0.032	0.044	0.049	0.030	0.031	0.042	0.050	0.026	0.036	0.043
SCALED IMPACTS (ug/m3)																									MAX
Ammonia																									
Arsenic	7.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.89E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E-07	0.00E+00	0.00E+00	0.00E+00	4.39E-07	4.43E-07	4.88E-07	4.95E-07	4.61E-07	4.69E-07	5.05E-07	5.16E-07	4.00E-07	4.38E-07	4.60E-07	7.39E-07
Beryllium	4.44E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.13E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.43E-08	0.00E+00	0.00E+00	0.00E+00	2.96E-06	2.99E-06	3.29E-06	3.34E-06	3.11E-06	3.16E-06	3.40E-06	3.48E-06	2.70E-06	2.95E-06	3.10E-06	3.48E-06
Boron																									
Cadmium	4.07E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E-06	0.00E+00	0.00E+00	0.00E+00	4.88E-08	4.93E-08	5.42E-08	5.50E-08	5.12E-08	5.21E-08	5.61E-08	5.73E-08	4.45E-08	4.87E-08	5.11E-08	4.07E-06
Chromium	5.17E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.82E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.17E-06	0.00E+00	0.00E+00	0.00E+00	1.18E-04	1.19E-04	1.31E-04	1.33E-04	1.24E-04	1.26E-04	1.36E-04	1.39E-04	1.08E-04	1.18E-04	1.24E-04	1.39E-04
Cobalt	3.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.83E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-07
Copper																									
Fluoride																									
Formaldehyde	2.85E-03	2.62E-03	2.71E-03	2.75E-03	2.69E-03	2.67E-03	2.87E-03	2.90E-03	3.06E-03	3.04E-03	2.84E-03	2.89E-03	3.17E-03	3.18E-03	2.20E-03	2.23E-03	2.45E-03	2.49E-03	2.32E-03	2.36E-03	2.54E-03	2.59E-03	2.01E-03	2.20E-03	2.31E-03	3.18E-03
H2SO4																									
Lead	1.81E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.69E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.81E-06	0.00E+00	0.00E+00	0.00E+00	1.00E-05	1.01E-05	1.12E-05	1.13E-05	1.05E-05	1.07E-05	1.15E-05	1.18E-05	9.16E-06	1.00E-05	1.05E-05	1.18E-05
Manganese	1.37E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-06	0.00E+00	0.00E+00	0.00E+00	1.72E-06	1.74E-06	1.91E-06	1.94E-06	1.81E-06	1.84E-06	1.98E-06	2.02E-06	1.57E-06	1.72E-06	1.80E-06	2.02E-06
Mercury	9.24E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.22E-07	0.00E+00	0.00E+00	0.00E+00	9.75E-08	9.85E-08	1.08E-07	1.10E-07	1.02E-07	1.04E-07	1.12E-07	1.15E-07	8.90E-08	9.73E-08	1.02E-07	9.24E-07
Nickel	7.76E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.23E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.75E-06	0.00E+00	0.00E+00	0.00E+00	1.41E-05	1.42E-05	1.57E-05	1.59E-05	1.48E-05	1.51E-05	1.62E-05	1.66E-05	1.29E-05	1.41E-05	1.48E-05	1.66E-05
Selenium	8.87E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.85E-08	0.00E+00	0.00E+00	0.00E+00	2.44E-06	2.46E-06	2.71E-06	2.75E-06	2.56E-06	2.61E-06	2.80E-06	2.86E-06	2.22E-06	2.43E-06	2.55E-06	2.86E-06
Toluene	1.54E-03	1.56E-03	1.61E-03	1.63E-03	1.60E-03	1.45E-03	1.71E-03	1.72E-03	1.82E-03	1.81E-03	1.54E-03	1.72E-03	1.89E-03	1.89E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E-03
Vanadium																									
Xylenes	7.53E-04	7.68E-04	7.93E-04	8.04E-04	7.87E-04	7.06E-04	8.40E-04	8.48E-04	8.95E-04	8.90E-04	7.51E-04	8.46E-04	9.28E-04	9.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.30E-04
Zinc																									

Killingly Energy Center - Soils Impact Screening Assessment

Trace Element	Annual Conc (ug/m3)	Maximum Project Deposited Soil Concentration (ppmw)	Soil Screening Criteria (ppmw)	Percent of Soil Screening Criteria	Avg. Soil Conc (ppmw)	Percent Increase	Soil Concentration Ratio	Plant Tissue Concentration (ppmw)	Plant Screening Criteria (ppmw)	Percent of Plant Screening Criteria
Arsenic	7.39E-07	2.12E-04	3	0.01%	6	0.00%	0.14	2.97E-05	0.25	0.01%
Cadmium	4.07E-06	1.17E-03	2.5	0.05%	0.06	1.94%	10.7	1.25E-02	3	0.42%
Chromium	1.39E-04	3.98E-02	8.4	0.47%	100	0.04%	0.02	7.96E-04	1	0.08%
Lead	1.18E-05	3.38E-03	1000	0.00%	10	0.03%	0.45	1.52E-03	126	0.00%
Manganese	2.02E-06	5.80E-04	2.5	0.02%	850	0.00%	0.066	3.83E-05	400	0.00%
Mercury	9.24E-07	2.65E-04	455	0.00%	0.1	0.26%	0.5	1.32E-04	NA	NA
Nickel	1.66E-05	4.75E-03	500	0.00%	40	0.01%	0.045	2.14E-04	60	0.00%
Selenium	2.86E-06	8.21E-04	13	0.01%	0.5	0.16%	1	8.21E-04	100	0.00%