Exhibit B:

June 10, 2013, Letter from Tetra Tech to MassDEP

(the "June 10, 2013 Supplement")

TETRA TECH

June 10, 2013

Mr. James Belsky, Permit Chief
MassDEP Northeast Region
205B Lowell Street
Wilmington, MA 01887

Re: Second Supplement to Major Comprehensive Plan Application – Salem Harbor Redevelopment (SHR) Project (Transmittal Number X254064)

Dear Mr. Belsky:

This Second Supplement to the Major Comprehensive Plan Application submitted on December 21, 2012, as supplemented by the First Supplement ("First Supplement" dated April 12, 2013 (collectively, the "Plan Application") is being submitted on behalf of Footprint Power Salem Harbor Development LP ("Footprint"). This Second Supplement updates the Plan Application: (1) to reflect Footprint's selection of GE as the turbine vendor for the SHR Facility; and (2) to provide additional information requested by the Department as set forth in the First Supplement.

Footprint has selected the GE Energy 107FA.05 Rapid Response Combined Cycle Plant for the SHR Facility. Accordingly, Footprint is now able to update the emissions profile for the Facility to more accurately reflect equipment-specific proposed conditions. That is, Footprint's previous emissions modeling was based on a "worst case equipment envelope" which encompassed the highest emissions values for both the GE and Siemen's equipment options. The selection of GE as equipment vendor allows Footprint to model emissions based upon data specific to the GE 107FA.05 equipment to be utilized at the SHR Facility, and based upon data that are specific to proposed operations at the SHR Facility. Highlights of key changes to the Plan Application are as follows:

- Annual emissions (tons per year) are the same or less than previously proposed. Importantly, the modeling results also show that emissions from the SHR Facility now will be below the SILs for PM_{10} and for annual $PM_{2.5}$

- With selection of the GE 107FA.05 combined cycle plant, the proposed GHG BACT value is reduced from 842 to 825 lb/MWhr. This is based on the projected "new and clean" full load ISO corrected heat rate for each GE-based combined cycle unit of 6,940 Btu/kWhr. This is also based on higher heating value (HHV), and net output to the grid. Using the EPA Part 75 default CO_2 emission factor of 118.9 lb/MMBtu, this corresponds to 825 lb/MWhr. This is for "new and clean" conditions, full load, and corrected to ISO conditions.

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- The site layout has been modified slightly, and the auxiliary boiler flue will now be located in the main stack rather than the separate 125' stack that was previously proposed.

In addition, this Second Supplement also provides additional information identified in the First Supplement as items 4, 5 and 7, and addresses item numbers 8, 9, 14 and 15. These items are as follows:

> 4. Additional information on evaluation of energy conservation improvements suggested by the Massachusetts Department of Energy Resources (DOER).
>
> 5. Additional information on start-up emissions and durations and all emissions expressed on an energy output basis (in units of lb/MW-hr).
>
> 7. Update on the required emissions offsets.
> 8. Final air quality impact modeling based on the selection of GE as turbine vendor with final site configuration and including GE Lynn and Wheelabrator Saugus as interacting sources for PM and NO_x and Rousselot, Peabody Municipal Light, and Marblehead Municipal Light as interacting sources for 1-hour NO_x.
>
> 9. A more detailed analysis of federal environmental justice (EJ) considerations in support of the PSD application.
> 14./15. Final acoustic documentation and modeling for the facility based on the turbine vendor selected, and the final site layout and noise mitigation plan.

Attachment 1 provides updated copies of the relevant tables of the Plan Application. Attachment 2 provides updated Application forms. Attachment 3 provides updated emission calculations. Attachment 4 provides the Environmental Justice (EJ) analysis. Attachment 5 provides an updated site layout. Attachment 6 provides noise analysis details. With respect to item 16 (more robust analysis of the costs and benefits of alternative noise mitigation techniques), this will be provided under separate cover.

4.c) Energy Efficiency Improvements Suggested by DOER

In its comments on the Draft EIR, DOER suggested several energy efficiency improvements in order to reduce the plant parasitic load. The improvements suggested are: high efficiency exterior and industrial interior lighting, variable speed electric drives and motors, piping and valve design to reduce pressure losses, and use of premium efficiency transformers.

With respect to exterior and industrial interior lighting, this was evaluated in the First Supplement.

With respect to variable speed electric drives and motors, engineering evaluations have been completed and it has been determined that variable speed drives will be used for all the ACC fan motors and the primary boiler feedwater pump and condensate pump motors. This will capture the energy efficiency of variable speed drives for this equipment.

For the fuel gas compressors, the type of rotary screw compressors that will be used will be equipped with a proprietary control system that uses a combination of an inlet slide valve and "spill back" valve to adjust the flow and pressure. This variable control system enables the rotary screw compressor to substantially reduce power consumption from the level at maximum flow and pressure ratio to lesser power at reduced flows and pressure ratio. At lower than design flow and/or pressure ratio the performance adjustment is not made by throttling away the extra capacity with a simple pressure control valve. Compressor power varies essentially linearly with flow across most of the operating range down to about 25% of maximum load. The result is that variable frequency drives (VFD's) are neither suitable nor cost beneficial for application to rotary screw type gas compressors.

With respect to piping and valve design to reduce pressure losses, this will be one of the key design considerations for GE and the EPC contractor in detailed plant design.

With respect to premium efficiency transformers, the project will use the highest efficiency commercially available transformers that are compatible for interconnection with the National Grid switchyard.

5. Additional information on start-up emissions and durations and express all emissions on an energy output basis (in units of lb/MW-hr)

5.a) Startup Emissions

Table 5-3 of the Plan Application has been updated (see Attachment 1) to reflect GE's latest startup/shutdown emissions performance estimates. This is expressed in pounds of emissions over 45 minutes for startup and over 27 minutes for shutdown. This is estimated performance for the project based upon best engineering estimates and we expect the installed equipment will meet these standards. However, since various site-specific equipment factors can influence the actual startup/shutdown emissions, Footprint is requesting that the limits in Table 5-3 be subject to revision based upon review of the stack test data and CEMS data for the first year of operation. The Pioneer Valley Energy Center Plan Approval contains a provision to this effect (page 35 of 54, Table 11, footnote 3).

5.b) Proposed Emission Limits – Energy Output Basis

Proposed emission limits on an energy output basis are provided in Table 2 below. These proposed limits are based on the proposed heat rate for the selected GE turbine (6,940 Btu/kWhr net). These limits are proposed to apply to full load operation, "new and clean," to be demonstrated by an initial stack test, with the turbine heat rate corrected to ISO conditions.

Short-Term Emission Rates for Turbine and HRSG Units – Energy Output Basis

Pollutant	pounds/MWhr corrected to ISO conditions
NO_x	0.051
CO	0.031
VOC, unfired	0.009
VOC, duct-fired	0.015
SO_2	0.010
PM	0.04
PM_{10}	0.04
$PM_{2.5}$	0.04
NH_3	0.019

7. **Update on the emissions offsets**

To date, Footprint has secured 194 tons per year (tpy) of offsets. Given the efficiency of the GE equipment, the number of offsets required is now reduced to 183 tpy. Accordingly, Footprint has secured the necessary quantity of offsets. As recorded in the latest Massachusetts ERC Registry dated February 13, 2013, 59 tpy were purchased from the Newark Group on February 4, 2013 (22 tpy from a shutdown at Haverhill Paperboard and 37 tpy from a shutdown at Natick Paperboard). Footprint has entered into a contract to purchase another 135 tpy from a prior source shutdown in Rhode Island and the transfer is expected to be recorded in the ERC Registry soon.

8. **Final air quality impact modeling based on the plant with the selected turbine vendor and final site configuration and including GE Lynn and Wheelabrator Saugus as interacting sources for PM and NO_x and Rousselot, Peabody Municipal Light, and Marblehead Municipal Light as interacting sources for 1-hour NO_x**

The final air dispersion modeling results are provided in the relevant tables in Attachment 1. In all cases, the impacts of the proposed facility decrease compared to those submitted in the Plan Application.

The current modeling also includes GE Lynn and Wheelabrator Saugus as interacting sources for PM and NO_x and Rousselot, Peabody Municipal Light, and Marblehead Municipal Light as interacting sources for 1-hour NO_x.

9. A more detailed analysis of federal environmental justice (EJ) considerations in support of the PSD application

The expanded EJ analysis is provided in Attachment 4.

14. Final acoustic modeling for the facility based on the turbine vendor selected, and the final site layout and noise mitigation plan

Final acoustic modeling results are provided in the revised acoustic impact Table 9-4 in Attachment 1. In all cases, the maximum predicted facility impact remains no more than 6 dBA over the ambient background. The revised site layout is provided in Attachment 5.

15. Acoustic data for key plant equipment used in the final acoustic modeling

Detailed equipment acoustic data is provided in Attachment 6.

16. A more robust analysis of the costs and benefits of alternative noise mitigation techniques

The requested analysis of alternative noise mitigation techniques will be provided under separate cover.

If you have any questions, please contact either me at (617) 803-7809 or George Lipka at (617) 443-7568.

Sincerely,

Keith H. Kennedy

Keith H. Kennedy
Senior Consultant – Energy Programs

Attachments

ATTACHMENT 1

CPA/PSD APPLICATION AIR AND NOISE TABLE UPDATES

SECOND APPLICATION SUPPLEMENT

Table 3-1 Short-Term Emission Rates for Turbine and HRSG Units

Pollutant	ppmvd at 15% O_2	lb/MMBtu	lb/hr (per CTG+HRSG)
NO_x	2.0	0.0074	18.1
CO	2.0	0.0045	11.0
VOC, unfired	1.0	0.0013	3.0
VOC, duct-fired	1.7	0.0022	5.4
SO_2	0.3	0.0015	3.7
PM	N/A	<0.009	15.5
PM_{10}	N/A	<0.009	15.5
$PM_{2.5}$	N/A	<0.009	15.5
NH_3	2.0	0.0027	6.6

Table 3-3 Facility-Wide Annual Potential Emissions

Pollutant	CT Unit 1 (tpy)	CT Unit 2 (tpy)	Auxiliary Boiler (tpy)	Emergency Generator (tpy)	Fire Pump (tpy)	Auxiliary Cooling Tower (tpy)	Facility Total (tpy)
NO_x	69.9	69.9	2.9	1.7	0.4	0	144.8
CO	48.0	48.0	9.2	1.0	0.3	0	106.4
VOC	13.1	13.1	1.3	0.35	0.12	0	28.0
SO_2	14.2	14.2	0.4	0.0017	0.0006	0	28.8
PM	53.8	53.8	1.3	0.06	0.02	0.43	109.4
PM_{10}	53.8	53.8	1.3	0.06	0.02	0.43	109.4
$PM_{2.5}$	53.8	53.8	1.3	0.06	0.02	0.17	109.2
NH_3	25.5	25.5	0	0	0	0	51.0
H_2SO_4 mist	9.4	9.4	0.03	0.00013	0.00005	0	18.8
Lead	0	0	0.00013	0.000001	0.0000003	0	0.00013
Formaldehyde	3.3	3.3	0.019	0.00009	0.0005	0	6.6
Total HAP	6.3	6.3	0.5	0.0018	0.0016	0	13.1
CO_2	1,122,920	1,122,920	31,247	180	66	0	2,277,333
CO_2e	1,124,003	1,124,003	31,277	181	66	0	2,279,530

Table 3-5 Total CO and VOC Mass Emissions Per Combustion Turbine Startup/Shutdown

Pollutant	Cold Startup + Shutdown (lbs)	Warm Startup + Shutdown (lbs)	Hot Startup + Shutdown (lbs)
CO	436	280	272
VOC	52	42	41

Table 3-6 HAP and Massachusetts Air Toxics Potential Emissions

Pollutant	HAP?	AAL/TEL?	Emission Factor (lb/MMBtu)				Max. Total tpy
			CT1 CT2	Aux. Blr.	Em. Gen.	Fire Pump	
Organic Compounds							
Acetaldehyde	Y	Y	4.0E-05		2.52E-05	7.67E-04	0.8
Acrolein	Y	N	6.4E-06		7.88E-06	9.25E-05	0.1
Benzene	Y	Y	1.2E-05	2.1E-06	7.76E-04	9.33E-04	0.2
1,3-Butadiene	Y	Y	4.3E-07			3.91E-05	8.2E-03
Dichlorobenzene	Y	Y		1.2E-06			3.1E-04
Ethylbenzene	Y	Y	3.2E-05				0.6
Formaldehyde	Y	Y	3.5E-04	7.4E-05	7.89E-05	1.18E-03	6.6
Hexane	Y	N		1.8E-03			0.5
Propylene oxide	Y	Y	2.9E-05		3.85E-03	3.56E-03	0.5
Toluene	Y	Y	1.3E-04	3.3E-06	2.81E-04	4.09E-04	2.5
Xylene	Y	Y	6.4E-05		1.93E-04	2.85E-04	1.2
PAH							
Acenaphthene	Y	N		1.8E-09	4.68E-06	1.42E-06	6.2E-06
Acenaphthylene	Y	N		2.4E-09	9.23E-06	5.06E-05	3.1E-05
Anthracene	Y	N		1.8E-09	1.23E-06	1.87E-06	2.6E-06
Benzo(a)anthracene	Y	N		1.8E-09	6.22E-07	1.68E-06	1.8E-06
Benzo(a)pyrene	Y	N		1.2E-09	2.57E-07	1.88E-07	6.7E-07
Benzo(b)fluoranthene	Y	N		1.8E-09	1.11E-06	9.91E-08	1.7E-06
Benzo(g,h,i)perylene	Y	N		1.2E-09	5.56E-07	4.89E-07	1.1E-06
Benzo(k)fluoranthene	Y	N		1.8E-09	2.18E-07	1.55E-07	7.7E-07
Chrysene	Y	N		1.8E-09	1.53E-06	3.53E-07	2.3E-06
Dibenz(a,h)anthracene	Y	N		1.2E-09	3.46E-07	5.83E-07	9.3E-07
7,12-Dimethylbenz(a) anthracene	Y	N		1.6E-08			4.1E-06
Fluoranthene	Y	N		2.9E-09	4.03E-06	7.61E-06	8.3E-06

Pollutant	HAP?	AAL/TEL?	Emission Factor (lb/MMBtu)				Max. Total tpy
			CT1 CT2	Aux. Blr.	Em. Gen.	Fire Pump	
Fluorene	Y	N		2.7E-09	1.28E-05	2.92E-05	2.7E-05
Indeno(1,2,3-cd)pyrene	Y	N		1.8E-09	4.14E-07	3.75E-07	1.1E-06
3-Methylchloranthrene	Y	N		1.8E-09			4.6E-07
2-Methylnaphthalene	Y	Y		2.4E-08			6.2E-06
Naphthalene	Y	Y	1.3E-06	6.2E-07	1.30E-04	8.48E-05	2.5E-02
Phenanthrene	Y	N		1.7E-08	4.08E-05	2.94E-05	6.2E-05
Pyrene	Y	N		4.9E-09	3.71E-06	4.78E-06	7.3E-06
TOTAL PAH	Y	N	2.2E-06	6.8E-07	2.12E-04	1.68E-04	4.2E-02
Metals/Inorganics							
Ammonia	N	Y	0.0027				51.0
Arsenic	Y	Y		2.0E-07	4.62E-08	4.62E-08	5.2E-05
Beryllium	Y	Y		1.2E-08			3.1E-06
Cadmium	Y	Y		1.1E-06	5.13E-09	5.13E-09	2.8E-04
Chromium	Y	Y		1.4E-06	1.24E-05	1.24E-05	3.8E-04
Chromium VI	Y	Y		2.5E-07	2.24E-06	2.24E-06	1.4E-09
Cobalt	Y	N		8.2E-08			2.2E-05
Copper	N	Y		8.3E-07			2.2E-04
Lead	Y	Y		4.9E-07	7.69E-07	7.69E-07	1.3E-04
Manganese	Y	N		3.7E-07	2.82E-07	2.82E-07	9.8E-05
Mercury	Y	Y		2.5E-07	1.03E-08	1.03E-08	6.7E-05
Nickel	Y	Y		2.1E-06	1.48E-06	1.48E-06	5.4E-04
Selenium	Y	Y		2.4E-08	2.56E-07	2.56E-07	6.6E-06
Sulfuric Acid	N	Y	0.001	0.00012	0.00012	0.00012	19.0
Vanadium	N	Y		2.3E-06			5.9E-04
Maximum single HAP, facility-wide tpy							**6.6**
Total for all HAP, facility-wide tpy							**13.1**

Notes:

1. Blank entry (shaded) indicates no emission factor reported in the reference cited.
2. Emission factors for CT1 and CT2 are from Table 3.1-3 of AP-42 except for formaldehyde which is based on expected performance for new lean pre-mix combustion turbines. H_2SO_4 is based on 67% of SO_2 emissions (mass basis).
3. Emission factors for the auxiliary boiler are from AP-42 Tables 1.4-3 and 1.4-4.
4. Emission factors for organics for the emergency diesel generator and fire pump are from AP-42 Tables 3.4-3 and 3.4-4 for the emergency generator and Table 3.3-2 for the fire pump.
5. Metal emissions for the emergency generator and fire pump 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 is used.

Pollutant	HAP?	AAL/TEL?	Emission Factor (lb/MMBtu)				Max. Total tpy
			CT1 CT2	Aux. Blr.	Em. Gen.	Fire Pump	

6. Hexavalent chrome for the aux boiler, emergency generator and fire pump are based on 18% of the total chrome emissions based on EPA 453/R-98-004a).
7. H_2SO_4 emissions for aux boiler, emergency generator and fire pump are based on 8% of SO_2 emissions (mass basis).

Table 4-1 National and Massachusetts Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS/MAAQS (µg/m³)		Significant Impact Level (µg/m³)	Maximum Predicted SHR Project impact
		Primary	Secondary		
NO_2	Annual[1]	100	Same	1	0.4
	1-hour[2]	188	None	7.5	41.8
SO_2	Annual[1, 3]	80	None	1	0.03
	24-hour[3, 4]	365	None	5	0.7
	3-hour[4]	None	1,300	25	1.1
	1-hour[5, 6]	196	None	7.8	1.0
$PM_{2.5}$	Annual[7]	12	Same	0.3	0.12
	24-hour[8]	35	Same	1.2	3.2
PM_{10}	24-hour[9]	150	Same	5	4.3
CO	8-hour[4]	10,000	None	500	112.4
	1-hour[4]	40,000	None	2,000	313.6
O_3	8-hr[10]	147	Same	NA	NA
Pb	3-month[1]	0.15	Same	NA	<0.00016

1 Not to be exceeded.
2 Compliance based on 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area.
3 The 24-hour and annual average primary standards for SO_2 will be revoked.
4 Not to be exceeded more than once per year.
5 Compliance based on 3-hear average of 99th percentile of the daily maximum 1-hour average at each monitor within an area.
6 The 1-hour SO_2 standard was effective as of August 23, 2010.
7 Compliance based on 3-year average of weighted annual mean $PM_{2.5}$ concentrations at community-oriented monitors.
8 Compliance based on 3-year average of 98th percentile of 24-hour concentrations at each population-oriented monitor within an area.
9 Not to be exceeded more than once per year on average over 3 years.
10 Compliance based on 3-year average of fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area.

Table 4-2 Prevention of Significant Deterioration Regulatory Threshold Evaluation

Pollutant	Project Annual Emissions (tons)	PSD Major Source Threshold (tons)	PSD Significant Emission Rate (tons)	PSD Review Applies
CO	106.4	100	100	Yes
NO_x	144.8	100	40	Yes
SO_2	28.8	100	40	No
PM	109.4	100	25	Yes
PM_{10}	109.4	100	15	Yes
$PM_{2.5}$	109.2	100	10	Yes
VOC (ozone precursor)	28.0	100	40	No
Lead	0.00013	100	0.6	No
Fluorides	Negligible.	100	3	No
Sulfuric Acid Mist	18.8	100	7	Yes
Hydrogen Sulfide (H_2S)	none expected	100	10	No
Total Reduced Sulfur (including H_2S)	none expected	100	10	No
Reduced Sulfur Compounds (including H_2S)	none expected	100	10	No
GHGs (as CO_{2e})	2,279,530	100,000	75,000	Yes

Table 5-1 Top Case BACT Emission Limits

Pollutant	Emission Limitation	BACT Determination	Control Technology
NO_X	2.0 ppmvd @ 15% O_2	MassDEP Top Case BACT Guidelines for Combined Cycle Turbine > 10 MW (June 2011)	• Dry Low NOx Combustor • SCR • Oxidation Catalyst
NH_3	2.0 ppmvd @ 15% O_2		
CO	2.0 ppmvd @ 15% O_2		
VOC[1]	1.0 ppmvd @ 15% O_2 without duct firing 1.7 ppmvd @ 15% O_2 with duct firing		

[1]The Top Case VOC BACT value in the MassDEP Top Case BACT Guidelines is 1.7 ppmvdc. The vendor guaranteed VOC emission rate with duct firing is 2.0 ppmvdc. MassDEP has more recently approved a similar project (Brockton) for 2.5 ppmvdc. Therefore, Footprint Power is proposing a VOC BACT emission limit of 2.0 ppmvd @ 15% O_2 with duct firing.

Table 5-3 Startup and Shutdown Emission Limits (lbs per event)

Pollutant	Startup (duration 45 minutes)	Shutdown (duration 27 minutes)
NO_X	89	10
CO	285	151
VOC	23	29

Table 6-2 Stack Characteristics

Parameter	Turbine Stacks	Auxiliary Boiler Stack	Emergency Generator Stack	Fire Pump Engine Stack	Auxiliary Cooling Tower
Base Elevation, msl (feet/meters)	16 / 4.9	16 / 4.9	16 / 4.9	16 / 4.9	16 / 4.9
Stack Height (feet/meters)	230 / 70.1	230 / 70.1	86 / 26.2	22 / 6.71	23.3 / 7.1
Inside Stack Diameter (feet/meters)	28.3 / 8.6 (Corresponds to the effective area of both adjacent flues)	3 / 0.9	1 / 0.3	0.667 / 0.2	12 / 3.6
Number of Stacks	1 (with 2 adjacent flues modeled as a single stack)	1	1	1	3
Predominant Land Use Type	Rural	Rural	Rural	Rural	Rural
Stack Location (in NAD83): UTM-E (m) UTM-N(m)	 345,732.6 4,709,832.6	 345,738.1 4,709,835.2	 345,736.1 4,709,846.0	 345,760.2 4,709,848.0	 345,837.0 4,709,808.2

Table 6-3 Turbine Load Scenarios and Emission Rates

Turbine Manufacturer	GE	GE	GE	GE
Operating Load	100%	75%	46%	Startup
Ambient Temperature (deg F)	90	20	20	50
Evap Cooler and Duct Firing Status	ON	OFF	OFF	OFF
Combined Turbine and Duct Firing Rate (MMBtu/hr) (both turbines)	4898	3580	2720	2530
Comment	Max Firing Case – GE	Intermediate Firing Case - GE	Low Firing Case - GE	Startup Worst Case Hour
Stack Exhaust Velocity (m/s)	18.87	15.82	11.95	12.89
Stack Exhaust Temperature (°K)	369.3	357.26	352.59	344.59
CO (g/s) (both turbines)	2.78	2.03	1.95	73.03
NO_X (g/s) (both turbines)	4.57	3.34	2.54	23.42
SO_2 (g/s) (both turbines)	0.93	0.677	0.514	0.479
$PM_{2.5}$ (g/s) (both turbines)	3.91	2.92	2.80	2.60
PM_{10} (g/s) (both turbines)	3.91	2.92	2.80	2.60

Table 6-9 Project Maximum Predicted Impact Concentrations Compared to Significant Impact Levels (micrograms/cubic meter)

Pollutant	Averaging Period	Maximum Predicted Salem Harbor Redevelopment Project Impact	SIL
PM_{10}	24-Hour	4.3	5
$PM_{2.5}$	24-Hour	3.2	1.2
	Annual	0.12	0.3
NO_2	1-Hour	41.8	7.5
	Annual	0.4	1
SO_2	1-Hour	1.0	7.8
	3-Hour	1.1	25
	24-Hour	0.7	5
	Annual	0.03	1
CO	1-Hour	313.6	2000
	8-Hour	112.4	500

Table 6-11 Salem Harbor Station Redevelopment Project NAAQS Compliance Assessment (micrograms/cubic meter)

Pollutant	Averaging Period	Cumulative Impact Concentration[1]	Background	Total Impact Plus Background	NAAQS
$PM_{2.5}$ ($\mu g/m^3$)	24-Hour	3.5	19.2	22.7	35
NO_2 ($\mu g/m^3$)	1-Hour	<105.7*	82.3	<188*	188

- Note The interaction source impacts dominate the maximum total concentrations, so the results were reviewed to confirm that the proposed SHR facility does not significantly contribute to any modeled concentration at or above 105.7 ug/m3. This evaluation uses the EPA default 80% conversion of NOx to NO_2.

Table 6-12 Salem Harbor Station Redevelopment Project PSD Increment Compliance Assessment (micrograms/cubic meter)

Pollutant	Averaging Period	Project Increment Consumption[1]	Maximum Allowable PSD Increment
$PM_{2.5}$ (µg/m3)	24-Hour	4.2	9

[1]Consistent with modeling guidance for PSD increment compliance assessments, impact concentrations are based on the 5-year average of the 1st highest values occurring in each year for 24-hour and annual PM-2.5 concentrations, and the highest predicted concentration across 5 years for 24-hour PM-10 concentrations.

Table 6-13 Salem Harbor Station Redevelopment Project Maximum Project Impacts Compared to DEP Air Toxics TELs and AALs (micrograms/cubic meter)

Pollutant	Averaging Period (Criterion)	Maximum Projected Impact ($\mu g/m^3$)	Criterion Value [SIL or TEL/AAL] ($\mu g/m^3$)	Impact as % of Criterion
Acetaldehyde	24-hour (TEL)	0.053708	2	2.685%
	Annual (AAL)	0.000775	0.5	0.155%
Ammonia	24-hour (TEL)	1.093673	100	1.094%
	Annual (AAL)	0.034497	100	0.034%
Benzene	24-hour (TEL)	0.080104	1.74	4.604%
	Annual (AAL)	0.000591	0.12	0.492%
1,3-Butadiene	24-hour (TEL)	0.002035	1.20	0.170%
	Annual (AAL)	0.000019	0.003	0.625%
o-Dichlorobenzene	24-hour (TEL)	0.000047	81.74	0.0001%
	Annual (AAL)	0.000006	81.74	0.00001%
p-Dichlorobenzene	24-hour (TEL)	0.000047	122.61	0.0000%
	Annual (AAL)	0.000006	0.18	0.003%
Ethylbenzene	24-hour (TEL)	0.012962	300	0.004%
	Annual (AAL)	0.000409	300	0.0001%
Formaldehyde	24-hour (TEL)	0.203990	2.0	10.200%
	Annual (AAL)	0.005265	0.8	0.658%
Naphthalene	24-hour (TEL)	0.009739	14.25	0.068%
	Annual (AAL)	0.000067	14.25	0.0005%
Propylene oxide	24-hour (TEL)	0.334015	6	5.567%
	Annual (AAL)	0.002126	0.3	0.709%
Sulfuric Acid	24-hour (TEL)	0.053184	2.72	1.955%
	Annual (AAL)	0.001841	2.72	0.068%
Toluene	24-hour (TEL)	0.083392	80	0.104%
	Annual (AAL)	0.001857	20	0.009%
Xylenes	24-hour (TEL)	0.047138	11.80	0.399%

Pollutant	Averaging Period (Criterion)	Maximum Projected Impact ($\mu g/m^3$)	Criterion Value [SIL or TEL/AAL] ($\mu g/m^3$)	Impact as % of Criterion
	Annual (AAL)	0.000942	11.80	0.008%
Arsenic	24-hour (TEL)	0.000012	0.003	0.398%
	Annual (AAL)	0.000001	0.0003	0.351%
Beryllium	24-hour (TEL)	0.000000	0.001	0.047%
	Annual (AAL)	0.0000001	0.0004	0.015%
Cadmium	24-hour (TEL)	0.000044	0.003	1.465%
	Annual (AAL)	0.000006	0.001	0.567%
Chromium (total)	24-hour (TEL)	0.001137	1.36	0.084%
	Annual (AAL)	0.000013	0.68	0.002%
Chromium (hexavalent)	24-hour (TEL)	0.000205	0.003	6.845%
	Annual (AAL)	0.000002	0.0001	2.376%
Copper	24-hour (TEL)	0.00003	0.54	0.006%
	Annual (AAL)	0.00000	0.54	0.001%
Lead[1]	24-hour (TEL)	0.00009	0.14	0.062%
	Annual (AAL)	0.000003	0.07	0.004%
Mercury	24-hour (TEL)	0.00001	0.14	0.008%
	Annual (AAL)	0.000001	0.07	0.002%
Nickel	24-hour (TEL)	0.00021	0.27	0.079%
	Annual (AAL)	0.00001	0.18	0.006%
Selenium	24-hour (TEL)	0.00002	0.54	0.004%
	Annual (AAL)	0.0000002	0.54	0.0000%
Vanadium	24-hour (TEL)	0.00009	0.27	0.034%
	Annual (AAL)	0.00001	0.27	0.004%

[1]Most of the air pollutants that are regulated under the AAL/TEL program do not have ambient air quality standards. Lead is the one pollutant that is regulated under the AAL/TEL program and also has an AAQS.

Table 7-1 Vegetation Impact Screening Thresholds

Pollutants	Averaging Period	Maximum Project Impacts (µg/m^3)	NAAQS Secondary Standards (µg/m^3	EPA's 1980 Screening Concentrations (µg/m^3)
SO_2	1-hour	1.1	NA	917
	3-hour	1.2	1300	786
	Annual	0.03	NA	18
NO_2	4-hour	41.8[1]	NA	3760
	1 month	41.8[1]	NA	561
	Annual	0.4	100	94
CO	Week	112.4[1]	NA	1,800,000 (weekly)
PM_{10}	24-hour	4.3	150	None
$PM_{2.5}$	24-hour	3.2	35	None
	Annual	0.12	15	

[1] Conservatively based on shorter term average predicted concentration.

Table 7-2 Soils Impact Screening Assessment

Pollutant	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	3.02E-04	3	0.0	4.23E-05	0.25	0.0
Cadmium	1.63E-03	2.5	0.1	1.74E-02	3	0.6
Chromium	3.78E-03	8.4	0.0	7.56E-05	1	0.0
Copper	1.23E-03	40	0.0	5.76E-04	0.73	0.1
Lead	8.30E-04	1000	0.0	3.73E-04	126	0.0
Mercury	3.71E-04	455	0.0	1.85E-04	NA	NA
Nickel	3.31E-03	500	0.0	1.49E-04	60	0.0
Selenium	7.08E-05	13	0.0	7.08E-05	100	0.0
Vanadium	3.40E-03	2.5	0.1	3.40E-05	NA	NA

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

Table 9-4. Predicted Noise Levels during Base Load Operation

Receptor	Existing Conditions Ambient L_{90}	CCG Facility	Total	Increase Over Ambient
1. 22 Fort Avenue	47	44	49	2
2. Block House Square/Derby Street	42	44	46	4
3. Bentley Elementary School	39	41	43	4
4. 36 Derby Street	39	43	44	5
5. 56 Derby Street South	39	44	45	6
6. 79 Naugus Avenue (Marblehead)	36	34	38	2
7. Winter Island Park	39	39	42	3
8. Winter Island Road	38	33	39	1
9. Blaney Street Pier on Salem Wharf	39	42	44	5
10. Mackey Building/Art Gallery	36	41	42	6
11. House of Seven Gables	39	37	41	2
12. Pickering Wharf	41	32	42	1
WITI-1 Plummer House	40	33	41	1
WITI-2 Winter Island Road Residences	34	33	38	4

ATTACHMENT 2

CPA/PSD APPLICATION CPA FORM UPDATES

SECOND APPLICATION SUPPLEMENT

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

CPA-FUEL (BWP AQ 02 Non-Major, BWP AQ 03 Major)
Comprehensive Plan Application for Fuel Utilization Emission Unit(s)

X254064
Transmittal Number

N/A
Facility ID (if known)

Use this form for:

- Boilers firing Natural Gas and having a heat input capacity of 40,000,000 British Thermal Units per hour (Btu/hr) or more.
- Boilers firing Ultra Low Sulfur Distillate Fuel Oil and having a heat input capacity of 30,000,000 Btu/hr or more.
- Emergency turbines with a rated power output of more than 1 Megawatt (MW) and/or in lieu of complying with 310 CMR 7.26(43) for engines or turbines as described at 310 CMR (43)2 and 3.
- Other Fuel Utilization Units as specified at 310 CMR 7.02(5)(a)2. See the instructions for a complete list.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Type of Application: ☐ BWP AQ 02 Non-Major CPA ☒ BWP AQ 03 Major CPA

A. Facility Information

Salem Harbor Redevelopment Project
1. Facility Name

24 Fort Avenue
2. Street Address

Salem	MA	01970
3. City	4. State	5. ZIP Code

N/A	N/A
6. MassDEP Account # / FMF Facility # (if Known)	7. Facility AQ # / SEIS ID # (if Known)

4911	221112
8. Standard Industrial Classification (SIC) Code	9. North American Industry Classification System (NAICS) Code

10. Are you proposing a new facility? ☒ Yes ☐ No - If Yes, skip to Section B.

11. List ALL existing Air Quality Plan Approvals, Emission Cap Notifications, and 310 CMR 7.26 Compliance Certifications and associated facility-wide emission caps, if any, for this facility in the table below. If you hold a Final Operating Permit for this facility, you may leave this table blank.

Table 1

Approval Number(s)/ 25% or 50% Rule/ 310 CMR 7.26 Certification	Transmittal Number(s) (if Applicable)	Air Contaminant (e.g. CO, CO2, NOx, SO2, VOC, HAP, PM or Other [Specify])*	Existing Facility-Wide Emission Cap(s) Per Consecutive 12-Month Time Period (Tons)

*CO = carbon monoxide, CO_2 = carbon dioxide, NOx = nitrogen oxides, SO_2 = sulfur dioxide, VOC = volatile organic compoun
HAP = hazardous air pollutant, PM = particulate matter, specify if "Other"

A. Facility Information (continued)

12. Will this proposed project result in an increase in any facility-wide emission cap(s)? ☐ Yes ☒ No

    If Yes, describe:

B. Equipment Description

Note that per 310 CMR 7.02, MassDEP can issue a Plan Approval only for proposed Emission Unit(s) with air contaminant emissions that are representative of Best Available Control Technology (BACT). See Section D: Best Available Control Technology (BACT) Emissions and the MassDEP BACT Guidance.

1. Is this proposed project modifying previously approved equipment? ☐ Yes ☒ No

   If Yes, list pertinent Plan Approval(s):

2. Is this proposed project replacing previously approved equipment? ☐ Yes ☒ No

   If Yes, list pertinent Plan Approval(s):

3. Provide a description of the proposed project, including relevant parameters (including but not limited to operating temperature and pressure) and associated air pollution controls, if any:

   Footprint Power Salem Harbor Development LP proposes to construct and operate a nominal 630 megawatt (MW) natural gas-fired, quick-start combined-cycle generating facility at the Salem Harbor power station site in Salem, Massachusetts. See attached cover document for detailed descriptions of the proposed emission units.

Netting & Offsets

4. Is netting being used to avoid 310 CMR 7.00: Appendix A? ☐ Yes* ☒ No

   *If Yes, attach a description of contemporaneous increases and decreases in applicable potential (or allowable) nonattainment pollutant emissions over a period of the most recent five (5) calendar years, including the year that the proposed project will commence operating. For each emission unit, this description must include: a description of the emission unit, the year it commenced operation or was removed from service, any associated MassDEP-issued Plan Approval(s), and its potential (or allowable) nonattainment pollutant emissions. In any case, a proposed project cannot "net out" of the requirement to submit a plan application and comply with Best Available Control Technology (BACT) pursuant to 310 CMR 7.02.

5. Is the proposed project subject to 310 CMR 7.00: Appendix A Nonattainment Review? ☒ Yes* ☐ No – Skip to 6

   *If Yes, pursuant to 310 CMR 7.00: Appendix A(6), federally enforceable emission offsets, such as Emission Reduction Credits (ERCs), must be used for this part of the application. Complete Table 2 on the next page to summarize either the facility providing the federally enforceable emission offsets, or what is being shut down, curtailed or further controlled at this facility to obtain the required emission offsets. Emission offsets must be part of a federally enforceable Plan Approval to be used for offsetting emission increases in applicable nonattainment pollutants or their precursors.

B. Equipment Description (continued)

Note: Complete this table if you answered Yes to Question 5. Otherwise, skip to Question 6.

Table 2					
Source of Emission Reduction Credits (ERCs) or Emission Offsets	Transmittal No. of Plan Approval Verifying Generation of ERCs, if Any	Air Contaminant	Actual Baselines Emissions (Tons per Consecutive 12-Month Time Period)[1]	New Potential Emissions[2] (Tons per Consecutive 12-Month Time Period After Control)	ERC[3] or Emission Offsets, Including Offset Ratio & Required ERC Set Aside (Tons per Consecutive 12-Month Time Period)
TBD	TBD	NOx	0.0	144.8	183

[1] Actual Baseline Emissions means the average actual emissions for the source of emission credits or offsets in the previous two years (310 CMR 7.00: Appendix A).
[2] New Potential Emissions means the potential emissions for the source of emission credits or offsets after project completion (310 CMR 7.00: Appendix A).
[3] Emission Reduction Credit (ERC) means the difference between Actual Baseline and New Potential Emissions, including an offset ratio of 1.26:1 (310 CMR 7.00: Appendix B(3)).

6. Complete the table below to summarize the details of the proposed project.

Note: For additional information, see the instructions for a link to the MassDEP BACT Guidance.

Table 3				
Facility-Assigned Identifying Number for Proposed Equipment (Emission Unit No.)	Description of Proposed Equipment Including Manufacturer & Model Number or Equivalent (e.g. Acme Boiler, Model No. AB500)	Manufacturer's Maximum Heat Input Rating in Btu/hr	Proposed Primary Fuel	Proposed Back-Up Fuel (if Any)
1 ☒ New ☐ Modified	GE 107FA.05 with HRSG duct burner	2,449,000,000	Natural gas	None
2 ☒ New ☐ Modified	GE 107FA.05 with HRSG duct burner	2,449,000,000	Natural gas	None
3 ☒ New ☐ Modified	Cleaver Brooks CBND-80E-300D-65 Boiler or similar	80,000,000	Natural gas	None
4 ☒ New ☐ Modified	Cummins DQFAA Diesel Emergency Generator or similar	7,400,000	Ultra-low-sulfur diesel oil	None

B. Equipment Description (continued)

Note: Complete this table if you answered Yes to Question 5. Otherwise, skip to Question 6.

Table 2

Source of Emission Reduction Credits (ERCs) or Emission Offsets	Transmittal No. of Plan Approval Verifying Generation of ERCs, if Any	Air Contaminant	Actual Baselines Emissions (Tons per Consecutive 12-Month Time Period)[1]	New Potential Emissions[2] (Tons per Consecutive 12-Month Time Period After Control)	ERC[3] or Emission Offsets, Including Offset Ratio & Required ERC Set Aside (Tons per Consecutive 12-Month Time Period)

[1] Actual Baseline Emissions means the average actual emissions for the source of emission credits or offsets in the previous two years (310 CMR 7.00: Appendix A).
[2] New Potential Emissions means the potential emissions for the source of emission credits or offsets after project completion (310 CMR 7.00: Appendix A).
[3] Emission Reduction Credit (ERC) means the difference between Actual Baseline and New Potential Emissions, including an offset ratio of 1.26:1 (310 CMR 7.00: Appendix B(3)).

1. Complete the table below to summarize the details of the proposed project.

Note: For additional information, see the instructions for a link to the MassDEP BACT Guidance.

Table 3

Facility-Assigned Identifying Number for Proposed Equipment (Emission Unit No.)	Description of Proposed Equipment Including Manufacturer & Model Number or Equivalent (e.g. Acme Boiler, Model No. AB500)	Manufacturer's Maximum Heat Input Rating in Btu/hr	Proposed Primary Fuel	Proposed Back-Up Fuel (if Any)
5 ☒ New ☐ Modified	Cummins CFP9E-F50 Diesel Fire Pump or similar	2,700,000	Ultra-low-sulfur diesel oil	None
☐ New ☐ Modified				
☐ New ☐ Modified				
☐ New ☐ Modified				

B. Equipment Description (continued)

2. Complete the table below to summarize the burner details if the proposed project includes boiler(s).

Note: For additional information, see the instructions for a link to the MassDEP BACT Guidance.

Table 4

Emission Unit No.	Burner Manufacturer & Model Number or Equivalent (e.g. Acme Burner, Model No. AB300)	Manufacturer's Maximum Firing Rate (Gallons per Hour or Cubic Feet per Hour)	Type of Burner (e.g. Ultra Low NOx Burner)	Is Emission Unit Equipped with Flue Gas Recirculation?
1	TBD (duct burner)	Included below	Duct burner	☐ Yes ☒ No
2	TBD (duct burner)	Included below	Duct burner	☐ Yes ☒ No
3	Cleaver Brooks, model unknown	81,950 cfh	Ultra-low NOx	☐ Yes ☐ No TBD
				☐ Yes ☐ No

3. Complete the table below if the proposed project includes turbine(s).

Table 5

Emission Unit No.	Maximum Firing Rate (Gallons per Hour or Cubic Feet per Hour)	Maximum Output Rating (Megawatts [MW] or Kilowatts [kW]; Indicate Unit of Measure)
1	2,449,000 cfh (w/ duct burner)	see Application text
2	2,449,000 cfh (w/ duct burner)	see Application text

Continue to Next Page ►

B. Equipment Description (continued)

1. Are you proposing an Air Pollution Control Device (PCD)? ☒ Yes* ☐ No

*If Yes, complete the table below to summarize the details of each PCD being proposed.

Note: If you are proposing one or more Air Pollution Control Devices (PCDs), you must also submit the applicable Supplemental Form(s). See Page 6 for additional information.

Table 6a

Description of Proposed PCD	Emission Unit No(s). Served by PCD	Air Contaminant(s) Controlled	Overall Control (Percent by Weight)
HRSG SCR Catalyst ☒ New ☐ Existing	1, 2	VOC	
		CO	
		PM[1]	
		NO_x	78% nominal
		NH_3	
		Other:	

[1] PM includes particulate matter having a diameter of 10 microns or less (PM_{10}) and particulate matter having a diameter of 2.5 microns or less ($PM_{2.5}$).

Note: If you are proposing more than two Air Pollution Control Devices (PCDs), complete additional copies of these tables.

Table 6b

Description of Proposed PCD	Emission Unit No(s). Served by PCD	Air Contaminant(s) Controlled	Overall Control (Percent by Weight)
Oxidation Catalyst ☒ New ☐ Existing	1, 2	VOC	< 25% expected
		CO	84% nominal
		PM[1]	
		NO_x	
		NH_3	
		Other:	

B. Equipment Description (continued)

Supplemental Forms Required

If you are proposing one or more PCDs, you will also need to submit the applicable form(s) below.

If Your Project Includes:	You Must File Form(s):
Wet or Dry Scrubbers	BWP AQ Scrubber
Cyclone or Inertial Separators	BWP AQ Cyclone
Fabric Filter	BWP AQ Baghouse/Filter
Adsorbers	BWP AQ Adsorption Equipment
Afterburners or Oxidizers	BWP AQ Afterburner/Oxidizer
Electrostatic Precipitators	BWP AQ Electrostatic Precipitator
Selective Catalytic Reduction	BWP AQ Selective Catalytic Reduction
Sorbent/Reactant Injection	BWP AQ Sorbent/Reactant Injection

2. Is there any external noise generating equipment associated with the proposed project? ☒ Yes ☐ No – Skip to 12

Note: The installation of some fuel burning equipment can cause off-site noise if proper precautions are not taken. For additional guidance, see MassDEP's Noise Pollution Policy Interpretation.

3. Complete the table(s) below to summarize all associated noise suppression equipment, if any is being proposed, and attach a completed Form BWP AQ Sound to this application (unless MassDEP waives this requirement).

Emission Unit No.	Type of Noise Suppression Equipment (e.g. Mufflers, Acoustical Enclosures)	Equipment Manufacturer	Equipment Model No.
1, 2	See Application text	TBD	TBD

B. Equipment Description (continued)

4. Have you attached a completed Form BWP AQ Sound to this application? ☒ Yes ☐ No*

*If No, explain:

5. Describe the potential for visible emissions from the proposed project and how they will be controlled:

The potential for visible emissions will be neglible due to the use of natural gas and ultra low-sulfur diesel oil as the only fuels. Visible emissions will be controlled through good combustion practices.

6. Describe the potential for odor impacts from the proposed project and how they will be controlled:

The proposed project has no potential for odor impacts.

C. Stack Description

Complete the table below to summarize the details of the proposed project's stack configuration.

Note: Discharge must meet Good Air Pollution Control Engineering Practice. When designing stacks, special consideration must be given to nearby structures and terrain to prevent emissions downwash and adverse impacts upon sensitive receptors. Stack must be vertical, must not impede vertical exhaust gas flow, and must be a minimum of 10 feet above rooftop or fresh air intake, whichever is higher. For additional guidance, refer to the MassDEP "Stack Design General Guidelines." See the instructions for a link.

Emission Unit No.	Stack Height Above Ground (Feet)	Stack Height Above Roof (Feet)	Stack Exit Diameter or Dimensions (Feet)	Exhaust Gas Exit Temperature Range (Degrees Fahrenheit)	Exhaust Gas Exit Velocity Range (Feet per Second)	Stack Liner Material
1	230	105	20	175 to 215	39.2 to 61.9	Steel
2	230	105	20	175 to 215	39.2 to 61.9	Steel
3	230	105	3	up to 530	up to 70.2	Steel
4	86	10	1	up to 620	up to 113.3	Steel

Continue to Next Page ▶

B. Equipment Description (continued)

6. Have you attached a completed Form BWP AQ Sound to this application? ☐ Yes ☐ No*

*If No, explain:

7. Describe the potential for visible emissions from the proposed project and how they will be controlled:

8. Describe the potential for odor impacts from the proposed project and how they will be controlled:

C. Stack Description

Complete the table below to summarize the details of the proposed project's stack configuration.

Note: Discharge must meet Good Air Pollution Control Engineering Practice. When designing stacks, special consideration must be given to nearby structures and terrain to prevent emissions downwash and adverse impacts upon sensitive receptors. Stack must be vertical, must not impede vertical exhaust gas flow, and must be a minimum of 10 feet above rooftop or fresh air intake, whichever is higher. For additional guidance, refer to the MassDEP "Stack Design General Guidelines." See the instructions for a link.

Table 8

Emission Unit No.	Stack Height Above Ground (Feet)	Stack Height Above Roof (Feet)	Stack Exit Diameter or Dimensions (Feet)	Exhaust Gas Exit Temperature Range (Degrees Fahrenheit)	Exhaust Gas Exit Velocity Range (Feet per Second)	Stack Liner Material
5	22	10	0.667	Up to 820	Up to 80.6	Steel

Continue to Next Page ►

D. Best Available Control Technology (BACT) Emissions

1. Complete the table(s) below to summarize the proposed project's BACT emissions.

Note: Complete a separate table for each proposed fuel to be used in each Emission Unit. For example, if one Emission Unit will be capable of burning two different fuels, you will need to complete two tables.

Table 2A

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O2 or CO2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O2 or CO2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 1, 2 (per unit) Fuel Used Natural gas	PM[1]	N/A	N/A	53.8	N/A	N/A
	$PM_{2.5}$	N/A	N/A	53.8	N/A	N/A
	PM_{10}	N/A	N/A	53.8	N/A	N/A
	NO_x[2]	9 ppmvd @ 15% O2	2 ppmvd @ 15% O2	69.9	N/A	N/A
	CO	12.5 ppmvd @ 15% O2	2 ppmvd @ 15% O2	48.0	N/A	N/A
	VOC	2-2.5 ppmvd @ 15% O2	1.7 ppmvd @15% O2	13.1	N/A	N/A
	SO_2	N/A	N/A	14.2	N/A	N/A
	Max HAP[3]	N/A	N/A	3.3	N/A	N/A
	Total HAPs[3]	N/A	N/A	6.3	N/A	N/A
	NH_3	NA	2 ppmvd @ 15% O2	25.5	N/A	N/A
	CO_2[4]	825 lb/MWhr net	825 lb/MWhr net	1,122,920	N/A	N/A

[1]PM includes particulate matter having a diameter of 10 microns or less (PM_{10}) and particulate matter having a diameter of 2.5 microns or less ($PM_{2.5}$).

[2] NO_x emissions from this proposed project need to be included for the purposes of NO_x emissions tracking for 310 CMR 7.00: Appendix A, if applicable.

[3]Operating Permit facilities are required to track emissions of Hazardous Air Pollutants.

[4]Pounds of CO_2 per net MW is based on a "new and clean" net heat rate of 6,940 Btu per kWh delivered to the grid, at base load conditions, and corrected to ISO conditions of 59°F, 14.7 psia, and 60% humidity.

[5]Enter "N/A" if not requesting emissions restrictions and/or fuel usage limit.

D. Best Available Control Technology (BACT) Emissions

1. Complete the table(s) below to summarize the proposed project's BACT emissions.

Note: Complete a separate table for each proposed fuel to be used in each Emission Unit. For example, if one Emission Unit will be capable of burning two different fuels, you will need to complete two tables.

Table 9A

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 1, 2 (per unit) Fuel Used Natural gas	PM^1	≤0.009 lb/MMBtu	≤0.009 lb/MMBtu	53.8	N/A	N/A
	$PM^1_{2.5}$	≤0.009 lb/MMBtu	≤0.009 lb/MMBtu	53.8	N/A	N/A
	PM^1_{10}	≤0.009 lb/MMBtu	≤0.009 lb/MMBtu	53.8	N/A	N/A
	NO_x^2	0.0332 lb/MMBtu	0.0074 lb/MMBtu	69.9	N/A	N/A
	CO	0.0281 lb/MMBtu	0.0045 lb/MMBtu	48.0	N/A	N/A
	VOC	0.0036 lb/MMBtu	0.0022 lb/MMBtu	13.1	N/A	N/A
	SO_2	0.0015 lb/MMBtu	0.0015 lb/MMBtu	14.2	N/A	N/A
	Max HAP[3]	N/A	N/A	3.3	N/A	N/A
	Total HAPs[3]	N/A	N/A	6.3	N/A	N/A
	NH_3	NA	0.0027 lb/MMBtu	25.5	N/A	N/A
	CO_2^4	825 lb/MWhr net	825 lb/MWhr net	1,122,920	N/A	N/A

[1] PM includes particulate matter having a diameter of 10 microns or less (PM_{10}) and particulate matter having a diameter of 2.5 microns or less ($PM_{2.5}$). *Note that vendor performance is given in lb/hr which varies with load.*

[2] NOx emissions from this proposed project need to be included for the purposes of NOx emissions tracking for 310 CMR 7.00: Appendix A, if applicable.

[3] Operating Permit facilities are required to track emissions of Hazardous Air Pollutants.

[4] Pounds of CO_2 per net MW is based on a "new and clean" net heat rate of 6,940 Btu per kWh delivered to the grid, at base load conditions, and corrected to ISO weather conditions of 59°F, 14.7 psia, and 60% humidity.

[5] Enter "N/A" if not requesting emissions restrictions and/or fuel usage limit.

D. Best Available Control Technology (BACT) Emissions

1. Complete the table(s) below to summarize the proposed project's BACT emissions.

Note: Complete a separate table for each proposed fuel to be used in each Emission Unit. For example, if one Emission Unit will be capable of burning two different fuels, you will need to complete two tables.

Table 9A

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 1, 2 (per unit) Fuel Used Natural gas	PM[1]	15.5 lb/hr	15.5 lb/hr	53.8	N/A	N/A
	$PM_{2.5}$	15.5 lb/hr	15.5 lb/hr	53.8	N/A	N/A
	PM_{10}	15.5 lb/hr	15.5 lb/hr	53.8	N/A	N/A
	NO_x[2]	81.3 lb/hr	18.1 lb/hr	69.9	N/A	N/A
	CO	68.8 lb/hr	11.0 lb/hr	48.0	N/A	N/A
	VOC	8.8 lb/hr	6.4 lb/hr	13.1	N/A	N/A
	SO_2	3.7 lb/hr	3.7 lb/hr	14.2	N/A	N/A
	Max HAP[3]	N/A	N/A	3.3	N/A	N/A
	Total HAPs[3]	N/A	N/A	6.3	N/A	N/A
	NH_3	NA	6.6 lb/hr	25.5	N/A	N/A
	CO_2[4]	825 lb/MWhr net	825 lb/MWhr net	1,122,920	N/A	N/A

[1]PM includes particulate matter having a diameter of 10 microns or less (PM_{10}) and particulate matter having a diameter of 2.5 microns or less ($PM_{2.5}$).

[2] NO_x emissions from this proposed project need to be included for the purposes of NO_x emissions tracking for 310 CMR 7.00: Appendix A, if applicable.

[3]Operating Permit facilities are required to track emissions of Hazardous Air Pollutants.

[4]Pounds of CO_2 per net MW is based on a "new and clean" net heat rate of 6,940 Btu per kWh delivered to the grid, at base load conditions, and corrected to ISO weather conditions of 59°F, 14.7 psia, and 60% humidity.

[5]Enter "N/A" if not requesting emissions restrictions and/or fuel usage limit.

D. Best Available Control Technology (BACT) Emissions (continued)

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 3 Fuel Used Natural gas	PM	0.005 lb/MMBtu	0.005 lb/MMBtu	1.3	N/A	540 MMscf/yr
	$PM_{2.5}$	0.005 lb/MMBtu	0.005 lb/MMBtu	1.3	N/A	540 MMscf/yr
	PM_{10}	0.005 lb/MMBtu	0.005 lb/MMBtu	1.3	N/A	540 MMscf/yr
	NO_x	0.011 lb/MMBtu	0.011 lb/MMBtu	2.9	N/A	540 MMscf/yr
	CO	0.035 lb/MMBtu	0.035 lb/MMBtu	9.2	N/A	540 MMscf/yr
	VOC	0.005 lb/MMBtu	0.005 lb/MMBtu	1.3	N/A	540 MMscf/yr
	SO_2	0.0015 lb/MMBtu	0.0015 lb/MMBtu	0.4	N/A	540 MMscf/yr
	Max HAP	N/A	N/A	0.019	N/A	540 MMscf/yr
	Total HAPs	N/A	N/A	0.5	N/A	540 MMscf/yr
	CO_2	118.9 lb/MMBtu	118.9 lb/MMBtu	31,247	N/A	540 MMscf/yr

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D. Best Available Control Technology (BACT) Emissions (continued)

Table D-3

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 3 Fuel Used Natural gas	PM	0.40 lb/hr	0.40 lb/hr	1.3	N/A	540 MMscf/yr
	$PM_{2.5}$	0.40 lb/hr	0.40 lb/hr	1.3	N/A	540 MMscf/yr
	PM_{10}	0.40 lb/hr	0.40 lb/hr	1.3	N/A	540 MMscf/yr
	NO_x	0.88 lb/hr	0.88 lb/hr	2.9	N/A	540 MMscf/yr
	CO	2.8 lb/hr	2.8 lb/hr	9.2	N/A	540 MMscf/yr
	VOC	0.40 lb/hr	0.40 lb/hr	1.3	N/A	540 MMscf/yr
	SO_2	0.12 lb/hr	0.12 lb/hr	0.4	N/A	540 MMscf/yr
	Max HAP	N/A	N/A	0.019	N/A	540 MMscf/yr
	Total HAPs	N/A	N/A	0.5	N/A	540 MMscf/yr
	CO_2	N/A	N/A	31,247	N/A	540 MMscf/yr

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D. Best Available Control Technology (BACT) Emissions (continued)

Table 4B

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 4 Fuel Used ULSD fuel oil	PM	0.232 g/kWh	0.232 g/kWh	0.06	N/A	15,810 gal/yr
	$PM_{2.5}$	0.232 g/kWh	0.232 g/kWh	0.06	N/A	15,810 gal/yr
	PM_{10}	0.232 g/kWh	0.232 g/kWh	0.06	N/A	15,810 gal/yr
	NO_x	6.4 g/kWh	6.4 g/kWh	1.7	N/A	15,810 gal/yr
	CO	3.5 g/kWh	3.5 g/kWh	1.0	N/A	15,810 gal/yr
	VOC	1.3 g/kWh	1.3 g/kWh	0.35	N/A	15,810 gal/yr
	SO_2	0.0015 lb/MMBtu	0.0015 lb/MMBtu	0.0017	N/A	15,810 gal/yr
	Max HAP	N/A	N/A	8.76e-05	N/A	15,810 gal/yr
	Total HAPs	N/A	N/A	1.76e-03	N/A	15,810 gal/yr
	CO_2	162.3 lb/MMBtu	162.3 lb/MMBtu	180	N/A	15,810 gal/yr

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D. Best Available Control Technology (BACT) Emissions (continued)

Table 9B

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 4 Fuel Used ULSD fuel oil	PM	0.42	0.42	0.06	N/A	15,810 gal/yr
	$PM_{2.5}$	0.42	0.42	0.06	N/A	15,810 gal/yr
	PM_{10}	0.42	0.42	0.06	N/A	15,810 gal/yr
	NO_x	11.6	11.6	1.7	N/A	15,810 gal/yr
	CO	6.4	6.4	1.0	N/A	15,810 gal/yr
	VOC	2.4	2.4	0.35	N/A	15,810 gal/yr
	SO_2	0.011 lb/hr	0.011 lb/hr	0.0017	N/A	15,810 gal/yr
	Max HAP	N/A	N/A	8.76e-05	N/A	15,810 gal/yr
	Total HAPs	N/A	N/A	1.76e-03	N/A	15,810 gal/yr
	CO_2	N/A	N/A	180	N/A	15,810 gal/yr

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D. Best Available Control Technology (BACT) Emissions (continued)

Table 9B

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 5 Fuel Used ULSD fuel oil	PM	0.232 g/kWh	0.232 g/kWh	0.02	N/A	5,760 gal/yr
	$PM_{2.5}$	0.232 g/kWh	0.232 g/kWh	0.02	N/A	5,760 gal/yr
	PM_{10}	0.232 g/kWh	0.232 g/kWh	0.02	N/A	5,760 gal/yr
	NO_x	4.0 g/kWh	4.0 g/kWh	0.4	N/A	5,760 gal/yr
	CO	3.5 g/kWh	3.5 g/kWh	0.3	N/A	5,760 gal/yr
	VOC	1.3 g/kWh	1.3 g/kWh	0.12	N/A	5,760 gal/yr
	SO_2	0.0015 lb/MMBtu	0.0015 lb/MMBtu	0.0006	N/A	5,760 gal/yr
	Max HAP	N/A	N/A	4.76e-04	N/A	5,760 gal/yr
	Total HAPs	N/A	N/A	1.57e-03	N/A	5,760 gal/yr
	CO_2	162.3 lb/MMBtu	162.3 lb/MMBtu	66	N/A	5,760 gal/yr

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D. Best Available Control Technology (BACT) Emissions (continued)

Table 9B

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O_2 or CO_2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O_2 or CO_2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. 5 Fuel Used ULSD fuel oil	PM	0.14	0.14	0.02	N/A	5,760 gal/yr
	$PM_{2.5}$	0.14	0.14	0.02	N/A	5,760 gal/yr
	PM_{10}	0.14	0.14	0.02	N/A	5,760 gal/yr
	NO_x	2.4	2.4	0.4	N/A	5,760 gal/yr
	CO	2.1	2.1	0.3	N/A	5,760 gal/yr
	VOC	0.79	0.79	0.12	N/A	5,760 gal/yr
	SO_2	0.004 lb/hr	0.004 lb/hr	0.0006	N/A	5,760 gal/yr
	HAP	N/A	N/A	4.76e-04	N/A	5,760 gal/yr
	Total HAPs	N/A	N/A	1.57e-03	N/A	5,760 gal/yr
	CO_2	N/A	N/A	66	N/A	5,760 gal/yr

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D. Best Available Control Technology (BACT) Emissions (continued)

Note: If you are proposing more additional Emissions Units or fuels, complete additional copies of these tables.

Table 9C

Emission Unit No. & Fuel Used	Air Contaminant	Uncontrolled Emissions (Pounds per Hour [lbs/hr], Pounds per 1 Million British Thermal Units [lb/MMBtu] or Parts per Million Dry Volume Corrected Basis [ppmvd@ %O2 or CO2])	Proposed BACT Emissions (lbs/hr, lb/MMBtu or ppmvd@ %O2 or CO2)	Proposed Consecutive 12-Month Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Monthly Time Period Emissions Restrictions (Tons, if Any)[5]	Proposed Fuel Usage Limit(s) (if Any)[5]
Unit No. Fuel Used	PM					
	$PM_{2.5}$					
	PM_{10}					
	NO_x					
	CO					
	VOC					
	SO_2					
	HAP					
	Total HAPs					
	CO_2					

Note: Top-Case BACT is the emission rate identified via the MassDEP BACT Guidance or a pre-application meeting with MassDEP.

2. Are proposed BACT emission limits in the tables above Top-Case BACT as referenced in 310 CMR 7.02(8)(a)2.a? ☒ Yes ☐ No*

*If No, you must submit form BWP AQ BACT to demonstrate that this project meets BACT as provided in 310 CMR 7.02(8)(a)2 or 310 CMR 7.02(8)(a)2.c..

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E. Monitoring Procedures

Complete the table below to summarize the details of the proposed project's monitoring procedures.

Table 10

Emission Unit No.	Type or Method of Monitoring (e.g. CEMS[1], Fuel Flow)	Parameter/Emission Monitored	Frequency of Monitoring
1, 2	CEMS, Fuel Flow, SCR parameters	NOx, CO, NH3, O2, opacity	Continuous
3	Fuel flow, hours of operation	Fuel flow, hours of operation	Continuous
4	Hour meter	Hours of operation	Continuous
5	Hour meter	Hours of operation	Continuous

[1] CEMS = Continuous Emissions Monitoring System

F. Record Keeping Procedures

Complete the table below to summarize the details of the proposed project's record keeping procedures. Proposed record keeping procedures need to be able to demonstrate your compliance status with regard to all limitations/restrictions proposed herein. Record keeping may include, but is not limited to, hourly or daily logs, meter charts, time logs, fuel purchase receipts, CEMS records, etc.

Table 11

Emission Unit No.	Parameter/Emission (e.g. Temperature, Material Usage, Air Contaminant)	Record Keeping Procedures (e.g. Data Logger or Manual)	Frequency of Data Record (e.g. Hourly, Daily)
1, 2	CEMS, Fuel Flow, SCR parameters	CEMS	Hourly
3	Fuel flow, hours of operation	Fuel flow	Daily
4	Hour meter	Hours of operation	Daily
5	Hour meter	Hours of operation	Daily

Examples of emissions calculations for record keeping purposes:

NOx: {(0.085 pounds per 1,000,000 British thermal units (MMBtu)*(**X** cubic feet)*(1,000 Btu per cubic feet) + (0.10 pounds per MMBtu)*(**Y** gallons of fuel oil)*(130,000 Btu per gallon)}* 1 ton per 2000 pounds = NOx in tons per consecutive twelve month time period

CO: {(0.035 pounds per MMBtu)*(**X** cubic feet)*(1000 Btu per cubic feet) + (0.035 pounds per MMBtu)*(**Y** gallons of fuel oil)*(130,000 Btu per gallon}*1 ton per 2000 pounds = CO in tons per consecutive twelve month time period

VOC: {(0.035 pounds per MMBtu)*(**X** cubic feet)*(1000 Btu per cubic feet) + (0.035 pounds per MMBtu)*(Y gallons of fuel oil)*(130,000 Btu per gallon}*1 ton per 2000 pounds= VOC in tons per consecutive twelve month time period

SO_2: {(0.0015 lb per MMBtu)*(Y gallons of fuel oil)*(130,000 Btu per gallon)}*1 ton per 2000 pounds = SO_2 in tons per consecutive twelve month time period

Where: **X** = cubic feet of natural gas burned per consecutive twelve month time period
Y = gallons of ULSD oil burned per consecutive twelve month time period

G. Additional Information Checklist

Attach a specific facility description and the following required additional information that MassDEP needs to process your application. Check the box next to each item to ensure that your application is complete.

- ☒ Plot Plan
- ☒ Combustion Equipment Manufacturer Specifications, Including but not Limited to Emissions Data
- ☐ Combustion Equipment Standard Operating Procedures
- ☐ Combustion Equipment Standard Maintenance Procedures, Including Cleaning Method & Frequency
- ☒ Calculations to Support This Plan Application
- ☐ Air pollution control device manufacturer specifications, if applicable
- ☐ Air pollution control device standard operating procedures, if applicable
- ☐ Air pollution control device standard maintenance procedures, if applicable
- ☐ BWP AQ BACT Form, if not proposing Top-Case BACT
- ☒ Air quality dispersion modeling demonstration documenting that National Ambient Air Quality Standards (NAAQS) are not exceeded
- ☐ Process flow diagram for the proposed equipment and any PCD, if applicable, including relevant parameters (e.g. flow rate, pressure and temperature)

Note: Pursuant to 310 CMR 7.02(5)(c), MassDEP may request additional information.

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H. Other Regulatory Considerations

Indicate below whether the proposed project is subject to any additional regulatory requirements.

310 CMR 7.00: Appendix A Nonattainment Review, or is netting used to avoid review under 310 CMR 7.00 Appendix A or 40 CFR 52.21? ☒ Yes ☐ No

40 CFR 60: New Source Performance Standards (NSPS)? ☒ Yes ☐ No

If Yes: Which subpart? **See text** Applicable emission limitation(s): **See text**

40 CFR 61: National Emission Standards for Hazardous Air Pollutants (NESHAPS) ☐ Yes ☒ No

If Yes: Which subpart? Applicable emission limitation(s):

40 CFR 63: NESHAPS for Source Categories – Maximum Achievable (MACT) or Generally Available (GACT) Control Technology ☒ Yes ☐ No
Emergency diesel generator and fire pump only

If Yes: Which subpart? **ZZZZ** Applicable emission limitation(s): **NSPS IIII**

301 CMR 11.00: Massachusetts Environmental Policy Act (MEPA)? ☒ Yes ☐ No

If Yes: EOEA No.: **14937**

Other Applicable Requirements? ☐ Yes ☐ No

If Yes: Specify:

Facility-Wide Potential-to-Emit Hazardous Air Pollutants (HAPS): ☐ Major* ☒ Non-Major

*A Major source has a facility-wide potential-to-emit of 25 tons per year or more of the sum of all hazardous air pollutants or 10 tons per year or more of any individual hazardous air pollutant.

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I. Professional Engineer's Stamp

The seal or stamp and signature of a Massachusetts Registered Professional Engineer (P.E.) must be entered below. Both the seal or stamp impression and the P.E. signature must be original. This is to certify that the information contained in this form has been checked for accuracy, and that the design represents good air pollution control engineering practice.

George S. Lipka
P.E. Name (Type or Print)

George S Lipka
P.E. Signature

Consulting Engineer
Position/Title

Tetra Tech
Company

06/10/2013
Date (MM/DD/YYYY)

29704
P.E. Number

J. Certification by Responsible Official

The signature below provides the affirmative demonstration pursuant to 310 CMR 7.02(5)(c)8 that any facility(ies) in Massachusetts, owned or operated by the proponent for this project (or by an entity controlling, controlled by or under common control with such proponent) that is subject to 310 CMR 7.00, et seq., is in compliance with, or on a MassDEP approved compliance schedule to meet, all provisions of 310 CMR 7.00, et seq., and any plan approval, order, notice of noncompliance or permit issued thereunder. This Form must be signed by a Responsible Official working at the location of the proposed new or modified facility. Even if an agent has been designated to fill out this Form, the Responsible Official must sign it. (Refer to the definition given in 310 CMR 7.00.)

I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.

Scott G. Silverstein
Responsible Official Name (Type or Print)

Responsible Official Signature

President & COO
Responsible Official Title

Footprint Power SH DevCo GP LLC,
General Partner of Applicant
Footprint Power Salem Harbor Development LP
Responsible Official Company/Organization Name

06/10/2013
Date (MM/DD/YYYY)

K. Energy Efficiency Evaluation Survey

1. Do you know where your electricity and/or fuel and/or water and/or heat and/or compressed air is being used/consumed? ☐ Yes ☐ No

2. Has your facility had an energy audit performed by your utility supplier (or other) in the past two years?[1] ☐ Yes ☐ No

   a. Did the audit include evaluations for heat loss, lighting load, cooling requirements and compressor usage? ☐ Yes ☐ No

   b. Did the audit influence how this project is configured? ☐ Yes ☐ No

3. Does your facility have an energy management plan? ☐ Yes ☐ No

   a. Have you identified and prioritized energy conservation opportunities? ☐ Yes ☐ No

   b. Have you identified opportunities to improve operating and maintenance procedures by employing an energy management plan? ☐ Yes ☐ No

4. Has each emission unit proposed herein been evaluated for energy consumption including average and peak electrical use; efficiency of electric motors and suitability of alternative motors such as variable speed; added heat load and/or added cooling load as a result of the operation of the proposed process; added energy load due to building air exchange requirements as a result of exhausting heat or emissions to the ambient air; and/or use of compressors? ☐ Yes ☐ No

5. Has your facility considered alternative energy methods such as solar, geothermal or wind power as a means of supplementing all or some of the facility's energy demand? ☐ Yes ☐ No

6. Does your facility comply with Leadership in Energy & Environmental Design (LEED) Green Building Rating System design recommendations?[2] ☐ Yes ☐ No

[1] A facility wide energy audit would include an inspection of such things as lighting, air-conditioning, heating, compressors and other energy-demand equipment. It would also provide you with information on qualifying equipment rebates and incentive programs; analysis of your energy consumption patterns and written cost-savings recommendations and estimated cost savings for installing new, high-efficiency equipment.

[2] To understand the LEED Rating System, it is important to become familiar with its comprising facets. To be considered for LEED New Construction and Major Renovations, a building must meet specific prerequisites and additional credit areas within six categories:

- Sustainable Sites
- Indoor Environmental Quality
- Materials and Resources
- Energy and Atmosphere
- Water Efficiency
- Innovation and Design

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

BWP AQ Selective Catalytic Reduction

Submit with Form CPA-FUEL and/or CPA-PROCESS whenever construction, substantial reconstruction or alteration of a Selection Catalytic Reduction system is proposed unless exempt per 310 CMR 7.02(2)(b).

X254064
Transmittal Number

N/A
Facility ID (if known)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Inlet Operating Conditions

1. Complete the table below with information on inlet gas flow(s).

Table 1a			
Emission Unit No(s). Being Controlled	**Average Inlet Gas Flow** (Actual Cubic Feet Per Minute)	**Inlet Temperature** (Degrees Fahrenheit (°F))	**Moisture Content in the Inlet** (Pounds Per Minute)
1, 2 (per unit)	2,340,000 (max)	760 °F (max)	5,080 (max)
Totals:			

2. Which metals/elements are present in gas stream? ☐ Potassium ☐ Arsenic ☐ Lead ☐ Zinc ☐ Sodium ☐ Phosphorus

3. Are there any other catalyst binding agents present in the gas stream? ☐ Yes – Describe Below ☒ No

4. Complete the table below to provide the maximum oxides of nitrogen (NOx) emissions:

Table 2		
Emission Unit No(s). Being Controlled	**Inlet NOx** (Pounds Per Hour)	**Inlet NOx** (Parts Per Million by Volume, Dry Basis)
1, 2 (per unit)	81.3	9 ppmvd @ 15% O2

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BWP AQ Selective Catalytic Reduction

Submit with Form CPA-FUEL and/or CPA-PROCESS whenever construction, substantial reconstruction or alteration of a Selection Catalytic Reduction system is proposed unless exempt per 310 CMR 7.02(2)(b).

X254064
Transmittal Number

N/A
Facility ID (if known)

B. Specifications

1. Manufacturer of Selective Catalytic Reduction (SCR) system: TBD (Company)
2. Model Number (or Equivalent): BASF VNX NOxCat or similar (Number)
3. Location of SCR unit relative to other pieces of equipment: ☐ High Dust ☒ Low Dust ☐ Tail End
4. Information about the catalyst used:
   a. Description of catalyst: Vanadia/titania type (Description)
   b. Operating temperature range of catalyst: from 600 (Degrees Fahrenheit (°F)) to 760 (Degrees Fahrenheit (°F))
   c. Pressure drop across the catalyst: 1.8 (Inches of Water)

5a. Number of catalyst layers the system can accommodate: 2 (Number)

5b. Number of catalyst layers that will be installed: 1 (Number)

6. Does the SCR system employ a guard bed for catalyst protection? ☐ Yes ☒ No*

   *If No, explain:

   Not necessary for natural gas combustion

7. Expected catalyst life: 3 years (Years)
8. Operating hours per layer of catalyst: N/A (Hours)
9. Can the catalyst be reactivated? ☐ Yes * ☒ No

   *If Yes, describe how:

10. Catalyst cleaning method: ☐ Compressed Air Soot Blower ☐ Steam Soot Blower ☐ Sonic Horns ☒ Other – Describe: N/A

11. Describe SCR system dust management technologies and strategies being used, if any (e.g. ash screens):

    None.

BWP AQ Selective Catalytic Reduction

Submit with Form CPA-FUEL and/or CPA-PROCESS whenever construction, substantial reconstruction or alteration of a Selection Catalytic Reduction system is proposed unless exempt per 310 CMR 7.02(2)(b).

X254064
Transmittal Number

N/A
Facility ID (if known)

B. Specifications (continued)

12. Are you proposing a by-pass stack? ☐ Yes * ☒ No

*If Yes, describe:

C. Description of Reducing Agent

1. Type and form of reducing agent proposed: ☐ Gaseous ☐ Liquid ☐ Anhydrous Ammonia ☒ Aqueous Ammonia ☐ Urea ☐ Other – Describe:

2. If liquid, provide weight percent in solution: 19
Weight Percent

3. Method of reducing agent injection: ☐ Direct Injection ☒ Injection Grid

4. Describe in detail how the concentration and usage rate of the reducing agent were determined. Continue on a separate attachment, if necessary.
19 percent aqueous ammonia has become accepted in the industry by precedent.

5. Describe the process controls for proper mixing of the reducing agent in the gas stream. Continue on a separate attachment, if necessary.
SCR OEM supplier provides system for metering liquid, evaporation to vapor, and injection and distribution in the gas stream by injection grid with multiple orifices vertically and horizontally distributed across duct.

6. Describe storage of the reagent, including details about any storage containment (e.g. dimension of berms, evaporative mitigation). Continue on a separate attachment, if necessary.
19% solution stored in pressure vessel provided with spill containment per attached details.

7. Is the reagent subject to 42 U.S.C. 7401, Section 112(r)? ☐ Yes * ☒ No

*If Yes, attach a copy of the Risk Management Plan to this form.

8. You MUST attach to this form a copy of an analysis of possible impacts to off-property locations from a catastrophic release of the reducing agent, in comparison with American Industrial Hygiene Association Emergncy Response Planning Guidelines.

D. Emissions Data

1. Complete the table below to provide maximum oxides of nitrogen (NOx) and ammonia (NH_3) slip concentrations and emission rates:

Air Contaminant	Outlet (Pounds Per Hour)	Outlet[1] (Parts Per Million By Volume, Dry Basis)
NOx	18.1	2 ppmvd at 15% O2
NH_3	6.6	2 ppmvd at 15% O2

[1]Boilers at 3% oxygen; combustion turbines at 15% oxygen; engines at 15% oxygen.

2. Explain how the above NOx and NH_3 emissions data were obtained. Attach appropriate calculations and documentation.

Emission rates are based on guaranteed outlet concentrations from turbine vendor. See Attachment 3 for vendor data and emission calculations.

E. Drawing of Selective Catalytic Reduction System

You must attach to this form a schematic drawing of the proposed Selective Catalytic Reduction system. At a minimum, it must show the location(s) of the catalyst bed(s), bypass damper(s) if applicable, bypass stack if applicable, and normal stack. Sampling ports for emissions testing must also be shown.

F. Monitoring, Record Keeping & Failure Notification

Note: You must notify the BWP Compliance & Enforcement Chief in the appropriate MassDEP regional office by telephone as soon as possible, within but no later than one (1) business day after you discover any upset or malfunction to facility equipment that results in excess emissions to the air and/or a condition of air pollution. You must submit written notice within seven (7) days thereafter.

1. Provide the manufacturer, make and model number of the proposed continuous emissions and opacity monitoring systems:

Make and model of CEMS not yet selected

2. Identify the air contaminants that will be continuously monitored and recorded (e.g. NOx, NH_3, opacity)

NOx, CO, NH3, opacity, O2

3. Describe any proposed process monitors (e.g. ammonia injection, fuel combustion) and frequency of data recording:

Plant control system and data logger will record fuel flow rate, MW load, and ammonia injection rate; 1-minute data recording and 1-hour data averaging.

F. Monitoring, Record Keeping & Failure Notification (continued)

4. Are there any alarms associated with the monitoring equipment? ☒ Yes – Complete Table 4 ☐ No – Explain Below

Table 4			
Operating Parameter Monitored	**Describe Alarm Trigger**	**Monitoring Device or Alarm Type**	**Does the Alarm Initiate an Automated Response?**
NOx	Out of compliance detected by CEMS	☒ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other – Describe:	☐ Yes ☒ No If Yes, Describe:
CO	Out of compliance detected by CEMS	☒ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other – Describe:	☐ Yes ☒ No If Yes, Describe:
NH3	Out of compliance detected by CEMS	☒ Visual ☐ Auditory ☐ Automatic (Remote Monitoring) ☐ Other – Describe:	☐ Yes ☒ No If Yes, Describe:

5. Describe the operating conditions that are monitored to determine the reducing agent injection rate:

Ammonia solution mass flow

6. How often will the catalyst be tested and by what test method (e.g. core sample)?

TBD

7. List and explain all of the operating and safety controls associated with the SCR system. Continue on a separate attachment, if necessary.

If inlet temperatures exceed allowable limits, alarm will sound. Operator will reduce load or shut down unit. Ammonia injection is maintained only when acceptable gas temperature is maintained.

8. List the SCR system emergency procedures to be used during system upsets. Continue on a separate attachment, if necessary.

TBD

F. Monitoring, Record Keeping & Failure Notification (continued)

9. Explain the typical fluctuations in SCR system operation, such as changes in effluent temperatures, flow rates, pollutant concentrations, etc., which may affect operation of the unit. Also explain the means by which control efficiency will be maintained throughout these fluctuations. Continue on a separate attachment, if necessary.

   SCR control logic automatically meters ammonia injection to maintain stack exit concentration set points.

10. Describe the record keeping procedures to be used in identifying the cause, duration and resolution of each system failure/emission(s) exceedance. Continue on a separate attachment, if necessary.

    TBD

11. How will the SCR system be designed so as to allow for emissions testing using MassDEP-sanctioned test methods?

    The exhaust stack will be fitted with platforms and test ports to allow stack testing using MassDEP-sanctioned test methods.

G. Standard Operating & Maintenance Procedures

Attach to this form the standard operating and maintenance procedures for the proposed Selective Catalytic Reduction system, as well as a list of the spare parts inventory that you will maintain on site, as recommended by the equipment vendor.

Continue to Next Page ▶

H. Professional Engineer's Stamp

The seal or stamp and signature of a Massachusetts Registered Professional Engineer (P.E.) must be entered below. Both the seal or stamp impression and the P.E. signature must be original. This is to certify that the information contained in this Form has been checked for accuracy, and that the design represents good air pollution control engineering practice.

George S. Lipka
P.E. Name (Type or Print)

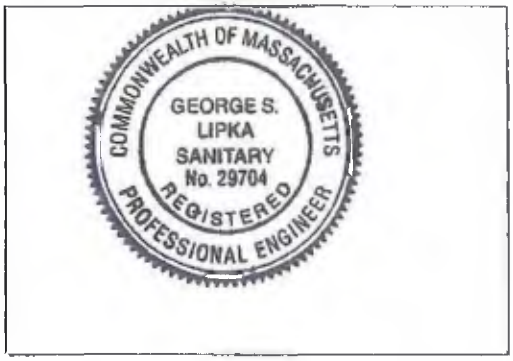
George S. Lipka
P.E. Signature

Consulting Engineer
Position/Title

Tetra Tech
Company

06/10/2013
Date (MM/DD/YYYY)

29704
P.E. Number



I. Certification by Responsible Official

The signature below provides the affirmative demonstration pursuant to 310 CMR 7.02(5)(c)8 that any facility(ies) in Massachusetts, owned or operated by the proponent for this project (or by an entity controlling, controlled by or under common control with such proponent) that is subject to 310 CMR 7.00, et seq., is in compliance with, or on a MassDEP approved compliance schedule to meet, all provisions of 310 CMR 7.00, et seq., and any plan approval, order, notice of noncompliance or permit issued thereunder. This Form must be signed by a Responsible Official working at the location of the proposed new or modified facility. Even if an agent has been designated to fill out this Form, the Responsible Official must sign it. (Refer to the definition given in 310 CMR 7.00.)

I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.

Scott G. Silverstein
Responsible Official Name (Type or Print)

Responsible Official Signature

President & COO
Responsible Official Title

Footprint Power SH DevCo GP LLC,
General Partner of Applicant
Footprint Power Salem Harbor Development LP
Responsible Official Company/Organization Name

06/10/2013
Date (MM/DD/YYYY)

MassDEP

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

BWP AQ Afterburner/Oxidizer

Submit with Form CPA-PROCESS whenever construction, substantial reconstruction or alteration of an Afterburner/Oxidizer is proposed unless exempt per 310 CMR 7.02(2)(b).

X254064
Transmittal Number

N/A
Facility ID (if known)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Inlet Operating Conditions

1. Complete the tables below with information on inlet gas flow(s).

Table 1a				
Emission Unit No(s). Being Controlled	**Average Inlet Gas Flow** (Actual Cubic Feet Per Minute)	**Moisture Content in the Inlet** (Pounds Per Minute)	**Inlet Temperature** (Degrees Fahrenheit (°F))	**Inlet Velocity** (Feet Per Second)
1, 2 (per unit)	2,340,000 (max)	5,080 (max)	760 °F (max)	TBD

Table 1b			
Provide the Maximum Gaseous Emissions			
Emission Unit No(s). Being Controlled	**Air Contaminant** (e.g. VOC, HAP, PM)*	**Air Contaminant Range Before Control** (Pounds Per Hour)	**Air Contaminant Range Before Control** (Parts Per Million, Dry Basis)
1, 2 (per unit)	CO	68.8 (max)	12.5 ppmvd @ 15% O2
1, 2 (per unit)	VOC	8.8 (max)	2-2.5 ppmvd @ 15% O2

*VOC = Volatile Organic Compounds; HAP = Hazardous Air Pollutant(s)' PM = Particulate Matter

2. Provide the capture efficiency of the ventilation system serving the Afterurner/Oxidizer. The presumption is that the capture efficiency of the system meets the criteria of the Permanent Total Enclosure (PTE) detailed in EPA Method 204.

   100
   Weight Percent (%)

3. If the proposed system does not meet the PTE criteria, explain:

   N/A

BWP AQ Afterburner/Oxidizer

Submit with Form CPA-PROCESS whenever construction, substantial reconstruction or alteration of an Afterburner/Oxidizer is proposed unless exempt per 310 CMR 7.02(2)(b).

X254064
Transmittal Number

N/A
Facility ID (if known)

B. Specifications

1. Manufacturer of Afterburner/Oxidizer: TBD (Company)
2. Model Number (or Equivalent): BASF Camet or similar (Number)
3. Type of Afterburner/Oxidizer: ☐ Recuperative ☐ Regenerative ☒ Catalytic ☐ Direct Flame

4a. If Regenerative, will there be a "puff" chamber? ☐ Yes ☐ No

4b. If Regenerative, describe how efficiency will be maintained when switching beds:

N/A

5a. If Catalytic, describe the unit:

TBD

5b. If Catalytic, provide dimensions of the bed: TBD (Height (Inches)); TBD (Width (Inches)); TBD (Depth (inches)); TBD (Weight (Pounds))

5c. If Catalytic, pressure drop range across the bed: 1.4 (Inches of Water)

6. Capacity of the Afterburner/Oxidizer: TBD (Standard Cubic Feet Per Minute)
7. Temperature at the Afterburner/Oxidizer outlet: TBD (Degrees Fahrenheit (°F))
8. Outlet gas exhaust flow rate: 2,340,000 (max) (Actual Cubic Feet Per Minute, Wet)
9. Proposed minimum operating temperature of the Afterburner/Oxidizer, as measured at the downstream end of the combustion chamber: 550 °F (Degrees Fahrenheit (°F))
10. Combustion chamber temperature control mechanism: N/A (Describe)
11. Minimum residence time of gases in combustion chamber at the minimum temperature: TBD (Seconds)
12. Explain the design and operation of any heat recovery system associated with this Afterburner/Oxidizer system. Continue on a separate attachment, if necessary.

Each combustion turbine (units 1 and 2) is equipped with a heat recovery steam generator, which will direct steam to a steam turbine generator.

Notes:
- The burner must be able to maintain this minimum operating temperature without the benefit of the heating value of contaminants in the waste stream.
- Design calculations must be submitted that incorporate fuel, air and waste stream supply rates as well as heat transfer phenomena (including heat recovery systems) used to determine the minimum gas temperature and residence time in the combustion chamber.

C. Fuel & Burner Data

1. Provide the burner manufacturer(s) and model number(s):

   N/A (no burner with this system) — Manufacturer(s)
   N/A — Model Number(s)

2. Type of Gaseous Fuel Used:
   ☐ Natural Gas ☐ Propane
   ☒ Other - Specify: N/A

3a. Gas firing rate:
   N/A — Maximum Cubic Feet Per Hour
   N/A — Minimum Cubic Feet Per Hour

3b. Maximum heat input rate:
   N/A — British Thermal Units (Btu) Per Hour

4. Describe burner design and explain how proper mixing of fuel and combustion air will be achieved:

   N/A

5. Describe the burner modulation system (e.g. full modulating, high/low, on/off):

   N/A

6. If on/off modulation will be used, describe how the minimum operating temperature will be maintained at all times:

   N/A

7. Describe what portion of the contaminant stream will bypass the burner to be mixed with the flame downstream:

   N/A

Continue to Next Page ►

D. Emissions Data

1. Describe air contaminant emissions after control by the proposed Afterburner/Oxidizer:

Table 2: Provide the Maximum Gaseous Emission Rate			
Emission Unit No(s). Being Controlled	**Air Contaminant**	**Air Contaminant Emission Range After Control** (Pounds Per Hour)	**Air Contaminant Emission Range After Control** (Parts Per Million by Volume, Dry Basis)
1, 2 (per unit)	CO	11.0 (max)	2 ppmvd @ 15% O2
1, 2 (per unit)	VOC	5.4 (max)	1.7 ppmvd @ 15% O2

2. Explain how the above air contaminant emissions data were obtained. Attach appropriate calculations and documentation.

Emission rates are based on guaranteed outlet concentrations from turbine vendor. See Appendix B of this application for detailed emission calculations and Appendix C for vendor performance data.

3a. Design destruction efficiency of organic compounds (as carbon) in the Afterburner/ Oxidizer: 84% CO; < 25% expected for VOC
Weight Percent (%)

3b. Explain how this efficiency was calculated or determined:

Based on guaranteed emission rates from turbine vendor.

4a. Design destruction efficiency for inorganic hazardous air pollutants in the Afterburner/ Oxidizer: N/A
Weight Percent (%)

4b. Explain how this efficiency was calculated or determined:

N/A

E. Catalytic Units Only

1. Estimated useful life of the catalyst: 3 years
   Amount of Time (e.g. Months or Years)

2. Describe how catalyst performance will be monitored, including the test method and frequency of testing:

   TBD

F. Drawing of Afterburner/Oxidizer Control System

You must attach to this form a schematic drawing of the proposed Afterburner/Oxidizer. At a minimum, it must show the location(s) of the burner(s), catalyst bed(s), bypass damper(s), bypass stack and normal stack. Clearly indicate the gas circulation pattern through preheat and burner chambers, and through heat recovery unit(s) prior to ambient discharge. Sampling ports for emissions testing, and location of each pressure and temperature indicator must also be shown.

G. Monitoring, Record Keeping & Failure Notification

Note: You must notify the BWP Compliance & Enforcement Chief in the appropriate MassDEP regional office by telephone as soon as possible, within but no later than one (1) business day after you discover any upset or malfunction to facility equipment that results in excess emissions to the air and/or a condition of air pollution. You must submit written notice within seven (7) days thereafter.

1. Describe the parameters that will be monitored as a surrogate for control device efficiency, and the frequency of monitoring. Continue on a separate attachment, if necessary.

   CO concetrations will be continuously monitored by a CEMS as a direct indication of compliance.

2. Describe the monitoring methods and warning/alarm system that protect against operation when the unit is not meeting design efficiency (e.g. visual monitoring, audible alarm, flashing lights, temperature indicator, pressure indicator). Continue on a separate attachment, if necessary.

   A visual alarm will be triggered by the CEMS if CO is detected to be out of compliance with emission limits.

3. Describe the record keeping procedures to be used to verify monitoring and to identify the cause, duration and resolution of each failure. Continue on a separate attachment, if necessary.

   Electronic and/or manual logbook records will be kept for each incident of missing data, excess emissions, or equipment malfunction.

Continue to Next Page ▶

G. Monitoring, Record Keeping & Failure Notification (continued)

4. Describe how failure of the Afterburner/Oxidizer will be made known to the operator during normal operations (e.g. visual monitoring, audible alarm, flashing lights, time indicator, pressure indicator). Continue on a separate attachment, if necessary.

   A visual alarm will be triggered by the CEMS if CO is detected to be out of compliance with emission limits.

5. List and explain all operating and safety controls associated with this system, including interlock systems that prevent introduction of the air contaminant(s) stream until the Afterburner/Oxidizer is operating properly. Continue on a separate attachment, if necessary.

   The oxidation catalyst is passive, and there is no bypass for the exhaust stream. During unit startups, heat from the exhaust will warm the catalyst to its required operating temperature range.

6. Describe the Afterburner/Oxidizer's emergency procedures during system upsets. Continue on a separate attachment, if necessary.

   The oxidation catalyst is passive, and therefore no emergency procedures are required during system upsets.

7. Describe features of the system design that will allow for emissions testing and operation using MassDEP-sanctioned test methods. Continue on a separate attachment, if necessary.

   The exhaust stack will be fitted with platforms and test ports to allow stack testing using MassDEP-sanctioned test methods.

H. Standard Operating & Maintenance Procedures

Attach to this form the standard operating and maintenance procedures for the proposed Afterburner/Oxidizer, as well as a list of the spare parts inventory that you will maintain on site, as recommended by the equipment vendor(s).

Continue to Next Page ►

I. Professional Engineer's Stamp

The seal or stamp and signature of a Massachusetts Registered Professional Engineer (P.E.) must be entered below. Both the seal or stamp impression and the P.E. signature must be original. This is to certify that the information contained in this Form has been checked for accuracy, and that the design represents good air pollution control engineering practice.

George S. Lipka
P.E. Name (Type or Print)

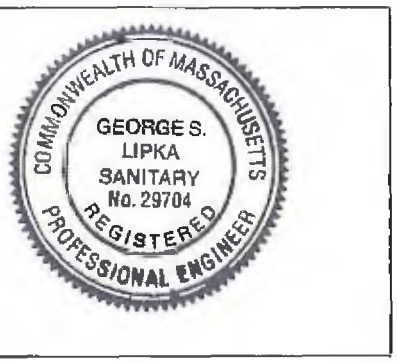
George S. Lipka
P.E Signature

Consulting Engineer
Position/Title

Tetra Tech
Company

06/10/2013
Date (MM/DD/YYYY)

29704
P.E. Number



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I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.

Scott G. Silverstein
Responsible Official Name (Type or Print)

Responsible Official Signature

President & COO
Responsible Official Title

Footprint Power SH DevCo GP LLC,
General Partner of Applicant
Footprint Power Salem Harbor Development LP
Responsible Official Company/Organization Name

06/10/2013
Date (MM/DD/YYYY)

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

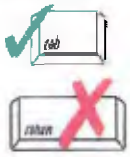
BWP AQ Sound

Submit alone and/or with Form CPA-FUEL and/or CPA-PPROCESS whenever the construction or alteration of stationary equipment (e.g. electrical generating equipment, motors, fans, process handling equipment or similar sources of sound) has the potential to cause noise, or in response to a MassDEP enforcement action citing noise as a condition of air pollution.

X254064
Transmittal Number

N/A
Facility ID (if known)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Introduction

When proposing sound suppression/mitigation measures, similar to the traditional "top-down" BACT process, the "top case" sound suppression/mitigation measures which deliver the lowest sound level increase above background are required to be implemented, unless these measures can be eliminated based upon technological or economic infeasibility. An applicant cannot "model out" of the use of the "top case" sound suppression/ mitigation measures by simply demonstrating that predicted sound levels at the property line when employing a less stringent sound suppression/mitigation strategy will result in a sound level increase of less than or equal to the 10 dBA (decibel, A –Weighted) above background sound level increase criteria contained in the MassDEP Noise Policy. A 10 dBA increase is the maximum increase allowed by MassDEP; it is not the sound level increase upon which the design of sound suppression/mitigation strategies and techniques should be based. Also, take into consideration that the city or town that the project is located in may have a noise ordinance (or similar) that may be more stringent than the criteria in the MassDEP Noise Policy

A. Sound Emission Sources & Abatement Equipment/Mitigation Measures

1. Provide a description of the source(s) of sound emissions and associated sound abatement equipment and/or mitigation measures. Also include details of sound emission mitigation measures to be taken during construction activities.

Please refer to Section 9 of the CPA application and April12, 2013 Supplement.

B. Manufacturer's Sound Emission Profiles & Sound Abatement Equipment

Please attach to this form the manufacturer's sound generation data for the equipment being proposed for installation, or the existing equipment as applicable. This data must specify the sound pressure levels for a complete 360° circumference of the equipment and at given distance from the equipment. Also attach information provided by the sound abatement manufacturer detailing the expected sound suppression to be provided by the proposed sound suppression equipment. Please refer to Attachment 5.

C. Plot Plan

Provide a plot plan and aerial photo(s) (e.g. GIS) that defines: the specific location of the proposed or existing source(s) of sound emissions; the distances from the source(s) to the property lines; the location, distances and use of all inhabited buildings (residences, commercial, industrial, etc) beyond the property lines; identify any areas of possible future construction beyond the property line; and sound monitoring locations used to assess noise impact on the surrounding community. All information provided in the sound survey shall contain sufficient data and detail to adequately assess any sound impacts to the surrounding community, including elevated receptors as applicable, not necessarily receptors immediately outside the facility's property line.
Please refer to Figure 9-2 and the maps and drawings in Appendix D of this CPA application.

Continue to Next Page ►

D. Community Sound Level Criteria

Approval of the proposed new equipment or proposed corrective measures will **not** be granted if the installation:

1. Increases off-site broadband sound levels by more than 10 dBA above "ambient" sound levels. Ambient is defined as the lowest one-hour background A-weighted sound pressure level that is exceeded 90 percent of the time measured during equipment operating hours. Ambient may also be established by other means with the consent of MassDEP.

2. Produces off-site a "pure tone" condition. "Pure tone" is defined as when any octave band center frequency sound pressure level exceeds the two adjacent frequency sound pressure levels by 3 decibels or more.

3. Creates a potential condition of air pollution as defined in 310 CMR 7.01 and the MassDEP Noise Policy.

Note: These criteria are measured both at the property line and at the nearest inhabited building.

For equipment that operates, or will be operated intermittently, the ambient or background noise measurements shall be performed during the hours that the equipment will operate and at the quietest times of the day. The quietest time of the day is usually between 1:00 a.m. and 4:00 a.m. on weekend nights. The nighttime sound measurements must be conducted at a time that represents the lowest ambient sound level expected during all seasons of the year.

For equipment that operates, or will operate, continuously and is a significant source of sound, such as a proposed power plant, background shall be established via a minimum of seven consecutive days of continuous monitoring at multiple locations with the dBA L 90 data and pure tone data reduced to one-hour averages.

In any case, consult with the appropriate MassDEP Regional Office before commencing noise monitoring in order to establish a sound monitoring protocol that will be acceptable to MassDEP.

E. Full Octave Band Analysis

The following community sound profiles will require the use of sound pressure level measuring equipment in the neighborhood of the installation. An ANSI S1.4 Type 1 sound monitor or equivalent shall be use for all sound measurements. A detailed description of sound monitor calibration methodology shall be included with any sound survey.

1. Lowest **ambient** sound pressure levels during operating hours of the equipment.

   a. At property line:

A-Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Closest noise sensitive areas (i.e., inhabited buildings) are located across the street from the property line. See Table 1b for lowest ambient sound pressure levels at those locations.										

E. Full Octave Band Analysis (continued)

b. At the nearest inhabited building and if applicable at buildings at higher elevation:

Receptor ID (see Sec 9 of text)	A-Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
3	39	45	44	44	38	38	32	26	19	14	15
4	39	52	49	48	40	37	31	23	19	15	16
5	39	43	53	46	39	36	35	25	13	11	12
9	39	56	51	46	41	38	33	25	20	17	19
10	36	43	41	37	37	35	30	21	16	14	15

Note: You are required to complete sound profiles 2a and 2b only if you are submitting this form in response to a MassDEP enforcement action citing a noise nuisance condition. If this is an application for new equipment, Skip to 3.

2. Neighborhood sound pressure levels with source operating without sound abatement equipment.

a. At property line:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

b. At the nearest inhabited building and if applicable at buildings at higher elevation:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Continue to Next Page ▶

E. Full Octave Band Analysis (continued)

3. Expected neighborhood sound pressure levels after installation of sound abatement equipment.

a. At property line:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Closest noise sensitive areas (i.e., inhabited buildings) are located across the street from the property line. See Table 3b for expected sound pressure levels after installation of sound abatement equipment at those locations.										

b. At nearest inhabited building and if applicable at buildings at higher elevations:

Receptor ID (see Sec 9 of text)	A-Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
3	43	66	60	52	43	41	35	31	23	14	-
4	44	67	63	55	44	41	36	30	23	15	-
5	45	68	64	54	44	41	38	33	24	12	-
9	44	64	59	52	45	42	38	31	22	17	-
10	42	63	59	51	42	40	35	28	19	14	-

Note: MassDEP may request that actual measurements be taken after the installation of the noise abatement equipment to verify compliance at all off-site locations.

F. Professional Engineers Stamp

The seal or stamp and signature of a Massachusetts Registered Professional Engineer (P.E.) must be entered below. Both the seal or stamp impression and the P.E. signature must be original. This is to certify that the information contained in this Form has been checked for accuracy, and that the design represents good air pollution control engineering practice.

George S. Lipka
P.E. Name (Type or Print)

P.E. Signature

Consulting Engineer
Position/Title

Tetra Tech
Company

06/10/2013
Date (MM/DD/YYYY)

29704
P.E. Number

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

BWP AQ Sound

Submit alone and/or with Form CPA-FUEL and/or CPA-PPROCESS whenever the construction or alteration of stationary equipment (e.g. electrical generating equipment, motors, fans, process handling equipment or similar sources of sound) has the potential to cause noise, or in response to a MassDEP enforcement action citing noise as a condition of air pollution.

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Facility ID (if known)

G. Certification by Responsible Official

The signature below provides the affirmative demonstration pursuant to 310 CMR 7.02(5)(c)8 that any facility(ies) in Massachusetts, owned or operated by the proponent for this project (or by an entity controlling, controlled by or under common control with such proponent) that is subject to 310 CMR 7.00, et seq., is in compliance with, or on a MassDEP approved compliance schedule to meet, all provisions of 310 CMR 7.00, et seq., and any plan approval, order, notice of noncompliance or permit issued thereunder. This Form must be signed by a Responsible Official working at the location of the proposed new or modified facility. Even if an agent has been designated to fill out this Form, the Responsible Official must sign it. (Refer to the definition given in 310 CMR 7.00.)

I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.

Scott G. Silverstein
Responsible Official Name (Type or Print)

Responsible Official Signature

President & COO
Responsible Official Title

Footprint Power SH DevCo GP LLC,
General Partner of Applicant
Footprint Power Salem Harbor Development LP
Responsible Official Company/Organization Name

06/10/2013
Date (MM/DD/YYYY)

ATTACHMENT 3

CPA/PSD APPLICATION

EMISSION CALCULATION AND VENDOR DATA UPDATES

SECOND APPLICATION SUPPLEMENT

Attachment 3

Updates to Footprint Air Emissions Calculations

Potential Emissions

GE performance data is provided as Attachment 3-1 (3 sheets). This is the same as the GE data provided in Appendix C of the December 21, 2012 application except that GE Cases 11-12, 14-15, 19-20, and 22-23 are revised. These cases have been revised to include GE turbine peak firing conditions and are highlighted in yellow. Also, the 10% duct firing cases are replaced with 50% duct firing cases. The combined turbine and duct burner heat inputs for 100% duct firing are higher than the previous GE cases, but in all cases are still less than the prior Siemens maximum firing case.

The GE load cases selected in order to characterize emissions for calculating potential emissions (and also for identifying an appropriate range of cases for dispersion modeling) are discussed below.

Calculation Sheet 1 presents the potential to emit (PTE) calculations for one turbine. Two operating cases are used to calculate potential emissions (PTE) are 100% load at 50 °F for baseload operation (8,040 hours/year) and 100% load at 90 °F with the duct burners and evaporative coolers on (720 hours per year). GE Case 7 is 100% load at 50 °F, with a heat input of 2,130 MMBtu/hr. GE Case 12 is 100% load at 90 °F with the duct burners and evaporative coolers on with a heat input of 2,449 MMBtu/hr. The CPA values are based on the direct calculation with the exact lb/MMBtu values shown on Sheet 1.

For CO, Sheet 1 shows the PTE based on 8,760 hours of operation, but the worst case PTE is based on separate calculations using startup and shutdown (SUSD) emissions and an assumed operating scenario. These calculations are provided on Sheet 2 for GE and reflect a higher PTE for CO compared to those in Sheet 1. Therefore, the maximum SUSD scenario value for CO PTE is used. In the December 21, 2012 application, VOC also had higher PTE for the SUSD but this was for the Siemens turbine. Now that GE selected, the VOC PTE is no longer controlled by the SUSD scenario. Revised GE SUSD data is provided on Attachment 3-1, Sheet 3 of 3. Compared to the previous values, the pounds of CO and VOC for startup and shutdown decrease. The pounds of NO_x for a cold startup increase very slightly (from 88 to 89 pounds) but the pounds of NO_x for shutdown decrease more substantially (from 60 to 10 pounds). The annual NO_x emissions are controlled by the full load case (8760 hours per year) and are not impacted by the startup emissions. The PM-10 SUSD emissions remain the same. Calculation Sheets 4, 5, and 6 in the December 21, 2012 application

presented emission calculations for the emergency generator, emergency diesel fire pump, and auxiliary cooling tower respectively. These have not changed and are not repeated here. Calculation Sheet 7 presents the overall summary of potential-to-emit (PTE) for the facility.

Dispersion Modeling Cases

For dispersion modeling, the combustion turbine load cases in Table 6-3 of the Application are based on selecting turbine loads to bracket the range of emissions and gas flow, now for just the GE equipment:

GE 100%: GE Case 12 (GE Max Fire)

GE 75%: GE Case 5 (Mid load conditions)

GE 46%: GE Case 6 (Low load conditions)

GE SUSD

Emissions (lb/hr) for modeling were determined the same way as described above for potential emissions. HRSG exhaust temperatures are taken directly from the vendor data.

GE Energy 107FA.05 Rapid Response Combined Cycle Plant - Manufacturer's Emissions Data - Natural Gas

GE Energy Performance Data - Site Conditions

Operating Point		1	2	3	4	5	6	7	8	9	10	11	12	13
Case Description		Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	50% DB firing	100% DB firing	Unfired
Ambient Temperature	°F	0	0	0	20	20	20	50	50	50	90	90	90	90
Ambient Pressure	psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Ambient Relative Humidity	%	60	60	60	60	60	60	60	60	60	60	60	60	60

GE Energy Performance Data - Plant Status

HRSG Duct Burner (On/Off)		Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Unfired	Fired	Fired	Unfired
Evaporative Cooler state (On/Off)		Off	Off	Off	Off	Off	Off	Off	Off	Off	On	On	On	Off
Gas Turbine Load	%	BASE	75%	50%	BASE	75%	46%	BASE	75%	46%	BASE	PEAK	PEAK	BASE
Gas Turbines Operating		1	1	1	1	1	1	1	1	1	1	1	1	1

GE Energy Performance Data - Fuel Data

GT Heat Consumption	MMBtu/hr, HHV	2300	1850	1460	2250	1790	1360	2130	1700	1310	2040	2082	2082	1980
Duct Burner Heat Consumption	MMBtu/hr, HHV	0	0	0	0	0	0	0	0	0	0	183	367	0
Total Heat Consumption (GT + DB)	MMBtu/hr, HHV	2300	1850	1460	2250	1790	1360	2130	1700	1310	2040	2265	2449	1980

GE Energy Performance Data - HRSG Exit Exhaust Gas

Composition:														
Ar	mol %	0.8900	0.8900	0.8901	0.8900	0.8901	0.8900	0.8900	0.8899	0.8900	0.8699	0.8638	0.8610	0.8700
CO2	mol %	3.8900	3.8200	3.8004	3.8900	3.8104	3.8000	3.8900	3.8796	3.6700	3.8096	4.2452	4.5717	3.7800
H2O	mol %	7.6200	7.4700	7.4307	7.7500	7.5908	7.5500	8.2400	8.2092	7.8000	10.4790	11.1012	11.7129	10.0700
N2	mol %	75.0700	75.1300	75.1475	74.9700	75.0375	75.0500	74.5800	74.5925	74.7500	72.7727	72.5443	72.3805	73.0700
O2	mol %	12.5300	12.6900	12.7313	12.5000	12.6713	12.7100	12.4000	12.4288	12.8900	12.0688	11.2454	10.5459	12.2100
Exhaust Gas Molecular Wt	lb/mole	28.4797	28.4898	28.4923	28.4655	28.4755	28.4794	28.4125	28.415	28.4408	28.1602	28.1339	28.0967	28.2020
Temperature	°F	194.5	186.5	175.0	190.1	183.4	175.0	187.4	177.1	175.0	215.0	206.0	205.0	212.0
Mass Flow	lb/hr	4,490,000	3,680,000	2,930,000	4,390,000	3,560,000	2,730,000	4,150,000	3,320,000	2,730,000	4,030,000	4,045,900	4,053,800	3,940,000

GE Energy Performance Data - HRSG Exit Exhaust Gas Emissions

NOx	ppmvd @ 15% O2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO	ppmvd @ 15% O2	2	2	2	2	2	2	2	2	2	2	2	2	2
VOC	ppmvd @ 15% O2	1	1	1	1	1	1	1	1	1	1	2	2	1
NH3	ppmvd @ 15% O2	2	2	2	2	2	2	2	2	2	2	2	2	2
Particulates - Filterable + Condensible, Including Sulfates	lb/hr	12.2	11.7	11.2	12.1	11.6	11.1	12.0	11.4	11.0	11.9	13.8	15.5	11.8

GE Energy 107FA.05 Rapid Response Combined Cycle Plant - Manufacturer's Emissions Data - Natural Gas

GE Energy Performance Data - Site Conditions

Operating Point		14	15	16	17	18	19	20	21	22	23	24	25
Case Description		50% DB firing	100% DB firing	Unfired	Unfired	Unfired	50% DB firing	100% DB firing	Unfired	50% DB firing	100% DB firing	Unfired	Unfired
Ambient Temperature	°F	90	90	90	90	105	105	105	105	105	105	105	105
Ambient Pressure	psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Ambient Relative Humidity	%	60	60	60	60	50	50	50	50	50	50	50	50

GE Energy Performance Data - Plant Status

HRSG Duct Burner (On/Off)		Fired	Fired	Unfired	Unfired	Unfired	Fired	Fired	Unfired	Fired	Fired	Unfired	Unfired
Evaporative Cooler state (On/Off)		Off	Off	Off	Off	On	On	On	Off	Off	Off	Off	Off
Gas Turbine Load	%	PEAK	PEAK	75%	47%	BASE	PEAK	PEAK	BASE	PEAK	PEAK	75%	49%
Gas Turbines Operating		1	1	1	1	1	1	1	1	1	1	1	1

GE Energy Performance Data - Fuel Data

GT Heat Consumption	MMBtu/hr, HHV	2017	2017	1590	1260	1990	2005	2005	1880	1928	1928	1520	1240
Duct Burner Heat Consumption	MMBtu/hr, HHV	183	377	0	0	0	183	377	0	183	377	0	0
Total Heat Consumption (GT + DB)	MMBtu/hr, HHV	2201	2394	1590	1260	1990	2188	2382	1880	2112	2305	1520	1240

GE Energy Performance Data - HRSG Exit Exhaust Gas

Composition:													
Ar	mol %	0.8671	0.8642	0.8700	0.8700	0.8600	0.8487	0.8458	0.8601	0.8524	0.8494	0.8600	0.8601
CO2	mol %	4.2201	4.5542	3.9100	3.5400	3.8000	4.2460	4.5840	3.7504	4.2205	4.5687	3.8500	3.4703
H2O	mol %	10 7188	11 3460	10.3200	9.6000	11.4900	12.7308	13 3587	10.8911	12.3026	12.9508	11.0600	10.3510
N2	mol %	72.8242	72.5819	72.9700	73.2500	71.9800	71.2727	71.0327	72.4172	71 5880	71 3399	72.3500	72.6273
O2	mol %	11 3698	10 6536	11.9300	12.7400	11.8700	10.9019	10 1788	12.0812	11.0364	10 2912	11.8800	12.6913
Exhaust Gas Molecular Wt	lb/mole	28.1735	28.1353	28.1866	28.2317	28.0485	27 9556	27.9177	28.1088	28.0001	27 9610	28.0999	28.1424
Temperature	°F	204.0	203.0	189.4	184.7	223.9	214.0	214.0	219.0	212.0	212 0	199.1	196.0
Mass Flow	lb/hr	3,959,400	3,967,300	3,060,000	2,680,000	3,920,000	3,882 300	3,890,200	3,770,000	3,775,500	3,967,300	2,970,000	2,680,000

GE Energy Performance Data - HRSG Exit Exhaust Gas Emissions

NOx	ppmvd @ 15% O2	2	2	2	2	2	2	2	2	2	2	2	2
CO	ppmvd @ 15% O2	2	2	2	2	2	2	2	2	2	2	2	2
VOC	ppmvd @ 15% O2	1.7	1.7	1	1	1	1.7	1.7	1	1.7	1.7	1	1
NH3	ppmvd @ 15% O2	2	2	2	2	2	2	2	2	2	2	2	2
Particulates - Filterable + Condensible, Including Sulfates	lb/hr	13.8	15.4	11.3	10.9	11.8	13.8	15.4	11.7	13 7	15 4	11.2	10.9

Attachment 3-1 (Sheet 3 of 3)

GE Energy 107FA.05 Rapid Response Combined Cycle Plant
Manufacturer's Emissions Data - Natural Gas - Startup and Shutdown Conditions - Single Unit Basis

	NOx (lb)	CO (lb)	VOC (lb)	PM10 (lb)	Duration (min)
Cold Start (GT Fire to HRSG Stack Emissions Compliance with Base Load Hold)	89	285	23	7.3	45
Warm Start (GT Fire to HRSG Stack Emissions Compliance with Base Load Hold)	54	129	13	5.0	32
Hot Start (GT Fire to HRSG Stack Emissions Compliance with Base Load Hold)	28	121	12	2.6	18
Shutdown (HRSG Stack EC to GT Flame Off)	10	151	29	5.8	27

Calculation Sheet 1
Potential Emissions for Combustion Turbines and Auxiliary Boiler

	One Combustion Turbine at 100% Load			Auxiliary Boiler	
	50 deg F	90 deg F	Annual	Gas	Annual
	No DF	DF, EC	tpy	lb/MMBtu	tpy
Hours per Year	8040	720		6570 (FLE)	6570 (FLE)
MMBtu/hr	2130	2449		80	
NOx (lb/MMBtu)	0.0074	0.0074	69.9	0.011	2.9
CO (lb/MMBtu)	0.0045	0.0045	42.5	0.035	9.2
VOC (lb/MMBtu) (See Note 4)	0.0013	0.0022	13.1	0.005	1.3
SO2 (lb/MMBtu)	0.0015	0.0015	14.2	0.0015	0.4
PM/PM-10/PM-2.5 (see Note 5)	12 lb/hr	15.5 lb/hr	53.8	0.005	1.3
NH3 (lb/MMBtu)	0.0027	0.0027	25.5	--	--
H2SO4 (lb/MMBtu)	0.001	0.001	9.4	0.00012	0.03
Lead (lb/MMBtu)	--	--	--	4.90E-07	0.00013
Formaldehyde (lb/MMBtu)	0.00035	0.00035	3.3	7.40E-05	0.019
Total HAP (lb/MMBtu)	0.000667	0.000667	6.3	1.90E-03	0.5
CO2 (lb/MMBtu)	118.9	118.9	1,122,920	118.9	31,247
CO2e (lb/MMBtu)	119.0	119.0	1,124,003	119.0	31,277
Notes:					
1. DF = Duct Firing					
2. EC = Evaporative Coolers					
3. FLE = Full Load Equivalent					

Calculation Sheet 2
GE Emissions for CO and VOC Including Startup Shutdown Scenario

Emissions for Normal Load Cases	MMBtu/hr	CO (lb/hr)	VOC (lb/hr)
Spring/Fall Normal Load Case 7 (50 deg)	2130	9.6	2.8
Summaer Case 13 except for 720 hours	1980	8.9	2.6
Summer Case 12 for 720 hours (90 deg)	2449	11.0	5.4
Winter Case 4 (20 deg)	2250	10.1	2.9

	ASSUMED OPERATING SCENARIOS											GE STARTUP/SHUTDOWN EMISSIONS						Normal Load Cases Emissions for Each Season	
	Assumed Operating Profile Normal Loads					starts/wk			starts/yr			CO			VOC				
	days/ week	hrs/ day	hrs/ week	Weeks/ yr	hrs/yr	cold	warm	hot	cold	warm	hot	cold	warm	hot	cold	warm	hot		
	Combined startup/shutdown pounds of emissions per single event											*436*	*280*	*272*	*52*	*42*	*41*		
												Annual SUSD emissions for each category and season (lbs)							
Spring/Fall	5	12	60	20	1200	1	4	0	20	80	0	8720	22400	0	1040	3360	0		
																	Case 7	11502	3323
Summer	7	24	168	2	336	0	2	0	0	4	0	0	1120	0	0	168	0		
	5	16	80	8	640	0	5	0	0	40	0	0	11200	0	0	1680	0		
	5	12	60	2	120	0	5	0	0	10	0	0	2800	0	0	420	0		
					1096												Case 13	3350	968
																	Case 12	7935	3879
Winter	7	24	168	2	336	1	0	0	2	0	0	872	0	0	104	0	0		
	5	16	80	8	640	1	4	0	8	32	0	3488	8960	0	416	1344	0		
					976												Case 4	9882	2855
TOTAL RUN HRS				42	**3272**														
Planned outage	7	24	168	4	**672**				6			2616	0	0	312	0	0		
Not Dispatched (includes time in SUSD)					**4457**														
Unplanned FO	4.1%				359						4			1088			164		
ANNUAL HRS					8760														
Total Tons in Each Category												31.6			4.5			16.3	5.5
																		CO	VOC
																	Total Emissions per unit	48.0	10.0

Calculation Sheet 7
Summary of Facility Potential to Emit (PTE) in tons per year (tpy)

	Annual emissions, tons/year						
Pollutant	CT Unit 1 (GT + DB)	CT Unit 2 (GT + DB)	Aux Boiler	Emergency Generator	Fire Pump	Aux Cooling Tower	Facility Totals
NO_x	69.9	69.9	2.9	1.7	0.4	0	144.8
CO	48.0	48.0	9.2	1.0	0.3	0	106.4
VOC	13.1	13.1	1.3	0.35	0.12	0	28.0
SO_2	14.2	14.2	0.4	0.0017	0.0006	0	28.8
PM_{10}	53.8	53.8	1.3	0.1	0.0	0.4	109.4
$PM_{2.5}$	53.8	53.8	1.3	0.1	0.0	0.2	109.2
NH_3	25.5	25.5	0	0	0	0	51.0
H_2SO_4 mist	9.4	9.4	0.03	1.33E-04	4.84E-05	0	18.8
Lead	0	0	0.00013	8.54E-07	3.10E-07	0	0.00013
Formaldehyde	3.3	3.3	0.019	8.76E-05	4.76E-04	0	6.6
Total HAP	6.3	6.3	0.5	1.76E-03	1.57E-03	0	13.1
CO_2	1,122,920	1,122,920	31,247	180	66	0	2,277,333
CO_2e	1,124,003	1,124,003	31,277	181	66	0	2,279,530

ATTACHMENT 4

CPA/PSD APPLICATION

ENVIRONMENTAL JUSTICE (EJ) EVALUATION

SECOND APPLICATION SUPPLEMENT

ATTACHMENT 4 – ENVIRONMENTAL JUSTICE

I. Introduction

Footprint Power is applying for a Prevention of Significant Deterioration (PSD) permit from MassDEP pursuant to the April 11, 2011 Delegation Agreement between US EPA and MassDEP for MassDEP to implement and enforce the PSD regulations under 40 CFR 52.21. The Delegation Agreement specifies that MassDEP identify and address, as appropriate, "disproportionality high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations," in accordance with Executive Order 12898 (February 11, 1994). Tetra Tech has considered draft federal guidance[1] as well as the Massachusetts Executive Office of Environmental Affairs (EOEA) Massachusetts-specific Environmental Justice (EJ) Policy in preparing the EJ assessment for the SHR Facility, and this analysis is intended to satisfy both state and federal requirements.

The US EPA defines EJ as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies."[2]

As demonstrated in the Air Plan Application, Supplements, and as further set forth below, no such group of people will bear a disproportionate share of negative health or environmental consequences from the issuance of a PSD permit to Footprint as (1) the SHR Facility will not be located in or abutting an EJ area; (2) nearby EJ communities have been provided with many opportunities to participate in the permitting process; and (3) the SHR Facility meets all applicable air emissions standards and would not cause or contribute to a violation of the health-based National Ambient Air Quality Standards (NAAQS). Moreover, the resulting regional emission reductions will benefit all communities, including EJ areas.

II. Identification of Environmental Justice Areas

EOEA Geographic Information System (GIS) includes EJ areas divided by block groups based on the 2010 US Census data.[3] The block groups are based on the number of people generally ranging from 500 to 2500 people as opposed to physical boundaries such as streets or rivers. There are three main EJ classifications in the EOEA EJ Policy - Minority, Low Income, and English Isolation (referred to as "Lacking English Language Proficiency" in the EOEA Policy):

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[1] US EPA, "Draft Technical Guidance for Assessing Environmental Justice in Regulatory Analysis", May 1, 2013 Post-Internal Agency Review Draft.

[2] US EPA, Basic Information: Environmental Justice. http://www.epa.gov/environmentaljustice/basics/index.html

[3] 2010 census data is the latest demographic data available. http://www.mass.gov/mgis/ej_boston_metro.pdf

- "Minorities" under the EOEA Policy are individuals who refer to themselves on federal census forms as "non-white" or as "Hispanic," which is broader than the EPA EJ definition. Any block group with 25 percent or more minority population is considered to be an EJ area.

- Income of approximately 65% of the median annual household income is considered low income. In Massachusetts median income is based on the state median household income of $62,133 per year. Thus, any block group with a median annual household income of $40,673 or less is considered to be an EJ area.

- English Isolation is any household in which members 14 years old and older speak a non-English language and also speak English less than "very well" (i.e., are not proficient in English). Any block group with 25% or more of households as English Isolated is considered to be an EJ area.

Based on EJ mapping completed by EOEA, the SHR Project does not abut any EJ areas and is not located within 1 kilometer of any EJ areas. However, the site is within approximately 10 kilometers of a number of EJ communities in Salem, Lynn, Peabody, Danvers and Beverly (see Figure 1). The closest EJ areas are classified as Minority/Low Income and Minority/Low Income/English Isolation and are located approximately 1.2 kilometers (¾ of a mile) to the southwest of the SHR Project property boundary. A portion of this area is known as the "Point Neighborhood."

The Point was originally surrounded by water on three sides and was known as Long Point or Stage Point. There were fish shacks and mill buildings in this area originally. In the mid 1880's the Naumkeag Steam Cotton Company built its first mill along the South River in the area of current day Shetland Park. French Canadians settled in this area and provided the labor force for the textile mills. The area was filled in to provide housing and more mill buildings. The Great Salem Fire of 1914 destroyed this area but it was quickly rebuilt. The area thrived until the 1950's when the textile industry moved to the south. Over the past few decades, many Spanish speaking immigrants have settled in this area.

There are several additional areas in Salem located further from the SHR Project property and these are classified as containing low income and minority populations.

III. Public Participation

Footprint has conducted informational meetings, answered questions, and translated presentations in non-English languages, in response to public interest and to encourage public participation. The following is a summary of the public outreach, including outreach to EJ communities, conducted over the past year.

- Notification of Filing an Environmental Notification Form (ENF) under the Massachusetts Environmental Policy Act (MEPA) – August, 2012

A legal notice of the availability of the ENF was published in the Salem News in English, Spanish and Portuguese on August 8, 2012. It was also published in the Marblehead Reporter in English on August 9, 2012. Additional publication of the Legal Notice of Environmental Review was published in English, Spanish and Portuguese in the Boston Globe on August, 18, 2012, the Lynn Daily Item on August 21,

2012 and in the Danvers Herald, the Beverly Citizen and the Peabody-Lynnfield Weekly News on August 23, 2012.

- Energy Facilities Siting Board (EFSB) Public Hearing, Salem MA – September 19, 2012

The following actions were taken by Footprint for the EFSB Hearing:

--Placed Notification advertisements in both English and Spanish in the Boston Globe, Salem News, and Spanish Paper El Mundo.

--Placed English and Spanish Legal Notice of the of EFSB Petition, stating Footprint Power's Development plans and the date/location of upcoming EFSB hearings, in the following locations: Salem Public Library, City Clerk's Office, North Shore Community Development Coalition, Salem Housing Authority, and ABE/ESOL Training Resources of America (Salem Office). English copies of the EFSB Petition were also placed in these locations. Notification of the placement of these EFSB documents in both English and Spanish was placed in the EFSB advertisements in all three papers.

--Mailed EFSB Notice to abutters of existing Salem Harbor Power Plant.

--Retained services of Spanish translator for EFSB hearings, to both translate information as it was presented, and to translate questions presented from the public in Spanish.

--Offered to meet with interested members of the public along with Spanish translator.

- Presentation to Historic Derby Street Neighborhood Association, November 12, 2012

In addition to the presentation, Footprint offered to Linda Haley, Chairperson that representatives would meet with individual residents to answer questions if requested.

- Draft Environmental Impact Report, December 2012

Notice of the public scoping meeting and site visit was sent to Beverly, Lynn, Salem, Peabody, Marblehead, and Danvers. Notification of the availability of the Draft Environmental Impact Report was published in the Boston Globe, the Salem News, the Marblehead Reporter, the Beverly Citizen, the Danvers Herald, the Lynn Daily Item and the Peabody-Lynnfield Weekly News in English, Spanish and Portuguese. These notices appeared on December 19 and December 20, 2012 with the exception of the Marblehead Reporter notice which appeared on December 27, 2012.

- Presentation to the Salem Harbor Power Plant Stakeholders Group, January 22, 2013

Members have been appointed by Mayor Kim Driscoll. The Stakeholders are those individuals who represent abutters to the plant, city officials whose position speaks for abutters (e.g., City Councilors, state elected officials, etc.). Footprint has made a pledge to respond to all requests for information (English or Spanish), and to openly discuss Community needs and requests.

- Presentation to The Point Neighborhood Association, February 25, 2013

Lucy Corchado, Chairperson. Footprint provided a Spanish Translator. The presentation was translated to Spanish sentence for sentence by the translator. Much of the Point leadership attended the meeting and many questions were asked. The translator obtained questions from the Point membership, translated

those questions into English so they could be answered by Footprint representatives, and then translated back into Spanish in response to the questioner. Footprint Power offered to either meet with any members and provide a Spanish interpreter, or to respond in writing (Spanish) to questions if submitted.

- Public Presentation at the Bentley Elementary School, February 26, 2013

At Mayor Driscoll's request, Footprint made a presentation to the general public. The public was invited to ask questions and/or request additional information.

- Final Environmental Impact Report, April 4, 2013

Notification of the availability of the Draft Environmental Impact Report was published in the Boston Globe, the Salem News, the Marblehead Reporter, the Beverly Citizen, the Danvers Herald, the Lynn Daily Item and the Peabody-Lynnfield Weekly News in English, Spanish and Portuguese on April 4, 2013.

- Salem Planning Board Meetings, May 2, 2013, May 6, 2013, and June 6, 2013

These meetings are being continued to June 20, 2013 and are held at Bentley Elementary School. They are open to the public.

- Ongoing coordination with Lucy Corchado, Chairperson of the Point Neighborhood Association

Footprint is in process of translating most recent/complete power point presentation into Spanish for distribution to the membership. Footprint has asked if there are other issues, questions or concerns about which she or her membership would like us to translate/provide information or responses.

IV. Impact Analysis

Prior to 1949 the site was used for commercial purposes related to the handling of coal and oil. The first power plant built on the site was a coal fired unit that commenced operation in 1951. A second coal-fired generation unit commenced operation in 1952, and a third coal-fired unit was added in 1958. In 1978 a fourth, oil-fired, unit was added. The existing facility has operated as a grandfathered facility (that did not have to meet emissions standards applied to new power plants) for many years and would not have been able to be built under today's environmental regulations. However, the existing facility did provide a significant economic value to the residents of Salem in tax payments. The proposed SHR facility will result in significant decreases of emissions, not just as compared with the existing facility, but also regionally, while providing a tax benefit to the City of Salem and its residents.

Once operational, the SHR Facility will be the most efficient fossil-fueled electric generator in the Northeast Massachusetts (NEMA) zone and is expected to provide 5.1 million MWh of electricity annually. This additional supply will reduce the need for generation from other power plants with lower efficiency and higher operating costs, primarily fueled by natural gas, oil, and coal. Charles River Associates has conducted an analysis projecting the operation of the New England bulk power system over the period 2016-2025, for scenarios with and without the SHR Facility in service, and quantified the

expected changes in air emissions by the project directly and the associated reductions of emissions at competing plants elsewhere in New England and, in particular, Massachusetts. One of the key findings of this study is that because it displaces other, less efficient generation on the New England grid, operation of the SHR Facility reduces annual regional air emissions by 457,626 tons (1.3%) of CO_2, 984 tons (10%) of NO_x, and 888 tons (8%) of SO_2.

Health Risk Assessment

Footprint commissioned a health risk assessment (HRA) for the EFSB process to assess the potential for human health risk associated with the SHR Project.[4] Gradient Corporation prepared the human health risk assessment evaluating the likelihood of both acute non-cancer health risks and chronic non-cancer and cancer health risks that may result from people's inhalation of airborne pollutants for SHR Project stack air emissions. Gradient also collected relevant background health information for Salem and surrounding communities to determine if any types of disease (*e.g.*, cancer and asthma) were higher than expected compared to Massachusetts as a whole.

Overall, the health risk assessment for the SHR Project indicates that maximum predicted air levels of specific substances associated with SHR Project air emissions would not be expected to contribute to adverse health effects among potentially affected populations. Several separate lines of evidence from the HRA support the conclusion that the potential air emissions from the SHR Project are not expected to have an adverse effect on public health in the Salem area. These include the following:

1. The maximum cumulative air concentrations (project impact plus existing background) of the criteria pollutants of concern, which include SO_2, CO, NO_2, and PM, are well below the health-protective NAAQS. NAAQS are set to protect human health with a wide margin of safety even for sensitive populations. Stack emissions of criteria air pollutants are thus not expected to lead to impacts on human health (*e.g.*, asthma, cardiovascular and respiratory diseases) in nearby communities, even in sensitive populations.
2. The quantitative HRA showed that, for possible non-cancer effects, all hazard quotients (HQs), calculated for an off-site resident exposed to maximum modeled incremental SHR Project stack impacts, were well below unity (HQ = 1), with none being higher than HQ = 0.01. The overall summed HI for SHR Project stack emissions is also well below 1.0, *i.e.*, HI = 0.08. These results help assure that non-cancer, adverse health effects are not to be expected from the non-criteria air-pollutant emissions.
3. The quantitative HRA showed that conservatively projected cancer risks for maximum modeled SHR Project stack impacts of possible carcinogenic chemicals were well below the 1 in 10,000 to 1 in 1,000,000 lifetime risk range, which is considered to be acceptably low by US EPA. The overall summed cancer risk from the Project was about 1 in 10,000,000 over a lifetime, which is well below the US EPA *de minimis* risk level. The individual pollutant cancer risks were each even lower than the *de minimis* level, between about 1 in 10,000,000,000 and about 4 in 100,000,000. These results support *de minimis* cancer risk from worst-case chronic exposures to maximum modeled SHR Project stack impacts.
4. Based on the air-modeling results, short-term SHR air emissions impacts are not expected to give rise to acute health effects. SHR Project-related maximum short-term concentrations of SO_2 and

[4] Gradient Corporation, "Health Risk Assessment (HRA) for the Salem Harbor Redevelopment (SHR) Project", January 4, 2013.

NO_2 were compared to short-term exposure guidelines and standards, including the short-term NAAQS for SO_2 and NO_2 which were specifically designed to protect against asthma exacerbation and respiratory irritation. The comparisons show that the cumulative impacts (maximum 1-hour + ambient background) for NO_2 and SO_2 are well below the 1-hour health-protective NAAQS as well as other short-term exposure guideline levels.

5. The review of community health data for Salem and nearby communities has indicated that the Salem area has overall similar rates of asthma, cardiovascular conditions, and cancer compared with the state as a whole. In combination with the results of the HRA, Gradient concluded that air emissions from operation of the proposed SHR Project are not expected to significantly alter any of these baseline health statistics.

Additional Analysis of Surrounding Areas

The maximum criteria air pollutant impacts from the Project were also compared to the EPA- and MassDEP-adopted significant impact levels (SILs). SILs are impact levels set at only a few percent of the ambient air quality standards and below which the regulatory agencies consider impacts to be insignificant.[5] Impacts above the SILs are not considered significant, but rather additional modeling is required to demonstrate that the proposed project will not exceed the NAAQS. A significant impact area (SIA) is the area of a circle having the radius of the maximum distance from a source to the point at which concentrations drop below the SIL. However, in EJ analyses, the SIA is often presented on a direction specific basis and represents all receptors which projected impacts above the SIL.

The dispersion modeling completed for the SHR Project demonstrates that the predicted maximum impacts from the Facility for the majority of criteria air pollutants are below the SILs at all locations and therefore, represent no adverse human health or environmental effects to Salem and outlying communities. The predicted impacts of the SHR Facility resulted in slight to moderate exeedances of SILs for only $PM_{2.5}$ (24-hour average concentrations), and NO_2 (1-hour concentrations). Since the SILs are set considerably lower than the NAAQS, the modeled emissions do not necessarily mean a project's impacts would be unhealthy or would have an adverse effect on any population. Footprint evaluated these as a way to determine if an EJ area would be disproportionately subject to higher air impacts than other segments of the community at large.

Figures 2 through 4 depict maximum pollutant impact concentration contours (also called isopleths) associated with emissions from the SHR Facility. These are shown with respect to the EJ communities in Salem and surrounding communities. The corresponding SIL concentrations are shown in a striped pattern. The area between the Project and the SIL contour is above the SIL concentration and represents the SIA.

The following sections describe the maximum modeled impacts for the only two pollutants with maximum impacts exceeding their respective SIL with specific reference to the SIAs in reference to nearby EJ areas versus other nearby areas.

[5] For example, the 1-hour NO_2 SIL is 7.5 microgram per cubic meter versus the health based standard of 188 micrograms per cubic meter and the 24 hour $PM_{2.5}$ SIL is 1.2 microgram per cubic meter versus the health based standard of 35 micrograms per cubic meter. These SIL concentrations are only 3 to 4 percent of the NAAQS.

NO_2 Analysis

The 1-hour NO_2 SIL is 7.5 $\mu g/m^3$. The 1-hour NO_2 isopleths are shown on Figures 2 and 3. The following summarizes the information on this figure.

- There are two small areas of isolated peak NO_2 one-hour concentrations (in the range of 36 to 42 $\mu g/m^3$ and well below the NAAQS of 188 $\mu g/m^3$). These are located very close to the Project site to the northeast and southwest of the power plant stack. These areas are not close to any EJ areas.

- Maximum concentrations beyond approximately 1 kilometer from the SHR main stack are less than approximately 16 $\mu g/m^3$ and thus are all less than 10% of the health based NAAQS. However, the SIA of 7.5 $\mu g/m^3$ extends as far as 14 kilometers beyond the Footprint property line extending into Salem, Beverly, Marblehead, Middleton, Wenham, Danvers, Peabody, Lynn, and Swampscott. While this encompasses all of the EJ areas in Salem as well some in Beverly, Danvers, Middleton and Lynn, the population associated with the EJ areas within the SIA is a small percentage of the total population within the SIA.

The results of this assessment demonstrate that the SHR Facility's NO_2 impact concentrations will not have disproportionately high human health or environmental effects on EJ areas.

$PM_{2.5}$ Analysis

Figure 4 shows isopleths of maximum 24-hour average predicted concentrations from the SHR Facility, respectively. The following summarizes the information on Figure 4.

- The highest 24-hour $PM_{2.5}$ concentrations are only a small fraction of the health based NAAQS (3 to 4 $\mu g/m^3$ compared to the 35 $\mu g/m^3$ NAAQS). These areas of highest impact are very localized and generally occur either on plant property, in areas immediately adjacent to the site, or in Salem Harbor adjacent to the Salem shoreline.

- The 24-hour $PM_{2.5}$ SIL is 1.2 $\mu g/m^3$ and this SIA encompasses a two city block area of a low income EJ area just south of the South River. However, the vast majority of the SIA is within Salem Harbor or consists of residences and businesses in the Salem downtown area along Derby Street. It also encompasses Winter Island and a portion of the Salem Willows Park. The EJ area represents a very small percentage of the total population within the SIA.

The results of this assessment demonstrate that the SHR Facility's $PM_{2.5}$ emissions will not have disproportionately high human health or environmental effects on EJ areas.

CO_2 Benefits

The EPA's May 1, 2013 Draft EJ Guidance states, "The U.S. Climate Change Science Program stated as one of its conclusions: The United States is certainly capable of adapting to the collective impacts of climate change. However, there will still be certain individuals and locations where the adaptive capacity is less and these individuals and their communities will be disproportionally impacted by climate change. Therefore, these specific population groups may receive benefits from reductions in greenhouse gas

(GHG) emissions." Operation of the proposed Project is actually projected to *reduce* (on a net basis) annual regional GHG emissions by 457,626 tons of CO_2, even after taking into account the SHR Facility's own CO_2 emissions. This is based on the study done by Charles River Associates provided as Appendix C of the DEIR prepared for the Project. The CO_2 reduction represents approximately 1.3% of the regional CO_2 emissions from power plants.

V. Conclusion

The Proposed SHR Facility is not located in or adjacent to an EJ area, and Footprint has demonstrated that there will be no disproportional impact to any such community. Indeed, the proposed facility will be an improvement over emissions from the existing facility, and will reduce regional emissions of NO_x, SO_2 and CO_2 to the benefit of all area residents. Footprint has demonstrated that emissions from the proposed SHR facility itself will be well within the NAAQS, which are designed to be health-protective of the most sensitive populations.

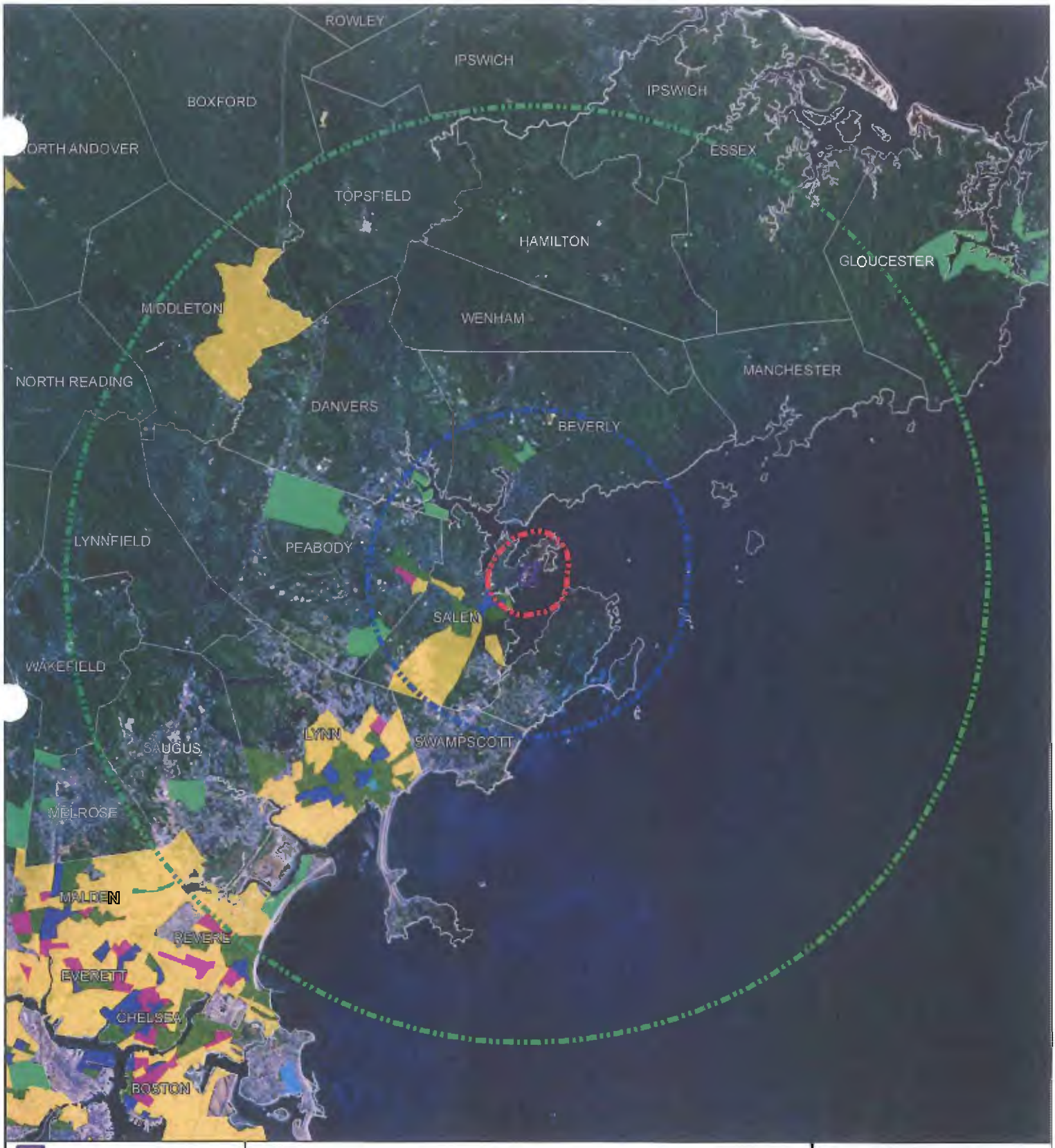
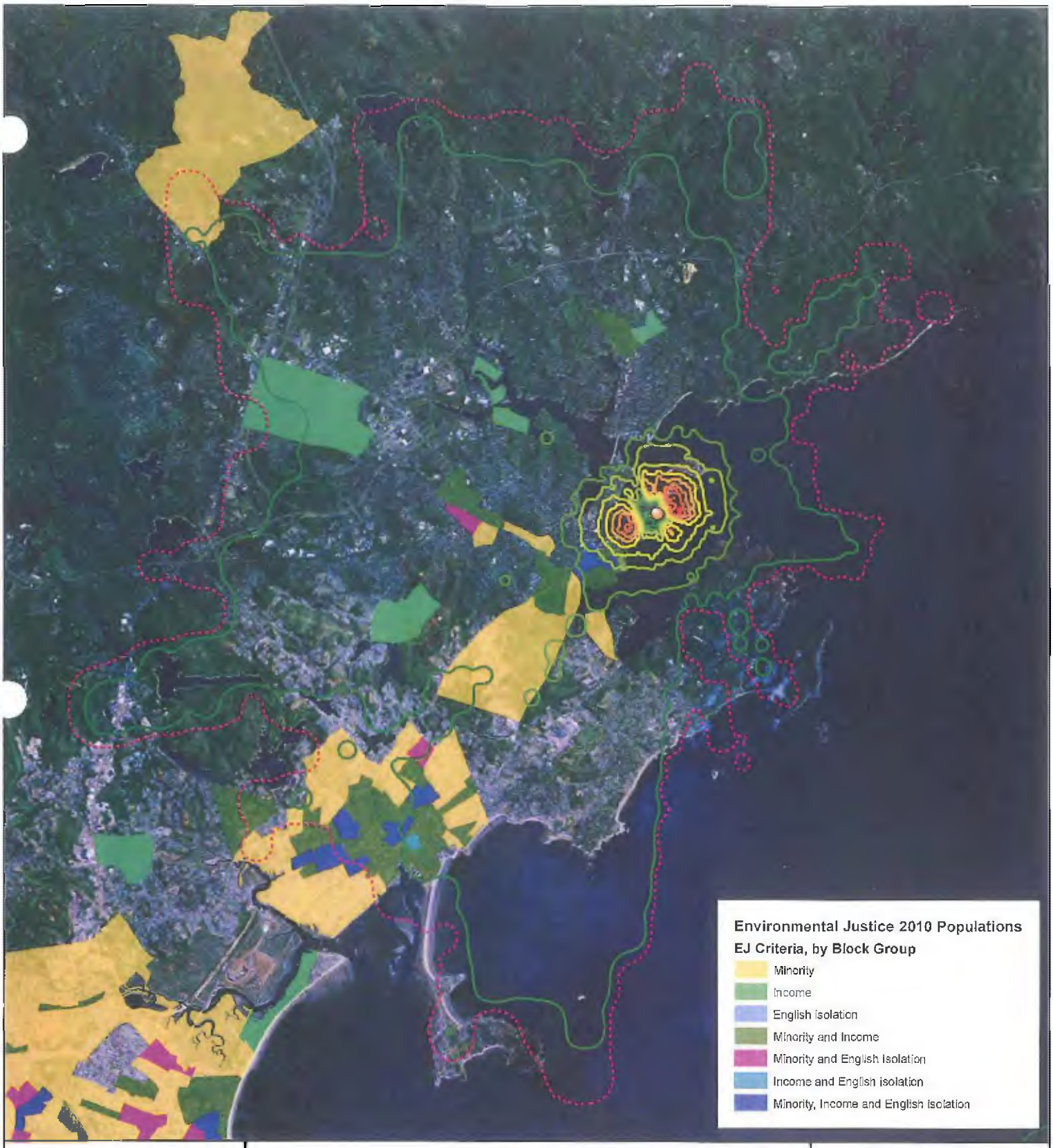


Figure 1

2010 Environmental Justice Areas
Within a 15-Mile Radius of the Site
Salem Harbor Power Station
Salem, MA

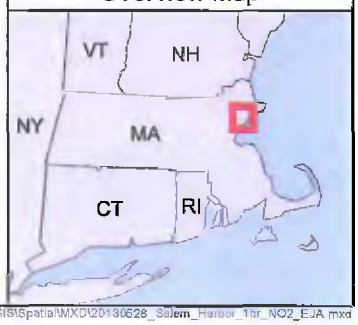
Path: P:\GIS\Projects\Salem\GIS\SpatialMXD\20130529_Salem_Harbor_Envir_Just_15mi.mxd



N
W E
S
0 1 2 3 4 km

Figure 2
AERMOD Predicted Concentration
Isopleth for Maximum 1-Hour NO2 (5 year average)
Environmental Justice Assessment
Salem Harbor Power Station
Salem, MA

Legend
Power Station Location
Significant Impact Area (7.5 µg/m3)
1-Hour NO2 Concentration Contour (µg/m3)

Overview Map


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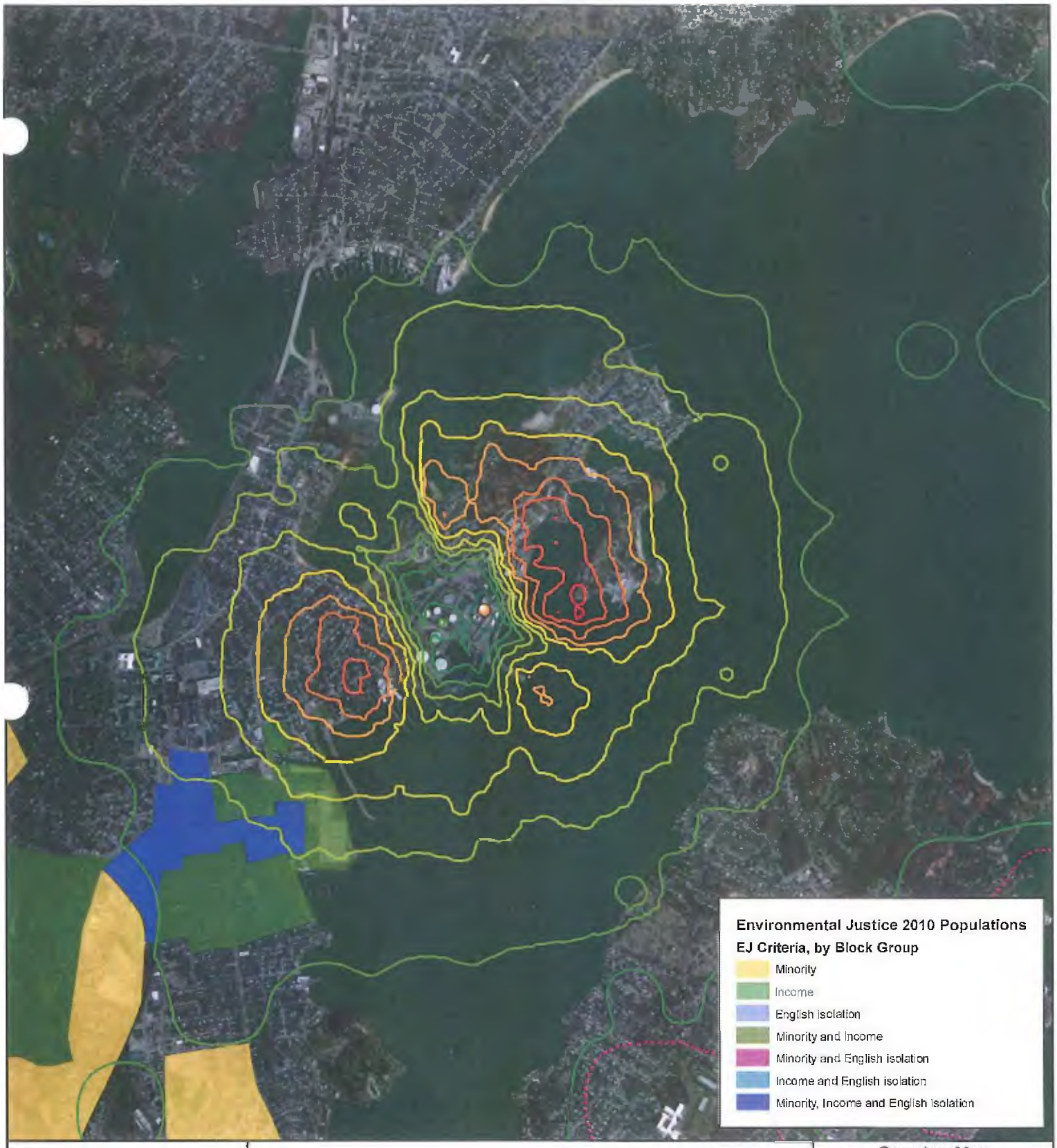


N
W E
S

0 0.2 0.4 0.6 0.8 km

Figure 3
AERMOD Predicted Concentration
Detailed Isopleth for Maximum 1-Hour NO2 (5 year average)
Environmental Justice Assessment
Salem Harbor Power Station
Salem, MA

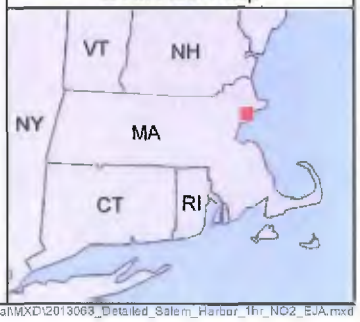
Legend

Power Station Location

Significant Impact Area (7.5 µg/m3)

1-Hour NO2 Concentration Contour (µg/m3)

Overview Map



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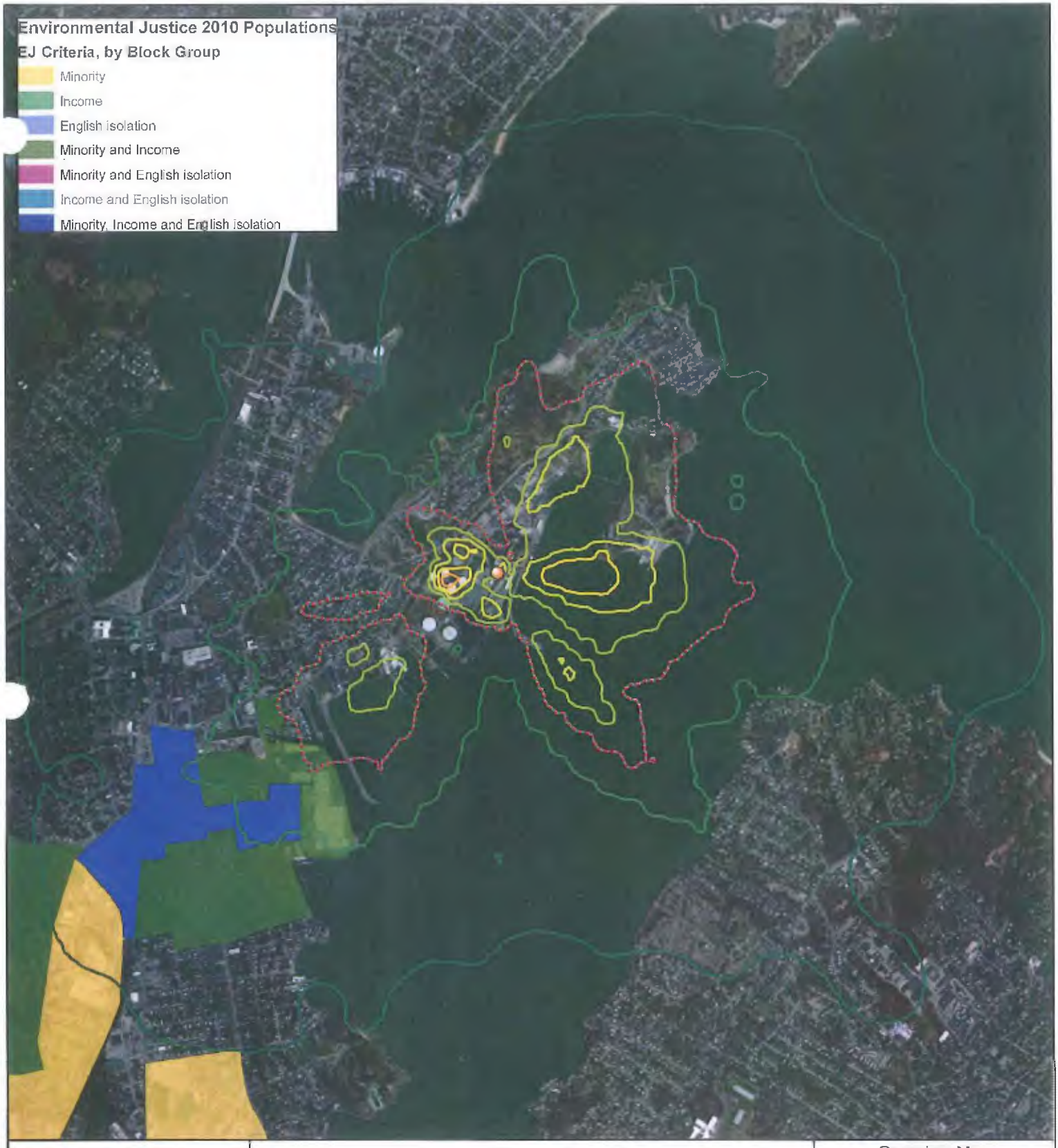

N
W E
S
0 0.2 0.4 0.6 0.8 km

Figure 4

AERMOD Predicted Concentration
Isopleth for Maximum 24-Hour PM 2.5 (5 year average)
Environmental Justice Assessment
Salem Harbor Power Station
Salem, MA

Legend

Power Station Location
Significant Impact Area (1.2 µg/m3)
24-Hour PM2.5 Concentration Contour (µg/m3)

0.4 0.8 1.2 1.6 2.0 2.4 2.8 3.2 3.6 4.0

Overview Map

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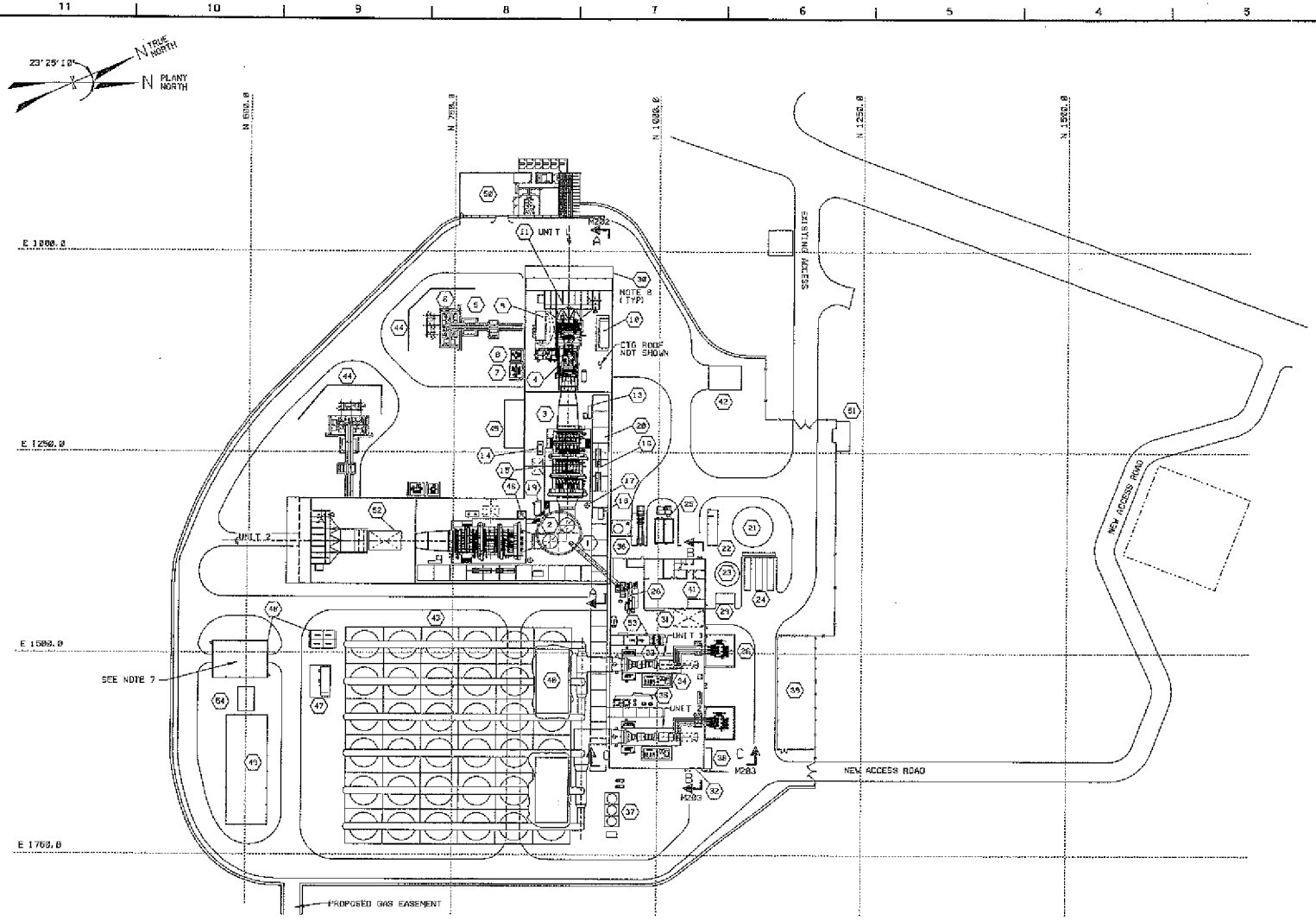
ATTACHMENT 5

CPA/PSD APPLICATION

GENERAL ARRANGEMENT

PLOT PLAN



NOTES

1. COMBUSTION TURBINE LAYOUT IS BASED ON GE FRAME 7FA.05 MACHINE.
2. STACK IS A CONCRETE STACK WITH TWO (2) 20 FT DIAMETER STEEL FLUES AND ONE(1) AUXILIARY BOILER STACK. TOP OF FLUE IS 230 FT ABOVE FINISHED GRADE ELEVATION. TOP OF STACK IS 210 FT ABOVE FINISHED GRADE ELEVATION.
3. ALL ROADS SHALL BE ASPHALT AND SHALL BE 24 FT IN WIDTH AND WITH 50 FT TURNING RADIUS IN ACCORDANCE WITH INTERNATIONAL FIRE CODE (IFC) REQUIREMENTS.
4. THE DIESEL GENERATOR IS SIZED FOR 750KW TO PROVIDE CAPABILITY FOR SAFE SHUT DOWN OF PLANT BASED ON LOSS OF OFF-SITE POWER. DIESEL GENERATOR IS ULTRA-LOW SULFER DIL FIRED WITH INTEGRAL 8 HOUR STORAGE TANK.
5. AMMONIA STORAGE CONSISTS OF ONE (1) 34,000 GAL. VERTICAL, 12 FT. DIAMETER TANK.
6. AUXILIARY BOILER CAPACITY SHALL BE 90,000 LB/HR.
7. FOR LAYOUT OF OPTIONAL GAS COMPRESSOR BLDG., REFER TO DRAWING M228.
8. EACH AIR INTAKE FILTER IS PROVIDED WITH AN AIR INTAKE PLENUM WITH LOUVERS ON TWO (2) SIDES.

LEGEND

1. STACK
2. FLUE
3. HEAT RECOVERY STEAM GENERATOR (HRSG)
4. COMBUSTION TURBINE GENERATOR (CTG)
5. AUXILIARY TRANSFORMER
6. CTG STEP-UP TRANSFORMER
7. STATIC START EXCITATION TRANSFORMER
8. EXCITATION TRANSFORMER
9. GT GENERATOR EXCITATION/LCI COMPARTMENT
10. PACKAGED ELECTRICAL ELECTRONIC CONTROL COMPARTMENT (PECC)
11. CTG AIR INLET FILTER
12. NOT USED
13. BURNER MANAGEMENT SKID
14. AMMONIA DILUTION AIR/HEATER BLOWER SKID
15. SCR/CO CATALYST REMOVAL AREA
16. BOILER FEED PUMPS
17. BOILER BLOWDOWN TANK
18. CHEMICAL INJECTION SKID
19. CEMS ENCLOSURE
20. RACK
21. COMBINED FIRE PROTECTION WATER/SERVICE WATER STORAGE TANK (58'0 X 48'H)
22. FIRE PUMP/SERVICE WATER PUMPS ENCLOSURE
23. DEMINERALIZED WATER STORAGE TANK (50'0 X 30'H)
24. DEMINERALIZED WATER TRAILER PARKING
25. STG ELECTRICAL SWITCHGEAR/MCC POD
26. STG GSU TRANSFORMER
27. NOT USED
28. AUXILIARY BOILER (SEE NOTE 6)
29. DEMINERALIZED WATER PUMPS ENCLOSURE
30. CTG AIR INLET PLENUM
31. EQUIPMENT LAYDOWN AREA
32. STG BUILDING
33. STEAM TURBINE GENERATOR (STG)
34. STG LUBE OIL PACKAGE
35. AIR COMPRESSORS/DRYERS/RECEIVERS
36. DIESEL GENERATOR (NOTE 4)
37. AUX COOLING SYSTEM COOLING TOWER/CHEM FEED
38. 19% AQUEOUS AMMONIA STORAGE TANK/UNLOADING AREA (SEE NOTE 5)
39. 115KV GIS SWITCHING STATION
40. AIR COOLED CONDENSER MECH/ELECT. BUILDING
41. OPERATIONS BLDG./MAINTENANCE SHOP/CONTROL ROOM
42. H2 TRAILER
43. AIR COOLED CONDENSERS (ACC)
44. SOUND WALL
45. MAIN POWER DISTRIBUTION CENTER (PDC)
46. HRSG ELEVATOR
47. GAS COMPRESSORS POWER DISTRIBUTION CENTER (PDC)
48. GAS COMPRESSOR/COOLER
49. UTILITY GAS METERING STATION
50. ADMINISTRATION/CONTROL BUILDING (BY ARCHITECT COOK & FOX)
51. GATE HOUSE (EXISTING)
52. CTG REMOVAL HATCH (ON CTG BLDG. ROOF)
53. DEW PLATE AND FRAME HEAT EXCHANGERS/PUMPS
54. GAS PRESSURE REDUCING STATION

GRAPHIC SCALE

0 30' 60' 120' 180'

1" = 60.0'

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr
G	ADDED CLOSED COOLING WATER PLATE HEAT EXCHANGERS/PUMPS REVISED CTG INLET FILTER; GAS COMPRESSOR AREA.	12/ 8/ 12	JGF		
H	REVISED HRSG AND CTG BUILDING SIZE FROM 110' TO 120'; OPERATIONS BUILDING LAYOUT PER COOK FOX.	2/ 8/ 13	JGF		

Rev No	Revision	Date	Dwn	Chkd	Approved Chief Engr
C	REVISED STACK HEIGHT FROM 250 FEET TO 230 FEET	12/ 8/ 12	JGF		
D	ADDED NOTE 8 REVISED LOCATION OF AMMONIA STORAGE TANK, LOCATION OF ATC BLDG. POD, ORIENTATION OF UNIT 2 AIR INTAKE FILTERS, NOTE 6.	12/ 28/ 12	JGF		
E	ADDED: CTG FIRE PROTECTION SKID (TYP.) SECTION ARROWS FOR SECTIONS A-B AND C. REVISED LOCATION OF BOILER BLOWDOWN TANK AND CHEM. INJECTION SKID.	12/ 8/ 12	JGF		
F	GENERAL REVISION	2/ 8/ 13	JGF		

Drawing Control	Purpose	Approved By	Date	Released By	Date
	For Information	JGF	9/6/12	JGF	9/11/12
	For Comment				
	For Bid				
	For Fabrication				
	For Construction				

Engineering Review	Engr	Date
Mech		
Elec		
Civil		
Arch		
Instr		

Drawn	Designed	Checked
JGF		JGF

Lead Engineer — Date — Scale 1"=60'-0"

Approved for Construction — Work Order 3246 — Sheet No — Drawing No M200 — Rev H

FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP

SALEM HARBOR STATION REDEVELOPMENT PROJECT
SALEM, MASSACHUSETTS

GENERAL ARRANGEMENT
PLOT PLAN

BURNS AND ROE ENTERPRISES, INC.
Engineers and Constructors - Orandi, NJ

3246

ATTACHMENT 6

CPA/PSD APPLICATION

EQUIPMENT NOISE DATA

SECOND APPLICATION SUPPLEMENT

Sound Power Level of Continuous Noise Sources in Octave Band Center Frequencies, *dB re 10^{-12} watt*

#	Noise Source	Octave Band Center Frequency, Hz									dBA
		31.5	63	125	250	500	1000	2000	4000	8000	
A. Noise Sources inside CTG Powerhouse Building											
1	CT Turbine Compartment	111	113	107	106	103	101	106	102	97	**110**
2	CT Generator	105	105	104	101	103	102	101	96	87	**107**
3	CT Accessory Module	104	107	101	98	97	97	99	93	87	**103**
4	CT Inlet Plenum	89	92	89	91	90	91	100	90	79	**102**
5	CT Load Compartment	106	108	108	103	98	96	99	96	89	**104**
6	CT Exhaust Diffuser	119	119	113	109	106	104	102	101	98	**110**
7	CT Inlet Ducting (including filter house)	99	98	92	90	79	72	80	52	24	**86**
8	HRSG Inlet Section	105	106	102	95	85	78	71	54	37	**91**
9	HRSG Body	97	102	100	93	81	73	61	43	25	**88**
10	Stack Breakout	95	101	98	90	78	67	47	40	35	**86**
11	Accessories (piping +valves+ continuous vents)	95	101	98	90	78	67	47	40	35	**86**
12	Boiler Feed Pump	95	98	96	100	104	103	101	92	88	**107**
B. Noise Sources inside STG Building											
13	A14 ST Turbine	118	114	105	104	103	99	95	92	91	**105**
14	ST Generator	106	106	105	102	99	96	92	91	88	**108**
15	ST Lube Oil Module	109	110	114	114	111	110	109	108	104	**116**
16	Condenser + ST Valves	105	103	100	98	95	94	92	88	85	**99**
17	Auxiliary Boiler	101	100	100	101	100	102	95	94	89	**105**
18	Air Compressor	86	97	91	91	88	87	86	85	81	**93**
C. Noise Sources outside Generation Buildings											
19	CT Inlet Filter House Face (without acoustical weather hood)	111	113	110	88	78	81	83	81	74	**96**
20	Turbine Compartment Vent Fan	102	102	110	101	98	95	94	98	95	**104**
21	Exhaust Compartment Vent Fan	103	104	110	102	99	96	92	91	88	**102**
22	ACC (36 cells)	111	110	107	103	100	97	90	86	81	**102**
23	CT GSU Transformer	91	90	94	87	91	82	78	73	66	**90**

24	ST GSU Transformer	91	90	94	87	91	82	78	73	66	**90**
25	CT Auxiliary Transformer	87	87	89	82	80	78	74	70	64	**83**
26	Static Start Isolation Transformer	87	87	89	82	80	78	74	70	64	**83**
27	Excitation Transformer	87	87	89	82	80	78	74	70	64	**83**
28	Stack Exit (90 degree directivity)	105	100	95	85	79	73	68	65	62	**83**
29	Gas Compressor	98	97	100	104	105	106	103	98	93	**110**
30	Gas Cooler, per fan	88	91	89	88	88	86	85	83	81	**92**
31	Aux Cooling Tower	93	96	94	93	93	91	90	88	86	**97**
D. ACC Ductwork in Normal Operation											
32	ACC Main Duct (Duct from ST to ACC Header)	97	98	103	96	92	94	94	93	82	**100**
33	ACC Header	97	98	103	96	92	94	94	93	82	**100**
34	ACC Riser, each	89	93	94	89	83	85	85	84	73	**91**

The ACC noise data is based on a far field sound level of 48 +/- 2 dBA at 400 feet, as provided by the turbine vendor.