



December 11, 2013

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

**Re: Major Comprehensive Plan Application No. NE-12-022  
Transmittal Number X254064 - Salem Harbor Redevelopment (SHR) Project  
Responses to Comments on Draft PSD Permit and Proposed Air Quality Plan  
Approval**

Dear Mr. Belsky:

This letter provides responses to comments made by the Environmental Protection Agency Region 1 (“EPA”) and the Conservation Law Foundation (“CLF”) on the draft PSD permit and proposed Air Quality Plan Approval for the Footprint Power Salem Harbor Development LP (“Footprint” or “Applicant”) Salem Harbor Redevelopment Project (“Project”). Additionally, comments made by Healthlink, Inc. in their November 1, 2013 letter related to dispersion modeling and ambient air quality impact analyses are addressed.

Key updated information is contained in Attachment 1 to this letter which contains: 1) updated facility potential-to-emit calculations due primarily to improved emissions guarantees for CO and particulate matter provided by GE, and also as a result of incorporation of a CO catalyst into the design of the auxiliary boiler, 2) revised pollutant-specific PSD applicability based on the updated emissions, and 3) and updated Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) analysis.

Listed below are specific comment responses with reference to the attached annotated comment letters by EPA (Attachment 2) and CLF (Attachment 3).

**EPA-1:** An updated PSD BACT analysis supported with revised potential to emit calculations is contained in Attachment 1.

**EPA-2:** An updated PSD BACT analysis is contained in Attachment 1. The BACT analysis follows a top-down approach as recommended in the 1990 draft New Source Review Workshop Manual which is available at <http://www.epa.gov/NSR/ttnsr01/gen/wkshpman.pdf> and MassDEP’s June 2011 BACT guidance document which is available at <http://www.mass.gov/dep/air/approvals/bactguid.pdf>

**EPA-3:** An updated PSD BACT analysis for NO<sub>x</sub> emissions is contained in Attachment 1.

**EPA-4:** The updated PSD BACT analysis contained in Attachment 1 follows the 2011 “top-down” BACT guidance document.

**EPA-5:** The dispersion modeling analyses are described in Sections 6 and 7 of the December 2012 Comprehensive Plan Approval application. These descriptions are supplemented by analyses described in the April 12, 2013 and June 10, 2013 letters from Tetra Tech to MassDEP. It is our understanding that these materials have been made available to the public.

**EPA-6:** Pages 3 through 8 of Tetra Tech’s April 12, 2013 “First Supplement to Major Comprehensive Plan Application,” address the suggestions made by EPA to compile background concentration levels and confirm that the difference between the PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS) and PM<sub>2.5</sub> background concentrations is greater than the applicable PM<sub>2.5</sub> significant impact level (SIL). PM<sub>2.5</sub> is the only pollutant addressed in Tetra Tech’s letter because it is the only pollutant addressed in the court decision referenced in EPA’s comment. The key text from Tetra Tech’s April 12 letter is as follows:

Key examples in the Appeals Court decision supporting the vacature and remand involved cases in which the ambient air quality background is very close to the NAAQS and that is certainly not the case in the Salem region where the PM<sub>2.5</sub> background is only slightly over half of the NAAQS (see Table 6-10 Revised above). Accordingly, use of the prior PM<sub>2.5</sub> SILs is appropriate in the case of the ambient air quality impact analysis for the SHR Facility because the background concentrations plus the SILs still leave a significant margin before the NAAQS would come close to being jeopardized.

The following table provides a comparison of the SILs to the difference between the representative background concentrations and the NAAQS for all modeled pollutants and averaging periods.

**Comparison of SILs to the Difference Between Background Concentrations and NAAQS  
(All Concentrations in Micrograms per Cubic Meter)**

Pollutant	Averaging Time	Background Concentration	National and Massachusetts Ambient Air Quality Standards	Difference Between Background and NAAQS	Significant Impact Level
PM <sub>2.5</sub>	24-hr	18.9	35	16.1	1.2
	Annual	7.2	12	4.8	0.3
PM <sub>10</sub>	24-hr	41	150	109	5
NO <sub>2</sub>	1-hr	82.3	188	105.7	7.5
	Annual	19.3	100	80.7	1
CO	1-hr	1,030	40,000	38,970	2,000
	8-hr	687	10,000	9,313	500
SO <sub>2</sub>	1-hr	57.6	196	138.4	7.8
	3-hr	60.3	1,300	1,239.7	25
	24-hr	31.4	365	333.6	5
	Annual	5.6	80	74.4	1

As shown on the above table, the difference between the background concentration and NAAQS concentration is significantly greater than the applicable SIL concentration for all pollutants and averaging periods. Therefore, use of the SILs in the dispersion modeling analyses is valid.

**CLF-1:** The updated PSD BACT analysis contained in Attachment 1 strictly follows federal BACT analysis guidance.

**CLF-2:** The revised potential to emit calculations demonstrate that updated potential CO emissions are less than 100 tons per year and thus are not subject to federal PSD BACT.

**CLF-3:** According to GE, the reason the CO emission limit of 2.0 ppmvd is not increased with duct firing but the VOC limit of 1.0 ppmvd is increased to 1.7 ppmvd with duct firing is that duct firing increases the mass emission rate and concentration prior to control more for VOC than for CO. Additionally, the oxidation catalyst is less efficient for controlling VOC emissions than for CO emissions. The result is a higher VOC concentration when duct firing. Neither of these pollutants is subject to federal PSD BACT as shown in Section 3 of Attachment 1.

**CLF-4:** In addition to emissions reductions for particulates and CO described in Section 2 of Attachment 1 to this letter, Footprint believes that the following changes should be made to the lb/hr emissions limits for no duct firing cases listed in Table 2 of the draft PSD permit:

For NO<sub>x</sub> change 18.1 lb/hr to 17.0 lb/hr

For SO<sub>2</sub> change 3.7 lb/hr to 3.5 lb/hr

For H<sub>2</sub>SO<sub>4</sub> change 2.3 lb/hr to 2.2 lb/hr

For NH<sub>3</sub> change 6.6 lb/hr to 6.2 lb/hr

For these pollutants, the same maximum lb/hr emissions for both duct firing and unfired (i.e., no duct firing) conditions were used for the draft approvals. We recommend that Footnote 2 to Table 2 be changed to the following:

2. Emission rates are based on burning natural gas in any one combustion turbine at a maximum natural gas firing rate of 2,300 MMBtu/hr, HHV (no duct firing) and 2,449 MMBtu/hr, HHV (duct firing), at 90 degrees F ambient temperature, 14.7 psia ambient pressure, and 60% ambient relative humidity. These constitute worst case emissions.

**CLF-5:** Page 2 of Tetra Tech's August 6, 2013 letter to MassDEP presents a comparison of the most recent relevant GE and Siemens NO<sub>x</sub> start-up and shutdown data. This illustrates that the start-up and shutdown NO<sub>x</sub> emissions are lower for the proposed GE turbine than the comparable quick start turbine offered by Siemens (5000F) for the combined cold start-up and shutdown cycle as well as the warm and hot start emissions. The following is the relevant text from the August 6<sup>th</sup> letter:

The more recent data for the same basic "quick start" Siemens machine (5000F) now has 83 lbs NO<sub>x</sub> over 45 minutes. Attachment 2 provides a comparison of this GE and Siemens NO<sub>x</sub> startup/shutdown data. For a combined cold start and shutdown, GE now has (89 + 10 = 99) lbs NO<sub>x</sub> while Siemens has (83 + 20 = 103) lbs NO<sub>x</sub>. GE has lower NO<sub>x</sub> emissions for both the

warm and hot start. So, based on the latest information, there is no advantage to selecting Siemens over GE for NO<sub>x</sub> startup/shutdown emissions.

We were unable to verify the 12 minute start-up cited by CLF for the El Segundo Power project permitted in 2008, and in fact were told by a plant representative that the current Title V Operating Permit for the facility allows for a 1-hour start-up with NO<sub>x</sub> emissions of 112 lbs. Siemens also offered no such shortened (12 minute) start-up for the Salem “quick start” project but rather offered a 45 minute cold and warm start comparable to GE’s but resulting in the higher overall startup/shutdown cycle emissions as noted above.

**CLF-6:** The updated PSD BACT analysis for NO<sub>x</sub> emissions contained in Attachment 1 addresses start-up and shutdown emissions.

**CLF-7, CLF-8, and CLF-9:** As described in Attachment 1, neither CO nor VOC emissions are subject to federal PSD BACT. A detailed top down BACT analysis for NO<sub>x</sub> emissions from the auxiliary boiler is presented in the updated PSD BACT analysis contained in Attachment 1.

**CLF-10:** A PM CEMS on a combined cycle plant firing exclusively natural gas is unnecessary and may be of questionable accuracy due to the inherently low emissions from natural gas firing. The requirement of a PM CEMS for this type of source would be unprecedented. The generating units cited by CLF with PM CEMS in the Commonwealth have much higher PM emissions because they fire solid fuels (coal or solid waste).

**CLF-11:** The updated PSD BACT analysis contained in Attachment 1 includes a case by case top down BACT analysis for PM emissions.

**CLF-12:** The fuel monitoring requirement for sulfur content in the draft permit is consistent with the requirement in other similar permits such as the permit for Pioneer Valley Energy Center and is compliant with the requirements in the relevant federal New Source Performance Standard of 40 CFR Part 60 Subpart KKKK.

**CLF-13 (also related HealthLink comments under sections “NO<sub>2</sub> 1 Hour Ambient Air Modeling Errors” and “NAAQS”):** The maximum cumulative 1-hour NO<sub>2</sub> concentration of 166 micrograms per cubic meter listed in the PSD Fact Sheet is a more accurate characterization of the maximum cumulative NO<sub>2</sub> concentration than the concentration listed in the June 2013 Tetra Tech letter to MassDEP. That letter presented the maximum cumulative 1-hour concentration as less than 188 micrograms per cubic meter. There were no changes in the modeling inputs or results from the June letter to the September PSD Fact Sheet. However the 166 micrograms per cubic meter concentration is based on a more refined evaluation of the modeling results to eliminate all cumulative 1-hour NO<sub>2</sub> concentrations to which the Salem Harbor Redevelopment Project had an insignificant impact. Tetra Tech determined that the maximum cumulative 1-hour NO<sub>2</sub> concentration to which the Project contributed significantly (i.e., had a contribution of 7.5 micrograms per cubic meter or greater) is only 166 micrograms per cubic meter, which includes the contribution of the Project. Previously, the review of concentration results had been conducted only to the extent needed to determine that the

maximum concentration to which the Project had a significant impact was less than the NAAQS of 188 micrograms per cubic meter. Elimination of concentrations to which the project has no significant impact is a commonly used and acceptable additional refinement in cumulative modeling compliance assessments (see for example Chapter C, The Air Quality Analysis, Section IV.E, The Compliance Demonstration, of the 1990 NSR Workshop Manual).

**CLF-14 and CLF-15:** The updated PSD BACT analysis for GHG emissions addresses the projects referenced in the April 17, 2012 letter from Steven Riva of EPA Region 2 to Francis Steitz of the NJ DEP as well as CLF's comment to translate the limits into a thermal efficiency requirement.

**CLF-16:** Emissions of methane and nitrous oxide are accounted for in the PSD permit in the definition of CO<sub>2</sub>e in the key to Table 2 and in recordkeeping requirements of Table 4 (items 12 and 22) and reporting requirements of Table 5 (item 19). However, footnotes 11 and 16 to Table 2 should include a reference to a combined CO<sub>2</sub>e emission factor of 119.0 lb/MMBtu rather than just the 40 CFR Part 75 default 118.9 lb/MMBtu emission factor for CO<sub>2</sub> to account for these additional GHG pollutants. The 119.0 lb/MMBtu factor was used in the emission calculations.

**CLF-17:** MassDEP provided a thorough and appropriate level of review of all of the proponent's analyses consistent with other PSD permit applications.

**CLF-18:** As noted in the response to EPA-6 above, pages 3 through 8 of the April 12, 2012 letter from Tetra Tech to MassDEP include a detailed justification that the use of Lynn and Harrison Avenue monitoring data in lieu of site specific preconstruction monitoring data for background concentrations is appropriate and conservative. The response to CLF-13 above addresses the question regarding the reported maximum 1-hour NO<sub>2</sub> concentrations.

**CLF-19:** Logan Airport meteorological data is representative of the Salem site. The Boston Logan surface station is the closest first order National Weather Service station to the Salem site, located approximately 13 miles southwest. In addition, the Boston Logan surface station is located near the coast and thus is influenced by a similar coastal meteorological regime to that found at the Salem site. The meteorological data set used in the analysis was provided by MassDEP.

**CLF-20 (also related HealthLink comments under section "NO<sub>2</sub> 1 Hour Ambient Air Modeling Errors"):** Standard modeling procedures were used to determine and justify the use of rural dispersion coefficients and the AERSURFACE data. These were approved by MassDEP prior to their use. Section 6.0 of the December 21, 2012 permit application provides the Air Quality Impact Analysis for the project. The introductory paragraph is as follows:

The dispersion modeling analyses for this project were conducted in accordance with the USEPA's *Guideline on Air Quality Models* (USEPA, November, 2005) and MassDEP's *Modeling Guidance of Significant Stationary Sources of Air Pollution* (MassDEP, June 2011), and as described in the Air Quality Modeling Protocol for the Footprint Power Salem Harbor

Redevelopment Project (submitted to the MassDEP on August 29, 2012). MassDEP concurrence with Protocol methodologies was provided on September 20, 2012.

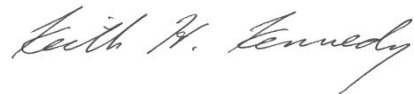
HealthLink also had a comment that the modeling analysis used an outdated methodology for the determination of rural dispersion coefficients and that surface conditions surrounding the meteorological data anemometer should instead be used. In fact, both techniques must be used today and were used in this analysis. These different techniques are used to develop different model inputs. The 3 km Auer land use technique is used to determine the appropriate model dispersion coefficients and the AERSURFACE techniques are used in the meteorological data preprocessing.

**CLF-21:** This comment relates to the proposed Air Quality Plan Approval rather than the draft PSD permit. The semi-annual reporting requirements contained in the proposed Air Quality Plan Approval are consistent with the requirements in other similar Plan Approvals such as the permit for Pioneer Valley Energy Center. There are no federal or state requirements for more frequent reporting as recommended by CLF.

**CLF-22:** Footprint assumes that MassDEP will clarify the venue and procedure for appeals of its final PSD permit Decision as recommended by CLF.

If you have additional questions on these responses or attached updated material, please contact either me at (617) 803-7809 or George Lipka at (617) 443-7545.

Sincerely,



Keith H. Kennedy  
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Attachments