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Executive Office of Energy & Environmental Affairs

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MassDEP Response to Comment Concerning:

NRG Canal 3 Development, LLC.
350 MW Simple-Cycle Combustion Turbine Project

Draft Prevention of Significant Deterioration (PSD) Permit

Application Number: SE-16-015
Transmittal Number: X269143

Issued September 29, 2017

Introduction

Public Notices were published for the public review and comment on the Proposed Air Quality Plan Approval and Draft Prevention of Significant Deterioration (PSD) Permit for NRG Canal 3 Development LLC's ("NRG") 350 MW Simple-Cycle Combustion Turbine Project. The dates of publication were as follows:

- January 9, 2017 in the Cape Cod Times,
- January 9, 2017 in the Boston Globe, and
- January 11, 2017 issue of the MEPA Monitor (Volume 87, Issue 5)

MassDEP also held a public hearing at the Sandwich Town Hall, 130 Main St., Sandwich, MA on Wednesday, February 8, 2017. The public comment period closed at 5 PM on Thursday, February 9, 2017.

Subsequent changes made to the proposed project necessitated a second public comment period for the draft PSD Permit.[1] Public Notices were published for the public review and comment on the modified Draft PSD Permit as follows:

- August 24, 2017 in the Cape Cod Times,
- August 25, 2017 in the Boston Globe, and
- September 6, 2017 issue of the MEPA Monitor (Volume 88, Issue 9)

[1] Refer to the PSD Fact Sheet dated August 23, 2017 for a complete description of the changes to the Project and the PSD Permit.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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Copies of the Draft PSD Permit, the PSD Fact Sheet and NRG's applications were available for review during both comment periods at the NRG Canal Security Guard Building, on NRG Canal 3 Development's website, at the MassDEP's Southeastern Regional Office located at 20 Riverside Drive, Lakeville, MA and on the MassDEP's website.

After careful review of all comments received during each of the two public comment periods, MassDEP has made a decision to issue the PSD Permit. MassDEP has prepared this document, known as the "Response to Comments" ("RTC"), which describes and addresses any significant issues raised during the comment periods and describes any requirements of the PSD Permit that have been changed and the reasons for the changes and/or clarifications.

MassDEP's decision-making process has benefitted from the public comments and additional information submitted. Any changes to the PSD Permit are described in detail below and are contained in the PSD Permit.

The final PSD Permit, PSD Fact Sheets, RTC, along with the previously issued Final Air Plan Approval and associated RTC are available on MassDEP's website at
http://www.mass.gov/eea/agencies/massdep/news/comment/nrg-canal.html

MassDEP is providing copies (electronic or hard copy) of the PSD Permit and RTC to everyone who commented on the draft PSD Permit or who requested copies of these documents. Copies of the PSD Permit may also be obtained by writing or calling MassDEP between the hours of 8:45 AM and 5:00 PM, Monday through Friday, excluding holidays:

Thomas Cushing, Permit Chief
MassDEP, Southeastern Regional Office
20 Riverside Drive
Lakeville, MA 02347
Telephone number: (508) 946-2824
Thomas.Cushing@state.ma.us

MassDEP's REVIEW OF COMMENTS and LIST OF COMMENTERS

MassDEP reviewed all comments received from commenters.

In some cases, MassDEP has included original comments nearly verbatim, for the reader's convenience. In others, MassDEP has included brief summaries of those comments to remind the reader of the topics discussed. Even though each comment submitted has not been reproduced here in its entirety, and many of the details of each comment were not repeated in the summary comments, please be assured that MassDEP has carefully read and considered every comment in its entirety. The form of this RTC is simply designed to structure MassDEP's responses and make them more accessible to the general public. No significance should be attached to the form in which MassDEP cited or summarized the original comment in this RTC. The complete text of every comment as submitted is in the administrative record and available by written request.

Testimony and Comments	
Name and Affiliation	**Date Received**
Shawn Konary, NRG	Email dated February 9, 2017
Ida E. McDonnell, Manager USEPA Region One	Letters (2) dated February 8, 2017

In addition to the comments listed above, additional comments were received during the prior public comment period ending February 9, 2017, which pertain solely to the draft Air Quality Plan Approval. The commenters and a response to their comments are provided in a separate RTC dated August 4, 2017, which is available on MassDEP's website at http://www.mass.gov/eea/agencies/massdep/news/comment/nrg-canal.html

The following comments all pertain to the Draft PSD Permit and Fact Sheet dated January 5, 2017. No comments were received relative to the revised Draft PSD Permit and Fact Sheet dated August 23, 2017.

1. *The proposed AQPA (Table 13, Special Condition 2) and proposed PSD Permit (Table 6, Special Condition 3) specify that:*

   > *The Permittee shall operate the SCR serving EU 10 whenever the flue gas temperature at the inlet to the SCR is above the minimum flue gas temperature specified by the SCR manufacturer and other system parameters are satisfied for SCR operation.*

   During initial firing, tuning and commissioning activities of the turbine, in order to prevent any potential damage to the air pollution control equipment, it is normal practice to not have either the SCR or oxidation catalysts systems loaded. During initial firing and commissioning, damage to the catalyst systems may potentially occur until the turbine combustion is properly tuned on both fuels. The SCR and oxidation catalyst systems will be loaded at the earliest practical time during initial commissioning and shakedown activities.

   NRG requests that the following sentence be added to the AQPA, Table 13, Special Condition 2 and proposed PSD Permit Table 6, Special Condition 3:

   The Permittee shall complete initial installation of the SCR and oxidation catalyst systems as soon as practicable during the initial commissioning and shakedown of the project (NRG)

   MassDEP Response to Comment 1:

   It is the Department's obligation to ensure that all emissions are minimized to the extent possible to help ensure the emissions do not cause or contribute to a condition of air pollution, namely, an exceedance of the NAAQS.

   During the initial firing and commissioning of the turbine, it is understood that the turbine's system parameters and emissions could be out of specification. Nonetheless, in accordance with Table 13, Special Condition 2 of the Air Quality Plan Approval and Table 6, Special Condition 3 of the PSD Permit, it is incumbent on NRG to ensure that the SCR is operational when "system parameters are satisfied for SCR operation."

NRG also has an obligation to operate the SCR as required by the NSPS subpart KKKK at 40 CFR 60.4333 (a), which states "You must operate and maintain your stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction." The Department cannot provide relief from NSPS requirements.

As required by the NSPS, NRG must identify and implement "good air pollution control practices for minimizing emissions." Despite the requirement to operate monitoring equipment, the Department acknowledges that emissions monitoring equipment will not be available until they are installed and certified in accordance with 40 CFR part 75, including the compliance dates specified therein.[2]

2. *Page 10, Table 1: As required by the definition of "Regulated Pollutant" in 40 CFR 52.21(b)(50)(i)(a), the MassDEP should clarify that all references to PM_{10} and $PM_{2.5}$ emission rates and limits include the condensable fraction of each pollutant. The Fact Sheet should also state the term "condensable" in reference to PM_{10} and $PM_{2.5}$ means gaseous emissions from the emission unit which condenses to form particulate matter at ambient temperatures. (EPA)*

   MassDEP Response to Comment 2:

   MassDEP agrees that particulate matter emission limits include both filterable and condensable particulate matter. The requested changes were included in the draft PSD Permit dated August 23, 2017.

3. *Page 20, Section VI 1.3 $PM/PM_{10}/PM_{2.5}$ BACT analysis: The MassDEP lists several emission limits for PM that apply during different operating scenarios without any context as to the basis for the emission limits. MassDEP should explain on the permit record the origin of these emission limits and its basis for determining the emission limits meet BACT. (EPA)*

   MassDEP Response to Comment 3:

   As stated on page 20 of the Fact Sheet dated January 5, 2017, "The Applicant concluded that the sole technically feasible control option for PM emissions is to fire clean-burning fuels and use good combustion practices."

   Monitoring good combustion practices for purposes of minimizing PM will be achieved through the control of CO, which also indicates unburned hydrocarbons are also well controlled. Compliance with the CO BACT[3] emission limits will ensure that good combustion practice is being maintained. In a facility using good combustion practice, PM emissions will be determined by the amount of sulfur in the fuel and the way that the combustion equipment functions, which are factors that are not within the control of the operator.

[2] See 40 CFR 75.4 Compliance dates

[3] As indicated in Table 2 of the PSD Fact Sheet dated January 5, 2017, CO emissions are below the PSD regulatory evaluation threshold, so CO is not subject to the PSD Permit. CO emissions are subject regulatory requirements contained in the Air Quality Plan Approval dated August 4, 2017.

Page 20 of the Fact Sheet states, in part, "The Applicant found that there are differences in PM emissions limits among various projects since the emissions are based on different manufacturer's guarantee and not emissions produced by turbine models." Because there are no H-class CTGs permitted in simple-cycle configuration, there are not any comparable permitted PM emission limits to assess the BACT limit, therefore the Applicant had to rely on PM emission limits provided by the turbine manufacturer to establish BACT for the different operating scenarios.

4. *Page 35, Section VIII: The Fact Sheet does not contain the analysis MassDEP conducted regarding the impacts from startup and shutdown emissions. The MassDEP should provide sufficient detail in the permit record for how startup and shutdown emission limits were addressed in air quality modeling and demonstrate how the permit emission limits are protective of the 24-hour PM_{10} and $PM_{2.5}$ standards. (EPA)*

MassDEP Response to Comment 4:

The requested analysis relative to the impacts from startup and shutdown emissions was included in the Fact Sheet dated August 23, 2017. As discussed in the August 23, 2017 Fact Sheet, a change in the manufacturer emissions guarantee reduced particulate emissions so PM_{10} emissions are below the PSD applicability threshold. The analysis is re-iterated here for the reader's convenience.

The Applicant evaluated the turbine start-up/shut-down (SU/SD) emissions by including this in the modeling analysis performed in support of the permit application. The specific SU/SD scenarios that were modeled are as follows:

- Natural gas start-up to steady-state base load (100%)
- Natural gas start-up to steady-state minimum load (30-40%)
- ULSD oil start-up to steady-state base load (100%)
- ULSD oil start-up to steady-state minimum load (30-40%)

For each of the four SU/SD scenarios, the Significant Impact Level (SIL) modeling analysis included emissions from the Canal 3 emergency generator and fire pump engines. For the SU/SD NAAQS modeling, emissions from the Canal 3 emergency generator and fire pump engines, emissions from all other existing sources at the Station, plus background air quality concentrations were included in the analysis.

The results of the SU/SD SIL modeling revealed impacts below SILs for all four SU/SD scenarios for CO, SO_2, and PM_{10} for all averaging periods (1-, 3-, 8-, and 24-hour). Impacts for 1-hour NO_2 and 24-hour $PM_{2.5}$ were over the SILs for many of the scenarios with the worst –case result for all three pollutants being from the ULSD oil start-up to steady-state minimum load scenario. Accordingly, these two pollutants were further assessed by modeling all other emission units at the Station and adding background to the modeled-predicted concentration for comparison to the NAAQS.

The SU/SD modeling results are presented in Table 5. Because the maximum facility-wide impacts were controlled by the existing emission units (primarily for NO_2), results from the Project alone are also presented in Table 5 to see how they compare to the NAAQS. SU/SD modeling results show compliance with the NAAQS by wide margins.

Results of SU/SD Impact Analysis						
NO_2: ULSD Oil Start-Up to Steady-State Base Load Scenario (Worst-Case Impacts) PM_{25}: ULSD Oil Start-Up to Steady-State Minimum Load Scenario (Worst-Case Impacts)						
Criteria Pollutant	**Averaging Period**	**Predicted Facility Impact ($\mu g/m^3$)**	**Background ($\mu g/m^3$)**	**Predicted Facility Impact plus background ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**	**Less than NAAQS?**
Facility-Wide (Project SU/SD + Existing Sources) Impacts						
NO_2[(1)]	1-Hour	91.23	40	131.23	188	Yes
$PM_{2.5}$	24-Hour	3.87	11	14.87	35	Yes
Project SU/SD Emissions Alone Impacts						
NO_2[(1)]	1-Hour	21.02	40	61.02	188	Yes
$PM_{2.5}$	24-Hour	1.05	11	12.05	35	Yes

Note:
1. NO_2 estimated by assuming 80% conversion of NO_x to NO_2 for 1-hour concentrations

5. *Page 40: The MassDEP should further explain the basis for determining that there are no other increment sources in NRG's surrounding area. (EPA)*

MassDEP Response to Comment 5:

The only major stationary source of PSD pollutants in the significant impact area of the Project or anywhere nearby is the existing NRG Canal Station Boiler Units 1 and 2 in the town of Sandwich in Barnstable County, MA. These emission units pre-date PSD increment trigger dates for all pollutants and their emissions are part of baseline concentrations.

The Project's SIL modeling revealed a significant impact area with a radius of significance of 1.7 km for $PM_{2.5}$. This distance of 1.7 km from Unit No. 3 is completely within the county of Barnstable. As a result, the Canal 3 Project triggers minor source baseline in Barnstable County for $PM_{2.5}$. The trigger date was January 5, 2017 and is based on the date the PSD application was considered complete by MassDEP.

Because the Canal No 3 Project is the source triggering baseline for $PM_{2.5}$, there would be no other increment consuming sources in NRG's surrounding area. Emissions from all existing sources at the time the PSD application was deemed complete are contributing to baseline ambient air quality concentration levels on that date. Hence, proposed NRG Canal Unit 3 is the only source currently consuming increment in NRG's surrounding area (i.e., in Barnstable County). The project has 1-hour NO_2 impacts above the SIL but the EPA has not promulgated a 1-hour increment for NO_2.

6. *Page 5, Table 2, page 7, Table 2a: MassDEP should revise the air contaminant listing for PM/PM_{10}/$PM_{2.5}$ by adding the following clarification:*

   "*including condensable fraction of PM_{10} and $PM_{2.5}$.*"

   This would alleviate the question whether condensable emissions should be included when determining compliance with the PM_{10} and $PM_{2.5}$ emission limits. (EPA)

   MassDEP Response to Comment 6:

   MassDEP agrees and has made the suggested changes as a footnote, which states "Particulate matter emission limits include both filterable and condensable particulate matter" in each of the tables.

7. *Page 9, Table 3, item 14: The MassDEP should include 40 CFR Part 51, Appendix M, when citing the list of test methods in order to include EPA's Method 202 for determining the condensable fraction of PM_{10} and $PM_{2.5}$. The PM test methods in 40 CFR part 60, Appendix A only address the filterable fraction. (EPA)*

   MassDEP Response to Comment 7:

   MassDEP agrees. 40 CFR Part 51, Appendix M has been added to the list of test methods cited in Table 3, item 14.

Typographical corrections to PSD Permit:

Typographical errors in Table 2 were corrected. The PM/PM10/PM2.5 emission rate for Emission Unit 11 was corrected to 0.10 g/bhp-hr and the GHG, CO2e emission rate for Emission Unit 12 was corrected to 162.85 lb/MMBtu. These emission rates, as corrected, are consistent with the emission rates contained in the PSD Permit Application.