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Fact Sheet

for

Prevention of Significant Deterioration of Air Quality (PSD) Permit

Massachusetts Institute of Technology

77 Massachusetts Avenue

Cambridge, MA 02139

MIT Central Utility Plant Combustion Turbine Expansion Project

Transmittal No. X262144

Application No. NE-15-018

June 21, 2017

Table of Contents

1.0 GENERAL INFORMATION 4

2.0 PROJECT SUMMARY 5

2.1 PSD Permitting Process 5
2.2 Project Scope 5
2.3 Project Description 5
2.4 PSD Applicability Review 7
2.5 Determination 7
2.5.1 BACT for $PM/PM_{10}/PM_{2.5}$ 8
2.5.2 BACT for Greenhouse Gas Emissions (GHG) 8
2.5.3 Completeness 9

3.0 PROJECT OBJECTIVE 9

4.0 PROJECT LOCATION 10

5.0 EQUIPMENT DESCRIPTION 11

6.0 PSD PROGRAM APPLICABILITY AND REVIEW 15

6.1 Applicability Procedure 15
6.2 PSD Permit Applicant Requirements 19

7.0 BACT 20

7.1 Definitions and Policy Regarding BACT 20
7.2 BACT Analysis for the CHPs (CTGs and HRSGs' Duct Burners) 21
7.2.1 Clean Fuels 21
7.2.2 $PM/PM_{10}/PM_{2.5}$ 24
7.2.3 Greenhouse Gas Emissions (GHG) 26
7.2.4 Startup and Shutdown Emissions 27
7.3 BACT Analysis for Cold Start Engine 27
7.3.1 Clean Fuels 27
7.3.2 $PM/PM_{10}/PM_{2.5}$ 29
7.3.3 Greenhouse Gas Emissions (GHG) 30
7.3.4 Startup and Shutdown Emissions 30

8.0 MONITORING AND TESTING 30

8.1 CTGs and HRSG Duct Burners 30
8.1.1 $PM/PM_{10}/PM_{2.5}$ 30
8.1.2 Greenhouse Gas Emissions (GHG) 31
8.2 Cold Start Engine 31
8.2.1 $PM/PM_{10}/PM_{2.5}$ 31
8.2.2 Greenhouse Gas Emissions (GHG) 31

9.0 AMBIENT AIR QUALITY IMPACT ANALYSIS BASED ON MODELING 31

9.1 Introduction 31
9.2 Modeling Description 32
9.3 Significant Impact Analysis 33
9.3.1 Basis for Significant Impact Levels 33
9.3.2 Project Specific Justification for Using SILs 33
9.3.3 Additional Justification for Using SILs for $PM_{2.5}$ 34

9.3.4 Significant Impact Analysis (SIA) Results ... 35
9.4 Preconstruction/Background Air Quality Monitoring Analysis ... 36
9.5 Cumulative Modeling Analysis ... 37
9.6 PSD Increment Analysis ... 38
9.7 Secondary $PM_{2.5}$ Impacts ... 40

10.0 ADDITIONAL IMPACTS ANALYSIS ... 40
10.1 Impairment to Visibility, Soils and Vegetation ... 40

11.0 MASS BASED EMISSION LIMITS ... 41

12.0 ENVIRONMENTAL JUSTICE ... 42
12.1 Public Participation ... 43

13.0 NATIONAL HISTORIC PRESERVATION ACT (NHPA), ENDANGERED SPECIES ACT (ESA), TRIBAL CONSULTATION ... 44
13.1 National Historic Preservation Act ... 45
13.2 Endangered Species Act ... 45
13.3 Tribal Consultation ... 45
13.4 Magnuson-Stevens Act ... 45

14.0 COMMENT PERIOD, HEARINGS AND PROCEDURES FOR FINAL DECISIONS ... 45

15.0 MASSDEP CONTACT ... 46

1.0 GENERAL INFORMATION

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Central Utility Plant
Combustion Turbine Expansion Project

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Transmittal Number: X262144
Application Number: NE-15-018

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2.0 PROJECT SUMMARY

2.1 PSD Permitting Process

The Massachusetts Department of Environmental Protection (MassDEP) administers the federal Prevention of Significant Deterioration of Air Quality (PSD) Program pursuant to the April 11, 2011 agreement between MassDEP and the New England Region of the United States Environmental Protection Agency (EPA) identified as "Agreement for Delegation of the Federal PSD Program by EPA to MassDEP" (PSD Delegation Agreement) and Title 40 Code of Federal Regulations (CFR) Part 124 – Procedures for Decision Making. The PSD Delegation Agreement directs that all PSD Permits issued by MassDEP under the Agreement follow the applicable procedures in 40 CFR Part 52, Section 52.21 and 40 CFR Part 124 regarding permit issuance, modification and appeals.

On December 15, 2015, Massachusetts Institute of Technology (MIT or Applicant) submitted initial Applications to MassDEP requesting a PSD Permit under Title 40, CFR Part 52 §52.21 and, as a separate but related action, a 310 Code of Massachusetts Regulations (CMR) 7.02 Plan Approval for its Central Utility Plant's (CUP) Combustion Turbine Expansion Project. On May 23, 2016, MIT submitted amendments to the initial Applications for the PSD Permit and 310 CMR 7.02 Plan Approval. On December 21, 2016, MIT submitted second amendments to the initial Applications for a PSD Permit and 310 CMR 7.02 Plan Approval and on March 31, 2017, MIT submitted revised pages for their Application submittals. These submittals constitute amendments to both Applications, and MassDEP is treating them as such.

The focus of this PSD Fact Sheet pertains to the PSD Permit Application exclusively.

2.2 Project Scope

The scope of MIT's proposed Combustion Turbine Expansion Project encompasses the objective of providing efficient, reliable, and responsive electrical and thermal energy to support the critical research facilities, laboratories, classrooms and dormitories on the MIT campus in an environmentally responsible manner by utilizing two dual fuel fired Combined Heat and Power (CHP) systems, each comprised of a combustion turbine generator (CTG) and Duct Burner-equipped heat recovery steam generator (HRSG), which will provide the ability to efficiently balance thermal and electrical output to meet campus needs, to respond quickly to system upsets, and to start and operate independently from any external energy supply during emergencies. To provide for operation independent of external energy supply, MIT has proposed an emergency engine to start the CTGs.

2.3 Project Description

The proposed Combustion Turbine Expansion Project (Project) includes the installation and operation of two new nominal 22 megawatt (MW) CHP units and one new 2 MW emergency engine in addition to a modification regarding the amount and type of fuel utilized in three existing campus boilers identified as BLR-42-3, BLR-42-4, and BLR-42-5. Additionally, as part of its energy strategy to mitigate climate change, MIT has contracted for firm, uninterruptable natural gas supply and resultantly MIT has proposed to restrict the amount of allowable fuel oil usage in two existing boilers identified as BLR-42-7 and BLR-42-9. It should be noted that this fuel oil restriction is not considered a major modification under 40 CFR 52.21(2)(i) since the proposed fuel restriction is neither a physical change nor a change in the method of operation. The Project is summarized below:

- The two proposed CHP units will each consist of a CTG with an associated HRSG equipped with supplementary natural gas firing capability via a Duct Burner. The CTGs will combust natural gas as the primary fuel of use. Since the scope of the Project includes providing reliable electric and thermal energy, the CTGs will also have the capability of firing ultra-low sulfur distillate (ULSD) as a limited back-up fuel for no more than 48 hours per consecutive twelve month period (C12MP) for testing and for no more than 168 hours per C12MP when natural gas is unavailable or unable to be burned in the equipment and including testing. Each of the two HRSGs will combust solely natural gas in its Duct Burner. The two proposed CHP units will be designated as CTG 200/HRSG 200 and CTG 300/HRSG 300. The proposed 2 MW emergency engine, designated as Cold Start Engine, will combust solely ULSD due to the Project objective of reliability, since operation of an emergency engine such as this is expected to include during emergencies when natural gas would be unavailable.

- The fuel firing capability of the three existing boilers, identified as BLR-42-3, BLR-42-4, and BLR-42-5 will be converted from the current option of firing either natural gas or No. 6 residual oil to the allowable firing of natural gas as a primary fuel and, in order to meet the Project objective of reliability, limited firing of ULSD as the only back-up fuel for no more than 48 hours per C12MP for testing and no more than 168 hours per C12MP including testing and when natural gas is unavailable or unable to be burned in the equipment. The Project's proposed switch to and restriction of ULSD is projected to result in a decrease in actual air emissions from BLR-42-3, BLR-42-4, and BLR-42-5 for all pollutants of consideration.

- Regarding the other two existing boilers at the CUP, identified as BLR-42-7 and BLR-42-9, MIT has proposed to reduce the allowable burning of ULSD in BLR-42-7 and BLR-42-9 from the current limit of 720 hours per C12MP, each, to no more than 48 hours per C12MP, each, for testing and to no more than 168 hours per C12MP, each, including testing and when natural gas is unavailable or unable to be burned in the equipment. In this way, the Combustion Turbine Expansion Project will result in all fuel burning equipment at MIT's CUP (other than emergency engines which necessarily fire ULSD for reliability during emergencies) utilizing natural gas as the primary fuel with limited firing of ULSD as the only backup fuel for no more than 48 hours per C12MP, each, for testing and for no more than 168 hours per C12MP, each, including testing and when natural gas is unavailable or unable to be burned in the equipment. MIT's proposed restriction in the allowable use of ULSD in BLR-42-7 and BLR-42-9 is not considered a physical change or a change in the method of operation and as such BLR-42-7 and

BLR-42-9 are not subject to PSD review. However, BLR-42-7 and BLR-42-9 have been relied upon in the increment modeling as increment expanding sources and, as such, MassDEP considers BLR-42-7 and BLR-42-9 part of the Project.

- In addition, MIT has recently installed, independent of the Project, three new cooling towers, designated as Cooling Tower 11, Cooling Tower 12, and Cooling Tower 13 which are located to the rear of the CUP. Due to their recent installations they have been included in Project emissions and in the increment modeling as increment consuming sources at their maximum potential to emit of 0.07 pounds Particulate Matter (PM) in terms of PM less than 10 micrometers (µm) in diameter (PM_{10}) and PM less than 2.5 µm in diameter ($PM_{2.5}$), collectively referred to as $PM/PM_{10}/PM_{2.5}$, per hour, each. As such, MassDEP considers them part of the Project.

The two proposed CHP units and Cold Start Engine will be located in a building, to be constructed and designated as MIT Building 42C, located on Albany Street at the site of an existing surface parking lot on the Cambridge, Massachusetts campus, between MIT Building N16 at 60 Albany Street and MIT's existing Albany Parking Garage at 32 Albany Street. The existing boilers, BLR-42-3, BLR-42-4, and BLR-42-5, will remain in MIT Building 42 at 59 Vassar Street on the MIT campus and existing boilers BLR-42-7 and BLR-42-9 will remain in MIT Building N16 at 60 Albany Street to the rear of the CUP.

2.4 PSD Applicability Review

MIT is considered a major source under 40 CFR 52.21(b)(1)(i)(a). Since the Project will be located in an area whose air quality is classified as either "attainment" or "unclassifiable" with respect to the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), $PM/PM_{10}/PM_{2.5}$, and lead, it could be subject to PSD review for these pollutants. Additionally, as required by EPA's Tailoring Rule greenhouse gas (GHG) emissions may also be subject to PSD review for a project that has been determined to be PSD-applicable for another pollutant. The proposed Project emissions of $PM/PM_{10}/PM_{2.5}$ and of GHG expressed as carbon dioxide equivalents (CO_2e) are above the PSD major modification thresholds for these pollutants. Therefore MIT's proposed Project is subject to PSD review for $PM/PM_{10}/PM_{2.5}$ and GHG as a major modification at an existing major source. For the purposes of the PSD Permit and this PSD Fact Sheet, $PM/PM_{10}/PM_{2.5}$ refer to both filterable PM and condensable PM which can be quantified by EPA-approved Reference Test Methods contained in Method 201A and Method 202, respectively, of 40 CFR Part 51, Appendix M or other such EPA-approved test methods.

2.5 Determination

A full technical review of the Project for $PM/PM_{10}/PM_{2.5}$, and GHG included a Best Available Control Technology (BACT) analysis for the proposed CHPs and Cold Start Engine. In addition, an analysis of the Project's effect on NAAQS, PSD increments, as well as on visibility, soils and vegetation, including growth and Environmental Justice was required, reviewed, and approved, and as such, is discussed in this PSD Fact Sheet.

2.5.1 BACT for PM/PM_{10}/$PM_{2.5}$

2.5.1.1 *CHPs*

Regarding PM/PM_{10}/$PM_{2.5}$, MIT proposed a BACT emission limit for each CHP of 0.02 pounds per million British thermal units (lb/MMBtu) when firing natural gas in each CHP's CTG, with and without its associated HRSG's Duct Burner firing natural gas. MIT proposed a PM/PM_{10}/$PM_{2.5}$ BACT emission limits for each CHP of 0.04 lb/MMBtu when firing ULSD in each CTG, with and without firing natural gas in its associated HRSG's Duct Burner.
Upon review, MassDEP concurred that the appropriate BACT emission limit for PM/PM_{10}/$PM_{2.5}$ emissions is 0.02 lb/MMBtu when firing natural gas in each CTG with and without firing natural gas in its associated HRSG's Duct Burner. However MassDEP determined that 0.034 lb/MMBtu most appropriately represents BACT when firing ULSD in each CTG without firing natural gas in its associated HRSG's Duct Burner and 0.029 lb/MMBtu most appropriately represents BACT when firing ULSD in each CTG with firing natural gas in its associated HRSG's Duct Burner, based on other recently approved similar projects. In addition to the limits above MassDEP has determined that a restriction on million British thermal units (MMBtu) per hour (MMBtu/hr) heat input is required to ensure emissions do not increase, dependent of firing rates. As such MassDEP has determined that the limits on fuel input firing in each CTG of 223.7 MMBtu/hr when firing natural gas and 229.3 MMBtu/hr when firing ULSD as well as 134.0 MMBtu/hr in each HRSG's Duct Burner while firing natural gas in its associated CTG and 135.2 MMBtu/hr in each HRSG's Duct Burner while firing ULSD in its associated CTG, all based on higher heating values of the fuels, are required in addition to the lb/MMBtu limits listed above, in order to represent BACT.

2.5.1.2 *Cold Start Engine*

MIT proposed a PM/PM_{10}/$PM_{2.5}$ BACT emission limit of 0.4 pounds per hour for the Cold Start Engine and based on its review of MIT's BACT analysis MassDEP has agreed with the proposed emission limit.

2.5.2 BACT for Greenhouse Gas Emissions (GHG)

2.5.2.1 *CHPs*

Regarding GHG, MIT proposed a BACT emission limit for each CHP of 119 lb/MMBtu when firing natural gas in each CHP's CTG, with and without its associated HRSG's Duct Burner firing natural gas. MIT proposed GHG BACT emission limits for each CHP of 166 lb/MMBtu when firing ULSD in each CTG, with and without firing natural gas in its associated HRSG's Duct Burner.

Upon review, MassDEP determined that the appropriate BACT emission limit for GHG emissions is 117.098 lb/MMBtu when firing natural gas in each CTG with and without firing natural gas in its associated HRSG's Duct Burner. MassDEP also determined that 163.61 lb/MMBtu most appropriately represents GHG BACT when firing ULSD in each CTG without firing natural gas in its associated HRSG's Duct Burner and 146.36 lb/MMBtu most appropriately represents GHG BACT when firing ULSD in each CTG with firing natural gas in its associated HRSG's Duct Burner, based on information contained in federal regulation

40 CFR Part 98, Subpart C. In addition to the limits above MassDEP has determined that a restriction on MMBtu/hr is required to ensure emissions do not increase, dependent of firing rates. As such MassDEP has determined that the limits on fuel input firing in each CTG of 223.7 MMBtu/hr when firing natural gas and 229.3 MMBtu/hr when firing ULSD as well as 134.0 MMBtu/hr in each HRSG's Duct Burner while firing natural gas in its associated CTG and 135.2 MMBtu/hr in each HRSG's Duct Burner while firing ULSD in its associated CTG, all based on higher heating values of the fuels, are required in addition to the lb/MMBtu limits listed above, in order to represent BACT.

2.5.2.2 ***Cold Start Engine***

MIT proposed a GHG BACT limit of 166 lb/MMBtu for the Cold Start Engine. Based on its review of MIT's BACT analysis and on information contained in federal regulation 40 CFR Part 98, Subpart C, MassDEP has determined that the appropriate BACT GHG emission limit is 163.61 lb/MMBtu with the addition of a ULSD firing limit of 19.04 MMBtu/hr based on the higher heating value of the fuel.

2.5.3 Completeness

Based on the March 31, 2017 submittal, MassDEP concluded that MIT's PSD Application is administratively and technically complete and provides the necessary information showing that the Project complies with federal PSD regulations contained at 40 CFR 52.21. As such, MassDEP prepared a Draft PSD Permit and an associated Draft PSD Fact Sheet and issued those draft documents for a 30 day public comment period as required by the April 11, 2011 PSD Delegation Agreement between MassDEP and the New England Region of the US Environmental Protection Agency and 40 CFR Part 124 – Procedures for Decision Making.

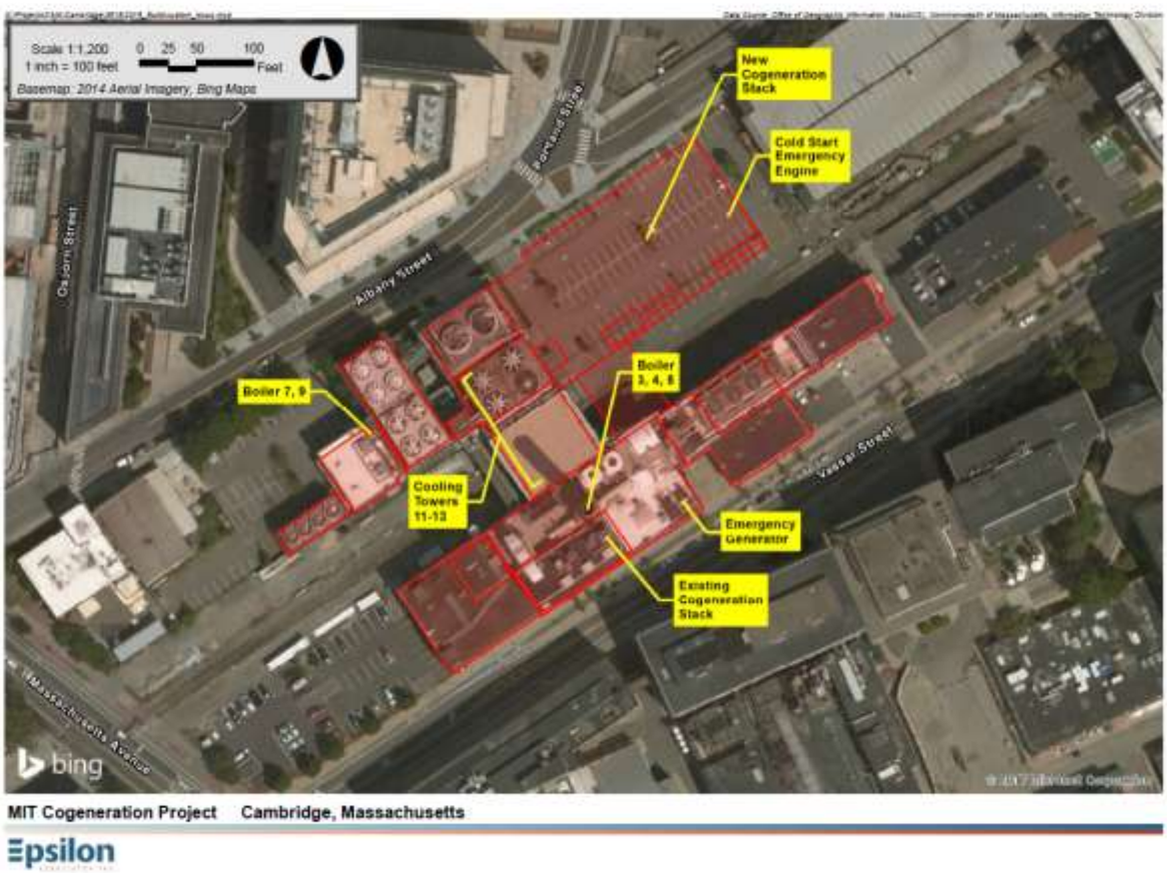
In addition to being subject to PSD review, the Project is also subject to the MassDEP Plan Approval requirements under 310 CMR 7.02. Based on all Project submittals, MassDEP has concluded that MIT's Plan Approval Application is also complete and provides the necessary information showing that the Project complies with the Plan Approval and Emission Limitations requirements contained under Massachusetts Regulation 310 CMR 7.02. As a separate action issued concurrently with this PSD Fact Sheet and the PSD Permit, MassDEP is issuing a Comprehensive Plan Application Approval which regulates air pollutants emitted by the Project, including PM/PM_{10}/$PM_{2.5}$ and GHG which are also regulated under the PSD Permit.

3.0 PROJECT OBJECTIVE

The objective of the proposed Project is to provide efficient, reliable, and responsive electrical and thermal energy to support the critical research facilities, laboratories, classrooms and dormitories on the MIT campus in an environmentally responsible manner utilizing dual fuel CHP systems, comprised of combustion turbine and duct burner systems, which provide the ability to efficiently balance thermal and electrical output to meet campus needs, to respond quickly to system upsets, and to start and operate independent of external energy supply during emergencies. The proposed Project is designed to be integrated operationally into the existing MIT CUP which provides steam, chilled water, and electricity through a variety of production equipment to over 100 buildings on the MIT campus. The Project is required to be responsive since during any period of time, there is a range of production equipment in service due to the ever-changing electrical and thermal demands of a dynamic campus.

4.0 PROJECT LOCATION

As shown in Figure 1, the Project will be located along Albany Street in Cambridge, Massachusetts, near the location where the existing MIT Central Utility Plant is currently operating to generate electricity and steam for heating and cooling parts of the MIT campus. Figure 1:



The Project will be located in an area whose air quality is classified as either “attainment” or “unclassifiable” with respect to the NAAQS for SO_2, NO_2, CO, PM_{10}, $PM_{2.5}$, and lead. Therefore, the Project is located in a PSD area for these pollutants and accordingly will be subject to PSD review for each of these pollutants for which the net emissions increase is above applicable Significant Emission Rates. Additionally, if subject to PSD review as described above, the Project may also be subject to review for GHG emissions expressed as CO_2e under EPA’s Tailoring Rule.

5.0 EQUIPMENT DESCRIPTION

MIT currently operates its CUP which includes one 21 MW CTG with an associated HRSG equipped with duct burners, one 2 MW emergency generator, and three boilers, all located in Building 42 at 59 Vassar Street in Cambridge. In addition the CUP currently operates two additional boilers in Building N16, located to the rear of the CUP, at 60 Albany Street, and seven cooling towers, three of which were recently installed, also located near the CUP between Vassar and Albany Streets. The Emission Units currently operated by MIT's CUP as well as those Emission Units proposed by MIT are described in more detail below in Table 1a and Table 1b, respectively:

Table 1a. Central Utility Plant Equipment			
Existing Units			
Emission Unit (EU) Identification	**Description of EU**	**EU Design Capacity**	**Post-Project Status**
GT-42-1A	ASEA Brown Boveri GT10 Combustion Turbine Generator	229 MMBtu/hr input 22 megawatt output	Unit will be permanently **removed** from service.
HRSG-42-1B	Applied Thermal Systems Supplementary-fired Heat Recovery Steam Generator	210.7 MMBtu/hr input total, of which 64.7 MMBtu/hr is input from duct burner firing	Unit will be permanently **removed** from service.
BLR-42-3	Wickes Type R Boiler	116.2 MMBtu/hr input	Unit will **remain**; switch from natural gas and No. 6 fuel oil firing capability to natural gas as primary fuel with ULSD as limited backup fuel and with decreased total allowable fuel oil usage.
BLR-42-4	Wickes Type R Boiler	116.2 MMBtu/hr input	Unit will **remain**; switch from natural gas and No. 6 fuel oil firing capability to natural gas as primary fuel with ULSD as limited backup fuel and with decreased total allowable fuel oil usage.

Table 1a. Central Utility Plant Equipment			
Existing Units			
Emission Unit (EU) Identification	**Description of EU**	**EU Design Capacity**	**Post-Project Status**
BLR-42-5	Riley Type VP Boiler	145.2 MMBtu/hr input	Unit will **remain**; switch from Natural gas and No. 6 fuel oil firing capability to natural gas as primary fuel with ULSD as limited backup fuel and with decreased total allowable fuel oil usage.
BLR-42-7	Indeck boiler	99.7 MMBtu/hr input	Unit will **remain**; natural gas as primary fuel with ULSD as limited backup fuel and with decreased total allowable fuel oil usage.
BLR-42-9	Rentech Model 0	119.2 MMBtu/hr input (ULSD) 125.8 MMBtu/hr input (Natural gas)	Unit will **remain**; natural gas as primary fuel with ULSD as limited backup fuel and with decreased total allowable fuel oil usage.
DG-42-6	Caterpillar 3516 Diesel Generator	20.2 MMBtu/hr input 2 megawatt output	Unit will **remain**
Cooling Tower 7	Wet mechanical cooling towers	varies	Unit will **remain**
Cooling Tower 8			Unit will **remain**
Cooling Tower 9			Unit will **remain**
Cooling Tower 10			Unit will **remain**
Cooling Tower 11			Unit will **remain**
Cooling Tower 12			Unit will **remain**
Cooling Tower 13			Unit will **remain**

Table 1a Key:
MMBtu/hr = 1,000,000 British thermal units per hour
ULSD = Ultra Low Sulfur Distillate, having a sulfur content of no more than 0.0015 percent by weight

Table 1b. Central Utility Plant Equipment			
Proposed Units			
Emission Unit (EU) Identification	**Description of EU**	**EU Design Capacity**	**Pollution Control Device (PCD)**
CTG 200	Solar Titan 250 Combustion Turbine Natural gas as primary fuel, with ULSD as limited backup fuel	219 MMBtu/hr (HHV) for natural gas firing 212 MMBtu/hr (HHV) for ULSD firing	Dry Low NO_X Combustor
HRSG 200	Heat Recovery Steam Generator with supplemental natural gas firing via a Duct Burner	134 MMBtu/hr (HHV) for natural gas firing	Selective Catalytic Reduction Oxidation Catalyst
CTG 300	Solar Titan 250 Combustion Turbine Natural gas as primary fuel, with ULSD as limited backup fuel	219 MMBtu/hr (HHV) for natural gas firing 212 MMBtu/hr (HHV) for ULSD firing	Dry Low NO_X Combustor
HRSG 300	Heat Recovery Steam Generator with supplemental natural gas firing via a Duct Burner	134 MMBtu/hr (HHV) for natural gas firing	Selective Catalytic Reduction Oxidation Catalyst
Cold Start Engine	CAT DM8263 or equivalent	19.04 MMBtu/hr (HHV) for ULSD firing	None

Table 1b Key:
MMBtu/hr = 1,000,000 British thermal units per hour
HHV = higher heating value basis, from Table C-1 to Subpart C of 40 CFR Part 98: 0.138 MMBtu per gallon ULSD and 1.026×10^{-3} MMBtu per standard cubic foot natural gas
NO_X = Nitrogen Oxides
ULSD = Ultra Low Sulfur Distillate, having a sulfur content of no more than 0.0015 percent by weight
CTG = combustion turbine generator
HRSG = heat recovery steam generator

MIT's proposed Project includes the installation and operation of two new 22 MW Solar Titan 250 combustion turbine generators, (CTG 200 and CTG 300), which will each utilize natural gas as the primary fuel and ULSD as a backup fuel for no more than 48 hours per C12MP for testing which requires the use of ULSD firing and for no more than 168 hours per C12MP including testing and when natural gas is unavailable or unable to be burned in the equipment. Combustion exhaust gases from CTG 200 and CTG 300 will pass through each's own associated HRSG (HRSG 200 and HRSG 300, respectively), each of which will be equipped with a supplementary-fired natural gas duct burner having a maximum design input rating of 134.0 million British thermal units per hour (MMBtu/hr). Each combustion turbine will feature a Dry Low NO_X (DLN) combustor during both natural gas firing and limited backup ULSD firing for control of NO_X. Each HRSG will be equipped with a selective catalytic reduction (SCR) system for post-combustion control of oxides of nitrogen (NO_X), including NO_2, and with an oxidation catalyst for post-combustion control of both CO and volatile organic compounds (VOC). The two CHPs, CTG 200/HRSG 200 and CTG 300/HRSG 300, will be housed entirely within an as yet not constructed building, to be designated as Building 42C, which will be located at the site of an existing ground level parking lot between Albany and Vassar Streets near the CUP. In addition to the installation and operation of CTG 200/HRSG 200 and CTG 300/HRSG 300, the Project includes the installation and operation of one 2 MW ULSD-fired emergency engine, identified as Cold Start Engine, which will be housed on the roof of the proposed Building 42C.

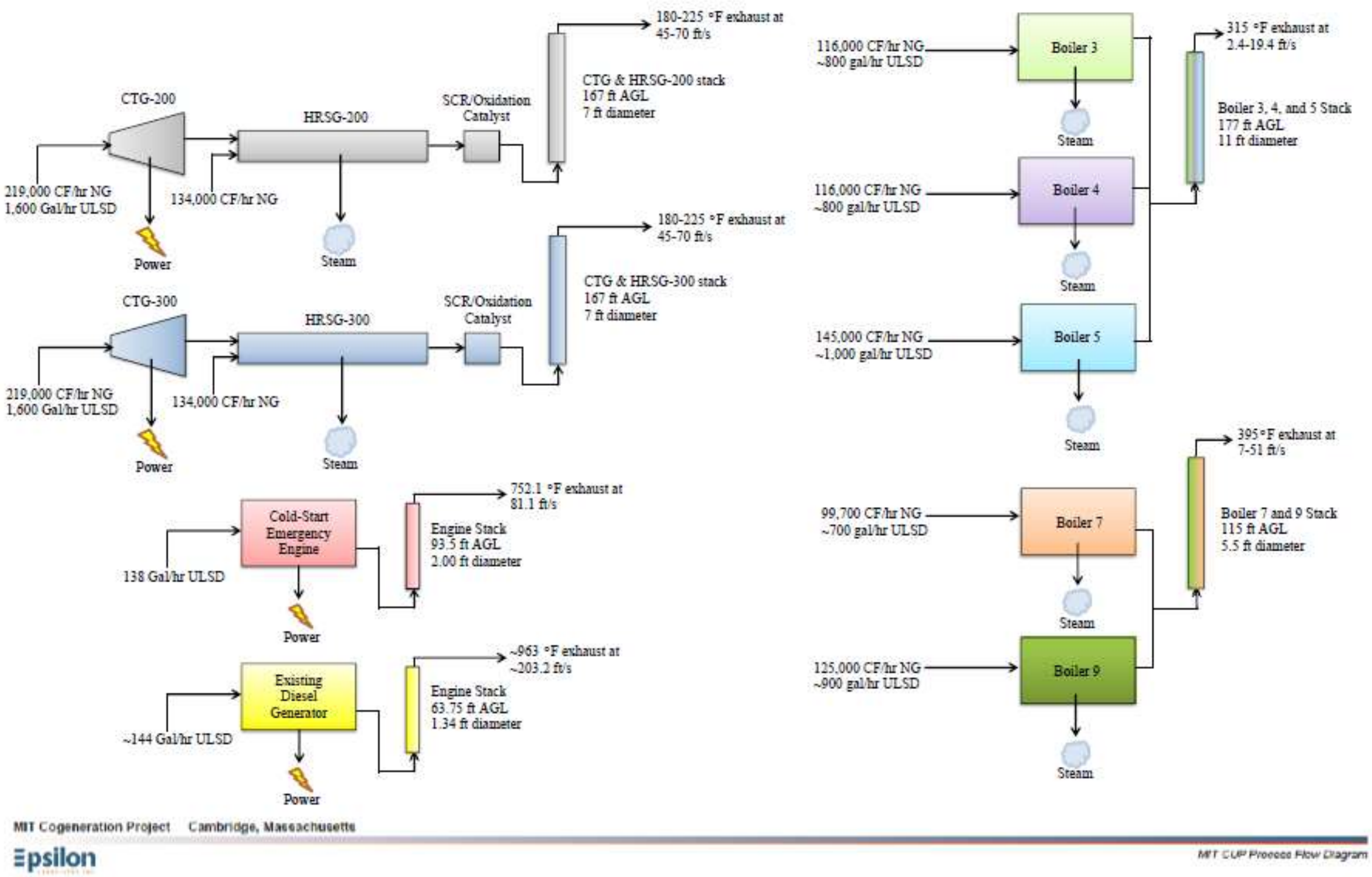
In addition to the above-mentioned installations, the Project includes switching to a less polluting fuel use scenario in existing boilers which is considered a physical change or a change in the method of operation. Boilers BLR-42-3, BLR-42-4, and BLR-42-5 will switch from their current capability of burning both natural gas and No. 6 residual oil to the capability of burning natural gas as a primary fuel with ULSD as the only backup fuel of use for no more than 48 hours per C12MP for testing which requires the use of ULSD firing and for no more than 168 hours per C12MP including testing and when natural gas is unavailable or unable to be burned in the equipment.

In addition to the fuel oil switch and usage restriction in BLR-42-3, BLR-42-4, and BLR-42-5, the Project also includes imposing a fuel oil restriction in two other existing boilers, BLR-42-7 and BLR-42-9, from their currently allowed maximum of 720 hours per year on ULSD to no more than 168 hours per C12MP of ULSD firing as a backup fuel when natural gas is unavailable and including no more than 48 hours per C12MP for testing which requires the use of ULSD firing. MIT's proposed restriction in the allowable use of ULSD in BLR-42-7 and BLR-42-9 is not considered a physical change or a change in the method of operation and as such BLR-42-7 and BLR-42-9 are not subject to PSD review though they are considered part of the Project due to their impact on increment modeling.

As a separate but recent action, MIT installed three new mechanical wet cooling towers, Cooling Tower 11, Cooling Tower 12, and Cooling Tower 13 and maximum potential emissions therefrom have been included in the emission calculations for the Project as well as the modeling. As such they are considered by MassDEP to be part of the Project, however they are not proposed units under 40 CFR 52.21.

Upon final build-out of the Project MIT's CUP will include the existing boilers and diesel generator along with the proposed CHPs and Cold Start Engine as shown in the schematic in Figure 2 below.

Figure 2:



The existing CTG and its associated HRSG, identified as GT-42-1A and HRSG-42-1B respectively, will be permanently removed from service, prior to the conclusion of shakedown of either of the two proposed CHPs, CTG 200/HRSG 200 and CTG 300/HRSG 300.

6.0 PSD PROGRAM APPLICABILITY AND REVIEW

6.1 Applicability Procedure

MassDEP administers the PSD program in accordance with the provisions of the April 11, 2011 PSD Delegation Agreement between MassDEP and EPA which states that MassDEP agrees to implement and enforce the federal PSD regulations as found in 40 CFR 52.21 and 40 CFR Part 124 regarding permit issuance, modification and appeals. The objective of the PSD program is to prevent significant adverse environmental impact from emissions into the atmosphere from a proposed new major source or major modification at an existing major source in an attainment area by limiting allowable degradation of air quality to below levels that would be considered "significant."

There are two basic criteria for determining PSD applicability. The first is whether the proposed project is sufficiently large, in terms of potential emissions, to be a "major stationary source" or a "major modification" at an existing major source. 40 CFR 52.21(b)(1) of the federal PSD regulations defines a "major stationary source" as either (a) any of 28 designated stationary source categories with potential emissions of 100 tons per year (tpy) or more of any regulated New Source Review (NSR) pollutant, or (b) any other stationary source with potential emissions of 250 tpy or more of any regulated NSR pollutant. MIT is an existing major stationary source as defined by 40 CFR 52.21(b)(1)(i)(a) due to fossil fuel fired boilers at the CUP totaling more than 250 million British thermal units per hour heat input and has potential emissions of a regulated New Source Review pollutant greater than 100 tons per year.

The second criterion for applicability of the PSD regulations at 40 CFR 52.21 requires that if a source or modification qualifies as major, its prospective location or existing location must qualify as a PSD area in order for PSD review to apply. A PSD area is one formally designated as "attainment" or "unclassifiable" for any pollutant for which a national ambient air quality standard exists. The MIT Project location is classified as either "attainment" or "unclassifiable" with respect to the NAAQS for SO_2, NO_2, CO, PM_{10}, $PM_{2.5}$ and lead. Therefore, the Project meets both criteria and may be subject to PSD review for these pollutants.

Additionally, as required by EPA's Tailoring Rule if GHG emissions expressed as CO_2e are greater than or equal to 75,000 tons per year for a project that triggers PSD review for another pollutant, then GHG emissions are also considered a PSD pollutant. Since potential GHG emissions from the MIT CUP Project will exceed 75,000 tpy, GHG emissions may also be subject to PSD review and need to be included in any PSD determination of BACT.

A major modification is a physical change or change in the method of operation at an existing major source that would result in both a significant emissions increase and a significant net emissions increase of a regulated NSR pollutant. The MIT Project will result in a significant emissions increase as shown in Table 2 below. The significant emissions increase analysis looks only at the emissions increases from the proposed Project and is referred to as Step 1. The significant net emissions increase analysis looks at additional increases and decreases from "contemporaneous" projects at the source and is referred to as Step 2.

For the significant emissions increase analysis, the Project will involve both constructing new emissions units, CT 200/HRSG 200, CT 300/HRSG 300, and Cold Start Engine, as well as modifying existing Emission Units, BLR-42-3, BLR-42-4, and BLR-42-5. The Project restriction to a lower quantity of allowable ULSD firing in BLR-42-7 and BLR-42-9 does not qualify as a modification under 52.21 because there is no physical change or change in the method of operation of those units. In addition, BLR-42-7 and BLR-42-9 are not expected to experience any increase in air emissions as a result of the Project.

The PSD regulations at 40 CFR 52.21(a)(2)(iv)(f) require use of the hybrid test for projects such as this which involve both the addition of new emissions units and the modification of existing emissions units. Under the hybrid test, a significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the emissions increases for each existing emissions unit being modified, using the actual-to-projected-actual applicability test at 40 CFR 52.21(a)(2)(iv)(c) and the actual-to-potential applicability test for new units at 40 CFR 52.21(a)(2)(iv)(d), equals or exceeds the significance threshold for that pollutant as defined in paragraph 40 CFR 52.21(b)(23). The actual-to-projected-actual applicability test involves adding the projected actual emissions from existing emissions units that are modified as part of the project or that are otherwise expected to experience an emission increase as a result of the project, and then subtracting the past actual emissions (called the "baseline actual emissions") from those units. Although, in lieu of projecting future actual emissions for an existing emissions unit, an applicant can choose instead to use the emission unit's potential to emit (PTE) as the emission unit's post project emissions as allowed under 40 CFR 52.21(b)(41)(ii)(d), MIT did not choose to do so.

The actual-to-potential test, which is required for all new units being constructed as part of the Project, involves totaling the potential emissions of the proposed new emissions units, then subtracting past actual emissions of those units. In the case of a new unit, under 40 CFR 52.21(b)(48)(iii), it has baseline actual emissions of zero. 40 CFR 52.21(b)(7)(i) defines a new unit as any emissions unit which is (or will be) newly constructed and which has existed for less than 2 years from the date such emissions unit first operated. Therefore for this Project, new units include the previously described CTG 200/HRSG 200, CTG 300/HRSG 300, and Cold Start Engine. In addition Cooling Tower 11, Cooling Tower 12, and Cooling Tower 13 were recently installed within the past two years and, as such, emissions therefrom are included in the emission calculations and air dispersion modeling for the Project.

If a project involving new and existing emission units will result in a significant emissions increase based on the hybrid test described above, then a significant net emissions increase analysis is conducted pursuant 40 CFR 52.21(b)(3)(i). However, MIT is seeking a PSD Permit based on a calculated significant emission increase alone and asserts that the Step 2 significant net emission increase calculation is not required. EPA explains in Federal Register Volume 67, Number 251, Tuesday December 31, 2002 that "if your calculations show that a significant emissions increase will result from a modification, you have the option of taking into consideration any contemporaneous emissions changes that may enable you to ''net out'' of review, that is, show that the net emissions increase at the major stationary source will not be significant." MIT is not proposing to "net out" of PSD review and thereby has opted to skip Step 2. MassDEP agrees with MIT's assertion based both on the above and consultation with EPA-New England.

For the reasons set forth above, the MIT Project is subject to PSD review for PM/$PM_{2.5}$/PM_{10} and GHG as a major modification at an existing major source as shown below in Table 2:

Table 2							
Pollutant	**Emissions Increase** (in tons per C12MP)					**PSD Significant Emission Rate (SER)[4]** (in tpy)	**PSD Review Applies?**
	CTG 200[1], HRSG 200[1], CTG 300[1], HRSG 300[1], combined	**Cold Start Engine[1]**	**Cooling Tower 11, Cooling Tower 12, Cooling Tower 13, combined**	**BLR-42-3[2], BLR-42-4[2], BLR-42-5[2], each**	**Total Emissions Increase**		
NO_X	21.1	5.3	-	There will be no increases in future projected actual emissions as compared to past actual emissions.	26.4	40	No
CO	15.3	0.3	-		15.7	100	No
VOC	10.15	0.17	-		10.3	40	No
PM[3]	50.7	0.06	0.92		51.7	25	**Yes**
PM_{10}[3]	50.7	0.06	0.92		51.7	15	**Yes**
$PM_{2.5}$[3]	50.7	0.06	0.92		51.7	10	**Yes**
SO_2	7.2	0.004	-		7.3	40	No
GHG as CO_2e	295,480	467.3	-		295,948	75,000	**Yes**
Sulfuric Acid (H_2SO_4) Mist	5.4	0.003	-		5.4	7	No
Lead (Pb)	-					0.6	No
Fluorides	-					3	No
Hydrogen Sulfide (H_2S)	-					10	No
Total reduced sulfur (including H_2S)	-					10	No
Reduced sulfur compounds	-					10	No

Table 2 Notes:
1. As calculated according to the actual-to-potential applicability test at 40 CFR 52.21(a)(2)(iv)(d).
2. As calculated according to the actual-to-projected-actual applicability test at 40 CFR 52.21(a)(2)(iv)(c).
3. The projected annual emissions of $PM/PM_{10}/PM_{2.5}$ have been calculated based on the conservative assumption for $PM_{2.5}$ that all particulate matter emitted is $PM_{2.5}$ and the conservative assumption for PM_{10} that all particulate

matter emitted is PM_{10} , whereby $PM/PM_{10}/PM_{2.5}$ include both filterable and condensable PM and can be quantified by analysis per EPA-approved Reference Test Methods contained in Method 201A and Method 202, of 40 CFR Part 51, Appendix M or other such EPA-approved test methods.
4. PSD Significant Emission Rates from 40 CFR 52.21(b)(23)(i).

Table 2 Key
tpy = tons per year
NO_x = Nitrogen Oxides
CO = Carbon Monoxide
C12MP = consecutive twelve month period
VOC = Volatile Organic Compounds
SO_2 = Sulfur Dioxide
PM = Particulate Matter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
GHG = Greenhouse Gases
GHG as CO_2e = Greenhouse Gases expressed as Carbon Dioxide equivalent and calculated by multiplying each of the six greenhouse gases (Carbon Dioxide, Nitrous Oxide, methane, Hydrofluorocarbons, Perfluorocarbons, Sulfur Hexafluoride) mass amount of emissions, in tons per year, by the gas's associated global warming potential published at Table A-1 of 40 CFR Part 98, Subpart A and summing the six resultant values.

6.2 PSD Permit Applicant Requirements

Per 40 CFR 52.21(a)(2)(ii), no source or modification subject to PSD review, as this Project is for $PM/PM_{10}/PM_{2.5}$, and GHG, may begin actual construction without a PSD permit. Based on EPA's 1990 draft guidance, "New Source Review Workshop Manual", to obtain a Permit an applicant must:

- Apply Best Available Control Technology (BACT): A BACT analysis is done on a case by case basis and considers energy, environmental, and economic impacts in determining the maximum degree of reduction available for the proposed source or modification. In no event can the determination of BACT result in an emission limitation which would not meet any applicable standard of performance under 40 CFR Part 60 and 61.

- Conduct an ambient air quality analysis: Each PSD source or modification must perform an air quality analysis to demonstrate that its new pollutant emissions would not violate either the applicable National Ambient Air Quality Standards (NAAQS) or any applicable PSD increments.

- Analyze impacts to soils, vegetation, and visibility: An applicant is required to analyze whether its proposed emissions would impair visibility, or impact on soils or vegetation. Not only must the applicant look at the direct effect of source emissions on these resources, but it must also consider the impacts from general commercial, residential, industrial, and other growth associated with the proposed source or modification.

- Not adversely impact a Class I Area: If a reviewing agency receives a PSD permit application for a source that could impact a Class I area, it notifies the Federal Land Manager and the federal official charged with direct responsibility for managing these lands, these officials are responsible for protecting the air quality-related values in Class I areas and for consulting with the reviewing authority to determine whether any proposed construction will adversely affect such values. If the Federal Land Manager demonstrates that emissions from a proposed source or modification would impair air quality-related values, even though the emission levels would not cause a violation of the allowable air quality increment, the Federal Land Manager may recommend that the reviewing authority deny the permit.

- Undergo adequate public participation by applicant: Specific public notice requirements and a public comment period are required before the PSD review agency takes final action on a PSD application.

In addition, MassDEP has an obligation under the provisions of the April 11, 2011 PSD Delegation Agreement between the EPA and MassDEP to "identify and address, as appropriate 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). The Executive Order was designed to ensure that each federal agency "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations." Therefore, in order to obtain a PSD permit the applicant must also evaluate Environmental Justice with respect to the Project.

7.0 BACT

7.1 Definitions and Policy Regarding BACT

All new major sources or major modifications are required to utilize BACT for those new and modified emission units that will experience an increase in emissions as a result of the Project. Pursuant to 40 CFR 52.21(j)(3), a major modification shall apply BACT for each regulated NSR pollutant for which it would result in a significant net emissions increase at the source. This requirement applies to each proposed emission unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit. Therefore the Project is required to utilize BACT for the pollutants $PM/PM_{10}/PM_{2.5}$ and GHG for CTG 200/HRSG 200, CTG 300/HRSG 300 and the Cold Start Engine.

Under 40 CFR 52.21(b)(12), BACT means *"an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the [Clean Air] Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or* *available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of Best Available Control Technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR part 60 and 61…"*

BACT determinations under PSD review must follow the following five step "top-down" methodology as outlined by federal guidance.

Identify all control technologies. Identify all possible control options, including inherently lower emitting processes and practices, add-on control equipment, or combination of inherently lower emitting processes and practices and add-on control equipment.

Eliminate technically infeasible options. Eliminate technically infeasible options based on physical, chemical and engineering principles.

Rank remaining control technologies by control effectiveness. Rank the remaining control options by control effectiveness, expected emission reduction energy impacts, environmental impacts, and economic impacts.

Evaluate most effective controls and document results. Determine the economic, energy and environmental impacts of the control technology on a case-by-case basis.

Select BACT. Select the most effective option not rejected as BACT.

As shown above, the "top-down" BACT process starts by considering all available emission control technologies, and ranks them for further evaluation from the most effective to least effective technically available control technology. The most effective emission reduction technology is then evaluated for feasibility based on economics, energy, or other environmental considerations. The most stringent level of emissions control that is not determined to be technically and economically infeasible is selected as BACT.

The BACT analyses for $PM/PM_{10}/PM_{2.5}$ and GHG emissions for the CHPs and Cold Start Engine provided by MIT were fully evaluated by MassDEP. The results are presented below.

7.2 BACT Analysis for the CHPs (CTGs and HRSGs' Duct Burners)

7.2.1 Clean Fuels

For the CTGs and HRSGs' Duct Burners, a major element of the BACT analysis is the use of clean fuels. This Fact Sheet discusses the BACT analysis for fuels here, rather than repeating it for each individual emission unit and pollutant. MIT has proposed to burn natural gas in each CTG as the primary fuel with ULSD as a limited backup fuel for no more than 48 hours per C12MP for testing and for no more than 168 hours per C12MP including testing and when natural gas is unavailable or unable to be burned in the equipment. MIT has proposed that the CTGs' associated HRSGs' duct burners will solely combust natural gas, without any backup fuel firing capability.

Step 1: Identify all control technologies.

Since this section is focusing on fuels, the identified control technologies are:

Use of natural gas as a sole fuel of use; and
Use of natural gas as the primary fuel with ULSD as a limited backup fuel when natural gas is unavailable or unable to be burned in the equipment and for testing.

Step 2: Eliminate technically infeasible options.

The use of natural gas as the only fuel in the CTGs is not technically feasible due to this Project's objective of providing reliability in terms of electric and thermal energy production, which could include periods when natural gas is unavailable or unable to be burned in the equipment.

With respect to pollutant emissions, natural gas is the least emitting fuel identified. ULSD has higher emissions than natural gas; however the use of ULSD is necessary to meet the Project objective of reliability in the event that natural gas becomes unavailable or unable to be burned in the equipment.

Therefore the sole remaining technically feasible option is use of natural gas as the primary fuel in the CTGs with use of limited ULSD firing as a backup fuel in the event that natural gas becomes unavailable or unable to be burned in the equipment and for testing and the use of natural gas as the only fuel of use in the HRSGs' duct burners. MIT has proposed that the only instances under which ULSD will be fired in each CTG are for no more than 168 hours per C12MP in the event that natural gas is unavailable or unable to be burned in the equipment and including for a period of no more than 48 hours per C12MP for testing purposes.

Step 3: Rank remaining control technologies by control effectiveness.

Although with regard to the pollutants of consideration natural gas is a cleaner fuel than ULSD and therefore ranks higher in control effectiveness, there is only one remaining technically feasible option: that of natural gas as the primary fuel in the CTGs with use of limited ULSD firing as a backup fuel in the event that natural gas becomes unavailable or unable to be burned in the equipment and for testing and the use of natural gas as the sole fuel in the HRSGs' duct burners.

The BACT process requires the reviewing authority to consider energy, environmental, and economic impacts.

Step 4: Evaluate most effective controls and document results.

Energy Impacts – Availability of natural gas can be affected by the type of natural gas service, firm or non-interruptible service or the less expensive, interruptible natural gas service. MIT has secured a contract with the natural gas supplier for a non-interruptible supply of natural gas.

Economic Impacts – Under certain market condition, even when natural gas is available, it may still be more expensive than ULSD. This can be attributed to whether a Facility/Project uses an interruptible or firm natural gas contract, or if there is a shortage of natural gas. The price of firm natural gas will always be high but provides that natural gas is always available. Interruptible natural gas will always be lower than a firm gas contract, except on the rare occasion when the spot market natural gas price could exceed the firm gas price. This price discrepancy would however occur only on those rare days when natural gas deliveries are affected or gas supplies are limited. MIT has secured a contract with the natural gas supplier for a non-interruptible supply of natural gas.

Environmental Impacts – The expected $PM/PM_{10}/PM_{2.5}$ emission rate when burning ULSD is approximately 70 percent higher than when combusting natural gas. Similarly, Greenhouse Gas emissions, expressed as CO_2e are approximately 40 percent higher when combusting ULSD as compared to when combusting natural gas. MIT has provided for mitigating such impacts by contracting for non-interruptible natural gas service which has allowed MIT to propose strict limits on the usage of ULSD as a backup fuel in each CTG for no more than 168 hours per C12MP in the event that natural gas is unavailable or unable to be burned in the equipment and including for a period of no more than 48 hours per C12MP for testing purposes.

Step 5: Select BACT.

Since MIT has contracted for a non-interruptible supply of natural gas as an integral component of the Project, natural gas will be the primary fuel burned. The PSD Permit will allow MIT to combust ULSD in each CTG in limited quantities as a backup fuel for testing and in the event that natural gas is unavailable or unable to be burned in the equipment.

The total number of hours of firing ULSD in each CTG shall not exceed 168 hours per C12MP which is equivalent to 279,216 gallons of ULSD and includes no more than 48 hours per C12MP for testing as well as periods when natural gas is unavailable or unable to be burned in the equipment. The HRSGs' duct burners will be restricted to firing solely natural gas. These fuel use restrictions are provided in Table 6, Special Terms and Conditions, of the PSD Permit.

7.2.2 $PM/PM_{10}/PM_{2.5}$

Emissions of particulate matter result from trace quantities of ash (non-combustibles) in the fuel being burned as well as from the products of incomplete combustion.

Step 1: Identify all control technologies.

The two main technology/strategy options to control and/or limit the emission of particulate matter from the CHPs provide for the use of clean fuels coupled with good combustion practices or post-combustion controls.

Step 2: Eliminate technically infeasible options.

MIT's BACT analysis stated and MassDEP concurred, that post-combustion control is technically infeasible because all available post-combustion controls have limits in terms of how clean an exhaust concentration they can achieve. The minimum outlet concentration achievable using post-combustion control is generally higher than the inlet concentration achievable using clean fuels (natural gas with ULSD backup). Therefore the installation of post-combustion controls would not reduce $PM/PM_{10}/PM_{2.5}$ emissions.

Step 3: Rank remaining control technologies by control effectiveness.

The only remaining control technology is the use of clean fuels (natural gas with ULSD backup) and good combustion practices.

Step 4: Evaluate most effective controls and document results.

The BACT analysis performed in Section 4 of MIT's PSD Application, which included a review of the EPA RACT/BACT/LAER Clearinghouse, demonstrated the technical infeasibility of post-combustion controls for $PM/PM_{10}/PM_{2.5}$. As such, MIT will minimize $PM/PM_{10}/PM_{2.5}$ emissions from each CTG through the use of clean fuels as described above with the additional requirement of utilizing good combustion practices.

Natural gas will be used as the primary fuel in the CTGs which is the lowest ash-content fuel available. However, due to the reliability component of the Project's objective to supply electricity, heat and chilled water to the campus at all times, ULSD is required as a backup fuel in the CTGs. MIT will limit the use of ULSD fired in CTG 200 and CTG 300, to 168 hours of ULSD operation per C12MP, each, when natural gas is unavailable or unable to be burned in the equipment and including no more than 48 hours per C12MP, each, for testing. MIT conservatively presumed that all particulate matter (PM) emissions from the Project will be less than 2.5 microns ($PM_{2.5}$). In addition MIT will utilize good combustion practices which include utilizing Solar Titan 250 CTGs which are equipped with Caterpillar's state-of-the-art SoLoNOx and Insight systems and operating and maintaining said CTGs according to the manufacturer's recommendations.

Regarding $PM/PM_{10}/PM_{2.5}$, MIT proposed a BACT emission limit, based on clean fuels and good combustion practices, for each CHP of 0.02 lb/MMBtu when firing natural gas in each

CHP's CTG, with and without its associated HRSG's Duct Burner firing natural gas. MIT proposed a $PM/PM_{10}/PM_{2.5}$ BACT emission limit for each CHP of 0.04 lb/MMBtu when firing ULSD in each CTG, with and without firing natural gas in its associated HRSG's Duct Burner.

Step 5: Select BACT.

Upon review, MassDEP concurred that the appropriate BACT emission limit for $PM/PM_{10}/PM_{2.5}$ emissions is 0.02 lb/MMBtu when firing natural gas in each CTG with and without firing natural gas in its associated HRSG's Duct Burner. However MassDEP determined that 0.034 lb/MMBtu most appropriately represents BACT when firing ULSD in each CTG without firing natural gas in its associated HRSG's Duct Burner based on other recently approved similar projects. MassDEP also determined that 0.029 lb/MMBtu most appropriately represents BACT when firing ULSD in each CTG with firing natural gas in its associated HRSG's Duct Burner based on other recently approved similar projects and utilizing a weighted average calculation to account for ULSD firing in each CTG and natural gas firing in each HRSG's Duct Burner. In addition to the limits above MassDEP has determined that a restriction on MMBtu/hr is required to ensure emissions do not increase, dependent of firing rates. As such MassDEP has determined that the limits on fuel input firing in each CTG of 223.7 MMBtu/hr when firing natural gas and 229.3 MMBtu/hr when firing ULSD as well as 134.0 MMBtu/hr in each HRSG's Duct Burner while firing natural gas in its associated CTG and 135.2 MMBtu/hr in each HRSG's Duct Burner while firing ULSD in its associated CTG, all based on higher heating values of the fuels, are required in addition to the lb/MMBtu limits listed above, in order to represent BACT.

MIT's BACT analysis identified eleven facilities that are similar to the proposed Project (turbines firing natural gas or distillate oil, operating in combined-cycle or CHP mode, sized smaller than 25 MW; facilities that only have filterable particulate matter limits were excluded since the particulate matter limits in MIT's PSD Permit include both filterable and condensable PM. MIT did not identify any similar projects outside of the United States.

Natural gas will be the only fuel utilized for each HRSG's Duct Burner as it is the lowest ash-content fuel available. Consistent with the $PM/PM_{10}/PM_{2.5}$ BACT review conducted for the combustion turbines, post combustion control technology is not feasible. MIT presumed that all particulate matter emitted from each Duct Burner will be $PM_{2.5}$. MIT proposed a BACT emission limit for $PM/PM_{10}/PM_{2.5}$ of 0.020 lb/MMBtu firing natural gas. The emission limit that MIT proposed for the Duct Burners is consistent with the emission limits established as BACT for similar size duct burner projects.

MassDEP agrees with the MIT's $PM/PM_{10}/PM_{2.5}$ BACT determination of 0.020 lb/MMBtu BACT emission limits for natural gas firing in each CTG with or without duct firing. Furthermore, MassDEP also concurs with the Applicant's $PM/PM_{10}/PM_{2.5}$ BACT pound per hour (lb/hr) emission limit of 4.47 lb/hr for natural gas firing in each combustion turbine without duct firing and 7.14 lb/hr for natural gas firing in each CTG with natural gas firing in its associated HRSG's Duct Burner.

The Department reviewed MIT's $PM/PM_{10}/PM_{2.5}$ BACT analysis for ULSD firing within the CTGs both with and without natural gas duct firing operating scenarios. MassDEP, however, concluded that MIT could achieve a $PM/PM_{10}/PM_{2.5}$ BACT emission rate which is lower than their proposed 0.04 lb/MMBtu based upon another combustion turbine/combined heat and power project previously permitted in Massachusetts. The University of Massachusetts Medical Center was permitted with a $PM/PM_{10}/PM_{2.5}$ BACT emission limit of 0.034 lb/MMBtu when firing ULSD fuel within its combustion turbine. MassDEP relied on MIT's BACT analysis and supportive application materials to conclude that 0.034 lb/MMBtu and 7.8 lb/hr appropriately represent BACT for $PM/PM_{10}/PM_{2.5}$ when each CTG is firing ULSD without duct firing. Additionally, based on other recently approved similar projects and utilizing a weighted average calculation to account for ULSD firing in each CTG and natural gas firing in each HRSG's Duct Burner, MassDEP concluded that when firing ULSD in each CTG and firing natural gas in its associated HRSG's Duct Burner, the emission rate of 0.029 lb/MMBtu and 10.6 lb/hr most appropriately represent BACT for $PM/PM_{10}/PM_{2.5}$ from each CHP.

7.2.3 Greenhouse Gas Emissions (GHG)

For PSD permitting for combustion sources, GHGs are the aggregate of a variety of pollutants, including primarily carbon dioxide (CO_2) and also methane (CH_4), and nitrous oxide (N_2O). Since each pollutant has a different effect on global warming, PSD applicability is based on CO_2e, determined by multiplying each pollutant by its global warming potential (GWP) as contained in 40 CFR Part 98, Subpart A, Table A-1.

For natural gas combustion in each CTG, with or without firing in its associated HRSG's Duct Burner, the CO_2e emission factor used was 117.098 lb/MMBtu. This emission factor is based on a CO_2 emission factor of 53.06 kilograms (kg) per MMBtu (kg/MMBtu) from 40 CFR Part 98, Subpart C, Table C-1, a conversion factor of 2.20462 pounds (lb) per kg (lb/kg) from 40 CFR Part 98, Table A-2 and from 40 CFR Part 98, Subpart A, Table A-1, the GWP factors: $CO_2 = 1$, $CH_4 = 25$, and $N_2O = 298$.

For ULSD firing in each CTG without firing its associated HRSG's Duct Burner, the CO_2e emission factor used was 163.61 lb/MMBtu. This emission factor is based on a CO_2 emission factor of 73.96 kg/MMBtu from 40 CFR Part 98, Subpart C, Table C-1, a CO_2 conversion factor of 2.20462 lb/kg from 40 CFR Part 98, Table A-2 and from 40 CFR Part 98, Subpart A, Table A-1, the GWP factors: $CO_2 = 1$, $CH_4 = 25$, and $N_2O = 298$.

For ULSD firing in each CTG with firing natural gas in its associated HRSG's Duct Burner, the CO_2e emission factor used was 146.36 lb/MMBtu. This emission factor is based on a CO_2 emission factor of 73.96 kg/MMBtu for ULSD firing in the CTG and a CO_2 factor of 53.06 kg/MMBtu for firing natural gas in its associated HRSG's Duct Burner, both from 40 CFR Part 98, Subpart C, Table C-1, a conversion factor of 2.20462 lb/kg from 40 CFR Part 98, Table A-2 and from 40 CFR Part 98, Subpart A, Table A-1, the GWP factors: $CO_2 = 1$, $CH_4 = 25$, and $N_2O = 298$.

The most stringent control technology for control of GHG from a CHP is by means of carbon capture sequestration (CCS). MIT evaluated the technical feasibility of CCS based upon the following four steps. The first step is the capture or removal of carbon (i.e., CO_2) from the exhaust gas. The capture system requires the use of an absorption system, which requires the use of ammonia, monoethanolamine, or other amine solution. The use of these chemicals in an urban setting is prohibitive. In addition, the required size of this adsorption system prohibits it use in the limited area of MIT Facility. The second step of CCS is the compression of the CO_2. The third step is the transport of the captured CO_2 to a suitable disposal site. The fourth step is the actual disposal of CO_2, normally deep underground in geological formations such as coal seams and oil and gas explorations. MIT pointed out that since most or all steps in the CCS are not technically feasible for the Project, CCS is not technically feasible. MassDEP agrees that CCS is not feasible for this Project.

MIT will use a combination of approaches to achieve BACT for GHG including all of the following elements.

MIT shall use natural gas, the lowest carbon emitting fossil fuel, as the primary fuel of use in each CTG, with ULSD, as a limited backup fuel for no more than 48 hours per C12MP, each, for testing and for no more than 168 hours per C12MP, each, including testing and when natural gas is unavailable or unable to be burned in the equipment. MIT shall use solely natural gas, the lowest carbon emitting fossil fuel, in each CTG's associated HRSG's Duct Burner. MIT shall operate and maintain each CHP in accordance with manufacturer's recommendations.

MIT has chosen to propose to install two Solar Titan 250 combustion gas turbines, which each have a highly energy efficient heat rate of 9260 kilojoules per kilowatt-hour (kJ/kWh) where a lower heat rate results in a higher turbine efficiency and therefore a less polluting turbine. As part of the BACT analysis, MIT performed hour by hour modeling using expected CUP operations based on projected campus electricity and thermal demands over the expected project life. The results showed that operation of the Solar Titan 250 CTGs resulted in less GHG emissions than an alternative turbine upon which the same analysis was performed.

MassDEP verified and concurs with the BACT analysis submitted by MIT for GHG emissions. The BACT determination is comparable to BACT emission limits established and published in EPA's RBLC and other BACT determinations made in Massachusetts.

7.2.4 Startup and Shutdown Emissions

MIT has not proposed nor has MassDEP approved of any alternative GHG or $PM/PM_{10}/PM_{2.5}$ emission limits for periods of startup or shutdown as the CHPs are expected to comply with the established BACT limits during all periods of operation, including those attributed to startup and shutdowns.

7.3 BACT Analysis for Cold Start Engine

7.3.1 Clean Fuels

For the Cold Start Engine, a major element of the BACT analysis is the use of clean fuels as discussed below. MIT has proposed to burn ULSD in the Cold Start Engine.

Step 1: Identify all control technologies.

Since this section is focusing on fuels, the identified control technologies are:

Use of natural gas as a sole fuel of use;
Use of ULSD as a sole fuel of use; and
Use of propane as a sole fuel of use.

Step 2: Eliminate technically infeasible options.

The use of natural gas as the only fuel in the Cold Start Engine is not technically feasible due to this Project's objective of providing reliability in terms of electric and thermal energy production, which could include periods when natural gas is unavailable or unable to be burned in the equipment. The Cold Start Engine needs a fuel that can be reliably stored onsite. MIT identified both ULSD and propane as possible fuel options that are able to be stored in a small tank, satisfying the requirement for the engine to have a fuel supply that is directly available without interruption. While propane can be stored locally, the operator needs to evaporate the propane before firing in an emergency engine. Due to its size, the Cold Start Engine proposed for the Project could need an external heat source to vaporize the propane fast enough to be used, especially in cold weather. Therefore, propane may be unreliable in an even such as an emergency which is the very event that would necessitate utilizing the Cold Start Engine. The use of propane in the Cold Start Engine is therefore technically infeasible, leaving ULSD as a technically feasible option.

Therefore the sole remaining technically feasible option is use of ULSD as the only fuel in the Cold Start Engine. MIT has proposed to limit usage of the Cold Start Engine to no more than 300 hours per C12MP and only in the event of emergencies and including testing.

Step 3: Rank remaining control technologies by control effectiveness.

Although with regard to the pollutants of consideration natural gas is a cleaner fuel than ULSD and therefore ranks higher in control effectiveness, ULSD is the only remaining technically feasible option for fuel use in the Cold Start Engine.

The BACT process requires the reviewing authority to consider energy, environmental, and economic impacts.

Step 4: Evaluate most effective controls and document results.

<u>Energy Impacts</u> – Availability of natural gas can be affected by the type of natural gas service, firm or non-interruptible service or the less expensive, interruptible natural gas service. Although MIT has secured a contract with the natural gas supplier for a non-interruptible supply of natural gas, the purpose of the Cold Start Engine is to operate under emergency conditions which would include periods where natural gas is unavailable.

<u>Economic Impacts</u> – Under certain market condition, even when natural gas is available, it may still be more expensive than ULSD. This can be attributed to whether a Facility/Project uses an interruptible or firm natural gas contract, or if there is a shortage of natural gas. The price of firm natural gas will always be high but provides that natural gas is always available. Interruptible

natural gas will always be lower than a firm gas contract, except on the rare occasion when the spot market natural gas price could exceed the firm gas price. This price discrepancy would however occur only on those rare days when natural gas deliveries are affected or gas supplies are limited. MIT has secured a contract with the natural gas supplier for a non-interruptible supply of natural gas, however the purpose of the Cold Start Engine is to operate under emergency conditions which would include periods where natural gas is unavailable.

Environmental Impacts – The expected PM/PM_{10}/$PM_{2.5}$ and GHG emissions when burning ULSD are higher than they would be if combusting natural gas, however the purpose of the Cold Start Engine is to operate under emergency conditions which would include periods where natural gas is unavailable.

Step 5: Select BACT.

Given the purpose of the Cold Start Engine, the PSD Permit will allow MIT to burn ULSD in the Cold Start Engine for no more than 300 hours per C12MP in the event of an emergency and including testing.

7.3.2 PM/PM_{10}/$PM_{2.5}$

MIT identified two candidate control technologies for PM/PM_{10}/$PM_{2.5}$ emissions from the Cold Start Engine. These technologies were an Active Diesel Particulate Filter (DPF) and the use of a Low PM Engine Design (defined as an engine that complies with Tier 2 engine limitations set forth in 40 CFR Part 60, Subpart IIII)[1]. Both of these technologies were determined to be technologically feasible with an active DPF being the most effective control technology with a potential 85% particulate matter removal efficiency. MIT evaluated the cost effectiveness of a DPF and found that the cost was approximately $730,000 per ton of PM/$PM_{10}$/$PM_{2.5}$ removed which is excessive, even if the Cold Start Engine were to run the maximum allowable duration of 300 hours per C12MP. There are no energy or environmental issues that would indicate that the use of a DPF is BACT, considering the unfavorable economics. As such, DPF was eliminated as BACT on an economic basis leaving the use of a Low PM Engine Design meeting the Tier 2 engine limitations set forth in 40 CFR Subpart IIII as BACT.

MassDEP concurs with the BACT analysis submitted by the Applicant for the Cold Start Engine concluding that 0.40 lb/hr for PM/PM_{10}/$PM_{2.5}$, via use of a Low PM Engine Design meeting the Tier 2 engine limitations set forth in 40 CFR Subpart IIII in addition to the limited hours of allowable operation represents BACT for PM/PM_{10}/$PM_{2.5}$.

1 The Cold Start Engine meets the qualifications for an emergency engine as stated in 40 CFR Part 60, Subpart IIII.

7.3.3 Greenhouse Gas Emissions (GHG)

For PSD permitting for combustion sources, GHGs are the aggregate of a variety of pollutants, including primarily CO_2 and also CH_4, and N_2O. For ULSD firing in the Cold Start Engine, the CO_2e emission factor used was 163.61 lb/MMBtu. This emission factor is based on a CO_2 emission factor of 73.96 kg/MMBtu from 40 CFR Part 98, Subpart C, Table C-1, a conversion factor of 2.20462 lb/kg from 40 CFR Part 98, Table A-2 and from 40 CFR Part 98, Subpart A, Table A-1, the GWP factors: CO_2 = 1, CH_4 = 25, and N_2O = 298.

In its BACT analysis MIT identified two candidate control technologies for GHG emissions from the Cold Start Engine. These technologies were post-combustion controls and the use of clean fuels and good combustion control. Post combustion control for CO_2 and other greenhouse gases is not technically feasible for an engine this size. These controls are designed for much larger systems and even have many technical issues as described in the GHG BACT analysis for the CHP units. As such, post-combustion controls were eliminated as BACT due to technical infeasibility. The use of clean fuels and good combustion control is technically feasible. The clean fuel chosen as BACT for the Cold Start Engine is described above. MIT determined that the use of ULSD as a clean fuel coupled with good combustion control and limited hours of operation in the event of emergency and for testing represents BACT for GHG emissions from the Cold Start Engine.

MassDEP verified and concurs with the BACT analysis submitted by the Applicant for GHG for the Cold Start Engine.

7.3.4 Startup and Shutdown Emissions

MIT has not proposed nor has MassDEP approved of any alternative GHG or PM/PM_{10}/$PM_{2.5}$ emission limits for periods of startup or shutdown as the Cold Start Engine is expected to comply with the established BACT limits during all periods of operation, including those attributed to startup and shutdowns.

8.0 MONITORING AND TESTING

8.1 CTGs and HRSG Duct Burners

8.1.1 PM/PM_{10}/$PM_{2.5}$

MIT will be required to perform an initial emissions compliance test on each CHP within 180 days of its initial startup to measure PM/PM_{10}/$PM_{2.5}$ emissions in the flue gas while firing natural gas in each CTG, both with and without its associated HRSG's Duct Burner firing natural gas and while firing ULSD in each CTG, without its associated HRSG's Duct Burner firing. In addition MIT will be required to establish a parametric monitoring system based on the initial emissions compliance testing that will provide for tracking PM/PM_{10}/$PM_{2.5}$ emissions on an ongoing basis. Said parametric monitoring shall include the averaging time which coincides with the applicable limits established in the PSD Permit for this Project.

8.1.2 Greenhouse Gas Emissions (GHG)

MIT will be required to perform an initial emissions compliance test on each CHP within 180 days of its initial startup to measure GHG emissions as CO_2e in the flue gas while firing natural gas in each CTG, both with and without its associated HRSG's Duct Burner firing natural gas and while firing ULSD in each CTG, without its associated HRSG's Duct Burner firing. In addition MIT will be required to monitor operations such that compliance with the GHG as CO_2e emission limits established in their PSD Permit can be verified. Specifically, MIT will install and use fuel meters to monitor heat input on a higher heating value (HHV) value basis so that compliance with emission limits in terms of lb/hr and tons per C12MP can be verified.

8.2 Cold Start Engine

8.2.1 PM/PM_{10}/$PM_{2.5}$

MIT will monitor to ensure installation and use of a Low PM Engine Design meeting the Tier 2 engine limitations set forth in 40 CFR Part 60 Subpart IIII. In addition MIT will monitor operating hours to ensure compliance with the limit of 300 hours of allowable operation per C12MP.

8.2.2 Greenhouse Gas Emissions (GHG)

MIT will be required to monitor operations such that compliance with the GHG as CO_2e emission limits established in their PSD Permit can be verified. Specifically, MIT will install and use an hour meter to monitor operating hours to ensure compliance with the limit of 300 hours of allowable operation per C12MP. The monitoring of operating hours will also be used to calculate the fuel input on an HHV basis, based on the engine's maximum design capacity so that compliance with emission limits in terms of lb/hr and tons per C12MP can be verified.

9.0 AMBIENT AIR QUALITY IMPACT ANALYSIS BASED ON MODELING

9.1 Introduction

As part of its Application, MIT submitted a dispersion modeling analysis for PM_{10} and $PM_{2.5}$ that met the requirements of 40 CFR Part 51, Appendix W.

MIT is required to demonstrate, using air quality dispersion modeling, that the increase in emissions as a result of the Project, in conjunction with background air quality and other emissions, will not cause or contribute to a violation of any NAAQS or any applicable PSD increment. The EPA promulgated NAAQS for six air contaminants, known as criteria pollutants, for the protection of public health and welfare. The criteria pollutants are: nitrogen dioxide, sulfur dioxide, particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide, ozone and lead. The NAAQS include both primary and secondary standards of different averaging periods. The primary standards protect public health and the secondary standards protect public welfare, such as damage to property or vegetation.

A PSD increment is the maximum allowable increase in ambient pollutant concentration above the applicable baseline air quality concentration for that pollutant and averaging period. PSD increments protect air quality in areas that meet the NAAQS for that pollutant.

The pollutants that triggered PSD for the MIT Project are PM_{10} and $PM_{2.5}$ and therefore are the only pollutants addressed herein.

9.2 Modeling Description

MIT conducted a refined dispersion modeling analysis to determine impact concentrations at receptors located along the property line and beyond. The refined analysis was based on proposed worst case emission rates and 5 years (2010-2014) of meteorological conditions. The analysis was conducted in accordance with EPA's "Guideline on Air Quality Models" (November 2005) and Guidance for $PM_{2.5}$ Permit Modeling (May 2014), as well as MassDEP's "Modeling Guidance for Significant Stationary Sources of Air Pollution" (June 2011) and as described in the Air Quality Modeling Protocol submitted to MassDEP (March 2014). The EPA-recommended AERMOD model (current at the time AERMOD version 15181, AERMAP version 11103, AERMET version 15181) was used to perform the dispersion modeling.

MIT used five years (2010 through 2014) of surface Automated Surface Observing System (ASOS) data collected by the National Weather Service (NWS) from the Logan Airport weather station in Boston, Massachusetts and the corresponding upper air data from the Gray, Maine station in the dispersion modeling. The Logan Airport station is located approximately 4.0 miles to the east of MIT and is the closest first order NWS station. This surface station is representative of the Project area since they are in close proximity and therefore are exposed to the same weather systems and conditions such as urban heat island effects and coastal air-land-sea interactions. The upper air station in Gray, Maine is the most representative upper station for the Boston area. The meteorological data was processed by MIT using the latest versions of U.S. EPA AERMINUTE (version 14337), AERSURFACE (version 13016) and AERMET (version 15181). The Applicant used default processing options in the AERMET processing for this analysis. The preferred ASOS 1-minute wind data was used in the processing to reduce the number of calm hours input to the model.

MIT characterized land use within a 3 kilometer (km) radius as urban and therefore used urban dispersion coefficients in the dispersion modeling. As required for urban dispersion, a population of 1,118,961 derived from the 2010 US Census and representing the Cambridge/Boston metropolitan area was utilized in the model.

The modeling predicted air quality concentration impacts on a nested Cartesian coordinate receptor grid extending 10 km from the main CUP stack. Receptors are discrete points that represent a specific location on a coordinate grid. A total of 2,415 receptors were included in the dispersion modeling analysis. The spacing of the receptors ranged from 20 meters close to the CUP stack and increased to 1000 meter spacing out to 10 km. This means the receptor field was denser (i.e., more receptors per unit of area) closer in to MIT and less dense with increasing distance away from MIT. The denser part of the grid covered the surrounding area including the neighborhoods of Kendall, East Cambridge, and Boston's Back Bay.

The future operational configuration modeled for the analysis consisted of the two new turbines operating through their HRSG's with duct burners on. Additionally, the 2 MW Cold Start Engine was included in the modeling along with the following existing MIT sources:

- Boilers, BLR-42-3, BLR-42-4, and BLR-42-5;
- Boilers, BLR-42-7 and BLR 42-9;
- Generator No. 01 (DG-42-6);
- Cooling Tower Nos. 7,8,9,10,11,12, and 13

9.3 Significant Impact Analysis

9.3.1 Basis for Significant Impact Levels

The first part of the analysis was to predict which pollutants at which averaging times have more than a 'significant' impact on air quality. To identify new pollution sources with the potential to significantly alter ambient air quality, the EPA adopted "significant impact levels" (SILs). If the predicted impact of the new or modified emission source is less than the SIL for a particular pollutant and averaging period, and the difference between background ambient air quality and the NAAQS is greater than the SIL, then no further evaluation is needed for that pollutant and averaging period. However, if the predicted impact of the new or modified source is equal to or greater than the SIL for a particular pollutant and averaging period, then further impact evaluation is required. This additional evaluation must include measured background levels of pollutants as well as emissions from both the proposed new or modified source and any existing emission sources that may interact with emissions from the proposed new emissions source (referred to as cumulative modeling).

The basis for use of the SILs is their establishment by EPA in currently-applicable regulations and guidance and based on past precedence from recent projects triggering PSD review for PM_{10} and $PM_{2.5}$ such as Exelon West Medway (Transmittal No. X265409), MATEP (Transmittal No.: X259947), and NRG Canal Development LLC (Transmittal No. X269143). The justification that the SILs are a de minimis level (consistent with the approach documented in the May 2014 Guidance for $PM_{2.5}$ Permit Modeling) is presented in Section 9.3.2. According to current EPA guidance (refer to flow charts on Pages 6 and 7 in EPA memorandum dated June 30, 2015 from Tyler Fox to Proposed Regulatory Docket No. EPA-HQ-OAR-2015-0310), compliance with the NAAQS and PSD increments is demonstrated for all pollutants and averaging periods for which impacts are below the SILs. In this case, the results of the significant impact analysis showed that Project impacts were above the SILs for both PM_{10} and $PM_{2.5}$ for all the averaging periods. Accordingly, the additional modeling evaluations were required (refer to Sections 9.5 and 9.6).

9.3.2 Project Specific Justification for Using SILs

If the air quality monitoring data shows that the difference between the NAAQS and the background concentration in the area is greater than the EPA SIL value for that pollutant and averaging period, then EPA believes it would be sufficient to conclude that a proposed source with an impact below the SIL value will not cause or contribute to a violation of the NAAQS. Table 3 presents the difference between the NAAQS and the monitored background concentration, compared to the SILs. As shown in Table 3 each pollutant for all averaging periods have a delta between the monitored value and the NAAQS, which is greater than the respective SIL. Therefore, use of the SILs for PM_{10}, and $PM_{2.5}$ as de minimis levels is appropriate.

Table 3 Justification for using SILs					
Pollutant	**Averaging Period**	**Background Level ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**	**Delta (NAAQS-Background) ($\mu g/m^3$)**	**Significant Impact Level (SIL) ($\mu g/m^3$)**
PM_{10}	24-Hour	53.0	150	97.0	5
$PM_{2.5}$	24-Hour	18.2	35	16.8	1.2
	Annual	7.7	12	4.3	0.3

Table 3 Key:
$\mu g/m^3$ = microgram per cubic meter
NAAQS = National Ambient Air Quality Standards
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter

9.3.3 Additional Justification for Using SILs for $PM_{2.5}$

Despite the fact that the PSD regulations addressing SILs for $PM_{2.5}$ were partially vacated and remanded (at EPA's request) in a January 22, 2013 Appeals Court decision, the use of the $PM_{2.5}$ SILs is still valid in certain circumstances in which ambient background concentrations are relatively low. EPA did not concede that it lacked authority to promulgate SILs and the Court found that it was not necessary to address the question of whether EPA had such authority. In fact, the SILs were vacated and remanded only in PSD sections 40 CFR 51.166(k)(2) and 52.21(k)(2) but were not vacated in 40 CFR 51.165(b)(2). This is most likely because the text of this latter regulation does not exempt a source from ambient air quality analysis but states that if a source located in an attainment area exceeds a SIL in a nonattainment area (or predicted nonattainment situation), it is deemed to have contributed to or caused a violation of a NAAQS.

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. This is not the case in the Cambridge/Boston area where the $PM_{2.5}$ background (24-hour averaging time) is only slightly over half of the NAAQS, 18.2 micrograms per cubic meter ($\mu g/m^3$) vs. 35 $\mu g/m^3$. Likewise, the annual $PM_{2.5}$ background is about two thirds of the NAAQS, 7.7 $\mu g/m^3$ vs. 12 $\mu g/m^3$, a difference that is fully 14 times the remanded annual SIL value of 0.3 $\mu g/m^3$. Therefore, use of the prior $PM_{2.5}$ SILs is appropriate in the case of the ambient air quality impact analysis for MIT's Project because the background concentrations plus the SILs still leave a significant margin before the NAAQS would come close to being jeopardized.

Use of the prior $PM_{2.5}$ SILs is also consistent with the recent EPA guidance on this matter which states[2]:

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2. EPA, Office of Air Quality Planning and Standards, "Circuit Court Decision on $PM_{2.5}$ Significant Impact Levels and Significant Monitoring Concentration – Questions and Answers", March 4, 2013. http://www.epa.gov/nsr/documents/20130304qa.pdf

- The EPA does not interpret the Court's decision to preclude the use of SILs for $PM_{2.5}$ entirely but additional care should be taken by permitting authorities in how they apply those SILs so that the permitting record supports a conclusion that the source will not cause or contribute to a violation of the $PM_{2.5}$ NAAQS.

- PSD permitting authorities have the discretion to select $PM_{2.5}$ SIL values if the permitting record provides sufficient justification for the SIL values that are used and the manner in which they are used to support a permitting decision.

- The $PM_{2.5}$ SIL values in the EPA's regulations may continue to be used in some circumstances if permitting authorities take care to consider background concentrations prior to using these SIL values in particular ways.

- Because of the Court's decision vacating the $PM_{2.5}$ Significant Monitoring Concentration (SMC), all applicants for a federal PSD Permit should include ambient $PM_{2.5}$ monitoring data as part of the air quality impacts analysis. If the preconstruction monitoring data shows that the difference between the $PM_{2.5}$ NAAQS and the monitored $PM_{2.5}$ background concentrations in the area is greater than the EPA's $PM_{2.5}$ SIL value, then the EPA believes it would be sufficient in most cases for permitting authorities to conclude that a proposed source with a $PM_{2.5}$ impact below the $PM_{2.5}$ SIL value will not cause or contribute to a violation of the $PM_{2.5}$ NAAQS and to, therefore, forego a more comprehensive cumulative modeling analysis for $PM_{2.5}$.

- As part of a cumulative analysis, the applicant may continue to show that the proposed source does not contribute to an existing violation of the $PM_{2.5}$ NAAQS by demonstrating that the proposed source's $PM_{2.5}$ impact does not significantly contribute to an existing violation of the $PM_{2.5}$ NAAQS. However, permitting authorities should consult with the EPA before using any of the SIL values in the EPA's regulations for this purpose (including the $PM_{2.5}$ SIL value in section 51.165(b)(2), which was not vacated by the Court).

As shown in Table 4, MIT did not show presumptive compliance with NAAQS and PSD increments by providing modeling results under the SILs. Cumulative and increment modeling was in fact performed for 24-hour PM_{10}/$PM_{2.5}$ and annual $PM_{2.5}$. Rather, SILs were used and assessed on a receptor by receptor basis for the purpose of identifying receptors with a significant Project impact for defining the Significant Impact Area for the cumulative NAAQS and PSD increment analysis.

9.3.4 Significant Impact Analysis (SIA) Results

The significant impact analysis dispersion modeling results for the Project are provided in Table 4 along with the corresponding Significant Impact Levels (SILs).

Table 4 SIA Dispersion Modeling Results					
Pollutant	**Avg. Time**	**Form**	**Max. Modeled Concentration ($\mu g/m^3$)**	**SIL ($\mu g/m^3$)**	**Above SIL?**
Future Operational Scenario (2 new turbines/HRSGs)					
PM_{10}	24-hr	High	**14.2**	5	Yes
$PM_{2.5}$	24-hr	High	**10.1**	1.2	Yes
	Annual	High	**0.98**	0.3	Yes

Table 4 Key:
$\mu g/m^3$ = microgram per cubic meter
SIL = Significant Impact Level
SIA = Significant Impact Analysis
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter

The SIL analysis results are used as the basis for the cumulative impact modeling. The modeling results in the Table 4 show maximum predicted impact concentrations are above the SILs for both PM_{10} and $PM_{2.5}$ for all averaging periods. Accordingly, cumulative impact modeling was required for the future operational scenario for both pollutants/averaging periods.

9.4 Preconstruction/Background Air Quality Monitoring Analysis

Ambient background monitoring data from MassDEP's Boston Kenmore Square monitoring site for the three (3) year period from 2012-2014 were used to characterize criteria pollutant ambient air impacts. For 24-hour PM_{10}, the form of the standard value was used. The average of the three annual arithmetic averages was used for annual $PM_{2.5}$. The observed annual ambient air quality concentrations and 3-year background levels are provided in Table 5.

Table 5 Observed Ambient Air Quality Concentrations and Background Levels						
Pollutant	**Averaging Period**	**2012**	**2013**	**2014**	**Background Level**	**NAAQS**
PM_{10} ($\mu g/m^3$)	24-Hour	28.0	50.0	53.0	53.0	150
$PM_{2.5}$ ($\mu g/m^3$)	Annual	9.0	8.0	6.0	7.7	12

Table 5 Key:
$\mu g/m^3$ = microgram per cubic meter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
NAAQS = National Ambient Air Quality Standards

24-hour $PM_{2.5}$ is not represented in Table 5 because background values of $PM_{2.5}$ were used in a post-processing step within AERMOD. For $PM_{2.5}$ the 3-year (2012-2014) average 98th percentile seasonal concentration was utilized consistent with the Tier 2 approach detailed in the EPA, Guidance for $PM_{2.5}$ Permit Modeling Memorandum (EPA, May 2014, EPA-454/B-14-001).

The memorandum, at Page 60, states:

> For the Second Tier 24-hour modeling analyses, it is recommended that the distribution of monitored data equal to and less than the annual 98th percentile be appropriately divided into seasons (or quarters) for each of the three years that are used to develop the monitored design value. This results in data for each year (for three years) which contains one season (quarter) with the 98th percentile value and three seasons (quarters) with the maximum values which are less than or equal to the 98th percentile value. The maximum concentration from each of the seasonal (or quarterly) subsets should then be averaged across these three years of monitoring data. The resulting average of seasonal (or quarterly) maximums should then be included as the four seasonal background values within the AERMOD model.

The range of seasonal 24-hour background $PM_{2.5}$ concentrations derived by this method and input to the model were 16.9 (winter), 16.8 (spring), 16.3 (summer) and 12.5 $\mu g/m^3$(fall).

The Kenmore Square monitoring site, located approximately 0.9 miles south of MIT, is representative of the Project location due to its close proximity and urban nature. The Kenmore monitoring station is in the vicinity of the source under consideration according to the Guideline on Air Quality Models (70 FR 68242). The Kenmore station fully meets the requirements of 40 CFR Part 51, Appendix W, Section 8.2 in terms of time period, length of record, completeness, and quality of data.

With respect to current representativeness, the Kenmore station was representative in the year preceding receipt of the Application and continues to be representative. Use of the data from this monitoring site is representative of the background ambient air levels for the urban Boston area, including the Project location in Cambridge. In addition, the data represents background concentrations that are conservative because they include impacts from multiple source emissions that are also included in the modeling.

For the reasons set forth above, in accordance with the PSD regulations and recent EPA guidance, MassDEP has determined that preconstruction monitoring is not required. Moreover, we have determined that the Kenmore Station ambient air data is representative of not only the Project area, but all its surrounding neighborhoods.

9.5 Cumulative Modeling Analysis

Non-MIT facilities required for inclusion in the cumulative modeling are those emission sources within 10 km of the MIT CUP that emit significant $PM_{2.5}$ or PM_{10} emission rates (>10 tpy $PM_{2.5}$, >15 tpy PM_{10} based on reported actual emissions). Four nearby facilities were identified as satisfying the criteria. The following facilities were identified as interactive sources for modeling purposes:

1. Veolia Kendall Station (~1.2 km to the east-northeast of MIT CUP)
2. Harvard Blackstone (~1.8 km to the west-northwest of MIT CUP)
3. MATEP (~3.0 km to the southwest of MIT CUP)
4. Exelon Mystic Station (~3.8 km to the north-northeast of MIT CUP)

MIT performed cumulative AERMOD modeling for the future operational configuration for 24-hour PM_{10}/$PM_{2.5}$ and annual $PM_{2.5}$. The cumulative modeling included the Project, existing MIT sources and the nearby interactive sources. The cumulative impacts of all modeled sources plus the monitored background concentration were then compared to the NAAQS. The results of the cumulative source air quality modeling are presented in Table 6.

Table 6
Cumulative Source Air Quality Modeling

Pollutant	**Avg. Period**	**Form**	**Total Concentration (μg/m³)**	**AERMOD Predicted Contribution (μg/m³)**					**NAAQS (μg/m³)**	**Percent (%) of NAAQS**
				MIT	**Kendall Station**	**Harvard Blackstone**	**MATEP**	**Mystic Station**		
Future Operational Scenario (2 new turbines/HRSGs)										
PM_{10}	24-hr	H6H	76.7	23.6	0.0032	0.0092	0.01452	0.0099	150	51%
$PM_{2.5}$	24-hr	H8H	34.4	18.1	0.014	0.4	0.010	0.014	35	98%
	Annual	H	11.0	2.34	0.18	0.51	0.05	0.21	12	92%

Table 6 Key:
μg/m³ = microgram per cubic meter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
NAAQS = National Ambient Air Quality Standards

The cumulative AERMOD modeling demonstrates that the MIT Project will not cause or contribute to a violation of the NAAQS, and therefore, the public health and welfare will remain protected, including residents in nearby buildings and adjacent neighborhoods.

9.6 PSD Increment Analysis

A PSD increment is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant. The baseline concentration is defined for each pollutant (and relevant averaging period) and, in general, is the ambient concentration existing at the time that the first complete PSD permit application affecting an area is submitted. Significant deterioration is said to occur when the amount of new pollution would exceed the applicable PSD increment. Modeling to show that allowable increments are not exceeded must include existing PSD sources that are both within the baseline area and were constructed after the PSD baseline date. These include increment consuming sources and can include increment expanding sources (those that have added controls or stopped operating) after the PSD baseline date. It is important to note, however, that the air quality cannot deteriorate beyond the concentration allowed by the applicable NAAQS, even if not all of the PSD increment is consumed.

The MIT Project is a major modification of an existing major source, and the date of the PSD Permit for the Project will establish the minor source baseline date for $PM_{2.5}$ for Middlesex County. The minor source baseline date was set for PM_{10} in Cambridge on September 10, 2001 (Southern Energy Kendall LLC PSD Permit approval date).

The PSD increment analysis requires additional modeling if the maximum modeled concentration of a pollutant due to emission increase from the proposed Project exceeds the applicable SIL (see Table 3). Therefore, MIT was required to model PSD increment consumption for 24-hour PM_{10}/$PM_{2.5}$ and annual $PM_{2.5}$ for the Project sources. There are no $PM_{2.5}$ increment-consuming sources already in the baseline area because this application is setting the minor source baseline date for $PM_{2.5}$ in Middlesex County. However, for PM_{10} the baseline was established in 2001 and the same nearby interactive sources included in the cumulative modeling were included in the increment modeling as increment consuming sources. The nearby sources consist of Veolia Kendall Station, Harvard Blackstone Station, MATEP and Exelon Mystic Station.

For new and existing MIT sources, increment-consuming sources (.i.e., new turbines, 2 MW cold start engine and recently installed cooling towers) were modeled at their maximum allowable emissions rates, while existing increment expanding sources (i.e., retiring existing turbine, switch from No.6 oil to ULSD in BLR-42-3, BLR-42-4, and BLR-42-5, reduction in the amount of allowable ULSD usage in BLR-42-7 and BLR-42-9, and retiring cooling towers) were modeled at their maximum actual emission rates (using a negative emission rate in AERMOD). The previously determined worst-case operating condition for the new turbines was used in the PSD increment modeling.

Increment modeling was performed to the most distant location where air quality modeling predicts a significant ambient impact will occur. This is referred to as the radius of significant impact. However, for the $PM_{2.5}$ increment modeling, no receptors were removed from the full receptor grid used in the SIA and cumulative modeling based on any impact thresholds. PM_{10} increment modeling was performed for receptors out to the farthest distance (0.75 km) where the Project had a significant impact.

Table 7 shows the results of the PSD increment analysis for PM_{10} and $PM_{2.5}$, which includes impacts from the new MIT Project sources and existing MIT sources for PM_{10} and $PM_{2.5}$ and nearby interactive sources for PM_{10} only. The results indicate that the operation of the proposed Project in MIT’s future operational configuration is protective of the PSD increments.

Table 7				
Modeled Results Compared to the PSD Increments				
Pollutant	**Averaging Period**	**Modeled Concentration ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**	**Less than PSD Increment?**
PM_{10}	24-Hour	8.85	30	Yes
$PM_{2.5}$		8.25	9	Yes
$PM_{2.5}$	Annual	1.41	4	Yes

Table 7 Key:
$\mu g/m^3$ = microgram per cubic meter
PSD = Prevention of Significant Deterioration
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter

9.7 Secondary $PM_{2.5}$ Impacts

EPA (2013) has recently adopted guidance regarding secondary $PM_{2.5}$ formation in PSD dispersion modeling analyses.

- Case 1: If $PM_{2.5}$ emissions < 10 tpy and NO_X and SO_2 emissions < 40 tpy, then no $PM_{2.5}$ compliance demonstration is required.
- Case 2: If $PM_{2.5}$ emissions > 10 tpy and NO_X and SO_2 emissions < 40 tpy, then $PM_{2.5}$ compliance demonstration is required for direct $PM_{2.5}$ emission based on dispersion modeling, but no analysis of precursor emissions from the project source is necessary.
- Case 3: If $PM_{2.5}$ emissions > 10 tpy and NO_X and/or SO_2 emissions > 40 tpy, then $PM_{2.5}$ compliance demonstration is required for direct $PM_{2.5}$ emission based on dispersion modeling, AND the applicant must account for impact of precursor emissions from the project source.
- Case 4: If $PM_{2.5}$ emissions < 10 tpy and NO_X and/or SO_2 emissions > 40 tpy, then $PM_{2.5}$ compliance demonstration not required for direct $PM_{2.5}$ emissions, BUT the applicant must account for impact of precursor emissions from the project source.

Since the Project falls into Case 2, only direct emissions of $PM_{2.5}$ were modeled.

10.0 ADDITIONAL IMPACTS ANALYSIS

10.1 Impairment to Visibility, Soils and Vegetation

40 CFR 52.21(o) requires the Applicant to conduct an analysis of the air quality impact and impairment to visibility, soils, and vegetation that would occur as a result of the Project and general commercial, residential, industrial, and other growth associated with the Project.

The Lye Brook Wilderness Area in southern Vermont is the closest Class I area to MIT. Lye Brook is located approximately 175.5 km to the northwest of MIT. As part of the Regional Haze Regulations, EPA has devised a screening criterion for sources located more than 50 km from the Class I area. A source is considered to have negligible impacts when the combined annual emissions of SO_2, NO_X, PM_{10}, and H_2SO_4 (in tons) divided by the distance (in km) from the Class I area is 10 or less. In this case, this ratio is about 0.52. Based on the proposed emission rates and distance to the nearest Class I location, it is not expected that impacts from the Project will have an adverse effect on visibility in the Class I area and as such a visibility modeling analysis for the proposed Project was not conducted. This decision received the concurrence of the FLM (Forest Service, Eastern Regional Office) in an email from Ralph Perron to Epsilon Associates, Inc. dated September 8, 2016 which stated that an Air Quality Related Values Analysis was not being requested by the US Forest Service.

The EPA guidance document for soils and vegetation, "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" (EPA Screening Procedure) (EPA 450/2-81-078) established a screening methodology for comparing air quality modeling impacts to "vegetation sensitivity thresholds." As an indication of whether emissions from the Project will significantly impact the surrounding vegetation (i.e., cause acute or chronic exposure to each evaluated pollutant), the modeled emission concentrations have been compared against both a range of injury thresholds found in the guidance, as well as those established by the NAAQS secondary standards. Since the NAAQS secondary standards were set to protect public welfare, including protection against damage to crops and vegetation, comparing modeled emissions to these standards provides some indication of whether potential impacts are likely to be significant.

Most of the designated vegetation screening levels are equivalent to or exceed NAAQS and/or PSD increments, so the satisfaction of NAAQS and PSD increments assures compliance with sensitive vegetation screening levels. Since there are no specific $PM/PM_{10}/PM_{2.5}$ screening level sensitive concentrations, no formal comparison was performed.

11.0 MASS BASED EMISSION LIMITS

To ensure the NAAQS and PSD increment are not violated, a PSD Permit must contain enforceable permit terms and conditions which ensure the mass flow rates for each modeled pollutant are not exceeded. This is accomplished by establishing mass-based emission limits for the modeled pollutants $PM/PM_{10}/PM_{2.5}$ with or without the use of Continuous Emissions Monitors (CEMS). Since CEMS will not be used for determining compliance with $PM/PM_{10}/PM_{2.5}$ or GHG as CO_2e, the applicable stack test method establishes the averaging period by default.

The PSD Permit contains the Project mass-based emission limits MIT used in demonstrating compliance with the NAAQS and $PM_{2.5}$ increment, and are therefore enforceable emission limits in the PSD Permit. The increment modeling also uses federally-enforceable mass-based emission limits for the boilers, as established in 310 CMR 7.02 BACT Approvals applicable to those units and as included in MIT's existing operating permit (Tr# X223574 MBR-95-OPP-026).

The mass-based emission limits for GHG were not used in the impact analysis for modeling since there is no NAAQS or GHG increment to protect. The PSD Permit does contain the mass-based emission limits for GHG which are representative of BACT for the Project.

12.0 ENVIRONMENTAL JUSTICE

MIT addressed the PSD Environmental Justice (EJ) requirements in its PSD permit application. The documentation that is provided in the PSD permit application enabled MassDEP to fulfill its obligation under the provisions of the April 11, 2011 PSD Delegation Agreement between the EPA and MassDEP to "identify and address, as appropriate 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). The Executive Order was designed to ensure that each federal agency "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations."

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 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.

EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work.

- The assessment of EJ considers the following:
- The areas in which the proposed Project may result in significant adverse environmental effects;
- The presence and characteristics of potentially affected minority and/or low-income populations ("communities of concern") residing in these study areas; and
- The extent to which these communities are disproportionately affected in comparison to the effects experienced by the population of the greater geographic area within which the affected area is located is determined.

The proposed Project's ambient air impacts, combined with the pre-existing background levels, will meet the federal NAAQS which are designed to protect public health against health effects of air pollutants with a margin of safety and will therefore have no disproportionately high adverse human health or environmental impacts upon any Environmental Justice population. Further, MIT's analysis has shown that the proposed Project represents an environmental improvement over existing conditions in nearby areas, including those with minority and low-income populations. Specifically, MIT has shown: 1) The upgraded plant will use natural gas for all normal operations, which is expected to lower MIT's regulated pollutant emissions as compared to current operations; 2) The two new turbines will be cleaner and more efficient than the plant's current equipment; 3) MIT's new firm gas supply contract with Eversource will enable the plant to run entirely on natural gas; 4) With the upgraded plant in operation, emergency diesel generators, which have higher emissions, will be relied upon to operate less frequently; 5) MIT will provide Eversource with a location within the plant to install a new gas regulator station that will provide additional capacity and more reliable gas service to the Cambridge community; and 6) The upgraded plant will have "black start" restoration capability which will allow MIT to avoid and minimize the use of additional diesel generators, thereby reducing emissions during emergencies. Based on the above, MassDEP concurs that the proposed Project represents an environmental improvement over existing conditions in nearby areas, including those with minority and low-income populations.

12.1 Public Participation

MIT has focused its public participation efforts throughout the permitting process on providing ample opportunity for the local community, including minority and low-income populations, to be provided access to information on the Project and opportunity for involvement in the process.

As a primary example of MIT's goal to provide access to information on the Project and opportunity for involvement in the process to the local community, including minority and low-income populations, MIT specifically created and developed the following website to post relevant Project details and updates: https://powering.mit.edu.

A summary of the additional public outreach previously conducted by MIT is given below.

- Notification of Filing an Expanded Environmental Notification Form (EENF) under the Massachusetts Environmental Policy Act (MEPA) and Public Scoping – December 2015

MIT consulted with the EOEEA Environmental Justice Director on December 9, 2015 regarding the overall public outreach approach for the EENF. MIT's outreach efforts are described below.

MIT submitted the Massachusetts Environmental Policy Act (MEPA) Expanded Environmental Notification Form (ENF). The Expanded ENF was submitted December 15, 2015 and noticed in the December 23, 2015 *Environmental Monitor*, in the December 18, 2015 *Boston Herald*, and in the December 24, 2015 *Cambridge Chronicle.*

Following notice in the *Environmental Monitor*, toward MIT's objective to include the local community, including minority and low-income populations, in the process, MIT published a two-page fact sheet describing the Project and options for comment in the three most common non-English languages spoken in the areas adjacent to the Project site. The fact sheet was published in English in the *Cambridge Chronicle* on January 7, 2016, in Spanish in *El Mundo* on January 7, 2016, in Chinese in *Sampan* on January 8, 2016 and in Portuguese in the *O Jornal* on January 8, 2016. The fact sheets, along with a news announcement, were also posted on MIT's CUP Combustion Turbine Expansion Project website at https://powering.mit.edu. All facts sheets and the Expanded ENF were sent to the Central Square Branch of the Cambridge Public Library. The MEPA Office accepted comments in all languages through January 22, 2016.

A public scoping session was held to hear comments on the proposed Project from 6:00 to 8:00 p.m. on January 14, 2016 at MIT Building 4, Room 270 (182 Memorial Drive, Cambridge, Massachusetts). Consistent with MIT's public participation efforts, to ensure that the local community, including minority and low-income populations, be provided ample opportunity to understand the Project, MIT provided interpretation services in Spanish, Portuguese, French, and Cantonese at the public meeting.

- Notification of Filing a Single Environmental Impact Report under the Massachusetts Environmental Policy Act (MEPA) – May 2016

The submittal of the Single Environmental Impact Report (EIR) was announced in the Environmental Monitor on May 25, 2016. MIT published the notification of the availability of the Single EIR in English in the *Cambridge Chronicle* on May 26, 2016, in Spanish in *El Mundo* on May 19, 2016, in Chinese in *Sampan* on May 27, 2016, and in Portuguese in the *O Jornal* on May 20, 2016. The Single EIR and translated fact sheets were provided to the Cambridge Public Library, Central Square Branch. Members of the public were able request copies through the MEPA Office.

- MIT has posted copies of the PSD Application, the Expanded ENF, and the Single EIR on the website it developed in order to keep the local community, including minority and low-income populations, up to date and aware of the proposed Project (https://powering.mit.edu), along with Project descriptions and responses to frequently asked questions.

Continuing with MIT's public participation efforts, in order to ensure that the local community, including minority and low-income populations, were provided ample opportunity to understand and comment on the Project, MIT published the Notice of Public Hearing and Public Comment Period on the Draft PSD Permit in English, Spanish, Portuguese, French and Chinese (Cantonese). MIT also ensured that interpreters for these languages were provided at the Public Hearing.

MIT posted electronic copies of the Notice of Public Hearing and Public Comment Period, Proposed Plan Approval, Draft PSD Permit and Draft PSD Fact sheet on its website, https://powering.mit.edu.

13.0 NATIONAL HISTORIC PRESERVATION ACT (NHPA), ENDANGERED SPECIES ACT (ESA), TRIBAL CONSULTATION

Section IV of the PSD Delegation Agreement contains the requirements for Applicants (e.g., MIT), MassDEP, and EPA with regards to the PSD Program. Under the PSD Delegation Agreement, EPA must engage in consultation as required by federal law before MassDEP issues PSD Permits.

Section IV.H.3. states that "[i]f EPA requires more time to consult with an Indian tribe before issuance of a Draft PSD Permit, refrain from issuing the Draft PSD Permit until EPA informs MassDEP that it may do so." In addition, Section IV.H.4. states that "[i]n all cases, MassDEP will refrain from issuing any PSD Permit until EPA has notified MassDEP that EPA has satisfied its NHPA, ESA, and Tribal consultation responsibilities with respect to that Permit."

The following sections outline how the NHPA, ESA, and Tribal consultation requirements identified under the PSD Delegation Agreement have been met.

13.1 National Historic Preservation Act

On December 17, 2015 Epsilon submitted a letter to the Massachusetts Historic Commission (MHC) notifying the MHC of MIT's submittal of a PSD Permit Application for the proposed Project.

In an October 13, 2016 letter to MassDEP, EPA stated that NHPA consultation requirements for the proposed Project have been satisfied.

13.2 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires that certain federal actions such as federal PSD Permits address the protection of endangered species in accordance with the ESA. An endangered species review was conducted and it was determined that no endangered species will be impacted by the proposed Project.

In an October 13, 2016 letter to MassDEP, EPA stated that ESA consultation requirements for the proposed Project have been satisfied.

13.3 Tribal Consultation

On December 17, 2015, Epsilon submitted separate letters to the Tribal Environmental Directors and the Tribal Historic Preservation Officers for the Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee Wampanoag Tribe. The letters notified the Tribes of the proposed Project's PSD Permit Application. As of this date, the Tribal Environmental Directors for the two tribes have not responded to the letters.

In an October 13, 2016 letter to MassDEP, EPA stated that Tribal consultation requirements for the proposed Project have been satisfied.

13.4 Magnuson-Stevens Act

In the October 13, 2016 letter to MassDEP, EPA also stated that the Magnuson-Stevens Act requirements do not apply to this Project.

14.0 COMMENT PERIOD, HEARINGS AND PROCEDURES FOR FINAL DECISIONS

A public hearing was held on May 22, 2017 during the public comment period. In reaching a final decision on the PSD Permit, MassDEP responded to all significant comments, and is issuing a Response to Comments (RTC) document, as appropriate, concurrently with this PSD Fact Sheet and the PSD Permit.

MassDEP will forward a copy of the PSD Permit, PSD Fact Sheet and RTC to the Applicant and each person who has submitted comments or requested notice.

Along with the PSD Permit, each person will be notified of their right to appeal, in accordance with 40 CFR 124.15 and 124.19 via the following language:

1. Within 30 days after the PSD Permit decision is issued under 40 CFR 124.15, any person who filed comments on the Draft Permit or participated in any public hearing may petition EPA's Environmental Appeals Board (EAB) to review any condition of the Permit decision.
2. The effective date of the Permit is 30 days after service of notice to the Applicant and commenters of the final decision to issue, modify, or revoke and reissue the Permit, unless review is requested on the Permit under 40 CFR 124.19 within the 30 day period.
3. If an appeal is made to the EAB, the effective date of the Permit is suspended until the appeal is resolved.

15.0 MASSDEP CONTACT

Additional information concerning the PSD Permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M., Monday through Friday, excluding holidays from:

Edward J. Braczyk
MassDEP Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887
(978) 694-3200
edward.braczyk@state.ma.us

In addition, information on the Project and the PSD Permit may be obtained through the MassDEP website at: http://www.mass.gov/eea/agencies/massdep/air/approvals/mit.html