



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
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February 11, 2009

Diane Leopold  
Dominion Energy Brayton Point, LLC  
5000 Dominion Boulevard  
Glen Allen, Virginia 03060-6711

RE: **PROPOSED CONDITIONAL APPROVAL**

Application for: BWP AQ 03  
Major Comprehensive Plan Approval  
310 CMR 7.02 Plan Approval and Emission Limitations  
Transmittal No.: X224106  
Application No.: 4B08052  
Source No.: 0061

AT: Brayton Point Station  
1 Brayton Point Road  
Somerset, Massachusetts 02726

Dear Ms. Leopold:

The Department of Environmental Protection (the "Department" or "MassDEP"), Bureau of Waste Prevention has reviewed the Major Comprehensive Plan Application (MCPA) submitted by Dominion Energy Brayton Point, LLC ("Dominion"), for proposed modifications to the Brayton Point Station ("Facility") located at 1 Brayton Point Road, Somerset, Massachusetts.

Proposed modifications to the Facility include alterations to existing coal fired electric utility generating Unit 3 and conversion of the Facility to closed cycle cooling. The application bears the seals and signatures of Andrew Jablonowski, P.E. No. 39123 of Epsilon Associates, Inc. and David Crispo, P.E. No. 41499 of Shaw Environmental, Inc..

MassDEP, on December 29, 2008, issued an Amended Emission Control Plan (ECP) Final Approval (4B08050) that defined how Dominion would come into compliance with 310 CMR 7.29 Emission Standards for Power Plants. The Amended ECP Final Approval and 310

CMR 7.29 required that Dominion submit to MassDEP an application pursuant to 310 CMR 7.02 Plan Approval and Emission Limitations for the alterations which will reduce stack gas exit temperature due to the construction of the Dry Scrubber (DS), Fabric Filter (FF) bag house, Powder Activated Carbon (PAC) injection systems.

Compliance Orders were issued to Dominion by the U.S. Environmental Protection Agency (Order No. 08-007) and the Massachusetts Department of Environmental Protection (Order No. UAO-BO-08-1N001) on December 17, 2007 and March 27, 2008, respectively. These Compliance Orders concern Dominion's compliance with the National Pollutant Discharge Elimination System (NPDES) Permit No. MA0003654 and requires the conversion of the Facility to closed cycle cooling and includes a schedule to meet the limits contained in the NPDES Permit.

In response to the Amended ECP Final Approval and Compliance Orders, on August 29, 2008 Dominion postmarked the MCPA and on September 2, 2008 MassDEP received the MCPA that is the subject of this Proposed Conditional Approval.

MassDEP is of the opinion that the material submitted is in conformance with the current Massachusetts Air Pollution Control Regulations and hereby **PROPOSES to CONDITIONALLY APPROVE** the proposed alterations of the Facility, subject to the conditions and provisions stated herein. The Conditional Approval when issued will supersede the June 27, 2003 Conditional Approval (4B02012), and the August 22, 2005 and December 20, 2006 Revised Conditional Approvals (4B04025 and 4B06002).

The MCPA was submitted in accordance with Section 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control Regulations", adopted by the Department pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-M. The Department's review has been limited to compliance with applicable Air Pollution Control Regulations and does not relieve you of the obligation to comply with all other permitting requirements contained in other regulations or statutes.

This Proposed Conditional Approval combines and includes: the 310 CMR 7.02 Comprehensive Plan Approval; and the 310 CMR 7.00: Appendix A: Emission Offsets and Nonattainment Review analysis; and hereby incorporates the MCPA submitted by Dominion Energy Brayton Point, LLC and revisions submitted by Dominion Energy Brayton Point, LLC by reference, including the December 29, 2008 Amended ECP Final Approval (4B08050).

MassDEP will hold a public hearing on March 16, 2009 and have a thirty (30) day public comment period to receive public comment on the Proposed Conditional Approval. Enclosed is a copy of the Public Notice that will be published in the local newspapers on February 11, 2009.

The **CONDITIONAL APPROVAL** when issued will allow for commencement of proposed construction and or alterations of the facility and its operation, and provides information on the project description, emission control systems, emission limits, continuous emission monitors, record keeping, reporting and testing requirements.

A list of submitted information pertinent to the MCPA (Application No. 4B08052) is delineated on page 34.

Should you have any questions concerning this matter, please feel free to contact the undersigned at (508) 946-2779.

Very truly yours,

*This final document copy is being provided to you electronically by the  
Department of Environmental Protection. A signed copy of this document  
is on file at the DEP office listed on the letterhead.*

John K. Winkler, Chief  
Permit Section  
Bureau of Waste Prevention

Enclosure: Public Notice

ec: Barry Ketschke, Dominion Energy Brayton Point, LLC  
Pamela Faggert, Dominion Resources Services, Inc.  
Scott Lawton, Dominion Resources Services, Inc.  
Board of Selectmen, Somerset, MA  
Board of Health, Somerset, MA  
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Shanna Cleveland, CLF, Boston, MA  
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Cindy Luppi, Clean Water Action, Boston, MA  
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**List of Abbreviations**

ARP.....	ash reduction process
BACT.....	Best Available Control Technology
Btu/kWh.....	British Thermal Units per kilowatt hour
Btu/lb.....	British Thermal Units per pound
CEM.....	continuous emission monitor
COM.....	continuous opacity monitor
CO.....	carbon monoxide
CO <sub>2</sub> .....	carbon dioxide
DS.....	dry scrubber
ECP.....	Emission Control Plan
EPA.....	U.S. Environmental Protection Agency
ESP.....	electrostatic precipitator
FF.....	fabric filter
FGD.....	flue gas desulfurization
gpm.....	gallons per minute
Hg.....	mercury
HAP.....	Hazardous Air Pollutant
HHV.....	higher heating value
lb/hr.....	pound per hour
lb/MMBtu.....	pound per million British Thermal Units
lb/MWh.....	pound per megawatt hour (net)
lb/GWh.....	pounds per gigawatt hour (net)
LAER.....	lowest achievable emission rate
LOI.....	loss-on-ignition
MCPA.....	Major Comprehensive Plan Application
MCR.....	maximum continuous rating
MMBtu/hr.....	Million British Thermal Units per hour
MW.....	megawatt
NAAQS.....	National Ambient Air Quality Standards
NH <sub>3</sub> .....	ammonia
NMCPA.....	Non-Major Comprehensive Plan Application
NO <sub>2</sub> .....	nitrogen dioxide
NO <sub>x</sub> .....	nitrogen oxides
NPDES.....	National Pollutant Discharge Elimination System
O <sub>3</sub> .....	ozone
ppm <sub>w</sub> .....	parts per million weight
ppm <sub>vd</sub> @ 3% O <sub>2</sub> .....	parts per million volume dry corrected to three percent oxygen
PAC.....	powder activated carbon
Pb.....	lead
PM.....	particulate matter
PM10.....	particulate matter up to 10 microns in size (condensables included)
PM2.5.....	particulate matter up to 2.5 microns in size (condensables included)
POTW.....	publicly owned treatment works
PTE.....	potential to emit
SCR.....	selective catalytic reduction
SDA.....	spray dryer absorber
SO <sub>2</sub> .....	sulfur dioxide
SO <sub>x</sub> .....	sulfur oxides
SO <sub>3</sub> .....	sulfur trioxide
tpy.....	tons per consecutive twelve-month period
VOC.....	volatile organic compound
WWTP.....	wastewater treatment plant

## **I. FACILITY DESCRIPTION**

### **A. Site Description**

The Dominion Energy Brayton Point, LLC (“Dominion”), formerly USGen New England, Inc., Brayton Point Station (“Facility”) site consists of approximately 250 acres of land situated in a mixed use area of Somerset, Massachusetts consisting of residential and commercial properties. The existing Facility includes approximately 1,589 MW net of coal, residual oil and natural gas boiler based electric power generation equipment, and approximately 11 MW of No. 2 distillate oil diesel engine based electric power generation equipment. The Facility site is bordered by the Lee River to the west; the Taunton River to the east; residential properties and U.S. 195 to the north; and Mount Hope Bay to the south.

### **B. Project Description**

Dominion Energy Brayton Point, LLC Brayton Point Station is subject to 310 CMR 7.29 Emissions Standards for Power Plants that were promulgated on May 11, 2001 and amended effective June 4, 2004, October 6, 2006 and June 29, 2007. These regulations impose facility-wide annual emission limits for nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and carbon dioxide (CO<sub>2</sub>), and calendar month emission limits for NO<sub>x</sub> and SO<sub>2</sub>, in units of pounds per megawatt hour (lb/MWh), and annual emission limits for mercury (Hg) in units of pounds per gigawatt hour (lb/GWh) or a minimum Hg removal efficiency. These regulations do not impose carbon monoxide (CO) and fine particulate matter (PM<sub>2.5</sub>) emission standards at this time, but development of such emission standards is reserved. These regulations required applicable power plants to submit an Emission Control Plan (ECP) that defined how the facility would comply with the 310 CMR 7.29 requirements. MassDEP issued Final Approval of the ECP (Application No. 4B01042) to USGen New England, Inc. (now Dominion Energy Brayton Point, LLC) on June 7, 2002. The Final Approval advised USGen New England, Inc. (“USGen”) of the requirement to receive a Plan Approval pursuant to 310 CMR 7.02 for the proposed alterations/construction. On April 26, 2002, MassDEP received USGen’s Major Comprehensive Plan Application (MCPA) requesting Plan Approval of the proposed alterations/construction. MassDEP issued a Conditional Approval of the MCPA (Application No. 4B02012) to USGen on June 27, 2003.

On July 30, 2004, MassDEP received USGen’s amended ECP application that requested approval of the Hg emission cap, the use of aqueous NH<sub>3</sub> for use in the SCR NO<sub>x</sub> emission control systems, and clarification of the construction schedule. MassDEP issued an Amended ECP Final Approval (Application No. 4B04021) to USGen on October 20, 2004. On August 11, 2004, MassDEP received USGen’s Non-Major Comprehensive Plan Application (NMCPA) requesting plan approval for the proposed alterations/construction. MassDEP issued a Conditional Approval of the NMCPA (Application No. 4B04025) to Dominion on August 22, 2005.

On December 6, 2005, Dominion submitted to MassDEP an amended ECP application (Application No. 4B05053) that requested approval of SDA/FF systems for control of SO<sub>2</sub> and PM emissions from Units 1 and 2. The amended ECP application also proposed the installation of PAC injection systems for removal of Hg upstream of the Units 1, 2 and 3 Koppers ESPs,

upstream of the Unit 1, 2 and 3 Research Cottrell ESPs and upstream of the Unit 1 and 2 SDA/FF systems. To optimize the performance of the PAC injection systems upstream of the ESPs, the Koppers ESPs would be taken out of service and abandoned in place or removed to provide additional residence time of the PAC with Hg while the Research-Cottrell ESPs would remain in service. MassDEP issued an Amended ECP Final Approval (Application No. 4B05053) to Dominion on March 29, 2006, and on June 16, 2006, MassDEP received Dominion's NMCPA (Application 4B06002) requesting plan approval for the proposed alterations/construction. MassDEP issued a Revised Conditional Approval of the NMCPA (Application No. 4B06002) to Dominion on December 20, 2006. The NMCPA (Application No. 4B06002) included an air quality modeling analysis to demonstrate compliance with the NAAQS given the lower stack gas exhaust temperatures from Unit 1 and 2 with the SDA/FF emission control systems. As a result of the ambient air quality impact assessment, the Revised Conditional Approval (Application No. 4B06002) established additional SO<sub>2</sub> emission limits to assure the Facility would not exceed NAAQS for SO<sub>x</sub>. The SO<sub>2</sub> emission limitations are defined in Section II Emissions of the Revised Conditional Approval (Application No. 4B08052).

On August 25, 2008, Dominion submitted to MassDEP an amended ECP application that requested approval of a DS system for control of SO<sub>2</sub> emissions from Unit 3, in lieu of the previously approved wet FGD system and new stack. The DS system will be equipped with a FF baghouse at the DS outlet for control of PM emissions and additional SO<sub>2</sub> emission control. The amended ECP application also proposed the installation of an additional PAC injection system for removal of Hg upstream of the Unit 3 DS/FF. MassDEP issued an Amended ECP Final Approval (Application No. 4B08050) to Dominion on December 29, 2008. On September 2, 2008, MassDEP received Dominion's MCPA (Application No. 4B08052) requesting plan approval for the proposed alterations/construction identified in the Amended ECP Final Approval (Application No. 4B08050), and for the construction of two natural draft evaporative cooling towers (Cooling Tower 1 and 2) to convert the Facility to closed cycle cooling. On January 14, 2009, MassDEP received a replacement MCPA that substantively revised the MCPA (Application No. 4B08052) dated September 2, 2008. The MCPA received on January 14, 2009 was deemed by the Department to be Administratively Complete.

The MCPA (Application No. 4B08052) included an air quality modeling analysis to demonstrate compliance with the NAAQS given the lower stack gas exhaust temperatures from Unit 3 with the DS/FF emission control systems and the associated emissions from Cooling Tower 1 and 2. This Conditional Approval (Application No. 4B08052) establishes PM, PM<sub>10</sub> and PM<sub>2.5</sub> emission limits for Units 1, 2, 3 and 4 and Cooling Tower 1 and 2. The PM, PM<sub>10</sub> and PM<sub>2.5</sub> emission limitations are defined in Section II Emissions of this Conditional Approval.

Air contaminant potential emission increases due to the previously approved (Application No. 4B06002, 4B04025 and 4B02012) Unit 1 and 3 alterations/construction and Cooling Tower 1 and 2 are addressed in Section VI Best Available Control Technology (BACT) of this Conditional Approval. The minor emission increases associated with the material handling and storage systems described herein are exempt from 310 CMR 7.02 Plan Approval and Emission Limitations, pursuant to 310 CMR 7.03(12) and (22); minor emission increases associated with the transfer of lime reagent and the use of reclaimed water from the Town of Somerset POTW in



Note:

- 1 - Average for years 2003 and 2004.
- 2 - Equivalent heat input capacity factor.
- 3 - Increase due to VOC from SDA & FGD make-up water.
- 4 - Increase based on 100% of NH<sub>3</sub> conversion to ammonia bisulfate and FGD limestone slurry based particulate and no air pollution controls.
- 5 - Future Actual Estimates of Hg are based upon 310 CMR 7.29 rate of 0.0075 lb/Gw-hr
- 6 - Estimate is conservative since based on SCR NH<sub>3</sub> slip with no conversion to ammonia bisulfate (refer to Note-4) and no reduction due to FGD.
- 7 - Exclusive of uncombined water

**Unit 3 DS, FF and PAC**

The alterations proposed for Unit 3 in the MCPA (Application No. 4B08052) submitted on January 9, 2009 are projected to reduce emissions of NO<sub>x</sub>, SO<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub> and Hg. The estimated actual emission changes, including previously approved PAC, SCR and ARP, are defined in Table 3.

<b>Table 3: ACTUAL EMISSION CHANGE ESTIMATE (DS, FF, PAC, SCR &amp; ARP) UNIT 3</b>				
		<b>Past Actual Baseline<sup>1</sup></b>	<b>Future Actual Emission</b>	<b>Net Change</b>
Fuel	MMBtu/yr	37,130,465	37,130,465	0
Fuel	% of max. <sup>2</sup>	75	75	0
NO <sub>x</sub>	Tons/yr	2,292	1,300	-993
CO	Tons/yr	1,268	1,268	0
VOC	Tons/yr	50.4	50.9	+0.5 <sup>3</sup>
SO <sub>2</sub>	Tons/yr	14,408	2,042	-12,366
H <sub>2</sub> SO <sub>4</sub>	Tons/yr	78	54.6	-23
PM	Tons/yr	134	185.6	+52 <sup>4</sup>
PM10	Tons/yr	134	185.6	+52 <sup>4</sup>
PM2.5	Tons/yr	134	185.6	+52 <sup>4</sup>
Pb	Tons/yr	0.01	0.01	0
Hg <sup>5</sup>	Tons/yr	0.038	0.005	-0.032
NH <sub>3</sub>	Tons/yr	0.66	0.66	0.0
Opacity <sup>6</sup>	%	0-5	0-5	0

Note:

- 1 - Average for years 2006 and 2007.
- 2 - Equivalent heat input capacity factor.
- 3 - Increase due to VOC from DS make-up water.
- 4 - Increase based on DS reaction products controlled via a FF. Estimates are filterable only consistent with Table 1 and 2, above.
- 5 - Future Actual Estimates of Hg are based upon 310 CMR 7.29 rate of 0.0025 lb/Gw-hr effective 2012
- 6 - Exclusive of uncombined water

**D. Description of Proposed Alterations**

The Dominion proposes alterations to Unit 3 and conversion of the Facility to a closed cycle cooling system utilizing two natural draft cooling towers, and has completed construction of most of the previously approved equipment associated with Units 1, 2 and 3 and the Ash Reduction Process:

**Unit 1**

Unit 1 is rated at 255 MW net with steam provided by a Combustion Engineering boiler that utilizes pulverized coal at 100% MCR as the primary fuel, natural gas at 25% MCR as a secondary fuel, No. 6 Fuel Oil at 100% MCR as a back-up fuel, and No. 2 Fuel Oil at 100% MCR as an alternate back-up fuel. The boiler is rated at 2,250 MMBtu/hr heat input. Products of

combustion are released to the ambient air from a stack 352.8 feet above ground level (367.3 feet above sea level) with an inside exit diameter of 174 inches.

Unit 1 has been equipped with an SCR system for the control of NO<sub>x</sub> emissions, a dry flue gas desulfurization system consisting of a SDA/FF for the control of SO<sub>2</sub> and PM, and Powder Activated Carbon (PAC) injection systems for the control of Hg. The SCR system is designed for up to 90% control of NO<sub>x</sub> and utilizes aqueous NH<sub>3</sub> solution (NH<sub>3</sub> concentration less than 20% by weight) to generate NH<sub>3</sub> for injection at the SCR inlet. The SDA/FF system, located downstream of the ESPs, is designed for up to 90% control of SO<sub>2</sub>. Lime is mixed with water and pumped to the SDA for SO<sub>2</sub> removal. The PAC injection system for removal of Hg includes three PAC injection locations: upstream of the Koppers ESPs, upstream of the Research Cottrell ESPs and upstream of the SDA/FF system. The PAC injection system in conjunction with the SDA/FF is designed for up to 95% control of Hg. Babcock Power Environmental, Inc. was selected as the vendor for the SCR and Wheelabrator Air Pollution Control, Inc. was selected as the vendor for the SDA/FF, and PAC emission control systems.

Unit 1 is equipped with ABB-Combustion Engineering low-NO<sub>x</sub> burners and two ESPs in series with the Koppers ESP upstream of the Research-Cottrell ESP. The EPRICON flue gas conditioning system, upstream of the Koppers ESP, was removed after the SCR system was commissioned since SO<sub>2</sub> passing through the SCR NO<sub>x</sub> controls partially converts SO<sub>2</sub> to SO<sub>3</sub> and provides SO<sub>3</sub> for particle conditioning upstream of the ESPs. The Koppers ESP remains in place but is no longer energized to provide PAC and fly ash a longer residence time to optimize removal of Hg.

## **Unit 2**

Unit 2 is rated at 255 MW net with steam provided by a Combustion Engineering boiler that utilizes pulverized coal at 100% MCR as the primary fuel, natural gas at 25% MCR as a secondary fuel, No. 6 Fuel Oil at 100% MCR as a back-up fuel, and No. 2 Fuel Oil at 100% MCR as an alternate back-up fuel. The boiler is rated at 2,250 MMBtu/hr heat input. Products of combustion are released to the ambient air from a stack 352.8 feet above ground level (367.3 feet above sea level) with an inside exit diameter of 174 inches.

Unit 2 has been equipped with a dry flue gas desulfurization system consisting of a SDA/FF for the control of SO<sub>2</sub> and PM and PAC injection systems for the control of Hg. The SDA/FF system, located down stream of the ESPs, is designed for up to 90% control of SO<sub>2</sub>. Lime is mixed with water and pumped to the SDA for SO<sub>2</sub> removal. PAC injection systems for removal of Hg include three PAC injection locations: upstream of the Koppers ESPs, upstream of the Research Cottrell ESPs and upstream of the SDA/FF system. The PAC injection system in conjunction with the SDA/FF is designed for up to 95% control of Hg. Wheelabrator Air Pollution Control, Inc. was selected as the vendor for the SDA/FF, and PAC emission control systems.

Unit 2 is equipped with ABB-Combustion Engineering low-NO<sub>x</sub> burners and two ESPs in series with the Koppers ESP upstream of the Research-Cottrell ESP. An EPRICON flue gas conditioning system can provide SO<sub>3</sub> upstream of the Koppers ESP to increase the resistivity of

the particulate to improve particulate collection by the ESPs. The EPRICON system will remain in service. The Koppers ESP remains in place but is no longer energized to provide PAC and fly ash a longer residence time to optimize removal of Hg.

### **Unit 3**

Unit 3 is rated at 633 MW net with steam provided by a Babcock and Wilcox boiler that utilizes pulverized coal at 100% MCR as the primary fuel, natural gas at 10% MCR as a secondary fuel, No. 6 Fuel Oil at 100% MCR as a back-up fuel, and No. 2 Fuel Oil at 100% MCR as an alternate back-up fuel. The boiler is rated at 5,655 MMBtu/hr heat input. Products of combustion are released from a stack 352.8 feet above ground level (367.3 feet above sea level) with an inside exit diameter of 234 inches.

Unit 3 has been equipped with an SCR system for the control of NO<sub>x</sub> emissions and a PAC injection system for the control of Hg. The SCR system is designed for up to 90% control of NO<sub>x</sub> and utilizes aqueous NH<sub>3</sub> solution (NH<sub>3</sub> concentration less than 20% by weight) to generate NH<sub>3</sub> for injection at the SCR inlet. The previously approved wet FGD system for the control of SO<sub>2</sub> and new stack planned for October 2012 is now proposed to be switched to a dry flue gas desulfurization system that will utilize lime reagent and consist of a DS/FF for the control of SO<sub>2</sub> and PM utilizing the existing stack and is currently planned for the first quarter of 2014. The SCR system is designed for up to 90% control of NO<sub>x</sub> and the DS/FF system is designed for up to 90% control of SO<sub>2</sub>. The PAC injection systems for removal of Hg inject PAC in two locations: upstream of the Koppers ESPs and upstream of the Research Cottrell ESPs and it is proposed to construct an addition PAC injection location upstream of the DS/FF. The PAC injection system in conjunction with the ESPs is designed for up to 80% control of Hg and with the proposed DS/FF is designed for up to a maximum of 95% control of Hg. Babcock Power Environmental, Inc., was selected as the vendor for the SCR system, Chemico Systems, LP was selected as vendor for the PAC emission control systems, and the vendor of the DS/FF has yet to be selected.

The DS/FF system will be designed to meet 0.010 lb/MMBtu PM/PM10/PM2.5 filterable emission limit and the Dominion contract with the selected vendor will require the selected vendor to meet this emission limit. The contract will include penalties and contractual make good clauses that will require the selected vendor to make good on the 0.010 lb/MMBtu emission limit and to take actions up to the value of the contract. But if Dominion is not able to achieve compliance with the PM filterable emission limit, after taking all actions allowed for under the contract, Dominion may propose, pursuant to 310 CMR 7.02 Plan Approval and Emission Limitations, an increase up to a value of 0.012 lb/MMBtu.

Unit 3 is equipped with Babcock & Wilcox low-NO<sub>x</sub> burners and two ESPs in series with the Koppers ESP upstream of the Research-Cottrell ESP. The Chemithon flue gas conditioning system, upstream of the Koppers ESP, was removed after the SCR system was commissioned since SO<sub>2</sub> passing through the SCR NO<sub>x</sub> controls partially converts SO<sub>2</sub> to SO<sub>3</sub> and provides SO<sub>3</sub> for particle conditioning upstream of the ESPs. The Koppers ESP remains in place and in service at this time. If necessary, the Koppers ESP will be de-energized to provide PAC and fly ash a longer residence time to optimize removal of Hg.

#### **Unit 4**

Unit 4 is rated at 446 MW net with steam provided by a Riley Stoker boiler that utilizes residual oil and natural gas fuels. The boiler is rated at 4,800 MMBtu/hr heat input. Products of combustion are released from a stack 500.5 feet above ground level (515 feet above sea level) with an inside exit diameter of 222 inches.

Unit 4 is equipped with a Research Cottrell ESP for the control of PM emissions, and Rodenhuis & Verloop low NO<sub>x</sub> burners and Riley Stoker flue gas recirculation for the control of NO<sub>x</sub> emissions.

#### **Natural Draft Cooling Towers**

Cooling Tower 1 and 2 will be utilized to convert the “Facility” to closed cycle cooling. Each cooling tower exhaust will be at 497 feet above ground level (529 feet above sea level) and have an inside exit diameter of 222 feet. The cooling towers are designed for an exhaust velocity of 3.31 feet per second and the towers will be 365 feet in diameter at the base. The cooling towers will be equipped with Drift Eliminators designed to limit water mist to 0.0005% of the cooling tower circulating water flow. The cooling towers will have a combined circulating water flow of 720,000 gallons per minute. At design conditions approximately 48,000 gallons per minute of make-up water will be withdrawn from the Taunton River and after water treatment 34,000 gallons per minute of blow down will return to Mt. Hope Bay. The cooling towers are designed for a circulating water flow dissolved solids of approximately 48,000 ppm<sub>w</sub> (approximately 1.5 cycles of concentration in the cooling tower circulating water). Water treatment will be mainly sodium hypochlorite (bleach) and other chemical treatments (e.g. anti-foam) will be utilized in lesser amounts. Chromium-based water treatment chemicals will not be used. Cooling Tower 1 and 2 will be located at UTM 317.604 E/4620.466 N and 317.751E/4620.332N, respectively. Sound emission controls will include installation of a 15 meter high, or higher, barrier wall located a maximum of 70 feet from the base of the cooling tower encompassing 100% of the circumference of each cooling tower, and the cooling tower pumps will be enclosed in a building and a 3-sided 10 meter high wall.

#### **Fly Ash Separation System**

The fly ash separation system, which included Separation Technologies, Inc. (STI) equipment, processed high carbon coal fly ash from Unit 1, 2 & 3 and has been shutdown and removed. Fly ash from Unit 1, 2 & 3 ESP hoppers is pneumatically conveyed to the fly ash storage silos and the transport air is returned to the ESP inlets. Approximately 85% of the total ash produced by Unit 1, 2 & 3 is fly ash, with the remainder being bottom ash.

A new Ash Reduction Process (ARP) has replaced the STI equipment to improve the beneficial use of the coal fly ash.

#### **Ash Reduction Process**

The new ARP processes coal fly ash in a fluid bed furnace and produces a high quality ash with low carbon content for use as a replacement of Portland cement in the production of concrete. NO<sub>x</sub> emission controls tend to increase Unit 1, 2 & 3 BTU/kWh heat rates due in part to

unburned carbon remaining in the fly ash typically as high as 10.6 which reduces its marketability as a product. High carbon coal fly ash represents a loss of combustion efficiency and an overall increase in heat rate, resulting in lower overall power generation efficiency.

Low-carbon ash, typically 2.5% or less, is used in the manufacturing of concrete. The ARP furnace recovers a substantial amount of the heat that would normally be wasted through the disposal of high-carbon fly ash. The furnace has a maximum design heat input of 97 MMBtu/hr with the exhaust routed through a new baghouse FF particulate control device and then conveyed to the windbox of Unit 1 or 3, and when both Unit 1 and 3 are not operating the ARP will be shutdown. The furnace heat input is provided by the high carbon ash and augmented as necessary with natural gas and PAC. PMI was the manufacturer of the CBO and Gemma installed the ARP system. PMI is the licensed technology holder.

### **Material Handling And Storage**

Material handling and storage activities support the SDA, PAC and SCR, and the DS emission control systems. Fully enclosed conveyors and transfer points, sealed pipes and hoses, and FF controls are used to minimize PM emissions to the ambient air. Lime will be received by enclosed bulk trucks, or possibly by ships in the future, and transferred pneumatically to storage silos. The SDA/FF and DS/FF byproduct will be transferred pneumatically to storage silos. PM emissions from the storage silos will be controlled by FF controls that provide at least 99.5% control of PM emissions. The gray water on-site use is exempt from 310 CMR 7.02 Plan Approval and Emission Limitations pursuant to 310 CMR 7.02(2)(b)7. *De minimus* Increase in Emissions. All other material handling and storage activities are exempt from 310 CMR 7.02 Plan Approval and Emission Limitations pursuant to 310 CMR 7.03(12) and (22). Material handling and storage include the following:

### **Powder Activated Carbon**

Powder Activated Carbon (PAC) is delivered to the facility via closed tank trucks. The PAC is transferred from the tank truck to the PAC silos and from the PAC silos to the injection points on Unit 1, 2 and 3 and the ARP pneumatically. There are two PAC Silos, one serving Unit 1 & 2 and the other serving Unit 3 & the ARP. PM emissions from the PAC silos will be controlled by FF controls that provide at least 99.5% control of OM emissions, and are exempt from 310 CMR 7.02 Plan Approval and Emission Limitations pursuant to 310 CMR 7.03(12) and (22).

### **Ammonia**

NH<sub>3</sub> in an aqueous solution less than 20% by weight NH<sub>3</sub> is utilized as the reagent for the SCR systems for Unit 1 and 3. The aqueous NH<sub>3</sub> is delivered to the site by truck and stored in four 55,000-gallon tanks. Each tank has its own contaminant equipped with control measures designed to minimize NH<sub>3</sub> evaporation and air emissions in the event of a spill.

### **Fly Ash and ARP Product**

Fly ash from the fly ash storage silos is pneumatically transferred to the ARP fly ash feed silo. From the ARP, the fly ash will be stored in the ARP fly ash storage dome and transferred pneumatically to the fly ash load-out silo for load-out into tank trucks, or directly transferred from the storage dome pneumatically to the barge. Ash transferred from the silos to trucks or

from the dome to the barge will be equipped with telescoping air slide load-out chutes and FF controls having a PM control efficiency of at least 99.5%. Each silo and the ARP fly ash storage dome is equipped with a FF controls to minimize PM emissions.

### **Reclaim Water On-site Use**

Reclaim water from the Somerset POTW is piped to a 300,000 gallon storage tank at the Brayton Point Station for use in the DS and SDA systems; other potential uses include circulating water pump cutlass bearings and boiler water seal. A detailed discussion of the reclaim water process can be found in Appendix D of Application No. 4B06002.

## **II. EMISSIONS**

### **A. Background**

Emissions to the ambient air from Unit 1, 2 and 3 currently include the following criteria air contaminants: PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, CO, NO<sub>x</sub>, Pb and VOC. With the modifications to Unit 1, 2 and 3, none of the criteria air contaminants will realize a potential to emit (PTE) increase greater than 1 ton per year. A non-criteria air contaminant, NH<sub>3</sub>, PTE increased by 35 tons per year based upon the Unit 1 and 3 NO<sub>x</sub> emission control SCR project. Post construction NH<sub>3</sub> emission testing will define NH<sub>3</sub> control efficiencies and emission rates for the air pollution control systems and it is anticipated that the data will reveal that NH<sub>3</sub> emissions will be significantly less than 35 tons per year. Unit 3 non-criteria air contaminant, PM, current potential to emit of 1,982 tons per year will be reduced to 248 tons per year. Unit 3 criteria air contaminants, PM<sub>10</sub> and PM<sub>2.5</sub>, current potential to emit of 4,985 tons per year will be reduced to 619 tons per year.

Emissions to the ambient air from Cooling Tower 1 and 2 will include non-criteria air contaminant, PM, and criteria air contaminants, PM<sub>10</sub> and PM<sub>2.5</sub>. Cooling Tower 1 and 2, in total, PTE for both PM<sub>10</sub> and PM<sub>2.5</sub> will be 389 tons per year and for PM will be 389 tons per year.

### **B. Assessment of Air Quality Impacts**

Dominion provided an air quality modeling analysis to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) given the lower stack gas exhaust temperatures from Unit 1 and 2 with the SDA/FF emission control systems and Unit 3 DS/FF emission control system, and Cooling Tower 1 and 2. The air quality modeling analysis addresses both the existing (pre 310 CMR 7.29) station configuration as well as the post-retrofit station, reflecting the previously approved and proposed emission controls and Cooling Tower 1 and 2. Post retrofit conditions consist of the following: Unit 1 SCR, SDA/FF, PAC and ARP; Unit 2 SDA/FF and PAC; Unit 3 SCR, DS/FF, ARP and PAC; Cooling Tower 1 and 2; and Unit 4 no changes.

As a result of the air quality impact assessment contained in NMCPA (Application No. 4B06002), the Revised Conditional Approval (Application No. 4B06002) dated December 20, 2006 establishes additional SO<sub>2</sub> emission limits to assure that the NAAQS for SO<sub>x</sub> will be met. The air quality impact assessment contained in MCPA (Application No. 4B08052) for the Unit 3

DS/FF, PAC and Cooling Towers 1 and 2 confirmed that the previously established SO<sub>2</sub> emission limits confirmed that the NAAQS for SO<sub>x</sub> will not be exceeded.

New emission limits for PM, PM10 and PM2.5 are established for Unit 3 and Cooling Tower 1 and 2, and new PM10 and PM2.5 emission limits are established for Unit 1, 2 and 4.

**C. New Emission Limits**

1. Unit 1 shall not exceed the NH<sub>3</sub> emission limits as specified in Table 4.

<b>Table 4: UNIT 1 - NH<sub>3</sub> EMISSION LIMITS</b>				
<b>Emission</b>	<b>ppm<sub>vd</sub> @ 3% O<sub>2</sub><sup>1</sup></b>	<b>lb/MMBtu<sup>1</sup></b>	<b>lb/hr<sup>1</sup></b>	<b>tpy<sup>2</sup></b>
NH <sub>3</sub>	2	0.001	2.26	9.9

Note:

- 1 - One hour average, measured at the stack.
- 2 - Tons per consecutive 12-month period.

2. Unit 3 shall not exceed the emission limits as specified in Table 5.

<b>Table 5: UNIT 3 - NH<sub>3</sub> EMISSION LIMITS</b>				
<b>Emission</b>	<b>ppm<sub>vd</sub> @ 3% O<sub>2</sub><sup>1</sup></b>	<b>lb/MMBtu<sup>1</sup></b>	<b>lb/hr<sup>1</sup></b>	<b>tpy<sup>2</sup></b>
NH <sub>3</sub>	2	0.001	5.71	25.0

Note:

- 1 - One hour average, measured at the stack.
- 2 - Tons per consecutive 12-month period.

3. Unit 1, 2, 3 and 4, in total, shall not exceed the emission limits as specified in Table 6.

<b>Table 6: Unit 1, 2, 3 and 4 (in total) SO<sub>2</sub> EMISSION LIMITS</b>		
<b>Emission</b>	<b>Existing Configuration<sup>1</sup></b>	<b>Post-Retrofit Configuration<sup>2</sup></b>
	<b>lb/hr<sup>3</sup></b>	<b>lb/hr<sup>3</sup></b>
SO <sub>2</sub>	16,857	18,292

1 - Prior to the installation of one or more SO<sub>2</sub> control system (SDA or DS), or when all SO<sub>2</sub> control systems are not in operation.

2 - Following the installation of one or more SO<sub>2</sub> control system (SDA or DS).

3 - Three hour average, recalculated hourly, as measured by Part 75 CEMs using valid data only.

4. Unit 1, 2, 3 and 4, and Cooling Tower 1 and 2 shall not exceed the emission limits as specified in Table 7.

<b>Table 7: Unit 1, 2, 3 and 4, and Cooling Tower 1 and 2 PM, PM 10 and PM2.5 EMISSION LIMITS</b>				
<b>Emission Unit</b>	<b>Emission</b>	<b>lb/MMBtu<sup>1</sup></b>	<b>lb/hr<sup>1</sup></b>	<b>tpy<sup>2</sup></b>
Unit 1 <sup>3,6,7</sup>	PM	0.08	180.0	788.4
Unit 1 <sup>3,5</sup>	PM10	0.08	180.0	788.4
Unit 1 <sup>3,5</sup>	PM2.5	0.08	180.0	788.4
Unit 2 <sup>3,6,7</sup>	PM	0.08	180.0	788.4

Unit 2 <sup>3,5</sup>	PM10	0.08	180.0	788.4
Unit 2 <sup>3,5</sup>	PM2.5	0.08	180.0	788.4
Unit 3 <sup>3,4,6,7</sup>	PM	0.010	56.6	247.7
Unit 3 <sup>3,4,5</sup>	PM10	0.025	141.4	619.2
Unit 3 <sup>3,4,5</sup>	PM2.5	0.025	141.4	619.2
Unit 4 <sup>6,7</sup>	PM	0.03	144.0	630.7
Unit 4 <sup>5</sup>	PM10	0.03	144.0	630.7
Unit 4 <sup>5</sup>	PM2.5	0.03	144.0	630.7
Cooling Tower 1	PM	NA	44.4	194.5
Cooling Tower 1	PM10	NA	44.4	194.5
Cooling Tower 1	PM2.5	NA	44.4	194.5
Cooling Tower 2	PM	NA	44.4	194.5
Cooling Tower 2	PM10	NA	44.4	194.5
Cooling Tower 2	PM2.5	NA	44.4	194.5

Note:

- 1 - One hour average, measured at the stack.
- 2 - Tons per consecutive 12-month period.
- 3 - Emission limits will be further restricted upon Department approval per Section VIII Special Condition E.2.
- 4 - Emission limits will be further restricted upon Department approval per Section VIII Special Condition C.2.
- 5 - Per test methods contained in 40 CFR 51, Appendix M, Method 201 or 201A and Method 202, or other test methods acceptable to MassDEP.
- 6 - Per test methods contained in 40 CFR 60, Appendix A, Method 5, or other test methods acceptable to MassDEP.
- 7 - The Final Operating Permit and previous approvals limit PM emissions to 0.08 lb/MMBtu for Unit 1, 2 and 3, and 0.03 lb/MMBtu for Unit 4.

5. After installation of the DS/FF, Unit 3 shall not exceed 10 % opacity exclusive of uncombined water vapor for a period or aggregate period of time in excess of two minutes during any one hour provided that, at no time during the said two minutes shall opacity exceed 20%.

### III. PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

#### A. Background

The federal government under the jurisdiction of the Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six air contaminants, known as criteria pollutants, for the protection of public health and welfare. These criteria pollutants are SO<sub>x</sub> as SO<sub>2</sub>, PM10, PM2.5, NO<sub>2</sub>, CO, O<sub>3</sub>, and Pb.

The state government under the jurisdiction of the Department of Environmental Protection has adopted these ambient air quality standards for the Commonwealth of Massachusetts as stated under 310 CMR 6.00 Ambient Air Quality Standards for the Commonwealth of Massachusetts. One of the basic goals of federal and state air regulations is to ensure that ambient air quality, including the impact of existing and new sources, complies with ambient standards. Towards this end, EPA classified all areas of country as “attainment”, “nonattainment”, or “unclassified” with respect to the NAAQS.

New major sources of regulated air pollutants or major modifications to existing major sources of regulated air pollutants that are located in areas classified as either “attainment” or

“unclassified” are subject to 40 CFR Section 52.21 Prevention of Significant Deterioration of Air Quality (“PSD”) regulations. Pursuant to 40 CFR 52.21(b)(1)(I)(a.), a source is considered “major” if it has the potential to emit 100 tons per year (tpy) or more of any pollutant and is listed as one of the 28 designated PSD stationary source categories, and is considered a “major modification” if the physical change or change in the method of operation of a “major” source would result in a significant net emission increase.

Effective July 1, 1982, the PSD program was implemented in accordance with the MassDEP's "Procedures for Implementing Federal Prevention of Significant Deterioration Regulations". Brayton Point Station Units 1, 2 and 3, steam to electric power generation units. Units 1 and 2 are rated at 2,250 MMBtu/hr heat input each and Unit 3 is rated at 5,655 MMBtu/hr, per the Title V Permit. Thus, the Brayton Point Station is one of the 28 designated PSD stationary source categories, namely a fossil fuel fired steam electric plant of more than 250 MMBtu/hr heat input. The Brayton Point Station is an existing major source of regulated air pollutants.

The application referenced in Section XVI herein includes a PSD application that identifies that the Closed Cycle Cooling Project potential emissions qualifies as a major modification to an existing PSD source for PM<sub>10</sub>; and the Unit 3 DS/FF project also qualifies as a major modification to an existing PSD source for filterable PM<sub>10</sub> based on the “past actual to future actual” netting analysis currently applied to electric utility steam generating facilities.

Effective March 3, 2003, MassDEP notified U.S. EPA Region 1 that Massachusetts would no longer implement the PSD program and returned delegation of the PSD program to the US EPA. Therefore, the US EPA Region 1 has the responsibility to determine PSD applicability for this project and issuance of the PSD Permit.

## **B. General Information**

Dominion is proposing to alter Units 1, 2 and 3, and construction of Cooling Tower 1 and 2 at Dominion's electric utility steam generating facility in Somerset, Massachusetts. The Facility is located in an area that is in either “attainment” or “unclassified” for SO<sub>x</sub> measured as SO<sub>2</sub>, NO<sub>2</sub>, CO, Pb, and PM, which includes PM<sub>10</sub> and PM<sub>2.5</sub>. Therefore, the Facility is located in a PSD area for these air contaminants.

On August 28, 2008, Dominion submitted a PSD application to U.S. EPA Region 1.

## **IV. EMISSION OFFSETS AND NONATTAINMENT REVIEW**

### **A. Background**

The entire Commonwealth of Massachusetts is designated "moderate" nonattainment for the pollutant O<sub>3</sub> NAAQS. NO<sub>x</sub> and VOC emissions are precursors to the formation of O<sub>3</sub>.

New major sources of regulated air pollutants or major modifications to an existing major sources of regulated air pollutants that are located in areas classified as “nonattainment” are subject to 310 CMR 7.00 Appendix A: Emission Offsets and Nonattainment Review. Pursuant to 310 CMR 7.00 Appendix A(2), a source is considered “major” if it has a potential to emit 50 tons per year (tpy) or

more of NO<sub>x</sub> or VOC, and is considered a “major modification” if the physical change or change in the method of operation of a “major” source would result in a significant net emission increase. A significant net emission increase for applications received after November 15, 1992 is defined as 25 tpy of either VOC or NO<sub>x</sub> emissions.

Applicable requirements for any proposed new major stationary source of NO<sub>x</sub> and/or VOC require the source to meet Lowest Achievable Emission Rate (LAER) and obtain emission offsets.

**B. General Information**

Alteration of Unit 1, 2 and Unit 3 are not categorized as a “major modification” to an existing major source and Cooling Tower 1 and 2 will not be source of NO<sub>x</sub> or VOC emissions.

**2000-2001 Average Past Actual Baseline**

For the alterations described in Revised Conditional Approval (Application No. 4B04025) dated August 22, 2005, the NO<sub>x</sub> and VOC net emission change estimates for Unit 1 and Unit 3 for emissions subject to Nonattainment review are defined in Table 8.

<b>Table 8: NONATTAINMENT REVIEW (SCR, FGD &amp; ARP)</b>						
		<b>Past Actual Baseline 2000-2001 Average</b>		<b>Future Representative Actual Annual Emissions<sup>2</sup></b>		<b>Net Change</b>
		<b>Unit 1</b>	<b>Unit 3</b>	<b>Unit 1</b>	<b>Unit 3</b>	
Fuel	MMBtu/yr	15,956,468	35,640,854	15,956,468	35,640,854	0
Fuel	% of max. <sup>1</sup>	81	72	81	72	0
NO <sub>x</sub>	tons/yr	2,362	7,306	638	1,426	<b>-7,604</b>
VOC	tons/yr	20.0	43.5	20.0	44.0	<b>+0.5</b>

Note:

1 - Equivalent heat input capacity factor.

2 - Future Representative Actual Annual Emissions based on the same heat input rate as Past Actual Baseline.

**2003-2004 Average Past Actual Baseline**

For the alterations described in Conditional Approval (Application No. 4B06002) dated December 20, 2006, the NO<sub>x</sub> and VOC net emission change estimates for Unit 1, 2 and 3 for emissions subject to Nonattainment review are defined in Table 9.

<b>Table 9: NONATTAINMENT REVIEW (SDA, FF, PAC, SCR, FGD &amp; ARP)</b>								
		<b>Past Actual Baseline 2003-2004 Average</b>			<b>Future Representative Actual Annual Emissions<sup>2</sup></b>			<b>Net Change</b>
		<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>	
Fuel	MMBtu/yr	15,104,804	15,094,162	34,595,539	15,104,804	15,094,162	34,595,539	<b>0</b>
Fuel	% of max. <sup>1</sup>	77	77	70	77	77	70	<b>0</b>
NO <sub>x</sub>	tons/yr	1,864	1,874	6,167	303	1,874	1,384	<b>-6,345</b>
VOC	tons/yr	20.3	20.4	44.3	20.6	20.7	44.8	<b>+1.1</b>

Note:

1 - Equivalent heat input capacity factor.

2 - Future Representative Actual Annual Emissions based on the same heat input rate as Past Actual Baseline.

**2006-2007 Average Past Actual Baseline**

For the alterations proposed in MCPA (Application No. 4B08052), the NO<sub>x</sub> and VOC net emission change estimates for Unit 3 for emissions subject to Nonattainment review, including previously approved SCR, PAC, and ARP, are defined in Table 10.

<b>Table 10: NONATTAINMENT REVIEW (DS, FF, PAC, SCR &amp; ARP) UNIT 3</b>				
		<b>Past Actual Baseline 2006-2007</b>	<b>Future Representative Actual Emission<sup>2</sup></b>	<b>Net Change</b>
Fuel	MMBtu/yr	37,130,465	37,130,465	0
Fuel	% of max. <sup>1</sup>	75	75	0
NO <sub>x</sub>	Tons/yr	2,292	1,300	-993
VOC	Tons/yr	50.4	50.9	+0.5

Note:

1 - Equivalent heat input capacity factor.

2 - Future Representative Actual Annual Emissions based on the same heat input rate as Past Actual Baseline.

The project, based on past actual emissions to future representative actual annual emissions, will result in significant NO<sub>x</sub> emission reductions, and less than significant net increase in representative actual emissions of VOC. The minor facility wide collateral VOC actual emission increase will not adversely affect NAAQS for ozone due to the substantial reductions of NO<sub>x</sub> emissions.

**C. Conclusion**

Unit 1, 2 and Unit 3 modifications and Cooling Tower 1 and 2, based on current information and pursuant to 310 CMR 7.00 Appendix A(2), is not considered a “major modification” to an existing major source. Based on current information, LAER and Offsets, pursuant to 310 CMR 7.00 Appendix A, are not required for the alterations/construction. Refer to Section X and XI for emission record keeping and reporting requirements.

**V. NEW SOURCE PERFORMANCE STANDARDS (NSPS)**

Unit 1, 2 and 3 are considered to be a “fossil-fuel fired steam generating unit” and an “electric utility steam generating unit” since each Unit burns fossil fuels at a rate greater than 250 MMBtu/hr and more than one third of each Unit’s net electrical output will be sold to a utility.

Construction/alteration of Unit 1, 2 and 3 will not constitute a “modification” since the primary function is the reduction of air pollutants. Substantial emission reductions of NO<sub>x</sub> and SO<sub>2</sub> will be realized with the SCR and SDA/FF systems on Unit 1, the SDA/FF system on Unit 2, and the SCR & DS/FF systems on Unit 3; and potential particulate emissions will not increase. In addition, the construction/alterations are not by definition “reconstruction” since the additional air pollution controls do not constitute “replacement of components”.

The New Source Performance Standards (NSPS) for fossil-fuel fired steam generators and electric utility steam generating units, Title 40 Part 60 Subpart D and Subpart Da, respectively, of the Code of Federal Regulations, are not applicable to either Unit 1, 2 or 3.

Based on a determination issued by USEPA Region 4, NSPS Subpart Dc applies to the ash reduction process (ARP) that is proposed as an integrated element of the ECP, since the ARP heat recovery meets the definition of a “steam generating unit.” Because the fly ash and PAC are not considered to meet the definition of coal, no Subpart Dc emission standards apply. However, the facility must meet the record keeping and reporting requirements of Section 60.48c(g) and the general provisions in 40 CFR 60.7.

Cooling Tower 1 and 2 are not subject to the New Source Performance Standards (NSPS).

## **VI. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

### **A. Background**

Pursuant to 310 CMR 7.00 Definitions and 310 CMR 7.02(3)(j)6., Dominion is required to evaluate Best Available Control Technology (BACT) for the “alterations” and “construction” as it applies to any air contaminant that will result in a potential emission increase. BACT is defined as an emission limitation using the optimum level of control applied to pollutant emissions based upon consideration of technical, economic, energy and environmental factors.

### **Unit 1 and 3**

Unit 1 and Unit 3 will have potential emission increases greater than 1 ton per year for NH<sub>3</sub> associated with the SCR NO<sub>x</sub> emission control systems. Excess NH<sub>3</sub> that does not react in the SCR system catalyst bed, referred to as NH<sub>3</sub> slip, will be emitted from stacks of Units 1 and 3. Therefore, BACT review requirements are limited to NH<sub>3</sub> emissions.

In addition, the wastewater treatment plant (WWTP) will have a potential emission increase of NH<sub>3</sub> due to the treatment of wastewater streams containing NH<sub>3</sub> from Units 1 and 3 air pre-heater and ESP washes. Therefore, the WWTP BACT review requirements are limited to NH<sub>3</sub> emissions.

### **Cooling Tower 1 and 2**

Cooling Tower 1 and 2 will have potential emissions greater than 1 ton per year for PM, PM<sub>10</sub> and PM<sub>2.5</sub> due to cooling tower circulating water becoming entrained in the air stream as drift droplets which contain salts, mineral matter, chemical treatments, etc. The drift droplets evaporate and result in the formation of particulate matter from suspended solids and through the crystallization of dissolved solids.

Excess NH<sub>3</sub> that does not react in the SCR system catalyst bed, referred to as NH<sub>3</sub> slip, will be emitted from stacks of Units 1 and 3, and PM/PM<sub>10</sub>/PM<sub>2.5</sub> will be emitted from Cooling Tower 1 and 2. Therefore, BACT review requirements are limited to NH<sub>3</sub>, PM, PM<sub>10</sub> and PM<sub>2.5</sub> emissions.

**B. BACT Analyses**

The first step in a BACT analysis is to determine for the emission source, the most stringent control available for a similar or identical source or source category. The proposed Facility must utilize BACT to control NH<sub>3</sub> emissions and PM, PM10 and PM2.5 emissions from Cooling Tower 1 and 2. The Department has verified and concurs with the following BACT analyses for NH<sub>3</sub> (as originally referenced in the Applicant’s MCPA, Application No. 4B02012), and for PM, PM10 and PM2.5 (as contained in the Applicant’s MCPA, Application No. 4B08052).

**1. Ammonia (NH<sub>3</sub>) BACT Analysis Unit 1 and 3**

<b>Table 11: NH<sub>3</sub> Comparative BACT Analysis</b>				
<b>Control Technology</b>	<b>Emission Rate<sup>1</sup></b>	<b>BACT</b>	<b>Costs<sup>2</sup></b>	<b>Reason</b>
SCONO <sub>x</sub>	0 ppmvd @ 3% O <sub>2</sub>	No	N/A	The technology has not been demonstrated on boilers burning residual oil or coal. Technology has been demonstrated on gas fired combustion turbines.
SCR	2 ppmvd @ 3% O <sub>2</sub>	Yes	\$\$	Method chosen to achieve BACT and lower than the lowest emission rate demonstrated from a coal fired boiler with SCR. The lowest emission rate identified for a coal fired boiler with SCR is 5 ppmvd @ 3% O <sub>2</sub> , or 2.5 times higher than that proposed. NH <sub>3</sub> preferentially reacts with SO <sub>3</sub> to form particulate ammonia salts downstream of the SCR systems with little anticipated impact to the wastewater and represents BACT for the WWTP as well.

Note:

1 - Potential Emissions

- 2 - \$ = least expensive (relative to control technologies for that specific pollutant)
- \$ = moderately expensive (relative to control technologies for that specific pollutant)
- \$\$\$ = fairly expensive (relative to control technologies for that specific pollutant)
- \$\$\$\$ = very expensive (relative to control technologies for that specific pollutant)
- \$\$\$\$\$ = extremely expensive (relative to control technologies for that specific pollutant)

**2. PM, PM10 and PM2.5 BACT Analysis Cooling Tower 1 and 2**

<b>Table 12: PM, PM10 and PM2.5 Comparative BACT Analysis</b>				
<b>Control Technology</b>	<b>Emission Rate<sup>1</sup></b>	<b>BACT</b>	<b>Costs<sup>2</sup></b>	<b>Reason</b>
Air Cooled Condensers	0	No	\$\$\$\$	Air cooled condensers would require significant land area and are less efficient than wet cooling resulting in much higher energy consumption and increase the facility's emission rates on a lb/MW-hr basis. Air cooled condenser sound impacts would be greater than wet cooling and is marginally feasible due to site area availability constraints.
Once Through Cooling	0	No	NA	Technically infeasible based upon Compliance Orders issued by MassDEP and U.S. EPA, and the NPDES permit.
Fresh Water	5	No	NA	Technical infeasible based upon a lack of an adequate fresh water supply, 70 million gallons per day.
Drift Eliminators <0.0005%	36	No	NA	Technical infeasible due to engineering limitations. A drift rate less than 0.0005% has not been demonstrated in practice.
Drift Eliminators 0.0005%	44.4	Yes	\$\$	Method chosen to achieve BACT. Represents the lowest drift rate, 0.0005%, of circulating water flow for cooling towers currently available and used in similar applications. Natural draft cooling towers use less energy in comparison to air cooled condensers or wet mechanical cooling. Natural draft cooling tower ambient air impacts, including the potential of ground level fogging and icing, are less in comparison to wet mechanical cooling.
Reduction in Cycles of Concentration	<89	No	NA	Technically infeasible based upon Compliance Orders issued by MassDEP and U.S. EPA, and the NPDES permit.

Note:

1 - lb/hr

- 2 - \$ = least expensive (relative to control technologies for that specific pollutant)  
 \$\$ = moderately expensive (relative to control technologies for that specific pollutant)  
 \$\$\$ = fairly expensive (relative to control technologies for that specific pollutant)  
 \$\$\$\$ = very expensive (relative to control technologies for that specific pollutant)  
 \$\$\$\$\$ = extremely expensive (relative to control technologies for that specific pollutant)

**C. Conclusion:**

Therefore, based upon the economic analysis portion of the top-down BACT process, currently available data, and the tenets and procedures of the BACT process, MassDEP has concluded: limiting the NH<sub>3</sub> emissions from Units 1 and 3 to no greater than 2 ppmvd @ 3% O<sub>2</sub> is best available control technology, or BACT, for NH<sub>3</sub>; and PM, PM10 and PM2.5 emissions from Cooling Tower 1 and 2 to no greater than 44.4 lb/hr, 44.4 lb/hr and 44.4 lb/hr per tower, respectively, is BACT for PM, PM10 and PM2.5.

## **VII. SOUND**

### **A. Background**

MassDEP regulation concerning sound emissions is contained in 310 CMR 7.10 Noise. This regulation requires that necessary equipment and precautions be used to prevent a condition of air pollution due to sound emissions from the facility. MassDEP's existing guideline for enforcing the noise regulation is contained in MassDEP's Policy 90-001; the policy provides broadband and pure tone sound level criteria.

Based upon a review of MassDEP records, the existing Facility has not caused a condition of air pollution due to sound emissions since the coal conversion in the 1980's.

### **B. General Information**

#### **Sound mitigation measures**

1. Thermal lagging on the following fans/blowers:
  - Selective Catalytic Reduction Ammonia Protection Blowers
2. Acoustical lagging on the following fans:
  - ARP Force Draft Fan
  - ARP Induced Draft Fan
  - Product Ash Transport Blowers
  - Unit 1 Induced Draft Fans
  - Unit 2 Induced Draft Fans
  - Unit 3 Induced Draft Fans
  - Unit 3 Flue Gas Booster Fans
3. A four-sided barrier (firewalls) around the auxiliary transformers (two feet higher than transformers).
4. Ductwork Silencers after Induced Draft Fans:
  - Unit 1 Ductwork Silencers
  - Unit 2 Ductwork Silencers
  - Unit 3 Ductwork Silencers
5. Cooling Tower 1 and 2
  - 15 meter or higher barrier wall located 70 feet or less from the base of the cooling tower encompassing 100% of the circumference of each cooling tower.
  - A 3-sided 10 meter high wall around the building enclosure housing the cooling tower pumps.

#### **Sound Monitoring/Modeling (with SCR, SDA, FF and ARP)**

1. Sound monitoring at five nearby receptor locations was performed during March and May, 2002.
2. Predicted impacts reveal that four of the five receptor locations will result in an increase of 1 dB(A) or less for a total impact between 39-47 dB(A). The fifth receptor will result in an increase of 3 dB(A) for a total impact of 40 dB(A).
3. At the fifth receptor that will realize a 3 dB(A) increase, the overall sound impact levels will be 2-7 dB(A) less than three of the four other receptors and only 1 dB(A) greater in comparison to the fourth receptor.

**Sound Monitoring/Modeling (with SCRs, SDAs, DS, FFs, ARP and Cooling Towers)**

1. The Facility shall not exceed the Sound emission limits as specified in Table 13.

<b>Table 13: Sound Emission Limits<sup>1</sup></b>			
Receptor Location	2003 Ambient Baseline <sup>2</sup> dB(A)	Sound Emission Limits <sup>3</sup> dB(A)	Net Change dB(A)
Home St.	38	39.1	+1.1
Jackson Ave.	42	43.6	+1.6
Perkins St.	47	48.3	+1.3
Bayside Ave.	45	49.2	+4.2
Gardner's Neck	37	44.1	+7.1

Note:

1 - Facility in total including 2003 Ambient Baseline

2 - Ambient sound levels with the existing Brayton Point Station included. Ambient sound levels at the various receptor locations without any sound impact from the Brayton Point Station was not required to support the MCPA due to the operational issues associated with shutting down the Brysytan Point Station in its entirety. MassDEP reserves the right to require ambient sound level monitoring in the future when all equipment at the Brayton Point Station is shutdown if deemed necessary to evaluate compliance with 310 CMR 7.10 and MassDEP Policy 90-001.

3 - Not to be exceeded during the lowest nighttime sound levels based upon a one hour average block period.

**C. Conclusion**

Sound impacts approved herein are predicted to not cause or contribute to a condition of air pollution and therefore comply with 310 CMR 7.10 Noise. MassDEP reserves the right to require additional acoustical treatments, on equipment components and/or buildings, should post construction operation exceed the above sound emission limits or causes or contribute to a condition of air pollution.

**VIII. SPECIAL CONDITIONS**

**A. General Special Conditions**

1. Dominion shall submit to MassDEP, in accordance with the provisions of Regulation 310 CMR 7.02(5)(c), the final general plans and specifications, including updated application forms as applicable, for the construction/alterations of each system approved herein within 60 days after each system passes acceptance testing.
2. Pursuant to Regulation 310 CMR 7.00: Appendix C and the November 7, 1995 US EPA letter to STAPPA/ALAPCO, the modifications approved on December 20, 2006 will be a "Minor Modification" to Operating Permit 4V95056 since the December 20, 2006 Revised Conditional Approval (Application No. 4B06002) is a minor New Source Review action. In consideration that Dominion submitted to MassDEP a timely Operating Permit (OP) Renewal Application that is pending MassDEP action, the OP Renewal Application was revised in lieu of submitting an OP Minor Modification application, to reflect the March, 29, 2006 Amended ECP Final Approval (Application No. 4B05053) and the December 20, 2006 Revised Conditional Approval (Application No. 4B06002), and any other applicable requirement that the Facility is subject to. The revised OP Renewal Application was submitted to MassDEP within 60 days of the date of the December 20, 2006 Revised Conditional Approval.

3. The modifications approved herein will be a “Significant Modification” to Operating Permit 4V95056 since this Conditional Approval (Application No. 4B08052) is a major New Source Review action. In consideration that Dominion submitted to the Department a timely Operating Permit (OP) Renewal Application that is pending MassDEP action, the OP Renew Application should be revised, in lieu of submitting an OP Significant Modification application to reflect the December 29, 2008 Amended ECP Final Approval (Application No. 4B08050) and this Conditional Approval (Application No. 4B08052), and any other applicable requirement that the Facility is subject to. A revised OP Renewal Application shall be submitted to MassDEP within 60 days of the date of this Conditional Approval.
4. Dominion shall submit Standard Operating and Maintenance Procedures (SOMP) for the new and altered equipment to the Department no later than 60 days after commencement of operation. Thereafter, Dominion shall submit updated versions of the SOMP to the MassDEP no later than 30 days prior to the occurrence of a significant change. The Department must approve in writing any significant changes to the SOMP prior to the SOMP becoming effective.
5. Dominion shall maintain a complaint log concerning emissions of odor, PM and sound from the Facility. Dominion shall make available to the general public a telephone number that will receive and record complaints 24 hours per day, 7 days per week. The complaint log shall be maintained for the most recent five (5) year period. The complaint log shall be made available to MassDEP upon request. Dominion shall take all reasonable actions to respond to public complaints.
6. A post construction sound survey shall be conducted to define actual sound impacts in comparison to impacts proposed in the application approved herein and sound emission limits contained in this Conditional Approval. Post construction sound surveys shall be conducted no later than 180 days after the later of the dates specified in Section XI.4.d, e, and f; no later than 180 days after the date specified in Section XI.4.h. but not to exceed 180 days from initial operation of the Unit 3 DS/FF; and no later than 180 days after the dates specified in Section XI.4.i. and j. but not to exceed 180 days after the initial operation with both cooling towers.

**B. Special Conditions Specific to the Installation of the SCR Emission Control Systems**

1. Dominion shall, within 60 days after the submittal to MassDEP of the compliance test report, propose a surrogate methodology or parametric monitoring for NH<sub>3</sub> emissions based on compliance test results, NH<sub>3</sub> CEMs and operating experience.
2. The basis for NH<sub>3</sub> emission compliance determination will automatically convert from quarterly compliance testing to the NH<sub>3</sub> CEM system upon each Unit’s CEM system demonstration that the relative accuracy of the NH<sub>3</sub> CEM system is within +/- 15% for four consecutive quarters and the NH<sub>3</sub> CEM system was operating 90% of the time during the same period.
3. Unit 1 and Unit 3 shall meet the NH<sub>3</sub> emission limits approved herein within four hours from initiating NH<sub>3</sub> feed to the SCR based upon compliance level ammonia CEM system data. During shutdown of the NH<sub>3</sub> system, Unit 1 and Unit 3 will be exempt from the hourly limits during the last hour of the NH<sub>3</sub> feed to the SCR.

**C. Special Conditions Specific to the Installation of the DS/FF Emission Control System**

1. Dominion, within 36-months after the date specified in Section XI.4.h., shall propose to MassDEP new PM, PM10 and PM2.5 emission limits for Unit 3 and provide supporting justification for the proposed new emission limits or supporting justification for maintaining the emission limits contained herein. A minimum of four (4) PM, PM10 and PM2.5 emission tests shall be conducted. MassDEP will establish, through issuance of an approval letter subject Section XVII Appeal Process, final PM, PM10 and PM2.5 emission limits after review of the applicants proposed final emission limits and supporting documentation.

**D. Special Condition Specific to the Installation of the ARP**

1. The ARP shall not operate when Unit 1 and Unit 3 are both shutdown.

**E. Special Conditions Specific to the Installation of the SDA/FF and PAC Emission Control Systems**

1. Dominion, within 36-months after the later date specified in Section XI.4.d. and e., shall propose to MassDEP new PM, PM10 and PM2.5 emission limits for Unit 1 and 2 and provide supporting justification for the proposed emission limits or provide supporting justification for maintaining the emission limits contained herein. A minimum of four (4) PM, PM10 and PM2.5 emission tests shall be conducted on each of the stacks serving Units 1 and 2. MassDEP will establish, through issuance of an approval letter subject to Section XVII. Appeal Process, a final PM emission limit after review of the applicants proposed final emission limits and supporting documentation.

**F. Special Conditions Specific to the Installation of the Cooling Towers**

1. Cooling Tower 1 shall be equipped with drift eliminators designed (manufacturers design guarantee) to limit water mist drift to 0.0005% of the cooling tower circulating water flow.
2. Cooling Tower 2 shall be equipped with drift eliminators designed (manufacturers design guarantee) to limit water mist drift to 0.0005% of the cooling tower circulating water flow.
3. Cooling Tower 1 and 2 lb/hr emission limits contained in Table 7 shall be determined from drift eliminator design performance, circulating water flow determined by manufacturer's pump curves and TDS determined by conductivity monitoring.
4. Cooling Tower 1 and 2 shall be inspected from internal walkways not less than every three months to assure that the drift eliminators are clean and in good working order and shall keep records of the inspection. Not less than once per calendar year a complete inspection of Cooling Tower 1 and 2 using an inspector with recognized expertise in the field of natural draft cooling tower drift eliminators and shall keep records of the inspection, including the inspector's resume or credentials.

**IX. MONITORING AND RECORDING REQUIREMENTS**

1. All current monitoring and recording requirements remain in effect and are not altered herein.
2. Unit 1 and 3 shall be equipped with NH<sub>3</sub> CEMs with the outputs directed to the data acquisition system. The NH<sub>3</sub> CEMs shall comply with the linearity check and RATA frequencies and grace periods as specified in 40 CFR 75 in conducting gas audits and RATAs.
3. The Unit 1, 2, 3 and 4 CEMs for CO shall comply with the linearity check and RATA frequencies and grace periods as specified in 40 CFR 75 in conducting cylinder gas audits and RATAs.
4. At least 60 days prior to commencing construction of the CEM/COM systems, protocols and plans for the new CEM/COM systems, including NH<sub>3</sub> CEMs, and supporting documentation, shall be submitted to MassDEP for review and approval.
5. NH<sub>3</sub> CEM data will initially be used as an operational tool. Compliance with the NH<sub>3</sub> emission limit will be determined during the initial compliance test, and by quarterly compliance testing performed every three months thereafter, until MassDEP in writing approves otherwise, or until the NH<sub>3</sub> CEM becomes a direct compliance monitor as defined in Section VIII(B)2. The NH<sub>3</sub> CEMs shall operate during NH<sub>3</sub> compliance testing and the test report shall be submitted to MassDEP within 30 days after completion of testing. Until the NH<sub>3</sub> CEM system becomes a direct compliance monitor the Applicant on an annual basis, starting 90 days after the fourth compliance test (initial and following three quarters), shall submit a report to MassDEP on the performance and relative accuracy of the NH<sub>3</sub> CEM systems along with a recommendation on the feasibility of their use as a compliance determination method.
6. Monitor the fly ash fuel feed rates to the ARP and record daily feed rates in tons per day.
7. Fly ash feed to and fly ash product from the ARP shall be sampled on a calendar quarter basis and analyzed for higher heat value (HHV) in units of Btu/lb.
8. Monitor the PAC feed rates to the ARP and record daily feed rates in tons per day.
9. Install and maintain non-resettable elapse operating meters or the equivalent software to accurately indicate the elapsed operating time for each circulating water pump servicing Cooling Tower 1 and 2.
10. Monitor the circulating water flow (use of pump curves is acceptable) to Cooling Tower 1 and 2, individually, and record gallons per day, month and consecutive 12-month period.
11. Monitor and record Cooling Tower 1 and 2 circulating water or blowdown water total dissolved solids (ppm<sub>w</sub>) using a continuous conductivity monitor.
12. If Cooling Tower 1 and 2 circulating water or blowdown water total dissolved solids (ppm<sub>w</sub>) is outside of the normal operating range, as determined by Dominion, or the conductivity monitor(s) are simultaneously out of service, a grab sample of the cooling tower circulating water shall be taken and analyzed within eight (8) hours to verify the accuracy of the conductivity monitors and the total dissolved solids content of the circulating water.
13. Cooling Tower 1 and 2 circulating water or blowdown water redundant conductivity monitors shall be installed, operated and maintained in accordance with the manufacturer's recommended installation and operating and maintenance practices.

14. Take a grab sample of Cooling Tower 1 and 2 circulating water on a calendar quarter basis and analyze within 24 hours to determine the circulating water total dissolved solids. Compare the conductivity monitor's accuracy to the grab sample results and recalibrate the conductivity monitor as necessary.
15. Continuously monitor and record Unit 3 FF pressure drop.
16. Continuously monitor and record Unit 3 exhaust temperature at the FF inlet.
17. Continuously monitor and record the amount of reagent used by the DS.

**X. RECORD KEEPING REQUIREMENTS**

1. Dominion shall establish and maintain a record keeping system for the proposed Facility. All such records shall be maintained up-to-date such that year-to-date information is readily available at the Facility for MassDEP examination upon request. The record keeping log/system, including any other "credible evidence", shall be kept at the Facility for a minimum of five (5) years. Record keeping shall, at a minimum, include:
  - a) Compliance records sufficient to demonstrate that emissions from the Facility have not exceeded emission limits contained in this Conditional Approval. Such records shall include, but are not limited to, fuel usage rate, emissions test reports, sound survey reports, monitoring equipment data and reports.
  - b) Maintenance: A record of routine maintenance activities performed on the proposed control equipment and monitoring equipment including, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
  - c) Malfunctions: A record of all malfunctions on the proposed Unit 1, 2 and 3, and Cooling Tower 1 and 2 emission control and monitoring equipment including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed and the proposed equipment was returned to compliance.
2. Dominion shall maintain on-site for five (5) years all records of output from all CEMs, continuous record of pressure drop across FF, continuous record of temperature at FF inlet, fuel consumption, circulating water flow monitors, circulating water conductivity monitors TDS ppm<sub>w</sub>, circulating water grab sample TDS results and circulating water chemical feed, and shall make these records available to the MassDEP upon request.
3. Dominion shall maintain a log to record upsets or failures associated with the emission control systems.
4. Dominion shall maintain monitoring equipment design, maintenance, and repair information, including dates and times of repairs or maintenance.
5. Dominion shall maintain ARP daily records including operating hours, fly ash feed in tons per day; PAC feed in tons per day; and cubic feet of natural gas burned per day.
6. Dominion shall maintain ARP calendar month records including number of operating hours, natural gas heat input, PAC heat input, fly ash heat input, and average total heat input (MMBtu/hr) during operating hours.
7. The use of reclaimed water from the Somerset POTW that contains minor amounts of VOCs is subject to the record keeping requirements contained in 310 CMR 7.02(2)(d).

8. The lime, fly ash and PAC material handling and storage systems are subject to the record keeping requirements contained in 310 CMR 7.03(6).
9. Total dissolved solids average ppm<sub>w</sub> per day, month and consecutive 12-month period.
10. The hours of operation of each cooling tower circulating water flow pump for each operating day.
11. The circulating water flow rate daily average gpm for each cooling tower.
12. Cooling tower three month interval and calendar year internal inspection records shall be maintained including information as to whether the drift eliminators are properly installed and in good working order.

**XI. REPORTING REQUIREMENTS**

1. All notifications and reporting required by this Conditional Approval shall be made to the attention of:

Department of Environmental Protection  
Bureau of Waste Prevention  
20 Riverside Drive  
Lakeville, Massachusetts 02347  
ATTN: Permit Section  
Telephone: (508) 946-2770  
Fax: (508) 947-6557 or (508) 946-2865
2. Pursuant to 310 CMR 7.00 Appendix A, Dominion on an annual basis for a period of 5 years from the date each unit (Unit 1, 2 and Unit 3) resumes regular operation after completion of the steps identified in 4.c through 4.j of this Section, shall submit to MassDEP information demonstrating that the physical or operational change did not result in an emission increase beyond the “representative actual annual emissions” defined in Section IV Emission Offsets and Nonattainment Review. Should there be an increase beyond that defined in Section IV, MassDEP will consider information provided by Dominion that the increase is unrelated to the alterations/construction approved herein, such as, any increased utilization due to the rate of electricity demand growth for the utility system as a whole. The installation dates of the Unit 3 SCR and DS/FF emission control systems do not coincide, as is the case of the Units 1 and 2 SCR and SDA/FF/PAC emission control systems. Therefore Units 1, 2 and 3 will have more than one different 5-year period subject to the requirements of this condition.
3. Dominion shall notify MassDEP by telephone or fax no later than three (3) business days after the occurrence of any Facility upsets or malfunctions to the Facility equipment which results in an excess emission to the ambient air and/or a condition of air pollution.
4. Dominion shall notify MassDEP in writing within 10 days after each activity listed below occurs:
  - a) The date construction commences.
  - b) The date construction is completed.
  - c) The date Unit 1 SCR system has passed acceptance testing (vendor guarantee).
  - d) The date Unit 1 SDA/FF and PAC systems passed acceptance testing (vendor guarantee).

- e) The date Unit 2 SDA/FF and PAC system passed acceptance testing (vendor guarantee).
  - f) The date Unit 3 SCR and ARP have both passed acceptance testing (vendor guarantee).
  - g) The date Unit 3 PAC system passed acceptance testing (vendor guarantee).
  - h) The date Unit 3 DS/FF has passed acceptance testing (vendor guarantee).
  - i) The date Cooling Tower 1 has passed acceptance testing (vendor guarantee).
  - j) The date Cooling Tower 2 has passed acceptance testing (vendor guarantee).
5. Notification as required by 40 CFR 60 Subpart Dc, Section 60.48c(a).
  6. The use of wastewater from the Somerset POTW that contains minor amounts of VOCs is subject to the reporting requirements contained in 310 CMR 7.02(2)(e).
  7. The lime, fly ash and PAC material handling and storage systems are subject to the reporting requirements contained in 310 CMR 7.03(5).
  8. Post construction sound survey final reports shall be submitted to MassDEP within 60-days after the last day of sound monitoring.
  9. Dominion shall ensure that all final emission test reports are submitted to the MassDEP within 60 days after completion of each of the tests.

## **XII. TESTING REQUIREMENTS**

1. Dominion shall ensure that the proposed facility is constructed to accommodate the initial emissions testing requirements contained herein. All emissions testing shall be conducted in accordance with MassDEP's "Guidelines for Source Emissions Testing" and in accordance with the Environmental Protection Agency reference test methods as specified in 40 CFR Part 60, Appendix A, or a method approved by MassDEP in writing.
2. Dominion shall obtain written MassDEP approval of an emissions test protocol. The protocol shall include a detailed description of sampling port locations, sampling equipment, sampling and analytical procedures, and operating conditions for any such emissions testing. Emission test Protocol shall be submitted to MassDEP at least 45 days prior to commencement of testing at the Facility. The test protocol shall include a test matrix that will define emission control efficiencies and emission rates, as follows:

### **Unit 1**

#### **SCR (see Section XI.4.c)**

- NO<sub>x</sub> (upstream and downstream of SCR)
- NH<sub>3</sub> (downstream of SCR)
- Opacity

#### **SDA/FF & PAC (see Section XI.4.d)**

- SO<sub>2</sub> (upstream and downstream of SDA/FF)
- PM (upstream and downstream of FF)
- Hg (upstream of PAC and downstream of SD/FF)
- Opacity

### **Unit 2**

#### **SDA/FF & PAC (see Section XI.4.e)**

- SO<sub>2</sub> (upstream and downstream of SDA/FF)
- PM (upstream and downstream of FF)
- Hg (upstream of PAC and downstream of SD/FF)
- Opacity

### **Unit 3**

#### **SCR & ARP (see Section XI.4.f)**

- NO<sub>x</sub> (upstream and downstream of SCR)
- NH<sub>3</sub> (downstream of SCR)
- Opacity

#### **PAC (see Section XI.4.g)**

- Hg (upstream of PAC and downstream of RC ESP)
- PM (downstream of RC ESP)
- Opacity

#### **DS/FF (see Section XI.4.h)**

- SO<sub>2</sub> (upstream and downstream of DS/FF)
- PM (upstream and downstream of DS/FF)
- PM<sub>10</sub> (upstream and downstream of DS/FF)
- PM<sub>2.5</sub> (upstream and downstream of DS/FF)
- Hg (upstream of PAC and downstream of DS/FF)
- NH<sub>3</sub> (downstream of DS/FF)
- Opacity

### **Unit 4**

- PM (upstream and downstream of the ESP)
- PM<sub>10</sub> (upstream and downstream of the ESP)
- PM<sub>2.5</sub> (upstream and downstream of the ESP)

### **Cooling Tower 1 and 2**

- Total dissolved solids, ppm<sub>w</sub>, in the circulating water
3. Dominion shall conduct initial emission tests no later than 180 days after each date specified in Sections XI.4.c, XI.4.d, XI.4e, XI.4.f, XI.4.g and XI.4.h. but not to exceed one year after the initial operation with the Unit 3 DS/FF.
  4. Dominion shall conduct an initial emission test to demonstrate that Units 1, 2 and 3 are in compliance with the emission limits (lb/hr, lb/MMBtu, ppmvd @ 3% O<sub>2</sub>, as applicable, and % opacity) for NO<sub>x</sub>, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NH<sub>3</sub>, Hg and opacity. With respect to Unit 3, Dominion shall conduct an initial emission test to demonstrate compliance, for the same air contaminants as required for Unit 1, 2 & 3, after SCR and PAC installation and again after the DS/FF installation. Testing shall be conducted between 90 and 100% of rated base load.
  5. Dominion shall conduct an initial emission test to demonstrate that Unit 1, 2, 3 and 4 are in compliance with PM, PM<sub>10</sub> and PM<sub>2.5</sub> emission limits and to define PM, PM<sub>10</sub> and PM<sub>2.5</sub> control equipment performance. The emission tests shall be conducted 180 days from the date of this Conditional Approval (4B08052).

6. In accordance with 310 CMR 7.13, MassDEP may require additional emissions testing of the Facility at any time to ascertain compliance with the Department's Regulations and/or this Conditional Approval.
7. In accordance with 310 CMR 7.04(4)(a), Dominion shall have Units 1, 2 and 3 inspected and maintained in accordance with the manufacturer's recommendations and tested for efficient operation at least once in each calendar year. The results of said inspection, maintenance and testing and the date upon which it was performed shall be recorded and posted conspicuously on or near each Unit.

### **XIII. GENERAL REQUIREMENTS**

1. Dominion shall train all personnel to operate the Facility and control equipment in accordance with vendor specifications and this Conditional Approval.
2. All requirements of this Conditional Approval that apply Dominion shall apply to all subsequent owners and/or operators of the Facility.
3. Dominion shall maintain the standard operating and maintenance procedures for all air pollution control equipment in a convenient location (e.g., control room/technical library) and make them readily available to employees and MassDEP.
4. Dominion shall comply with all provisions of 310 CMR 6.00-8.00 that are applicable to this Facility.
5. This Conditional Approval may be suspended, modified, or revoked by MassDEP if, at any time, MassDEP determines that Dominion is violating any condition or part of this Conditional Approval.
6. This Conditional Approval does not negate the responsibility of Dominion to comply with this or any other applicable federal, state, or local regulations now or in the future.
7. The Facility shall be operated in a manner to prevent the occurrence of dust, odor or sound conditions that cause or contribute to a condition of air pollution as defined in Regulations 310 CMR 7.01, 7.09 and 7.10.
8. Should asbestos remediation/removal be required as a result of this Conditional Approval, such asbestos remediation/removal shall be done in accordance with Regulation 310 CMR 7.15 and 310 CMR 4.00.
9. Any proposed increase in emissions above the limits contained in this Conditional Approval must first be approved in writing by MassDEP pursuant to 310 CMR 7.02. In addition, any emissions increase may subject the Facility to additional regulatory requirements.
10. Dominion shall not cause, suffer, allow, or permit the removal, alteration or shall otherwise render inoperative any air pollution control equipment or equipment used to monitor emissions which has been installed as a requirement of 310 CMR 7.00, other than for reasonable maintenance periods or unexpected and unavoidable failure of the equipment, provided that MassDEP has been notified of such failure, or in accordance with specific written approval of MassDEP.
11. The Facility shall be constructed and operated in strict accordance with this Conditional Approval. Should there be any differences between the Dominion's Major Comprehensive Plan Application (Application No. 4B08052, Transmittal No. X224106) and this Conditional Approval, this Conditional Approval shall govern.

12. All provisions contained in existing approvals and the Operating Permit concerning the subject facility, issued by MassDEP to the Dominion and/or previous owners, remain in effect other than those specifically altered herein

#### **XIV. CONSTRUCTION REQUIREMENTS**

During the construction phase of the proposed modifications at the Facility, Dominion shall take all reasonable precautions (noted below) to minimize dust, odor and sound emissions:

1. Facility personnel and/or contractors shall exercise care in operating any sound generating equipment (including mobile power equipment, power tools, equipment startup, equipment testing, etc.) at all times to minimize sound emissions.
2. Construction vehicles transporting loose aggregate to or from the Facility shall be covered and shall use leak tight containers.
3. The construction open storage areas, piles of soil, loose aggregate, etc. shall be covered or watered down as necessary to minimize dust emissions.
4. Any spillage of loose aggregate and dirt deposits on any public roadway, leading to or from the proposed facility shall be removed by the next business day or sooner, if necessary.
5. Facility unpaved roadways/excavation areas subject to vehicular traffic shall be watered down as necessary or treated with the application of a dust suppressant to minimize the generation of dust.

#### **XV. MASSACHUSETTS ENVIRONMENTAL POLICY ACT (MEPA)**

##### **SCR, SD/FF, DS/FF, PAC and ARP**

An Environmental Notification Form (EOEA No. 13022) was submitted to the Executive Office of Environmental Affairs, for air quality control purpose, pursuant to the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00 MEPA Regulations. The ENF was designated EOEA No. 13022. On May 22, 2003, the Secretary of Environmental Affairs issued a Certificate on the ENF with a determination that the project does not require the preparation of an Environmental Impact Report.

In response to a Notice of Project Change, the Secretary of Environmental Affairs issued a letter, dated August 23, 2004, indicating that no further review was required for the use of aqueous ammonia in place of the urea based system. In addition, in response to a Notice of Project Change the Secretary of Environmental Affairs issued a Certificate on the Notice of Project Change, dated March 24, 2006, indicating that no further review was required for the SDA/FF systems and PAC injection systems.

In response to a Notice of Project Change, the Secretary of Energy and Environmental Affairs issued a Certificate dated October 10, 2008, indicating that no further review was required for the Unit 3 DS/FF.

##### **Natural Draft Cooling Towers**

An Environmental Notification Form (EOEA No. 14235) was submitted to the Executive Office of Energy and Environmental Affairs, for air quality control purpose, pursuant to the

Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00 MEPA Regulations. The ENF was designated EOEA No. 14235. On May 23, 2008, the Secretary of Energy and Environmental Affairs issued a Certificate on the ENF with a determination that the project does not require the preparation of an Environmental Impact Report.

**Unit 3 DS/FF and PAC, and Cooling Towers**

Unit 3 DS/FF and PAC, and the Cooling Tower 1 and 2 is one project as submitted in MCPA (Application No. 4B08052) although addressed in the Notice of Project Change (EOEA No. 13022) Certificate dated October 10, 2008 and Environmental Notification Form (EOEA No. 14235) Certificate dated May 23, 2008. The project in total covered by these two Certificates will result in potential emission reductions of PM, PM10 and PM2.5 of 1,345 tpy, 3,977 tpy and 3,977 tpy respectively.

**XVI. LIST OF PERTINENT INFORMATION**

Application Title: “310 CMR 7.02 Major Comprehensive Plan Approval Application and Prevention of Significant Deterioration Application for the Closed Cycle Cooling and Unit 3 Dry Scrubber/Fabric Filter Projects at Dominion Energy Brayton Point, LLC” dated August 28, 2008

Application Prepared by: Epsilon Associates, Inc.

Attested to by: Andrew Jablonowski, P.E. No. 39123  
David Crispo, P.E. No. 41499

Submitted by: Dominion Energy Brayton Point, LLC

Date Submitted: August 28, 2008

Date Resubmitted: January 9, 2009

Revisions dated: January 23, 2009  
January 30, 2009

The following previously approved NMCPA and MCP applications are incorporated by reference:

- Application No. 4B06002/Transmittal No. W070639
- Application No. 4B04025/ Transmittal No. W053973
- Application No. 4B02012/Transmittal No. W027692

**XVII. APPEAL PROCESS**

This approval is an action of the Department. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts which are the grounds for the request, and the relief sought. Additionally, the request must state why the plan approval is not consistent with the applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts  
Department of Environmental Protection  
P.O. Box 4062  
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid unless the appellant is exempt or granted a waiver as described below.

The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

The Department may waive the filing fee for the adjudicatory hearing filing for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.