Kevin McMahon
Operations Manager

Asphalt Division
Chevron Products Company
1200 State Street
Perth Amboy, NJ 08861
Tel (732) 738-2048
Fax (732) 738-2028
mcmh@chevron.com

March 19, 2009

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. W. O'Sullivan
New Jersey Department of Environmental Protection
Division of Air Quality
401 E. State Street
P.O. Box 027
Trenton, NJ 08625-0027

SUBJECT: **Chevron Products Company, PI# 18058**
BART Requirements of the Federal Regional Haze Rule

REF: **3/3/09 Letter from W. O'Sullivan to K. McMahon, "PI#18058 – Chevron Products Co. Perth Amboy"**

Dear Mr. O'Sullivan,

We have received your letter notifying the facility that it may be subject to the Best Available Retrofit Technology (BART) requirements of the federal Regional Haze Rule and requesting our concurrence on the proposed schedule and procedures for preparing a case-by-case BART Evaluation. While we are in agreement that there are sources at the facility that are BART-eligible, the BART-eligible sources which are emitters of NOx, SO2, and PM10 are currently idled with no immediate plan to re-start. We propose to postpone the preparation of the BART evaluation until such time as the idled sources are scheduled for restart.

If this course of action is not acceptable to the Department we request that additional time be provided to prepare and submit the BART control plan. As stated in your letter, Chevron was inadvertently left off the November 2006 correspondence that was sent to other facilities notifying them of the potential BART eligibility of their sources and requesting confirmation or correction of this statement. The same letter also stated your plans to require their facility to prepare a BART evaluation in the near future; this has afforded them an additional 2+ years to gather data in support of preparing this evaluation.

Should you have any questions, please contact myself or Ms. Fran Lindsley-Matthews at (732) 738-2065.

Sincerely,

Kevin McMahon

cc: T. Depko
S. Owen
File 302.6.2

Kevin McMahon
Operations Manager

Asphalt Division
Chevron Products Company
1200 State Street
Perth Amboy, NJ 08861
Tel (732) 738-2048
Fax (732) 738-2028
mcmh@chevron.com

July 10, 2009

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Section Chief, Bureau of Operating Permits
Division of Air Quality
New Jersey Department of Environmental Protection
401 East State Street
PO Box 027
Trenton, New Jersey 08625-0027

SUBJECT: BART Evaluation for Chevron Products Company PI# 18058

REF: 3/3/09 Letter from W. O'Sullivan to K. McMahon, "PI#18058 – Chevron Products Co. Perth Amboy"

Dear Sir,

The Chevron Products Company Perth Amboy facility has received the Department's request for a BART Evaluation of the BART-eligible units at this facility. Chevron has completed this evaluation and is providing the information that the Department specified in its 3/3/09 letter. The evaluation indicates that there are two BART-eligible units at this facility, F-501 Atmospheric Crude Furnace and F-510 Vacuum Crude Furnace, triggered by their combined potential to emit more than 250 tons per year of NOx. The existing controls on these units, as well as an evaluation of the additional control technologies available are presented in the attached BART Evaluation. The facility evaluated these controls based on the BART definition appearing in 40CFR51.301 as well as the Appendix Y to Part 51 Guidelines for BART Determinations Under the Regional Haze Rule. While units falling within the BART-eligible date range of 8/7/1962 to 8/7/1977 typically do not have to meet many of the Clean Air Act requirements, the two BART eligible sources at this facility already comply with the fuel gas H2S limits of NSPS J. Additional controls available for these sources are the same as for most heaters, from new burners up to Selective Catalytic Reduction (SCR) units.

As stated in the 3/3/09 letter from the Department, the Chevron Products Company Perth Amboy facility did not appear in the Regional Haze SIP the Department submitted to EPA. The letter states the Department inadvertently left Chevron off the list of BART-eligible facilities and that this oversight was pointed out in comments submitted by the Federal Land Manager from the US Fish and Wildlife Service. We have reviewed a number of documents addressing BART prepared for the Mid-Atlantic/Northeast Visibility Union (MANE-VU) Regional Planning Organization, including a recent document entitled "Five-Factor Analysis of BART-Eligible Sources Survey of Options for Conducting BART Determinations" prepared by NESCAUM and dated June 1, 2007. Chevron Products Company does

appear on the list of 136 BART-eligible sources in Appendix A 'BART-Eligible Sources in the MANE-VU Region". The primary focus of this NESCAUM report was evaluating the degree of visibility improvement that may reasonably be anticipated from the use of BART based on the five statutory factors: the cost of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of visibility improvement which may reasonably be anticipated from the use of BART. Based on modeling 2002 emissions of SO2, NOx and PM10 from all BART-eligible units in the region this report developed a short list of 53 sources that had a greater than 0.1 dv impact at any Class 1 area which the report says they provided to the states. Chevron contacted NESCAUM and obtained this list of sources with greater than 0.1 dv impact. Chevron does not appear on the list of sources with an impact greater than 0.1 dv; Chevron's modeled impact result per NESCAUM was 0.0594 dv (sum of sulfate, nitrate, and PM impacts). The report indicates that sources whose impact is below 0.1 dv may be too small to warrant BART controls.

Based on our BART Evaluation and the NESCAUM report the facility does not believe that any further action is warranted for the purposes of Regional Haze compliance. The BART-eligible units at the facility are already compliant with the NSPS J fuel gas requirement, and any additional controls have significant costs associated with them and would achieve limited impact on visibility at Class 1 areas. For the purposes of regional haze compliance the facility is asking NJDEP to find that the current level of controls satisfies BART, as allowed under Part 51 Appendix Y Guidance.

Should you have any questions, please contact Ms. Fran Lindsley-Matthews at (732) 738-2065.

Sincerely,

Kevin McMahon

cc: T. Allen, U.S.F.W.S.
T. Depko
File 302.1.1.1 (113.161)

Responsible Official Signature Statement

Pursuant to N.J.A.C. 7:27-1.39(a)2: "I certify, under penalty of law, that I have personally examined and am familiar with the information submitted in this document and all attached documents and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true , accurate and complete. I am aware that there are significant civil criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Signature: K-McM Date: 7/10/09

Print: Kevin McMahon

Title of Responsible Official: Operations Manager

Telephone: 732 - 738 - 2048

Direct Knowledge Official Signature Statement

Pursuant to N.J.A.C. 7:27-1.39(a)1: "I certify, under penalty of law, that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Signature: F. D Date: 7/10/09

Print: Fran Lindsley-Matthews

Title of Direct Knowledge Official: Environmental Specialist

Telephone: 732 738-2065

CHEVRON PRODUCTS COMPANY PI#18058
BART EVALUATION

This BART Evaluation has been prepared based on guidelines provided in the 3/3/09 NJDEP Letter from W. O'Sullivan to K. McMahon, "PI#18058 – Chevron Products Co. Perth Amboy".

The Best Available Retrofit Technology was evaluated based on the BART definition from 40CFR51.301. The definition for BART, "means an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by an existing stationary facility. The emission limitation must be established, on a case-by-case basis, taking into consideration the technology available, the costs of compliance, the energy and nonair quality environmental impacts of compliance, any pollution control equipment in use or in existence at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology."

1) List of Equipment in Existence on August 7, 1977 Which Began Operation After August 7, 1962 with the Corresponding Potential to Emit of SO2, NOx, and PM10

Table 1
List of Equipment In Existence on 8/7/1977, & Not In Operation Prior to 8/7/1962

Equipment Number from Title V Permit	Equipment Name	SO2 PTE tpy	NOx PTE tpy	PM10 PTE tpy	Existing Controls
E1501	F-501 Atmospheric Crude Furnace	28	181.3	18.8	NSPS J Fuel Gas H2S Control
E1502	F-510 Vacuum Crude Furnace	12.5	80.9	13.9	NSPS J Fuel Gas H2S Control
TOTAL		**40.5**	**262.2**	**32.7**	

These two units above have a total potential to emit more than 250 tpy of NOx, therefore triggering BART Eligibility. They constitute a BART-eligible stationary source and will be reviewed for SO2, NOx, and PM10 controls. For discussion purposes the F-501 & F-510 furnaces will be called the Crude Unit Heaters.

The existing pollution control for the Crude Unit Heaters is the sodium hydroxide treatment (NaSH Plant) on the Refinery Fuel Gas Stream (NSPS J Compliant Control). This system limits the H2S in the Refinery Fuel Gas System thereby reducing SO2 & PM10 emissions. The NaSH Plant was installed to bring the refinery fuel gas system into compliance with NSPS Subpart J, which was triggered by modifications to the fuel gas system for the addition of boilers in the 1990s. Therefore the Crude Unit Heaters, E1501 & E1502, are in compliance with the fuel gas H2S requirements of NSPS J.

Table 2 provides actual emission data for the Crude Unit Heaters back to 2002. The table also includes the NOx lb/MMBtu emission rate for each heater based on stack testing. The maximum emission of NOx in the last 5 years is indicated. It should be noted that the emissions in 2002, the emission year modeled by NESCAUM, was representative of typical emissions from these units.

Table 2
Annual Emissions of Visibility Impairing Pollutants

	F-501 Atmospheric Crude Furnace				F-510 Vacuum Crude Furnace			
Reporting Year	NOx lb/MMBtu	NOx tpy	SOx tpy	PM10 tpy	NOx lb/MMBtu	NOx tpy	SOx tpy	PM10 tpy
2002	0.15	109.41	9.25	2.43	0.10	11.68	1.47	1.17
2003	0.16	105.77	8.37	9.80	0.10	9.88	1.20	2.06
2004	0.16	115.20	9.31	10.67	0.10	11.39	1.41	2.38
2005	0.16	99.96	7.06	9.26	0.10	13.65	1.48	2.85
2006	0.16	87.12	4.74	8.07	0.10	16.05	1.34	3.35
2007	0.16	46.82	3.09	4.34	0.10	6.12	0.62	1.28
2008	0.14	19.09	1.16	1.60	0.08	2.01	0.23	0.11

NOx - Max in the last 5 years 115.2 tpy for F-501 16.05 tpy for F-510

Source E1601, F-102 Hot Oil Heater, was installed during the specified time window for BART eligibility but was not included in Table 1 because it has been demolished. This source will be deleted from the Title V permit as a part of the Title V permit renewal.

During the 1962 to 1977 time window the control devices listed in Table 3 were installed at the facility. The table lists the control devices as well as their permitted potential to emit SO2, NOx, and PM10. The control equipment includes the CD2401 AER Incinerator on E2401 Light Products Loading Rack, as well as the installation of E1801 North Flare. These were not considered BART Eligible emission units and were not included in the BART evaluation as they are control devices.

Table 3
Control Devices Installed Within the Time Window From 1962 to 1977

Number from Title V Permit	Equipment Name	SO2 PTE tpy	NOx PTE tpy	PM10 PTE tpy
E1801	North Flare	Demin	2.93	0.35
CD2401 (for E2401)	Light Products Loading Rack with AER Incinerator	1.4	2.9	0.3

2) List of Additional Control Technologies or Measures Available for the BART Eligible Units:

Control technologies that can be applied to each furnace are listed below. The type of burners evaluated here are Ultra Low NOx Burners (ULNB); Low NOx Burners were not evaluated here as a separate line item. Ultra Low NOx Burners are significantly more efficient than Low NOx burners and the cost per burner is not significantly higher.

a) For E1501, F-501 Atmospheric Crude Furnace:

NOx –

Ultra Low NOx Burners (ULNB)
Selective Non-Catalytic Reduction (SNCR)
Selective Catalytic Reduction (SCR)

SO2 –

None, fuel gas sulfur control already implemented, and only gaseous fuels are combusted/permitted for use.

PM10 –

None, fuel gas sulfur control already implemented, and only gaseous fuels are combusted/permitted for use.

b) For E1502, F-510 Vacuum Crude Furnace:

NOx –

Ultra Low NOx Burners (ULNB)
Selective Non-Catalytic Reduction (SNCR)
Selective Catalytic Reduction (SCR)

SO2 –

None, fuel gas sulfur control already implemented, and only gaseous fuels are combusted/permitted for use.

PM10 –

None, fuel gas sulfur control already implemented, and only gaseous fuels are combusted/permitted for use.

3) Analysis of the Technological Feasibility of Additional Control Technologies or Measures Available for the BART Eligible Units:

The design and operation of the existing furnaces directly impacts the list of technologically feasible options. For the burners this becomes a factor because the vertical clearance from the burners to the radiant tubes in the furnace is a concern. The newer burners have significantly longer flame lengths than the conventional burners the furnaces were designed to house. Flame lengths that are too long for the firebox in the furnace can decrease efficiency and cause coking of process fluids in the tubes. For the add-on controls, SNCR and SCR, the operation of the furnace becomes a factor because the proper temperature window must be available in the furnace for the reduction reaction with the ammonia to occur.

a) Options for E1501, F-501 Atmospheric Crude Furnace:

Ultra Low NOx Burners (ULNB) – Current ULNB were evaluated for this application and are technologically feasible.

Selective Non-Catalytic Reduction (SNCR) – SNCR requires an optimum temperature window for operation, typically in the 1600 to 2000°F range. Installation of an SNCR to achieve stable NOx reduction is viewed as too much risk since the firing rate at the Crude Unit it too variable, temperature profiles in the flue gas are variable and it is difficult to pick an optimum spot for reagent injection. Due to temperature considerations and lower efficiencies than achievable with SCR or ULNB this technology was not evaluated further.

Selective Catalytic Reduction (SCR) – SCR requires an optimum flue gas temperature for vanadium-titanium catalysts between 550 – 750°F. Although significant NOx reduction can still be achieved at temperatures below 550°F efficiency is sacrificed and increase ammonia slip may result. The required temperature range exists in this heater, although it is

in the lower part of the range resulting in an expected reduction efficiency of about 80%. Additional modifications could be made to the heater, which include removing the steam coils to increase the flue gas temperature thereby increasing the NOx removal efficiency.

b) Options for E1502, F-510 Vacuum Crude Furnace:

This furnace typically has a low firing rate with respect to its design firing rate which makes the concerns of adequate temperatures for SNCR & SCR even greater.

Ultra Low NOx Burners (ULNB) – Current ULNB were evaluated for this application and are technologically feasible.

Selective Non-Catalytic Reduction (SNCR) – SNCR requires an optimum temperature window for operation, typically in the 1600 to 2000°F range. Installation of an SNCR to achieve stable NOx reduction is viewed as too much risk since the firing rate at the Crude Unit it too variable, temperature profiles in the flue gas are variable and it is difficult to pick an optimum spot for reagent injection. Due to temperature considerations and lower efficiencies than achievable with ULNB this technology was not evaluated further.

Selective Catalytic Reduction (SCR) – SCR requires an optimum flue gas temperature for vanadium-titanium catalysts between 550 – 750°F, although significant NOx reduction can still be achieved at temperatures below 550°F though efficiency is sacrificed and increase ammonia slip may result. The required temperature range will be difficult to achieve at this heater as the typical stack temperature at this heater is well below the temperature window for effective NOx reduction. Due to temperature considerations this technology was not evaluated further.

4) Estimate of the Cost of Installation and Operation of Technologically Feasible Measures:

The capital costs presented in Table 4 are the estimated installed cost for the technology as well as any modifications that need to be made to the equipment to accommodate the controls.

Table 4
Control Technologies - Costs and Emissions

Pollutant/ Emissions Unit	Control alternative	NOx Emissions in lb/ MMBtu (Baseline from Max in last 5 years)	NOx Emissions in tpy (Baseline from Max in last 5 years)	Installed Capital Cost Estimate, $Millions	Annual Operating Cost Estimate, $
NOx/ F-501 Atmospheric Crude Furnace	SCR w/ Steam Coil Removed	0.012	8.7	7.7	187,000
	SCR	0.04	29.0	8.75	187,000
	ULNB	0.025	18.1	4.9	Minimal
	Baseline	0.16	115.2	-	Minimal
NOx/ F-510 Vacuum Crude Furnace	ULNB	0.019	2.94	2.1	Minimal
	Baseline	0.10	16.05	-	Minimal

Note: Operating cost for SCR units estimated based on the use of a 300 hp fan. No catalyst change outs were included due to the estimated remaining useful life of the emission units.

5) Remaining Useful Life of the Source:

Both the F-501 Atmospheric Crude Furnace, and the F-510 Vacuum Crude Furnace are estimated to have a remaining useful life of 7 years based on the current condition of the equipment. Because this is well below the typical useful life for the controls being evaluated the lower value of 7 years should be used for annualized cost calculations.

6) Estimate of the NOx, SO2, and PM10 Emission Reductions:

See Table 4. Per the guidance in Part 51 Appendix Y the emission reductions have been estimated based on actual emissions.

7) Proposed Control Technology for BART & Proposed Schedule for Installation & Commencement of Operation:

As stated in the cover letter the "Five-Factor Analysis of BART-Eligible Sources Survey of Options for Conducting BART Determinations" prepared by NESCAUM and dated June 1, 2007 determined that the facility does not have a significant (greater than 0.1 dv) impact on regional haze at Class 1 areas. Based on the high costs of additional controls and the limited impact these controls

would have on improving regional haze we are not proposing any additional controls. The fuel gas system supplying the Crude Unit Heaters is already NSPS J compliant. Per the guidance in 40 CFR 51 Appendix Y the state can take this into account during the review process in determining whether the level of controls already in place are consistent with BART.

8) Proposed Emission Limits

No new emission limits are being proposed.

9) Energy Impacts and Non-Air Quality Impacts

Table 5
Environmental Impacts

		Environmental Impacts		
Pollutant/ Emissions Unit	**Control alternative**	**Toxic impact (Yes/No)**	**Adverse environmental impacts (Yes/No)**	**Energy Impact**
NOx/ F-501 Atmospheric Crude Furnace	SCR w/ Steam Coil Removed	Yes	No	Small to Medium[(1)]
	SCR	Yes	No	None or Small[(2)]
	ULNB	No	No	No
	Baseline	-	-	-
NOx/ F-510 Vacuum Crude Furnace	ULNB	No	No	No
	Baseline	-	-	-

Note:
1. Removal of steam coil will result in a loss of steam production that will have to be made up by additional firing at the boilers.
2. Based on use of aqueous ammonia.

HESS CORPORATION
1 Hess Plaza
Woodbridge, NJ 07095

HOWARD GOLDMAN
Environmental Manager
(732) 750-7735
FAX: (732) 636-0932

April 17, 2009
HSG/09/052
Certified Mail # 7002 2410 0003 9872 3141

Mr. William O'Sullivan, P.E. - Director.
NJ DEP
Division of Air Quality
P.O. Box 27
Trenton, NJ 08625-0029

Re: PI# 17996 – Hess Port Reading Refinery
Best Available Retrofit Technology (BART)
Regional Haze Rule (40 CFR 51.300)

Dear Mr. O'Sullivan:

Pursuant to Hess Corporation's letter of March 19, 2009, Hess has completed an evaluation of the start-up dates of all significant equipment (as defined by N.J.A.C. 7:27-22.1) at the Port Reading Refinery. All of the potentially BART affected emission units at the refinery have start-up dates that are either prior to August 7, 1962 or after August 7, 1977. Please see the attached table. Accordingly, the BART requirements of the Regional Haze Rule do not apply to the Port Reading Refinery.

If you have any questions or require additional information, please feel free to call me at 732-750-7735.

Sincerely,

Howard Goldman
Environmental Manager

cc: C. Colman
P. Haid
B. Howard
T. Ruddy
PR Air File

BART Applicability Analysis
Hess Port Reading, NJ Refinery

Equipment Inventory	Potential to Emit (tpy)			Exceeds BART Emissions Thresholds (Y/N)	Start-up Date
	NOx	SO2	PM-10		
U1 - FCCU	632.26	207.53	158.3	Y	1960
U4 - Boilers #3, #4	73.6	14.0	7.0	Y	1984
E7 - Separator FA-104A	0	0	0	N	NA
E8 - Separator FA-104B	0	0	0	N	NA
E9 - API Separator FA-104F	0	0	0	N	NA
E10 - API Separator FA-104G	0	0	0	N	NA
E11 - Parallel Plate Separator FA-104C	0	0	0	N	NA
E12 - Parallel Plate Separator FA-104D	0	0	0	N	NA
E13 - Sand Filter Feed Sump X-101	0	0	0	N	NA
E14 - Sand Filter Feed Sump X-202	0	0	0	N	NA
E15 - Parallel Plate Separator F-201	0	0	0	N	NA
E16 - Sand Filter Feed Sump X-203	0	0	0	N	NA
E64 - Flare	NA(1)	NA(1)	NA(1)	N	NA
E66 - Space Heating Boiler	0.74	1.05	Deminimus	N	NA
E69 - Rental Air Compressor	2.68	0.47	0.114	N	NA
E70 - Truck Loading Rack	0	0	0	N	NA
E94 - Marine Loading	0	0	0	N	NA
E95 - Boiler #1 - Second Reserve	34.15	47.3	2.19	Y	1986
E96 - Boiler #2 - Second Reserve	34.15	47.3	2.19	Y	1986
E97 - Boiler #3 - Second Reserve	34.15	47.3	2.19	Y	1986
E67 - Emergency Generator	0.338	0.0223	0.024	N	NA
E2001 - HDS Unit Process Heater	7.47	5.9	1.32	N	NA
E2002 - Hydrogen Unit Process Heater	17.1	7.75	2.55	N	NA
E2003 - E&I Shop Boiler	0.74	1.04	Deminimus	N	NA

(1) No emission limits specified in the Title V Permit.

Note: BART affected emission units are those with start-up dates between 8/7/62 and 8/7/77 and having cumulative potential emisssions for SO2 or for NOx greater than 40 tons per year or for PM-10 greater than 15 tons per year.

Subject: Fwd: BART Affected Equipment

>>> "JOHNSTON, PAUL K" <PKJOHNSTON@sunocoinc.com> 4/16/2009 4:17 PM >>>

Yogesh,

Attached for your review is a copy of the BART determination prepared for the Eagle Point facility. As you will note, Sunoco has determined that emissions from the BART affected equipment are less than the de minimus thresholds. Please provide your assessment of this determination and the need, if any, for further evaluation.

Feel free to contact me if you have any questions.

Regards,

Paul

<<BART Determination.PDF>>

Paul Johnston
Lead Environmental Engineer
Sunoco Eagle Point Refinery
856-853-4425

Sunoco, Inc. (R&M)
Eagle Point Facility
PO Box 1000
Route 130 & I-295 South
Westville NJ 08093-1000

Certified-Return
Receipt Requested
#7004 2890 0002 0367 4910

Env-E07136

May 7, 2007

New Jersey Department of Environmental Protection
Bureau of Operating Permits
401 East State Street
2nd Floor, PO Box 27
Trenton, New Jersey 8625-0027
Attention: Margaret Gardner

Re: Regional Haze Rule- BART Requirements
Reference letter William O'Sullivan to James A. Keeler dated November 1, 2006

Dear Ms. Gardner:

Sunoco, Inc. Eagle Point Refinery (Sunoco) has reviewed the "Draft List" of "BART-affected equipment" at the facility provided by the NJDEP in the referenced letter. Based on this review Sunoco prepared the attached table defining BART applicability for each emission unit. The table was prepared by utilizing the Draft List prepared by NJDEP and adding the following columns:

- Emission Unit (U)- from Eagle Point Title V Permit
- Potential To Emit (PTE) NOx- Tons/yr
- Potential To Emit (PTE) SO2- Tons/yr
- Potential To Emit (PTE) PM10- Tons/yr
- Meets BART date eligibility- Y/N
- Exceeds BART emissions deminimis levels- N or Y/Pollutant
- BART affected equipment- Y/N

Equipment with an indication of "N" in the column "BART affected equipment" does not meet one or both of the BART eligibility requirements. This equipment was installed and went into operation prior to August 17, 1962 or after August 17, 1977 or its potential-to-emit NOx, SO2 or PM10 is below the deminimis level for each pollutant (i.e. below 40 Tons/yr for NOx or SO2 and below 15 Tons/yr for PM10). Equipment with an indication of "Y" in the column "BART affected equipment" meets both eligibility requirements.

As you will note, no additional sources were added to the list. Five sources (E42, E46, E51, E61, E66) are currently out of service and are indicated as "OOS" in the Installation Date column. Two sources (E413, E414) were never constructed and should be removed from the list. Finally, four sources (E58, E59, E62 and E415) are "BART-affected equipment" at this facility.

The Table below summarizes the potential-to-emit from these four sources:

Equipment	NOx-TPY	SO2-TPY	PM10-TPY
E58-CRU Heater PH-3	30.66	30.53	22.61
E59-CRU Heater PH-4A	43.40	43.58	32.26
E62-CRU Heater PH-5B	63.95	13.20	9.77
E415-East Flare	23.74	3.37	64.84
Total TPY emitted	161.75	90.68	129.48

The cumulative emissions from all "BART-affected equipment" are less than 250 Tons per year for each pollutant. Therefore, this facility will not have to make a BART determination for any of the pollutants.

Should you have any questions or need additional information, please contact me at 856-384-3984.

Sincerely,

Paul Johnston
Environmental Lead Engineer

Attachment

cc: Helen Gregory
File: E 20.3575.001
Chron File

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
U5	E5	VPS Heater HA-1	1949	1026	Lo-NOx Burners				N		N
U5	E6	VPS Heater HA-3A	1949	1028	Lo-NOx Burners				N		N
U5	E7	VPS Heater HA-3B	1949	1027					N		N
U6	E8	VPS Heater HA-4	1956	1025	Ultra Lo-NOx Burners				N		N
U8	E12	FCCU Heater 5A	1971	1004A		4.47	4.47	6.38	Y	N	N
U9	E13	FCCU -Regenerator	1949	FCCU-Regen	Ten 3-stage cyclones Quench section of 2 stage scrubber system Venturi Scrubber				N		N
U14	E22	J15A FCCU Compressor engine	1949	J15A					N		N
U14	E23	J15B FCCU Compressor engine	1949	J15B					N		N
U14	E24	J15C FCCU Compressor engine	1949	J15C					N		N
U14	E25	J15D FCCU Compressor engine	1949	J15D					N		N
U14	E26	J15E FCCU Compressor engine	1949	J15E					N		N
U14	E27	J15F FCCU Compressor engine	1949	J15F					N		N
U20	E28	FCCU Heater B-2	1949	1001					N		N
U20	E29	FCCU Heater B-4	1949	1003	Lo-NOx Burners				N		N
U21	E30	FCCU Heater B-3	1949	1002					N		N
U23	E32	Poly Heater B-301	1949	RK1					N		N
U28	E37	HTU #1 Heater HH 1	1956	1005	Lo-NOx Burners				N		N
U30	E39	ISOM PH-1	1953	1012					N		N
U30	E42	ISOM PH-4	OOS	1013					-		-
U31	E43	Slop Oil Sump 2F-224	1972	Sump		0	0	0	Y	N	N
U32	E44	ULSD Process Heater 2H-201	1972	1006		5.26	1.54	9.57	Y	N	N
U33	E45	ULSD Process Heater 2H-202	1972	1007		23	10.52	14.95	Y	N	N
U33	E46	ULSD Process Heater 2H-203	OOS	1008					-		-
U34	E47	Cumene Loading Spot #1	1960	R5-1					N		N
U34	E48	Cumene Loading Spot #2	1960	R5-2					N		N
U37	E51	AH-1T Asphalt Heater	OOS	1029					-		-
U40	E55	CRU PH-6	1979	1023	Lo-NOx Burners				N		N
U41	E56	CRU Heater PH-1	1967	1016	Lo-NOx Burners	18.6	16.6	14	Y	N	N
U42	E57	CRU Heater PH-2	1967	1017	Lo-NOx Burners	16	14.2	13.3	Y	N	N
U43	E58	CRU Heater PH-3	1967	1018		30.66	30.53	22.61	Y	Y/PM10	Y
U43	E59	CRU Heater PH-4A	1967	1019		43.4	43.58	32.26	Y	Y/NOx,SO2,PM10	Y

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
U43	E60	CRU Heater PH-4B	1967	1020		16	16	11.84	Y	N	N
U44	E61	CRU Heater PH-5A	OOS	1055					-		-
U44	E62	CRU Heater PH-5B	1967	1021		63.95	13.2	9.77	Y	Y/NOx	Y
U47	E65	CRU Heater HC-301	1967	1009							
U47	E66	CRU Heater HC-302	OOS	1010					-		-
U48	E67	SRU 1 Complex	1995	SRU 1	SRU Thermal Oxidizer				N		N
U49	E77	Sour Water Stripper	1994	SRU 2	SWS Offgas Flare				N		N
U49	E78	Oil Skimmer Vessel	1994	SR 3	SWS Offgas Flare				N		N
	E81	Sulfolane/Clay Treater Unit	1967	FL 1	East Side Flare West Side Flare Ground ZTOF Flare				Y	N-See Note 6	N
	E82	CRU-2/HTU-4	1967	FL 2	East Side Flare West Side Flare Ground ZTOF Flare				Y	N-See Note 6	N
	E83	Hydrotreater Unit	1956	FL 3	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E84	ULSD Unit	2006	FL 4	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E85	ISOM/HTU-2	1953	FL 5	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E86	Vacuum Pipe Still	1949	FL 6	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E87	FCCU	1949	FL 7	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E88	Catalytic Poly Unit	1949	FL 8	East Side Flare West Side Flare Ground ZTOF Flare				N		N

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
	E89	Cumene Unit	1960	FL 9	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E90	Sulfur Recovery Unit	1995	FL 10	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E91	Alkylation Unit	1953	FL 11	East Side Flare West Side Flare Ground ZTOF Flare				N		N
U110	E92	Powerhouse	2002	FL 12	East Side Flare West Side Flare Ground ZTOF Flare				N		N
	E93	Wastewater Treatment Plant	1972	FL 13	East Side Flare West Side Flare Ground ZTOF Flare	0	0	0	Y	N	N
U53	E94	API Separator	1949	APIS	Cover w/nitrogen blanket				N		N
U53	E95	API Thickner	1972	APIT		0	0	0	Y	N	N
U54	E96	Dock Sump	4/10/1977	Sump		0	0	0	Y	N	N
U53	E97	Aeration Basin	1972	AER		0	0	0	Y	N	N
U56	E98	WWTU-Emerg. Diesel Pump	1972	DSL 1		1.5	0.1	3.42	Y	N	N
U57	E99	Handex	1992						N		N
U66	E142	River Pump Diesel Fire Pump Driver	unknown	DSL 2		2.9	0.2	0.4	unknown	N	N
U96	E310	Brinemaker #1	1984	BR 1	Particulate filter(dust bag)				N		N
U96	E311	Brinemaker #2	1984	BR 2	Particulate filter(dust bag)				N		N
U99	E318	Gas fired duct burner for gas turbine #1	1990	DB 1	Catalytic Oxidizer				N		N
U99	E319	Gas turbine generator #1	1990	GT 1	Catalytic Oxidizer				N		N
U99	E320	Gas fired duct burner for gas turbine #2	1990	DB 2	Catalytic Oxidizer				N		N
U99	E321	Gas turbine generator #2	1990	GT 2	Catalytic Oxidizer				N		N
U103	E325	Cogen Diesel Fire Pump	1990	DL 3					N		N
U14	E334	J15G FCCU Compressor engine	1997	J15G					N		N
U8	E412	FCCU Heater 5B	1971	1004B		4.47	4.47	6.38	Y	N	N
-	E413	Spray Dryer Air Heater	never built	Dryer 1					-		-
-	E414	Metal Hydroxide Spray Dryer	never built	Dryer 2					-		-
U52	E415	East Side Flare	1967	East Flare	Flare gas recov. system	23.74	7.23	64.84	Y	Y/PM10	Y

ATTACHMENT
BART DETERMINATION CHART

Emission Unit(U)	Equipment Inventory, NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE-NOx Tons/Yr.	PTE-SO2 Tons/Yr.	PTE-PM10 Tons/Yr.	Meets BART date eligibility Y/N	Exceeds BART emissions deminimus levels- N or Y/Pollutant	BART affected equipment Y/N
U52	E416	West Side Flare	1949	West Flare	Flare gas recov. system				N		N
U52	E417	Ground ZTOF Flare	1995	Ground Flare	Flare gas recov. system				N		N
U560	E5600	Distillate fired engine	Temporary mobile equipment as needed	Engine					N		N
U560	E5601	Distillate fired Boiler #1	Temporary mobile equipment as needed	Hot Vap					N		N
U560	E5602	Distillate fired Boiler #2	Temporary mobile equipment as needed	Cold Vap					N		N
U48	E6702	Sulfur Recovery Unit Process (new)	2005	SRU Process 2	SRU Thermal Oxidizer				N		N
U45	E55015	LSG Reactor Preheat Furnace	2005	H-1	Lo-NOx Burners				N		N
U45	E55016	LSG Stripper Reboiler	2005	H-2	Lo-NOx Burners				N		N

NOTES:

1- PTE-NOx and PTE-SO2 are based on enforceable limits in the Title V Permit.

2- PTE-PM10 for Heaters is based on recent stack tests.

3- PTE-PM10 for the East Flare is based on the highest annual emission reported for the applicable pollutant in the previous five years.

4- PTE-PM10 for other miscellaneous equipment is based on enforceable limits in the Title V Permit.

5- NOx, SO2 and PM10 for non-combustion equipment are zero.

6- Except for emissions from the Unit's combustion equipment which is identified separately on this chart, emissions of NOx, SO2 and PM10 occur only when non-routine releases of gases from the Unit are flared. Emissions from these incidents are included in the PTE-NOx, PTE-SO2 and PTE-PM10 for the flares (Equipment E415, E416 and E417).

>>> "JOHNSTON, PAUL K" <PKJOHNSTON@sunocoinc.com> 7/10/09 2:29 PM >>>

Max,

As you requested, we have prepared a summary table of emissions from sources subject to BART that compares current potential to emit values to those previously reported in the May 2007 submittal. In reviewing this data please note the following changes:

* Heater HC-301 was inadvertently omitted as a source in the 2007 submission. The emissions from this source have been added to the table for both 2007 and 2009.
* Estimates of the PTE from the East Flare provided in the 2007 submission were based on the highest emission inventory value reported between 2002 and 2007. The current PTE is based on the 2008 emission inventory estimate, which is the first full year that the flare gas recovery system was in operation.
* Heaters Isom PH-4, 2H-203, AH-1T, CRU Ph-5A and HC-302 are out of service and deleted from the current Title V permit.

With the changes noted above, the aggregate PTE for all BART sources is less than 250 tpy for each pollutant.

Feel free to contact me if you have any questions regarding this data.

Regards,

Paul

<<Microsoft Office Excel Worksheet>>

Paul Johnston
Lead Environmental Engineer
Sunoco Eagle Point Refinery
856-853-4425

CC: Friedman, Max; Wong, Danny

BART APPLICABILITY COMPARISON 2007 - 2009

Emission Unit (U)	Equipment Inventory NJID	Equipment Description	Installation Date	Facility Designation	Control Device	PTE - NOx (TPY)		PTE - SO2 (TPY)		PTE - PM-10 (TPY)	
						2007	2009	2007	2009	2007	2009
U8	E12	FCCU Heater 5A	1971	1004A	Lo-NOx Burners	4.47	4.47	4.47	4.9	6.38	1.8
U8	E412	FCCU Heater 5B	1971	1004B	Lo-NOx Burners	4.47	4.47	4.47	4.9	6.38	1.8
U30	E42	ISOM PH-4	OOS	1013	Source deleted from permit	40.5	0	2.7	0		0
U31	E43	Slop Oil Sump 2F-224	1972	Sump		0	0	0	0	0	0
U32	E44	ULSD Process Heater 2H-201	1972	1006	Lo-NOx Burners	5.26	5.26	1.54	1.54	9.57	2.72
U33	E45	ULSD Process Heater 2H-202	1972	1007	Lo-NOx Burners	23.1	23	10.5	10.5	14.95	4.25
U33	E46	ULSD Process Heater 2H-203	OOS	1008	Source deleted from permit	11.7	0	5.3	0		0
U37	E51	AH-1T Asphalt Heater	OOS	1029	Source deleted from permit	6.83	0	N/A	0		0
U41	E56	CRU Heater PH-1	1967	1016	Lo-NOx Burners	18.6	18.6	16.6	16.6	14	4.4
U42	E57	CRU Heater PH-2	1967	1017	Lo-NOx Burners	16	16	14.2	14.2	13.3	3.77
U43	E58	CRU Heater PH-3	1967	1018	Lo-NOx Burners	30.66	30.3	30.53	17.4	22.61	6.4
U43	E59	CRU Heater PH-4A	1967	1019	Lo-NOx Burners	43.4	43.2	43.58	24.9	32.26	9.1
U43	E60	CRU Heater PH-4B	1967	1020	Lo-NOx Burners	16	15.9	16	9.1	11.84	3.4
U44	E61	CRU Heater PH-5A	OOS	1055	Source deleted from permit	47.63	0	5.64	0	7.3	0
U44	E62	CRU Heater PH-5B	1967	1021		63.77	53.9	7.56	13.2	9.77	2.76
U47	E65	CRU Heater HC-301	1967	1009	Lo-NOx Burners	13	13	12.5	12.5		0.96
U47	E66	CRU Heater HC-302	OOS	1010	Source deleted from permit	0	0	0	0	0	0
U52	E415	East Side Flare	1967	East Flare	Flare gas recov. system	23.74	0.75	7.23	0.81	64.84	2.04
U53	E95	API Thickner	1972	APIT		0	0	0	0	0	0
U53	E97	Aeration Basin	1972	AER		0	0	0	0	0	0
U54	E96	Dock Sump	4/10/1977	Sump		0	0	0	0	0	0
U56	E98	WWTP - Emerg. Diesel Pump	1972	DSL 1		1.5	1.5	0.1	0.1	3.42	3.42
U66	E142	River Pump Diesel Fire Pump Driver		DSL 2		2.9	2.9	0.2	0.2	0.4	0.4
					TOTAL	**373.53**	**233.25**	**183.12**	**130.85**	**217.02**	**47.22**

NOTES:

1) PTE for NOx, SO2 and PM-10 are based on enforceable limits in the Title V Permit in place at the time of the report.
2) PTE for the East Flare for 2007 is based on the highest annual emission reported for the applicable pollutant from 2002 to 2007.
3) PTE for the East Flare for 2009 is based on the annual emission reported for the first full year of flare gas recovery operation (2008).
4) NOx, SO2 and PM10 for non-combustion equipment are zero.

Bayway Refinery
BART Review

Bart Sources

Bayway submitted a summary of BART affected sources to NJDEP on March 20, 2007. This summary reviewed a list of 70 sources at the refinery provided by the Department. It was determined that a total of 13 refinery sources were "potentially" BART affected. This included 12 refinery heaters and the Sulfur Recovery Unit (SRU). Since that submission, the SRU has been removed from service, having been replaced by a state of the art sulfuric acid regeneration plant owned and operated by DuPont.

One heater, the Pipestill Atmospheric Tower Heater, F-701 has undergone two major permit reviews for which SOTA applicability was reviewed since 2004 and we believe the Title V significant modifications are sufficient to remove this source from the BART eligible list.

One additional source, the Pipestill Vacuum Tower Heater (F-751) is scheduled to be removed from service and replaced by a new state of the art heater. This project is required by an existing Consent Decree (Civil Action H-05-258) and has already completed the permit process. We believe that a BART analysis of this heater is not warranted since it is scheduled to be replaced.

Therefore the ten sources which remain from the original list submitted will be reviewed to determine if additional controls are warranted.

Equip. No.	Equipment Description	Facility Designation	Potential to Emit (tpy)		
			NOx	SO_2	PM_{10}
E241	PFBW Hydrofiner Heater	F-101 PFBW	30.7	170.4 (10.6)	6.6
E242	DSU-1 Gas Oil Heater	F-101 DSU-1	22.3	N/A	N/A
E243	PFBW Reheat Heater	F-102 PFBW	186	243.5 (64.4)	24.6
E245	PFBW Reheat Heater	F-103 PFBW	F-102 – F-105 Emissions combined in one stack shown above under F-102.		
E246	PFBW Reheat Heater	F-104 PFBW			
E247	PFBW Reheat Heater	F-105 PFBW			
E248	PFBW Regen Heater	F-106 PFBW	27.6	157.2 (9.6)	6.1
E250	PFBW Reboiler Heater	F-108 PFBW	47.3	N/A	N/A
E253	DSU-2 Reactor Heater	F-401 DSU-2	60.9	330.7 (19.4)	4.4
E257	Atmospheric Tower Heater	F-701	65.7[2]	81.0[2]	16.0[2]
E258	Outboard Flash Heater	F-702	157.7	81	23.6
E259	Vacuum Tower Heater	F-751	N/A[3]	N/A[3]	N/A[3]
Total			533.5	1063.8 (185.)	65.3

[1] F-101 (DSU-1) and F-108 emissions of SO_2 and PM_{10} were used in netting for a PSD permit in 2004. The project was not major for NOx so those emissions should be included in the BART study. Since the SO_2 and PM_{10} were considered as part of a PSD permit they are not BART eligible.

[2] Title V Significant Modification was recently completed and source will meet SOTA for these pollutants. Not BART eligible.

[3] Source to be removed by 12/31/2010 and replaced with a newly permitted heater meeting SOTA.

(Note – SO2 numbers in parentheses represent estimated new permit limits following CD requirement to comply with NSPS Subpart J)

Description of BART Eligible Sources

PFBW Hydrofiner Heater, F-101

The hydrofiner heater, F-101, was installed in 1969 and is BART eligible for all three pollutants. The heater was retrofitted with Callidus Ultra-Low NOx Burners in 1999. Its permitted capacity is 74 MMBtu/hr. The PTE for NOx emissions is 30.7 tpy based on a permitted emission limit of 7 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is already less than half of the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

The PTE for sulfur dioxide is 170.4 tpy and is based on a permit limit of 38.9 lb/hr. This limit derives from a 1974 Consent Order between Exxon and the NJDEP that allowed for fuel to be combusted which contained up to 0.5% sulfur in the heaters. The consent order was originally crafted when all refinery heaters were equipped to fire fuel oil. This Consent Order remains in effect although the refinery is prohibited from firing fuel oil by permit condition U3, OS Summary, Reference #64. The refinery is required under the most recent Consent Decree (Civil Action H-5-258, hereafter known as the "Consent Decree") to have all heaters comply with NSPS Subpart J by December 31, 2010. This requires combustion of fuel that does not exceed 162 ppm H_2S, a marked reduction from the current permit basis of 0.5% Sulfur. This will be accomplished when the Title V Permit is modified to incorporate this Consent Decree requirement the PTE for SO_2 which will result in a new estimated SO2 limit of 10.6 tpy.

The PTE for PM_{10} for this heater is 6.6 tpy based on an hourly emission limit of 1.5 lb/hr. This is equivalent to 0.02 gr/scf calculated at the capacity of the heater.

DSU-1 Gas Oil Heater, F-101

The DSU-1 Gas Oil Heater, F-101 was installed in 1969 and is BART eligible only for NOx. This is because its SO2 and PM10 emissions were considered as part of the Clean Fuels PSD permit and the emissions were included in the netting for that project. Sources that have undergone major permitting reviews since 1977 (e.g. PSD) are not subject to BART. However, this heater did not undergo a PSD review for NOx and therefore should be evaluated for BART for that pollutant. The heater was retrofitted with Callidus Ultra-Low NOx Burners in 1999. Its permitted capacity is 51 MMBtu/hr. The PTE for NOx emissions is 22.3 tpy based on a permitted emission limit of 5.1 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is already half of the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

Powerformer Reheat Heaters, F-102 – F-105

These four heaters have individual radiant section but share a common convection section and consequently exhaust from a common stack. They were installed in 1971 and are BART eligible for all three pollutants. The heaters were retrofitted with Callidus Ultra-Low NOx Burners in 1999. The heaters are permitted for a combined heat duty of 448 MMBtu/hr. Since the heaters emit from a common stack compliance is determined at the stack although individual emission limits exist for the separate heaters based on their heat duty.

The PTE for NOx emissions is 186 tpy based on a permitted emission limits totaling 42.5 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is already less than half of the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

The PTE for sulfur dioxide is 243.5 tpy and is based on a permit limit of 55.6 lb/hr. This limit derives from a 1974 Consent Order between Exxon and the NJDEP that allowed for fuel to be combusted which contained up to 0.5% sulfur in the heaters. The consent order was originally crafted when all refinery heaters were equipped to fire fuel oil. This Consent Order remains in effect although the refinery is prohibited from firing fuel oil by permit condition U3, OS Summary,

Reference #64. The refinery is required under the most recent Consent Decree (Civil Action H-5-258, hereafter known as the "Consent Decree") to have all heaters comply with NSPS Subpart J by December 31, 2010. This requires combustion of fuel that does not exceed 162 ppm H_2S, a marked reduction from the current permit basis of 0.5% Sulfur. This will be accomplished When the Title V Permit is modified to incorporate this Consent Decree requirement the PTE for SO_2 which will result in a new estimated SO2 limit of 64.4 tpy.

The PTE for PM_{10} for these heaters is 24.6 tpy based on an hourly emission limit of 5.6 lb/hr. This is equivalent to 0.02 gr/scf calculated at the capacity of the heater.

PFBW Regen Heater, F-106

The PFBW Regen Heater, F-106, was installed in 1971 and is BART eligible for all three pollutants. The heater was retrofitted with Callidus Ultra-Low NOx Burners in 1999. Its permitted capacity is 66 MMBtu/hr. The PTE for NOx emissions is 27.6 tpy based on a permitted emission limit of 6.3 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is already half of the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

The PTE for sulfur dioxide is 157.2 tpy and is based on a permit limit of 35.9 lb/hr. This limit derives from a 1974 Consent Order between Exxon and the NJDEP that allowed for fuel to be combusted which contained up to 0.5% sulfur in the heaters. The consent order was originally crafted when all refinery heaters were equipped to fire fuel oil. This Consent Order remains in effect although the refinery is prohibited from firing fuel oil by permit condition U3, OS Summary, Reference #64. The refinery is required under the most recent Consent Decree (Civil Action H-5-258, hereafter known as the "Consent Decree") to have all heaters comply with NSPS Subpart J by December 31, 2010. This requires combustion of fuel that does not exceed 162 ppm H_2S, a marked reduction from the current permit basis of 0.5% Sulfur. This will be accomplished When the Title V Permit is modified to incorporate this Consent Decree requirement the PTE for SO_2 which will result in a new estimated SO2 limit of 9.6 tpy.

The PTE for PM_{10} for this heater is 6.1 tpy based on an hourly emission limit of 1.4 lb/hr. This is equivalent to 0.02 gr/scf calculated at the capacity of the heater.

PFBW Reboiler Heater, F-108

The PFBW Reboiler Heater, F-108, was installed in 1971 and is BART eligible only for NOx. This is because its SO2 and PM10 emissions were considered as part of the Clean Fuels PSD permit and the emissions were included in the netting for that project. Sources that have undergone major permitting reviews since 1977 (e.g. PSD) are not subject to BART. However, this heater did not undergo a PSD review for NOx and therefore should be evaluated for BART for that pollutant. The heater was retrofitted with Callidus Ultra-Low NOx Burners in 1999. Its permitted capacity is 114 MMBtu/hr. The PTE for NOx emissions is 47.3 tpy based on a permitted emission limit of 10.8 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is already half of the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

DSU-2 Reactor Heater, F-401

The DSU-2 Reactor Heater, F-401 was installed in 1972 and is BART eligible for all three pollutants. The heater was retrofitted with Callidus Ultra-Low NOx Burners in 2000. Its permitted capacity is 139 MMBtu/hr. The PTE for NOx emissions is 60.9 tpy based on a permitted emission limit of 13.9 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is half of the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

The PTE for sulfur dioxide is 330.7 tpy and is based on a permit limit of 75.5 lb/hr. This limit derives from a 1974 Consent Order between Exxon and the NJDEP that allowed for fuel to be combusted which contained up to 0.5% sulfur in the heaters. The consent order was originally crafted when all refinery heaters were equipped to fire fuel oil. This Consent Order remains in effect although the refinery is prohibited from firing fuel oil by permit condition U3, OS Summary, Reference #64. The refinery is required under the most recent Consent Decree (Civil Action H-5-258, hereafter known as the "Consent Decree") to have all heaters comply with NSPS Subpart J by December 31, 2010. This requires combustion of fuel that does not exceed 162 ppm H_2S, a marked reduction from the current permit basis of 0.5% Sulfur. This will be accomplished When the Title V Permit is modified to incorporate this Consent Decree requirement the PTE for SO_2 which will result in a new estimated SO2 limit of 19.4 tpy.

The PTE for PM_{10} for this heater is 4.4 tpy based on an hourly emission limit of 1 lb/hr. This is equivalent to 0.006 gr/scf calculated at the capacity of the heater.

Pipestill Atmospheric Tower Heater, F-701

The Pipestill Atmospheric Tower Heater, F-701 was installed in 1970. This heater underwent a major permit review (significant modification) in 2004 and was reviewed at that time for SOTA applicability. Part of that project involved the installation of ULNB on the heater. A second major permit review was recently completed (again, a significant modification) due to a Consent Decree requirement to install SCR on this heater. Again, a SOTA review was completed. Since this heater has now undergone two major permitting efforts and was reviewed for PSD/NSR applicability and underwent Subchapter 18 analysis we believe this heater is no longer BART eligible.

Pipestill Vacuum Tower Heater, F-751

The Pipestill Vacuum Tower Heater, F-701 was installed in 1970. This heater underwent a major permit review (significant modification) in 2004 and was reviewed at that time for SOTA applicability. We believe that review should have made this heater no longer BART eligible. Nevertheless, this heater is due to be replaced with a new heater by December 31, 2010 and therefore will not require BART review.

Pipestill Outboard Flash Tower Heater, F-702

The Pipestill Outboard Flash Tower Heater, F-702 was installed in 1970 and is BART eligible for all three pollutants. The heater was retrofitted with John Zink designed Low NOx Burners in the 1990's. Its permitted capacity is 500 MMBtu/hr. The PTE for NOx emissions is 157.7 tpy based on a permitted emission limit of 36 lb/hr and operation at that emission rate for an entire year. This allowable emission rate (PTE) is significantly lower than the newly promulgated NOx RACT limit for Industrial, Commercial and Institutional (ICI) heaters and boilers (0.2 lb/MMBtu).

The PTE for sulfur dioxide is 81.0 tpy and is based on a permit limit of 18.5 lb/hr. This limit derives from a 1974 Consent Order between Exxon and the NJDEP that allowed for fuel to be combusted which contained up to 0.5% sulfur in the heaters. The consent order was originally crafted when all refinery heaters were equipped to fire fuel oil. This Consent Order remains in effect although the refinery is prohibited from firing fuel oil by permit condition U3, OS Summary, Reference #64. The refinery is required under the most recent Consent Decree (Civil Action H-5-258, hereafter known as the "Consent Decree") to have all heaters comply with NSPS Subpart J by December 31, 2010. This requires combustion of fuel that does not exceed 162 ppm H_2S, a marked reduction from the current permit basis of 0.5% Sulfur. This will be accomplished when the Title V Permit is modified to incorporate this Consent Decree requirement the PTE for SO_2.

The PTE for PM_{10} for this heater is 23.4 tpy based on an hourly emission limit of 5.35 lb/hr. This is equivalent to 0.01 gr/scf calculated at the capacity of the heater.

Determination of BART

EPA allows states to use MACT standards to help assess potential limits and controls for BART eligible sources. There is no MACT standard for Heaters and Boilers. A Heater and Boiler MACT standard was promulgated in 2006 but that rule did not address any of the BART pollutants and the rule was vacated in 2008.

A review of other rules and sources of information can be instructive and helpful in determining BART. New Jersey publishes and maintains a State of the Art Manual that describes controls and emission limits for new and reconstructed sources. The SOTA manual for refineries has a section specific to heaters. The SOTA limit for NOx for new heaters is 0.05 lb/MMBtu. If you are replacing burners in a heater the SOTA limit is 0.07 lb/MMBtu.

The RACT/BACT/LAER Clearinghouse (RBLC) was also queried regarding limits imposed on new sources. It must be noted first that the RBLC contains limits primarily for new sources which is not consistent with the "retrofit" nature of BART. Second, the RBLC data queried was almost exclusively not verified. That is, these were the limits established in a permit. There is no record that those limits were achieved in practice. Finally, BART is concerned with retrofit "technology" more than emission limits themselves so it is important to note the technology listed under the RBLC. Most of the RBLC entries represent Best Available Control Technology (BACT) which by their very nature would seem to be equivalent or more stringent that BART.

<u>Top Down Analysis for NOx</u>

Several techniques are available to reduce NOx emissions. Selective Catalytic Reduction (SCR) is generally accepted as the most effective control for NOx emissions. SCR relies on a reaction between ammonia and nitrogen oxides to form nitrogen and water. The use of a catalyst makes this reaction relatively fast at temperatures in the 500 degree range. The technique is relatively costly, takes up valuable real estate and suffers from unreacted ammonia emissions (ammonia slip). Of these the most problematic is cost and therefore is it typically only used for new sources. New Jersey's "State of the Art" manual for refinery heaters does contain limits for NOx that would not require the installation of SCR. The limits are easily achievable using ULNB. Thus, one could say that New Jersey considers ULNB to be "State of the Art".

A review of the RBLC yielded 30+ **new** heaters that have been permitted within the past 10 years. Only one of these 30+ heaters has SCR listed as the control device and it was noted that it was **voluntarily** installed. The vast majority of the heaters were using ULNB as the means of control with three control devices listed as Low NOx Burners and 3 where no control was listed. Permitted emissions ranged from 0.033 lb/MMBtu to 0.6 lb/MMBtu. The latter number was from the Kenai Peninsula in Alaska and should not be considered representative. Nearly all of the sources listed represented BACT and the average emission limit was ~0.045 lb/MMBtu, easily achievable with ULNB.

We believe that although SCR is an effective control technique, it is not reasonable for a retrofit application. It does not show once in the RBLC as required to meet BACT. If BACT is something less than SCR then BART should be as well. A variation on SCR is Selective Non-Catalytic Reduction, or SNCR. It should be mentioned for the sake of completeness. This technique involves spraying ammonia directly into a flue gas stream and relying on the same reaction to take place as in SCR. This technique suffers from the fact that high temperatures are required for the reaction to take place in the absence of catalyst. While these temperatures sometimes are found in heaters the temperature zone where SNCR is successful tends to move as the heater is turned down from maximum firing to other operating levels. Most industrial heaters operate at a wide range of firing rates which makes SNCR an unacceptable choice for NOx control. SNCR was not listed once in the RBLC as a control technique for NOx nor are we aware of any use of SNCR specifically on refinery heaters.

We believe it is clear that ULNB represents BART and that technologies that are slightly less effective should also be considered; specifically any generation of LNB installed to reduce NOx emissions.

Top Down Analysis for SO_2

Sulfur dioxide is produced form the combustion in a heater of fuel containing hydrogen sulfide, H_2S. The hydrogen sulfide is produced from sulfur in the incoming crude oil during various refinery processing steps. It is removed from products and generally ends up if the gases that are burned as fuel in process heaters. Two means of dealing with sulfur dioxide emissions are well known. The first involves removing hydrogen sulfide from the fuel gas using an amine based (typically) absorbing solution. Such systems are capable of removing large amounts of H_2S lowering the concentration in fuel gas from 1%-2% down to <10 ppm levels in some cases. The process is very capital intensive. However, nearly all of a refinery's sour fuel gas can be treated in a few amine treaters and distributed to dozens of furnaces. When smaller amounts of H_2S must be removed a caustic contacting solution is sometimes used to treat the fuel gas.

Another method sometimes used to reduce SO_2 emissions is to install a caustic scrubber and treat the flue gas from a source, removing the SO_2 that has been creating during combustion. While effective in reducing SO_2 emissions it is not cost effective since it has to be applied to each source of SO_2. Caustic scrubbing is most often used on a single large source of SO_2 such as a large utility boiler burning coal or an FCCU at a refinery.

SO_2 scrubbing should not be considered BART when multiple small sources of SO_2 are involved. It is cost prohibitive. Amine scrubbing is equally effective as caustic scrubbing and could be considered in a BART analysis.

New Jersey does not address SO2 emissions from refinery heaters in its SOTA manual. A review of the RBLC indicates that there is no control equipment required for any of the sources listed. In fact, the database indicates that that no controls were feasible for these sources. The permit requirements range from 25 ppm (2 sources) to 160 ppm (~20 sources) and it is inferred that amine treating is used in order to achieve these levels. In addition, all of these permits considered these limits to represent BACT. As mentioned previously, we believe that Best Available Retrofit Technology" should not be more stringent than "Best Available Control Technology".

We believe that refinery fuel gas treated to meet New Source Performance Standards should represent BART.

Top Down Analysis for PM_{10}

There are two main methods for reducing PM_{10} emissions from heaters. Similar to sulfur dioxide, particulates can be scrubbed from individual heater stacks. This is exceedingly expensive and not cost effective. They would also have to be constructed on each of the BART eligible sources. There are no known refinery heaters that have employed scrubbing as a means of reducing PM_{10} emissions.

New Jersey does not address PM_{10} emissions from refinery heaters in its SOTA Manual. A review of the RBLC reveals that the only means of PM10 emission control specified in the permits for every heater listed in the query was "Good Combustion Practices" or Proper Design, Operation and Good Engineering Practices". Proper, efficient combustion will minimize PM_{10} emissions. If NEW heaters are employing these practices and they have been determined to represent BACT then BART should not be considered to be more stringent.

We believe that "Good Combustion Practices" and "Proper Design, Operation and Good Engineering Practices" represent BART for PM_{10}.

Demonstration That Existing and Planned Controls Represent BART for Bayway Refinery BART Eligible Sources.

All of the sources that are BART eligible are process heaters. We believe that BART requirements will be identical for each source and therefore we will present the determination once, rather than repeating it for each heater.

Based on the top-down analysis presented above we believe that the existing Ultra Low NOx Burners (ULNB) on the BART eligible heaters represent BART controls. Although the Pipestill Outboard Flash Tower, F-702 has older Low NOx Burners (LNB) the PTE for this furnace is lower than all other BART eligible heaters on a lb/MMBtu basis.

The top down analysis of controls for SO_2 indicates that burning NSPS compliant fuel gas represents BART for all refinery heaters. In every case reviewed in the RACT/BACT/LAER Clearinghouse it was shown that burning NSPS compliant gas represented BACT for new sources. It is our position that Best Available Retrofit Technology should not be more stringent than Best Available Control Technology.

Our review indicates that BART for process heaters should be good combustion practices. Review of the New Jersey SOTA manual and the RBLC indicate that no additional controls are required. Good combustion practices represent BACT in each and every case of the permitted sources reviewed in the RBLC. It is our position that Best Available Retrofit Technology should not be more stringent than Best Available Control Technology. It is particularly true in this case since no permits were shown to require any additional controls.

Other Comments

It should be noted that the Consent Decree mentioned in the text of this review requires that at least 30% of the refinery heaters be “controlled” as defined in the Decree. That means they must be designed to emit no more than 0.04 lb/MMBtu NOx at test stand conditions (no air preheat). All heaters at Bayway have ULNB meeting this requirement with the exception of the LNB installed on F-702.

In addition, the Department has indicated that it will be issuing a Refinery RACT rule in the future. This rule is targeting NOx emissions from heaters as one of its initiatives. We believe that this rule will also represent acceptable BART controls and that we will comply with those limits.

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PSEG
Services Corporation

VIA E-MAIL and FEDERAL EXPRESS

July 15, 2009

Mr. Yogesh Doshi
Section Chief, Bureau of Operating Permits
Division of Air Quality
New Jersey Department of Environmental Protection
401 East State St. – 2nd Floor
Trenton, NJ 08625

Reference: PSEG Fossil LLC
Hudson Generating Station
Program Interest No. 12202
Preliminary Best Available Retrofit Technology (BART) Control Plan

Dear Mr. Doshi:

PSEG Fossil LLC ("PSEG Fossil" or "the Company") is submitting a preliminary Best Available Retrofit Technology ("BART") control plan for its Hudson Generating Station ("Hudson" or "the facility") in response to a March 3, 2009 letter from Mr. William O'Sullivan, P.E. of the New Jersey Department of Environmental Protection ("NJDEP" or "the Department") to Mr. Daniel Cunningham of PSEG as well as recent correspondence with Mr. Max Friedman of your staff. Please note that this letter contains PSEG Fossil's preliminary BART control plan and PSEG Fossil will be submitting a formal BART control plan within the next few weeks. This was acceptable to NJDEP as noted during a July 9th phone conversation between Mr. Max Friedman of your staff and myself.

BACKGROUND

One of the most common forms of air pollution - haze - degrades visibility in many American cities and scenic areas. Haze is caused when sunlight encounters tiny pollution particles in the air, which reduce the clarity and color of what we see, particularly during humid conditions.

The haze-forming pollution comes from a variety of natural and manmade sources. Natural sources can include windblown dust, and soot from wildfires. Manmade sources can include motor vehicles, electric utility and industrial fuel burning, and manufacturing operations. Particulate matter pollution is the major cause of reduced visibility (haze) in parts of the United States, including many of our national parks. Some haze-causing particles are directly emitted to

the air. Others are formed when gases emitted to the air form particles as they are carried many miles from their source.

The Clean Air Act of 1990 (Title I, Sections 169A and 169B) declared it a national goal to prevent any future, and to remedy any existing, impairment of visibility in 156 mandatory federal Class I areas, the impairment of which results from manmade air pollution. New Jersey's only federal Class I area is the Brigantine Wilderness Area of the Edwin B. Forsythe National Wildlife Refuge located near Brigantine, Atlantic County. In response to increased adverse visibility impacts at federal Class I "pristine" air quality areas due to existing major sources, the U.S. Environmental Protection Agency (EPA) promulgated the BART rules in 1999.

Revisions to the regional haze rules were promulgated on July 6, 2005 and October 13, 2006. These regulations require states to establish goals for improving visibility by developing long-term strategies for reducing emissions of air pollutants that cause visibility impairment. The overall goal of the regional haze regulations is to achieve natural background visibility conditions in all Class I areas by the year 2064.

To avoid confusion with other Clean Air Act requirements which also use the term "major stationary source" to refer to a somewhat different population of sources, the regional haze rule uses the term "BART-eligible source" to describe these sources. The BART-eligible sources are sources that meet the following criteria:

1) Major stationary sources that contain emission units whose operations fall within one or more of 26 specifically listed source categories;
2) Emission units that were put in place between August 7, 1962 and August 7, 1977; and
3) Major stationary sources with a combined potential to emit 250 tons per year ("tons/yr") or more of a visibility-impairing pollutant ("VIP"), namely nitrogen oxides ("NO_x"), particulate matter less than 10 microns ("PM_{10}") or sulfur dioxide ("SO_2"), from qualified emission units. Qualified emission units are defined as emission units that meet the criteria of #2 above with cumulative potential to emit SO_2, NO_x, or PM_{10} are greater than 40 tons/yr, 40 tons/yr, or 15 tons/yr, respectively.

BART-eligible sources may be required to apply emissions control technology to reduce emissions of VIPs, if such emissions are demonstrated to cause an adverse visibility impact at the nearest Class I areas. The major recommendations for BART visibility impact modeling and application of emissions controls are:

1) Identify BART-eligible sources (based on date of operation, potential emissions of VIPs and facility source category)
2) Identify which pollutants have greater than EPA-suggested *de minimis* emissions levels
3) Identify sources that are subject to BART
4) Identify baseline visibility impact of each BART source
5) Identify feasible controls and emission changes
6) Identify the change in visibility impact for each candidate BART control

option

7) Compare the visibility improvement of BART control options to other statutory factors in the engineering analysis

HUDSON GENERATING STATION

Hudson is considered BART-eligible because it meets the above criteria. Hudson is a fossil fuel-fired electric generating station located at Duffield and Van Keuren Avenues in Jersey City, Hudson County, New Jersey. Currently, there are two (2) electric generating units ("EGUs") at the facility: Hudson Unit No. 1 and Hudson Unit No. 2. Additional equipment at the facility supports the operation of Hudson Units No. 1 and 2.

Hudson is subject to the Title V Operating Permit Rule (N.J.A.C. 7:27-22). The Department issued the initial Hudson Title V Operating Permit on December 29, 2005. The most recently approved Title V permit modification for Hudson was issued by the Department on May 27, 2008 (BOP080001).

The emission sources at Hudson that were installed between August 7, 1962 and August 7, 1977 with their current potential to emit are included in the following table.

Table 1. Current Potential to Emit NO_x, SO_2, and PM_{10} from Sources Installed Between August 7, 1962 and August 7, 1977

Emission Unit	Emissions (tons/yr)[1]		
	NO_x	SO_2	PM_{10}
Unit No. 1	8,360	6,389	995[2]
Unit No. 2	3,486[3]	5,270[3]	5,122[2]
Coal Receiving System	--	--	2.7
Coal Reclaim System	--	--	1.2

(1) Emission limits from the facility's Title V permit No. BOP080001 unless otherwise noted.
(2) PM_{10} emission rates proposed by PSEG Fossil in 12/2/2008 Title V modification application, based on stack testing.
(3) The NO_x and SO_2 emission caps are from the Consent Decree, and are in effect for calendar years 2008 through 2010.

The emission units in Table 1 above are subject to BART, and PSEG Fossil's preliminary BART control plan for these units is addressed below.

In NJDEP's November 1, 2006 letter to Mr. Francis X. Sullivan of PSEG, the Department stated that the facility's emergency fire pump (Emission Unit U7, Equipment E14 in Hudson's Title V permit) was BART-eligible. The facility's emergency fire pump is a pump supplied with mechanical power by a stationary internal combustion engine used to maintain water pressure or flow for fire fighting at the facility. The emergency fire pump was originally installed in 1963. However, PSEG Fossil's records indicate that the emergency fire pump's emission source, the

stationary internal combustion engine, was replaced in the 1985-1986 timeframe, which is outside the August 7, 1962 through August 7, 1977 period for BART-eligibility. Therefore, the emergency fire pump is not subject to BART.

HUDSON UNIT NO. 1

Hudson Unit No. 1 (Emission Unit U1, Equipment E1 in Hudson's Title V permit) is a cyclone-fired steam electric generating unit with an electric generating capacity of approximately 420 megawatts ("MW"). Hudson Unit No. 1 was manufactured by Babcock and Wilcox, and is permitted to burn either natural gas or No. 6 fuel oil. Hudson Unit No. 1 began commercial operation on December 10, 1964. Hudson Unit No. 1 is equipped with with Continuous Emissions Monitoring Systems ("CEMS") for NO_x, SO_2, and carbon monoxide ("CO"), as well as a Continuous Opacity Monitoring System ("COMS") for opacity.

Please note that although NJDEP's November 1, 2006 letter to Mr. Francis X. Sullivan of PSEG references water injection, the facility does not utilize this control device to comply with its NOx emissions.

The currently permitted NO_x, SO_2, and PM_{10} emission rates for Hudson Unit No. 1, expressed in pounds per million British thermal unit ("lb/MMBtu"), are summarized in Table 2 below:

Table 2. Current Hudson Unit No. 1 Permitted NO_x, SO_2, and PM_{10} Emission Rates

Fuel	Emissions (lb/MMBtu)		
	NO_x	**SO_2**	**PM_{10}**
Natural Gas	0.39	0.0017	0.022(1)
No. 6 Fuel Oil	0.43	0.32	0.050(1)

(1) PM_{10} emission rate proposed by PSEG Fossil in 12/2/2008 Title V modification application, based on stack testing.

HUDSON UNIT NO. 1 BART

In September 2004, PSEG Fossil advised PJM[1] that it intended to retire Hudson Unit No. 1 because the Company was unable to continue operating it economically. PJM subsequently determined, however, that Hudson Unit No. 1 was needed by PJM for reliability purposes. In April 2005, Hudson Unit No. 1 became one of the first units located within the PJM footprint to be designated as a Reliability Must Run ("RMR") unit by PJM. Hence, Hudson Unit No. 1 continues to remain in service to maintain electrical system reliability.

As an RMR unit, Hudson Unit No. 1 operates relatively infrequently and well below its annual operating capacity. Also, operational problems have prevented the unit from burning No. 6 fuel oil since 2005, so in recent years the unit has burned only natural gas, which has inherently lower

[1] PJM refers to the Pennsylvania-New Jersey-Maryland Interconnection, a regional transmission organization that manages the competitive wholesale electricity market in New Jersey, twelve other states, and the District of Columbia.

NO_x, SO_2, and PM_{10} emissions than No. 6 oil firing. The limited amount of operation on almost exclusively natural gas is reflected in Table 3 below, which summarizes the potential and actual emissions of NO_x, SO_2, and PM_{10} for Hudson Unit No. 1, and compares the unit's actual fuel use to its potential fuel use.

Table 3. Hudson Unit No. 1 Potential and Actual Emissions and Fuel Use

	Emissions (tons/yr)			Fuel Use (MMBtu/yr)	Fuel-Based Capacity Factor (%)
	NO_x	**SO_2**	**PM_{10}**		
	Potential				
	8,360	6,389	995[(1)]	39,930,000	100%
Year	*Actual*				
2004	177.74	45.06	9.75	927,489	2.3%
2005	196.37	6.06	6.32	1,695,213	4.2%
2006	58.52	2.24	1.98	532,758	1.3%
2007	51.77	2.12	1.86	499,321	1.3%
2008	34.20	1.33	3.15	344,013	0.9%

(1) PM_{10} emission rate proposed by PSEG Fossil in 12/2/2008 Title V modification application, based on stack testing.

Table 3 illustrates that Hudson Unit No. 1 has operated well below its potential capacity, both from an emissions and a fuel use standpoint. From calendar years 2004 through 2008, Hudson Unit No. 1's fuel-based annual capacity factor ranged from a high of 4.2% in 2005 to a low of 0.9% in 2008. NO_x emissions ranged from a high of 196.37 tons/yr in 2005 to a low of 34.2 tons/yr in 2008. SO_2 emissions ranged from a high of 45.06 tons/yr in 2004 to a low of only 1.33 tons/yr in 2008, with all but 2004 SO_2 emissions less than 10 tons/yr. PM_{10} emissions ranged from a high of 9.75 tons/yr in 2004 to a low of only 1.86 tons/yr in 2007.

The low actual annual NO_x, SO_2, and PM_{10} emission rates and utilization rates for Hudson Unit No. 1, combined with its marginal economic viability and short remaining useful life, as indicated by its RMR status, make it extremely cost-prohibitive to equip this unit with any add-on NO_x, SO_2, and PM_{10} emission controls.

PSEG Fossil proposes the existing configuration of the unit, with primary operation on natural gas when burning No. 6 fuel oil as BART for this source.

HUDSON UNIT NO. 2

Hudson Unit No. 2 (Emission Unit U2, Equipment E2 in Hudson's Title V permit) is a dry-bottom, wall-fired steam electric generating unit with an electric generating capacity of approximately 640 MW. The unit was manufactured by Foster-Wheeler, and is capable of burning either pulverized coal, natural gas, or a combination of coal and natural gas. Hudson Unit No. 2 is also permitted to burn No. 6 fuel oil. Hudson Unit No. 2 began commercial operation on December 18, 1968. Hudson Unit No. 2 is equipped with CEMS for NO_x, SO_2, CO, and mercury ("Hg"), as well as a COMS for opacity. Hudson Unit No. 2 is also required to be equipped with a particulate matter ("PM") CEMS by December 31, 2010.

For NO_x emission control, Hudson Unit No. 2 is currently equipped with Low-NO_x Burners ("LNB") and Selective Non-Catalytic Reduction ("SNCR"). LNB use modified air and fuel entry to slow mixing rates, reduce the oxygen ("O_2") available for NO_x formation, and reduce the amount of fuel burned at peak flame temperatures. Low NO_x burners operate at much lower O_2 levels than conventional burners, and therefore generate less fuel and thermal NO_x. SNCR involves injecting urea into the furnace exhaust gases. The basic chemical reaction involves the decomposition of urea and the reaction of nitric oxide ("NO") with NH_2 to form mostly elemental nitrogen ("N_2"), carbon dioxide ("CO_2"), and water ("H_2O").

Please note that although NJDEP's November 1, 2006 letter to Mr. Francis X. Sullivan of PSEG references flue gas recirculation, the facility no longer employs this control device and it has been removed from the facility's Title V permit.

For SO_2 emission control, on January 1, 2007, the Company began burning Ultra-Low Sulfur Coal ("ULSC") in Hudson Unit No. 2, as required under the terms of a Consent Decree[2]. "Ultra-Low Sulfur Coal" is defined in the Consent Decree as sub-bituminous coal obtained by PSEG Fossil with a sulfur content of no greater than 0.25%, a nitrogen content of no greater than 1% and an ash content no greater than 2.5%, all as determined on a quarterly basis from fuel analysis data for each barge of coal delivered to the station during that quarter. The 0.25% sulfur content limit is 75% lower than the 1% sulfur content limit in effect for Hudson Unit No. 2 prior to January 1, 2007.

Since May 1, 2007, the Company has burned only ULSC in Hudson Unit No. 2. Under the Consent Decree, PSEG Fossil must continue burning 100% ULSC in Hudson Unit No. 2 until the Company either shuts down Hudson Unit No. 2 or operates a Flue Gas Desulfurization ("FGD") system on the unit for SO_2 emission control.

For PM_{10} emission control, Hudson Unit No. 2 is equipped with electrostatic precipitators ("ESPs"). The electrostatic precipitation process involves: 1) charging particles by means of ions produced in a corona discharge (an electrical discharge accompanied by ionization of the exhaust gas), 2) separating the charged particles from the gas stream in an imposed electric field, 3) collecting the particles on a grounded surface, and 4) removing the collected particles from the grounded surface and consolidating them for disposition.

NO_x emissions are also reduced by combusting ULSC which, with its lower nitrogen content than traditional bituminous coals, tends to reduce the formation of NO_x during combustion. PM_{10} emissions may also be reduced by combusting ULSC because of its lower ash content than traditional bituminous coals.

The current NO_x, SO_2, and PM_{10} emission rates for Hudson Unit No. 2, expressed in lb/MMBtu, are summarized in Table 4 below:

[2] United States of America, State of New Jersey v. PSEG Fossil LLC, Civil Action No. 02CV340 (JCL), as amended.

Table 4. Current Hudson Unit No. 2 Permitted NO_x, SO_2, and PM_{10} Emission Rates

Fuel	Emissions (lb/MMBtu)		
	NO_x	SO_2	PM_{10}
Any Coal	0.259[(1)]	0.216[(2)]	0.206[(3)]
Natural Gas	0.49	0.0005	0.0045
No. 6 Fuel Oil	0.6	0.314	0.031

(1) Interim 30-day rolling average NO_x emission rate proposed by PSEG Fossil in a 1/15/2009 submittal to NJDEP, based on actual NO_x emissions performance with new LNB burning ULSC. If approved, this interim limit would remain in effect until SCR operation.

(2) Interim 30-day rolling average SO_2 emission rate in effect until FGD operation. An alternative interim SO_2 emission rate of 0.310 lb/MMBtu would apply if a *force majeure* event prevents PSEG Fossil from procuring ULSC from the current supplier.

(3) PM_{10} emission rate proposed by PSEG Fossil in 12/2/2008 Title V modification application, based on stack testing.

Table 5 below summarizes the potential and actual emissions of NO_x, SO_2, and PM_{10} for Hudson Unit No. 2, and compares the unit's actual fuel use to its potential fuel use.

Table 5. Hudson Unit No. 2 Potential and Actual Emissions and Fuel Use

	Emissions (tons/yr)			Fuel Use (MMBtu)	Fuel-Based Capacity Factor (%)
	NO_x	SO_2	PM_{10}		
	Potential				
	3,486[(1)]	5,270[(1)]	5,122[(2)]	49,630,000	100%
Year	*Actual*				
2004	8,061	21,467	2,928	36,631,793	74%
2005	8,582	23,960	3,189	40,299,670	81%
2006	7,401	19,707	1,491	35,844,495	72%
2007	3,322	4,339	2,055	32,338,221	65%
2008	2,945	2,177	2,099	25,256,106	51%

(1) The NO_x and SO_2 emission caps are from the Consent Decree, and are in effect for calendar years 2008 through 2010.

(2) PM_{10} emission rate proposed by PSEG Fossil in 12/2/2008 Title V modification application, based on stack testing.

Table 5 illustrates that compared to Hudson Unit No. 1, Hudson Unit No. 2 has operated much closer to its potential capacity, both from an emissions and a fuel use standpoint. From calendar years 2004 through 2008, Hudson Unit No. 2's fuel-based annual capacity factor ranged from a high of 81% in 2005 to a low of 51% in 2008. NO_x emissions ranged from a high of 8,582 tons/yr in 2005 to a low of 2,945 tons/yr in 2008. SO_2 emissions ranged from a high of 23,960 tons/yr in 2005 to a low of 2,177 tons/yr in 2008. PM_{10} emissions ranged from a high of 3,189 tons/yr in 2005 to a low of 2,055 tons/yr in 2007. The substantial reductions in actual NO_x and SO_2 emissions in 2007 and 2008 reflect the Consent Decree-required burning of ULSC in Hudson Unit No. 2 beginning in 2007, as well as the installation of new LNB in 2008.

Hudson Unit No. 2's higher annual utilization and emissions makes it a more appropriate candidate for investment in the installation of back-end NO_x, SO_2, and PM_{10} emission control technologies than Hudson Unit No. 1.

HUDSON UNIT NO. 2 BART

NO_x

The most advanced NO_x emission control technology for coal-fired boilers like Hudson Unit No. 2 is Selective Catalytic Reduction ("SCR"). SCR is a proven technology used on hundreds of NO_x emission sources in the United States and abroad. SCR uses ammonia ("NH_3") to react with NO_x in the exhaust gas over a catalyst. NO_x from fuel combustion processes is typically found in the form of NO or nitrogen dioxide ("NO_2"). The general chemical reaction for the reduction of NO is:

$$4\ NO + 4\ NH_3 + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$

For the reduction of NO_2, the reactions are:

$$6\ NO_2 + 8\ NH_3 \rightarrow 7N_2 + 12\ H_2O$$

$$2\ NO_2 + 4\ NH_3 + O_2 \rightarrow 3\ N_2 + 6\ H_2O$$

These reactions occur within a relatively narrow flue gas temperature window. At temperatures below approximately 550 ^oF, the NO_x reduction reactions become less efficient. At temperatures above approximately 850 ^oF, the catalyst is progressively destroyed.

Under the terms of the Consent Decree, Hudson Unit No. 2 must be equipped with SCR by December 31, 2010. The SCR being installed on Hudson Unit No. 2 is a conventional "high dust"/"hot side" unit typical of the SCRs installed on utility boilers in the United States. A "high dust"/"hot side" SCR is installed prior to any particulate control devices (e.g. ESPs) at a location in the flue gas stream where temperatures are suitable for proper operation without the need for flue gas reheating. The Hudson Unit No. 2 SCR will inject aqueous ammonia into the flue gas stream by means of an injection grid installed between the economizer and air heater sections of the boiler. Static mixers will be installed to achieve uniform velocity distribution and mixing of NO_x and ammonia before the flue gas enters the catalyst.

With SCR, the maximum NO_x emission rates prescribed for Hudson Unit No. 2 in the Consent Decree are:

- 0.150 lb/MMBtu (24-hour average)
- 0.100 lb/MMBtu (30-day rolling average)

With SCR operation, potential annual NO_x emissions from Hudson Unit No. 2 in calendar year 2011 and beyond are expected to be even lower than the 3,486 tons/yr NO_x emission cap that applies in calendar years 2008 through 2010. For example, if Hudson Unit No. 2 burned all

4.963E13 Btu of its permitted fuel emitting at the above 30-day rolling average NO_x emission rate of 0.100 lb/MMBtu, its potential to emit would be 2,481.5 tons/yr.

PSEG Fossil proposes the existing configuration of the unit with LNB and SNCR as well as the planned future SCR as BART for this source.

SO_2

The advanced SO_2 emission control technology PSEG Fossil is installing on Hudson Unit No. 2 is an FGD system that utilizes a Spray Dryer Absorber ("SDA") in which an atomized lime slurry is injection into the flue gas. The lime slurry will then react with sulfur oxides ("SO_x") to form calcium sulfate ("$CaSO_4$") and calcium sulfite ("$CaSO_3$") in the flue gas stream. The FGD will treat the flue gas downstream of the existing ESPs.

The FGD will use pebble lime ("CaO") as a reagent. Pebble lime will be delivered to Hudson by truck. Upon delivery, the pebble lime will be pneumatically conveyed to lime storage silos and/or to lime storage day bins, as needed. From the storage silos or day bins, the pebble lime will be pneumatically conveyed to vertical ball mills, where the pebble lime will be crushed to a fine powder. From the ball mills, the crushed pebble lime will be conveyed to lime slakers, where water will be added to form calcium hydroxide ("$Ca(OH)_2$"). The slaked lime will be transferred to lime slurry storage tanks via transfer pumps. Feed pumps will then transfer the lime slurry from the lime slurry storage tanks to atomizing injectors located in the flue gas stream. The lime slurry will then react with SO_2 in the flue gas stream as follows:

$$Ca(OH)_2 + SO_2 \rightarrow CaSO_3 \bullet ½(H_2O) + ½(H_2O)$$

$$CaSO3 \bullet ½(H_2O) + ½\ O_2 \rightarrow CaSO_4 \bullet ½(H_2O)$$

$$Ca(OH)_2 + SO_3 \rightarrow CaSO_4 \bullet 1/2(H_2O) + ½(\ H_2O)$$

As these reactions occur, the lime slurry water will evaporate, leaving a dry power. The reactions products, unreacted reagent, and fly ash will be captured downstream of the FGD by the baghouse described below.

The FGD will utilize a recycle system to optimize reagent utilization. The recycle system will include a removal, transport, and storage system to recycle particulates collected in the SDA and baghouse hoppers. Recycled material will be re-injected into the lime slurry process stream.

Particulates collected in the baghouse hoppers will be transported to recycle storage bins using a vacuum-type pneumatic conveying system. Recycle material from the recycle storage bins will be metered into recycle mix tanks using recycle feeders. Particulates collected at the bottom of the SDA vessel will be conveyed to the recycle mix tanks using drag chain conveyers. Delumpers will be provided to break up oversized particulates that are collected in the SDA vessel and prevent them from entering the recycle mix tanks. Slurry transfer pumps will transfer recycled slurry from the recycle mix tanks to the lime slurry storage tanks.

Under the terms of the Consent Decree, Hudson Unit No. 2 must be equipped with an FGD system by December 31, 2010. With FGD, the maximum SO_2 emission rates prescribed for Hudson Unit No. 2 in the Consent Decree are:

- 0.250 lb/MMBtu (24-hour average)
- 0.150 lb/MMBtu (30-day rolling average)

With FGD operation, potential annual SO_2 emissions from Hudson Unit No. 2 in calendar year 2011 and beyond are expected to be even lower than the 5,270 tons/yr SO_2 emission cap that applies in calendar years 2008 through 2010. For example, if Hudson Unit No. 2 burned all 4.963E13 Btu of its permitted fuel emitting at the above 30-day rolling average SO_2 emission rate of 0.150 lb/MMBtu, its potential to emit would be 3,722.25 tons/yr.

PSEG Fossil proposes the existing configuration of the unit with the burning of ULSC as well as the planned future FGD as BART for this source.

PM_{10}

The most advanced technology for particulate matter ("PM") emission control on a coal-fired boiler like Hudson Unit No. 2 is a full-size pulse-jet baghouse. Pulse-jet baghouses are proven technology, used on hundreds of PM emission sources in the United States and abroad. Pulse-jet baghouses collect PM generated by both coal combustion (i.e., fly ash) and FGD operation ($CaSO_4$ and $CaSO_3$).

The flue gas from Hudson Unit No. 2 will exit the FGD and enter the baghouse inlet plenum. The flue gas will be distributed into individual compartments, which can be isolated for maintenance or inspection while the unit is still on-line. Filter bags will be located in each compartment. The filter bags will be hung from the top of the compartment and supported by a cage. Some heavy particulates will fall out into the compartment hoppers simply due to the effects of gravity. The remaining particles will be captured on the filter bag surfaces. A "cake" will eventually build up on the filter bag surfaces, and the pressure drop across the bags will increase. At a pre-set point, the bags will be cleaned from the inside-out using low-pressure air (i.e. a "pulse-jet") to blow the particulates off the bags for collection in the hoppers.

Bypass dampers will be installed to allow the flue gas exiting the FGD to bypass the baghouse during periods of unit startup and shutdown, as well as when Hudson Unit No. 2 is combusting only natural gas. The flue gas exiting the bypass dampers will be directed to the existing Hudson Unit No. 2 stack. When Hudson Unit No. 2 is combusting coal or No. 6 fuel oil and operating under normal conditions, the bypass dampers will not be utilized and the flue gas will be treated by the baghouse.

Under the terms of a Consent Decree, Hudson Unit No. 2 must be equipped with a baghouse for PM emission control by December 31, 2010. The Consent Decree also requires that Hudson Unit No. 2 be equipped with a PM CEMS by December 31, 2010. With the baghouse, the maximum PM emission rate prescribed for Hudson Unit No. 2 in the Consent Decree is:

- 0.0150 lb/MMBtu[3]

PSEG Fossil proposes the existing configuration of the unit with the ESP as well as the planned future baghouse as BART for this source.

COAL RECEIVING SYSTEM

The Coal Receiving System (Emission Unit U15, Equipment E22 in Hudson's Title V permit) is the materials handling equipment associated with accepting deliveries of the coal burned in Hudson Unit No. 2, through to storage of the coal on the coal pile.

The coal for Hudson Unit No. 2 is delivered to the facility by barge. The Coal Receiving System includes Barge Unloading, Coal Conveyors, the Conveyor Tower, the Transfer Tower, and the Coal Pile.

There are no SO_2 or NO_x emissions associated with the Coal Receiving System. The Coal Receiving System's potential to emit PM_{10} is 2.7 tons/yr.

COAL RECEIVING SYSTEM BART

Given that PM_{10} emissions are minimal from this equipment, and the emissions from this equipment do not tend to travel over long distances that may affect visibility in Federal Class I areas[4], PSEG Fossil proposes the existing configuration of the unit as BART for this source.

COAL RECLAIM SYSTEM

The Coal Reclaim System (Emission Unit U16, Equipment E23 in Hudson's Title V permit) is the materials handling equipment associated with transferring coal for Hudson Unit No. 2 from the coal pile to the unit itself.

The Coal Reclaim System includes Coal Conveyors, the Breaker House, Feeders, Silos, and Pulverizers.

There are no SO_2 or NO_x emissions associated with the Coal Receiving System. The Coal Reclaim System's potential to emit PM_{10} is 1.2 tons/yr.

COAL RECLAIM SYSTEM BART

Given that PM_{10} emissions are minimal from this equipment, and the emissions from this equipment do not tend to travel over long distances that may affect visibility in Federal Class I areas, PSEG Fossil proposes the existing configuration of the unit as BART for this source.

[3] PM emission rate is defined in the Consent Decree as the average number of pounds of PM emitted per million Btu of heat input, as measured in annual stack tests, in accordance with the reference methods set forth in 40 C.F.R. Part 60, Appendix A, Method 5.

[4] The nearest federal Class I area, the Edwin B. Forsythe National Wildlife Refuge located near Brigantine, Atlantic County, New Jersey, is located approximately 105 kilometers (65 miles) southeast of Hudson.

SUMMARY

PSEG Fossil's proposed BART control plan for Hudson is summarized in Table 6 below:

TABLE 6. SUMMARY OF PROPOSED BART

Emission Unit	BART Proposal	NO_x	SO_2	PM_{10}
Unit No. 1	Action	None	None	None
	Emission Rates	Retain Current Levels (LNB, SNCR)	Retain Current Levels	Retain Current Levels
Unit No. 2	Action	Install SCR by 12/31/2010	Install FGD by 12/31/2010	Install Baghouse by 12/31/2010
	Emission Rates	0.150 lb/MMBtu (24-hour average) 0.100 lb/MMBtu (30-day rolling average)	0.250 lb/MMBtu (24-hour average) 0.150 lb/MMBtu (30-day rolling average)	0.0150 lb/MMBtu[(1)]
Coal Receiving System	Action	None	None	None
	Emission Rates	Retain Current Levels	Retain Current Levels	Retain Current Levels
Coal Reclaim System	Action	None	None	None
	Emission Rates	Retain Current Levels	Retain Current Levels	Retain Current Levels

[(1)] PM emission rate, defined in the Consent Decree as the average number of pounds of PM emitted per million BTU of heat input ("lb/mmBTU"), as measured in annual stack tests, in accordance with the reference methods set forth in 40 C.F.R. Part 60, Appendix A, Method 5.

If you have any questions about the issues raised in these comments, please feel free to contact Mr. Erin Gorman at (973) 430-6359.

Sincerely,

Donald McCloskey
Director, Environmental Strategy and Policy

Enclosures

cc: Max Friedman (NJDEP)
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