ATTACHMENT A

Table 2-3. Combustor—Criteria Pollutant Emissions Rates (per unit)

Pollutant	ppmvd at 7-percent oxygen	tpy*	lb/hr†
NO_x	45	114.7	28.8
SO_2 (short term)	24	N/A	21.4
SO_2 (annual)	14	49.7	11.3
CO	100	155.2	39.0
VOC	6.6	5.9	1.5
$PM_{2.5}$	24	32.1	8.1
PM_{10} (total)	24	32.1	8.1
Lead	0.075	0.10	0.025

*Assumes 8,760 hr/yr at 100-percent load.
†At 110-percent load.

Note: $PM_{2.5}/PM_{10}$ is the sum of the filterable and condensable fractions.
See Tables B-4 and B-5 of Appendix B for emissions calculations.

Sources: WTI, 2010.
ECT, 2010.

ATTACHMENT B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 Broadway
New York, NY 10007-1866

February 14, 2006

Mr. William O'Sullivan, Director
Division of Air Quality
New Jersey Department of
Environmental Protection
PO Box 423
401 East State Street, 3rd floor
Trenton, NJ 08625-0423

Dear Mr. O'Sullivan:

This is in response to your December 13, 2005 e-mail and February 6, 2006 follow-up e-mail inquiry to me regarding a discussion that you saw in Pages 23-25 of the proposed New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (ICE). More specifically, you mentioned that in the proposed rule in the evaluation of "best demonstrated technology" for the emergency generators, EPA took into account no hour limits on actual emergency use and that EPA only took into account hours the manufacturer recommended for test firing the units, i.e., 30 hours in this case. You specifically mentioned an EPA statement in the proposed NSPS which says "[t]here is no time limit on the use of emergency stationary ICE in emergency situations." You also mentioned that this approach is consistent with what New Jersey recently did with the NOx RACT rule, i.e., removing the 500 hour/year total use limitation and replacing it with restrictions on the use of the equipment to maintenance and testing recommended by the manufacturer (to be specified in individual permits).

You stated that consistent with the New Jersey NOx RACT Rule and the proposed NSPS, New Jersey intends to specify that the potential to emit (PTE) for emergency generators be the emissions associated with non-emergency use, i.e., the 30 hours in this particular NSPS case (but up to 100 hours in some other cases). According to your proposal, actual emergency use would not count against PTE. You reasoned that otherwise we would be restricting the actual use of emergency generators which is not what New Jersey or EPA intends. New Jersey wanted a confirmation that this approach is appropriate.

We raised this issue with our Office Air Quality Planning and Standards (OAQPS) and Office of Enforcement and Compliance Assurance (OECA). The consensus is that for the purposes of determining PTE in the New Source Review (NSR) and the Title V programs, EPA has no policy that specifically requires exclusion of "emergency" (or malfunction) emissions. Rather,

to determine PTE, a source must estimate its emissions based on the worst-case scenario taking into account startups, shutdowns and malfunctions. The EPA statement that you quote above from the proposed NSPS is for the purposes of determining the actual cost of a control technology for NSPS purposes. As you know, the intended effect of the proposed NSPS standard is to require all new, modified, and reconstructed stationary CI ICE to use the best demonstrated system of continuous emission reduction, considering costs, non-air quality health, and environmental and energy impacts. So in determining the actual cost of the control technology being proposed, EPA took into account no hour limits on actual emergency use of the equipment. In determining PTE, there is no actual cost consideration factored into it. So the EPA statement would not be appropriate in that case.

Consequently, it is EPA's opinion that for the purposes of the NSR and the Title V programs, New Jersey should continue as they have and permit emergency units at some amount of operation sufficiently large to cover emergencies (i.e., 500 hours a year). Malfunctions that may require the operation of the emergency units and that may exceed the 500 hours/year limit could be handled through enforcement discretion on a case-by-case basis, as appropriate.

If you have any questions, please contact me at (212) 637-4074.

Sincerely,

/s/

Steven C. Riva, Chief
Permitting Section
Air Programs Branch

bcc: J. Siegel, 2ORC-AIR
F. Jon, 2APB-PS
R. Ruvo, 2APB-SIP
S. Riva, 2APB-PS
APB File

ATTACHMENT C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

September 20, 1999

MEMORANDUM

SUBJECT: State Implementation Plans: Policy Regarding Excess Emissions During Malfunctions, Startup, and Shutdown

FROM: Steven A. Herman
Assistant Administrator for Enforcement and Compliance Assurance

Robert Perciasepe
Assistant Administrator for Air and Radiation

TO: Regional Administrators, Regions I - X

EPA's policy for state implementation plans (SIPs) regarding excess emissions during malfunctions, startup, shutdown, and maintenance is contained in memoranda from Kathleen Bennett, formerly Assistant Administrator for Air, Noise and Radiation dated September 28, 1982 and February 15, 1983. A recent review of SIPs suggests that several contain provisions that appear to be inconsistent with this policy, either because they were inadvertently approved after EPA issued the 1982-1983 guidance or because they were part of the SIP at that time and have never been removed. In order to address these provisions in a consistent manner, today we are reaffirming and supplementing the 1982-83 policy. In so doing, we are taking this opportunity to clarify several issues of interpretation that have arisen since that time. The updated policy will clarify the types of excess emissions provisions states may incorporate into SIPs so that they can in turn provide greater certainty to the regulated community.

As EPA stated in its 1982 memorandum, because excess emissions might aggravate air quality so as to prevent attainment or interfere with maintenance of the ambient air quality standards, EPA views all excess emissions as violations of the applicable emission limitation. Nevertheless, EPA recognizes that imposition of a penalty for sudden and unavoidable

malfunctions caused by circumstances entirely beyond the control of the owner or operator may not be appropriate. Accordingly, a state or EPA can exercise its "enforcement discretion" to refrain from taking an enforcement action in these circumstances.

The main question of interpretation that has arisen regarding the old policy is whether a state may go beyond this "enforcement discretion" approach and include in its SIP a provision that would, in the context of an enforcement action for excess emissions, excuse a source from penalties if the source can demonstrate that it meets certain objective criteria (an "affirmative defense"). This policy clarifies that states have the discretion to provide such a defense to actions for penalties brought for excess emissions that arise during certain malfunction, startup, and shutdown episodes.

In the context of malfunctions, EPA recognizes that even equipment that is properly designed and maintained can sometimes fail. At the same time, EPA has a fundamental responsibility under the Clean Air Act to ensure that SIPs provide for attainment and maintenance of the national ambient air quality standards ("NAAQS")and protection of PSD increments. Thus, EPA cannot approve an affirmative defense provision that would undermine the fundamental requirement of attainment and maintenance of the NAAQS, or any other requirement of the Clean Air Act. See sections 110(a) and (l) of the Clean Air Act, 42 U.S.C. § 7410(a) and (l).[1] Accordingly, an acceptable affirmative defense provision may only apply to actions for penalties, but not to actions for injunctive relief. This restriction insures that both state and federal authorities remain able to protect air quality standards and PSD increments.

Furthermore, this approach is appropriate only when the respective contributions of individual sources to pollutant concentrations in ambient air are such that no single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments.[2] Where a single source or small

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[1]Pursuant to Section 110(l), EPA may not approve a SIP revision if "the revision would interfere with any applicable requirement concerning attainment and reasonable further progress, or any other applicable requirement of this chapter." See also CAA § 193, 42 U.S.C. § 7515, and the definitions of "emission limitation" and "emission standard" contained in CAA § 302(k), 42 U.S.C. § 7602(k).

[2] In the case of lead and sulfur dioxide, attainment problems usually are caused by one or a few sources and an affirmative defense is not appropriate. This situation can be

group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, EPA believes an affirmative defense approach will not be adequate to protect public health and the environment, and the only appropriate means of dealing with excess emissions during malfunction, startup, and shutdown episodes is through an enforcement discretion approach.[3]

EPA is also taking this opportunity to clarify that it does not intend to approve SIP revisions that would allow a state director's decision to bar EPA's or citizens' ability to enforce applicable requirements. Such an approach would be inconsistent with the regulatory scheme established in Title I of the Clean Air Act. EPA is also adding contemporaneous record keeping and notification criteria to make its policy regarding these types of events consistent with its enforcement approach.

Finally, EPA is clarifying how excess emissions that occur during periods of startup and shutdown should be addressed. In general, because excess emissions that occur during these periods are reasonably foreseeable, they should not be excused. However, EPA recognizes that, for some source categories, even the best available emissions control systems might not be consistently effective during startup or shutdown periods. In areas where the respective contributions of individual sources to pollutant concentrations in ambient air are such that no single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, these technological limitations may be addressed in the underlying standards themselves through narrowly-tailored SIP revisions that take into account the potential impacts on ambient air quality caused by the inclusion of these allowances. In these instances, as part of its justification of the SIP revision, the state should analyze the

---

particularly aggravated where a short-term standard (e.g., where exceedances or violations are based on a few hour period) is also in place. Although this policy is generally applicable for other NAAQS, enforcement discretion is the only appropriate approach for dealing with excess emissions during startup, shutdown, and malfunction in a specific area where a single source or a small group of sources has the potential to cause nonattainment of a short-term NAAQS.

[3] In American Trucking Association v. EPA, 175 F. 3d 1027 (D.C. Circ., 1999), the court remanded the PM2.5 NAAQS to the EPA. The Agency has not determined whether this policy is appropriate for PM2.5 NAAQS.

impact of the potential worst-case emissions that could occur during startup and shutdown.[4]

In addition to this approach, states may address this problem through the use of enforcement discretion or they may include a general affirmative defense provision in their SIPs for short and infrequent startup and shutdown periods along the lines outlined in the attachment. As mentioned above, however, in those areas where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, issues relating to excess emissions arising during startup and shutdown may only be addressed through an enforcement discretion approach.

All Regions should review the SIPs for their states in light of this clarification and take steps to insure that excess emissions provisions in these SIPs are consistent with the attached guidance.

Attachment

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[4]States may account for such emissions by including them in their routine rule effectiveness estimates. Rule effectiveness estimates may be prepared in accordance with an EPA policy document entitled "Guidelines for Estimating and Applying Rule Effectiveness for Ozone/Carbon Monoxide State Implementation Plan Base Year Inventories." (EPA-452/R-92-010) November 1992.

Attachment

POLICY ON EXCESS EMISSIONS DURING MALFUNCTIONS, STARTUP, AND SHUTDOWN

Introduction

This policy specifies when and in what manner state implementation plans (SIPs) may provide for defenses to violations caused by periods of excess emissions due to malfunctions,[1] startup, or shutdown. Generally, since SIPs must provide for attainment and maintenance of the national ambient air quality standards and the achievement of PSD increments, all periods of excess emissions must be considered violations. Accordingly, any provision that allows for an automatic exemption[2] for excess emissions is prohibited.

However, the imposition of a penalty for excess emissions during malfunctions caused by circumstances entirely beyond the control of the owner or operator may not be appropriate. States may, therefore, as an exercise of their inherent enforcement discretion, choose not to penalize a source that has produced excess emissions under such circumstances.

This policy provides an alternative approach to enforcement discretion for areas and pollutants where the respective contributions of individual sources to pollutant concentrations in ambient air are such that no single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments. Where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, as is often the case for sulfur dioxide and lead,[3] EPA believes approaches other than enforcement discretion are not appropriate. In such cases, any excess emissions may have a significant chance of causing an exceedance or violation of the applicable standard or PSD increment.

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[1]The term excess emission means an air emission level which exceeds any applicable emission limitation. Malfunction means a sudden and unavoidable breakdown of process or control equipment.

[2]The term automatic exemption means a generally applicable provision in a SIP that would provide that if certain conditions existed during a period of excess emissions, then those exceedances would not be considered violations.

[3]This policy also does not apply for purposes of PM2.5 NAAQS. In American Trucking Association v. EPA, 175 F. 3d 1027 (D.C. Circ., 1999), the court remanded the PM2.5 NAAQS to the EPA. The Agency has not determined whether this policy is appropriate for PM2.5 NAAQS.

Except where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, states may include in their SIPs affirmative defenses[4] for excess emissions, as long as the SIP establishes limitations consistent with those set out below. If approved into a SIP, an affirmative defense would be available to sources in an enforcement action seeking penalties brought by the state, EPA, or citizens. However, a determination by the state not to take an enforcement action would not bar EPA or citizen action.[5]

In addition, in certain limited circumstances, it may be appropriate for the state to build into a source-specific or source-category-specific emission standard a provision stating that the otherwise applicable emission limitations do not apply during narrowly defined startup and shutdown periods.

I. AUTOMATIC EXEMPTIONS AND ENFORCEMENT DISCRETION

If a SIP contains a provision addressing excess emissions, it cannot be the type that provides for automatic exemptions. Automatic exemptions might aggravate ambient air quality by excusing excess emissions that cause or contribute to a violation of an ambient air quality standard. Additional grounds for disapproving a SIP that includes the automatic exemption approach are discussed in more detail at 42 Fed. Reg. 58171 (November 8, 1977) and 42 Fed. Reg. 21372 (April 27, 1977). As a result, EPA will not approve any SIP revisions that provide automatic exemptions for periods of excess emissions.

The best assurance that excess emissions will not interfere with NAAQS attainment, maintenance, or increments is to address excess emissions through enforcement discretion. This policy provides alternative means for addressing excess emissions of criteria pollutants. However, this policy does not apply where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments. Moreover,

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[4]The term affirmative defense means, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding.

[5]Because all periods of excess emissions are violations and because affirmative defense provisions may not apply in actions for injunctive relief, under no circumstances would EPA consider periods of excess emissions, even if covered by an affirmative defense, to be "federally permitted releases" under EPCRA or CERCLA.

nothing in this guidance should be construed as requiring states to include affirmative defense provisions in their SIPs.

II. AFFIRMATIVE DEFENSES FOR MALFUNCTIONS

EPA can approve a SIP revision that creates an affirmative defense to claims for penalties in enforcement actions regarding excess emissions caused by malfunctions as long as the defense does not apply to SIP provisions that derive from federally promulgated performance standards or emission limits, such as new source performance standards (NSPS) and national emissions standards for hazardous air pollutants (NESHAPS).[6] In addition, affirmative defenses are not appropriate for areas and pollutants where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments. Furthermore, affirmative defenses to claims for injunctive relief are not allowed. To be approved, an affirmative defense provision must provide that the defendant has the burden of proof of demonstrating that:

1. The excess emissions were caused by a sudden, unavoidable breakdown of technology, beyond the control of the owner or operator;

2. The excess emissions (a) did not stem from any activity or event that could have been foreseen and avoided, or planned for, and (b) could not have been avoided by better operation and maintenance practices;

3. To the maximum extent practicable the air pollution control equipment or processes were maintained and operated in a manner consistent with good practice for minimizing emissions;

4. Repairs were made in an expeditious fashion when the operator knew or should have known that applicable emission limitations were being exceeded. Off-shift labor and overtime must have been utilized, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;

5. The amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions;

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[6]To the extent a state includes NSPS or NESHAPS in its SIP, the standards should not deviate from those that were federally promulgated. Because EPA set these standards taking into account technological limitations, additional exemptions would be inappropriate.

6. All possible steps were taken to minimize the impact of the excess emissions on ambient air quality;

7. All emission monitoring systems were kept in operation if at all possible;

8. The owner or operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs, or other relevant evidence;

9. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

10. The owner or operator properly and promptly notified the appropriate regulatory authority.

EPA interprets these criteria narrowly. Only those malfunctions that are sudden, unavoidable, and unpredictable in nature qualify for the defense. For example, a single instance of a burst pipe that meets the above criteria may qualify under an affirmative defense. The defense would not be available, however, if the facility had a history of similar failures because of improper design, improper maintenance, or poor operating practices. Furthermore, a source must have taken all available measures to compensate for and resolve the malfunction. If a facility has a baghouse fire that leads to excess emissions, the affirmative defense would be appropriate only for the period of time necessary to modify or curtail operations to come into compliance. The fire should not be used to excuse excess emissions generated during an extended period of time while the operator orders and installs new bags, and relevant SIP language must limit applicability of the affirmative defense accordingly.

III. EXCESS EMISSIONS DURING STARTUP AND SHUTDOWN

In general, startup and shutdown of process equipment are part of the normal operation of a source and should be accounted for in the planning, design, and implementation of operating procedures for the process and control equipment. Accordingly, it is reasonable to expect that careful and prudent planning and design will eliminate violations of emission limitations during such periods.

A. SOURCE CATEGORY SPECIFIC RULES FOR STARTUP AND SHUTDOWN

For some source categories, given the types of control technologies available, there may exist short periods of emissions during startup and shutdown when, despite best efforts regarding planning, design, and operating procedures, the

otherwise applicable emission limitation cannot be met. Accordingly, except in the case where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, it may be appropriate, in consultation with EPA, to create narrowly-tailored SIP revisions that take these technological limitations into account and state that the otherwise applicable emissions limitations do not apply during narrowly defined startup and shutdown periods. To be approved, these revisions should meet the following requirements:

1. The revision must be limited to specific, narrowly-defined source categories using specific control strategies (e.g., cogeneration facilities burning natural gas and using selective catalytic reduction);

2. Use of the control strategy for this source category must be technically infeasible during startup or shutdown periods;

3. The frequency and duration of operation in startup or shutdown mode must be minimized to the maximum extent practicable;

4. As part of its justification of the SIP revision, the state should analyze the potential worst-case emissions that could occur during startup and shutdown;

5. All possible steps must be taken to minimize the impact of emissions during startup and shutdown on ambient air quality;

6. At all times, the facility must be operated in a manner consistent with good practice for minimizing emissions, and the source must have used best efforts regarding planning, design, and operating procedures to meet the otherwise applicable emission limitation; and

7. The owner or operator's actions during startup and shutdown periods must be documented by properly signed, contemporaneous operating logs, or other relevant evidence.

B. GENERAL AFFIRMATIVE DEFENSE PROVISIONS RELATING TO STARTUP AND SHUTDOWN

In addition to the approach outlined in Section II(A) above, states may address the problem of excess emissions occurring during startup and shutdown periods through an enforcement discretion approach. Further, except in the case where a single source or small group of sources has the potential to cause an exceedance of the NAAQS or PSD increments, states may also adopt for their SIPs an affirmative defense approach. Using this

approach, all periods of excess emissions arising during startup and shutdown must be treated as violations, and the affirmative defense provision must not be available for claims for injunctive relief. Furthermore, to be approved, such a provision must provide that the defendant has the burden of proof of demonstrating that:

1. The periods of excess emissions that occurred during startup and shutdown were short and infrequent and could not have been prevented through careful planning and design;

2. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance;

3. If the excess emissions were caused by a bypass (an intentional diversion of control equipment), then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

4. At all times, the facility was operated in a manner consistent with good practice for minimizing emissions;

5. The frequency and duration of operation in startup or shutdown mode was minimized to the maximum extent practicable;

6. All possible steps were taken to minimize the impact of the excess emissions on ambient air quality;

7. All emission monitoring systems were kept in operation if at all possible;

8. The owner or operator's actions during the period of excess emissions were documented by properly signed, contemporaneous operating logs, or other relevant evidence; and

9. The owner or operator properly and promptly notified the appropriate regulatory authority.

If excess emissions occur during routine startup or shutdown periods due to a malfunction, then those instances should be treated as other malfunctions that are subject to the malfunction provisions of this policy. (Reference Part I above).

ATTACHMENT D

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 28 1993

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Automatic or Blanket Exemptions for Excess Emissions During Startup, and Shutdowns Under PSD

FROM: John B. Rasnic, Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Linda M. Murphy, Director
Air, Pesticides and Toxics Management Division
Region 1

This is in response to your memorandum dated June 15, 1992, asking that we advise Region I on whether you are correct in telling States and applicants that Prevention of Significant Deterioration (PSD) permits cannot contain automatic exemptions which allow excess emissions during startup and shutdown. You also requested that the Stationary Source Compliance Division (SSCD) issue a memo which outlines the Environmental Protection Agency's (EPA's) policy on excess emissions during startup and shutdown (especially as it pertains to Best Available Control Technology determinations) and on automatic exemptions that are granted in PSD permits. I understand that my staff has discussed this issue and the response with your staff by phone. However, we regret the delay in providing a written response.

The two memoranda you mention, entitled "Policy on Excess Emissions During Startup, Shutdown, Maintenance, and malfunction" from Kathleen M. Bennett (dated February 15, 1983 and September 28, 1982), address automatic exemptions under the State Implementation Plan (SIP). The memoranda state that the rationale for establishing these emissions as violations, as opposed to granting automatic exemptions, is that SIPs are ambient-based standards and any emissions above the allowable may cause or contribute to violations of the national ambient air quality standards. This rationale applies to the PSD program not only because PSD is ambient-based but also because generally, the PSD program is part of the SIP. Even in States where the PSD program is not SIP approved, the emissions limits are established to protect increments and the national ambient air quality standards (NAAQS).

Another 1977 memorandum, entitled "Contingency Plan for FGD Systems During Downtime as a Function of PSD" from Edward E. Reich, states that PSD and SIP regulations require the establishment of emission limitations which will be sufficient to ensure nondegradation of air quality and attainment and maintenance of the NAAQS. This memorandum specifically refers to the April 27, 1977 Federal Register notice (42 FR 21472) that is also mentioned in the EPA policy attached to the Bennett memoranda.

Although we concur with Region I that PSD permits cannot contain automatic exemptions which allow excess emissions during startup and shutdown, we do not believe that EPA's policy concerning this issue under PSD is somewhat vague. The exemptions granted under some New Source Performance Standards (NSPS) are not applicable to this issue under PSD. The NSPS are technology based standards that are not directly required for meeting ambient standards.

Likewise, we do not concur at this time with the approach as outlined in the footnote. You suggest setting a specific emission rate that would apply during startup and/or shutdown that is demonstrated to not cause a violation of any short-term increments or standards. While this may protect the ambient standards, this cannot be easily determined if, as is suggested, the emission rate would reflect a longer averaging time. Further, as the 1982 memoranda states, without clear definition and limitations, these automatic exemptions or even secondary limits could effectively shield excess emissions arising from poor operation and maintenance or design, thus precluding attainment.

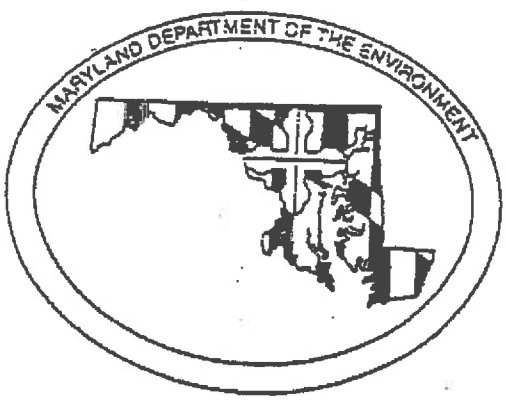
However, the States retain enforcement discretion, as discussed in the memoranda, to address the occurrence of excess emissions. The attachments to the memoranda provide that infrequent periods of excess emissions during startup and shutdown need not be treated as violations where the source adequately shows that the excess could not have been prevented through careful planning and design and that bypassing of control equipment was unavoidable to prevent loss of life, personal injury, or severe property damage. Startup and shutdown of process equipment are part of the normal operation of a source and should be accounted for in the planning, design and implementation of operating procedures for the process and control equipment. Accordingly, it is reasonable to expect that careful and prudent planning and design will eliminate violations of emission limitations during such periods. If excess emissions occur during routine startup and shutdown due to a malfunction, then those instances should be treated as other malfunctions which are subject to the malfunction provisions of the policy (attached).

If you have any questions regarding this matter, please contact Clara Poffenberger at 703 308-8709.

Attachments

ATTACHMENT E

13.04.29.91.12
CEM



Air Management Administration

Technical Memorandum 90-01

Continuous Emission Monitoring (CEM) Policies and Procedures

October, 1990

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR MANAGEMENT ADMINISTRATION
2500 BROENING HIGHWAY
BALTIMORE, MARYLAND 21224
(301) 631-3215

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PART I

Enforcement Policy for Continuous Emission Monitoring Sources Subject to COMAR 26.11.01.10 and .11

1.1 Statement of Purpose.

The purpose of this document is to establish a policy for State enforcement of Maryland's continuous emission monitoring (CEM) requirements found in COMAR 26.11.01.10 and .11. Maryland's continuous emission monitoring program is an integral part of its overall compliance strategy for stationary sources of air pollution. The CEM is one of several key program elements and tools by which the compliance of sources can be evaluated on a continuous basis. The Department will use all continuous emission monitoring systems required by these regulations for direct enforcement.

There are three types of CEM related violations which may result from these regulations. These violations are:

(1) Emissions standard violations;

(2) Data availability violations; and

(3) Opacity violations.

The CEM regulations require sources to submit quarterly self monitoring reports to the Department. The two key elements of these reports are the identification of excess emission periods and the reporting of monitor downtime incidents which occur during source operation.

CEM data are considered sufficient to initiate any of the following enforcement actions, which are listed in approximate order of increasing severity:

(a) Targeting of sources for further investigative activities such as increased inspections;

(b) Issuance of Finding of Violation;

(c) Issuance of Notices of Violation or other Administrative orders;

(d) Assessing penalties; and

(e) Taking other appropriate enforcement action as provided by law.

1.2 Discussion of CEM Related Violations.

1.2.1 Emissions Violations.

The CEM provides data on gas concentrations in a stack. This data is used to calculate average gas concentrations over a period of time. These averages are then compared to the applicable emission standards to determine compliance. Any exceedance of an emission standard constitutes a violation. For example, a 24-hour sulfur dioxide standard requires that a 24-hour average be calculated from at least four data points per hour provided by the CEM. The system will generate 96 data points each day which will be used to calculate the daily average. The source is required to generate three months of daily averages of sulfur dioxide concentration and report exceedances of the standard in a quarterly report.

The regulation also requires the calculation of averages even when less than 24-hours of data is collected.

The Department will use enforcement discretion depending upon the frequency and extent of exceedances. The level of enforcement action to be taken by the Department for exceedances of gaseous pollutant emission standards is shown in Table I.

1.2.2 Violation of Data Availability Requirements.

The regulations require continuous data availability excluding audit and check periods and malfunctions that are corrected within two hours each day. The CEM should operate whenever the source being monitored is operating or causing emissions. If the source being monitored is shut down the CEM must, at a minimum, continue to operate to complete the "operating day" (i.e. until midnight of that day). For the purpose of determining operating hours and data unavailability it will be assumed that the source is operating up to midnight of the day the source is shut down. Exceedances of standards recorded during this time will be treated as any other exceedance through use of the enforcement policy.

Following the completion of that operating day a CEM may be shut down during the period when the source is shut down. The CEM however, must be in operation when the source has induced or forced draft. CEM data collected during down time of the source after completing the last operating day will not be considered in Tables I through III. However, the data is to be reported so that the Department may determine the compliance status of the source.

CEM downtime should not occur frequently since a good quality assurance program will minimize equipment breakdowns. Extended downtime will be considered a violation. However, the enforcement actions established in Table II for data availability violations take into consideration that a breakdown of the CEM system that requires servicing or parts from the equipment vendor may involve an extended downtime that is beyond the control of the source.

1.2.3 Opacity Violations

The CEM system must provide a continuous read-out of six minute averages for opacity. The opacity standard generally requires no emissions visible to a human observer for Areas III and IV and 20 percent opacity for Areas I, II, V, and VI.

The Department has determined that a human observer will report an opacity of between zero and 10 percent as no visible emissions. Therefore, in the Baltimore and Washington areas, an exceedance of the requirements occurs when the CEM records an average of 10 percent opacity or greater. The regulations allow an opacity of up to 40 percent during certain conditions such as startup or process change. Therefore, the exceedances in Table III for opacity violations mean exceedances above one six minute exclusion for changes in operation. However, all exceedances of standards must be reported.

1.2.4 Derivation of Tables I, II, and III.

Although the Department's emissions standards differ from those developed by the EPA under its New Source Performance Standards, and data availability requirements are expressed differently, the levels of action in Tables I - III are similar to the levels of action suggested in EPA guidance. Gaseous pollutant standard exceedance levels are nearly identical to EPA proposed action levels.

Maryland's CEM regulation requires "continuous" data availability while EPA and other states specify a percent of time during which valid data must be collected. With the exclusions provided in Maryland's CEM regulations Maryland's data availability requirements are similar to, but slightly more restrictive than, EPA proposals.

Table I
Policy on Enforcement Actions for CEMs Showing
Exceedances of Emission Standards

	Condition		Action to be taken
1.	Emission standards exceeded one time in one quarter.	1.	Notify source in writing of exceedance. Increase frequency of inspection. Scrutinize next quarterly report.
2.	Emission standards exceeded up to two times in one quarter or one time for two out of four quarters.	2.	Issue Finding of Violation (FOV). Require plan for compliance.
3.	Emission standards exceeded more than two times in one quarter or recurring exceedances of two or more times in four quarters.	3.	Issue Notice of Violation (NOV). May assess penalty or take other appropriate enforcement action as provided by law.

Table II
Policy on Enforcement Actions for CEMs
Showing Violations of Data Availability

	Conditions		Action to be Taken
1.	Unscheduled downtime up to two hours per day and scheduled maintenance.	1.	No action.
2.	CEM downtime up to 10% of operating time, or one incident of downtime up to two weeks in one quarter.	2.	Inform source in writing of violations and scrutinize next quarterly report.
3.	Downtime over 10% but less than 20% of operating time, or one incident of downtime exceeding two weeks but less than four weeks.	3.	Issue Finding of Violation (FOV) and require plan for compliance.
4.	Downtime over 20% of operating time, or one incident of downtime over four weeks.	4.	Issue Notice of Violation (NOV). Require written explanation and documentation of problems and require schedule for correction. The Department may assess a penalty consistent with the severity of the violations and the source's history of noncompliance or take other appropriate enforcement action as provided by law.

Table III
Policy on Enforcement Actions for CEMs
Showing Exceedances of Opacity Standards

	Condition		Action to be Taken
1.	Opacity less than 10%. (Areas III and IV) or less than 20% (Areas I, II, V, and VI).	1.	No action.
2.	Opacity exceedances occurring up to 5% of operating time in a given quarter.	2.	Notify source in writing of exceedances. Schedule Method 9 observations. Scrutinize next quarterly report closely.
3.	Opacity exceedances occurring over 5% but less than 10% of operating time in a given quarter or recurring exceedances up to 5% of operating time for two quarters.	3.	Issue Finding of Violation (FOV) notice. Schedule frequent Method 9 observations or inspections. Consider requiring stack test.
4.	Opacity exceedances occurring more than 10% of operating time in a given quarter or recurring exceedances for more than two quarters.	4.	Issue Notice of Violation (NOV). May assess penalty, require stack test, or take other appropriate enforcement action as provided by law.

1.3 Finding of Violation and Notice of Violation.

The Department will issue a Finding of Violation (FOV) for the purpose of alerting the source that exceedances have occurred and, unless the condition is corrected, further enforcement action may be taken by the Department. Issuance of an FOV allows the source the opportunity to correct the condition and to provide information to the Department that explains the circumstances that led to the violating condition. Upon receiving a FOV a source may provide a schedule for correcting the condition. The Department may take further action if it determines that the violating condition could have been avoided with proper operation or maintenance.

In order for the Department to consider the conditions that caused the exceedances, the source must provide information and a schedule for correcting the condition at the time it submits the quarterly report. Depending upon the Department's evaluation of the information provided by the source, the Department may suspend further enforcement action pending scrutiny of the next quarterly report.

A Notice of Violation (NOV) is issued when corrective action fails to eliminate exceedances or when there is a more frequent level of exceedances or recurrences. When receiving a NOV a source may provide a compliance plan and schedule. The Department may assess a penalty even upon acceptance of an expeditious plan.

1.4 Discussion and Use of Tables.

Table I summarizes the level of enforcement action to be taken when emissions standards are exceeded. The enforcement level depends upon the extent of violations and the frequency at which the exceedances occur during a calendar

quarter. Table I also considers repeated exceedances that occur during more than one quarter of a four quarter period.

Although the table shows specific levels of enforcement action to be taken with recurring exceedances, the Department can use enforcement discretion. The Department, after review of the information from the source, will make its determination as to the appropriate enforcement action to pursue.

Table II summarizes the level of enforcement action to be taken for violations of the continuous data availability requirements. It is expected that CEM malfunctions will not occur frequently with good operating and maintenance procedures. The downtime, however, may be of longer duration. The enforcement policy establishes the level of enforcement action that will be taken based on an extended exceedance or recurring downtimes for more than one quarter.

Table III establishes the level of enforcement action to be taken for exceedances of opacity standards. For most sources, the opacity will vary with particulate matter concentration. Therefore, if extended exceedances of opacity requirements occur, the Department may require that stack tests be performed by the source to demonstrate compliance with emission standards.

1.5 Level of Enforcement for Multiple CEMs.

Tables I, II, and III apply to each CEM at any premises. The Department, however, may take more serious enforcement action if more than one pollutant at a single source, or if more than one source at a premises, is shown by CEMs to be in violation during the same period. The Department will not consider a required CEM and a back-up CEM running simultaneously as operating multiple CEMs.

Any source will have the opportunity to demonstrate that an exceedance is the result of a condition that is beyond its control and that corrections are underway. It is the responsibility of the source to provide this information

when submitting the quarterly report. The Department will carefully review any information provided by the source before taking enforcement action.

1.6 Quality Assurance Checks.

In order to ensure the accuracy of data submitted, the Department may, without advance notice, require the source to perform an audit using the Department's calibrated standards.

1.7 Telemetry.

Each source must have an exclusive telephone line that allows the Department access to a computer data file. The Department will access this file at 2400 baud using the specifications and format in Part III of this Technical Memorandum. The file must contain readings of the CEM and the results of the last calibration check for all monitors. This file must also include a list of all exceedances for a seven day period. This data will be used as a quality assurance check of the information provided in the quarterly excess emissions reports and to assist the Department in scheduling inspections or stack tests.

Part II
QUALITY ASSURANCE REQUIREMENTS FOR CONTINUOUS OPACITY MONITORING SYSTEMS

2.1 Applicability and Principle.

2.1.1 Applicability. This procedure is used to evaluate the effectiveness of a facility's quality assurance (QA) and quality control (QC) procedures for opacity CEMs. The QA and QC procedures for gas monitors are addressed in 40 CFR Part 60, Appendicies B and F. The procedure specifies the minimum quality assurance requirements for the assessment and control of opacity CEM data. Source owners and operators subject to this procedure must meet these minimum requirements and are encouraged to develop and implement a more extensive QA/QC program or to continue such programs where they already exist.

Data collected as a result of QA/QC measures required in this procedure are to be submitted to the Department. These data are to be used by both the enforcement agency and the opacity CEM operator in assessing the effectiveness of the QA/QC procedures in maintaining acceptable operation and valid emission data.

All sources subject to this procedure shall develop and implement the required QC plan upon successful completion of the initial performance specification test and shall conduct the required QA procedures beginning with the first calendar quarter following the successful performance specification test. Sources with existing opacity monitors shall implement the procedure beginning with the first full calendar quarter following the effective date of the CEM regulation.

2.1.2 Principle. The QA procedures consist of two distinct and equally important functions: (1) assessment of data quality by measurement of opacity

CEM performance, and (2) control and improvement of data quality by implementing QC policies and corrective actions. These two functions form a control loop. When the assessment function indicates that data quality is inadequate, the control effort must be increased until data quality is acceptable.

This procedure explicitly specifies the quality assessment methods to be used for calibration drift and quarterly audits. This procedure does not address the evaluation of monitor installation location nor the design specification verification procedures, which are addressed in Appendix B of 40 CFR Part 60.

Quarterly performance audits involving a series of checks of monitoring system components and operation are performed to assess the accuracy of the opacity CEM data, since it is not feasible to obtain independent effluent measurements for comparison with the opacity CEM data. Calibrated audit materials are required for some of these checks. The required audits serve to identify problems that detract from the accuracy of the opacity CEM data. In the absence of such problems, the opacity monitoring data are assumed to be accurate.

Quality control and corrective actions encompass a variety of policies, specifications, standards, and corrective measures. To accommodate these site-specific variables, this procedure treats QC requirements in general terms to allow each source owner or operator to develop a QC system that is most effective and efficient for the circumstances. However, the final data output device used to report emissions to the Air Management Administration in the quarterly excess emission report shall be used for all required QA/QC measurements.

2.2 Definitions.

2.2.1 Opacity CEM - All equipment required for the determination of the opacity of emissions.

2.2.2 Span Value. The opacity value at which the opacity CEM is set to produce the maximum data display output.

2.2.3 Simulated Zero Check. Use of a Method or device to provide a simulated zero opacity (or low-level value between zero and 20 percent of span value) and providing a system check of the analyzer internal optical surfaces and all electronic circuitry including the lamp and photodetector assembly.

2.2.4 Upscale calibration value. The opacity value at which a calibration check of the opacity CEM is performed by simulating an upscale opacity condition using a neutral density filter or other related technique to produce a known obscuration of the light beam as viewed by the receiver.

2.2.5 Calibration Drift (CD). The difference in the opacity CEM output reading from a reference value after a period of operation during which no unscheduled maintenance, repair, or adjustment took place. The reference value may be the simulated zero (or low-level) check or the upscale calibration value.

2.2.6 Calibration Error. The difference between the opacity values indicated by the opacity CEM and the known values of a series of calibration attenuators (neutral density filters).

2.3 Quality Control Requirements.

Each source owner or operator must develop and implement a quality control program. At a minimum, each QC program must include written procedures which describe in detail, complete, step-by-step procedures and operations for each of the following activities:

1. Opacity CEM calibration.
2. Calibration drift determination and adjustment.
3. Daily, monthly, and quarterly checks of component or system performance.

4. Preventive maintenance, including spare parts inventory.

5. Data recording, calculations, and reporting.

6. Performance audit and zero alignment procedures.

7. Program of corrective action for malfunctioning opacity CEM.

8. Notification scheme for monitor "Out of Control" discovery and reporting to the Air Management Administration.

As described in Section 2.5.6, whenever unacceptable audit results occur for two consecutive quarters, the source owner or operator must revise the current written procedures or modify or replace the opacity CEMs to correct the deficiency causing the unacceptable performance. These written procedures must be submitted to AMA for approval and kept on-site for inspection. Existing procedures must be resubmitted for approval when changed.

2.4 Calibration Drift Assessment.

2.4.1 Calibration Drift Requirement. Source owners and operators of opacity CEMs must check, record, and quantify the CD at two opacity values at least once daily in accordance with the method prescribed by the manufacturer. The opacity CEM calibration must, at a minimum, be adjusted whenever the daily zero (or low-level) CD or the daily high-level CD exceeds the limits specified in Performance Specification 1 (PS1) in Appendix B or 40 CFR Part 60.

2.4.2 Recording Requirement for Automatic CD Adjusting Monitors. Monitors that adjust the data to the corrected calibration values automatically (e.g., microprocessor control) must be programmed to record the unadjusted opacity prior to resetting the calibration, or must record the amount of adjustment that is applied to the effluent opacity measurements. This data must be maintained for review by the Department for a period of two years.

2.4.3 Criteria for Excessive Calibration Drift. If either the zero (or low-level) or high-level CD result exceeds the applicable drift specification in Performance Specification 1 for five consecutive daily periods, the opacity CEM is out-of-control. If either the zero (or low-level) or high level CD result exceeds two times the applicable drift specification in Performance Specification 1 during any CD check, the opacity CEM is out-of-control. If the opacity CEM is out of control, the source owner or operator must take necessary corrective action. Following corrective action, the owner or operator must repeat the CD checks twenty-four hours later.

2.4.4 Out of Control Period. The beginning of the out-of-control period is the time corresponding to the completion of the fifth consecutive daily CD check with a CD in excess of the allowable limit or the time corresponding to the completion of the daily CD check preceding the daily CD check that results in a CD in excess of two times the allowable limit. The end of the out-of-control period is the time corresponding to the completion of the CD check following corrective action that results in the CD at both the zero (or low-level) and the high-level measurement points being within the corresponding allowable CD limit.

2.5 Audits.

2.5.1 Audit Requirements. Each opacity CEM must be audited at least once each calendar quarter. Successive quarterly performance audits shall not occur within two months. A zero alignment audit must be conducted at least annually in conjunction with and prior to a quarterly performance audit. Successive zero alignment audits shall not occur within two quarters. The source must use the same output device as used to report emissions to the Air Management Administration in the quarterly excess emission report.

2.5.2 Performance Audit. A performance audit must be conducted at least once every calendar quarter for each opacity CEM. The performance audit includes a series of checks of individual monitoring system components and factors affecting the accuracy of the monitoring data as described below. However, some of these procedures are monitor-specific and should be described in detail in the QC plan as required by Part II, Section 2.3. Examples of detailed audit procedures may be found in Citation 1, "Performance Audit Procedures for Opacity Monitors." At a minimum, the following checks must be included in the performance audit:

2.5.2.1 Stack Exit Correlation Error. The value of the pathlength correction factor used by the monitor is measured according to procedures specified by the manufacturer. The correct value of the pathlength correction factor is computed from the monitor pathlength and stack exit diameter. The stack exit correlation error is determined as the ratio of the measured value to the correct value and is expressed as a percent.

2.5.2.2 Fault Indicators. Fault lamp indicators, data acquisition system error messages, and other system self diagnostic indicators are examined to determine if the opacity CEM is operating within preset limits.

2.5.2.3 Zero and Upscale Responses. The opacity CEM responses to the simulated zero condition (or low-level) and upscale calibration value are determined from the permanent data recording device according to the routine CD check procedure. The zero and upscale response errors are determined as the difference between the corrected values and the observed response for the zero and upscale calibration check.

2.5.2.4 Zero Compensation. Some monitors include an automatic correction to compensate for drift in the monitor's response to the simulated zero opacity

condition or dust accumulation on the optical surfaces of the transceiver. If applicable, the value of the zero compensation applied at the time of the audit must be determined as equivalent percent opacity, corrected to stack exit conditions, according to the procedures specified by the manufacturer.

2.5.2.5 Optical Alignment. The status of the optical alignment of the transmissometer components is determined using the alignment sight. (Performance Specification 1 requires that the alignment sight indicate that the monitor is misaligned when a measurement error of 2 percent opacity or greater is caused by misalignment.)

2.5.2.6 Optical Surface Dust Accumulation. An estimate of the amount of dust (or other particulate matter) deposited on the exposed optical surfaces of the transmissometer is obtained by recording the apparent effluent opacity before and after cleaning of each of the exposed optical surfaces. The total optical surface dust accumulation is the sum of the apparent reduction in opacity for all of the optical surfaces that are cleaned. Caution should be employed in performing this check since fluctuations in the effluent opacity may adversely affect the results. (See Citation 1.)

2.5.2.7 Calibration Error. The calibration error test involves the comparison of the opacity CEM's responses to the known values of three reference neutral density filters corrected to stack exit conditions. The preferred method for conducting the calibration error test requires the installation of an audit device that simulates the clear path condition and allows insertion of the filters into the light path. For this test, the audit device must be adjusted to provide the same zero response as the monitor's simulated zero check. In those cases where an audit device is not available, an alternate method may be used by conducting an incremental calibration (i.e., superimposing the audit

filters and effluent opacity) and comparing the monitor responses to the expected value calculated from the filter and effluent opacity values. This method is sensitive to fluctuations in the effluent opacity during the test.

For both calibration error methods, three filters are each placed in the light path five times and the monitor responses are determined from the permanent data recorder. The low, mid, and high range calibration error results are computed as the main difference and 95 percent confidence interval for the difference between the expected and actual responses of the monitor difference as corrected to the stack exit conditions. (Additional guidance for conducting this test is included in Citation 1. Use neutral density filters with values that have been determined according to "7.1.3 Attenuator Calibration" of Performance Specification 1.

The stability of the attenuator values should be checked at least once per year according to the procedures specified in Performance Specification 1 and the attenuators shall be recalibrated if the stability checks indicate a change of 2 percent opacity or greater. Use calibration attenuators that produce simulated opacities (as corrected to stack exit conditions) in the ranges listed in Table I. Where the use of the specified audit filter values is not practical, alternate filter ranges may be used subject to the approval of the Air Management Administration.

Table I. Filter ranges for opacity performance audits.

Audit Point		Audit Filter Range (% Opacity)
1	-	8-15% Opacity (low)
2	-	20-30% Opacity (mid)
3	-	40-50% Opacity (high)

2.5.3 Zero Alignment Audit. A zero alignment audit must be conducted annually in conjunction with and prior to a performance audit. The zero alignment audit is performed by comparing the monitor responses to the simulated zero check and the actual clear path condition. Primary and alternate methods for performing the zero alignment audit are described below.

2.5.3.1 Primary Zero Alignment Method. The primary zero alignment method must be performed under clear path conditions. This may be accomplished for the installed transmissometer if the process is not operating and the monitor pathlength is free of particulate matter or the monitor may be removed from its installation and set up under clear path conditions. In either case, no adjustment to the monitor should be made other than the establishment of the proper monitor pathlength and correct optical alignment of the transmissometer components. The monitor response to the clear path condition and to the simulated zero condition should be recorded as percent opacity. (For some monitors it may be necessary to disable the zero compensation mechanism or to record the amount of correction applied to the simulated zero condition.) The response difference in percent opacity to the clear path and simulated zero conditions should be recorded as the zero alignment error. The simulated zero

device should then be adjusted to provide the same response as a clear path condition. The monitor should then be restored to its operating mode at the facility.

2.5.3.2 Alternate Zero Alignment Method. Some monitor vendors offer an external, removable zero-jig to facilitate periodic checks of the simulated zero condition. These devices may be used as an alternate zero alignment audit method provided that: (1) the zero-jig setting is established for the specific monitor by comparison of the monitor responses to the zero-jig and to the clear path condition, (2) the zero-jig is demonstrated to be capable of producing a consistent zero response when it is repeatedly installed on the monitor, and (3) the zero-jig is protected when not in use to ensure that the setting equivalent to zero opacity does not change. Source owners who use a zero-jig shall perform a primary zero alignment audit and check of the zero-jig setting at least once every three years.

2.5.4 Criteria for a Successful Audit.

2.5.4.1 Performance Audit. Performance of the CEM shall be considered acceptable if it meets the following criteria:

Stack Exit Correlation Error: ≤ 2 percent opacity

Fault Indicators: Inactive/no error messages present

Zero and Upscale Responses: ≤ 2 percent opacity

Zero compensation: ≤ 4 percent opacity

Optical Alignment: misalignment error ≤ 2 percent opacity

Optical Surface Dust Accumulation: ≤ 4 percent opacity

Calibration Error: ≤ 3 percent opacity

2.5.4.2 Zero Alignment. The zero alignment is acceptable if the error of the simulated zero check is less then 2 percent opacity prior to adjustment.

The simulated zero check should be adjusted to provide the correct response each time the zero alignment audit is performed.

2.5.5 Out-of-Control Periods. The beginning of the out-of-control period is the time corresponding to the completion of the performance audit indicating unacceptable performance. The end of the out-of-control period is the time corresponding to the completion of the subsequent successful audit.

2.5.6 Corrective Actions.

2.5.6.1 Unacceptable Audit Results - Single Performance Audit. If the opacity CEM is out-of-control, take necessary corrective action to eliminate the problem. Following corrective action, the source owner or operator, at a minimum, must conduct an opacity CEM performance audit on the portion of the criteria that failed to determine whether the opacity CEM is operating properly. The opacity CEM operator shall include both the audit results showing the opacity CEM to be out-of-control and the results following corrective action showing the opacity CEM to be operating within specification in the quarterly report.

2.5.6.2 Unacceptable Audit Results - Multiple Performance Audits. Repeated audit failures (i.e., out-of-control conditions identified by the quarterly audits) indicate that the QC procedures are inadequate or that the opacity CEM is incapable of providing quality data. Therefore, whenever unacceptable performance occurs for two consecutive quarters, the source owner or operator must revise the QC procedures (see Part II, Section 2.3) or modify or replace the opacity CEM.

2.5.6.3 Unacceptable Zero Alignment - If the error of the simulated zero check prior to adjustment exceeds 5 percent opacity for any zero alignment audit or exceeds the 2 percent opacity acceptance criterion for three consecutive zero alignment audits, the performance of the monitoring system is unacceptable. The

source must take corrective action to resolve the problem and improve the stability of the simulated zero check method or device, or replace the opacity CEM. If the opacity CEM is not replaced, conduct zero alignment audits at least twice each year during non-consecutive calendar quarters. If the results of the semi-annual zero alignment audits exceed the above acceptance criteria, the owner or operator must replace the opacity CEM.

2.6 Calculations for Opacity CEM Audits.

2.6.1 Performance Audit Calculations. Follow the monitor-specific calculations contained in the appropriate section of Citation 1.

2.6.2 Zero Alignment Audit. Follow the procedures contained in Citation 1.

Citation 1. "Performance Audit Procedures for Opacity Monitors" EPA-600/8-87-025 April, 1987. Environmental Systems Laboratory, Research Triangle Park, North Carolina, 27711.

Part III
Specifications for a Remote Data Telemetry System

3.1 Introduction.

Sources that are required to install a Continuous Emission Monitor (CEM) are also required to install a direct, continuous, real-time, on demand telemetry system that provides the Department with immediate access to monitoring data. The system must be capable of accepting an output sensor signal that provides currently generated monitoring data and have the capability of storing certain processed data for seven days. It must also be capable of storing seven days of daily calibration checks for pollutant concentration and opacity. The data must be made available to the Department via non-dedicated but exclusive telephone lines. All data transfer will be initiated by the Department.

3.2 Equipment Requirements.

Each CEM source shall maintain a set of data files that can be accessed by AMA. AMA will access the data using an IBM compatible computer at 2400 Baud using the "Procomm Plus 1.1b" communications software.

The required data files are:

File 1: "Current"

Current CEM Readings for all required monitors in the following format:

Facility Name_____ Date_____ Time_____

Monitor I.D._____

Raw data readings_____

Current average for regulated pollutants_____

The raw data readings must be unaltered data obtained from the CEM devices with the same number of digits expressed as contained in the output of the

device. The current average column shall contain the average in units of the applicable standard for the last applicable block average.

File 2: "CALCHK:

The second data file shall contain the results of the calibration checks undertaken on all monitors for the most recent seven days in the following format:

Facility Name Date Time

Monitor I.D.

	Date 1	Date 2	Date 3	Date 4	Date 5	Date 6	Date 7
Zero							
Highlevel							

File 3: "Exceedances"

There shall be an additional data file for each regulated pollutant with a CEM which is to contain a list of all exceedances during the current quarter in the following format: Each file shall have a unique name composed of the letters EX and the Monitor ID for a total of 6 characters. For example, the sulfur dioxide monitor on Unit 2 would have an exceedance file with the name "EX 2SO2."

Facility Name Date Time

Monitor I.D.

Date	Time	Magnitude
_____	_____	_____
_____	_____	_____

3.3 Further Specifications.

All data must be right justified in their columns with four spaces between data fields. No file shall be wider than 80 characters. The length of data fields shall be as follows:

Facility Name: Maximum 20 characters in length.

Date: 6-8 characters, month/day/year e.g. 08/08/90 for August 8, 1990.

Time: 9 characters, military time e.g. 0913 for 9:13 a.m. and 1811 for 6:11 p.m.. This time shall indicate the time of last file update.

File name: 6 characters to abbreviate file names.

Monitor ID: 4 characters, beginning with the unit number followed by a 3-digit code for the pollutant monitored, SO_2 for sulfur dioxide, CO_2 for carbon dioxide, O_2, for oxygen, HCl for hydrogen chloride, CO, for carbon monoxide, TRS for reduced sulfur compounds, OPA for opacity monitoring. For example, the monitor ID for a sulfur dioxide monitor on Unit 2 would be "2SO2."

Additional data fields shall contain not more than 7 characters including the decimal point if necessary.

The source may use any method available to make the required files available. AMA recommends that the source file system contain the capability for restricted access via a password system. Although not recommended or required, Procomm + 1.1b has the ability to serve as a host system with password access.

ATTACHMENT F

Final Recommended Licensing Conditions
PSC Case No. 9199
Energy Answers Baltimore, LLC - Fairfield Renewable Energy Project

GENERAL CONDITIONS

G-1. Except as otherwise provided for in the following provisions, the application for the Certificate of Public Convenience and Necessity (CPCN) is considered to be part of this CPCN for the Energy Answers Baltimore, LLC (EA) Fairfield Renewable Energy Project (the "Fairfield Project" or "Project"). The application consists of the original application received by the Maryland Public Service Commission (PSC) in May 2009, the revised application received by the PSC in October 2009, and the Motion to Amend and technical amendment received by the PSC in January 2012. In the application, estimates of dimensions, volumes, emission rates, operating rates, feed rates and hours of operation are not deemed to constitute enforceable numeric limits except to the extent that they are necessary to make a determination of applicable regulations. Construction of the facility shall be undertaken in accordance with the CPCN application and subsequent amendments approved by the Commission. If there are any inconsistencies between the conditions specified below and the application, the conditions in this CPCN shall take precedence. If CPCN conditions incorporate federal or state laws through paraphrased language, where there is any inconsistency between the paraphrased language and the actual state or federal laws being paraphrased, the applicable federal or state laws shall take precedence.

G-2. If any provision of this CPCN shall be held invalid for any reason, the remaining provisions shall remain in full force and effect and such invalid provision shall be considered severed and deleted from this CPCN.

G-3. Representatives of the Maryland PSC shall be afforded access to the Fairfield Renewable Energy Project facility at any reasonable time to conduct inspections and evaluations necessary to assure compliance with the CPCN. EA shall provide such assistance as may be necessary to conduct such inspections and evaluations by representatives of the PSC effectively and safely.

G-4. Representatives of the Maryland Department of the Environment (MDE) and the Baltimore City Health Department shall be afforded access to the Fairfield Renewable Energy Project facility at any reasonable time to conduct inspections and evaluations necessary to assure compliance with the CPCN requirements. EA shall provide such assistance as reasonably may be necessary to conduct such inspections and evaluations effectively and safely, which may include but need not be limited to the following:

a) Inspecting construction authorized under this CPCN;

b) Sampling any materials stored or processed on site, or any waste or discharge into the environment;

c) Inspecting any monitoring or recording equipment required by this CPCN or applicable regulations;

d) Having access to or copying any records required to be kept by EA pursuant to this CPCN or applicable regulations;

e) Obtaining any photographic documentation and evidence; and

f) Determining compliance with the conditions and regulations specified in the CPCN.

G-5. Informational copies of the reports and notifications as described in Conditions A-2, A-8, A-13, A-15, A-20b, A-21 b-d, A-41, A-44, A-46, A-53, A-56, A-57, A-58, A-61, F-4, and E-7 shall be sent to the Maryland Power Plant Research Program (PPRP) at:

Power Plant Assessment Division
Department of Natural Resources
Tawes State Office Building, B-3
580 Taylor Avenue
Annapolis, Maryland 21401

AIR QUALITY REQUIREMENTS

General Air Quality Requirements

A-1. MDE Air and Radiation Management Administration (MDE-ARMA) shall have concurrent jurisdiction with the PSC to enforce the air quality conditions of this CPCN.

A-2. The CPCN serves as the Prevention of Significant Deterioration (PSD) approval, Nonattainment New Source Review (NA-NSR) approval, and air quality construction permit for the Fairfield Renewable Energy Project and does not constitute the permit to construct or approvals until such time as EA has provided documentation demonstrating that nitrogen oxides (NO_x) emission offsets totaling at least 781 tons, volatile organic compound (VOC) emission offsets totaling at least 125 tons, particulate matter less than 2.5 micrograms (PM2.5) emission offsets totaling at least 156 tons, and SO_2 (as a PM2.5 precursor) emission offsets totaling at least 446 tons have been obtained and approved by the MDE-ARMA and are federally enforceable. Should the PM2.5 Lowest Achievable Emissions Rate (LAER) limit be determined to be greater than the provisional LAER limit for PM2.5 in Condition 21(b) of 22 milligrams per dry standard cubic meter (mg/dscm) @ 7% O_2, EA shall be required to obtain additional PM2.5 offsets for the difference between the provisional and final LAER limit at a ratio of 1:1 within 180 days of the final PM2.5 limit having been imposed by MDE-ARMA.

A-3. For air permitting purposes, the facility shall be comprised of the following equipment:

a) Four spreader-stoker boilers ("combustors") each designed to operate at 450 million British thermal units per hour (MMBtu/hr), and each designed to combust an average of 1,000 tons per day (tpd) of Waste-derived Fuel to generate electricity and steam. High pressure steam from the boilers will drive one, nominal, 157-megawatt (MW) turbine generator. Each boiler shall be equipped with three, 150-million Btu per hour (MMBtu/hr) natural burners. Each boiler

shall be equipped with the following air pollution control systems: regenerative selective catalytic reduction (RSCR) to control NO_x emissions; an activated carbon injection system to control mercury and dioxin/furan emissions; a Turbosorp® (or equivalent) humidifying circulating bed scrubber with dry lime injection to neutralize acid gases; fabric filters (baghouses) to capture particulate matter; and an oxidation catalyst to control CO emissions;

b) Two four-celled water-cooled condenser cooling towers;

c) One diesel fuel-fired emergency generator, model year 2010 or later, with a power output of up to 500 kilowatts (kW));

d) Two diesel fuel-fired emergency fire water pumps, model year 2010 or later, with a power output of up to 100 kW;

e) Bottom ash handling system; and

f) Fly ash handling system.

A-4. Definitions:

a) "Automotive Shredder Residue" ("ASR") is defined as shredded interior plastic trim, upholstery fabric and filler, insulation and padding of end-of-life vehicles (ELV). ASR may consist of rubber, paper, hard plastic, vinyl, glass, and some aluminum and plated metals from the scrap, as well as rocks and dirt, the amount of which depends on scrap handling procedures.

b) "Malfunction" is defined as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process that operates in an abnormal or unusual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. Periods of malfunction shall not exceed 3 hours per occurrence, except if a loss of boiler water level control or combustion air control is determined to be a malfunction, the duration of the malfunction period is limited to 15 hours per occurrence [40 CFR 60.58b(a)(1) and 40 CFR 60.58b(a)(1)(iii)].

c) "Processed Refuse Fuel" ("PRF") is shredded municipal solid waste, commercial waste, and non-hazardous industrial wastes, after a portion of the ferrous metals is removed.

d) "Processed Urban Wood Waste" is wood fuel derived from both green and dried wood waste materials, and may include sawn lumber, pruned branches, stumps, and whole trees from street and park maintenance, shipping pallets, wood debris segregated from construction and demolition and land clearing and grubbing activities;

e) "Shutdown" is defined as that period of time that the combustor temperature is lowered, following cessation of the charging of Waste-derived Fuel to the combustor, and beginning at the point at which the temperature drops below 1,500°F and combustion firing with natural gas commences, and continuing until

natural gas stops flowing. Shutdown shall not exceed 3 hours per occurrence [40 CFR 60.58b(a)(1)];

f) "Startup" commences when a Fairfield combustor begins the continuous burning of Waste-derived Fuel and does not include any warmup period when that combustor is combusting fossil fuel, and no Waste-derived Fuel is being fed to the combustor [40 CFR 60.58b(a)(1)(i)]. Startup shall not exceed 3 hours per occurrence [40 CFR 60.58b(a)(1)] following which operation of the continuous burning of Waste-derived Fuel shall begin;

g) "Tire Derived Fuel" ("TDF") is a processed (ground) material made primarily from scrap tires that are no longer usable for their original intended purpose because of wear, damage, or defect;

h) "Warmup" is defined as the period of time from initiation of combustion firing with natural gas until the combustor's temperature can be maintained at or above 1,500°F for a period of at least one second after secondary air injection, and before any Waste-derived Fuel is introduced into the combustor;

i) "Waste-derived Fuel" shall consist of PRF, ASR, TDF, and Processed Urban Wood Waste. Other non-hazardous Waste-derived Fuel may only be combusted upon written approval from MDE-ARMA.

A-5. EA shall construct exhaust stacks for the Fairfield combustors at a minimum height of 295 feet above ground level.

A-6. In accordance with COMAR 26.11.02.04B, the air quality provisions expire if, as determined by MDE-ARMA:

a) Construction is not commenced within 36 months after the August 6, 2010 effective date of the CPCN issued in Case 9199;

b) Construction is substantially discontinued for a period of 18 months or more after it has commenced; or

c) Construction is not completed within a reasonable period of time after the issuance of a final CPCN.

A-7. At least 60 days prior to the anticipated date of initial startup of the facility, EA shall submit to MDE-ARMA an application for a temporary permit to operate.

A-8. All requirements pertaining to air quality that apply to EA shall apply to all subsequent owners and/or operators of the facility. In the event of any change in control or ownership, EA shall notify the succeeding owner/operator of the existence of the requirements of this CPCN pertaining to air quality by letter and shall send a copy of that letter to the PSC and MDE-ARMA.

Plant-wide Air Requirements

A-9. The Fairfield Project is subject to all applicable federally enforceable air quality requirements including, but not limited to, the following regulations:

a) *Testing and Monitoring*—Requires EA to follow test methods described in COMAR 26.11.01.04C to determine compliance. MDE-ARMA may require EA to install, use, and maintain monitoring equipment or employ other methods as specified by MDE-ARMA to determine the quantity or quality, or both, of emissions discharged into the atmosphere and to maintain records and make reports on these emissions to MDE-ARMA in a manner and on a schedule approved by MDE-ARMA [COMAR 26.11.01.04A-C];

b) *Emission Statements*—Requires EA to submit a certified, facility-wide emission statement to MDE-ARMA by April 1 of each year [COMAR 26.11.01.05-1];

c) *Malfunctions and Other Temporary Increase of Emissions*—Requires EA to report the onset and the termination of the occurrence of excess emissions, expected to last or actually lasting for one hour or more to MDE-ARMA by telephone [COMAR 26.11.01.07C-F];

d) *Permits, Approval, and Registration: Title V Permits*—Requires EA to apply for and obtain a Part 70 permit from MDE-ARMA [COMAR 26.11.03.01];

e) *Particulate Matter From Materials Handling and Construction*—Prohibits EA from causing or permitting any material to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne [COMAR 26.11.06.03D];

f) *Control of NSPS Source*—Prohibits EA from constructing, modifying, or operating, or causing to be constructed, modified, or operated, a New Source Performance Standard source as defined in COMAR 26.11.01.01C, which results or will result in violation of the provisions of 40 CFR Part 60 [COMAR 26.11.06.12];

g) *Control of PSD Source*—Prohibits EA from constructing, modifying, or operating, or causing to be constructed, modified, or operated, a PSD source, as defined in COMAR 26.11.01.01B(37), which will result in a violation of any provision of 40 CFR §52.21, 2009 edition, except that the reviewing authority is MDE-ARMA instead of the U.S. EPA Administrator, unless otherwise specified in 40 CFR §52.1116, and the applicable procedures are those set forth in COMAR 26.11.02 [COMAR 26.11.06.14]; and

h) *Requirements for Major New Sources and Modifications, General Conditions*—Requires EA to meet the reasonable further progress requirements in §173(a)(1)(A) of the Clean Air Act by obtaining emission reductions (offsets) of the same pollutant from existing sources in the area of the proposed source, whether or not under the same ownership, at a minimum ratio of 1.3 to 1 for sources of NO_x and VOCs in Baltimore City, Maryland [COMAR 26.11.17.03B(3)].

A-10. EA is subject to all applicable State-only air quality requirements including, but not limited to, the following regulations:

a) *Title V Fee Schedule*—Requires EA to pay annual Title V operating permit fees [COMAR 26.11.02.19A];

b) *Nuisance*—Prohibits EA from operating or maintaining any source in such a manner that a nuisance is created [COMAR 26.11.06.08];

c) *Odors*—Prohibits EA from causing or permitting the discharge into the atmosphere of gases, vapors, or odors beyond the property line in such a manner that a nuisance or air pollution is created [COMAR 26.11.06.09]; and

d) *Toxic Air Pollutants (TAPs)*—Requires EA to comply with the requirements for the assessment of TAPs set forth in COMAR 26.11.15 and 26.11.16 [COMAR 26.11.15.03A(2)].

Emissions and Operational Requirements for the Combustors

A-11. Emissions shall be limited to the following in any consecutive 12-month rolling period, including emissions during periods of startup, shutdown, and malfunction:

Pollutant	Emission Limit for All EA Fairfield Combustors Combined (tons per year)	Emission Limit for Entire EA Fairfield Project (tons per year)
Particulate Matter (PM) - Filterable	70	147
Particulate Matter (PM10) - Filterable+Condensible	167	182
Particulate Matter (PM2.5) - Filterable+Condensible	153	156
Sulfur Dioxide (SO_2)	446	446
Nitrogen Oxides (NO_x)	600	601
Volatile Organic Compounds (VOCs)	96	96
Carbon Monoxide (CO)	653	654
Sulfuric Acid Mist (SAM)	110	110
Municipal Waste Combustor Organics	7.0E-05	7.0E-05
Municipal Waste Combustor Metals (Measured as PM) (Measured as Cadmium) (Measured as Lead)	 70 7.0E-02 0.5	 70 7.0E-02 0.5
Municipal Waste Combustor Acid Gases (Measured as HCl) (Measured as SO_2)	 228 446	 228 446
Greenhouse Gases measured as Carbon Dioxide Equivalent (CO_2e)[1]	--	2,045,088

[1] Inclusive of both the biogenic and non-biogenic emissions.

A-12. Subject to the provisions of Condition A-13, annual average mercury emissions shall be limited to the following in any consecutive 12-month rolling period, including emissions during periods of startup, shutdown and malfunction:

Pollutant	Emission Limit for All EA Fairfield Combustors Combined (pounds per year)	Emission Limit for Entire EA Fairfield Project (pounds per year)
Municipal Combustor Metals (Measured as Mercury)	240	240

A-13. Notwithstanding the mercury mass emission limitation contained in Condition A-12, EA shall use its best efforts to achieve a lower annual average mercury mass emission limitation of 56 pounds per year. In the event average annual mercury mass emissions exceed 56 pounds per year, no later than 30 days following the date upon which submission of its annual emissions certification to MDE is due pursuant to Condition A-54, EA shall:

a) At its own expense, retain the services of an independent consultant approved by MDE to perform an optimization study of the mercury control technology and Mercury Diversion Plan (Condition F-4) and prepare a report making recommendations for improving the efficiency of the mercury control technology and the effectiveness of the Mercury Diversion Plan;

b) Ensure that the optimization study and report are completed no later than three months following the date EA submits the annual emissions certification to MDE;

c) Submit the optimization study report to MDE for review and approval no later than twenty (20) business days following EA's receipt of the report;

d) Implement the report's recommendations no later than 60 days following MDE's approval of the report, unless MDE agrees to an extended implementation schedule; and

e) Perform a streambank mercury mitigation project, in addition to the annual mitigation project(s) required by Condition E-7, which is approved by MDE, and which will offset on a 1:1 ratio, mercury deposition in an approved water body, resulting from mercury emissions in excess of 56 pounds per year not to exceed 1,310 linear feet of streambank, or such other equivalent mitigation project approved by MDE. Direct mercury deposition to water resulting from EA's emissions shall be determined by emissions and transport modeling to be conducted by DNR-PPRP, or such other methodology proposed by EA and approved by MDE.

A-14. The mercury mass emission limitation set forth in Condition A-13 is provisional and subject to revision, if, based upon MDE-ARMA's review of mercury emissions data from the first two years of commercial operation after all four boilers are operational, or in any subsequent single year, and following an evaluation by MDE-ARMA of the effectiveness of the Mercury Diversion Plan and a mercury control technology

optimization study performed at EA's expense by an independent consultant, MDE determines that a mercury mass emission limitation below 56 pounds per year is achievable.

A-15. No less than 180 days prior to initiation of commercial operation of the first facility boiler, EA shall submit to MDE, for review and approval, written notice of EA's intent to commence commercial operation of the first boiler and a plan to optimize the reduction of mercury emissions using the systems and practices required by Condition A-20. The plan shall include a schedule for implementation. EA shall implement the plan as approved or amended by MDE.

A-16. The Fairfield combustors are each subject to all applicable federally enforceable air quality requirements including, but not limited to, the following regulations:

a) *Visible Emissions*—Prohibits EA from causing or permitting the discharge of emissions from any incinerator, other than water in an uncombined form, which are visible to human observers [COMAR 26.11.08.04B]; exceptions: these requirements do not apply to emissions during startup, or adjustments or occasional cleaning of control equipment if [COMAR 26.11.08.04C]:

   i) The visible emissions are not greater than 40 percent opacity; and

   ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period;

b) *Particulate Matter*—Prohibits EA from causing or permitting the discharge of particulate matter into the outdoor atmosphere that exceeds 0.03 grains per dry standard cubic feet (gr/dscf) [COMAR 26.11.08.05];

c) *Incinerator Operator Training*—Requires EA to comply with the incinerator operator training and certification requirements of COMAR 26.11.08.09; and

d) *Control of NO_x Emissions for Major Stationary Sources*—Prohibits EA from causing or permitting the discharge of NO_x emissions that exceed 205 parts per million (ppm) on a 24-hour average basis (COMAR 26.11.08.08) or applicable Prevention of Significant Deterioration limits, whichever is more restrictive [COMAR 26.11.09.08H(3)].

A-17. When burning natural gas, the EA Fairfield combustors are each subject to all applicable State-only air quality requirements including, but not limited to, the following regulations:

a) *Visible Emissions*—Prohibits EA from causing or permitting the discharge of emissions from any fuel burning equipment, other than water in an uncombined form, which is visible to human observers. [COMAR 26.11.09.05A(2)]. This limitation does not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if [COMAR 26.11.09.05A(3)]:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period.

b) *Control of NO_x Emissions for Major Stationary Sources*—Prohibits EA from causing or permitting the discharge of NO_x emissions that exceed 0.2 lb/MMBtu [COMAR 26.11.09.08B].

c) *NSPS*—The natural gas-fired burners shall be subject to all applicable requirements of the Standards Of Performance For Electric Utility Steam Generating Units For Which Construction Is Commenced After September 18, 1978 (40 CFR Part 60, Subpart Da) and SO_2 emissions shall not exceed 180 ng/J (1.4 lb/MWh) gross energy output on a 30-day rolling average basis or 5 percent of the potential combustion concentration (95 percent reduction) on a 30-day rolling average basis.

A-18. The Fairfield combustors shall be subject to applicable requirements of the Standards of Performance For Large Municipal Waste Combustors For Which Construction Is Commenced After September 20, 1994 Or For Which Modification Or Reconstruction Is Commenced After June 19, 1996 (40 CFR Part 60, Subpart Eb), including but not limited to, provisions related to emission limitations, notifications, performance testing, monitoring, and recordkeeping and to applicable requirements of 40 CFR Part 60, Subpart A.

A-19. EA shall not cause to be emitted into the atmosphere from each combustor emissions in excess of the standards listed in Table A.

a) The standards shall apply at all times when Waste-derived Fuel is being continuously burned;

b) The use of Waste-derived Fuel solely to provide thermal protection of the grate or hearth during the startup period when Waste-derived Fuel is not being fed to the grate is not considered to be continuous burning [40 CFR 60.58b(a)(1)(ii)].

A-20. To meet Best Available Control Technology (BACT) requirements, when burning Waste-derived Fuel alone or in conjunction with natural gas:

a) Emissions of NO_x, PM, PM10, CO, MWC Organics, MWC Acid Gases (HCl, SO_2), MWC Metals (Hg, Pb, Cd), HF, sulfuric acid mist (SAM), and GHG from the Fairfield combustors shall not exceed the limits listed in Table A through the installation, maintenance and operation of the following:

i) An activated carbon injection system;

ii) A Turbosorp® (or equivalent) humidifying dry lime injection system;

iii) A fabric filter baghouse;

iv) A regenerative selective catalytic reduction (RSCR) system;

v) Oxidation catalyst;

vi) Application of good combustion practices.

b) The emission limit for PM10, inclusive of the filterable and condensable fractions, is subject to revision in accordance with the terms of this condition. Following the initial performance test for PM10, inclusive of the filterable and condensable fractions, EA shall perform a minimum of four (4) and a maximum of eight (8) quarterly performance tests, at an interval of not fewer than 90 days and not more than 120 days between tests. EA shall submit the results of each quarterly test to MDE-ARMA within 30 days of receiving the results. Based on an analysis of the PM10 emissions test data resulting from the initial and quarterly performance tests, EA shall propose to MDE-ARMA a final PM10 emission limit, inclusive of the filterable and condensable fractions. EA shall submit the proposed final emission limit and EA's supporting analysis to demonstrate that the limit represents Best Available Control Technology (BACT) to MDE-ARMA within 45 days after EA has submitted the final quarterly test results to MDE-ARMA.

A-21. To meet Lowest Achievable Emissions Rate (LAER) requirements, when burning Waste-derived Fuel alone or in conjunction with natural gas,

a) Emissions of NO_x, VOC, PM2.5, and SO_2 shall not exceed limits listed in Table A through the installation, maintenance and operation of the following:

i) A Turbosorp® (or equivalent) humidifying dry lime injection system;

ii) A fabric filter baghouse;

iii) A regenerative selective catalytic reduction (RSCR) system; and

iv) Application of good combustion practices.

b) The emission limit for PM2.5, inclusive of the filterable and condensable fractions, is subject to revision in accordance with the terms of this condition. Following the initial performance test for PM2.5, inclusive of the filterable and condensable fractions, EA shall perform a minimum of four (4) and a maximum of eight (8) quarterly performance tests, at an interval of not fewer than 90 days and not more than 120 days between tests. EA shall submit the results of each quarterly test to MDE-ARMA within 30 days of receiving the results. Based on an analysis of the PM2.5 emissions test data resulting from the initial and quarterly performance tests, EA shall propose to MDE-ARMA a final PM2.5 emission limit, inclusive of the filterable and condensable fractions. EA shall submit the proposed final emission limit and EA's supporting analysis to demonstrate that the limit represents LAER to MDE-ARMA within 45 days after EA has submitted the final quarterly test results to MDE-ARMA.

c) Following the completion of two full years of commercial operation, MDE-ARMA shall re-evaluate the LAER emission limits for SO_2 and NO_x given in Table A and investigate more stringent LAER emission limits if an adequate technical basis for doing so can be established, based on the first two years of

operational experience. Within 90 days following the completion of two full years of commercial operation, EA shall submit to MDE-ARMA a technical analysis, based on emissions and operating data compiled during the first two years of operation, demonstrating whether or not new, more stringent LAER emission limits for SO_2 and NO_x are technically appropriate without modification of design or operation, and in any case, the appropriate numerical values for the limits that would preserve an adequate margin of safety between actual performance and any revised LAER limit.

d) At least 120 days prior to initial startup of any combustor unit, EA shall submit to MDE-ARMA for review and approval, an Emission Limit Optimization Plan that describes the specific emissions and operating data that will be collected and recorded over the course of the initial two years of operation, to serve as the technical basis for developing potentially more stringent emission limits for NO_x, SO_2 and PM2.5. EA shall also propose in the Emission Limit Optimization Plan the statistical and other analyses to be undertaken for developing the potentially more stringent emission limits.

A-22. EA shall limit emissions of ammonia resulting from unreacted ammonia ("ammonia slip") emitted from the RSCR to 20 parts per million by volume, dry basis, corrected to 7 percent oxygen. Compliance with the ammonia slip limit shall be determined based on a 24-hour block average basis.

a) Compliance with the ammonia slip limit shall be demonstrated by using the following calculation procedure: ammonia slip ppmvd@7% oxygen = ((a-(bxc/1,000,000)) x 1,000,000/b) x d

where:
a = aqueous ammonia injection rate (lb/hr)/17 (lb/lb-mole),
b = dry exhaust gas flow rate (lb/hr)/29 (lb/lb-mole),
c = change in measured NO_x concentration ppmv, dry at 7% oxygen across catalyst, and
d = correction factor.

The correction factor shall be derived during compliance testing by comparing the measured and calculated ammonia slip.

b) Alternatively, EA may request permission from MDE-ARMA to utilize a continuous in-stack ammonia monitor acceptable to MDE-ARMA to monitor ammonia emissions.

A-23. EA shall not operate the combustors at a unit load level greater than 110% of the maximum demonstrated municipal waste combustor unit load [40 CFR 60.53b(a)], except for testing purposes, as specified in 40 CFR 60.53b(b). Unit load means the steam load of the municipal waste combustor as specified in 40 CFR 60.58b(i)(6). Maximum demonstrated municipal combustor load means the load as defined in 40 CFR 60.51b.

A-24. Municipal waste combustor unit capacity shall be calculated using the procedures in 40 CFR 60.58b(j).

A-25. EA shall develop and update, at least each calendar year, a site-specific operating manual that shall, at a minimum, address the elements of municipal waste combustor unit operations specified in 40 CFR 60.53b(e). EA shall maintain the manual on site and make it available to MDE-ARMA upon request.

A-26. EA shall not cause the combustors to operate at a temperature, measured at the particulate matter control device inlet, exceeding 17°C above the maximum demonstrated particulate matter control device temperature defined in 40 CFR 60.51b, except during certain specified types of testing [40 CFR 60.53b(c)].

A-27. EA shall comply with the operator training and certification requirements outlined in 40 CFR 60.54b.

A-28. EA shall use the procedures in 40 CFR 60.58b(i) to determine compliance with applicable operating requirements.

A-29. Warmup on Waste-derived Fuel is prohibited. During warmup, auxiliary fuel (natural gas) shall be used to achieve combustion chamber operating temperature.

Emissions and Operational Requirements for Emergency Diesel Generator and Firewater Pump Engines

A-30. The emergency diesel generator and the two firewater pump engines are each subject to all applicable federally enforceable air quality requirements including, but not limited to, the following regulations:

a) *Visible Emissions*—Prohibits EA from causing or permitting the discharge of emissions from any fuel burning equipment, other than water in an uncombined form, which is visible to human observers. [COMAR 26.11.09.05A(2)]. This limitation does not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if [COMAR 26.11.09.05A(3)]:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period.

b) *Visible Emissions Stationary Internal Combustion Engine Powered Equipment*—Prohibits EA from causing or permitting the discharge of emissions from any engine [COMAR 26.11.09.05B(2)-(4)]:

i) Operating at idle at an opacity greater than 10 percent; or

ii) At conditions other than idle at an opacity greater than 40 percent.

c) *Control of Sulfur Oxides from Fuel Burning Equipment*—Prohibits EA from burning, selling or making available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds 0.3 percent for distillate fuel oils [COMAR 26.11.09.07A(2)(c)]; and

d) *Control of NO_x Emissions For Major Stationary Sources: Requirements for Fuel-Burning Equipment with a Rated Heat Input Capacity of 100 Million Btu Per Hour or Less*—Requires EA to do the following for each piece of fuel burning equipment with a rated heat input capacity of 100 MMBtu per hour or less [COMAR 26.11.09.08E(1-5)]:

i) Submit to MDE-ARMA (for each installation) an identification, information on the rated heat input capacity of the unit, and the type of fuel burned;

ii) Perform a combustion analysis at least once each year;

iii) Maintain the results of the combustion analysis for at least 2 years;

iv) Once every 3 years, require an operator to attend operator training programs on combustion optimization; and

v) Prepare and maintain a record of training program attendance.

A-31. The emergency diesel generator and firewater pump engines shall each be designed to meet applicable requirements of 40 CFR §60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR §60.4200, *et seq.*) and related applicable requirements of 40 CFR §60 Subpart A – General Provisions (40 CFR §60.1, *et seq.*), including, but not limited to the following:

a) The nominal 500-kW emergency diesel generator shall be designed to meet applicable requirements of 40 CFR §60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR §60.4200, *et seq.*). Emission limits as listed below shall be achieved through the exclusive use of ultra low sulfur diesel fuel and a restriction on hours of operation of 250 hours in any consecutive 12-month period for routine maintenance and testing:

i) Combined NO_x and non-methane hydrocarbons (NMHC) emissions shall not exceed 4.0 grams per kilowatt-hour (g/kW-hr);

ii) CO emissions shall not exceed 3.5 g/kW-hr; and

iii) PM/PM10 emissions shall not exceed 0.2 g/kW-hr.

b) The two nominal 100-kW firewater pump engines shall each be designed to meet the applicable requirements of 40 CFR §60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR §60.4200, *et seq.*). These emission limits as listed below shall be achieved through the exclusive use of ultra low sulfur diesel fuel and a restriction on hours of operation of 250 hours each in any consecutive 12-month period for routine maintenance and testing:

i) Combined NO_x and NMHC emissions shall not exceed 4.0 g/kW-hr;

ii) CO emissions shall not exceed 5.0 g/kW-hr; and

iii) PM/PM10 emissions shall not exceed 0.3 g/kW-hr.

A-32. To meet BACT requirements, emissions from the nominal 500-kW emergency diesel generator shall not exceed the following limits through the use of ultra-low sulfur diesel fuel, good combustion practices and a limitation on the hours of operation of 250 hours per year:

i) PM/PM10 emissions shall not exceed 0.2 g/kW-hr;

ii) Combined NO_x and NMHC emissions shall not exceed 4.0 g/kW-hr;

iii) CO emissions shall not exceed 3.5 g/kW-hr (emergency generator);

iv) SO_2 emissions shall not exceed 0.0084 g/kW-hr;

v) GHG emissions shall not exceed the CO_2e limit for the entire EA facility, including emissions from the emergency diesel generator, listed in Condition A-11; and

vi) SAM emissions shall be controlled by the exclusive use of ultra low-sulfur diesel fuel with a sulfur content not to exceed 15 parts per million by weight (ppmw).

A-33. To meet BACT requirements, emissions from each of the two nominal 100-kW firewater pump engines shall not exceed the following limits through the use of ultra-low sulfur diesel fuel, good combustion practices and a limitation on the hours of operation of 250 hours each per year:

i) PM/PM10 emissions shall not exceed 0.3 g/kW-hr;

ii) Combined NO_x and NMHC emissions shall not exceed 4.0 g/kW-hr;

iii) CO emissions shall not exceed 5.0 g/kW-hr;

iv) SO_2 emissions shall not exceed 0.0084 g/kW-hr;

v) GHG emissions shall not exceed the CO_2e limit for the entire EA facility, including from the two firewater pump engines, listed in Condition A-11; and

vi) SAM emissions shall be controlled by the exclusive use of ultra low-sulfur diesel fuel with a sulfur content not to exceed 15 parts per million by weight (ppmw).

A-34. To meet LAER requirements, emissions from the nominal 500-kW emergency diesel generator shall not exceed the following limits through the use of ultra-low sulfur diesel fuel, good combustion practices and a limitation on the hours of operation of 250 hours per year:

i) Combined NO_x and NMHC emissions shall not exceed 4.0 g/kW-hr;

ii) PM2.5 emissions shall not exceed 0.2 g/kW-hr; and

iii) SO_2 emissions shall not exceed 0.0084 g/kW-hr.

A-35. To meet LAER requirements, emissions from the each of two nominal 100-kW firewater pump engines shall not exceed the following limits through the use of ultra-low sulfur diesel fuel, good combustion practices and a limitation on the hours of operation of 250 hours each per year:

i) Combined NO_x and NMHC emissions shall not exceed 4.0 g/kW-hr;

ii) PM2.5 emissions shall not exceed 0.3 g/kW-hr; and

iii) SO_2 emissions shall not exceed 0.0084 g/kW-hr.

A-36. The emergency diesel generator and firewater pump engines are subject to National Emission Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines ("RICE MACT"), 40 CFR Part 63, Subpart ZZZZ.

Emissions and Operational Requirements for Cooling Towers

A-37. EA is prohibited from causing or permitting the discharge of emissions from the Fairfield cooling towers, other than water in an uncombined form, which are visible to human observers [COMAR 26.11.06.02C(2)].

A-38. To meet BACT requirements for PM and PM10, and LAER requirements for PM2.5, the cooling towers shall be equipped with high efficiency drift eliminators designed to achieve a drift loss not to exceed 0.0005% of recirculating water flow and emissions shall not to exceed 27.0 pounds per day (lb/day) of PM, 4.2 lb/day of PM10, and 0.03 lb/day of PM2.5.

Testing and Monitoring Requirements

A-39. EA shall comply with all the testing and monitoring requirements of 40 CFR Part 60, Subpart Eb including, but not limited to the following:

a) EA shall install, calibrate, maintain, and operate continuous emissions monitoring systems (CEMS) for CO [40 CFR 60.58b(i)], NO_x, [40 CFR 60.58b(h)], SO_2 [40 CFR 60.58b(c)], opacity [40 CFR 60.58b(c)], steam flow meter (or feedwater flow meter) [40 CFR 60.58b(i)] on each of the combustors;

b) EA shall install, calibrate, maintain, and operate CEMS for measuring carbon dioxide (CO_2) content of the flue gas at each location where CO, SO_2, and NO_x are monitored continuously; and if EA elects to monitor PM continuously, CO_2 content of the flue shall also be measured at that location. Testing of the CEMS shall comply with 40 CFR 60.58b(b);

c) CEMS data shall be dismissed or excluded from compliance calculations during periods of startup, shutdown or malfunction, but shall be recorded and reported in accordance with 40 CFR 60.59b(d)(7);

d) EA shall install, calibrate, maintain and operate a device for measuring, on a continuous basis, the temperature of the flue gas stream at the inlet to each particulate matter control device to determine compliance with the maximum particulate matter control device temperature requirements. Temperature shall be calculated in 4-hour block arithmetic averages [40 CFR 60.58b(i)].

e) EA shall install, calibrate, maintain, and operate a meter to monitor exhaust flow rates in the flue gas of each combustor.

f) EA shall install, calibrate, maintain, and operate a CEMS for mercury on each unit in accordance with 40 CFR 60.58b(d)(4), and shall record the output of the CEMS according to 40 CFR 60.58b(n) and (o).

EA shall maintain records of all CEMS data and shall provide MDE with an annual report evaluating the performance of the mercury CEMs. The report shall be due 30 days following the end of the first and second full years of operation.

In lieu of demonstrating compliance with mercury emission limitations by use of stack testing, EA may, at any time, elect to use the CEMS to demonstrate compliance with the mercury emissions limits in Table A. Commencing two years following the date of initial startup, and following review of the CEMS annual performance reports required by this Condition, MDE may require the use of CEMS to demonstrate compliance with the Hg emission limits in Table A. Should the Hg CEMS be used to demonstrate compliance, such demonstration shall be based on 24-hour daily block averages of hourly arithmetic concentrations [40 CFR 60.58b(d)(4) and (n)]. Should use of the Hg CEMS be required to demonstrate compliance, then EA is not required to conduct further stack tests for Hg as specified in Condition A-45 [40 CFR 60.58b(d)(4)];

g) During the performance tests for dioxin/furans and mercury, as applicable, EA shall establish an average carbon mass feed rate based on carbon injection system operating parameters being employed [40 CFR 60.58b(m)(1)];

h) An average carbon mass feed rate in kilograms per hour or pounds per hour shall be estimated by EA during the initial performance tests for mercury emissions and each subsequent performance test for mercury emissions [40 CFR 60.58b(m)(1)(i)];

i) An average carbon mass feed rate in kilograms per hour or pounds per hour shall be estimated by EA during the initial performance tests for dioxin/furan emissions and each subsequent performance test for dioxin/furan emissions [40 CFR 60.58b(m)(1)(ii)]; and

j) During operation of the EA Fairfield combustors, the carbon injection system operating parameters that are the primary indicators of the carbon mass feed rate

must be equal to or exceed the levels documented during the performance tests specified under 40 CFR 60.58b(m)(1)(i) and (ii).

A-40. EA shall comply with all applicable testing and monitoring requirements of 40 CFR Part 60, Subpart Da for each of the Fairfield combustors including, but not limited to, the following:

a) EA shall install, calibrate, maintain, and operate a wattmeter; measure gross electrical output in MWh on a continuous basis; and record the output of the monitor [40 CFR §60.49Da(k)(1)];

b) EA shall install, calibrate, maintain, and operate meters for steam flow, temperature, and pressure; measure gross process steam output in joules per hour (or Btu per hour) on a continuous basis; and record the output of the monitor [40 CFR §60.49Da(k)(2)]; and

c) EA shall prepare and submit to MDE-ARMA for approval a unit-specific monitoring plan for each monitoring system, at least 45 days before commencing certification testing of the monitoring systems. The owner or operator shall comply with the requirements contained in an approved plan [40 CFR §60.49Da(s)].

A-41. At least 30 days prior to conducting any compliance stack test, EA shall submit a test protocol to MDE-ARMA for review and approval.

a) Compliance stack testing shall be conducted in accordance with MDE-ARMA Technical Memorandum (TM) 91-01, "Test Methods and Equipment Specifications for Stationary Sources" (January 1991), as amended by Supplement 1 (1 July 1991), 40 CFR §51, 40 CFR §60, or subsequent test protocols approved by MDE-ARMA; and

b) Test ports shall be located in accordance with TM 91-01 (January 1991), or subsequent or alternative measures approved by MDE-ARMA.

A-42. Compliance stack testing of the combustors shall be conducted within 180 days after initial startup to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: PM, PM10, PM2.5, SAM, CO, HCl, Hg, dioxin/furans, Cd, and Pb. Emissions of NO_x and SO_2 shall be determined based on the 24-hour daily arithmetic average of the hourly emission concentrations from the CEMS. For all other pollutants, EA may request approval from EPA and MDE-ARMA to use certified CEMS in lieu of stack testing for compliance. Initial performance tests shall comply with applicable requirements outlined in 40 CFR 60.59b(f).

A-43. In accordance with COMAR 26.11.01.04A, EA may be required by MDE-ARMA to conduct additional stack tests at any reasonable time, to determine compliance with COMAR Title 26, Subtitle 11.

A-44. EA shall submit a facility Operation and Maintenance (O&M) Plan to MDE-ARMA for review and approval at least 60 days prior to anticipated startup of any of the combustors, air pollution control equipment, emergency diesel generator, fire water pump engines, and cooling towers.

a) At a minimum, the O&M Plan shall identify all air pollution control equipment and normal operating range of each piece of equipment, and shall include a preventative maintenance program for the equipment, a description of the corrective actions to be taken to restore the equipment to proper operation to meet applicable permit conditions, a description of the employee training programs for proper operation and maintenance of the control equipment, and the records kept to demonstrate plan implementation.

b) EA shall retain a copy of the O&M Plan on site at all times, and it shall be available to MDE-ARMA upon request.

A-45. Subject to Condition A-39f, EA shall conduct stack testing for Hg emissions from each unit each calendar quarter to demonstrate compliance with the emission limits in Table A.

A-46. EA shall determine compliance with the BACT and LAER limits as follows:

a) For the Fairfield combustors, EA shall conduct the performance tests and continuous compliance demonstration methods specified in Table A;

b) For the emergency diesel generator and the firewater pumps, EA shall conduct initial performance tests or provide the manufacturers' certifications;

c) For the cooling towers, EA shall monitor:

i) The conductivity of the circulating water to determine the concentrations of total dissolved solids (TDS); and

ii) The flow rate of the circulating water.

d) At least 60 days prior to commencing operation, EA shall submit a detailed monitoring plan to MDE-ARMA for approval. MDE-ARMA shall approve the plan prior to startup of any of these emissions units.

Recordkeeping and Reporting

A-47. EA shall maintain and provide reports as specified in 40 CFR Part 60, Subpart Eb including, but not limited to the following:

a) EA shall maintain records of CEMS data, hours in which CEMS data was not collected, exceedance data (with description of corrective action), and all records that apply to active carbon control [40 CFR 60.59b(d)];

b) EA shall submit an initial performance test report including information specified in paragraphs 40 CFR 60.59b(f);

c) Following the first year of operation, EA shall submit an annual report that includes the information as outlined in 40 CFR 60.59b(g);

d) EA shall submit a semi-annual report that includes the information as outlined in 40 CFR 60.59b(h);

e) EA shall estimate the total carbon usage of the plant for each calendar quarter by two independent methods as stated in conditions i) and ii) below [40 CFR 60.58b(m)(3)];

i) EA shall estimate total carbon usage at the plant by maintaining records of the weight of carbon delivered to the plant on a quarterly basis [40 CFR 60.58b(m)(3)(i)]; and

ii) EA shall estimate the average carbon mass feed rate for each hour of operation for each affected facility based on the carbon feed system parameters specified during performance testing. EA shall sum the results for all affected facilities at the plant for the total number of hours of operation during the calendar quarter [40 CFR 60.58b(m)(3)(ii)].

A-48. EA shall maintain and provide reports as specified in 40 CFR Part 60, Subpart Da including, but not limited to the following:

a) For SO_2 emissions and opacity, the performance evaluation of the continuous monitors (including the transmissometer) are submitted to the Administrator [40 CFR §60.51Da(a)];

b) SO_2 emission rates for each 30 successive combustor operating days, ending with the last 30-day period in the quarter; reasons for non-compliance with the emission standards; and, description of corrective actions taken [40 CFR §60.51Da(b)];

c) Reporting requirement for missing data during any 30 successive combustor operating days [40 CFR §60.51Da(c)];

d) EA shall submit a signed statement if any standards under 40 CFR 60.43Da are exceeded during emergency conditions because of control system malfunction [40 CFR §60.51Da(d)];

e) For any periods for which opacity or SO_2 emissions data are not available, EA shall submit a signed statement indicating if any changes were made in operation of the emission control system during the period of data unavailability. Operations of the control system and affected facility during periods of data unavailability are to be compared with operation of the control system and affected facility before and following the period of data unavailability [40 CFR §60.51Da(f)];

f) EA shall submit a signed statement indicating whether the required CEMS calibration, span, and drift checks or other periodic audits have or have not been performed as specified [40 CFR §60.51Da(h)];

g) EA shall submit written reports required under this section and subpart A to the Administrator semi-annually for each six-month period. All semi-annual reports shall be postmarked by the 30th day following the end of each six-month period [40 CFR §60.51Da(j)]; and

h) EA may submit electronic quarterly reports for SO_2 in lieu of submitting the written reports required under this section. The format of each quarterly electronic report shall be coordinated with the permitting authority. The electronic report(s) shall be submitted no later than 30 days after the end of the calendar quarter and shall be accompanied by a certification statement from EA, indicating whether compliance with the applicable emission standards and minimum data requirements of this subpart was achieved during the reporting period. Before submitting reports in the electronic format, EA shall coordinate with the permitting authority to obtain their agreement to submit reports in this alternative format [40 CFR §60.51Da(k)].

A-49. EA shall record daily fuel charging rates to each combustor and hours of operation of each combustor. Daily charging rates will be determined by using the average combustor evaporation rate (lb steam per lb of fuel combusted) and daily total steam produced for each combustor.

A-50. EA shall monitor and maintain records of aqueous ammonia injection rates and hourly dry exhaust gas flow rates on site and make the records available for review by MDE-ARMA upon request.

A-51. EA shall maintain a record of the activated carbon injection rate for each unit and shall make such records available to MDE-ARMA upon request.

A-52. EA shall submit a report to MDE-ARMA to be postmarked by the 30th day following the end of each calendar quarter that:

a) Summarizes separately the date, time, and duration of each startup, shutdown, or malfunction that occurred at each combustor during the prior period. The report shall include total monthly and 12-month rolling total hours of startup, shutdown, and malfunction for each combustor;

b) Summarizes the monthly and 12-month rolling total combustor hours of operation;

c) Summarizes total monthly and 12-month rolling total emissions (in tons per year, inclusive of periods of startup and shutdown) of PM, PM10, PM2.5, SO_2, NO_x, CO, VOCs, sulfuric acid mist, MWC Organics, MWC Metals, MWC Acid Gases, and CO_2e separately for each combustor, and for total emissions of those pollutants facility-wide;

d) Summarizes the total amount of Waste-derived Fuel and PRF combusted at the Fairfield facility on successive 12-month rolling periods;

e) Summarizes the monthly and 12-month rolling total amount of steam generated from the four combustors; and

f) Summarizes the monthly and the 12-month rolling average GHG emissions intensity from the four combustors (in tons CO_2e per million pounds of steam generated).

A-53. Final results of each compliance stack test must be submitted to MDE-ARMA within 60 days after completion of the test unless otherwise specified in these conditions. Analytical data shall be submitted to MDE-ARMA directly from the emission testing company.

A-54. EA shall certify the actual emissions of regulated pollutants from the facility [COMAR 26.11.01.05-1]:

a) Certification shall be on a form obtained from MDE-ARMA and shall be submitted to MDE-ARMA no later than April 1 of the year following the year for which certification is required.

b) The individual making the certification shall certify that the information is accurate to the individual's best knowledge. The certifying individual shall be:

i) Familiar with each source for which the certification form is submitted; and

ii) Responsible for the accuracy of the emission information.

A-55. All records and logs required by this CPCN shall be maintained at the facility for at least 5 years after the completion of the calendar year in which they were collected. These data shall be readily available for inspection by representatives of MDE-ARMA. [40 CFR 60.59b(d), 40 CFR 60.59b(j), and 40 CFR 60.59b(k)].

A-56. EA shall report actual annual greenhouse gas emissions in accordance with 40 CFR §98. Reporting is required to begin for actual GHG emissions that are generated in the calendar year in which the facility begins operation, with the report submitted electronically to EPA by 31 March of the following year and annually thereafter.

A-57. EA shall furnish written notification of certain events related to the Fairfield combustors, as specified in 40 CFR 60.07 and 40 CFR 60.59b, to MDE-ARMA and U.S. EPA Region III, which include, but may not be limited to:

a) The date construction commenced within 30 days after such date [40 CFR 60.07(a)(1)];

b) The actual date of initial startup within 15 days after such date [40 CFR 60.7(a)(3)];

c) Any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies at least 60 days prior to the change [40 CFR 60.7(a)(4)];

d) The anticipated date of performance testing at least 30 days prior to such date [40 CFR 60.8(d)];

e) The planned initial startup date [40 CFR 60.59b(b)];

f) The types of fuels that are planned to be combusted [40 CFR 60.59b(b)]; and

g) The combustor unit capacity and supporting capacity calculations [40 CFR 60.59b(b)].

A-58. EA shall furnish written notification of certain events related to the emergency diesel generator and fire water pumps to MDE-ARMA and U.S. EPA Region III, including, but not limited to:

a) The intent to construct [40 CFR 0.7(a)(1)];

b) The actual date of initial startup within 15 days after such date [40 CFR 60.7(a)(3)];

c) Any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies at least 60 days prior to the change [40 CFR 60.7(a)(4)]; and

d) The anticipated date of performance testing at least 30 days prior to such date [40 CFR 60.8(d)].

A-59. All air quality notifications and reports required by this CPCN shall be submitted to:

Administrator, Compliance Program
Air and Radiation Management Administration
1800 Washington Boulevard
Baltimore, Maryland 21230

A-60. All notifications and reports required by 40 CFR §60 Subpart Da, Subpart Eb, and Subpart IIII; and 40 CFR Part 63 Subpart ZZZZ, unless specified otherwise, shall be submitted to:

U.S. EPA, Region III
Director, Air Protection Division
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Other Air Conditions

A-61. Plan for Reduction of Transportation-related GHG Emissions:

a) No later than one year prior to commencing operation of the facility, EA shall submit to MDE, for review and approval, a plan to reduce transportation-related greenhouse gas emissions that utilizes transportation of solid waste to each refuse processing facility and PRF to the facility by rail and/or barge to the maximum extent practicable.

b) EA shall implement the plan as approved or amended by MDE upon commencing operation of the facility.

FACILITY FUEL AND RELATED REQUIREMENTS

F-1. EA may only burn Waste-derived Fuel, as defined in Condition A-4, and natural gas at the Fairfield facility.

F-2. EA shall only receive Waste-derived Fuel from fuel production facilities that operate under a plan outlining general operating procedures in accordance with COMAR 26.04.07.23 (or equivalent, if facility is located outside the State of Maryland). The plan (or equivalent) must be approved by MDE prior to the acceptance of any Waste-derived Fuel at the Fairfield facility.

F-3. EA shall not combust more than 1,460,000 tons of Waste-derived Fuel at the Fairfield facility in any rolling 12-month period.

F-4. EA shall prepare a Mercury Diversion Plan (MDP) for all service areas of the facility. The MDP shall establish means for diverting mercury-containing items from the solid waste stream that is to be subsequently combusted at the Fairfield Renewable Energy Project facility through identification, separation, collection and recycling or proper disposal of mercury-bearing products contained in the solid waste stream.

The MDP shall also include proposed measures to determine the effectiveness of the MDP in removing mercury-containing items following implementation. The MDP shall, at a minimum, include the following four elements:

a) An education/outreach program for citizens, businesses and local governments;

b) A collection program for unused mercury and mercury-containing items;

c) A recovery/recycling program for mercury-containing devices; and

d) A proposed schedule for implementation of the MDP.

EA shall submit the proposed MDP to MDE for review and approval at least 180 days prior to initial startup. EA shall implement the MDP in the intended service area as approved or amended by MDE prior to commencing operation of the facility. EA shall submit a progress report to MDE annually no later than 30 days following the anniversary of initial startup of the facility, documenting the effectiveness of the MDP, and making recommendations, as appropriate, to enhance the effectiveness of the Plan.

Any modifications to the MDP must be submitted to MDE for approval. EA shall implement any modifications as directed or approved by MDE.

F-5. Prior to the start of operation, EA shall obtain all permits that may be required by MDE - Land Management Administration, Solid Waste Program. If processed scrap tires are to be used as supplemental fuel, EA must obtain a Substitute Fuel/Tire Derived Fuel Facility Approval from MDE prior to the use of tires as fuel. Prior to MDE approval, Maryland Environmental Service must approve the designated Substitute Fuel/Tire Derived Fuel Facility as noted in COMAR 26.04.08.02B(22).

CULTURAL RESOURCES

C-1. If relics of unforeseen archeological sites are revealed and identified in the project area during construction, EA, in consultation with and as approved by the Maryland Historical Trust, shall develop and implement a plan for avoidance and protection, data recovery, or destruction without recovery of such relics or sites.

VISUAL QUALITY

V-1. EA shall develop a lighting distribution plan for new facility structures that will mitigate intrusive night lighting and avoid undue glare onto nearby non-industrial properties. EA shall coordinate development of the plan with PPRP and the Baltimore City Planning Department. EA shall submit the plan to PPRP for review and approval prior to operation of the facility.

EMERGENCY PREPAREDNESS AND SECURITY

EP-1. EA shall make available for onsite review by PPRP and PSC representatives copies of its site and plant safety and security procedures, in particular those procedures addressing site and plant safety and security during construction and operation of the facility. Any review of security sensitive documentation must follow security protocols. The procedures should address issues such as how EA plans to control vehicle and construction worker access and protect any vulnerable assets from being threatened from outside the perimeter of the property. The security and plant emergency procedures should also identify how local, state, and federal agencies would be coordinated in the event of a large-scale plant emergency or a security event. Security procedures should consider the effects of any proposed measures on the surrounding community and mitigate adverse effects to the maximum extent possible.

TRAFFIC

T-1. EA shall designate a truck route connecting I-895 to the site access driveway via Frankfurst Avenue, Shell Road, and Patapsco Avenue. The truck route will be enforced during both construction and operation of the facility for trucks transporting, materials and fuels to the site and for trucks transporting by-products from the site. EA shall include the designated truck route as a condition in all contracts with suppliers and contractors and a specific prohibition of trucks on residential or business thoroughfares of Curtis Bay and Brooklyn.

T-2. Contingent upon its receiving all applicable permits for the construction and operation of this project, EA shall reimburse to the City of Baltimore Department of Transportation the non-federal share of costs for the construction of geometric improvements to the intersection of Shell Road and Patapsco Avenue to accommodate design vehicles and increases in truck traffic.

T-3. EA shall require all trucking, contractors transporting hazardous materials to or from the project site to comply with all statutes of the Motor Vehicle Administration relating to Vehicle Operations and with all statutes of the Maryland Transportation

Authority (MdTA) relating to the Transport of Hazardous Materials over MdTA facilities as defined in the Transportation Article of the Annotated Code of Maryland.

LANDUSE

L-1. EA shall design the facility in substantial conformity with the Site Development Plan drawings reviewed by the Baltimore City Planning; Department.

L-2. Prior to construction, EA shall obtain a Building; Permit and Grading Permit from the Baltimore City Planning Department.

TERRESTRIAL AND AQUATIC ECOLOGY

E-1. Construction and operation of the EA Fairfield project and all its appurtenant features shall comply with all applicable local, State, and Federal regulations, including, but not limited to the following:

a) Nontidal Wetlands—COMAR 26.23 applies to activities conducted in nontidal wetlands.

b) Water Quality and Water Pollution Control — COMAR 26.08.01 through COMAR 26.08.04 apply to discharges to surface water and maintenance of surface water quality.

c) Erosion and Sediment Control —COMAR 26.17.01 applies to the preparation, submittal, review, approval, and enforcement of erosion and sediment control plans.

E-2. EA shall not commence construction on any aspect of the project under the jurisdiction of the Chesapeake Bay Critical Area Commission (CAC) until it has received approval of the proposed Fairfield project from the CAC. All site preparation and construction activities at the site shall be implemented in accordance with the CAC-approved plans.

E-3. Areas that are disturbed during construction of the EA Fairfield facility shall be stabilized after the cessation of construction in accordance with the best management practices provided in the NIDE document 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, and as approved by the City of Baltimore. In wetlands and wetland buffers, seed application shall consist of the following species: annual ryegrass *(Loliuni multi:I-Thrum)*, millet *(Setaria italica)*, barley *(Horeduin* spp.), oats *(Liniola* spp.), and/or rye *(Secale cereale)*. Other non-persistent vegetation may be acceptable, but must be approved by the NIDE Water Management Administration. Kentucky 31 fescue shall never be used in wetlands or buffers.

E-4. The EA Fairfield facility will be constructed in an area adjacent to Stonehouse Cove, a known historic waterfowl concentration area. Should there be any construction of water-dependent facilities, a time-of-year restriction may be required. Prior to the start of construction, EA shall contact Wildlife and Heritage Service for further technical assistance for matters concerning waterfowl.

E-5. The CPCN is not an authorization to discharge wastewater to waters of the State. If required by MDE, EA shall obtain a discharge permit from MDE under the National Pollutant Discharge Elimination System (NPDES) for the Fairfield Renewable Energy Project.

E-6. The State of Maryland is a signatory to the Chesapeake Bay Agreement 2000 and as such is committed to reducing sources of nutrient nitrogen to the Bay. The NO, emissions from the EA facility will, through atmospheric deposition, add nutrient nitrogen to the Bay. The NO offsets that EA is required to obtain for air quality purposes will, in part, mitigate this nutrient addition. Once the source or sources of the NO offsets have been identified, and in the event that there is a net increase in nutrient addition to the Bay, the Applicant shall mitigate this net increase either through a riparian forest buffer planting at 40 acres per excess ton of nitrogen or by surrendering to the Maryland Department of Natural Resources sufficient certified and verifiable nutrient offset credits.

E-7. Mercury mitigation measures:

a) EA shall fund mercury mitigation measures in an approved watershed(s), for any water body determined by MDE to be significantly impacted by mercury emissions, to offset direct mercury deposition to the water bodies in the watershed resulting from EA's emissions. Mercury mitigation measures shall offset a portion of EA's annual mercury deposition to State water bodies in accordance with this condition.

b) Calculation of EA's annual mercury deposition shall be based on EA's average annual emissions, as demonstrated by quarterly stack tests or, if CEMS are utilized for demonstrating compliance in accordance with Condition A-39f, CEMs data. Direct mercury deposition to water resulting from EA's emissions shall be determined by emissions and transport modeling to be conducted by DNR-PPRP, or such other methodology proposed by EA and approved by MDE.

c) No later than 30 days following receipt by MDE of EA's annual emissions certification for each calendar year, EA shall submit to MDE for review and approval a mitigation plan (the "Plan"), developed in consultation with MDE and PPRP, to fund one or more proposed mercury mitigation projects in a watershed approved by MDE consisting of stream restoration or installation of wet weather controls to offset EA's mercury emissions on a ratio of 1:1 up to 2,620 linear feet of streambank to minimize surface and/or stream bed and bank erosion, or other equivalent project(s) approved by MDE. The Plan shall not result in detrimental impacts to the regional ecosystem.

d) The Plan may include projects to offset projected future mercury emissions and shall include:

i) An analysis that quantifies the projected reduction in mercury loading to the water body or the quantity of mercury removed from the impacted water body, as applicable; and

ii) A proposed schedule for implementation of the mitigation measures, including interim milestones.

e) EA shall complete implementation of the Plan in accordance with the approved schedule, unless MDE agrees in writing to an extension of the schedule.

STORMWATER MANAGEMENT/EROSION AND SEDIMENT CONTROL

S-1. At a minimum, sediment control during construction of all aspects of this project shall include the following Best Management Practices: construction of earth dikes and retaining walls in appropriate locations, sediment traps, use of super silt fences, stabilizing disturbed areas as quickly as possible, and converting silt traps to permanent features as soon as practicable.

WATER SUPPLY

WS-1. EA shall utilize treated effluent from Baltimore City's Patapsco wastewater treatment plant (WWTP) as the primary source of makeup water to the cooling system. A copy of the executed contractual agreement for water between EA and Baltimore City shall be provided to PPRP and the PSC when available but no later than 12 months in advance of the start-up of the cogeneration facility.

WS-2. This CPCN does not constitute approval to use surface water, including storm water collected on site.

WS-3. EA shall ensure that the effluent obtained from the Patapsco WWTP is chlorinated to establish and maintain a detectable free chlorine residual in the reclaimed water from the time it enters the EA Fairfield site until the reclaimed water is used in the cooling water makeup system. If reclaimed water is to be stored on site, EA shall have the ability to acid additional chlorine, if necessary, to ensure that a detectable chlorine residual exists in the reclaimed water after it leaves the on-site storage tank and prior to use in the cooling water makeup system.

WS-4. Following receipt of reclaimed water at the EA Fairfield site and prior to introducing, reclaimed water into the cooling; tower basin for use as cooling, water, EA shall as a minimum perform daily or continuous sampling, and analyses for turbidity and free chlorine residual. These daily tests shall be performed in accordance with procedures specified in 40 CFR "136, and the results maintained in the facility's operating; log. Data obtained from continuous on-line analyzers shall be archived. Reclaimed water with turbidity values greater than 5 Nephelometric Turbidity Units (NTU) shall not be introduced into the cooling tower basin. EA shall submit these analytical data to PPRP for interagency review no less frequently than once per quarter.

WS-5. No later than 90 days prior to start of construction of the water supply and treatment facilities at the EA Fairfield project, EA shall provide to PPRP and the PSC final design documentation, including, but not limited to, drawings, materials and equipment specifications related to the proposed disinfection system, water quality

monitoring systems, and water storage. The scope of this submittal shall be sufficient to demonstrate that EA will have in place the means to adequately disinfect water prior to its use in the cooling, system. The submitted plans must also demonstrate the mechanism for ensuring; that reclaimed water of unacceptable quality does not enter the cooling; system, and the mechanism for returning, such water to the Patapsco WWTP.

WS-6. No later than 60 days prior to the start of operation, EA shall provide to PPRP and the PSC, for review and approval, standard operating, procedures related to the proposed disinfection system, water quality monitoring systems, and water storage. The procedures must identify steps to be taken in the event that reclaimed water with turbidity greater than 5 NTU arrives at the facility.

WS-7. EA shall adhere to specifications outlined by the American Water Works Association (AWWA) in "Guidelines for Distribution of Nonpotable Water" and OSHA regulations 1926.51 b to prevent inadvertent and inappropriate use of the reclaimed water.

WS-8. Before the start of operations, EA shall identify and procure an adequate supply of water to charge and test the fire suppression system at the Fairfield facility. This water may be obtained from one of the following three sources: 1) treated effluent from the Patapsco WWTP; 2) municipal water from the City of Baltimore; or 3) water withdrawn from a surface water body.

a) If municipal water from the City of Baltimore is utilized, EA must incorporate appropriate controls to prevent backflow from the site's fire suppression system into the municipal water system.

b) If surface water is utilized, EA must modify this CPCN to obtain a new water appropriation permit from MDE-Water Management Administration (WMA).

c) Within 180 days after the issuance of this CPCN, EA shall inform WMA, PPRP, and the PSC of which option will be utilized to provide water to charge and test the fire suppression system. EA shall not begin operating until it has demonstrated to WMA and PPRP that it has satisfied all Baltimore City regulatory requirements (e.g., building codes) regarding the source of fire suppression water and has complied with this entire CPCN condition.

NOISE

N-1. EA shall design, construct, and operate the Fairfield facility in such a way as to maintain compliance with all applicable State and municipal noise limits.

BY-PRODUCT MANAGEMENT

B-1. EA shall implement a plan to characterize the fly ash and the bottom ash recovered from the boilers. The scope of the ash characterization study must specify the sampling frequency and analytical methods that EA will use to test the fly ash and bottom ash produced by the facility. The study must provide sufficient analytical data to allow MDE - Land Management Administration to determine the appropriate disposal or beneficial use requirements for the various combustion by-

products. EA must submit the ash characterization study plan to MDE Solid Waste Program, the PSC, and PPRP within one year after the issuance of this CPCN, for MDE's review and approval.

B-2. Before the facility begins operating, EA must obtain approval from MDE Solid Waste Program for its ash characterization plan, as described in Condition B-1. EA shall fully implement the ash characterization plan as approved by MDE. EA shall not send any combustion by-products off site in any form without receiving prior approval from MDE Solid Waste Program for the specific disposal method or beneficial use application being utilized for those by-products.

B-3. EA shall store all fly ash and bottom ash in a manner that prevents contact with precipitation and stormwater runoff and in accordance with COMAR 26.04.10.05.

B-4. EA shall provide MDE Solid Waste Program, the PSC and PPRP with an annual report on by-product generation, use, and disposal. The report shall be submitted by 28 February of each year, addressing the previous calendar year's operation. The report shall provide a summary of the total volume of combustion by-products generated, and a breakdown of that volume into the following categories:

a) Fly ash disposed as hazardous waste;

b) Fly ash disposed as nonhazardous solid waste;

c) Ferrous metals separated and recovered from bottom ash;

d) Non-ferrous metals separated and recovered from bottom ash;

e) Bottom ash beneficially used (specify the use or uses); and

f) Bottom ash disposed (specify the method of disposal and whether the material was classified as hazardous)

PSC STAFF CONDITIONS

PSC-1. Prior to putting any portion of the project in service, the applicant shall file with the Commission a listing of the transmission system improvements required by PJM prior to putting that portion of the project in service and certification that the improvements have been completed.

PSC-2. Prior to putting any portion of the project in service, the applicant shall file with the Commission a listing of the interconnection requirements of the interconnecting transmission line owner prior to putting that portion of the project in service and certification that the interconnection requirements have been met.

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
PM	10 mg/dscm @7% O_2 (filterable only)	BACT NSPS [40 CFR 60.52b(a)(1)(ii)] *Note: BACT limit is more stringent than the NSPS of 20 mg/dscm @ 7% O_2*	3-hour average	Initial and annual performance tests using EPA Reference Method 5 (front half only), per 40 CFR 60.58(c). Test methods and procedures as specified in 40 CFR 60.58b(c).	Parametric Monitoring - Pressure drop indicator, COMS, inlet flue gas temperature indicator and Broken Bag Detectors (BBD). If PM CEMS is used for compliance demonstration in lieu of COMS, then compliance shall be based on 24-hour daily block averages of hourly arithmetic concentrations [40 CFR 60.58b(c)(10)].
PM10	Provisional limit of 24 mg/dscm @7% O_2 (filterable and condensable portions)	BACT	3-hour average	Initial and annual performance tests using Test Methods 201 or 201A (filterable) and Method 202 (condensable) or equivalent approved by MDE. Following the initial performance test, EA shall perform a minimum of four (4) and a maximum of eight (8) quarterly performance tests, at an interval of not fewer than 90 days and not more than 120 days between	Parametric Monitoring - Pressure drop indicator, COMS, inlet flue gas temperature indicator and Broken Bag Detectors (BBD).

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
				tests and submit the results of each quarterly test to MDE-ARMA within 30 days of receiving the results. Based on analysis of the quarterly performance tests, EA shall propose to MDE-ARMA a final PM10 emission limit, inclusive of the filterable and condensable fractions.	
PM2.5	Provisional limit of 22 mg/dscm @7% O_2 (filterable and condensable)	LAER	3-hour average	Initial and annual performance tests using Test Methods 201A or OTM 27 (filterable) and Method 202 (condensable) or equivalent approved by MDE. Following the initial performance test, EA shall perform a minimum of four (4) and a maximum of eight (8) quarterly performance tests, at an interval of not fewer than 90 days and not more than 120 days between tests and submit the results of each quarterly test to MDE-ARMA within 30 days of	Parametric Monitoring - Pressure drop indicator, COMS, inlet flue gas temperature indicator and Broken Bag Detectors (BBD).

Table A – Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
				receiving the results. Based on analysis of the quarterly performance tests, EA shall propose to MDE-ARMA a final PM2.5 emission limit, inclusive of the filterable and condensable fractions.	
Opacity	10%	NSPS [40 CFR 60.52b(a)(2)]	6-min average	Initial and annual performance tests, per 40 CFR 60.58b(c)(7) and (11), using EPA Reference Method 9. Applicable test procedures and methods as specified in 40 CFR 60.58b(c).	COMS [40 CFR 60.58b(c)(1) - (8)]
NO_x	45 ppmvd @7% O_2	LAER (ozone precursor) BACT (NO_2) NSPS [40 CFR 60.52b(d)(1)-(2)] *Note: BACT/LAER limit is more stringent than the NSPS of 150 ppmdv @7% O_2 with 180 ppmdv allowed during first year of operation.*	24-hour daily arithmetic average of hourly CEMS concentrations [40 CFR 60.58b(h)(3) and (5)]	Initial performance test using CEMS and EPA Reference Method 19 [40 CFR 60.58b(h)(3)]. Applicable test procedures and methods as provided in 40 CFR 60.58b(h).	CEMS [40 CFR 60.58b(h)]

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
SO_2	24 ppmvd @7% O_2	LAER (PM2.5 precursor) BACT NSPS [40 CFR 60.52b(b)(1)] *Note: BACT limit is more stringent than the NSPS of 30 ppmvd @ 7% O_2*	24-hr daily geometric average of hourly arithmetic average CEMS concentrations [40 CFR 60.58b(e)(4) and (6)]	Initial performance test using CEMS and EPA Reference Method 19. Applicable test procedures and methods as specified in 40 CFR 60.58b(e).	CEMS [40 CFR 60.58b(e)]
CO	75 ppmvd @7% O_2	BACT NSPS [40 CFR 60.53b(a)] *Note: BACT limit is more stringent than the NSPS of 150 mg/dscm @ 7% O_2*	24-hour daily arithmetic average of hourly CEMS concentrations [40 CFR 60.58b(i)(2) and (4)]	Initial performance test using CEMS (40 CFR 60.b(i)(2)]. Methods and procedures as specified in 40 CFR 60.58b(i).	CEMS [40 CFR 60.58b(i)(3)]
VOC (as propane)	7 ppmvd @7% O_2	LAER	Average of three test runs (minimum 1-hour)	Initial and annual performance test using EPA Method 18, 25A or equivalent.	CO CEMS serves as a surrogate indicator that VOC emissions are continuously minimized via Good Combustion Practice.

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
HCl	20 ppmvd @7% O_2	BACT NSPS [40 CFR 40 CFR 60.52b(b)(2)] *Note: BACT limit is more stringent than the NSPS of 25 ppmvd @ 7% O_2*	Average of three test runs (minimum 1-hour)	Initial and annual performance tests, using EPA Reference Method 26, except as provided in 40 CFR 60.58b(f)(8). Applicable test procedures and methods as provided in 40 CFR 60.58b(f).	Parametric Monitoring - Pressure drop indicator, flue gas exit temperature indicator and lime flow rate indicator; SO_2 CEMS as surrogate. EA shall install and operate HCl CEMS in accordance with NSPS Subpart Eb, including, but not limited to 40 CFR 60.58b(f)(8), (n), and (o). EA shall make records available to MDE ARMA upon request. The HCl CEMS shall be operated for informational purposes. If CEMS is used for compliance demonstration, then compliance shall be based on 24-hour daily block averages of hourly arithmetic concentrations [40 CFR 60.58b(f)(8) and (n)].

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
Hg	17 µg/dscm @7% O_2	BACT NSPS [40 CFR 60.52b(a)(5)(ii)] *Note: BACT limit is more strict than the NSPS of* 50 µg*/dscm @ 7% O_2 or 85% control, whichever is less stringent* *[40 CFR 60.52b(a)(5)(ii)]*	Average of three test runs (minimum 1-hour)	Initial and quarterly performance tests, using EPA Reference Method 29, except as provided in 40 CFR 60.58b(d)(4) and (n). Applicable test procedures and methods as specified in 40 CFR 60.58b(d).	Parametric Monitoring – Activated carbon flow rate indicator CEMS shall be operated in accordance with NSPS Subpart Eb, including, but not limited to, 40 CFR 60.58b(d)(4) and (n). EA shall have the option to demonstrate compliance using CEMS [40 CFR 60.58b(d)(4) and (n)] On or after two years following initial startup, MDE may require compliance to be demonstrated using CEMS. If CEMS is used for compliance demonstration, then compliance shall be based on 24-hour daily block averages of hourly arithmetic concentrations [40 CFR 60.58b(d)(4) and (n)]

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
					If CEMS is used for compliance demonstration, then performance testing requirements via stack testing are waived [40 CFR 60.58b(d)(4) and (n)]
MWC Organics (dioxins and furans, total mass)	10 ng/dscm @7% O_2	BACT NSPS [40 CFR 40 CFR 52b(c)(2)]	Average of three test runs [40 CRF 60.58b (g)(9)], with a minimum sampling time of 4 hours per test run [40 CRF 60.58b(g)(3)(i)]	Initial and annual performance tests using EPA Reference Method 23, except as provided in 40 CFR 60.58b(g) (5). Applicable test procedures and methods as specified in 40 CFR 60.58b(g).	Parametric Monitoring - Carbon injection flow rate, inlet flue gas temperature.
Cd	10 µg/dscm @7% O_2	NSPS [40 CFR 60.52b(a)(3)(ii)]	Average of three test runs (minimum 1-hour)	Initial and annual performance tests using EPA Reference Method 29 per 40 CFR 60.58b(d)(1). Applicable test procedures and methods as specified in 40 CFR 60.58b(d)(1).	Parametric Monitoring - Pressure drop indicator, COMS, inlet flue gas temperature indicator and Broken Bag Detectors (BBD).

Table A—Emissions Standards for Fairfield Project Generating Units

Pollutant	Emission Limit	Underlying Requirement	Averaging Period	Performance Test	Continuous Compliance Demonstration Method
Pb	75 µg/dscm @7% O_2	BACT NSPS [40 CFR 60.52b(a)(4)(ii)] *Note: Limit is more stringent than the NSPS of 140 µg/dscm @7% O_2.*	Average of three test runs (minimum 1-hour)	Initial and annual performance tests using EPA Reference Method 29 per 40 CFR 60.58b(d)(1). Applicable test procedures and methods as specified in 40 CFR 60.58b(d)(1).	Parametric Monitoring - Pressure drop indicator, COMS, inlet flue gas temperature indicator and Broken Bag Detectors (BBD).
Fluorides (as HF)	3.6 mg/dscm	BACT	Average of three test runs (minimum 1-hour)	Initial and annual performance tests using EPA reference Method 13B or equivalent method approved by MDE.	Parametric Monitoring - Pressure drop indicator, exit flue gas temperature indicator and lime flow rate.

Table A—Emissions Standards for Fairfield Project Generating Units

Sulfuric Acid Mist (as H_2SO_4)	0.014 lb/MMBtu	BACT	Average of three test runs (minimum 1-hour)	Initial and annual performance tests using EPA reference Method 8 or equivalent method approved by MDE.	Parametric Monitoring - Pressure drop indicator, exit flue gas temperature indicator and lime flow rate.
Fugitive Ash Emissions	No visible emission to the atmosphere in excess of 5% of the observation period (i.e., ≤9 minutes per 3-hour period), except as provided under 40 CFR 60.55b(b) and (c).	NSPS [40 CFR 60.55b]	Average of three 1-hour observations	Initial and annual performance tests, using EPA Reference Method 22 per 40 CFR 60.58(c). Test methods and procedures as specified in 40 CFR 60.58b(k).	Parametric Monitoring - Pressure (vacuum) indicator.
GHG	162 tons CO_2e per million pounds of steam produced	BACT	12-month rolling average	N/A	CO_2e Emissions – The sum of CO_2 emissions as measured by the CEMS and NH_4 and N_2O as calculated using the emission factors and methodology prescribed in 40 CFR 98, Subpart D Steam – As measured using a continuous steam flow meter as required under 40 CFR 60.58b(i)(6)

ATTACHMENT G

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
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Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Mimi A. Drew
Secretary

PERMITTEE

Solid Waste Authority of Palm Beach County
7501 North Jog Road
West Palm Beach, FL 33412

Air Permit No. 0990234-017-AC (PSD-FL-413)
Palm Beach Renewable Energy Park
Palm Beach Renewable Energy Facility No. 2

Authorized Representative:
Mark Hammond, Executive Director

Expires: December 31, 2015
Palm Beach County

PROJECT

This is the final air construction permit authorizing the construction of three 1,000 tons per day (TPD) mass-burn municipal waste combustors (MWC), a 90 to 100 megawatts (MW) steam turbine-electrical generator (STG) and ancillary equipment. The proposed work will be conducted at the existing Palm Beach Renewable Energy Park (PBREP), which is a municipal solid waste (MSW) facility categorized under Standard Industrial Classification Number (No.) 4953. The existing facility is located in Palm Beach County at 7501 North Jog Road in West Palm Beach, Florida. The UTM coordinates are Zone 17, 585.3 kilometers (km) East, and 2961.7 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); and Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix CF of Section 4 of this permit. As noted in the Final Determination provided with this final permit, only minor changes and clarifications were made to the draft permit.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality and a corresponding best available control (BACT) determination.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida

Joseph Kahn, Director
Division of Air Resource Management

12/23/10
(Date)

14. Combustion Practices: To ensure that the facility's fuel does not adversely affect the facility's combustion process or emissions, the facility operator shall:

    a. comply with good combustion operating practices in accordance with 40 CFR 60.53b;

    b. install, operate and maintain CEMS for oxygen, CO, SO_2, NO_X and temperature in accordance with 40 CFR 60.58b; and

    c. record and maintain the CEMS data in accordance with 40 CFR 60.59b.

    These steps shall be used to ensure and verify continuous compliance with the emissions limitations in this permit. Natural gas may be used as fuel during boiler startup, shutdown and flame stabilization, and at other times when necessary and consistent with good combustion practices.

NSPS APPLICABILITY

15. NSPS Subpart Eb and Subpart A Applicability: Each MWC unit, including the shared STG, are subject to all applicable requirements of 40 CFR 60, Subpart Eb which applies to Large Municipal Waste Combustors and Subpart A, General Provisions. The applicable conditions are given in Appendices A and Eb of this permit. [Rule 62-204.800(7)(b) and 40 CFR 60, NSPS-Subpart Eb and 40 CFR 60 Subpart A]

EMISSIONS STANDARDS

16. Emissions from each MWC unit (EU-024, EU-025 and EU-026) shall not exceed the following limits:

Pollutant	Emission Standard/Limit [1]	lb/hour [2]	Basis
NO_X	50 ppmvd – 24 hour block arithmetic mean	37.4	BACT
	45 ppmvd – 12 month rolling average		BACT
CO	100 ppmvd – 4 hr block arithmetic mean	45.5	Subpart Eb
	80 ppmvd – 30-day rolling average		BACT
SO_2	24 ppmvd – 24 hour geometric mean	25.0	BACT
HCl [3]	20 ppmvd	11.9	BACT
VOC (as propane)	7 ppmvd	5.0	BACT
$PM/PM_{10}/PM_{2.5}$	12.0 mg/dscm	4.7	BACT
Lead (Pb)	125 µg/dscm	0.049	Avoid PSD
Hg [4]	N/A [5]	37.7 lb/yr [6]	Avoid PSD
	25 µg/dscm	0.0098	Applicant Request
Cadmium (Cd)	10 µg/dscm	$3.91E^{-03}$	Subpart Eb
D/F [7]	13.0 ng/dscm		Subpart Eb
	10 ng/dscm during initial two years		Initial Test
	0.75 to 10 ng/dscm 3rd year and thereafter		BACT
Opacity	10 % – 6 minute average	N/A	BACT Subpart Eb
Ammonia Slip	10 ppmvd	2.76	PM, Opacity

1 All concentration values are corrected to 7% O_2: µg/dscm = micrograms per dry standard cubic meter; mg/dscm = milligrams per dry standard cubic meter; ng/dscm = nanograms per dry standard cubic meter; and ppmvd = part per million dry volume.
2 Mass emission limits reflect maximum values calculated at 110% of 24 hour steam production limit of 291,000 lb steam/hr for each MWC. The 110% steam limit is 320,100 lb steam/hr for each MWC.
3 HCl is not a BACT pollutant. However, it must be limited together with SO_2 because they both comprise MWC-Acid Gases which has its own PSD threshold.
4 Within 60 days after achieving the maximum production rate, but not later than 180 days after the initial startup, PBREF-2 shall commence quarterly performance Hg stack test events for each MWC exhaust flue to show compliance with the 25 µg/dscm emission limit. The 25 µg/dscm quarterly stack based standard is based on the applicant's request. By meeting the quarterly stack test standard, PBREF-2 will show compliance with Subpart Eb Hg emission standard of 50 µg/dscm.

5 N/A = not applicable.
6 The 37.7 lb/yr emission limit is a 12 month rolled monthly average based on CEMS data. The Hg CEMS must become operational within 60 days after PBREF-2 achieves its maximum production rate, but not later than 180 days after the initial startup. During the first four quarters of Hg CEMS availability, the CEMS must achieve an 80% data availability rate. Subsequently, an 85% data availability rate is required. See Appendix CEMS for the procedures to be used for data replacement during times of Hg CEMS unavailability.
7 Dioxins/furans: Total tetra through octa-chlorinated dibenzo-p-dioxins and dibenzofurans. During the first year of the PBREF-2 operation of the 10 ng/dscm limit applies. Subsequently, the To Be Determined (TBD) limit will govern based on initial performance and efficiency tests at the inlet and outlet of the SCR as per **Specific Conditions 19 and 20** of this subsection. Based on these tests a D/F limit between 10 ng/dscm and 0.75 ng/dscm will be selected by the Department. The pound per hour limit will correspond to TBD ng/dscm limit.

TEST METHODS AND PROCEDURES

17. Test Methods: Any required stack test shall be performed in accordance with the following methods.

EPA Method	Description of Method and Comments
1 - 4	Determination of Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content. Methods shall be performed as necessary to support other methods.
5	Determination of Particulate Emissions. The minimum sample volume shall be 30 dry standard cubic feet.
6C	Determination of SO_2 Emissions (Instrumental).
7E	Determination of NO_X Emissions (Instrumental). NO_X emissions testing shall be conducted with the air heater operating at the highest heat input possible during the test.
8	Measurement of Sulfuric Acid Mist
9	Visual Determination of Opacity
10	Measurement of Carbon Monoxide Emissions (Instrumental). The method shall be based on a continuous sampling train.
13A or 13B	Measurement of Fluoride Emissions
18	Measurement of Gaseous Organic Compound Emissions (Gas Chromatography) *{Note: EPA Method 18 may be used (optional) concurrently with EPA Method 25A to deduct emissions of methane and ethane from the total hydrocarbons (THC) emissions measured by Method 25A.}*
23	Measurement of Dioxin/Furan Emissions
26 or 26A	Determination of Hydrogen Chloride Emissions
29	Determination of Metals Emissions from Stationary Sources (Hg, Cd, Pb)
CTM-027	Procedure for Collection and Analysis of Ammonia in Stationary Source • This is an EPA conditional test method. • The minimum detection limit shall be 1 ppm.

Method CTM-027 is published on EPA's Technology Transfer Network Web Site at "http://www.epa.gov/ttn/emc/ctm.html". The other methods are specified in Appendix A of 40 CFR 60, adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. Tests shall be conducted in accordance with the appropriate test method and the applicable requirements specified in this permit, and NSPS Subpart A in 40 CFR 60. [Rules 62-204.800, F.A.C. and 40 CFR 60, Appendix A]

18. Testing Requirements: Initial tests shall be conducted between 90% and 100% of permitted capacity; otherwise, this permit shall be modified to reflect the true maximum capacity as constructed. Subsequent annual tests shall be conducted between 90% and 100% of permitted capacity in accordance with the requirements of Rule 62-297.310(2), F.A.C. [Rule 62-297.310(7)(a) and (b), F.A.C.; 40 CFR 60.8]

19. Initial Compliance Demonstration: Initial compliance stack tests shall be conducted within 60 days after achieving the maximum production rate, but not later than 180 days after the initial startup for each MWC unit. In accordance with the test methods specified in this permit, each units exhaust flue gas shall be tested to demonstrate compliance with the emission standards for NO_X, VOC, CO, SO_2, HCl, $PM/PM_{10}/PM_{2.5}$, Pb, Cd, Hg (quarterly), D/F (quarterly during first two years of operation at the inlet and outlet of the SCR and stack flue exhaust and annually thereafter), VE, and ammonia slip given in **Specific Condition 16** of this subsection. Relative Accuracy Test Audit (RATA) tests for CEMS can constitute initial stack tests for these pollutants. The permittee shall provide the Compliance Authority with any other initial emissions performance tests conducted to satisfy vendor guarantees.
[Rule 62-297.310(7)(a) and (b), F.A.C.; 40 CFR 60.8]

20. Initial Tests for F and SAM Emission Rates: Initial compliance stack tests shall be conducted on each units exhaust flue gas within 60 days after achieving the maximum production rate, but not later than 180 days after the initial startup to determine the emission rates of SAM and F.
Rules 62-4.070(3), 62-210.200 (BACT) and 62-212.400 (PSD), F.A.C.]

21. Subsequent Compliance Testing: Annual stack tests for each MWC units exhaust flue gas shall be conducted for VOC, HCl, $PM/PM_{10}/PM_{2.5}$, Pb, Cd, Hg (quarterly), D/F (quarterly during first two years of operation at the inlet and outlet of the SCR and stack flue exhaust and annually thereafter at the stack flue exhaust only), VE and ammonia slip during each federal fiscal year (October 1st to September 30th) to show compliance with the emission limits given in **Specific Condition 16** of this subsection. Data collected from the reference method during the required RATA tests for CO, NO_X, SO_2 and Hg (one quarter of four) may be used to satisfy the annual testing requirement provided the notification requirements and emission testing requirements for performance and compliance tests of this permit are satisfied.
[Rules 62-297.310(7)(a) and (b), and 62-296.416, F.A.C., and 40 CFR 60.8 and 60.58b]

22. Emissions Limit Subject to Revision D/F: D/F emissions from each MWC shall not exceed the limitation stated **Specific Condition 16** of this subsection. Stack acceptance testing and SCR inlet/outlet D/F destruction testing shall be performed quarterly on each MWC exhaust flue gas during the first two years of operation. The permittee shall provide a protocol for the SCR efficiency testing for review and approval by the Department ninety days prior to the commencement of testing. The permittee shall provide the results to the Department within 45 days of completion of the eight D/F destruction efficiency and stack tests so that the Department can set a numerical BACT D/F limit based on the performance of the SCR technology.

    The D/F emission limit standard will be between a maximum value of 10 ng/dscm and a minimum value of 0.75 ng/dscm. Between these upper and lower limit values, the limit will be ten times the average of the eight quarterly D/F SCR efficiency and stack test results conducted during the first two years of PBREF-2 operation. For example, if the average of these tests is 0.50 ng/dscm then the limit will be set by the Department at 5.0 ng/dscm, while if the average of the stack tests is 1.2 ng/dscm then the limit will be set at the upper limit value of 10.0 ng/dscm.

    If the D/F average emissions based on the SCR efficiency and stack tests is 0.05 ng/dscm or less, then the D/F emission limit shall be set at 0.74 ng/dscm as a non-PSD/BACT limit. The D/F emission limit shall be established prior to issuance of the facility's Title V operating permit.

    *{In accordance with **Specific Condition 6** of this subsection NSPS Subpart Eb, only the annual D/F compliance test and not the additional SCR efficiency tests will be used to re-set the maximum demonstrated MWC unit load or other operating parameter levels.}*

    [40 CFR 60.52b(c); Rules 62-4.070(3), 62-210.200 (BACT) and 62-212.400 (PSD), F.A.C.]

23. Continuous Compliance: The permittee shall demonstrate continuous compliance with the CO, NO_X and SO_2 concentration and mass emission standards and the long-term Hg mass emissions standard based on data collected by the certified CEMS. The permittee shall demonstrate continuous compliance with the opacity limit based on data collected by the required COMS.
[Rule 62-210.200 (BACT), F.A.C. and 40 CFR 60, Subpart Eb]

EXCESS EMISSIONS

*{Permitting Note: **Specific Conditions 24, 25 and 26** apply to the State Implementation Plan (SIP)-based emissions standards specified in **Specific Condition 16** of this subsection. Rule 62-210.700, F.A.C. (Excess Emissions) cannot vary or supersede any federal provision of the NSPS, or Acid Rain programs.}*

24. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. All such preventable emissions shall be included in any compliance determinations based on CEMS data. [Rule 62-210.700(4), F.A.C. and Rule 62-4.070(3), F.A.C.]

25. Emission Limit Compliance and Excess Emissions: Because of the long-term nature of the 12-month NO_X and 12-month Hg concentration limits as part of PSD and the associated BACT determination, all emissions data for these pollutants/averaging times, including periods of startup, shutdown and malfunction, shall be included in compliance determinations based on CEMS data. [Rule 62-210.700(4), 62-210.200(PTE); [Rule 62-212.400(10) (PSD), Control Technology Review; and Rule 62-4.070(3), F.A.C.]

26. Excess Emissions Allowed: As specified in this condition, excess emissions resulting from startup, shutdown and documented malfunctions are allowed for the 24-hour NO_X and 30-day CO rolling concentration and mass limit provided that operators employ the best operational practices to minimize the amount and duration of emissions during such incidents. NO_X and CO emission data exclusions resulting from startup, shutdown, or documented malfunctions shall not exceed three hours in any 24-hour period. A "documented malfunction" means a malfunction that is documented within one working day of detection by contacting the Compliance Authority by telephone, facsimile transmittal, or electronic mail.

27. Regulations Pursuant to 40 CFR 60, Subpart Eb: The following provisions apply to the emissions limits given in **Specific Condition 16** of this subsection that were specified pursuant to 40 CFR 60, Subpart Eb.

    a. *The opacity standards* set forth in 40 CFR 60 shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard. [40 CFR 60.11(c)]

    b. *Startup, Shutdown and Malfunction:* Except as provided by 40 CFR 60.56b, the standards under 40 CFR 60, Subpart Eb, as incorporated in Rule 62-204.800(8)(b), F.A.C., apply at all times except during periods of startup, shutdown, or malfunction. Duration of startup or shutdown periods are limited to 3 hours per occurrence, except as provided in 40 CFR 60.58b(a)(1)(iii). During periods of startup, shutdown, or malfunction, monitoring data shall be dismissed or excluded from compliance calculations, but shall be recorded and reported in accordance with the provisions of 40 CFR 60.59b(d)(7).

        i. The startup period commences when the affected facility begins the continuous burning of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other non-municipal solid waste fuel, and no municipal solid waste is being fed to the combustor.

        ii. Continuous burning is the continuous, semi-continuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production. The use of municipal solid waste solely to provide thermal protection of the grate or hearth during the startup period when municipal solid waste is not being fed to the grate is not considered to be continuous burning.

    [40 CFR 60.58b(a)]

ATTACHMENT H

Table B-5. 100 Percent of Maximum Continuous Rating (MCR) (Page 1 of 2)
Short-Term and Annual Average Potential Emission Rates

1. Exhaust Gas Flow Rates (Per Flue)

Actual Exhaust Data						Standard Exhaust Flow Rates†	
Flow Rate* (ft^3/min)	Actual Flow Rate (ft^3/min)	Temperature (°F)	Moisture (%)	Oxygen			
				%, wet	%, dry	ft^3/min	m^3/min
103,868	140,539	257	16.2	6.6	7.9	81,557	2,309

2. Criteria Pollutant Emission Rates - Gases

Pollutant	Averaging Period	Concentration (ppmvd @ 7% oxygen)	Emission Rates (per flue)			Emission Rates (two flues)		
			lb/hr	g/s	tpy	lb/hr	g/s	tpy
CO	1-Hour, 8-Hour, 24-Hour, Annual	100	35.4	4.47	155.2	70.9	8.93	310.4
NO_x	1-Hour (During Startup)	N/A	83.8	10.56	N/A	167.5	21.11	N/A
NO_x	24-Hour, Annual	45	26.2	3.30	114.7	52.4	6.60	229.5
SO_2	1-Hour, 3-Hour, 24-Hour	24	19.5	2.45	N/A	38.9	4.90	N/A
SO_2	Annual	14	11.3	1.43	49.7	22.7	2.86	99.4
VOC (as CH_4)	Test Average, Annual	6.6	1.3	0.17	5.9	2.7	0.34	11.7

3. Criteria Pollutant Emission Rates - Particulate Matter and Lead

Pollutant	Averaging Period	Concentration (mg/dscm @ 7% oxygen)	Emission Rates (per flue)			Emission Rates (two flues)		
			lb/hr	g/s	tpy	lb/hr	g/s	tpy
PM/$PM_{2.5}$ (filterable)	24-Hour, Annual	10.0	3.1	0.38	13.4	6.1	0.77	26.8
PM_{10} (filterable and condensable)	24-Hour, Annual	24.0	7.3	0.92	32.1	14.7	1.85	64.2
Lead (Pb)	Quarterly, Annual	0.075	0.023	0.0029	0.10	0.046	0.006	0.20

4. Trace Metal Emission Rates

Pollutant	Averaging Period	Concentration (µg/dscm @ 7% oxygen)	Emission Rates (per flue)			Emission Rates (two flues)		
			lb/hr	g/s	tpy	lb/hr	g/s	tpy
Antimony (Sb)‡	24-Hour, Annual	8.09	2.47E-03	3.11E-04	1.08E-02	4.94E-03	6.23E-04	2.16E-02
Arsenic (As)‡	24-Hour, Annual	0.77	2.35E-04	2.96E-05	1.03E-03	4.70E-04	5.93E-05	2.06E-03
Beryllium (Be)‡	24-Hour, Annual	0.043	1.31E-05	1.65E-06	5.75E-05	2.63E-05	3.31E-06	1.15E-04
Cadmium (Cd)‡	24-Hour, Annual	10	3.05E-03	3.85E-04	1.34E-02	6.11E-03	7.70E-04	2.68E-02
Chromium (Cr)‡	24-Hour, Annual	5.85	1.79E-03	2.25E-04	7.83E-03	3.57E-03	4.50E-04	1.57E-02
Hexavalent chromium (Cr+6)‡	24-Hour, Annual	0.78	2.38E-04	3.00E-05	1.04E-03	4.76E-04	6.00E-05	2.09E-03
Cobalt (Co)‡	24-Hour, Annual	1.01	3.08E-04	3.89E-05	1.35E-03	6.17E-04	7.77E-05	2.70E-03
Copper (Cu)	24-Hour, Annual	5.67	1.73E-03	2.18E-04	7.59E-03	3.46E-03	4.36E-04	1.52E-02
Lead (Pb)‡	24-Hour, Annual	75	2.29E-02	2.89E-03	1.00E-01	4.58E-02	5.77E-03	2.01E-01
Manganese (Mn)‡	24-Hour, Annual	14.52	4.43E-03	5.59E-04	1.94E-02	8.87E-03	1.12E-03	3.88E-02
Mercury (Hg)‡	24-Hour, Annual	17	5.19E-03	6.54E-04	2.27E-02	1.04E-02	1.31E-03	4.55E-02
Nickel (Ni)‡	24-Hour, Annual	5.35	1.63E-03	2.06E-04	7.16E-03	3.27E-03	4.12E-04	1.43E-02
Selenium (Se)‡	24-Hour, Annual	6.39	1.95E-03	2.46E-04	8.55E-03	3.90E-03	4.92E-04	1.71E-02
Zinc (Zn)	24-Hour, Annual	24.68	7.54E-03	9.50E-04	3.30E-02	1.51E-02	1.90E-03	6.60E-02

Table B-5. 100 Percent of Maximum Continuous Rating (MCR) (Page 2 of 2)
Short-Term and Annual Average Potential Emission Rates

5. Trace Organic Emission Rates

Pollutant	Averaging Period	Concentration (ppmvd @ 7% oxygen)	Emission Rates (per flue)			Emission Rates (two flues)		
			lb/hr	g/s	tpy	lb/hr	g/s	tpy
Formaldehyde‡	24-Hour, Annual	0.00103	3.91E-04	4.93E-05	1.71E-03	7.83E-04	9.86E-05	3.43E-03
Pollutant	**Averaging Period**	**Concentration (ng/dscm @ 7% oxygen)**	**Emission Rates (per flue)**			**Emission Rates (two flues)**		
			lb/hr	g/s	tpy	lb/hr	g/s	tpy
Polycyclic Aromatic Hydrocarbons (PAHs)‡								
Benzo(a)anthracene	24-Hour, Annual	3.4	1.04E-06	1.31E-07	4.55E-06	2.08E-06	2.62E-07	9.10E-06
Benzo(b)flouranthene	24-Hour, Annual	18.0	5.50E-06	6.93E-07	2.41E-05	1.10E-05	1.39E-06	4.82E-05
Benzo(k)flouranthene	24-Hour, Annual	2.3	7.02E-07	8.85E-08	3.08E-06	1.40E-06	1.77E-07	6.15E-06
Benzo(a)pyrene	24-Hour, Annual	8.8	2.69E-06	3.39E-07	1.18E-05	5.38E-06	6.77E-07	2.35E-05
Chyrsene	24-Hour, Annual	11.3	3.45E-06	4.35E-07	1.51E-05	6.90E-06	8.70E-07	3.02E-05
Indeno(1,2,3-cd)pyrene	24-Hour, Annual	13.0	3.97E-06	5.00E-07	1.74E-05	7.94E-06	1.00E-06	3.48E-05
Dibenzo(a,h)anthracene	24-Hour, Annual	1.5	4.58E-07	5.77E-08	2.01E-06	9.16E-07	1.15E-07	4.01E-06
Total PAHs	24-Hour, Annual	58.3	1.78E-05	2.24E-06	7.80E-05	3.56E-05	4.49E-06	1.56E-04
Dioxins and Furans (PCDD/PCDF)‡								
Dioxin (TEQ)	24-Hour, Annual	0.18	5.50E-08	6.93E-09	2.41E-07	1.10E-07	1.39E-08	4.82E-07
Total Dioxin/Furan	24-Hour, Annual	13	3.97E-06	5.00E-07	1.74E-05	7.94E-06	1.00E-06	3.48E-05
Polychlorinated Biphenyls (PCBs)‡								
PCB-77	24-Hour, Annual	5.37	1.64E-06	2.07E-07	7.18E-06	3.28E-06	4.13E-07	1.44E-05
PCB-81	24-Hour, Annual	0.33	1.01E-07	1.27E-08	4.41E-07	2.02E-07	2.54E-08	8.83E-07
PCB-105	24-Hour, Annual	11.80	3.60E-06	4.54E-07	1.58E-05	7.21E-06	9.08E-07	3.16E-05
PCB-114	24-Hour, Annual	0.17	5.19E-08	6.54E-09	2.27E-07	1.04E-07	1.31E-08	4.55E-07
PCB-118	24-Hour, Annual	2.99	9.13E-07	1.15E-07	4.00E-06	1.83E-06	2.30E-07	8.00E-06
PCB-123	24-Hour, Annual	0.11	3.36E-08	4.23E-09	1.47E-07	6.72E-08	8.47E-09	2.94E-07
PCB-126	24-Hour, Annual	0.03	9.16E-09	1.15E-09	4.01E-08	1.83E-08	2.31E-09	8.03E-08
PCB-156/157	24-Hour, Annual	0.07	2.14E-08	2.69E-09	9.36E-08	4.28E-08	5.39E-09	1.87E-07
PCB-167	24-Hour, Annual	0.09	2.75E-08	3.46E-09	1.20E-07	5.50E-08	6.93E-09	2.41E-07
PCB-169	24-Hour, Annual	0.02	6.11E-09	7.70E-10	2.68E-08	1.22E-08	1.54E-09	5.35E-08
PCB-189	24-Hour, Annual	0.03	9.16E-09	1.15E-09	4.01E-08	1.83E-08	2.31E-09	8.03E-08
Total PCBs	24-Hour, Annual	21.01	6.42E-06	8.09E-07	2.81E-05	1.28E-05	1.62E-06	5.62E-05

6. Inorganic Acid Gases and Ammonia

Pollutant	Averaging Period	Concentration (ppmvd @ 7% oxygen)	Emission Rates (per flue)			Emission Rates (two flues)		
			lb/hr	g/s	tpy	lb/hr	g/s	tpy
Hydrochloric acid‡	24-Hour, Annual	25	11.5	1.45	50.5	23.1	2.91	101.0
Total fluoride (as HF)‡	24-Hour, Annual	4.3	1.09	0.137	4.8	2.18	0.274	9.5
Sulfuric acid mist	24-Hour, Annual	3.6	4.5	0.56	19.6	8.9	1.13	39.1
Ammonia	24-Hour, Annual	20	4.31	0.543	18.9	8.62	1.086	37.8

*At 70°F, 14.696 psia, wet, actual percent oxygen.
†At 70°F, 14.696 psia, dry, 7.0-percent oxygen.
‡Clean Air Act Section 112 Hazardous Air Pollutant (HAP).

Sources: WTI, 2010.
ECT, 2010.

ATTACHMENT I

- High steam cycle. FCCRWTE will have the highest steam cycle boiler of any existing waste-to-energy facility in the country. Steam will be produced in the boilers at 1,305 psia and 932°F to provide higher steam turbine efficiency that will produce more than 670 net kilowatt-hours (kWh) per ton of MSW combusted, which is well above the approximate national average of 550 kWh per ton.

These same technologies were also considered in the LAER analysis for control of NO_x emissions.

FCCRWTE will also use energy efficiency technologies to improve the amount of electricity generated and used onsite. These technologies will be comparable to technologies used throughout the waste-to-energy industry including but not limited to the following:

- Energy efficient motors, pumps, and lighting.
- The ability to perform online cleaning of heat exchanger surfaces by soot blowers, which will help ensure the higher boiler efficiency is maintained.

Based on the use of clean fuel, energy efficient technology, and the most efficient steam cycle boiler in the production of steam, FCCRWTE proposes a GHG BACT emissions limit of 241 tons of CO_2e per million pounds of steam produced based on a 12-month rolling average. Steam production was chosen as a measure of energy efficiency, because it is directly and accurately measured and provides the facility the flexibility it needs to use steam for electrical generation and/or supply steam for local district heating. Maximizing steam production was the basis for installation of the highest MSW-fired steam cycle boilers in the country, and, subsequently, maintaining high steamflow generation efficiency is a primary goal for facility operation. This GHG BACT emissions limit will be based on normal operation including periods of startup and shutdown.

The annual GHG BACT emissions limit for the MWCs was derived from the following calculation:

$$\frac{total\ E_{CO2e}}{STEAM_{calculated}} = 241\ tons / MMlb\ steam$$

Total $E_{CO2e} = E_{CO2} + E_{CH4}$ (CO_2e) + E_{N2O} (CO_2e) [MSW] = E_{CO2} + (HI_{max} × (EF_{CH4} kg/MMBtu (MSW) × 21 GWP) + (HI_{max} × (EF_{N2O} kg/MMBtu [MSW] × 310 GWP) × 0.001.

where: total E_{CO2e} = CO_2e (tpy) (851,051) from MWCs.

E_{CO2} = maximum CO_2 emissions (tpy) resulting from worst-case fuel blend combustion using MWC design/operation CO_2 emission factor (837,944).

HI_{max} = maximum annual vendor design heat input (MMBtu/year) (for all fuels) (6,022,500).

EF_{CH4} = 40 CFR 98, Subpart C, Table C-2 default emission factors, 3.2×10^{-02} kg CH_4/MMBtu - MSW and tires.

EF_{N2O} = 40 CFR 98, Subpart C, Table C-2 default emission factors; 4.2×10^{-03} kg N_2O/MMBtu - MSW and tires.

GWP = global warming potential for CH_4 and N_2O (40 CFR 98, Subpart C, Table A-1).

0.001 = conversion factor from kg to metric tons.

$STEAM_{calculated}$ = calculated boiler steam production (including low load and variable fuel operation) (annual) (million lb/yr) (3,539).

Table B-10 in Appendix B provides the GHG emission calculations.

Compliance with this GHG BACT limit will be demonstrated by monitoring the total CO_2 emissions using the CO_2 CEMS during periods of normal operations when combusting all fuels (MSW, tires, and sludge) when required and during periods of startup and shutdown when combusting natural gas in accordance with the Tier 4 monitoring requirements in Subpart C of EPA's 40 CFR 98 Mandatory Greenhouse Gas Reporting Rule. Methane and nitrous oxide emissions will also be calculated in accordance with

ATTACHMENT J

Table B-10. Greenhouse Gas Emission Estimates

A. Input Data

Project Data*	Units	100% Load
MWC steam flow (calculated)	MMlb steam/yr	3,539
MWC maximum rated heat input capacity (HI)	MMBtu/hr	687.5
	MMBtu/yr	6,022,500
No. 2 fuel oil consumption (emergency diesel)	gal/hr	15.3
No. 2 fuel oil heat content	Btu/gal, HHV	138,000
No. 2 fuel oil heat input (emergency diesel)	MMBtu/hr, HHV	2.11
	MMBtu/yr, HHV	1,056
Emergency diesel annual operating hours	hr/yr	500
MWC annual operating hours	hr/yr	8,760

B. Greenhouse Gas (CO_2 Equivalents) Emission Estimates; 100% Capacity Factor

Fuel Type	GHG	Emission Factors‡		GWP*	GHG Emission Rates (as CO_2e Equivalents)				
		Units	Value		lb/hr	tpy	tonnes/yr†	tons/MMlb steam	tonnes/MMlb steam
90% municipal solid waste/ 10% sewage sludge fuel blend‡‡	CO_2	kg/MMBtu, HHV	126.2	1	191,278	837,944	760,040	236.8	214.8
		lb/MMBtu, HHV	278.2						
	CH_4	kg/MMBtu, HHV	0.032	21	1,019	4,462	4,047	1.3	1.1
		lb/MMBtu, HHV	0.071						
	N_2O	kg/MMBtu, HHV	0.0042	310	1,973	8,645	7,841	2.4	2.2
		lb/MMBtu, HHV	0.0093						
MSW Totals					**194,270**	**851,051**	**771,928**	**240.5**	**218.2**
Distillate fuel oil No. 2 (emergency diesel engine)	CO_2	kg/MMBtu, HHV	73.96	1	344	86	78	N/A	N/A
		lb/MMBtu, HHV	163.1						
	CH_4	kg/MMBtu, HHV	0.0030	21	0.3	0.1	0.1	N/A	N/A
		lb/MMBtu, HHV	0.0066						
	N_2O	kg/MMBtu, HHV	0.00060	310	0.9	0.2	0.2	N/A	N/A
		lb/MMBtu, HHV	0.0013						
Distillate Fuel Oil No. 2 Totals					**345**	**86**	**78**		
FCCRWTE Facility Totals					**194,616**	**851,137**	**772,006**	**240.5**	**218.2**

‡Vendor emission factor for CO_2, 40 CFR Part 98, Subpart C, Table C-2 default emission factors for CH_4 and N_2O.
*Data is for two, 750-ton-per-day MWCs.
†Metric ton = 2,205 pounds.
‡‡Maximum GHG emission rate fuel blend assumed to occur 8,760 hrs/yr.

Sources: WTI, 2012.
ECT, 2012.