EXHIBIT E

State Plan Narrative and Proposed PSEG Permit Modification and Public Participation Documents

1. Notice of intent
2. Certification of public hearing
3. A summary of written comments and responses

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Notice of Intent to Adopt State Plan for Air Quality

The Commissioner of the Department of Environmental Protection (Commissioner and Department, respectively) hereby gives notice of a public hearing as part of a proceeding to adopt a state plan specifying requirements to control mercury emissions from coal-fired electric generating units (EGUs) as required by the Clean Air Act Amendments of 1990 (CAA) and *Standards of Performance for New and Existing Stationary Sources; Electric Utility Steam Generating Units*, 70 FR 28606 (CAMR). This state plan will be submitted to the United States Environmental Protection Agency (EPA) for review and approval. The proposed state plan is described below.

All interested persons are invited to comment on the proposed state plan. Comments should be submitted to the Department of Environmental Protection, Bureau of Air Management, Planning and Standards Division, 79 Elm Street, Hartford, Connecticut 06106-5127. All comments should be directed to the attention of Patricia Downes and must be received by 4:30 PM on January 5, 2007. Comments may be submitted by post, facsimile, to (860) 424-4063, or by electronic mail to patricia.downes@po.state.ct.us.

Connecticut Clean Air Mercury Rule State Plan: This state plan is proposed to limit mercury emissions from new and existing coal-fired EGUs in satisfaction of CAA Section 111(d) and 40 CFR 60.24(h). Any state with EGUs to which CAMR applies must submit a state plan and enforceable mechanism indicating how the state will meet its federally assigned state budgets for mercury emissions from coal-fired EGUs. For Connecticut, these emissions budgets are 0.053 tons, or 106 pounds, per year of allowable mercury emissions in 2010-2017 and 0.021 tons, or 42 pounds, per year in 2018 and beyond. A state may meet its assigned CAMR budgets by either participating in a national cap-and-trade program for mercury emissions or by demonstrating that state requirements limit the mercury emissions from the CAMR units in the state to a level below the applicable state emissions budget in any given year.

CAMR units to which this Connecticut state plan applies will not be permitted to generate and trade mercury emissions reductions. Rather, the Department proposes in this state plan to implement and enforce the emissions limitations, monitoring, recordkeeping and reporting requirements necessary to satisfy CAMR and state law through its new source review permitting (NSR) program. Implementation of the Plan described here will reduce emissions of mercury from the state's coal-fired EGUs earlier and to a greater extent than required by CAMR.

There are three existing CAMR units in Connecticut: the Bridgeport Harbor steam generator #3 owned and operated by PSEG Power Connecticut, LLC and two circulating fluidized bed boilers owned and operated by AES Thames, LLC. Applications to modify the NSR permits issued with respect to each of these units have been submitted to the Department and are now being processed.

In addition to accepting written comments on the proposed plan, the Department will also hold the public hearing described below. Any person appearing at the hearing is requested to submit a written copy of his or her statement. However, oral comments will also be made a part of the hearing record and are welcome.

The Department recognizes that the outcome of the proceedings to modify the NSR permits for the three existing CAMR units and the proposal to add subsection (n) to section 22a-174-3a(n) of the Regulations of Connecticut State Agencies (R.C.S.A.) are integral to the finalization of this plan. However, at this time, the Department solicits comments only on the concepts set forth in the narrative of the proposed state plan, and the use of the NSR permitting program to meet the state plan requirements of CAMR, and not on the NSR permit modifications for the three existing CAMR units or on the proposal to add subsection (n) to R.C.S.A. section 22a-174-3a, as those matters are currently the subject of separate proceedings with associated comment periods.

PUBLIC HEARING
December 28, 2006 at 10 AM
Department of Environmental Protection, 5th Floor, Holcombe Room
79 Elm Street, Hartford, CT

Copies of the plan described above are available for public inspection during normal business hours and may be obtained from Patricia Downes at the Bureau of Air Management, Planning and Standards Division, 5th Floor, 79 Elm Street, Hartford, CT. Additional copies are also available for review at the Law Reference Desk at the Connecticut State Library, Torrington Public Library, New London Public Library and Bridgeport Public Library. For further information, contact Patricia Downes of the Bureau of Air Management at (860) 424-3027 or by electronic mail to patricia.downes@po.state.ct.us.

The Department is an affirmative action/equal opportunity employer, providing programs and services in a fair and impartial manner. In conformance with the Americans with Disabilities Act of 1990, individuals with disabilities who need information in an alternative format to allow such individuals to benefit from and/or participate in the Department's programs and services should call TDD (860)-424-3000 and make their request to the receptionist. Requests for accommodations to attend the noticed hearing must be made at least two weeks prior to the hearing date to Marcia Z. Bonitto, ADA Coordinator, via electronic mail to Marcia.Bonitto@po.state.ct.us.

The authority to adopt the proposed plan is granted by C.G.S. sections 22a-5, 22a-6 and 22a-174. This notice is required pursuant to 40 CFR 60.23.

11/17/06
Date

Gina McCarthy
Commissioner

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

HEARING CERTIFICATION

This certifies in accordance with the provisions of Title 40 Code of Federal Regulations Part 51.102 that the actions listed below were taken regarding the adoption of the Connecticut Clean Air Mercury Rule State Plan:

1) The public hearing was held on December 28, 2006 as announced in the notice of hearing (copy attached);

2) In accordance with the notice, materials were available for review in each Air Quality Control Region (AQCR) in Connecticut;

3) Copies of the notice were mailed to the directors of the air pollution control agencies in New York, New Jersey, Rhode Island and Massachusetts along with a copy to the Director of the Air Management Division of Region I of the U.S. Environmental Protection Agency; and

4) The notice of hearing was published in newspapers as follows:

Newspaper	AQCR	Date
Connecticut Post (Bridgeport)	43	November 22, 2006
Hartford Courant	42	November 22, 2006
New London Day	41	November 22, 2006
The Register Citizen (Torrington)	44	November 22, 2006

December 28, 2006
Date

Merrily A. Gere
Bureau of Air Management

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

HEARING REPORT

Pursuant to 40 Code of Federal Regulations (CFR) 60.23

Adoption of the Connecticut Clean Air Mercury Rule State Plan

Hearing Officer:
Merrily A. Gere

Date of Hearing: December 28, 2006

On November 17, 2006, the Commissioner of the Department of Environmental Protection (Commissioner and Department, respectively) signed a notice of intent to adopt a state plan (the Plan) specifying requirements to control mercury emissions from coal-fired electric generating units (EGUs) as required by the Clean Air Act Amendments of 1990 (CAA) and *Standards of Performance for New and Existing Stationary Sources; Electric Utility Steam Generating Units*, 70 FR 28606 (CAMR). Pursuant to such notice, a public hearing was held on December 28, 2006, with the public comment period closing on January 5, 2007. Finalization of the Plan and this report was delayed pending final adoption of the enforceable mechanisms of the Plan.

I. Hearing Report Content

This report describes the Plan as proposed for hearing; the principal reasons in support of the proposed Plan; all comments made in this proceeding and responses thereto; and the final wording of the Plan. Commenters are identified in Attachment 1.

II. Summary and Text of the State Plan

The Plan was proposed to limit mercury emissions from new and existing coal-fired EGUs in satisfaction of CAA Section 111(d) and 40 CFR 60.24(h). Any state with EGUs to which CAMR applies must submit a state plan and enforceable mechanism indicating how the state will meet its federally assigned state budgets for mercury emissions from coal-fired EGUs. For Connecticut, these emissions budgets are 0.053 tons, or 106 pounds, per year of allowable mercury emissions in 2010-2017 and 0.021 tons, or 42 pounds, per year in 2018 and beyond. CAMR allows a state to meet its assigned CAMR budgets by either participating in a national cap-and-trade program for mercury emissions or by demonstrating that state requirements limit the mercury emissions from the CAMR units in the state to a level below the applicable state emissions budget in any given year.

CAMR units to which the Plan applies will not be permitted to generate and trade mercury emissions reductions. Rather, the Department proposes to implement and enforce the emissions limitations, monitoring, recordkeeping and reporting requirements necessary to satisfy CAMR and state law through its new source review permitting (NSR) program.

As required pursuant to the applicable regulations of the U.S. Environmental Protection Agency (EPA), the proposed Plan includes: an inventory of the state's CAMR units and the units' associated mercury emissions; a description of the state's enforceable mechanism; monitoring,

record keeping and reporting requirements in satisfaction of 40 CFR 75, with regard to mercury mass emissions; emissions standards, compliance schedules and a demonstration of compliance with the state's annual mercury budget; a demonstration of the state's legal authority to adopt and implement the Plan; provisions for progress reporting to EPA; and records of the public notice and hearings on the Plan and its components.

The text of the proposed Plan is located in Attachment 2 to this report.

III. Principal Reasons in Support of the Proposal

The primary purpose of the proposed action is to address the Department's obligations under CAMR to submit a state plan and enforceable mechanism describing how the state will meet its federally assigned state budgets for mercury emissions from coal-fired EGUs and demonstrating that state requirements limit the mercury emissions from the CAMR units in the state to a level below the applicable state emissions budget in any given year.

Implementation of the Plan is anticipated to reduce emissions of mercury from the state's coal-fired EGUs earlier and to a greater extent than required by CAMR. This reduction is possible due to the requirements of a state statute, section 22a-199 of the Connecticut General Statutes (CGS) and the Plan's opt-out from the national mercury emissions trading program. If Connecticut were to participate in CAMR's national cap-and-trade program and fully allocate the Connecticut CAMR mercury budgets, then in-state emissions reductions achieved and maintained under CGS section 22a-199 could be negated from emissions transported from upwind states, and the potential for mercury "hot spots" could be created.

Furthermore, the Plan provides a useful planning document for the owners and operators of potential new coal-fired EGUs in Connecticut. Adherence to the Plan requires any such unit to be designed and sited not only to serve the state's energy planning needs but also to use the best combination of generator technology, fuel and air pollution controls to limit mercury emissions.

IV. Summary of Comments

All comments submitted are summarized below with the Department's responses. Commenters are identified by abbreviation in this section and are identified fully in Attachment 1 to this report. When changes to the proposed text are indicated in response to comment, new text is in bold font and deleted text is in strikethrough font.

General

Comment 1. Clean Water Action applauds the Department's draft rule, which rejects the weak standard set by CAMR. The Federal rule fails to protect public health by allowing trading of mercury pollution and permitting the creation of local mercury hot spots, instead of achieving mercury reduction at each plant. The Federal rule's timetables are far too long and the targets too weak relative to what is technically and economically feasible.

Connecticut is right to forego the CAMR mercury trading program and permanently retire allowances representing our permissible mercury pollution from the Federal cap. All existing and future Connecticut mercury sources should at least be able to meet the weak standards set by the Federal program and hopefully do far better and enable us to reach the New England Governors' pledge to "virtually eliminate" mercury pollution by 2010.

Response: The Department notes Clean Water Action's support for the proposed state

plan, particularly the decision to opt-out of the federal trading program and the recognition that the Plan furthers the regional "virtual elimination" goal created in 1998 by The New England Governors and The Eastern Canadian Premiers. *See also* Comment 7, which clarifies the status of Connecticut's CAMR allowances given the Department's decision to opt-out of the national mercury emissions trading program.

Comment 2. PSEG Power supports the Department's decision to use the NSR program as the enforceable mechanism of the state plan.

Response: The Department notes PSEG Power's support for the choice of enforceable mechanism.

Comment 3. PSEG Power offers that the mercury emissions limits adopted by the state [*i.e.*, CGS section 22a-199] should be more than sufficient to ensure compliance with the CAMR Phase 1 and Phase 2 budgets for Connecticut.

Response: The Department believes that the emissions limitations of CGS section 22a-199 are sufficient to ensure that the state's ***existing*** CAMR units allow the state to comply with the CAMR Phase 1 and 2 state caps. However, to satisfy EPA's state plan criteria, the requirements of CGS section 22a-199 have been augmented with the restrictions on permitting in new subsection (n) of section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA). The requirements of subsection (n) ensure that the state will remain in compliance with the CAMR state caps in the event that any ***new*** coal-fired EGUs are constructed in Connecticut.

Comment 4. EPA notes that the final state plan cannot be submitted until the following items are completed: (1) adoption and submission of the amendment to RCSA section 22a-174-3a to add subsection (n) in a manner that addresses EPA's comments on the proposal; (2) issuance of the modification to the NSR permit for Bridgeport Harbor #3, in a manner that addresses EPA's comments on the tentative determination; and (3) issuance of a modification to the NSR permit for AES Thames units 1 and 2.

Response: The Department has completed the adoption of the elements of the Plan and may now submit a final version of the Plan for approval.

Section II.A, Description of Existing Unit

Comment 5. PSEG Power provides information so that the Department may correct the state plan narrative with respect to unit specifications for Bridgeport Harbor #3, as follows:

Unit #3 is a 410 MW tangentially-fired boiler. The unit is dual-fueled and can burn either coal or #6 oil when producing electricity. The operation of the unit on coal includes the rated capacity of up to 400 MW net output, daily average. While on oil, the rated capacity is up to 410 MW net output, daily average. As such, the unit has a maximum heat input, nameplate value, of 4,100 MMBtu per hour.

Response: The Department should revise Section II.A. of the proposed Plan to take into account the unit specifications provided by PSEG Power. *See* the response to Comment 6 for the specific recommended changes to update the text with regard to the Bridgeport Harbor #3.

Comment 6. PSEG Power provides the following update concerning the construction of an activated carbon injection (ACI) system and pulse-jet fabric filter baghouse at Bridgeport Harbor #3:

- The ACI system is being installed downstream from the unit's existing electrostatic precipitator and upstream from the stack.
- The ACI system will operate only when the unit is burning coal. The system will not be used when the unit is burning oil, including during startup and shutdown, as oil will wreak havoc with the baghouse. The electrostatic precipitator will operate when the unit is burning oil.
- Foundation supports are largely complete for the ACI silo, duct supports, booster fan, ash silo and electrical transformers. Construction of the foundation supports and the steel frame for the pulse jet fabric filter is also underway. PSEG Power expects the system to be fully operational by July 1, 2008.

Response: The Department notes that PSEG Power's installation of mercury emissions control equipment is proceeding as anticipated. The final Plan narrative should be revised at II.A. to reflect some of the information provided here as well as in Comment 5, as follows:

A. Bridgeport Harbor #3

By way of background, PSEG Bridgeport Harbor #3 is owned and operated by PSEG Power Connecticut, LLC, a subsidiary of a major unregulated independent power producer. Unit #3 is located in Bridgeport, Connecticut at the Bridgeport Harbor Station. **Unit #3 is a 410 MW tangentially-fired boiler. The unit is dual-fueled and can burn either coal or #6 oil when producing electricity. The operation of the unit on coal includes the rated capacity of up to 400 MW net output, daily average.** Adaro sub-bituminous coal from Indonesia is used to comply with Connecticut's strict regulatory requirements to limit sulfur emissions. Indonesian coal has a lower sulfur content, ash content and mercury content than domestic bituminous coal. **While burning #6 oil, the rated capacity is up to 410 MW net output, daily average. As such, the unit has a maximum heat input, nameplate value, of 4,100 MMBtu per hour.** ~~At 400 MW, the~~ **The** unit is the largest coal-fired unit in Connecticut and the third largest in the New England Power Pool.

Unit #3 is ~~a dual-fired (low sulfur coal and residual oil) unit~~ equipped with an in-line heater (#2 oil-fired) to remove excess moisture from coal prior to combustion, an electrostatic precipitator to control particulate emissions and a sulfur injection system to control the resistivity of the ash and thereby the effectiveness of the precipitator. To comply with Connecticut General Statute (CGS) Section 22a-199, PSEG is installing an activated carbon injection (ACI) system with pulse-jet fabric filter baghouse to control mercury. **This system is being installed downstream from the unit's existing electrostatic precipitator and upstream from the stack. The unit will only operate when Unit #3 is burning coal and will not be used when the unit is burning oil, including unit startups and shutdowns, as oil will seriously compromise the function of the bags. The electrostatic precipitator will still be used when the unit burns oil.** This new control equipment is scheduled to be in operation prior to July 1, 2008.

Section IV, Opt-Out of National Trading Program

Comment 7. In Section IV, Connecticut requests that EPA eliminate allowances from the national trading program equivalent to Connecticut's budget. EPA states that since Connecticut will not be participating in the trading program, Connecticut's budget will not be included in the national trading program.

> **Response:** The Department appreciates EPA's confirmation of the elimination of Connecticut's budgeted emissions allowances from the national trading program. To improve the accuracy of the proposed Plan on this point, the Department should clarify the last sentence of the first paragraph of Section IV, as follows:
>
> . . . serve as an enforceable state cap, and this Plan is complete without a method to allocate mercury allowances to the state's CAMR units. ~~As follows from the opt-out from the trading program, the Department requests that EPA eliminate allowances equivalent to the Connecticut state budgets from the national trading program.~~ **The Department understands that, as a result of the opt-out, Connecticut's budget will not be included in the national trading program.**

Comment 8. AES Thames requests that Connecticut fully participate in the national mercury trading program to ensure that clean coal burning facilities may continue to operate in the state. Without such participation, AES Thames believes that the state plan will limit fuel diversity by limiting the construction of new coal-burning electric generators. In support of this concern, AES Thames notes:

- Various policy statements prepared by the Connecticut Energy Advisory Board and the Connecticut Siting Council have identified fuel diversity as an issue of concern that should be addressed with regulations to encourage diversity.
- The Department cannot guarantee that the current operating CAMR units will remain at the mercury emission levels projected by the Department.
- By not participating in the federal trading program, the Department is limiting Connecticut's ability to use clean coal technologies to generate electricity. Mercury emissions from coal burning units such as the two units operated by AES Thames vary in mercury emissions depending on fuel, combustion and design characteristics. An absolute budget without the ability to purchase allowances hampers operation.
- Without participation in the national trading program, the Department is limiting the construction of new units such as integrated gasification combined cycle (IGCC) units.
- The emissions limits of CGS section 22a-199 are sufficient to ensure that the air quality in the state is protected.

AES Thames recommends the following allocation method for Connecticut should the state participate in the national trading program: allocate to each CAMR unit only enough allowances to cover emissions, and retire or bank any allowances that are not allocated. If the state budget is not sufficient to address emissions, then source owners should be allowed to purchase allowances in the national program.

> **Response:** The Department will not participate in the CAMR national trading program for mercury but will instead rely on the requirements of CGS section 22a-199 as implemented through the NSR permit program to achieve more certain reductions in mercury emissions, ensuring better protection of public health and the environment.

Connecticut's approach to reducing mercury from coal-fired EGUs is consistent with the Department's long-held determination that trading of toxic air pollutants is not appropriate. This concern was one of the issues raised by Connecticut, along with eight other states, in a March 29, 2005 petition filed in the D.C. Circuit Court requesting reconsideration on CAMR.[1] Opting out of the national trading program also furthers the regional goal of virtual elimination of anthropogenic mercury emissions.[2]

In response to the commenter's bulleted points, the Department notes:

- Fuel diversity and environmental protection are not mutually exclusive goals. Efforts to meet environmental mandates from CAMR to climate change-based initiatives encourage diversity, as long as "diversity" is understood to encompass technologies and approaches beyond traditional fossil and nuclear-fueled electric generating plants. Preservation and protection of the environment are enhanced by an increase in the use of all "clean," *i.e.,* low-emitting, generation such as wind, solar, hydro and clean coal technologies. Furthermore, energy efficiency measures that reduce overall demand are another crucial element of Connecticut's energy planning efforts. Neither clean generation nor demand reduction are limited by efforts to reduce mercury emissions.
- Through the addition of subsection (n) to RCSA section 22a-174-3a, the Department has enforceable requirements that place the responsibility on CAMR unit owners to limit mercury emissions to levels below the state caps. Subsection (n) includes a requirement for unit-specific annual mass caps in NSR permits issued to CAMR units and prohibits the issuance of a permit for a CAMR unit unless the emissions of all CAMR units in the state total an amount less than the applicable state mercury emissions cap.
- In contrast to the commenter's assertion, the Department's opt-out of the trading may encourage the use of clean coal technology. Regulatory programs are one incentive for technology development and serve to reduce the costs of such new technologies.
- The Plan, as proposed and as recommended in response to comment, allows for the construction of new IGCC units in the state.
- *See* the response to Comment 3.

In summary, no change to the Plan is recommended in response to this comment.

Section V, Monitoring

Comment 9. EPA notes that at Section V, Connecticut relies on CAMR's low-emitter provisions to allow stack testing to satisfy CAMR's monitoring requirements. EPA suggests that the text should be clarified to indicate that a continuous emissions monitoring (CEM) system for mercury will be required to be installed and certified in accordance with 40 CFR 75.81 at any unit from which the annual emissions exceed 464 ounces.

Response: In referencing the low-emitter requirements in the proposed Plan narrative, the Department understood that reliance on those provisions requires the CAMR units to remain within the emissions bracket, *i.e.*, less than 464 ounces, that defines a mercury low-emitter in 40 CFR 75. To make this understanding clear in the Plan, the last two

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1 *State of New Jersey, et al. v. U.S. Environmental Protection Agency*, Docket No. 06-1211 (D.C. Cir.).

2 Conference of New England Governors/Eastern Canadian Premiers. 1998. *Mercury Action Plan.*

paragraphs of proposed Section V should be supplemented, as follows:

> . . . . .As indicated in Sections VI and VIII, the Department will be updating the compliance demonstration of this Plan with actual emissions data to establish the existing units as low mercury emitting units. **Should any CAMR unit monitor annual mercury emissions in excess of 29 pounds, a CEM system for mercury will be required to be installed and certified in accordance with 40 CFR 75.81.**
>
> ~~Should~~ **In addition to installation of CEM systems should any unit exceed the low-emitter emissions bracket, should** CEMs for mercury become commercially available, CGS Section 22a-199(b)(3)(B) provides for the Commissioner to order CEM installation and operation at the state's CAMR units. In such an event, the Commissioner would notify EPA of the monitoring change.

That annual testing is required for low-emitting units with annual mercury emissions of less than 9 pounds per year should also be mentioned in paragraph two of Section V of the final Plan, to supplement the discussion of the low-emitting unit monitoring requirements.

Section VI, Compliance Demonstration

Comment 10. The Department has included in its proposed Plan calculations that show mercury emissions from existing and potential future coal-based generation in Connecticut may be below the federal Phase I state cap of 106 pounds per year, and in fact, meet the federal Phase II cap of 42 pounds per year. The Department, therefore, has proposed to implement the Phase II cap starting 2010, rather than in 2018 as proposed by EPA. NRG reiterates its comments on proposed RCSA section 22a-174-3a(n), which can be summarized as the Department does not need to implement the 42-pound cap starting in 2010.

> **Response:** The Department, based on known factors and assumptions about the state's existing CAMR units, states in the proposed Plan its reasoned expectation that the annual mercury emissions from the existing units will total less than the 42-pound Phase 2 federal cap and will likely be at such a level by 2010. However, the Plan does not commit the state to meet the Phase 2 limit at such a date. The Plan clearly notes that the requirements of CGS section 22a-199 allow that emissions may be higher than those calculated (see Section II) but that the Plan will "be implemented to ensure that emissions from the universe of coal-fired EGUs in Connecticut will be below the federally assigned caps." (Proposed Plan, Section II at page 3)
>
> RCSA section 22a-174-3a(n) is the regulatory vehicle that requires the coal-fired EGUs to meet state mercury emissions cap. Based on comment received on proposed RCSA section 22a-174-3a(n), the Department has clarified the dates on which the state mercury mass emissions caps apply to mirror the timing and level of the two phases of the federal caps. The Department will use the 2012 review of the existing unit emissions mandated in CGS section 22a-199 to determine whether the Phase 2 cap should be imposed earlier than 2018, and, as appropriate, revise RCSA section 22a-174-3a(n). The emissions data from the existing units available at that future date, combined with more certainty regarding the construction of new coal-fired EGUs, will allow for an informed decision.

The Plan should be revised at Section VI.B to include a statement about the 2012 emissions review at the end of the first paragraph, as follows:

> . . . .specific authority to the Commissioner to, after July 1, 2012, establish mercury emission limits that are more stringent than those provided in CGS Section 22a-199. **The Department will use the 2012 review of the existing unit emissions mandated by CGS section 22a-199 to determine whether the Phase 2 state mercury emissions cap of 42 pounds should be imposed earlier than 2018, and, if so, seek to revise RCSA section 22a-174-3a(n) accordingly.**

Comment 11. EPA suggests that the Plan narrative be clarified at page 7 to indicate that each CAMR unit will have an annual mercury emission cap specified in the unit's NSR permit. EPA indicates that such emissions caps are important to EPA approving the final state plan as satisfying CAMR.

> **Response:** The Department agrees to the inclusion of a unit-specific annual mass cap on mercury emissions and has included a provision in RCSA section 22a-174-3a(n)(2)(A)(ii) to require such a cap in any permit or modification issued for a CAMR unit.
>
> The final Plan narrative should discuss the unit-specific caps in Sections II.C. and VI.A., and the future annual emissions in Table 1 of the Plan should be revised to specify the permitted level of each unit-specific cap, namely 21.76 pounds for PSEG Bridgeport Harbor #3 and 5.2 pounds for each AES Thames unit.

Comment 12. NRG objects to the proposed mercury cap calculations for existing coal generation. The Department's proposal to cap mercury emissions starting year 2010 from the existing coal-fired units in Connecticut based on the statutory limit of 0.6 lbs/TBtu, the units' design heat input and a 100% capacity factor. NRG believes that this will overestimate the mercury emissions from the existing units to the detriment of future coal-based generation, since, at a minimum, no coal-based generating unit in the state operates at a 100% capacity factor.

NRG recommends that the Department determine the allowable mercury emissions from the existing units based on actual mercury emissions rates as of 2012, consistent with the review mandated by CGS section 22a-199. The mercury monitoring required under CGS section 22a-199 and the highest five-year coal use available at that time will provide a more realistic mercury cap.

> **Response:** In Section VI.A of the proposed Plan, the Department intentionally overestimates the mercury emissions of existing units and notes that understanding.[3] These calculations are not a hard cap on the existing units, but a statement of our expectations. As such, an overestimate of emissions that nonetheless shows compliance with the 2018 state cap is beneficial to demonstrating our compliance to EPA and in putting owners and operators of potential new coal-fired EGUs on notice of the need to incorporate mercury emissions controls. As NRG recommends, the Department will also review emissions from coal-fired EGUs in 2012 to determine compliance with CGS

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[3] *See* page 6, Section VI.A. ("the emissions in Table 1 are likely higher than actual emissions will be . . . .")

section 22a-199 and will be reporting mercury emissions under our CAMR plan annually to EPA.

Comment 13. AES Thames requests that the state plan narrative reference the full definition of "inlet conditions" as it is defined in CGS section 22a-199. On page 8 of the proposed Plan, the definition for inlet conditions does not include the reference to fluidized bed combustion units. We request that the Department quote or incorporate the entire definition for "inlet conditions" from CGS section 22a-199 to include the fluidized bed combustion unit definition, which allows for the use of coal mercury concentration to determine inlet conditions.

Response: Subsection (a)(4) of CGS section 22a-199 defines "inlet conditions" as:

"Inlet conditions" means either: (A) The concentration of mercury in the flue gas exiting the combustion source prior to application of any air pollution control device; or (B) in the case of a fluidized bed combustion unit, the concentration of mercury input to the combustion source based on representative fuel sampling and analysis, as determined by the Commissioner of Environmental Protection.

The language of interest to the commenter concerning fluidized bed combustors is not pertinent to the discussion in the location of the Plan narrative referenced by him. However, it is not objectionable to include the full definition of inlet conditions set out above as a footnote to the referenced text in Section VI.B. of the final Plan.

Comment 14. In the proposed Plan, the Department calculates emissions from a theoretical IGCC unit to demonstrate that the Plan may accommodate such new construction. The Department estimates mercury emissions of 10 pounds per year based on an emission rate of 0.6lbs/TBtu, a heat input of 1818MMBtu/hr and the use of Adaro coal. NRG estimates annual mercury emissions of 24 pounds per year using the same rate, a gross output of 630MW, a heat input of 4500 MMBtu/hr and a 100% capacity factor. NRG comments that the gap between the two estimates may be closed by adjusting four variables: the size of the unit, the mercury removal efficiency, the capacity factor and the coal stock. NRG provides detailed information to suggest that adjustments to result in emissions levels similar to those of the Department are not economically practical. For example, the use of Adaro coal, suggested by the Department in the proposed Plan, overlooks the ability of an IGCC plant to use lower cost high sulfur content coal.

Response: As there are only two operating IGCC plants in the U.S. and as cost estimates for plants have a wide range, are plant-specific and depend on a variety of inputs, including market-driven inputs that change over short time periods and are difficult to project into the future, disagreement over assumptions about a theoretical plant are not only possible but inevitable. Belabored argument about such uncertainty is not necessary to devising and finalizing a meaningful Plan. Despite the uncertainty, the inclusion of the theoretical IGCC plant in the Plan serves to illustrate that the existing CAMR units, controlling mercury emissions as specified in CGS section 22a-199 and the Plan, will allow for new construction. The number of design variations that such a new plant could take is vast. For example, a 770 MW IGCC plant is now under construction in Illinois. That plant will have mercury emissions below 0.0000020 lb/MWh. Even operating at 100% capacity, such a plant would have mercury emissions near 10 pounds per year. Furthermore, advanced gasification technologies may be considerably less expensive than

previously anticipated.[4] For these reasons, we continue to hold that the calculations of the Plan represent one of many technologically feasible variations useful to demonstrate that new construction is possible under the Plan.

The information noted above concerning the new Illinois IGCC unit should be incorporated in the Plan at Section VI.B. No additional change to the final Plan is recommended in response to this comment.

V. Additional Comment by the Hearing Officer

In addition to the above-recommended revisions, the Department should make the following corrections and clarifications to the final version of the proposed Plan:

- The word "section" should be lower case when used as part of a full citation to a state law or regulation.
- The Plan should be revised to delete the reference in Section VI.B. to the possible construction of an IGCC facility by NRG in Montville, Connecticut, as NRG decided not to pursue such a project.
- The public participation requirements of Section IX should be revised to reflect the final adoption of subsection (n) in RCSA section 22a-174-3a on May 29, 2007, the issuance of the modified NSR permit for PSEG Bridgeport Harbor #3 on February 7, 2007 and the issuance of the modified NSR permits for AES Thames units on October 17, 2007. The subsection as issued and the permits as modified should be included as exhibits to the final Plan.

VI. Conclusion

I recommend a final Plan, consistent with this report, be submitted by the Commissioner to EPA.

Merrily A. Gere
Hearing Officer

October 25, 2007
Date

4 Argus Air Daily, vol. 13: November 16, 2006.

Attachment 1
List of Commenters

David B. Conroy, Chief
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Roger Smith
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Attachment 2

Text of Proposed State Plan

Available in electronic format at:
http://www.ct.gov/dep/cwp/view.asp?a=2684&q=331234&depNav_GID=1619

DRAFT

Connecticut Clean Air Mercury Rule State Plan

Submitted to the
U.S. Environmental Protection Agency
DATE

Connecticut Department of Environmental Protection
Bureau of Air Management
79 Elm Street
Hartford, Connecticut 06106-5127

DRAFT

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LIST OF EXHIBITS SUBMITTED

DRAFT

I. INTRODUCTION

On May 18, 2005, the U.S. Environmental Protection Agency (EPA) promulgated a final rule establishing standards of performance under Section 111 of the Clean Air Act (CAA) for mercury emissions from coal-fired electric generating units (EGUs). *Standards of Performance for New and Existing Stationary Sources; Electric Utility Steam Generating Units*, 70 FR 28606 (CAMR). CAMR establishes requirements by which mercury emissions from new and existing coal-fired EGUs are capped at specified, nation-wide levels in two phases. A first phase (Phase 1) cap of 38 tons per year applies in 2010, and a second phase (Phase 2) cap of 15 tons per year applies in 2018. EPA apportions each national cap by assigning to each state annual mercury emissions budgets. For Connecticut, these budgets are 0.053 tons, or 106 pounds, per year of allowable mercury emissions in 2010-2017 and 0.021 tons, or 42 pounds, per year in 2018 and beyond.

CAMR also provides for an optional market-based mercury cap-and-trade program. A state may meet its state budget by either joining the federal cap-and-trade program or by demonstrating that the mercury emissions from the CAMR units in the state will not exceed the state budget in any given year. For states that choose not to participate in the trading program, the budget assigned under CAMR becomes a hard cap on mercury emissions from coal-fired EGUs in that state.

CAA Section 111(d) requires that any state with EGUs to which CAMR applies must submit a state plan and enforceable mechanism indicating how the state will meet its specified budgets for mercury emissions reductions from CAMR units. There are three existing CAMR units in the State of Connecticut. The Connecticut Department of Environmental Protection (Department) is proposing to regulate these three CAMR units under the Connecticut Clean Air Mercury Rule State Plan (Plan) described herein. The Department has chosen to enforce the Plan through its new source review permitting (NSR) program. The Plan is described in detail at Sections II through IX below and in the referenced exhibits. Implementation of the Plan described here will reduce emissions of mercury from the state's coal-fired EGUs earlier and to a greater extent than required by CAMR, consistent with the state's "virtual elimination" goal for mercury.[1] Consequently, the Department chooses to opt-out of the federal mercury emissions trading program.

In satisfaction of the procedures established in 40 CFR 60 Subpart B and 40 CFR 60.24(h), this Plan includes:

- An inventory of the state's CAMR units and the units' associated mercury emissions;
- A description of the state's enforceable mechanism for the Plan;
- Monitoring, record keeping and reporting requirements in satisfaction of 40 CFR 75, with regard to mercury mass emissions;
- Emissions standards and compliance schedules and a demonstration of compliance with the state's annual mercury budget;
- A demonstration of the state's legal authority to adopt and implement the Plan;
- Provisions for progress reporting to EPA; and
- Records of the public notice and hearings on the Plan and its components.

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1 Conference of New England Governors/Eastern Canadian Premiers. 1998. *Mercury Action Plan.*

II. CAMR ELECTRIC GENERATING UNITS AND EMISSIONS

40 CFR 60.25 requires the state plan to include an inventory of all designated facilities and emissions data for the designated pollutant.

There are three existing CAMR units (the CAMR units) in the State of Connecticut: the Bridgeport Harbor steam generator #3 owned and operated by PSEG Power Connecticut, LLC (hereafter, PSEG Bridgeport Harbor #3) and two circulating fluidized bed boilers owned and operated by AES Thames, LLC (hereafter, AES Thames Units A and B).

A. Bridgeport Harbor #3

By way of background, PSEG Bridgeport Harbor #3 is owned and operated by PSEG Power Connecticut, LLC, a subsidiary of a major unregulated independent power producer. Unit #3 is located in Bridgeport, Connecticut at the Bridgeport Harbor Station. Unit #3 is a dual-fired (low sulfur coal and residual oil) unit equipped with an in-line heater (#2 oil-fired) to remove excess moisture from coal prior to combustion, an electrostatic precipitator to control particulate emissions and a sulfur injection system to control the resistivity of the ash and thereby the effectiveness of the precipitator. At 400 MW, the unit is the largest coal-fired unit in Connecticut and the third largest in the New England Power Pool. To comply with Connecticut General Statute (C.G.S.) Section 22a-199, PSEG is installing an activated carbon injection (ACI) system with pulse-jet fabric filter baghouse to control mercury. This new control equipment is scheduled to be in operation prior to July 1, 2008.

Unit #3 has a maximum heat input of 3900 MMBtu/hr when firing coal. Adaro sub-bituminous coal from Indonesia is used to comply with Connecticut's strict regulatory requirements to limit sulfur emissions.[2] Indonesian coal has lower a sulfur content, ash content and mercury content than domestic bituminous coal. Unit #3 also fires residual oil as a back-up fuel.

B. AES Thames Units A & B

AES Thames, LLC operates a cogeneration facility located in the Uncasville, Connecticut. The facility produces electricity, which it sells to the grid, and steam, which it sells to a neighboring paper plant. The two units are identical Combustion Engineering circulating fluidized bed boilers, each with maximum heat input of 923 MMBtu/hr. Together, the two units can generate 181 MW of electricity. Dry limestone injection followed by fabric filtration controls sulfur emissions. The boilers are primarily fired with bituminous coal. Distillate oil is used during startup, shutdown and operational stabilization. The boilers are designed to operate continuously.

C. Mercury Emissions

Total current mercury emissions from the three CAMR units are calculated to be 71.80 pounds per year, a level below the Phase 1 state mercury emissions cap assigned under CAMR. Beginning July 1, 2008, C.G.S. Section 22a-199 requires the owners and operators of the three CAMR units to meet an emissions rate of equal to or less than 0.6 pounds of mercury per TBtu, or meet a mercury emissions rate equal to a ninety per cent reduction of mercury from the measured inlet conditions for the unit. In response to the requirements of C.G.S. Section 22a-199, PSEG is in the process of installing mercury emissions control equipment. AES is not

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2 See R.C.S.A. section 22a-174-19a.

installing additional control equipment since the mercury emissions from Units A and B now comply with the limitations of C.G.S. Section 22a-199. As of July 1, 2008, projected annual mercury mass emissions from the three CAMR units will total 31.56 pounds, well below the Phase 1 and 2 mercury emission caps assigned to Connecticut. Current and projected mercury emissions from the three CAMR units are summarized in Table 1. Additional explanation of the emissions projections is provided in Section VI of this Plan.

C.G.S. Section 22a-199 also provides that an owner or operator of a coal-fired EGU who installs pollution control equipment to control mercury emissions yet fails to achieve the 0.6 lbs/TBtu or 90% reduction requirement may petition the Commissioner for an alternative limit based on actual emissions data. Given PSEG's new ACI and baghouse installation, PSEG may request an alternative emissions limit. As explained in Section VI of this Plan, such an event would not abrogate the demonstration of compliance made in this Plan, since this Plan will be implemented to ensure that emissions from the universe of coal-fired EGUs in Connecticut will be below the federally assigned caps.

Table 1. CAMR unit annual mercury emissions

	Current Calculated Annual Mercury Emissions (pounds)	**Annual Emissions Projected under C.G.S. Section 22a-199 (pounds)**	**CAMR Phase 1 (2010) State Cap (pounds)**	**CAMR Phase 2 (2018) State Cap (pounds)**
PSEG Bridgeport Harbor #3	43.4	21.76*		
AES Thames Unit A	14.2	4.9		
AES Thames Unit B	14.2	4.9		
Total	**71.8**	**31.56**	**106**	**42**

*PSEG expects to operate Bridgeport Harbor #3 in compliance with the emissions rate requirement of C.G.S. Section 22a-199 as of July 1, 2008 and, assuming that, will effectively meet the 21.76 lb/yr limit. However, C.G.S. Section 22a-199 does not specify an annual limitation on emissions, so the 21.76 lb/yr limit is not effective as a permit requirement until January 1, 2010, under the authority of CAMR.

III. ENFORCEABLE MECHANISM

The Department has chosen to use the state's federally approved new source review program (NSR) as the basis of the enforceable mechanism for the Plan. The requirements of C.G.S. Section 22a-199 in combination with Regulations of Connecticut State Agencies (R.C.S.A.) section 22a-174-3a(n), an addition to the Department's federally approved NSR program, and modifications to NSR permits for the CAMR units will ensure that the existing and any new CAMR units will not exceed the state mercury budget.

A. C.G.S. Section 22a-199

The Connecticut General Assembly adopted C.G.S. Section 22a-199 in 2003. Beginning July 1, 2008, Section 22a-199 requires the owners and operators of the CAMR units to either meet an emissions rate equal to or less than 0.6 pounds of mercury per TBtu or meet a mercury emissions rate equal to a ninety per cent reduction of mercury from the measured inlet conditions for the unit. Section 22a-199 also requires quarterly stack testing and reporting. Because C.G.S. Section 22a-199 includes the alternative emissions limit option for an owner or operator who installs and operates appropriate mercury control equipment yet fails to comply with the 0.6

pounds of mercury per TBtu limit or the 90% reduction requirement, EPA does not consider C.G.S. Section 22a-199 standing alone to be a sufficient enforceable mechanism. As a result, the Department buttresses the requirements of C.G.S. Section 22a-199 with specific NSR permit requirements for new and existing CAMR units to establish a complete and sufficient enforceable mechanism in satisfaction of CAMR. The NSR portions of the enforceable mechanism are described below. The text of C.G.S. Section 22a-199 is available at: http://www.cga.ct.gov/2005/pub/Chap446c.htm#Sec22a-199.htm

B. New Source Review Permits

To satisfy CAMR's requirements for limits on allowable rates of emissions, as well as requirements for monitoring, recordkeeping and reporting in satisfaction of 40 CFR 60.24(h)(4), current NSR permits[3] for each of the three CAMR units are in the process of being modified to reflect the requirements of C.G.S. Section 22a-199, CAMR and, in the case of the Bridgeport Harbor #3, the installation of ACI and a pulse-jet fabric filter baghouse. See Exhibits B and C for copies of the modified CAMR unit permits. See Section IX of this Plan regarding public notice of and the opportunity for public comment on the permit modifications.

C. Amendment of the New Source Review Permitting Program

The state mercury emissions caps assigned by CAMR are permanent caps regardless of growth in the electric sector. Thus, new unit emissions must be addressed within the levels of the caps.

To address CAMR requirements for any new coal-fired EGUs that may be constructed in the state, the Department has proposed to add subsection (n) to Connecticut's NSR permitting program regulation, R.C.S.A. section 22a-174-3a, to ensure that mercury emissions from any new CAMR units that may be constructed in the state, in combination with the existing CAMR units, will not exceed the CAMR state mercury emissions caps. Under proposed subsection (n), no person will be granted a permit to construct and operate a coal-fired EGU unless such an EGU can be operated so that the state will remain in compliance with CAMR and this Plan.

Proposed subsection (n) also addresses the monitoring, recordkeeping and reporting required under CAMR. A hearing was held on the proposed subsection on October 31, 2006 with the comment period closing on November 3, 2006. The proposed amendment and the hearing notice are available at: http://www.dep.state.ct.us/air2/regs/index.htm. Additional documents are available in Exhibit A of this Plan.

IV. OPT-OUT OF NATIONAL TRADING PROGRAM

The Department will not participate in the CAMR national cap-and-trade program for mercury but will instead rely on the requirements of C.G.S. Section 22a-199 as implemented through the NSR permit program and this Plan to achieve more certain reductions in mercury emissions, ensuring better protection of public health and the environment.[4] Because Connecticut will not participate in the national cap-and-trade program for mercury, the state emissions budget will

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3 PSEG Bridgeport Harbor #3 operates under permit number 015-0089, originally issued on May 10, 1985. AES Thames Units A and B operate under permit numbers 107-44-0010 and 107-44-0011, originally issued on July 29, 1987.

4 Connecticut, along with eight other states, on March 29, 2005 filed a petition in the D.C. Circuit Court requesting reconsideration on CAMR. The case is *State of New Jersey, et al. v. U.S. Environmental Protection Agency*, Docket No. 06-1211 (D.C. Cir.). The submission of this Plan does not imply the Department's agreement to the legal basis of CAMR or contradict the issues briefed by Connecticut and the other state plaintiffs in that case.

serve as an enforceable state cap, and this Plan is complete without a method to allocate mercury allowances to the state's CAMR units. As follows from the opt-out from the trading program, the Department requests that EPA eliminate allowances equivalent to the Connecticut state budgets from the national trading program.

If Connecticut were to participate in CAMR's national cap-and-trade program and fully allocate the Connecticut CAMR Phase 1 and 2 mercury budgets, then in-state emissions reductions achieved and maintained under C.G.S. Section 22a-199 could be negated. The owners of the Connecticut CAMR units could sell their excess mercury allowances to owners and operators of CAMR units in upwind states who, in turn, could operate their units to emit more mercury that could travel back to Connecticut on the prevailing winds. Even if Connecticut participated in the national mercury trading program and allocated allowances at the level of emissions based on the limitations of C.G.S. Section 22a-199, there would be no guarantee that emissions at any particular location would be controlled, thus creating the potential for mercury hotspots.

V. MONITORING, RECORDKEEPING AND REPORTING

Even in a state that does not participate in the national trading program, the owners and operators of CAMR units are required to comply with the monitoring, recordkeeping and reporting requirements of 40 CFR 75. Monitoring options include (1) continuously collecting mercury emissions data from each affected unit using continuous emissions monitoring (CEM) equipment; (2) an appropriate long-term method (e.g., sorbent trap) that can collect an uninterrupted, continuous sample of the mercury in the flue gases emitted from the unit; (3) stack testing for low-emitters; or (4) an EPA-approved facility-specific alternative monitoring system, for which any facility owner may petition. CAMR also requires the owner or operator of a CAMR unit "to maintain records of all information needed to demonstrate compliance with the applicable Hg emissions limit, including the results of performance tests, data from the continuous monitoring systems, fuel analyses, calculations used to assess compliance, and any other information specified in 40 CFR 60.7 (General Provisions)."

While CAMR generally requires owners and operators of CAMR units to determine and report emissions by following the procedures of 40 CFR 75 beginning January 1, 2009, including submitting an electronic data report each calendar quarter containing consolidated mercury, sulfur dioxide, nitrogen oxides and carbon dioxide emissions data, CAMR also provides for an alternative, less rigorous monitoring option for low mercury emitting units.[5] Qualifying units may use periodic emissions testing (i.e., stack tests) to quantify mercury mass emissions, rather than continuously monitoring the concentration of mercury emitted. To qualify, affected units must meet a low-emitter criterion based on annual emissions. For affected units with mercury emissions greater than 9 lbs/year but less than or equal to 29 lbs/year, semi-annual testing is required.

The Department is proposing to require owners and operators of CAMR units to comply with the emissions monitoring, record keeping and reporting provisions of 40 CFR 75 and to allow the use of stack testing to monitor compliance under CAMR's low-emitter provisions.

As indicated in Section II of this Plan and Table 1, the Department anticipates that each of the state's CAMR units will have annual mercury emissions less than 29 pounds as of July 2008 when each unit is operated in compliance with the 0.6 pounds of mercury per TBtu emissions

5 See 40 CFR 75.81(b) through (g).

limit of C.G.S. Section 22a-199, or the alternative 90 percent reduction. All three of the state's existing CAMR units are required to perform quarterly stack testing for mercury under C.G.S. Section 22a-199. Section 22a-199(b)(3)(A) requires such quarterly stack tests to be conducted on a calendar quarter basis in accordance with the EPA Method 29 for the determination of metal emissions from stationary sources, as set forth in 40 CFR 60, Appendix A, as amended from time to time. C.G.S. Section 22a-199(b)(4) requires quarterly reporting to the Commissioner of stack testing results. R.C.S.A. section 22a-174-3a(n) and the modified NSR permits for the three existing CAMR units add to the stack testing and reporting requirements of C.G.S. Section 22a-199 the need for the owners and operators of CAMR units to also comply with the applicable requirements of 40 CFR 75. Therefore, the quarterly stack testing required under C.G.S. Section 22a-199 and incorporated into the NSR permits for each of the units will satisfy the monitoring requirements of CAMR. As indicated in Sections VI and VIII, the Department will be updating the compliance demonstration of this Plan with actual emissions data to establish the existing units as low mercury emitting units.

Should CEMs for mercury become commercially available, C.G.S. Section 22a-199(b)(3)(B) provides for the Commissioner to order CEM installation and operation at the state's CAMR units. In such an event, the Commissioner would notify EPA of the monitoring change.

VI. DEMONSTRATION OF COMPLIANCE

40 CFR 60.24(h)(3) requires that a CAMR state plan "contain emission standards and compliance schedules and demonstrate that they will result in compliance with the State's annual electrical generating unit (EGU) mercury (Hg) budget." As a result of the requirements of C.G.S. Section 22a-199 and additional requirements identified in this Plan, mercury emissions from the state's CAMR units are projected to be reduced to a level below CAMR's Phase 2 mercury budget for Connecticut before 2013. See Figure 1 and Table 1 for a summary of the emissions reductions. This demonstration both addresses the potential construction of new CAMR units and includes assumptions to generate what could be characterized as a moderated "worst case" analysis.

A. Existing CAMR Units

Connecticut is relying on the mercury emissions limitations of C.G.S. Section 22a-199, as incorporated into NSR permits for the CAMR units, to demonstrate compliance with the CAMR Phase 1 and 2 budgets for Connecticut. Beginning July 1, 2008, C.G.S. Section 22a-199 requires that any owner or operator of a coal-fired EGU either meet an emissions rate equal to or less than 0.6 pounds of mercury per TBtu or meet a mercury emissions rate equal to a ninety per cent reduction of mercury from the measured inlet conditions for the unit.

Calculating the mercury emissions from the three existing CAMR units under the requirements of C.G.S. Section 22a-199 as of July 1, 2008 yields the annual mercury emissions indicated in Table 1 when the assumptions listed below are applied. Given the capacity, compliance limit, coal content and removal efficiency assumed, the emissions in Table 1 are likely higher than actual emissions will be:

- Each unit operates at 100% annual capacity.
- Each of the three units intends to comply with C.G.S. Section 22a-199 by meeting the 0.6 lbs/TBtu limit, not the 90% reduction, or an alterative.

- AES Thames Units A and B, as a result of the fluidized bed combustion technology with limestone injection and collection system and as verified by stack testing, complies with the 0.6 lbs/TBtu.
- PSEG Bridgeport Harbor #3 combusts Indonesian coal with a maximum mercury content of 4 lbs/TBtu. Therefore, compliance with the 90 percent reduction requirement of C.G.S. Section 22a-199 would be more stringent than the 0.6 lbs/TBtu limit. The 0.6 lbs/TBtu limit will yield higher or more conservative annual mercury emissions. See Attachment 1 to the modified permit for PSEG in Exhibit B for the pertinent calculations.
- PSEG operates the ACI system and baghouse now under construction.
- PSEG Bridgeport Harbor #3 obtained an 85% mercury removal efficiency guarantee from its air pollution control equipment vendor.

Because the current emissions are lower than the CAMR Phase 1 budget of 106 pounds, and since, under the assumptions identified above, the emissions from the existing CAMR units are projected to decrease to 31.56 pounds in 2008 under the limitations of C.G.S. Section 22a-199, the requirements of C.G.S. Section 22a-199, incorporated into the NSR permits for each of the three existing CAMR units, constitutes compliance with the CAMR Phase 1 mercury budget and deadlines. For the existing CAMR units, the projected annual mercury emissions of 31.56 pounds, as of 2008, also constitutes compliance with the CAMR Phase 2 mercury budget of 42 pounds per year. Thus, a portion of the budget is preserved for new units.

In making this demonstration, the Department acknowledges that certain factors may result in actual emissions from the existing units that vary from those predicted. To wit, PSEG is now installing mercury emissions control equipment and may, after July 1, 2008 and in accordance with C.G.S. Section 22a-199, request an emissions limit alternative to either limit designated in Section 22a-199. As a result, the estimated 21.76 pounds of annual mercury emissions may increase. An equally likely alternative is that actual emissions from the CAMR units in 2008 and beyond will be lower than the 31.56 pounds per year projected, if, for example, the controls at PSEG Bridgeport Harbor #3 operate at a higher removal efficiency than assumed here. Furthermore, as the assumptions used to calculate emissions from the existing CAMR units ensure that the calculated levels are conservatively high, the margin remaining for new units may, indeed, be larger than estimated here. As indicated below, an update to this compliance demonstration based on actual emissions data collected in 2008 and 2009 will resolve the uncertainty of the emissions projections.

B. New CAMR Units

To ensure compliance with the CAMR Phase 2 mercury budget should any new CAMR units be constructed, the Department is relying on the emissions limitations of C.G.S. Section 22a-199 in combination with the addition of subsection (n) to R.C.S.A. section 22a-174-3a. The portion of the emissions reserved for potential new units provides for the construction of new CAMR units, yet subsection (n) ensures that no such new CAMR unit will be granted a NSR permit unless the combined emissions from the proposed unit and the existing CAMR units at that time is below the CAMR Phase 2 cap. Subsection (n) effectively results in a review of the actual mercury emissions from all the CAMR units whenever the Department receives an application proposing construction of a new coal-fired EGU or modification of an existing CAMR unit in a manner that changes its mercury emissions. Furthermore, subsection (c) of C.G.S. Section 22a-199 provides

specific authority to the Commissioner to, after July 1, 2012, establish mercury emission limits that are more stringent than those provided in C.G.S. Section 22a-199.

While the Department is concerned about the environmental impacts of mercury emissions from EGUs, we understand that coal-fired generation may have a role in diversifying Connecticut's energy generation technologies and balancing the portfolio of the state's generation resources to maintain electric system reliability and security into the future. Thus, in devising requirements applicable to potential CAMR units, the Department has given particular attention to the possible construction of one or more integrated gasification combined cycle (IGCC) units in Connecticut.[6] The Department has even engaged in pre-application meetings with NRG regarding the possible construction of such an IGCC facility in Montville, Connecticut. EPA believes the best method of reducing mercury emissions from IGCC units is to remove mercury from the synthetic gas (syngas) before combustion. An existing industrial IGCC unit has demonstrated a process, using sulfur-impregnated activated carbon (AC) beds, that has proven to yield 90 to 95 percent mercury removal from the coal syngas. Available information indicates that this technology could be adapted to the electric utility IGCC units, and EPA believes this to be a viable option for new IGCC units.[7] The availability of such technology plus the availability of coals, such as Adaro, with a very low mercury content enables the construction of an IGCC plant with annual mercury emissions below 10 lbs/year.

The constraint on emissions imposed by C.G.S. Section 22a-199 further assured the Department that the Plan does not preclude the construction of potential IGCC units. Specifically, Section 22a-199 requires the owner or operator of a regulated unit to either meet a mercury emissions rate of less than or equal to 0.6lbs/TBtu or a 90 percent reduction of mercury *from measured inlet conditions*. "Inlet conditions" are defined as "the concentration of mercury in the flue gas exiting the *combustion source* prior to application of any air pollution control device. [*emphasis added*]" Thus, an IGCC owner or operator would be very limited in meeting the 90 percent reduction limitation since that reduction would be in addition to the 90 to 95 percent potential mercury removal from the syngas prior to combustion. By default, such an owner or operator would look to compliance with the 0.6lbs/TBtu limit. Recently issued permits for IGCC units, namely Elm Road, Wisconsin and Southern Illinois Clean Energy Center, have mercury emission limitations below 0.6 lbs/TBtu. The IGCC unit being contemplated in Connecticut would have a proposed firing rate of 1818 MMBtu/hr. A 0.6 lbs/TBtu emission limitation on this source would yield potential annual mercury emissions below 10 pounds.

C. Emissions Maintained Below State Caps

As demonstrated above, the requirements of C.G.S. section 22a-199, enforced through individual NSR permits modified as indicated herein for the three existing CAMR units, ensures that the mercury emissions from the state's existing units do not now exceed the CAMR Phase 1 budget for the state and will not in the future exceed the CAMR Phase 2 state mercury budget. The requirements of Section 22a-174-3a(n), will, if adopted largely as proposed, ensure that mercury emissions from any new CAMR units that may be constructed in the state, in combination with the emissions from the existing CAMR units, will not exceed the CAMR Phase 2 state mercury budget.

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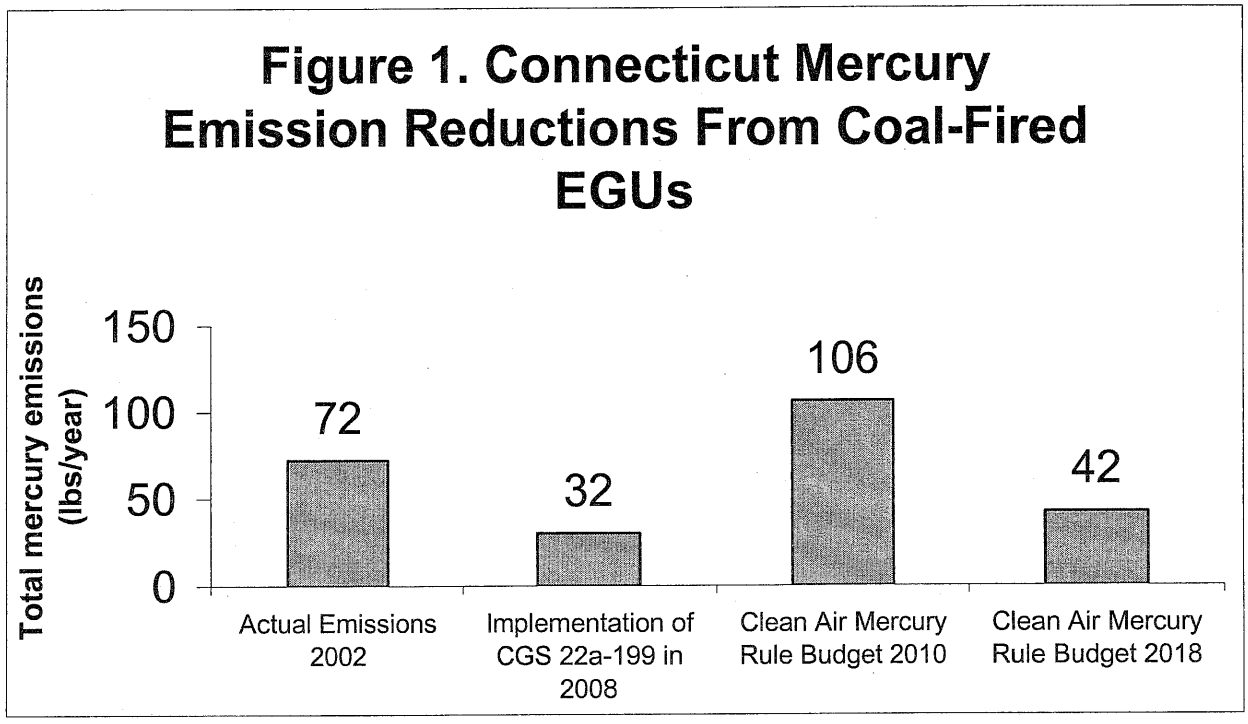
6 CAMR is applicable to IGCC units as they are considered "electric utility steam generating units." CAMR at 28611.

7 CAMR at 28614.

As described in Part V of this Plan, each CAMR unit will have to perform quarterly mercury stack tests under the authority of C.G.S. Section 22a-199. This testing schedule commences in July 2008. The Department will have two years of mercury stack test data prior to the 2010 CAMR implementation date. This will afford the Department time to review mercury emissions from the existing CAMR units and make a subsequent compliance demonstration prior to the implementation date based on actual data for 2008-2009.



VII. LEGAL AUTHORITY

40 CFR 60.24(h)(5) requires a state to demonstrate two general components of its legal authority with regard to the CAMR units: (1) to adopt emissions standards and compliance schedules necessary for attainment and maintenance of the state's annual CAMR EGU mercury budget; and (2) require owners and operators of CAMR EGUs in the state to meet the necessary monitoring, record keeping and reporting requirements.

The general statutes of Connecticut provide adequate legal authority for the Department to develop the Plan. The Commissioner is required under C.G.S. Section 22a-5(e) to "provide for the prevention and abatement of all water, land and air pollution, including, but not limited to, that related to particulates, gases, ..." To carry out this power, the General Assembly grants the Commissioner "all powers necessary and convenient to faithfully discharge this duty."[8]

The broad grant of authority to the Commissioner, as outlined above, to limit emissions from sources of air pollution, in combination with the mandates of C.G.S. Section 22a-199 and

8 C.G.S. Section 22a-5.

additional authority provided in statute and regulation, is more than sufficient to require owners and operators of coal-fired EGUs to limit mercury emissions to a level below the federally assigned state cap and to meet necessary monitoring, recordkeeping and reporting requirements. Information on obtaining statutes and regulations referenced in this Section are provided in Exhibit E.

A. Adopt Emission Standards and Compliance Schedules

40 CFR 60.24(h)(5) requires that a state plan must demonstrate the state's legal authority to "adopt emission standards and compliance schedules necessary for attainment and maintenance of the state's relevant annual EGU mercury budget." The emissions standards that limit mercury emissions from CAMR units are provided in statute, regulation, permit. The main statement of standards and compliance dates for mercury from CAMR units is in C.G.S. Section 22a-199, which requires that, as of July 1, 2008, coal-fired electric generating units either meet an emissions rate less than or equal to 0.6 pounds of mercury per TBtu or a rate equal to a 90% reduction of mercury from the measured inlet. Additional elements of the Commissioner's authority provide as follows:

Adopt emissions standards and compliance schedules. The Commissioner is empowered to "adopt, amend or repeal . . .such environmental standards, criteria and regulations . . . as are necessary and proper to carry out his functions, powers and duties."[9]

Adopt, amend and repeal regulations. The Commissioner has the power "to formulate, adopt, amend and repeal regulations to control and prohibit air pollution throughout the state. . .which regulations shall be consistent with the federal Air Pollution Control Act..."[10]

Issue permits. C.G.S. section 22a-174(c) provides the Commissioner with the power:

> in accordance with regulations adopted by him, (1) to require that a person, before undertaking the construction, installation, enlargement or establishment of a new air contaminant source. . .submit to him plans, specifications and such information as he deems reasonably necessary relating to the construction, installation, enlargement or establishment of such new air contaminant source; (2) to issue a permit approving such plans and specifications and permitting the construction, installation, or establishment of the new air contaminant source. . . .

B. Require Monitoring, Recordkeeping and Reporting

In addition to the statutory authority summarized above, the Commissioner has adopted a regulation, R.C.S.A. section 22a-174-3a, to implement the state's federally approved NSR program. Of note, subsection (d)(3) of that regulation identifies a broad array of requirements an applicant for an NSR permit or modification must meet, including operation in accordance with all applicable and relevant emissions limitations, statutes, regulations, schedules for stack tests, standards of performance pursuant to 40 CFR Parts 60, 61, and 63, as may be amended from time to time, and the installation and operation of monitoring equipment. Summarized below are additional elements of the Commissioner's authority to require monitoring, recordkeeping and reporting and to obtain information necessary to determining compliance.

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9 C.G.S. Section 22a-6(a)(1).

10 C.G.S. Section 22a-174(a).

Conduct tests and require the use of monitors. C.G.S. Section 22a-174(d) provides that "The commissioner shall have all incidental powers to carry out the purposes of [Chapter 446c, entitled "Air Pollution Control," which encompasses C.G.S. Sections 22a-170 through 22a-206] . . . ."[11]

R.C.S.A. section 22a-174-5(e)(2) provides the broad authority of the Commissioner to require testing:

> . . . [T]he Commissioner may require the owner or operator of any stationary source to conduct emission tests of emissions [*sic*]. Tests required under the provisions of . . . this subdivision shall be conducted in a manner satisfactory to the Commissioner . . . and the Commissioner or his representative shall be entitled to observe the tests, including initial sampling, subsequent laboratory tests, and other related procedures.[12]

R.C.S.A. section 22a-174-4(a)(1) provides the authority of the Commissioner to require air pollutant monitoring: "The owner or 'operator' of any 'air pollution' 'source' shall install, use, and maintain monitoring equipment . . . ."[13] R.C.S.A. Section 22a-174-4(a)(2) provides that, when continuous emissions monitoring equipment and methods are "reasonably available," the Commissioner may require the owner or operator to continuously monitor emissions.[14] If the Commissioner determines continuous emissions monitoring is technologically infeasible, he may require reasonable monitoring or intermittent stack testing as he deems necessary to determine compliance with applicable regulations.[15]

C.G.S. Section 22a-199(b)(3) further requires the owners and operators of CAMR units to demonstrate compliance with the mercury emissions limitations of that statute through quarterly stack testing and further provides for the Commissioner to direct the installation and operation of CEMS for mercury at such time as such CEMs are commercially available.

Require recordkeeping. C.G.S. Section 22a-174(c) states "The commissioner shall have the power, in accordance with regulations adopted by him, to require any person to maintain such records relating to air pollution or to the operation of facilities designed to abate air pollution as he deems necessary to carry out the provisions of [Chapter 446c, entitled "Air Pollution Control," which encompasses C.G.S. Sections 22a-170 through 22a-206] . . . ."[16]

R.C.S.A. section 22a-174-4(c) implements C.G.S. Section 22a-174(c) and establishes the scope of the Commissioner's authority to require recordkeeping:

> The "Commissioner" may require the submission of any records or reports of monitoring data and other information as he deems necessary to fulfill the purpose and policies contained in these

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11 C.G.S. Section 22a-174(d).
12 R.C.S.A. section 22a-174-5(e)(2).
13 R.C.S.A. section 22a-174-4(a)(1).
14 R.C.S.A. section 22a-174-4(a)(2).
15 Id.
16 C.G.S. Section 22a-174(c)(4).

> regulations. Such record keeping and reporting may be required of any "point source" or any "indirect source" of "air pollution." Records and reports required by the "Commissioner" concerning "air pollutants," fuels, and operational information shall be recorded, compiled, and submitted on forms furnished or prescribed by the "Commissioner." And shall be signed or verified in writing by a ranking corporate officer or managing official with offices located in the state.[17]

R.C.S.A. section 22a-174-4(c) also establishes the form in which the records must be maintained and the length of time for which they must be kept, unless other requirements apply.[18]

Require emission reports. C.G.S. Section 22a-174(c) states:

> The commissioner shall have the power, in accordance with regulations adopted by him, to require any person to maintain such records relating to air pollution or the operation of facilities designed to abate air pollution as he deems necessary to carry out the provisions of [Chapter 446c, entitled "Air Pollution Control," which encompasses Connecticut General Statutes Sections 22a-170 through 22a-206].[19]

R.C.S.A. section 22a-174-4(a)(1) provides the specific authority of the Commissioner to require periodic reports of source emissions : "The owner or 'operator' of any 'air pollution' 'source' shall . . . make periodic reports as prescribed herein by the Commissioner."[20] The related reporting requirement is described in R.C.S.A. section 22a-174-4(c).[21]

C.G.S. Section 22a-199(b)(4) requires the owners and operators of CAMR units to report on a calendar quarter basis the result of any stack tests or the average of any CEMs data.

Obtain information necessary to determine compliance. The General Assembly has provided the Commissioner with ample authority to determine compliance. C.G.S. Section 22a-6 states:

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17 R.C.S.A. section 22a-174-4(c)(1).

18 "Any monitoring data required of [any real or personal property that emits or may emit dust, fumes, mist, smoke, other particulate matter, vapor, gas, aerosol, odorous substances, or any combination, excluding carbon dioxide, uncombined water vapor or water droplets, or molecular oxygen or nitrogen] shall be kept current and in a form allowing easy inspection and shall be retained . . . for a period of three years." R.C.S.A. section 22a-174-4(c)(2).

19 C.G.S. Section 22a-174(c)(4).

20 R.C.S.A. section 22a-174-4(a)(1).

21 R.C.S.A. section 22a-174-4(c) states:

> The Commissioner may require the submission of any records or reports of monitoring data and other information as he deems necessary to fulfill the purpose and policies contained in these regulations. Such record keeping and reporting may be required of any point source or any indirect source of air pollution. Records and reports required by the Commissioner concerning air pollutants, fuels, and operational information shall be recorded, compiled, and submitted on forms furnished or prescribed by the Commissioner. And shall be signed or verified in writing by a ranking corporate officer or managing official with offices located in the state.

> The commissioner may, in accordance with constitutional limitations, enter at all reasonable times, without liability, upon any public or private property, except a private residence, for the purpose of inspection and investigation to ascertain possible violations of any statute, regulation, order or permit administered, adopted or issued by him and the owner, managing agent or occupant of any such property shall permit such entry . . . .[22]

Further, the Commissioner "may apply to any court having criminal jurisdiction for a warrant to inspect such premises to determine compliance with any statute, regulation, order or permit administered, adopted, or enforced by him . . . ."[23]

VIII. PROGRESS REPORTING

The Department will report to EPA annually and as necessary regarding the information specified in 40 CFR 60.25(f) including identification of any CAMR units that ceased or began operation during the reporting period; submission of inventory data for CAMR units began operating subsequent to previous reports, and any additional data necessary to update the unit or emissions inventory.

IX. PUBLIC HEARING AND NOTICE REQUIREMENTS

In satisfaction of 40 CFR 60.23, this Section identifies the public notification and participation opportunities available concerning the Plan and its components.

A. Amendment of R.C.S.A. Section 22a-174-3a

The addition of subsection (n) to the NSR permitting regulation, R.C.S.A. section 22a-174-3a, was set for hearing and the notice of hearing was signed by the Commissioner on September 8, 2006. The hearing notice was published on September 26, 2006 in four area newspapers: The *New London Day*, the *Connecticut Post*, *The Register Citizen* and the *Hartford Courant*. The amendment was available for public inspection at the Bureau of Air Management and four public libraries. Notice of the hearing was provided to the EPA Regional Administrator and the state air quality regulators in the surrounding states of Massachusetts, New Jersey, New York and Rhode Island.

A public hearing was held on October 31, 2006 at 2 PM in Hartford, Connecticut. Representatives from PSEG Power Connecticut LLC and NRG Energy, Inc. attended the hearing and submitted written comments along with EPA and AES Thames LLC. Certification that a public hearing was held regarding the Plan and a summary of the written comments is provided in Exhibit A.

B. NSR Permit Modifications for Existing CAMR Units

A notice of tentative determination for PSEG's application to modify the NSR permit for Bridgeport Harbor #3 was published in the *Connecticut Post* on November 8, 2006. Regarding the application submitted by AES Thames LLC to modify the NSR permit for Units A and B, a notice of tentative determination was published in NEWSPAPER on DATE. In the case of AES Thames LLC, the notice provided for a 30-day comment period and the opportunity to request a

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22 C.G.S. Section 22a-6(a)(5). For further authority of such powers, *see* C.G.S. Section 22a-177.

23 C.G.S. Section 22a-6(a)(5).

hearing. In addition, the permit modifications for the existing CAMR units were also subject to hearing with respect to their role as elements of the enforcement mechanism of this Plan.

Copies of the NSR permits and related documents are included at Exhibits B and C to this Plan.

Pursuant to 40 CFR 60.23(g), the Department submits the public notice procedure concerning these permit modifications as a substitute to the procedure provided 40 CFR 60.23(c), since this procedure meets the same purpose of providing for adequate notice to and participation of the public.

C. The Plan Narrative

The Plan was set for hearing and the notice signed by the Commissioner on November 17, 2006. The hearing notice was published on November 22, 2006 in four area newspapers: The *New London Day*, the *Connecticut Post*, *The Register Citizen* and the *Hartford Courant*. The Plan was available for public inspection at the Bureau of Air Management and four public libraries. Notice of the hearing was provided to the EPA Regional Administrator and the state air quality regulators in the surrounding states of Massachusetts, New Jersey, New York and Rhode Island.

A public hearing was held on December 28, 2006 in Hartford, Connecticut. [Identify persons] attended the hearing. Written comments were submitted by INSERT. Certification that a public hearing was held regarding the Plan, a list of the attendees at the hearing and their affiliation and a summary of the written comments are provided in Exhibit D.

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EXHIBIT A

R.C.S.A. Section 22a-174-3a(n) and Public Participation Documents

1. Text of the adopted version of R.C.S.A. section 22a-174-3a(n)
2. Certification that a public hearing was held before the amendment was adopted
3. A summary of written comments

NOTE: Only the certification is included in the draft of this Plan noticed for public hearing. The remaining documents identified here will be included in the final version of this Plan. The text of the proposed amendment is available at: http://www.dep.state.ct.us/air2/regs/index.htm

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HEARING CERTIFICATION

This certifies in accordance with the provisions of Title 40 Code of Federal Regulations Part 51.102 that the actions listed below were taken regarding the amendment of section 22a-174-3a of the Regulations of Connecticut State Agencies.

1) The public hearing was held on October 31, 2006 as announced in the notice of hearing (copy attached);

2) In accordance with the notice, materials were available for review in each Air Quality Control Region (AQCR) in Connecticut;

3) Copies of the notice were mailed to the directors of the air pollution control agencies in New York, New Jersey, Rhode Island and Massachusetts along with a copy to the Director of the Air Management Division of Region I of the U.S. Environmental Protection Agency; and

4) The notice of hearing was published in newspapers as follows:

Newspaper	AQCR	Date
Connecticut Law Journal		September 26, 2006
Connecticut Post (Bridgeport)	43	September 26, 2006
Hartford Courant	42	September 26, 2006
New London Day	41	September 26, 2006
The Register Citizen (Torrington)	44	September 26, 2006

November 1, 2006
Date

/s/Merrily A. Gere
Bureau of Air Management

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EXHIBIT B

Minor Permit Modification for PSEG Bridgeport Harbor #3 and Public Participation Documents

1. Text of the final permit as modified
2. Notice of tentative determination
3. A summary of written comments

NOTE: Only the tentative determination is included in the draft of this Plan noticed for public hearing. The remaining documents identified here will be included in the final version of this Plan.

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LEGAL NOTICE PSEG POWER CONNECTICUT, LLC BRIDGEPORT HARBOR

LEGAL NOTICE PSEG POWER CONNECTICUT, LLC BRIDGEPORT HARBOR STATION BRIDGEPORT, CT NOTICE OF TENTATIVE DETERMINATION REGARDING A MODIFIED POINT SOURCE PERMIT The Department of Environmental Protection hereby gives notice it has made a tentative determination to approve an application submitted by PSEG Power Connecticut, LLC ("the applicant") under section 22a-174 of the Connecticut General Statutes for a permit to construct, install, enlarge or establish an air contaminant source or to operate a source regulated under the Clean Air Act Amendments of 1990. Specifically, the applicant proposes to install an air pollution control equipment to significantly reduce the mercury emissions from Unit #3. This permit will be submitted to the United States Environmental Protection Agency (USEPA) for review and approval as part of a state plan to implement and enforce federal requirements for coal-fired electric generating units pursuant to 40 Code of Federal Regulations (CFR) 60.24(h). The name and address of the permit applicant are: PSEG Power Connecticut, LLC, Bridgeport Harbor Station, 1 Atlantic Street, Bridgeport, CT 06604. The proposed activity will take place at: 1 Atlantic Street, Bridgeport, CT. The proposed activity will affect air resources. The application has been assigned PAMS number 200601311 by the Department of Environmental Protection, Bureau of Air Management. Interested persons may obtain copies of the application and proposed permit from Mr. Robert Silvestri, PSEG Connecticut, LLC, 1 Atlantic Street, New Haven, CT 06604, telephone no. (203) 551-6032. The application, engineering evaluation and proposed permit are available for inspection at the office of the Department of Environmental Protection, Bureau of Air Management, 79 Elm Street, 5th floor, Hartford, Connecticut, 06106-5127 from 8:30 - 4:30, Monday through Friday.

Appeared in: ***Connecticut Post*** on Wednesday, 11/08/2006

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EXHIBIT C

Non-Minor Permit Modification for AES Thames Units A and B and Public Participation Documents

1. Text of the final permit as modified
2. Notice of tentative determination
3. A summary of written comments

Note: The documents identified here will be included in the final version of this Plan.

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EXHIBIT D

State Plan Narrative:
Public Participation Documents

1. Certification that a public hearing was held
2. A summary of written comments

Note: The documents identified here will be included in the final version of this Plan.

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EXHIBIT E

Referenced Regulations and Statutes

All the Connecticut air quality regulations referenced in this Plan are available at:
http://www.dep.state.ct.us/air2/regs/index.htm

The Connecticut General Statutes referenced in this Plan are available at:
http://www.cga.ct.gov/2005/pub/Chap446c.htm

To obtain paper copies of referenced statutes and regulations, please get in touch with Patti Downes at (860) 424-3027.