NORTHWEST
AIR POLLUTION AUTHORITY

302 Pine Street, #207
Mount Vernon, WA 98273-3852
Tel: 206-428-1617 / Fax: 206-428-1620

Representing Island, Skagit and Whatcom Counties

April 14, 1993

Rev. 1 April 19, 1993
Rev. 2 May 1, 1995

Rob Hoyt
Lone Star Energy
915 Cornwall Ave.
Bellingham, WA 98225

ORDER OF APPROVAL TO CONSTRUCT #428

Dear Mr. Hoyt

On March 5, 1993 Lone Star Energy submitted a "Notice of Construction and Application for Approval" to construct three 470,000 gallon fixed-roof diesel fuel storage tanks.

The information submitted was reviewed to determine that all known, available, and reasonable air pollution control measures would be employed. The project was reviewed subject to Northwest Air Pollution Authority (NWAPA) Regulation Section 302, Washington Administrative Code (WAC) 173-400-110, and WAC 173-460. A Determination of Non Significance was issued for the Encogen Cogeneration Project by the City of Bellingham on February 8, 1991.

You are hereby authorized to construct and operate the aforementioned equipment subject to the following conditions:

1. The tanks shall be constructed and maintained in accordance with the information submitted with the Notice of Construction Application.

2. The exterior color of the tanks shall be no darker than light gray.

3. Only diesel fuel may be stored in the tanks.

4. In no case shall the True Vapor Pressure of product stored exceed 5.2 kPa (0.75 psia).

Final approval to operate shall be conditioned upon the facility meeting the requirements described above and conditions set forth in the applicable air pollution control regulations, when in actual operation.

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Please call Valerie Lagen if you have any questions about the approval of this project.

Sincerely,

Terryl L. Nyman
Air Pollution Control Officer

Reviewed: Valerie H. Lagen, P. E.

Revision 1: Revised tank color
Revision 2: Revised size of tank from working volume to total tank capacity.

DEPARTMENT OF ECOLOGY
State of Washington

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT

Issued To:	Puget Sound Energy (PSE)
Facility Name/Location:	Encogen Generating Station 915 Cornwall Avenue, Bellingham, Washington
Permit Number:	PSD 91-02, Amendment 4
Date of Permit Issuance:	January 5, 2021
Effective Date of Permit:	January 5, 2021

This PSD permit is issued under the authority of the Washington State Clean Air Act, Chapter 70.94 Revised Code of Washington; the Washington State Department of Ecology regulations for the Prevention of Significant Deterioration of Air Quality as set forth in Washington Administrative Code 173-400-700 through 750.

PREPARED BY:

MENGCHIU LIM STATE OF WASHINGTON 50167 REGISTERED PROFESSIONAL ENGINEER

MengChiu Lim, P.E.
Science and Engineering Section
Air Quality Program

1/5/2021
Date

APPROVED BY:

Rob Dengel
Air Quality Deputy Program Manager
Washington Department of Ecology

1/5/21
Date

Project Description

On September 11, 2020, Ecology issued PSD No. 91-02, Amendment 3 to approve several permit condition changes as requested by Puget Sound Energy.

One of the approved changes is to clarify that the short-term emission limits for nitrogen oxide (NO_X) do not apply during start-up and shutdown.

However, while this change was discussed extensively in the permitting records including the technical support document and project description, the clarification was inadvertently missed from the approval conditions.

This permit amendment is to add the clarification as originally intended in PSD No. 91-02, Amendment 3.

The emission units affected by this permit are listed below.

Emission Unit Description	No. of Unit(s)	Maximum Heat Input Rate (MMBtu/hour)
Combustion gas turbine (GE Frame 6, Model MS6001B) generator system with heat recovery steam generator (HRSG)	3	440

Approval Conditions

1. The combustion turbine/heat recovery steam generator trains shall be fueled only by natural gas except for periods when the supply of natural gas has been curtailed or for limited testing.

   During periods of natural gas curtailment and during limited test periods, the combustion turbine/heat recovery steam generator trains may be fueled by "on-road specification diesel fuel" (referred to as "oil" throughout the remainder of this Approval). The oil may contain no more than 0.05 percent sulfur by weight, as specified in 40 CFR 80.29, as amended through July 1, 1992. No more than 300,000 gallons of oil may be fired by the combustion turbine/heat recovery steam generator trains in any calendar year for the purposes of testing. No more than 10,600,000 gallons of oil may be fired by the combustion turbine/heat recovery steam generator trains in any calendar year for the purposes of testing or operation during periods of natural gas curtailment.

   Puget Sound Energy (PSE) shall report any oil-fired operations of the combustion turbine/heat recovery steam generator trains to the Northwest Clean Air Agency (NWCAA) in accordance with the reporting requirements in Condition 11.

2. The NO_X emissions from each exhaust stack of the combined cycle combustion turbine (CCCT) shall not exceed:

   a. 7.0 parts per million on a dry volume basis (ppmdv) corrected to 15 percent oxygen on calendar day average when the unit is fired on natural gas.

   b. 11.0 ppmdv corrected to 15 percent oxygen on calendar day average when the unit is fired on oil.

   The emission limits in this condition do not apply during startup and shutdown events.

3. NO_X emissions from the three combined cycle combustion turbines (CCCTs) combined shall not exceed:

   a. 1,000 pounds per day when fired on natural gas.

   b. 1,605 pounds per day when fired on oil.

   c. 175 tons in any consecutive 12 months.

   The emission limits in this condition apply at all time, including start-up and shutdown.

4. For the purpose of the NO_X emission limit in Condition 2, start-up is defined as the period beginning with ignition and ending 20 minutes following the first minute where the NO_X emissions are 7.0 ppmdv corrected to 15 percent oxygen or less. Shutdown is defined as a

30-minute period beginning with the lowering of equipment from normal operating load and lasting until fuel flow is completely off and combustion has ceased .

5. For the purpose of the NO_X emission limit in Condition 2, the duration of cold start-ups shall not exceed 270 minutes, warm start-ups shall not exceed 180 minutes, and hot start-ups shall not exceed 90 minutes per occurrence. Duration of shutdowns shall not exceed 30 minutes per occurrence.

   Cold start-up means a start-up when the combustion turbine has not been in operation during the preceding eight hours. Hot start-up means a start-up when the combustion turbine has been in operation during the preceding one hour. Warm start-up means a start-up that is not a hot or cold start-up.

   PSE shall record the time, date, and duration of each start-up and shutdown event.

6. SO_2 emissions from each exhaust stack of the CCCT shall not exceed 9.0 ppmdv corrected to 15 percent oxygen on a daily average when the unit is fired on oil. Compliance shall be determined by EPA Reference Method 6, or an equivalent method approved in advance by Ecology.

   SO_2 emissions from the three CCCTs combined shall not exceed 658 pounds per day when fired on oil. Upon request from NWCAA, PSE shall provide data demonstrating compliance for this condition for any period(s) that the combustion turbine/heat recovery steam generator trains are fueled by oil. Such data shall be in a format agreed to in advance by NWCAA. The data shall include at a minimum:

   - Copies of receipts from the oil supplier showing the sulfur content of the oil or if blended the laboratory analysis report(s) from sampling of the tank(s).
   - The quantity of oil fired per day.
   - Calculations showing the maximum SO_2 concentration and emission rates in units of the emission limitations in this condition.

7. CO emissions from each exhaust stack of the CCCT shall not exceed 10.0 ppmdv corrected to 15 percent oxygen on an hourly average as measured by EPA Reference Method 10. CO emissions from the three CCCTs combined shall not exceed 718 pounds per day.

8. PM_{10} emissions (particulate finer than 10 micrometers in diameter) from each exhaust stack of the CCCT shall not exceed 60 pounds per day when the unit is fired on natural gas or 408 pounds per day when the unit is fired on oil.

   Compliance shall be determined by EPA Reference Methods 5, 201, or an equivalent method agreed to in advance by Ecology or NWCAA. PM_{10} emissions from the three CCCTs combined shall not exceed 180 pounds per day when the fired on natural gas or 1,224 pounds per day when fired on oil.

9. Sampling ports and platforms shall be provided for each affected source, after the final pollution control device. The ports shall meet the requirements of 40 CFR, Part 60, Appendix A Method 20. Adequate permanent and safe access to the test ports shall be provided. Other arrangements may be acceptable if approved by Ecology or NWCAA prior to installation.

10. PSE shall install, and thereafter operate, maintain, certify, and quality-assure a continuous emission monitoring system (CEMS) for each CCCT which measures stack gas NO_X and O_2 concentrations in ppmv.

    The CEMS shall complete a minimum of one cycle of operations (sampling, analyzing, and data recording) for each successive 15-minute period. The NO_X concentrations shall be corrected to 15 percent O_2 on a dry basis to demonstrate compliance with the NO_X limit in Condition 2. The CEMS shall, at a minimum, conform to EPA Title 40 Code of the Federal Regulations, Part 60, Appendix B Performance Specifications.

    In addition, before initial start-up, a continuous emission monitoring quality control plan conforming with 40 CFR 60, Appendix F and acceptable to Ecology or NWCAA shall be submitted, and Ecology or NWCAA may require the plan to be periodically updated.

11. CEMS and process data shall be reported in written form to NWCAA at least monthly (unless a different testing and reporting schedule has been approved by Ecology or NWCAA) within 30 days of the end of each calendar month and in a format approved by Ecology or NWCAA, which shall include but not be limited to the following:

    a. Quantity of oil burned for testing, total quantity of oil burned, sulfur content of all oil purchased since the last report, and the laboratory analysis report(s) from sampling of the blended oil from the tank(s).

    b. For each stack, the daily average NO_X concentration, in ppmdv corrected to 15 percent O_2 conditions.

    c. Total mass emissions of NO_X on daily (pounds per day) and 12 month moving total (tons per year) bases.

    d. The duration and nature of any monitor downtime, excluding zero and span checks.

    e. Results of any monitor audits or accuracy checks.

    f. Results of any stack tests.

    g. The above data shall be retained at the PSE site for a period of five years.

12. Each occurrence of monitored emissions in excess of the standards shall be reported to NWCAA. Excess emissions, which represent a potential threat to human health or safety, shall be reported as soon as possible. Other excess emissions shall be reported as part of the routine reporting described in Approval Condition 11 above. Each excess emissions report shall include the following:

a. The time of the occurrence.

b. Magnitude of the emission or process parameters excess.

c. The duration of the excess.

d. The probable cause.

e. Corrective actions taken or planned.

f. Any other agency contacted besides NWCAA.

13. Operating and maintenance manuals for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Copies of the manuals shall be available to Ecology or NWCAA. Emissions that result from a failure to follow the requirements of the manuals may be considered proof that the equipment was not properly operated and maintained.

14. Operation of the emitting equipment must be conducted in compliance with all data and specifications submitted as part of the PSD application unless otherwise approved by Ecology.

15. Any activity undertaken by PSE, in a manner that is inconsistent with the PSD application and this determination, may subject to Ecology enforcement under applicable regulations. Nothing in this Approval shall be construed to relieve the permittee of its obligations under any local, state, or federal laws or regulations.

16. Access to the source by the EPA, Ecology, or NWCAA shall be permitted upon request for the purpose of compliance assurance inspections. Failure to allow access is grounds for revocation of this determination of approval.

17. This permit cancels and supersedes PSD No. 91-02, Amendment 3.

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AIR POLLUTION AUTHORITY

302 Pine Street, #207
Mount Vernon, WA 98273-3852
Tel: 206-428-1617 / Fax: 206-428-1620

Representing Island, Skagit and Whatcom Counties

January 31, 1995

Rob Hoyt
Lone Star Energy
915 Cornwall Ave.
Bellingham, WA 98225

EXCESS EMISSION SEMIANNUAL REPORTING REQUIREMENT

Dear Mr. Hoyt:

This letter is in response to your January 26, 1995 letter requesting a waiver from the semiannual reporting requirements for the Encogen Northwest Cogeneration Plant in Bellingham, Washington.

The reporting requirements contained in the New Source Performance Standards (NSPS) for stationary gas turbines, 40 CFR § 60, subpart GG require semiannual submittal of excess emission reports. These reports must include the magnitude of the excess emission, date and time of each occurrence, nature and cause of any malfunction, corrective action taken or preventative measures adopted. In addition, each period during which the continuous emission monitoring system was inoperative shall be reported. Both the NWAPA Order of Approval to Construct Number 340 and the Washington Department of Ecology (WDOE) Prevention of Significant Deterioration (PSD) PSD-91-02 require excess emission reports with more detail than that required by the NSPS. In addition, the NWAPA and WDOE reports must be submitted on a monthly basis no later than 30 days following the end of the calendar month.

The NSPS for stationary gas turbines, 40 CFR § 60, subpart GG require sulfur and nitrogen monitoring of the fuel being fired in the turbines. In a letter from Region 10 of the EPA dated March 10, 1993, Encogen was granted a waiver from the requirement to monitor sulfur in the fuel gas being fired in the turbines as long as Northwest Pipeline (NWP) conducted adequate monitoring. Encogen was responsible for ensuring that EPA Regional Office receive not less than 6 quarterly reports from NWP demonstrating satisfactory monitoring of the fuel gas sulfur content. This requirement has been met and Encogen is no longer required to submit quarterly sulfur fuel monitoring reports subject to the conditions of the original waiver. The March 10 letter also granted a waiver to Encogen from the requirement to monitor nitrogen in the fuel.

The NSPS for stationary gas turbines, 40 CFR § 60, subpart GG requires monitoring of the water-to-fuel ratio, steam and ammonia injection rates and the turbine load. Encogen monitors each of these parameters continuously, and reports daily averages of ammonia slip, NO_x emissions, hours of operation, and fuel consumption. These parameters are reported on a monthly basis and will serve as a substitute for semiannual reporting of monthly averages required by the NSPS. Therefore, the requirement for these monthly reports is waived.

The Northwest Air Pollution Authority (NWAPA) received delegation of the NSPS program in which we are allowed to approve minor changes in testing and monitoring methods, procedures and

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equipment. These changes must be site specific, cannot affect the stringency of the test method or procedure, and must have no national significance. I believe your request to be exempt from the semiannual reporting requirements as described above meet this criteria, therefore your request is granted.

If you have questions regarding this matter, please call me at (360) 428-1617.

Sincerely,

Valerie Lagen
Air Quality Engineer

cc: Tim Curley, Enserch
John Keenan, EPA

Source Testing Correspondence

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

JR file ENCOGEN

MAR 10 1993

Reply To
Attn Of: AT-082

Rob Hoyt
Lone Star Energy
Plant Operations, Inc.
915 Cornwall Avenue
Bellingham, Washington 98225

Re: New Source Performance Standards, Subpart GG
Custom Fuel Monitoring Schedule

Dear Mr. Hoyt:

This letter is in response to your January 29, 1993 letter requesting a custom fuel monitoring schedule for the stationary gas turbines located at the Encogen Northwest Cogeneration Plant in Bellingham, Washington.

The New Source Performance Standards (NSPS) for stationary gas turbines, 40 C.F.R. Part 60, Subpart GG requires sulfur and nitrogen monitoring of the fuel being fired in the turbines. With respect to the sulfur monitoring, a custom fuel monitoring schedule can be approved following review of performance test results as required by 40 C.F.R. §§ 60.8 and 60.335. A copy of performance test results for each turbine, upon completion, shall be submitted to the EPA Regional Office at the address listed above, Attention: Olga Loera, AT-082. The sulfur fuel monitoring schedule shall be as follows: The sulfur content of the fuel shall be determined by the methods specified in 40 C.F.R. § 60.335(d) and is to be conducted quarterly for a period not less than six quarters.

I understand that natural gas is being supplied to Encogen Northwest Cogeneration Plant (Encogen) by Northwest Pipeline Corporation (NWP) which has a legal tariff to maintain gas sulfur content at 4 ppm or less. NWP is currently monitoring sulfur content in the fuel gas at each one of points of entry to the United States from Canada to satisfy the New Source Performance Standards for stationary gas turbines. It is the Environmental Protection Agency (EPA) Region 10's position that since sulfur fuel gas monitoring is currently being conducted by NWP, additional monitoring of sulfur in the fuel gas is not necessary by Encogen. However, it shall be Lone Star Energy's responsibility to ensure that a copy of NWP quarterly sulfur monitoring results are submitted to the EPA Regional Office.

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Original Issuance: December 2, 1993
Revision R1: May 4, 1995
Revision R2: August 17, 1995
Revision R3: May 29, 1998
Revision d: March 6, 2009
Revision e: January 13, 2011
Revision f: October 7, 2020

Northwest Clean Air Agency (NWCAA) hereby issues Order of Approval to Construct (OAC) #400f

Project Summary: Puget Sound Energy – Encogen operates three natural gas-fired combustion turbine/heat recovery steam generator trains and a single steam turbine generator.

Approved Emission Units:

- Three GE Frame 6 Model MS6001B combined cycle combustion gas turbine generator systems and associated heat recovery steam generators, each with a maximum heat input capacity of 440 MMBtu/hr heat input (natural gas) or 470 MMBtu/hr heat input (diesel).

OPERATOR

Puget Sound Energy – Encogen
Generating Station
915 Cornwall Avenue
Bellingham, WA 98225

OWNER

Puget Sound Energy
P.O. Box 97034 EST-04W
Bellevue, WA 98009-9734

Permit History

- As of the date of issuance, this Order supersedes NWCAA OAC#400e issued January 13, 2011.

Note that in addition to other applicable rules and regulations, this project is subject to applicable portions of the following federal regulations:

New Source Performance Standards (NSPS)

- 40 CFR 60 Subpart A – General Provisions
- 40 CFR 60 Subpart GG – Standards of Performance for Stationary Gas Turbines

Issuance of this Order is authorized by Northwest Clean Air Agency Regulation Section 300. The Owner/Operator must comply with the following restrictions and conditions[1]:

(1) The combustion turbines shall burn only natural gas as defined in 40 CFR 60.331(u),

[1] Nothing in this permit is intended to, or shall, alter or waive any applicable law [including but not limited to defenses, entitlements, challenges or clarifications related to the Credible Evidence Rule, 62 FR 8315 (Feb. 27, 1997)] concerning the use of data for any purpose under the Act, generated by the reference method specified herein or otherwise.

(as amended through July 8, 2004) during periods when there is no natural gas curtailment[2]. Periodic testing for oil firing per manufacturer's recommendations is exempt from this restriction. During periods of natural gas curtailment or testing, the combustion turbines shall not burn more than ten million six hundred thousand (10,600,000) gallons of oil per calendar year. The operator shall not burn more than 300,000 gal/year of oil for testing purposes. Oil is defined as "on-road specification diesel fuel" containing no more than 0.05 percent sulfur by weight, as specified in 40 CFR 80.29, as amended through July 1, 1992.

(2) Emissions from each combustion turbine stack shall not exceed the following:

(A) Nitrogen oxides - 7.0 ppmdv corrected to 15% O_2 daily average when burning natural gas, and 11.0 ppmdv corrected to 15% O_2 daily average when burning oil.

(B) Carbon monoxide - 10.0 ppmdv corrected to 15% O_2 hourly average.

(C) Ammonia - 10.0 ppmdv corrected to 15% O_2 one-hour average.

(D) Opacity - Not to exceed five percent (5%) as measured by EPA Method 9.

(3) Pollutant emissions from the entire project shall not exceed the following:

		Natural Gas Firing	Oil Firing
(A)	Nitrogen oxides (NO_x)	1,000 lb/day 175 ton/12 consecutive months	1,605 lb/day 175 ton/12 consecutive months
(B)	Carbon monoxide (CO)	718 lb/day	718 lb/day
(C)	Ammonia (NH_3)	437 lb/day	437 lb/day

(4) Continuous emission monitors for oxygen and nitrogen oxides shall be installed and operated for each stack:

(A) Oxygen (O_2) in accordance with Performance Specification 3 (40 CFR 60 Appendix B).

(B) NO_x in accordance with Performance Specification 2 (40 CFR 60 Appendix B).

All monitoring systems shall be approved by the NWCAA prior to installation. The CEMS shall be installed, calibrated, maintained and operated in accordance with appropriate specifications of 40 CFR 60 Appendices B and F, and NWCAA Section 367 and Appendix A.

Pursuant to Section 300.10 of the NWCAA Regulation and ch 43.21B RCW, this Order may be appealed to the Pollution Control Hearings Board (PCHB). To appeal to the PCHB, a written notice of appeal must be filed with the PCHB and a copy served upon the NWCAA within 30 days of the date the applicant receives this Order. Additional information regarding appeal procedures can be found at: http://www.eluho.wa.gov/ under PCHB.

[2] *Period of natural gas curtailment or supply interruption* means a period of time during which the supply of natural gas to an affected facility is halted for reasons beyond the control of the facility. An increase in the cost or unit price of natural gas does not constitute a period of natural gas curtailment or supply interruption. (This definition is taken from 40 CFR 63.7575).

(5) Annual source testing for carbon monoxide (CO) and ammonia (NH_3) emissions shall be completed for each gas turbine/heat recovery steam generator stack using the following test methods:

(A) CO: EPA 40 CFR 60 Appendix A Method 10

(B) Ammonia: Bay Area Air Quality Management District Source Test Procedure ST-1B, "Ammonia, Integrated Sampling" (BAAQMD Method ST-1B), or an equivalent method approved in advance by the NWCAA. Source test samples must be unfiltered as taken from each stack. Fuel consumption, nitrogen oxides emissions, and ammonia injection rate during each emission test shall be reported with the test results.

Testing shall be conducted while burning natural gas and shall be completed within eleven to thirteen months of the anniversary date of the previous test. After three consecutive years of CO source test results compliant with the applicable emission limit, CO testing frequency may be reduced to once every three years. Testing shall revert to annual CO source testing for all turbines if any results are not compliant with the applicable emission limits. All source testing shall be conducted, and plans and test results submitted, in accordance with NWCAA Section 367 and NWCAA Appendix A.

(6) The following data shall be reported on a calendar month basis. The information shall be submitted to the NWCAA within 30 days after the end of the previous month. Records of the following data shall be maintained on site for a period of at least five years.

(A) Total MMBtu of natural gas burned in the turbines.

(B) The number of hours each turbine operated.

(C) Total pounds of SO_2 emitted on a monthly basis.

(7) A quality assurance manual for all continuous emission monitors shall be kept current and available onsite at all times for operators and for inspection by NWCAA personnel. The quality assurance procedures shall be in accordance with 40 CFR 60 Appendix F and the NWCAA Section 367 and Appendix A.

Christos Christoforou, P.E.
Engineer

Agata McIntyre, P.E.
Engineering Manager

Revision R1: Deleted reference to NSPS Subpart Db, changed NOC number from 340 to 400, and revised language to clarify that NOC number 400 replaces previously issued NOC number 310.

Revision R2: Removed requirements to report highest concentration and excess emissions of CO on monthly basis.

Revision R3: Revise NO_x limits to allow flexibility for variable operating conditions. Remove requirement for continuous ammonia monitoring. Delete obsolete requirements.

Revision d: Update OAC format and Northwest Clean Air Agency name. Change monthly emissions report due date from within 20 days after the end of the previous month to within 30 days after the end of the previous month to be consistent with other similar sources and with Encogen's AOP language. Remove references to NWAPA's "Guidelines for Industrial Monitoring Equipment and Data Handling" and replace with the NWCAA Section 367 and NWCAA Appendix A. Remove Condition 7 and add applicable New Source Performance Standards to the beginning of the permit.

Revision e: Added periodic CO and NH_3 stack testing requirements, updated the ammonia stack testing method from EPA Method 5 to the Bay Area Air Quality Management District (BAAQMD) Method ST-1B, dropped the unburned hydrocarbon emission limit, and dropped initial testing requirements. Removed reference to "pipeline grade" natural gas and included a definition for natural gas curtailment and a citation for the definition of "natural gas". Dropped the particulate matter (PM) mass emission limit and SO_2 mass and concentration emission limits, since PM and SO_2 are regulated through the PSD permit. Removed duplicate PSD reporting requirements. Dropped the nuisance odor condition, since that requirement is covered by NWCAA regulations. Added a requirement that the CEMs quality assurance manual be kept current and available onsite. Also included some minor grammatical revisions.

Revison f: ISO correction requirements were removed to incorporate recent modifications to the PSD permit. Monthly reporting requirement for the units of natural gas combustion was changed from therms to MMBtu.