

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION



STATE OF CONNECTICUT)
AND)
YALE UNIVERSITY)

Trading Agreement and
Order NO. 8110

Whereas, the Commissioner of Environmental Protection ("Commissioner") and Yale University ("Yale") agree that it is in the public interest that they work cooperatively to improve the air quality within the State of Connecticut and that the use of emissions averaging and emission reduction trading of nitrogen oxides (NO_x) in conjunction with the reconstruction and replacement of existing emission sources at Yale will achieve this result in a timely and cost-effective manner:

- A. At the request and with the agreement of Yale, the Commissioner finds the following:
 - 1. Yale is a corporation that owns and operates an institution of higher education on a campus of buildings in New Haven, Connecticut.
 - 2. Yale provides heat and chilled water to its campus through three power plants. Prior to commencement of reconstruction activities the power plants contained the following boilers:
 - a. the Central Power Plant ("Central"), located at 18 Ashmun Street, New Haven, Connecticut, consisting of four operable steam boilers capable of burning natural gas or #6 fuel oil, and four operable steam boilers capable of burning #6 fuel oil only. These were Department of Environmental Protection ("DEP") registered sources 157, 158, 159, 993, 161, 162, 163, and 164. DEP registered source 160 was removed from service in 1977 and has not operated since that time.
 - b. the Pierson-Sage Power Plant ("Pierson-Sage"), located at 41 Sachem Street, New Haven, Connecticut, consisting of three operable steam boilers capable of burning #6 fuel oil only. These are DEP registered sources 172, 173 and 174.
 - c. the Sterling Power Plant ("Sterling"), located at 309 Congress Avenue, New Haven, Connecticut, consisting of five operable steam boilers capable of burning natural gas and #6 fuel oil. These are DEP registered sources 995, 170, 171, 105, and 178.
 - 3. The 1990 DEP Emissions Inventory, using an emission factor from AP-42, lists a total of 385.3 tons per year of NO_x emissions from the Yale plants. A total of 278.0 tons of NO_x

Initials JPM

was emitted in 1994, based on 1994 fuel data, unofficial stack tests conducted in 1994 (on equipment that is no longer in operation) and official stack tests in 1996 by Yale's environmental consultant, TRC Environmental Corporation ("TRC"). 1994 is considered to be a year representative of operations at Central and Pierson-Sage prior to reconstruction for purposes of determining internal offsets.

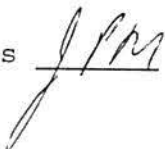
4. Central and Pierson-Sage are located on contiguous properties and constitute a single premise sometimes referred to herein as the "Central/Pierson-Sage premise". Sterling is a separate, single premise. All of the power plant facilities are owned by Yale and operated by the Yale Facilities Management Department Power Plant Management Division.
5. In 1994, the last full year before the reconstruction project commenced, the operable boilers at Central emitted a total of 85.0 tons of NO_x emissions burning a total of 249,189 MMBtu of #6 fuel oil with 1% sulfur content and 461,618 MMBtu of natural gas. The operating characteristics of these boilers prior to the reconstruction were:
 - a. Central #1: 30,000 lbs. steam/hr maximum rated capacity of 37.5 MMBtu/hr, and an emission rate of 0.448 lb/MMBtu on residual fuel oil and 0.167 lb/MMBtu on natural gas as determined by TRC in 1994 through an unofficial Method-7 stack test.
 - b. Central #2: 30,000 lbs. steam/hr. maximum rated capacity of 37.5 MMBtu/hr., and an emission rate of 0.448 lb/MMBtu on residual fuel oil and 0.167 lb/MMBtu on natural gas as determined by TRC in 1994 through an unofficial Method-7 stack test.
 - c. Central #3: 30,000 lbs. steam/hr., maximum rated capacity of 37.5 MMBtu/hr. and an emission rate of .398 lbs/MMBtu on residual fuel oil as determined by TRC in 1994 through an unofficial Method-7 stack test.
 - d. Central #4: 30,000 lbs. steam/hr., maximum rated capacity of 37.5 MMBtu/hr. and an emission rate of .398 lbs/MMBtu on residual fuel oil as determined by TRC in 1994 through an unofficial Method-7 stack test.
 - e. Central #7: 30,000 lbs. steam/hr., maximum rated capacity of 37.5 MMBtu/hr. and an emission rate of .398 lbs/MMBtu on residual fuel oil as determined by TRC in 1994 through an unofficial Method-7 stack test.
 - f. Central #8: 30,000 lbs. steam/hr., maximum rated capacity of 37.5 MMBtu/hr, and an emission rate of .398 lbs/MMBtu on residual fuel oil as determined by TRC in 1994 through an unofficial Method-7 stack test.

Initials



- g. Central #9: 30,000 lbs. steam/hr., maximum rated capacity of 37.5 MMBtu/hr. and an emission rate of .450 lbs/MMBtu on residual fuel oil and .125 lbs/MMBtu on natural gas as determined by TRC in 1994 through an unofficial Method-7 stack test.
 - h. Central #10: 30,000 lbs. steam/hr., maximum rated capacity of 37.5 MMBtu/hr, and an emission rate of .450 lbs/MMBtu on residual fuel oil and .125 lbs/MMBtu on natural gas as determined by TRC in 1994 through an unofficial Method-7 stack test.
6. In 1994, the last full year before the reconstruction project commenced, the operable boilers at Pierson-Sage emitted a total of 90.8 tons of NO_x emissions, burning a total of 453,562 MMBtu of #6 fuel oil with 1% sulfur content. The operating characteristics of these boilers are:
- a. Pierson-Sage #1: 35,000 lbs. steam/hr, maximum rated capacity of 43.5 MMBtu/hr, and an emission rate of 0.374 lbs/MMBtu on residual fuel oil as determined in 1996 through an official Method-7 stack test.
 - b. Pierson-Sage #2: 40,000 lbs. steam/hr, maximum rated capacity of 50 MMBtu/hr, and an emission rate of 0.368 lbs/MMBtu on residual fuel oil as determined in 1996 through an official Method-7 stack test.
 - c. Pierson-Sage #3: 40,000 lbs. steam/hr, maximum rated capacity of 50 MMBtu/hr and an emission rate of 0.452 lbs/MMBtu on residual fuel oil as determined by 1996 through an official Method-7 stack test.
7. In 1994, the operable boilers at Sterling emitted a total of 102.2 tons of NO_x emissions burning a total of 188,165 MMBtu of #6 fuel oil, and 897,003 MMBtu of natural gas. The operating characteristics of these boilers are:
- a. Sterling #5: 35,000 lbs. steam/hr., maximum rated capacity of 43.75 MMBtu/hr, and an emission rate of 0.413 lbs/MMBtu on residual fuel oil and 0.125 lbs/MMBtu on natural gas as determined in 1996 through an official Method-7 stack test.
 - b. Sterling #6: 35,000 lbs. steam/hr., maximum rated capacity of 43.75 MMBtu/hr, and an emission rate of 0.397 lbs/MMBtu on residual fuel oil and 0.136 lbs/MMBtu on natural gas as determined by 1996 through an official Method-7 stack test.
 - c. Sterling #7: 60,000 lbs. steam/hr., maximum rated capacity of 75 MMBtu/hr, and an emission rate of 0.458 lbs/MMBtu on residual fuel oil and 0.122 lbs/MMBtu on natural gas as determined in 1996 through an official Method-7 stack test.

Initials



- d. Sterling #8: 70,000 lbs. steam/hr., maximum rated capacity of 87.5 MMBtu/hr, and an emission rate of 0.363 lbs/MMBtu on residual fuel oil and 0.138 lbs/MMBtu on natural gas as determined in 1996 through an official Method-7 stack test.
- e. Sterling #9: This boiler, previously located at Sterling, was permanently installed at Central in November 1995 and will operate in accordance with the conditions of consent order No. 1433. This boiler has been replaced at Sterling by a 60,000 lb/hr Nebraska boiler to be operated in accordance with consent order No. 1437.
8. Each boiler listed in paragraphs 5-7 above is subject to the requirements of § 22a-174-22 of the Regulations of Connecticut State Agencies ("Regulations") pertaining to the control of Nitrogen Oxides (NO_x).
9. Compliance with the emission limitations in § 22a-174-22 of the Regulations at the Central/Pierson-Sage premise is not technologically or economically feasible due to the fact that the Central plant was built in 1917, has inefficient, field-erected boilers, and is in need of total renovation. The Pierson-Sage plant is also inefficient, has boilers that are limited to burning #6 fuel oil, and has stack heights that are too low to be permitted under current regulations.
10. Yale has agreed to reconfigure the steam system at Central to allow production and distribution of steam at 250 psi, instead of 125 psi. This will allow steam generated at Central to be transmitted to Pierson-Sage for distribution to Yale's Science campus, thereby reducing the need to produce steam with the Pierson-Sage oil-fired boilers. In addition, as part of the reconstruction program required by this Trading agreement and order, Yale has represented that it will install at least 6000 tons of new steam-driven chilled water capacity at Central to allow chilled water generated at Central to supplant chilled water currently generated by the Pierson-Sage oil-fired boilers. After these installations are operational, ozone season emissions of NO_x will be reduced during the reconstruction period.
11. At the Central/Pierson-Sage premise, Yale will comply with § 22a-174-22 of the Regulations through the retirement of all of the boilers listed in paragraphs A.5. and A.6., and the reconstruction and replacement of these boilers with new fuel-burning equipment pursuant to § 22a-174-22(h) of the Regulations.
12. At the Sterling premise, Yale will comply with § 22a-174-22 of the Regulations through emissions averaging and emission reduction trading.
13. During the reconstruction period, at the Central/Pierson-Sage premise, Yale will meet the requirements of §§ 22a-174-

Initials



22(d)(1), and 22a-174-22(h) of the Regulations through emissions averaging, emission reduction trading, and establishment of an escrow account.

14. To insure timely completion of the reconstruction project and yet meet the heating and cooling needs of Yale's campus during reconstruction, Yale will operate two new temporary boilers and has moved a currently-permitted 100,000 lb/hr boiler from Sterling to Central. Yale will include these boilers in its Central/Pierson-Sage emission averaging set. These boilers are as follows:
- a. A 12M Zurn temporary boiler producing 52,000 lbs./hr of steam ("Central Temporary Boiler #1"), which is operating on natural gas with No. 2 distillate oil with sulfur content of 0.05% as a backup fuel. This temporary boiler will operate in accordance with the terms of consent order No. 1422 and 1433.
 - b. A Nebraska NS-F-89 watertube boiler producing 100,000 lbs./hr. of steam ("Central Temporary Boiler #2"), which is operating on natural gas with No. 2 distillate oil with sulfur content of 0.05% as a backup fuel. Under separate order (consent order No. 1433) this boiler, which was located at Sterling and authorized to operate under permit #1117-0178, was moved permanently to Central in November 1995. The boiler has been retrofitted with flue gas recirculation.
 - c. A Nebraska NOS-2A-58 watertube boiler capable of producing 60,000 lbs/hr of steam ("Central Temporary Boiler #3"), which is operating on natural gas with No. 2 distillate oil with sulfur content of 0.05% as a backup fuel. This temporary boiler will operate in accordance with the terms of consent order No. 1433.
15. The use of emission reduction trading and emission averaging are forms of emission trading as defined in the United States Environmental Protection Agency Economic Incentive Plan rules, 40 C.F.R. § 51.493 et seq. Yale will use emission reduction trading in conjunction with its emission averaging plan to overcomply (i.e., operate below allowable emission limits set forth in § 22a-174-22 of the Regulations) to provide a benefit to the environment as specified in paragraph 19.
16. In compliance with the requirements of § 22a-174-22(h)(3) of the Regulations, on February 28, 1996, Yale placed into escrow \$157,500 to be maintained until such time as the project is demonstrated to the satisfaction of the Commissioner to be complete.
17. Upon conclusion of the reconstruction and replacement project, and as specified by the Commissioner, all fuel burning equipment at the Central/Pierson-Sage premise will

Initials



meet NO_x emission requirements through the application of best available control technology (BACT) or lowest achievable emission rate (LAER), as applicable. The Sterling premise will either comply with applicable emission limitations in accordance with § 22a-174-22 of the Regulations, or will enter into a new agreement with the Commissioner for an alternative compliance method no later than May 1, 1999.

18. On February 20, 1996, the Department officially received an application for the final construction and operating permits for new fuel burning equipment associated with the reconstruction and replacement of Central/Pierson-Sage. On April 10, 1996, the Commissioner determined that the application was complete.
 19. Yale's proposed reconstruction and replacement plan, including the proposal for emission averaging between existing boilers and the temporary boilers will result in the following significant environmental benefits during the reconstruction period:
 - a. Emissions of NO_x during the reconstruction period will achieve compliance, through emission reduction trading and emission averaging, with the applicable emission limits set forth in § 22a-174-22 of the Regulations, with appropriate adjustments and including a ten (10) percent environmental discount for the sole benefit of the environment.
 - b. Emissions of NO_x following reconstruction will be minimized at the Central/Pierson-Sage premise through the application of best available control technology (BACT) or lowest achievable emission rate (LAER), as applicable.
 - c. Modern fuel-burning equipment installed at the Central/Pierson-Sage premise will be more energy efficient and will minimize emissions of other pollutants such as sulfur dioxide, carbon monoxide, and particulate matter.
- B. The Commissioner, in accordance with the provisions of this trading agreement and order, and pursuant to §§ 22a-174-22(d), (f), (h) and (j) of the Regulations hereby allows Yale to comply with § 22a-174-22 of the Regulations through the reconstruction and replacement of the Central/Pierson-Sage premise and compliance with applicable emission limitations at the Sterling premise as provided herein.
- C. With the agreement of Yale, the Commissioner, acting under the Connecticut General Statutes §§ 22a-6, 22a-171, 22-174, 22a-176, and 22a-177, orders Yale as follows:

Initials



1. No later than May 31, 1999, Yale shall complete construction and commence operations of the new fuel burning equipment at the Central/Pierson-Sage premise. Yale shall take all reasonable actions to expedite the reconstruction and replacement of the Central/Pierson-Sage premise. Such actions may include site preparation and construction activities, so long as Yale recognizes that such activities are solely at its own risk and that such activities may not include delivery or installation of any pollutant emitting equipment which requires a construction permit until such time as a permit to construct has been issued for such equipment.
2. For purposes of calculating the number of internal offsets for the reconstructed Central/Pierson-Sage premise, the lower of the actual or allowable NO_x emissions from the Central/Pierson-Sage premise occurring during 1994 shall be used. Such emissions are most representative of the Central/Pierson-Sage premise prior to reconstruction. (Emissions from the Central/Pierson-Sage premise after May 31, 1995, have been affected by the on-going reconstruction activities; such emissions shall not be used for purposes of calculating offsets as required by § 22a-174-3 of the Regulations.)

The Commissioner has determined that, when the boilers are demonstrated to be permanently shutdown at Pierson-Sage, the amount of available internal offsets from these boilers will be 56.7 tons. All boilers at Central have been permanently shutdown, thereby creating 65.2 tons of internal offsets. The total amount of available internal offsets will be 121.9 tons for the Central/Pierson-Sage premise.

3. On or before May 1, 1997, in order to minimize the need to utilize the Pierson-Sage boilers to generate steam and chilled water, Yale shall: (a) complete the reconfiguration of the Central steam system to allow production and distribution of steam at 250 psi; and (b) install additional steam-driven chilled water capacity at Central.
4. On and after May 1, 1996, Central Temporary Boiler No. 2 shall not be operated without the installation of flue gas recirculation (FGR).
5. Yale shall make a written request, by certified mail, to the Commissioner for release of the escrow account and shall provide documentation that the project is complete. The escrow account may be released to Yale 1) if the Commissioner provides written approval for release or 2) if the Commissioner fails to provide a written objection to Yale within 30 calendar days of the date of receipt of request. Pursuant to § 22a-174-22(h)(4), if Yale fails to complete reconstruction of the Central/Pierson-Sage premise by May 31, 1999, to the satisfaction of the Commissioner, the Commissioner may direct that Yale use the escrow funds to acquire approved NO_x ERCs. In accordance with § 22a-174-

Initials



22(h)(2)(A), the existing boilers at Pierson-Sage shall not exceed a NO_x emission rate of 0.3 lb/MMBtu during the reconstruction period, as described in Section D of this trading agreement and order.

D. Averaging sets and requirements.

1. Central/Pierson-Sage premise Averaging Set. The Central/Pierson-Sage averaging set is defined to be the following sources:

(1) For the period from June 1, 1995 to August 8, 1995, the Central/Pierson-Sage premise Averaging set shall include: Central boilers #1, 2, 3, 4, 7, 8, 9, 10, and Pierson-Sage boilers # 1, 2, 3.

(2) For the period from August 9, 1995 until May 31, 1999, or completion of the reconstructed Central/Pierson-Sage premise and decommissioning of Pierson-Sage, whichever is earlier, the Central/Pierson-Sage premise Averaging Set shall include: Central Temporary Boilers #1,2,3, and Pierson-Sage boilers #1, 2, 3.

Central/Pierson-Sage Premise Averaging/ERC trading: For the Central/Pierson-Sage premise, Yale shall acquire approved emission reduction credits (ERCs) for the period commencing after May 31, 1995, and until completion of the final reconstruction and replacement of the Central/Pierson-Sage premise, to comply with NO_x emission rate limitations, based on a 24-hour average, as follows:

- 0.20 lbs/MMBtu when burning natural gas
- 0.30 lbs/MMBtu when burning fuel oil

Yale shall:

- a. Acquire sufficient approved ERCs to assure that an adequate number of ERCs are available at least 24 hours prior to use for each 24-hour averaging period. For the months of June, 1995, through April, 1996, the purchase and retirement of approved ERCs must be completed no later than April 30, 1996. Yale shall purchase and retire an additional ten (10)% of number of ERCs actually required from June 1, 1995 through the date of acquisition of ERCs.
- b. No later than the tenth day of each month, beginning the month after issuance of this trading agreement and order, calculate ERCs used in the preceding calendar month, as follows:

Initials



(1) Yale will calculate the Total Daily Averaging Credits available from the combustion of natural gas or No. 2 fuel oil in the Central/Pierson-Sage premise Averaging Set (as defined in Paragraph D.1.). The Total Daily Averaging Credits shall be the sum of the Daily Averaging Credits calculated for each boiler in the averaging set as follows:

Daily Averaging Credits (tons) = [fuel use in MMBtu x (0.18* lb/MMBtu - Full Load Emission Rate ("FLER") as defined in Section E. in lb/MMBtu)] / 2000 pounds.

* includes 10% averaging credit discount

(2) Yale will calculate the Total Daily Averaging Debits generated from the combustion of #6 fuel oil in the Central/Pierson-Sage premise Averaging Set. The Total Daily Averaging Debits shall be the sum of the Daily Averaging Debits calculated for each boiler in the Central/Pierson-Sage premise Averaging Set as follows:

Daily Averaging Debits (tons) = [No. 6 Oil use in MMBtu x (FLER in lb/MMBtu - (.95** x 0.30 lb/MMBtu))] / 2000 pounds.

** includes 5% design margin

(3) Yale will calculate the Net Daily Averaging Debit for each day as follows: Net Daily Averaging Debit = the sum of the Total Daily Averaging Debits and the Total Daily Averaging Credits. No approved ERCs will be required for emissions on any day during which there are more Daily Credits than Daily Debits. Net Daily Averaging Credits may not be carried forward to the next day.

(4) For each day with a Net Daily Averaging Debit, the amount of ERCs required for such day shall equal the Net Daily Averaging Debit. The total amount of approved ERCs used and permanently retired each month shall be equal to the sum of the ERCs required for each day during the month.

- c. The above calculations will be performed on forms prescribed by the Commissioner for each boiler using actual fuel consumption records.
- d. Yale shall document and record fuel consumption, heat input, and NO_x emissions for each boiler in the averaging set on a daily basis, and will maintain records of the amounts of fuel used by each boiler and the credits and debits generated for emission averaging purposes on a monthly basis. Yale shall maintain documentation regarding the number of ERCs in its possession and used each month, as well as

Initials 

information to attest to the fact that ERCs used during the ozone season were generated during the ozone season. All records shall be maintained in accordance with §§ 22a-174-4 and 22a-174-22 of the Regulations and will be provided to the Commissioner within thirty (30) days of receipt of a written request from the Commissioner.

2. Sterling Averaging Set. The Sterling averaging set is defined to be the following sources: Sterling boilers #5, 6, 7, 8, and the 60,000 lbs/hr replacement boiler authorized by consent order No. 1437 ("Sterling Temporary Boiler #1").

Sterling Averaging/ERC trading: For the Sterling premise, Yale shall acquire approved emission reduction credits (ERCs) for the period commencing after May 31, 1995, and until May 1, 1999, or termination of this Trading agreement and order, whichever is earlier, to comply with the NO_x emission rate limitations, based on a 24-hour average, as follows:

- 0.20 lbs/MMBtu when burning natural gas
- 0.25 lbs/MMBtu when burning #6 fuel oil

Yale shall:

- a. Acquire sufficient approved ERCs to assure that an adequate number of ERCs are available at least 24 hours prior to use for each 24-hour averaging period. For the months of June, 1995, through April, 1996, the purchase and retirement of approved ERCs must be completed no later than April 30, 1996. Yale shall purchase and retire an additional 10 (ten)% of ERCs actually required from June 1, 1995 through the date of acquisition of ERCs.
- b. No later than the tenth day of each month, beginning the month after issuance of this Trading agreement and order, calculate ERCs used in the preceding calendar month, as follows:

(1) Yale will calculate the Total Daily Averaging Credits available from the combustion of natural gas in the Sterling Averaging Set (as defined in Paragraph D.2.). The Total Daily Averaging Credits shall be the sum of the Daily Averaging Credits calculated for each boiler in the Sterling Averaging Set as follows:

Daily Averaging Credits (tons) = [fuel use in MMBtu x (0.18* lb/MMBtu - FLER in lb/MMBtu)] / 2000 pounds.

* includes 10% averaging credit discount

(2) Yale will calculate the Total Daily Averaging Debits generated from the combustion of #6 fuel oil in

Initials 

the Sterling Averaging Set. The Total Daily Averaging Debits shall be the sum of the Daily Averaging Debits calculated for each boiler in the Sterling Averaging Set as follows:

Daily Averaging Debits (tons) = [#6 Oil use in MMBtu x (FLER in lb/MMBtu - (.95** x 0.25 lb/MMBtu))] / 2000 pounds.

** includes 5% design margin

(3) Yale will calculate the Net Daily Averaging Debit for each day as follows: Net Daily Averaging Debit = the sum of the Total Daily Averaging Debits plus the Total Daily Averaging Credits. No approved ERCs will be required for emissions on any day during which there are more Daily Credits than Daily Debits. Net Daily Averaging Credits may not be carried forward to the next day.

(4) For each day with a Net Daily Averaging Debit, the amount of ERCs required for such day shall equal the Net Daily Averaging Debit. The total amount of approved ERCs used and permanently retired each month shall be equal to the sum of the ERCs required for each day during the month.

- c. The above calculations will be performed on forms prescribed by the Commissioner for each boiler using actual fuel consumption records.
- d. Yale shall document and record fuel consumption, heat input, and NO_x emissions for each boiler in each averaging set on a daily basis, and will maintain records of the amounts of fuel used by each boiler and the credits and debits generated for emission averaging purposes on a monthly basis. Yale shall maintain documentation regarding the number of ERCs in its possession and used each month, as well as information to attest to the fact that ERCs used during the ozone season were generated during the ozone season. All records shall be maintained in accordance with §§ 22a-174-4 and 22a-174-22 of the Regulations and will be provided to the Commissioner within thirty (30) days of receipt of a written request from the Commissioner.


E. Boiler Restrictions and annual emissions caps.

- 1. In addition to the averaging and ERC trading requirements for the averaging sets contained in Sections D.1. and D.2. of this Trading agreement and order, each unit included in Yale's averaging sets shall not exceed the following FLERs and operating restrictions:

Initials




- a. Central #1: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.448 lb/MMBtu on residual fuel oil, 0.167 lb/MMBtu on natural gas;
- b. Central #2: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.448 lb/MMBtu on residual fuel oil, 0.167 lb/MMBtu on natural gas;
- c. Central #3: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.398 lb/MMBtu on residual fuel oil;
- d. Central #4: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate .398 lb/MMBtu on residual fuel oil;
- e. Central #7: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.398 lb/MMBtu on residual fuel oil;
- f. Central #8: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.398 lb/MMBtu on residual fuel oil;
- g. Central #9: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.45 lb/MMBtu on residual fuel oil, 0.125 lb/MMBtu on natural gas;
- h. Central #10: Maximum Gross Heat Input, 37.5 MMBtu/hr; emission rate 0.45 lb/MMBtu on residual fuel oil, 0.125 lb/MMBtu on natural gas;
- i. Pierson-Sage #1: Maximum Gross Heat Input, 43.5 MMBtu/hr; emission rate 0.40 lb/MMBtu on residual fuel oil;
- j. Pierson-Sage #2: Maximum Gross Heat Input, 50 MMBtu/hr; emission rate 0.46 lb/MMBtu on residual fuel oil;
- k. Pierson-Sage #3: Maximum Gross Heat Input, 50 MMBtu/hr; emission rate 0.46 lb/MMBtu on residual fuel oil;
- l. Central Temporary Boiler #1: Maximum Gross Heat Input 65.3 MMBtu/hr; emission rate 0.08 lb/MMBtu on natural gas; emission rate of 0.15 on #2 distillate oil.
- m. Central Temporary Boiler #2: Maximum Gross Heat Input 124 MMBtu/hr; before installation of FGR, emission rate of 0.14 lbs/MMBtu on natural gas, emission rate of 0.22 on #2 distillate oil; after installation of FGR, emission rate of 0.08 lbs/MMBtu on natural gas, emission rate of 0.15 on #2 distillate oil.

Initials 

- n. Central Temporary Boiler # 3: Maximum Gross Heat Input 76.2 MMBtu/hr, emission rate of 0.08 lbs/MMBtu on natural gas; emission rate of 0.15 on #2 distillate oil.
 - o. Sterling #5: Maximum Gross Heat Input, 43.75 MMBtu/hr; emission rate 0.47 lb/MMBtu on residual fuel oil, 0.14 lb/MMBtu on natural gas;
 - p. Sterling #6: Maximum Gross Heat Input, 43.75 MMBtu/hr; emission rate 0.45 lb/MMBtu on residual fuel oil, 0.14 lb/MMBtu on natural gas;
 - q. Sterling #7: Maximum Gross Heat Input, 75 MMBtu/hr; emission rate 0.47 lb/MMBtu on residual fuel oil, 0.14 lb/MMBtu on natural gas;
 - r. Sterling #8: Maximum Gross Heat Input, 87.5 MMBtu/hr; emission rate 0.45 lb/MMBtu on residual fuel oil, 0.14 lb/MMBtu on natural gas;
 - s. Sterling Temporary Boiler #1: Maximum Gross Heat Input 76.2 MMBtu/hr, emission rate of 0.08 lbs/MMBtu on natural gas; emission rate of 0.30 on #6 oil.
2. To prevent exceeding the lower of historic actual or allowable (as listed in Table 22-1, Section 22a-174-22 of the Regulations) emission levels ("historic levels"), the total actual emissions shall not exceed historic levels as shown below:
- a. Central/Pierson-Sage NO_x emissions shall not exceed 139.4 tons per year, based on the 1994 historic level;
 - b. Sterling NO_x emissions shall not exceed 103.1 tons per year, based on the 1993 historic level.

Approved ERCs may be used to offset emissions above the historic level; however, said ERCs shall be separate from ERCs and/or averaging credits used for meeting emission rate limits specified in Table 22-2, Section 22a-174-22 of the Regulations. The quantity of ERCs required to offset excess emissions above the historic level shall equal the difference between the total actual emissions (in tons) and the historic level (in tons).

For purposes of calculating total emissions, only emissions from sources in each averaging set shall be included; emissions used shall be for a calendar year, computed using the most recent official stack tests, beginning in calendar year 1996. ERCs shall be in Yale's possession before the historic level is exceeded.

Initials 

F. Other Requirements.

1. No later than thirty (30) days after the issuance of this order, and continuing no later than March 1 of 1997, 1998, 1999, and 2000, or until the year following the date reconstruction is complete and the escrow account established in paragraph A.16. has been terminated, Yale shall submit to the Commissioner an annual report on NO_x emissions for each boiler in the averaging sets and the quantity of fuel consumed, by type, for each boiler in the averaging set during the previous 12 month calendar year. This report shall include a demonstration that the averaging sets have achieved compliance with conditions of this order for each day and with the annual emission limits in tons.
2. Yale shall retain records and supporting documentation as described in this Trading agreement and order for a minimum of five years. Yale shall provide records specified above to the Commissioner within thirty (30) days of receipt of a written request from the Commissioner.
3. On or before July 31, 1996, and every 180 days thereafter until the Central/Pierson-Sage premise reconstruction is complete, Yale shall submit a progress report to the Commissioner describing the status of the reconstruction and replacement project, and indicating any deviation in the schedule of installation as described in the compliance plan and air quality permit application received by the Commissioner on February 20, 1996.

On or before September 1, 1998, Yale shall submit a report indicating how the Sterling premise will comply with § 22a-174-22 of the Regulations after May 1, 1999.

4. Notwithstanding any provision contained in this trading agreement and order, Yale shall obtain all necessary approvals from the Department prior to the installation or relocation of any new or temporary boiler associated with this reconstruction.
5. Definitions. As used in this order,

"Commissioner" means the Commissioner of Environmental Protection or an agent of the Commissioner.

"Ozone season" means the period between May 1 and September 30 in any given calendar year.

"Approved emission reduction credits" are those for which the Commissioner has provided written authorization for use in compliance with § 22a-174-22 of the Regulations.

"Official Stack Test" is a NO_x test procedure meeting all requirements of § 22a-174-5 and § 22a-174-22 of the

Initials



Regulations and which has been reviewed and approved by the Commissioner.

"Unofficial Stack Test" is a NOx test procedure that does not meet all requirements of § 22a-174-5 and § 22a-174-22 of the Regulations and/or which has not been reviewed and approved by the Commissioner.

"Fuel-burning equipment" is defined in § 22a-174-1 of the Regulations.

"Premise" is defined in § 22a-174-1 of the Regulations.

6. Notification of noncompliance. In the event that Yale becomes aware that it did not or may not comply, or did not or may not comply on time, with any requirement of this trading agreement and order or of any document required hereunder, Yale shall immediately notify the Commissioner and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. In so notifying the Commissioner, Yale shall state in writing the reasons for the noncompliance or delay and propose, for the review and written approval of the Commissioner, dates by which compliance will be achieved, and Yale shall comply with any dates which may be approved in writing by the Commissioner. Notification by Yale shall not excuse noncompliance or delay, and the Commissioner's approval of any compliance dates proposed shall not excuse noncompliance or delay unless specifically so stated by the Commissioner in writing.
7. Certification of documents. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this Trading agreement and order shall be signed by a responsible corporate officer of Yale or a duly authorized representative of such officer, as those terms are defined in Section 22a-430-3(b)(2) of the Regulations, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157 of the Connecticut General Statutes, and in accordance with any other applicable statute."

Initials



8. Dates. The date of submission to the Commissioner of any document required by this Trading Agreement and Order shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this trading agreement and order, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three (3) days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this trading agreement and order, the word "day" as used in this trading agreement and order means calendar day. Any document or action which is required by this trading agreement and order to be submitted or performed by a date which falls on a Saturday, Sunday or a Connecticut or federal holiday shall be submitted or performed on or before the next day which is not a Saturday, Sunday or Connecticut or federal holiday.
9. Final Agreement and Order. This Trading agreement and order is the final agreement and order by and between the Commissioner and Yale with respect to the matters addressed herein, and shall not be modified without the written agreement of both parties.
10. False statements. Any false statement in any information submitted pursuant to this Trading agreement and order may be punishable as a criminal offense under Section 22a-175 of the Connecticut General Statutes or, in accordance with Section 22a-6, under Section 53a-157 of the Connecticut General Statutes.
11. Notice of transfer; liability of Yale and others. Until May 1, 1999, and in accordance with Public Act 95-218, Yale shall notify the Commissioner in writing at least thirty (30) days prior to transferring any license held by Yale to any other party and shall notify the Commissioner in writing no later than fifteen (15) days after transferring all or any portion of the operations, the facilities or the business which are the subject of this Trading agreement and order, or obtaining a new mailing or location address. Yale's obligations under this Trading agreement and order shall not be affected by the passage of title to any property to any other person or municipality. Any future owner of the facilities may be subject to the issuance of an order from the Commissioner.
12. Commissioner's powers. Nothing in this Trading agreement and order shall affect the Commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law which are willful or criminally negligent or for which penalties have not been specifically provided in this Trading agreement and order, including but not limited to violations of any permit issued by the Commissioner. If at any time the Commissioner

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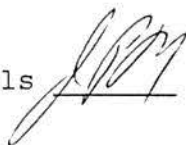


determines that the actions taken by Yale pursuant to this Trading agreement and order have not fully achieved compliance with Section 22a-174-22 of the Regulations, the Commissioner may institute any independent proceeding to require Yale to undertake further investigation or further action.

13. Yale's obligations under law. Nothing in this Trading agreement and order shall relieve Yale of other obligations under applicable federal, state and local law.
14. Access to records and premise. Any representative of the Department of Environmental Protection may enter the facilities and inspect and copy records within normal business hours without prior notice for the purposes of monitoring and enforcing the actions required or allowed by this Trading agreement and order.
15. No effect on rights of other persons. This Trading agreement and order shall neither create nor affect any rights of persons who or municipalities which are not parties to this Trading agreement and order.
16. Notice to Commissioner of changes. Within fifteen (15) days of the date Yale becomes aware of a change in any information submitted to the Commissioner under this Trading agreement and order, or that any such information was inaccurate or misleading or that any relevant information was omitted, Yale shall submit the correct or omitted information to the Commissioner.
17. Submission of documents. Any document required to be submitted to the Commissioner under this Trading agreement and order shall, unless otherwise specified in writing by the Commissioner, be directed to:

Mr. Roland Severance, Jr., P.E.
Department of Environmental Protection
Bureau of Air Management, Engineering and
Enforcement
79 Elm Street
Hartford, Connecticut 06106

Initials



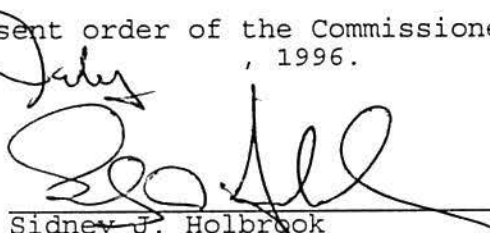
Yale consents to the issuance of this Trading agreement and order without further notice. The undersigned certifies that he/she is fully authorized to enter into this Trading agreement and order and to legally bind Yale to the terms and conditions of the Trading agreement and order.

By Yale University

Date 7/25, 1996


Joseph P. Mullinix
Vice President, Finance & Administration

Issued as a final consent order of the Commissioner of Environmental Protection on 29 July, 1996.


Sidney J. Holbrook
Commissioner

CITY OF NEW HAVEN LAND RECORDS (18 Ashmun Street and 41 Sachem Street)
MAILED CERTIFIED MAIL, RETURN RECEIPT REQUESTED
Certified Document 266 542 009