ORIGINAL

DOCKET NO. 81 - AN APPLICATION OF THE EXETER ENERGY LIMITED PARTNERSHIP FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE EXETER ENERGY STERLING PROJECT, WHICH WOULD GENERATE ELECTRICITY FROM THE COMBUSTION OF WASTE TIRES IN THE TOWN OF STERLING, CONNECTICUT.	: Connecticut Siting : Council : May 3, 1988

FINDINGS OF FACT

1. Exeter Energy Limited Partnership (Exeter) applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need (Certificate) to construct and operate a facililty to generate electricity in Sterling, Connecticut, on July 31, 1987. (Record)

2. The application fee was submitted as prescribed by Section 16-50v-la of the Regulations of Connecticut State Agencies (RSA). (Record)

3. The application was accompanied by proof of service as required by Connecticut General Statute (CGS) Section 16-501(b). (Record)

4. Pursuant to CGS Section 16-50j, the Connecticut Department of Environmental Protection (DEP) filed written comments with the Council. (Record)

5. The parties to the proceeding include the applicant and those persons and organizations whose names are listed in the Decision and Order which accompanies these Findings. (Record)

6. The Council and its staff made a field inspection of the proposed and alternative Sterling sites on November 18, 1987. (Record)

7. Pursuant to CGS section 16-50m, the Council, after giving due notice thereof, held public hearings on this application on November 18, 1987, beginning at 3:00 P.M. and continuing at 7:00 P.M., on November 19, 1987, beginning at 10:30 A.M., on December 23, 1987, beginning at 10:00 A.M., and on February 9, 1988, beginning at 10:00 A.M. All hearings were held in the gymnasium of the Sterling Memorial School, Oneco, Connecticut. (Record)

Project Description

8. The proposed facility would be a 30.2 MW (gross) 26.5 MW (net) electrical generating plant consisting of two identical boilers which would use waste tires as fuel. Steam from the boilers would be fed into a single turbine generator to produce electricity. (Exeter 1, p. A-1; Exeter 5, p. 19; Exeter 25, p. 1)

9. The electricity generated by the proposed facility would be purchased by the Connecticut Light and Power Company (CL&P) under a 25-year contract under rates and terms approved by the Department of Public Utility Control (DPUC). (Exeter 1, p. A-1; Exeter 5, p.3)

10. Electricity generated by the proposed facility would be sold to CL&P at 89% of avoided costs. The proposed facility would save CL&P rate payers over $228,000,000.00 over the term of the contract. (Exeter 1, Exhibit B-1, p.8; Exeter 5, p. 25)

11. The proposed facility would meet both the near and long-term objectives of CL&P. The proposed facility would diversify CL&P's electrical generation fuel mix, and reduce CL&P system requirements that would otherwise be met by conventional generation. (Exeter 1, p. B-3; Exeter 5, pp. 20-23)

Facility Description

12. The proposed main plant building would be a 100-foot by 100-foot structure with a 90-foot by 120-foot extension for the turbine generator and auxiliary equipment. The main plant building would enclose the boilers, turbine generator, the ash system, and the water treatment system. (Exeter 1, p. I-3)

13. Other buildings and structures would include a 30-foot by 90-foot administrative and maintenance building, a 20-foot by 20-foot fire pumphouse, a 20-foot by 20-foot fly ash unloading building, a 30-foot cooling tower, a 60-foot by 40-foot shredded tire tipping building, a 196-foot exhaust stack, and a substation. (Exeter 25, p. 45; Exeter 5, p. 40; Exeter 1, Exhibit B.2-11, Tr., Volume III, November 19, 1987, p. 192)

14. The proposed facility would operate on a 24-hour a day basis. Tires would be fed to the boilers via conveyors, and instantly ignite. The burning tires would then move down a grate incinerator. All combustible parts of the tires would burn, leaving only metallic slag. (Exeter 1, pp. A-2-A-3; Exeter 5, p.15)

15. The combustion temperature of 1800°F would be developed and maintained during the start-up periods by the use of No. 2 fuel oil. The standard operating temperatue would be approximately 2000°F for 1.6 seconds. (Exeter 2a, Q.19; Exter 18, Final Technical Application p. 3-17)

16. It is expected that about 157,500 gallons of oil would be required annually. This oil would be stored in a 30,000 gallon above ground tank. This tank would be installed in a bermed area 200 feet from the boiler building. A diked area around the oil tank would be capable of retaining the entire contents of the oil storage tank. The No. 2 fuel oil would have a sulphur content of 0.5%. (Exeter 2a, Q.20; Exeter 2c, Q.41; Exeter 33, Q.1)

17. The proposed facility would have two totally independent tire-fired boilers. Each boiler would have its own tire feed system, air control system, and ash disposal system. The two flue gas trains would then be connected to a common electrostatic precipitator, dry scrubber, bag house, and exhaust stack. (Exeter 1, p. D-6)

18. Ash and residue from combustion would be conveyed to a common ash storage area by a conveyor. (Exeter 1, p. D-7)

19. The annual production of by-products from combustion would be as follows: Zinc oxide calcine, 1,650 tons per year, dry scrubber residue, 6,450 tons per year, and iron slag, 13,000 tons per year. (Exeter 1, Exhibit B-3)

20. The electrostatic precipitator would extract zinc oxide calcine for market use. Exeter has received an initial purchase order for 10 tons of zinc calcine fly ash from New Jersey zinc refiner, and a letter of intent from a Pennsylvania zinc processor. (Exeter 1, Exhibit B-3; Exeter 5, Rettger, pp. 19-20; Tr., 11/18/87, Vol. I, p. 65)

21. Iron slag is the ferrous product of tire incineration, and would be marketed to the scrap metal or steel industry. If not able to be sold, the slag could be placed in landfills. Exeter has a long-term contract with disposal facilities if no buyer is found. (Exeter 1, Exhibit B-3; Exeter 2a, Q7)

22. The dry scrubber residue would be captured in the baghouse system and conveyed to a storage silo. Scrubber residue could be marketed. The facility would produce 14 truckloads of bottom ash weekly, and seven truckloads of scrubber residue weekly. The trucks would be multi-axled rear loading, containerized tractor trailers. (Exeter 1, Exhibit B-3.7; Exeter 4, Q.17, Q.19)

23. Exeter testified that they do not intend to use Connecticut landfills for the disposal of the combustion by-products. The applicant has access to a secure landfill in the Buffalo, New York area. Exeter also has letters of intent or interest for backup landfills in the event any recycling markets are unavailable. (Exeter 2b, Q.36; Exeter 1, Exhibit B-3; Exeter 5, p. 20)

24. The proposed cooling tower would cool 28,000 gallons per minute of 98.9^{O}F boiler water to 86.4^{O}F. The cooling tower would circulate boiler water containing hot water from the steam cycle and evaporate some of this water to dissipate excess heat. The source of this evaporated water, which amounts to about 400 gallons per minute of the circulating flow, would be the Town of Sterling municipal well system. (Exeter 1, Exhibit B-2.11, Item M-24; Exeter 5, pp. 40-41)

25. During evaporation in the cooling tower, minerals in the boiler water would continuously accumulate as water in the tower is replaced with new boiler water. This water, known as blow down, would consist of 53 gallons per minute. Most of this water would be used to meet the water requirements of the scrubber system. (Exeter 5, pp. 40-41)

26. The remainder of the cooling tower blow down that is not used would be discharged into the Town of Sterling sewer system, which feeds into the Town of Plainfield sewage plant. Exeter would add one part per million of chlorine to inhibit algal and bacterial growth. The only other additive would be scaling inhibitors. No damage to the Plainfield sewage plant would occur from these additives. (Exeter 7, pp 3-4)

27. The existing Sterling municipal water supply well which would supply an average 430 gallons per minute of water to the cooling tower has been pump-tested up to 550 gallons per minute. (Tr., Volume III, November 19, 1987, p. 145; Exeter 1, p. A-3))

28. Since the cooling tower would be in an elevated area, the visible evaporative steam plume from this tower would not reach the ground in areas outside the immediate vicinity of the proposed facility. The modeled incremental maximum predicted fogging by the cooling tower would be approximately 2 hours per year. The maximum fogging would occur within about 100 meters of the cooling tower, primarily during the winter and spring. Fog occurs naturally in the region about 110 hours per year. (Exeter 2a, Q.9; Exeter 9, pp 4-5)

29. A control system would coordinate and control the entire proposed facility, including the steam generation system for the boilers and the generation and export of electricity. Industrial controls would regulate the boiler steam production, the tire and auxiliary feed system, air supply to the furnace, and turbine speed. Flue gas parameters would be monitored and recorded automatically. (Exeter 1, p. D-12)

30. The facility would have a planned operating life of 30 years. The plant would operate an estimated 7,500 hours per year. (Tr., Volume III, 11/19/87, p. 55; Tr., Volume IV, 12/23/87, p. 82; Exeter 1, p. D-6)

31. Over the life of the plant, system availability would average 85%, with a down time of 15%. Approximately 12% of this down time would be for scheduled maintenance. Three percent would be unscheduled down time. During an emergency, a plant microprocessor would automatically bring the plant into a safe shutdown condition. (Exeter 1, p. D-6, p. D-8; p. D-10)

32. Exeter has no steam customer at this time, but it is possible it will have customers in the future. Exeter has agreed to provide hot water heating by means of a cooling tower bypass to a greenhouse which proposes to locate in the Sterling Industrial Park. Exeter plans to discuss providing heat to other tenants in the Industrial Park. (Exeter 2a, Q.22; Exeter 3, Q20)

33. The proposed substation would include a step-up transformer, a 115-kV oil circuit breaker, disconnect and grounding switches, instrument transformers, and lightning arrestors. (Exeter 1, Exhibit B-22.1, Part 2.3)

34. Power generated from the proposed facility would be stepped up to 115-kV and transported through a high voltage transmission line to the CL&P 115-kV transmission system. A transmission line would be routed overhead from the transformer to the facility property line. A seven mile transmission line, to be owned by CL&P, would be submitted as a separate application. (Exeter 1, p.I-17; Tr., 11/18/87, Volume I, pp. 61-62)

Waste Tires as Fuel

35. Tires as fuel have a high energy content, burn cleanly in a properly designed system, and produce useful residues as ash products. (Tr. 11/18/87, Volume I, pp. 33-34)

36. The proposed facility would consume 8 million to 9 million waste tires per year, equivalent to a maximum of 96,000 tons per year. (Exeter 1, p. A-1, P.J-1)

37. About 3.5 million to 5 million scrap tires are disposed of annually in Connecticut. About 10 to 12 million scrap tires are annually generated in New England. (Exeter 4, Q.1, Q.3)

38. Most waste tires in Connecticut are landfilled. Of the 12 existing municipal solid waste landfill sites in Connecticut, only four have the potential for significant expansion. (Exeter 1, Exhibit B-5, Part 4.0)

39. Connecticut would supply an estimated 30% to 40% of the total tires, 20% would be from Rhode Island, and 50% would originate in Massachusetts. (Tr. 11/19/87, Volume 3, pp. 77-78)

40. To minimize contamination from hazardous materials, tires would be brought to the proposed facility primarily by suppliers and haulers, and inspected by the material handling staff at the facility during operation. (Exeter 4, Q.13)

41. About 50% of the stored tires would be shredded, with the remainder being whole tires. Shredded tires would consist of pieces four inches or less in size. (Exeter 25, p. 79)

42. It is expected there would be no tire rejects from the proposed facility, which would be able to process tires containing dirt, ice, or studs. (Exeter 2C, Q.46)

43. Tires would be fed to the tire feed hoppers at a rate greater than 30 tires per minute. (Exeter 1, Exhibit B.2-11, Part 5.1)

44. The only type of tire which could not be processed would be a tire greater than seven feet in diameter. (Exeter 2a, Q.17)

45. Over 90% of the tires produced in the United States are steel belted, and therefore most of the tires burned in the proposed facility would be steel-belted. (Exeter 33, Q.16)

46. The sulphur content of the tires is generally less than the 1.6% assumed in Exeter's Air Quality Permit Application. (Exeter 24)

47. Upon arrival at the proposed facility, trucks carrying the tires would be weighed, and then driven to the unloading area. Tires would then be unloaded directly onto the feed conveyors or to the storage piles. After the tires are burned, steel slag from the tires would remain on the stoker grate. This slag would be pushed down the grate to a water quench. (Exeter 5, Rettger pp. 15-17).

48. The total on-site storage of tires would consist of 1,300,000 whole and shredded tires in nine piles. This represents a 46 day supply. Most of the stored tires would be shredded. The tire storage area would be landscaped by a wooded buffer zone around the proposed site. (Exeter 1, p. A-2; Exeter 1, Exhibit B-3; Exeter 2a, Q.6; Tr., 11/19/87, Volume III, p. 103)

49. The leachate from the tire storage piles would be non-hazardous, based on leachate tests. (Exeter 2a, Q.1; Exeter 1, p. J-8)

50. To prevent possible mosquito breeding in the tire storage piles, final vector control plans would be developed in the course of the DEP Solid Waste Permit. Vector controls would include limitations on the volume of tires stored, limitations on the length of time for tire storage, and covering whole tires stored on the proposed site. Tire piles would be covered if they contained whole tires exposed more than seven to ten days. Shredded tires would not be covered because they do not accumulate water which fosters mosquito breeding. (Exeter 2b, Q.32; Exeter 2c, Q.38)

Fire Prevention

51. The maximum tire storage pile size would be restricted to no more than 100 feet on each side and no more than 20 feet in height. Fifty-foot separation lanes would be maintained between the storage piles. (Tr., 11/19/87, Volume III, pp. 113-116p Exeter 1, Exhibit B-3)

52. The tire storage area would be at least 100 feet from the incineration area. (Exeter 1, p. D-4)

53. Exterior fire protection would consist of an underground loop around the proposed plant with hydrants, hydrant houses, and hydrant house equipment spaced 300 feet apart. Pumps would be rated at 1000 gallons per minute capacity. Hydrants and hoses in the vicinity of the tire piles would have a special additive, Tire-X, added to the water to aid in fire suppression. (Tr., 11/19/87, Volume III, pp. 113-116; Exeter 1, p. D-2; Exeter 17, p.1)

54. Interior fire protection would consist of a dry-pipe sprinkler system on the roof over the tire feed pit. Water cannons would be installed above the charging and tire pit area. (Exeter 1, p. D-2)

55. The source of the water would be from the Town of Sterling Water Supply and a 400,000 gallon water storage tank in the Industrial Park. (Exeter 1, p. D-2)

56. For fire detection, three systems are being investigated: rotating cameras with infrared illuminators, infrared flame detectors, and photo electric beam smoke detectors. (Exeter 17)

Truck Routes and Traffic

57. On an average day, 25 to 30 trucks carrying tires would enter the proposed facility. This would result in traffic volume increases of less than 1% on Route I-395 and 1.5% on Route 14, two of the main approaches to the proposed facility. (Exeter 1, p. J-14)

58. The trucks would use Route 395, and exit at Exit 89 onto Route 14. Trucks would then travel east on Route 14 through Moosup. They would then turn from Route 14 in Sterling onto Industrial Park Road to the proposed facility entrance. (Exeter 1, Exhibit B-3.8)

59. The Connecticut Department of Transporation has stated no improvements are necessary to the existing road system in the area. Adequate public highways are available to accomodate the allowable length, height and weight limits of the proposed tire transport vehicles. (Exeter 2a, Q.2, supplemental response of 9/21/87; Exeter 2d, Q.49)

60. The Rhode Island Department of Transportation does not anticipate any significant impacts on Rhode Island roads from trucks going to or from Sterling on Route 6, or Rhode Island routes 14, 102 or 165. (Licht Exhibit 1, DOT letter of 1/21/88)

61. Three principal types of trucks would normally transport tires to the proposed facility. The three truck types would be tractor trailers hauling 15 tons of whole tires per load, open-bed trucks hauling 20 to 25 tons of chipped tires per trip, and uni-body trucks transporting three to sixteen tons of whole tires per load. These trucks would be owned by the applicant, contractors to the applicant, and independent haulers. (Exeter 1, Exhibit B-3)

Proposed Site

62. The proposed site is on property owned by the applicant within the Sterling Industrial Park. The proposed site is 20 acres, with elevations of between 500 feet and 580 feet. There are no existing structures on the proposed site, and the nearest residence is 1400 feet south of the boundary of the proposed site. (Exeter 1, p. A-4, p. G-1; Exeter 2a, Q.14; Exeter 9, p. 10)

63. Except within the Sterling Industrial Park, there are no residential or commercial developments on adjacent properties. The Town of Sterling has no zoning regulations. The proposed project has received the approval of the Sterling Planning Commission. (Exeter 1, p. G-1, p. J-2)

64. The abutting property to the proposed site is owned by the Town of Sterling, which has plans for additional industrial development of this park. (Exeter 2a, Q.25)

65. To provide screening, a treed buffer zone 30 feet to 50 feet wide would be left around the boundary of the entire proposed site. Grass and shrubs would be planted around the steam turbine/control building. (Exeter 1, Exhibit B.2-11, Item C-19; Exeter 1, P. I-15)

66. The top of the boiler building and exhaust stack would be visible from unobscured high elevation points along nearby roads. (Exeter 2c, Q. 40)

67. The stack would be visible along Route 14 in Sterling to the west of the proposed site. The stack would not be generally visible along Route 14A. From Main Street in Sterling the steep angle to the proposed site would preclude visibility. (Tr., 11/19/87, Volume III, pp. 194-195)

68. Three-inch stone surfacing would cover the area of the proposed site within the switchyard fence, stack gas clean-up equipment, and fire lanes of the tire storage area. (Exeter 1, Exhibit B.2-11, Item C-8)

69. Access to the proposed site would be via an existing 30-foot wide paved road. This paved road would be extended eastward a distance of approximately 700 feet to the main plant entrance. (Exeter 1, p. G-9, p. I-15; Exeter 2a, Q.16)

70. The proposed facility would be surrounded by an eight-foot chain link fence. Access gates would be controlled to prevent unauthorized entry. The entire proposed facility would be lighted 24 hours a day. (Exeter 1, Exhibit B.2-11, Item C-7; Exeter 1, p. D-3)

Alternative Site

71. Exeter has acquired an option on a site on the southern side of Route 14 in Sterling. This alternative site has an elevation of 425 feet and has no wetlands. It is approximately one mile southwest of the proposed site. (Exeter 1, p. H-7; Exeter 2a, Q.15)

72. The alternative site has no existing sewer lines and no water supply. Water would have to be supplied by extending mains up Route 14 from the Town of Sterling system, or by developing new wells on the alternative site. (Exeter 1, p. H-7)

73. The site development of the alternative site would be more costly than that of the proposed site, due to the need for a longer roadway and new sewer and water lines. (Exeter 2a, Q.15)

74. The area surrounding the alternative site is being developed for residential purposes. There are two existing residences adjacent to the alternative site, and 12 others within a 2000-foot radius. The construction of the proposed facility at the alternative site would result in a facility which would be highly visible along Route 14. (Exeter 2c, Q.40)

Site Selection Process

75. During its evaluation of a tire burning facility, Exeter determined that two such facilities could be situated in New England. One such facility is proposed for the State of New Hampshire. (Exeter 1, p. H-1)

76. Criteria evaluated in the site selection process included easy access to transportation routes, a location central to the southern New England population, and the maximization of electric revenues. CL&P offered the most attractive pricing terms. (Exeter 1, pp. H-1 to H-2)

77. Exeter investigated a potential site in the Town of Voluntown. This site was rejected due to the 1.5 miles of new right-of-way which would be required, the length of travel required by trucks carrying tires on secondary roads, and the lack of a municipal water or sewer system in Voluntown. These factors would have added from three to five million dollars to the cost of the development of the project. (Exeter 1, p. H-4)

78. Exeter attempted to negotiate an option on a parcel of land on Route 12 within the Town of Plainfield. This potential site did not have municipal water or sewer lines available. Additionally, Exeter could not reach an agreement with the owner of this parcel, and therefore this site was rejected. (Exeter 1, p. H-5)

79. Using money from the State of Connecticut Economic Development Commission, the Town of Sterling developed an industrial park where Town officials would prefer to locate all new industry. This would serve to conserve farmland and woodland in the Town of Sterling, and keep such new industry removed from adjacent residences. (Tr., 11/18/87, Volume I, p 38; Town of Sterling, p. 16)

80. Exeter proposed to develop the preferred Sterling site for reasons including access to existing transmission line right-of-ways, good access to Route I-395, an existing municipal water and sewer system within the Sterling Industrial Park, a high elevation which would aid in minimizing air quality impacts, and the distance of the proposed side from nearby homes. (Exeter 1, p. H-6)

Noise Impacts

81. The major potential noise sources of the proposed facility would include draft fans, the cooling tower, and the emergency diesel generators. (Exeter 9, pp. 13-18)

82. A "worst case" scenario was predicted to occur when the cooling tower was operating at full speed and the emergency diesel generators operating simultaneously. In this situation, the maximum predicted noise from the proposed facility at the Sterling Industrial Park boundary would be about 50.5 decibels on A scale (50.5 dB(A)). This would be 15.5 dB(A) below the Connecticut noise control regulation level of 66 dB(A).

The maximum noise level at the nearest home would be 41.2 dB(A), which is nearly 10 dB(A) under the allowable night time impact of 51 dB(A). The proposed facility would therefore comply with the existing Connecticut noise standards. (Exeter 9, pp. 13-18)

83. To reduce noise impacts, vehicle unloading operations would be conducted only during daytime hours. Building wall material would be selected for appropriate sound absorption. Low noise emission equipment would be installed. Safety relief valves and emergency generators would be fitted with silencers and exhaust mufflers. (Exeter 1, p. J-20)

Air Emissions

84. The proposed site is within the Eastern Connecticut Interstate Air Quality Control Region. This region is in attainment for all air pollutants but ozone. (Exeter 1, p. G-8)

85. Since the estimated air emissions are below Prevention of Significant Deterioration (PSD) levels, the proposed facility would not be subject to PSD review. Although not required by federal or state regulation, the air pollution control system would consist of equipment recognized as Best Available Control Technology (BACT) for similar installations. (Exeter 1, p. I-14)

86. There would be no visible smoke or by-product emissions from the stack other than water vapor which might become visible during cold weather. (Exeter 2a, Q.13)

87. The estimated worst case air emission rates after control are estimated in tons per year (t.p.y.) as follows: carbon monoxide, 235.7 t.p.y.; nitrous oxide, 172.5 t.p.y.; sulphur dioxide, (SO_2) 249.2 t.p.y.; particulate matter, 42.4 t.p.y.; hydrocarbons, 48.7 t.p.y.; hydrogen chloride, 8.5 t.p.y.; sulphuric acid, 61.4 t.p.y. lead, 0.1 t.p.y. These rates are below the limits set by the federal Environmental Protection Agency (EPA) and the Connecticut DEP. (Exeter 18, Final Technical Application, p. 3-12)

88. Emissions during start-up and shut-down would be no higher than those at full operation. (Exeter 2a, Q.18)

89. The proposed facility would operate with a sulphur emissions ceiling. As the facility approached the PSD upper limit of 250 t.p.y., the facility would be run at a lower capacity or a small number of hours over the year to prevent exceeding this emission limitation. (Tr. 12/23/87, Volume IV, pp. 82-83)

90. Based on an expected average tire sulphur content of 1.31%, a tire feed rate of 24,000 lbs. per hour, a 92% control efficiency, a plant operation period of 7500 hours per year, and SO_2 emissions of 3.5 tons per year from oil burners, the expected SO_2 emissions from the proposed facility would be 191.8 tons per year. The 92% SO_2 removal control efficiency is a higher level of SO_2 removal control efficiency than other facilities are currently proposing in Connecticut, and would provide substantially lower emissions than necessary to meet both State and Federal standards. (Exeter 2c, Q.45; Exeter 5, p. 39)

91. The SO_2 from the proposed Sterling facility would add 0.1% to 0.2% to the pre-existing background SO_2 levels in the area of the Scituate Reservoir in Rhode Island. (Rahn, Exhibit 1, pp. 2)

92. At 250 tons per year, the maximum emission of SO_2 from the proposed facility would represent 1.5% of the current Rhode Island emissions from all sources, which total approximately 15,000 to 20,000 tons. (Rahn, Exhibit 1, p. 3)

93. The maximum predicted 24 hour average lead ground level concentration as a result of the proposed facility would not exceed 0.0078 ug/m^3 within the State of Rhode Island. The National Ambient Air Quality Standard (NAAQS) for lead is 1.5 ug/m^3 averaged over a calendar quarter. The allowable lead level as defined by the NAAQS would therefore not be exceeded in Rhode Island. (Exeter 23, Results of Air Quality Analysis, letter of 12/9/87).

94. The cumulative increase in lead deposition for the Scituate Reservoir in Rhode Island from the proposed facility over a 30-year period would be 0.57 x 10^{-6} mg/l. The western portion of the Scituate Reservoir is 15,917 meters from the proposed facility. This concentration is about 1/5000 of the most stringent applicable water quality standard. (Exeter 23, pp. 1-1 to 1-2, Table 4-4)

95. The rate of deposition of particulate matter in the Moosup River Watershed is estimated to be 0.000001 g/m^2 per year. The particulate matter deposition rate would be highest nearest the proposed facility, and would rapidly drop within 500 meters of the proposed plant. (Exeter 3, Q.22)

96. About 2.6% of the annual particulate matter deposition from the proposed facility would enter the Moosup River. At this expected deposition rate, the deposition of particulates from the proposed facility would have no significant impact on local brook trout reproduction. (Exeter 3, Q.23, supplemental response; Exeter 4, Q.23)

97. The proposed facility would produce no detectable changes in cadmium inhalation in the Connecticut-Rhode Island area. The existing Rhode Island air contains about 200 times more ambient cadmium than would be emitted by the proposed facility. (Exeter 34, pp. 1-2)

98. Chlorine is a necessary ingredient for the formation of dioxins and furans. Tires are relatively low in chlorine, varying in content from .03% in steel-belted passenger tires to .21% in fabric nylon tires. Less than 5% of the tires received would be fabric nylon tires. (Exeter 18, p. 1-3, Final Technical Application p. 3-17; Exeter 2a, Q.19; Exeter 2d, Q.50)

99. Connecticut Standards on dioxin currently require a temperature of 1800^{o}F being maintained a minimum of one second for the destruction of dioxin. (Tr., 11/19/87, Volume III, p. 94)

100. The proposed facility would operate with high temperatures and residence times, 1.6 seconds at 2000^{o}F, or 3.6 seconds at 1800^{o}F. (Exeter 18, Final Technical Application, p. 3-17)

101. In a test of the bottom ash from a similar tire burning facility in Modesto, California conducted in December, 1987, no dioxins or furans were detected. (Exeter 28; Exeter 15, p. 21; Tr., 12/23/87, Volume IV, p. 107)

102. Hydrocarbons are a pollutant considered a pre-cursor to the formation of ozone in the atmosphere. The proposed facility would produce relatively a small amount of hydrocarbons. (Tr. 11/18/87, Volume I, p. 85)

103. The predicted impacts of the criteria pollutants such as sulphur dioxide, carbon monoxide, nitrogen oxides, lead, and particulate matter in Rhode Island are all well below PSD levels set by the EPA, and therefore these emissions would not contribute to a violation of any National Ambient Air Quality Standard. (Licht, Exhibit 1; Exeter 30)

104. The EPA will not be issuing any environmental permits for the proposed facility, including PSD, because the proposed facility's emissions are below the level at which a PSD permit is required. (Exeter 30, EPA letter of 12/7/87)

105. DEP has informed the EPA that the air permit from DEP would contain very stringent emission limitations for each of EPA's criteria pollutants. Additionally, DEP plans to impose stringent emission limitations on about 20 non-criteria pollutants EPA does not presently regulate, including dioxins, furans, hydrogen chloride, mercury, chromium, arsenic, copper, and zinc oxide. Strict operating conditions imposed by the air permit would ensure all of the emission limitations are met continually. (Exeter 30, EPA letter of 12/7/87)

106. Once in operation, the proposed facility would be required to conduct a performance test to prove it is meeting all of the emissions limitations. The proposed facility would not be issued a permit unless it passes all of the emission performance tests. (Exeter 30, EPA letter of 12/7/87)

107. Exeter has submitted to DEP a computer modeling demonstration showing the expected ambient impacts of emissions for areas surrounding the proposed site, including Rhode Island. If this modeling shows significant impacts which would contribute to a violation of any NAAQS in any nearby area, the DEP cannot issue a permit. (Exeter 30, EPA letter of 12/7/87; Licht Exhibit 1)

Air Emissions Controls

108. Gases leaving the boilers of the proposed facility would pass through electrostatic precipitators, a dry scrubber, and a fabric filter bag house. (Exeter 1, p. B-6)

109. The electrostatic precipitators and bag house would remove over 99% of the particulates from the boilers. The electrostatic precipitators would be located upstream of the gas flow from the dry scrubber and bag house systems to capture the fly ash which contains zinc calcine, which would be sold. A fabric filter can provide particulate matter control efficiencies of greater than 99%. The bag house would remove at least 99% of particulates less than 1 micron in size. Fabric filter bag houses are determined to be BACT for the control of particulate matter. (Exeter 1, Exhibit B-2.10; Exeter 5, Rettger p. 18; Exeter 19)

110. Most trace metals would be deposited on the flue gas particulate matter and would therefore be collected by the electrostatic precipitators and bag house. For trace metals, the bag house is determined to be BACT. (Exeter 1, Exhibit B-2.10)

111. Dry scrubbers remove over 90% of sulphur in the form of H_2SO_4. The DEP Air Compliance Unit has determined that a dry scrubber would be BACT for sulphur removal. (Exeter 4, Q.14)

112. A dry scrubber consumes a great deal of water through evaporation in the flue gases. It has no waste water discharge. A dry scrubber would be used because it would provide better H_2SO_4 control than a wet scrubber. (Exeter 7, p. 3; Tr., 12/23/87, Volume 4, p. 90)

113. If the dry scrubber is not operating, the proposed facility would be required to go off-line. (Tr., 11/19/87, Volume III, p. 158)

114. Carbon monoxide is a product of incomplete combustion. Improper feed controls or insufficient air for combustion can lead to high carbon monoxide emissions in incinerators. Proper maintenance and operation based on integrated combustion controls are BACT for carbon monoxide. (Exeter 1, Exhibit B-2.10; Exeter 18, Final Technical Application, p. 6-6)

115. The proposed facility would utilize a flue gas treatment known as thermal DeNox to control nitrogen oxide (NO_x) emissions. Combustion gases in the boilers would receive an injection of ammonia into the combustion stream. Thermal DeNox offers a NO_x control efficiency of 50%. This would be the first thermal DeNox system installed in Connecticut. (Exeter 1, p. B-6; Exeter 1, Exhibit B-2.10; Exeter 5, Rettger p. 38)

116. Fugitive dust emissions from the proposed facility might have three sources: vehicular traffic, waste tire handling, and combustion waste by-product handling. (Exeter 1, p. J-10)

117. To control dust, all access roads to the facility would be paved, wetted, and cleaned as necessary. During tire handling, tires would be wetted to control dust as necessary. All waste and by-products would be transferred to enclosed containers. (Exeter 1, pp. J-10 to J-11)

118. Initial modeling of expected air emissions extended no farther than 2.7 kilometers from the proposed site, because beyond that distance emission rates become too small to model. Subsequent modeling of air emissions was filed with the Rhode Island DEM. (Tr. 11/19/87, Volume III, p. 191, Exeter 23)

119. The proposed facility would have a continuous stack emissions monitoring system. The following emission would be monitored: Carbon monoxide, carbon dioxide, SO^2, and nitrogen oxide. Opacity and temperatue would also be monitored. Telemetry of this monitoring would be sent to DEP in Hartford. (Tr., 11/19/87, Volume III, p. 190; Exeter 25, p. 59)

120. If the emissions monitoring system detected a high SO^2 rate, the sensor would call for a reduction in fuel input to maintain a stack emission rate below the DEP air permit conditions. (Tr., 12/23/87, Volume IV, pp. 113-114)

121. The temperature of the gas emitted from the stack would be 180^oF. (Tr., 11/19/87, Volume III, p. 217)

122. The air pollution control technologies proposed for this facility are state of the art. (Licht, Exhibit 1; Exeter 30, EPA letter of 12/7/87)

Water

123. The proposed facility would consume about 620,000 gallons per day from the Sterling Municipal Water System. The Town of Sterling currently uses about 30,000 gallons of water per day from wells. Assuming full development of the Sterling Industrial Park, the combined maximum draw down, including the proposed Exeter facility, would be 760,000 gallons per day. This is 12.6% of the 6,000,000 gallon per day long-term yield of the Moosup River acquifer. (Exeter 2a, Q.10; Exeter 3, Q.2)

124. The proposed facility would require water for the boiler, cooling tower, ash handling system, dry scrubber additive and for fugitive dust control. (Exeter 1, p. I-9)

125. When the Moosup River's stream flow is at average levels, 53,000,000 gallons per day, the flow reduction expected as a result of the proposed facility would be less than 0.1%. (Exeter 3, Q.3)

126. The water draw down from the proposed facility would not affect the water supply of the Quinnebaug Valley Trout Hatchery. (Exeter 3, Q.4)

127. The proposed facility is expected to increase the average daily discharge of the Town of Plainfield sewage treatment plant by less than 1%. It is not expected that the water discharge from the proposed facility would cause problems at the Sterling sewage treatment plant. (Exeter 3, Q.17, Q. 18)

128. Sanitary wastewater and wastewater from uses such as filter backwash, demineralizer regenerant, cooling tower blowdown, and washdown water would be discharged into the Sterling sewage system. (Exeter 1, p. B-6)

129. Normally, only sanitary wastewater and treated wastewater would be discharged into the Sterling sewage system. Cooling tower blowdown is expected to be 40,000 gallons per day, and sanitary discharge would be 3,000 gallons per day. (Exeter 1, p. I-11; Exeter 2a, Q.8)

130. A primary mitigation of water quality impacts is the maximum recycling of process wastewater to minimize the amount discharged into the sewage system. Average process water discharge would be two gallons per minute. The maximum rate would be 10 gallons per minute, equal to 14,000 gallons a day. All wastewaters would be re-used. Residual blowdown water would be discharged into the Sterling municipal sewage system. (Exeter 5, pp.39-40, pp. 42-43; Exeter 8, p.5)

131. Blowdown water contains no metals or toxics. (Exeter 1, Exhibit B-3)

132. There would be potential seepage into the groundwater from the tire storage area and from runoff from the proposed site. (Exeter 1, p. J-8)

133. The Town of Sterling would have to apply to DEP for a new water diversion permit for the proposed facility. The Town would make such an application if the proposed facility received Council approval. (Tr., 11/19/87, Volume III, p. 183)

134. Exeter has applied to the DEP for and expects to receive a National Pollution Discharge Elimination System permit for run-off from parking lots, roofs, and storage areas at the proposed facility. (Exeter 2a, Q.33)

135. The water quality of the Scituate and Providence Water Supply Board watersheds would not be adversely impacted by the proposed facility. (Exeter 36)

136. The proposed facility would have no significant impact on the environment or water supply of Rhode Island over the 25-year operational term of the facility. (Exeter 32, Q.13)

Permits

137. Exeter filed for a Solid Waste Permit from DEP in July, 1986. In December 1987, Exeter received a draft permit from the DEP Solid Waste Unit. Final permit approval is pending a DEP hearing. (Exeter 5, Rettger testimony, pp. 7-8; Exeter 22)

138. Exeter filed for an Air Permit from the DEP in October 1986. In October, 1987, the Air Compliance Unit prepared a draft permit to construct the proposed facility. A final permit will be issued following a public hearing on the draft permit. (Exeter 5, Rettger testimony, pp. 7-8; Exeter 22)

139. Exeter filed for a Wastewater Discharge Permit to connect the proposed facility to the Sterling municipal sewer system and to permit parking lot runoff in September 1987. The Water Compliance Unit of the DEP issued a draft Wastewater Discharge Permit in January 1988. Final approval is pending a DEP hearing. (Exeter 5, Rettger testimony, pp. 7-8; Exeter 22)

140. Each of the air quality, solid waste, sewer system interconnection, and storm water runoff permits must be issued by the DEP before the proposed facility can be constructed. (Tr., 11/18/87, Volume I, pp. 34-35)

141. The proposed facility would not be subject to review under New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants. (DEP Comments of 9/9/87)

142. The proposed exhaust stack would not be obstruction marked or lighted under Federal Aviation Administration regulations. (Exeter 2a, Q.23; Tr., 11/19/87, Volume III, p. 195)

Other Environmental Concerns

143. There are no known existing records of federally endangered or threatened species or Connecticut species of special concern or critical habitats occurring at the proposed site. (Exeter 1, Exhibit J-4)

144. The proposed facility would have no significant effects on state recreation or conservation properties. (Exeter 1, Exhibit J-2)

145. The proposed facility would have no effect on historical, architectural, or archaeological resources listed on or eligible for the National Register of Historic Places. (Exeter 1, Exhibit J-3)

<u>Need</u>

146. The proposed facility is a Block One project as designated by the DPUC. According to CL&P data, electricity from Block One projects is necessary to prevent an electricity shortfall in the years 1994 to 1995. (Exeter 5, Exhibits PR-8, PR-9)

147. Exeter's contract with CL&P begins in 1991, three years before capacity need. CL&P and its rate payers would pay nothing until electricity actually flows from the proposed project, and then only for electricity actually delivered. (Exeter 1, p. B-3; Exeter 5, p. 25)

148. According to the DPUC, the proposed project would provide benefits to Connecticut by providing payments of less than anticipated costs over the duration of the contract, promote resource recovery, reduce landfill problems, diversify the State's fuel mix, reduce Connecticut's dependence on fossil fuels and develop innovative technologies. (Exeter 1, Exhibit B-2.10, p. 15)

149. A five-year extension option of the contract between Exeter and CL&P at 50% of avoided costs would bring the total rate payer savings over a 30-year period to approximately $450,000,000.00. (Exeter 1, p. E-4)

150. The DPUC issued a decision on March 31, 1987, approving the requested power sales contract for the sale of the proposed facility's electrical output. (Exeter 1, Exhibit B-1, pp. 16-18; Exeter 5, Rettger testimony, pp. 6-7)

151. According to the Division of Consumer Counsel (DCC), the proposed project has a pricing stream equal to or better than any other project previously approved the DPUC, serves a social purpose by removing tires from the waste stream, and provides capacity in 1991 at a time closer to CL&P's need for additional capacity. (Exeter 1, Exhibit B-1, p. 7)

152. The risks of construction and start-up would be borne by the developers of the proposed project, and not the rate payers. If there were failures in the technology of the proposed facility during pre-operation, or in the early years of the proposed project, ratepayer risk would be minimized. (Exeter 1, Exhibit B-1, p. 7)

153. The proposed project would use environmental controls which have not been previously implemented in Connecticut. Demonstration of these technologies would pave the way for their use in future projects, thereby providing additional benefits to Connecticut residents. (Exeter 1, Exhibit B-1, p. 10)

154. Approximately 240,000,000 automobile and truck tires are discarded annually in the United States. Most of these tires are discarded in ravines or stock piled in landfills. (Concerned Citizens of Sterling, Exhibit 2, p. 1; Exeter 1, p. B-5)

155. Tires are costly to landfill and tires piled in landfills are potential fire hazards and mosquito breeding grounds. (Concerned Citizens of Sterling, Exhibit 2, p. 1; Exeter 1, p. B-5)

Project Cost and Schedule

156. Proposed project costs are estimated as follows, in millions of dollars:

Construction	
Turnkey Contractor	$49.500
Interconnection	3.000
Engineering	0.675
Tire stock pile maintenance	0.650
Development costs	0.600
Construction management	2.460
Insurance, license fee	0.595
Closing costs	2.430
Debt service reserve	4.000
Construction interest (net)	6.500
Contingency	4.090
TOTAL PROJECT COST	$74.500

(Exeter 1, p. E-1)

157. Construction of the proposed facility is expected to take two years. Commercial operation is expected to begin before 1991.(Exeter 1, p. B-8; Exeter 5, p. 27)