DOCKET NO. 96 - AN APPLICATION OF KILLINGLY ENERGY LIMITED PARTNERSHIP FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION OF A 32.2 MW (NET) WOOD BURNING ELECTRIC GENERATING FACILITY IN THE TOWN OF KILLINGLY, CONNECTICUT.	:	Connecticut Siting Council May 8, 1989

F I N D I N G S O F F A C T

1. Killingly Energy Limited Partnership (KELP) applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need (Certificate) to construct a 32.2 (net) megawatt (MW) electric generating facility in Killingly, Connecticut, on May 6, 1988. (Record)

2. The application fee was submitted as prescribed by section 16-50v-1 of the Regulations of Connecticut State Agencies (RSA). (Record)

3. The application was accompanied by proof of service as prescribed by Connecticut General Statutes (CGS) section 16-501(b). (Record)

4. The Department of Environmental Protection (DEP) and The Office of Policy and Management (OPM) filed written comments with the Council pursuant to section 16-50j of the CGS. (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 public field inspection of the proposed site on September 8, 1988. (Record)

7. Pursuant to CGS section 16-50m, the Council, after giving due notice thereof, held public hearings on this application on September 8, 1988, beginning at 2:30 P.M. and continuing at 7:00 P.M.; on September 9, 1988, beginning at 10:00 A.M.; on October 6, 1988, beginning at 10:00 A.M.; on October 20, 1988, beginning at 10:00 A.M.; on October 21, 1988, beginning at 10:00 A.M.; on November 17, 1988, beginning at 10:00 A.M.; on November 18, 1988, beginning at 10:00 A.M.; and on December 8, 1988, beginning at 10:00 A.M.. All hearings were held in the auditorium of the Killingly High School, Danielson, Connecticut. (Record)

8. The General Partners of KELP are the ARS Killingly Corporation owned by William Hull and Peter Bos, and HYDRA-CO Enterprises, Inc., a subsidiary of Niagara Mohawk Power Corporation of Syracuse, New York. KELP is a limited partnership organized under the laws of the State of Delaware. (KELP 5, p.1; Tr. 9/9/88, p.187)

Project Description

9. The proposed facility would be a 36.5 MW (gross), 32.2 MW (net) electrical generating plant consisting of one boiler which would use wood chips as fuel. Steam from the boiler would be fed into a single turbine generator to produce electricity. (KELP 1, pp.1, 10; KELP 32, p.46)

10. The electricity generated by the proposed facility would be purchased by the Connecticut Light and Power Company (CL&P) under a 25-year contract with rates and terms approved by the Department of Public Utility Control (DPUC) on September 10, 1987, February 17, 1988, and April 19, 1988. (KELP 1, pp.10, 36, Exhibit B)

11. With proper maintenance, the useful life of the proposed facility would be on the order of 50 years. The minimum life of the project would be 25 years based upon the Electricity Purchase Agreement signed by the applicant and CL&P. (KELP 20, Q.64)

12. Based on a 1987 analysis by the DPUC, over a front-end loaded 25-year term of the electric purchase agreement, ratepayers of CL&P would be purchasing power from the proposed project for 86 percent of the utility's projected avoided costs, with a resulting saving of over $383,000,000 (nominal) or $42,000,000 (present worth). (KELP 1, p.36, Exhibit B, Exhibit C; KELP 4, Q.1, Q.2)

Need

13. The proposed project is a Block One project as designated by the DPUC. Electricity from Block One projects is necessary to prevent an electricity shortfall in the years 1994 to 1995. (KELP 1, p.36, Testimony p.2; KELP 4, Q.1, Q.2, Q.4; Tr. 11/18/88, p.225)

14. 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. (KELP 1, pp.36-37, Exhibit B)

15. The generation of electricity from wood furthers the State's energy policy of developing and utilizing renewable energy resources. The use of renewable resources is also consistent with the State's environmental policies. As a user of renewable, indigenous fuel, the proposed project would advance the legislative objective of encouraging new and improved methods of generating electricity by diversifying Connecticut's fuel mix and reducing dependence on fossil fuel and imports. (OPM 1; Office of Policy and Management Comments of 12/23/88; KELP 1, p.36; KELP 4, Q.1, Q.2)

16. Ratepayers would receive indirect benefits including the development of small, dispersed energy sources that would reduce the need for utilities to maintain costly reserve capacity and would provide for the ability to dispatch smaller, more efficient increments of power into CL&P's system. (KELP 1, p.36)

17. Because New England is a capacity-short region, the proposed project would ease the region's energy shortage and enhance CL&P's ability to make capacity sales. (KELP 1, p.36; KELP 4, Q.1, Q.2; Tr. 11/18/88, p.225)

18. The proposed facility would create jobs and stimulate the local economy. Facility operation would require up to 35 full-time plant employees. Approximately 100 additional jobs would be created in Connecticut and neighboring states through the harvesting, segregation, chipping, transportation, and handling of the wood supply. In addition, the proposed project would employ approximately 70 to 90 persons during the two-year construction period. (KELP 1, p.39; KELP 4, Q.1, Q.2, Q.14; KELP 5, Exhibit PB-4; Tr. 9/8/88, p.25; Tr. 11/18/88, pp.11, 12)

19. The facility could increase the taxable base of Killingly for a period of at least 25 years. The estimated yearly tax payable to the Town of Killingly upon completion of plant construction would be $403,000 per year over 25 years. The increase to the tax base of the Town of Killingly would be approximately 10 percent. The applicant has not investigated whether the proposed project would be eligible for any manufacturer tax deferments or tax privileges. (KELP 1, p.39; KELP 4, Q.14; KELP 5, Exhibit PB-4; KELP 20, Q.79; Tr. 9/8/88, p.25; Tr. 9/9/88, pp.188, 189-190; Tr. 11/18/88, p.11)

20. The proposed facility would enhance the management of Connecticut's forestland by providing a market for small size material from forest thinning and improvements as well as residue from harvesting higher quality products. Many landowners who do not want mess list this residue as reason not to manage forestland. (DEP Bureau of Forestry comments of 10/7/88)

Facility Description

21. The proposed main facility structures would be the 110-foot by 85-foot by 110-foot high boiler bay building, the 80-foot by 100-foot by 70-foot high turbine building, the 70-foot by 34-foot by 70-foot high electrostatic precipitator, and the 175-foot to 270-foot exhaust stack with a nine-foot diameter. (KELP 1, pp.10, 13; KELP 7, pp.7, 12)

22. Major ancillary systems in the proposed facility would include the cooling water system, wood handling equipment, the supplemental fuel system, and the ash handling system. (KELP 1, p.15)

23. The power generating equipment would consist of a wood-fired spreader-stoker boiler with a maximum steam capacity of 325,000 pounds per hour when burning wood chips, and a steam turbine-generator system. The overall efficiency of the facility would be 23.2 percent. The facility net heat rate would be 14,125 BTU/kw hour. (KELP 1, pp.10, 14; KELP 4, Q.73; Tr. 11/17/88, p.203)

24. With a boiler temperature of over 1800 degrees Fahrenheit (F) and at least one second fuel residence time, the proposed boiler/combustion unit would meet the same regulatory design requirements as municipal incinerators in Connecticut. (KELP 7, p.4; KELP 13, p.2; Tr. 9/8/88, p.56; Tr. 9/9/88, p.196; Tr. 10/21/88, pp.43, 44; Tr. 11/17/88, p.45)

25. The combustion temperatures would normally be above 2,000 degrees F, and probably at 2,400 degrees F for two seconds residence time. (Tr. 9/9/88, p.201; Tr. 10/21/88, p.46)

26. The boiler would burn approximately 47.5 tons per hour of wood chips as its primary fuel. Number 2 fuel oil with a sulfur content of less than 0.3 percent, or natural gas, would serve as an auxiliary fuel during five to ten start-ups and for 50 to 100 hours of flame stabilization, when overly wet wood was burned, each year. An annual level of supplemental fuel use of five percent total annual heat input was used for air modeling purposes. Annual supplemental fuel consumption is expected by the applicant to be well below the five percent level. (KELP 1, pp.10, 18; KELP 4, Q.5)

27. The plant startup process would take about 10 to 12 hours. (Tr. 11/18/88, pp.173-174, 175)

28. A 44-foot tall mechanical evaporative cooling tower with a cold weather bypass line, and a rated capacity of 30,000 gallons per minute (gpm) would cool the boiler water. Water pumps would use circulating water to supply cooling requirements for the cooling condenser, and the various plant equipment coolers. Approximately 62 gpm of water would be blown down from the tower and discharged to the Quinebaug River after treatment. (KELP 1, p.15; KELP 7, p.7; KELP 26)

29. Should number 2 fuel oil be the supplemental fuel, the system components would be a 20,000 gallon vertical aboveground oil tank constructed of carbon steel, located within a concrete dike, adjacent to the boiler house, which would be capable of containing 110 percent of the tank capacity; an unloading pump; and a transfer pump. The tank would be filled from oil trucks using the unloading pump, and the oil burners would be fed by the transfer pump. The expected usage would average 150,000 gallons per year. (KELP 1, pp.15-16; KELP 9, p.7; KELP 20, Q.61)

30. Besides fuel oil and fuel wood, lubricating oil, cleaners, pH adjusters, and corrosion inhibitors would be stored on site. All chemicals would be stored in a diked area. (KELP 20, Q.62; Tr. 12/8/88, p.151)

31. The proposed facility would be shut down for approximately one month each year for both scheduled and non-scheduled maintenance. The annual maintenance shutdown would last approximately two weeks. Non-scheduled shutdowns would generally last one to three days, depending on the work being done. A specific schedule for maintenance shutdowns has not yet been developed, but would be prior to plant start-up. (KELP 4, Q.5)

32. Should natural gas be the supplemental fuel, a distribution line would be installed to the plant. (KELP 1, p.16)

33. The facility would employ approximately 30 technical/managerial persons and three secretary/bookkeeper persons. (KELP 32, pp.112-117)

Proposed Site

34. The proposed site is a 47-acre parcel of land currently owned by John and Edith Garvey in the northwest corner of Killingly, Connecticut. (KELP 1, pp.1-2, 25; KELP 7, p.9)

35. The site lies on the east bank of the Quinebaug River about 0.2 miles west of Interstate 395. Putnam Center is approximately 2.8 miles north-northeast, and Dayville Center is about two miles south-southeast. The north shore of a recreational area, Alexander Lake, one of the cleanest lakes in Connecticut, is one mile to the south. The site is accessed from a cul-de-sac at the end of Louisa Viens Drive within the Killingly Industrial Park. (KELP 1, p.25; Tr. 9/8/88, p.19)

36. The proposed plant structures would be located north of a CL&P right-of-way which runs east to west through the proposed site, on which 115-kV transmission lines are located. (KELP 1, p.25)

37. The site is currently devoid of structures except for the 350-foot wide right-of-way on which two CL&P 115-kV transmission lines and support towers extend across the site. Another 150-foot wide CL&P right-of-way (abandoned) intersects these lines. The land owners have excavated a gravel pit in the southern half of the property. (KELP 1, p.29; KELP 2, p.8; KELP 4, Q.62)

38. The major portion of the parcel is located in an Industrial District Zone. A small section of the site adjacent to the Quinebaug River is located in a Flood Hazard District. The plant proper would be built in the Industrial Zone on a grade about 40 feet above the level of the River. No structures would be built in the Flood Hazard District. A settling basin would be constructed in the clearing at the northeast end of the property. (KELP 1, p.25; KELP 4, Q.89)

39. The entire site is located in a primary recharge area of the Town of Killingly Aquifer Protection Zone as defined in Section 580 of the Killingly Zoning Regulations. The applicant would comply with all requirements of that zone as defined in Section 580.2. (KELP 1, pp.25, 29; KELP 4, Q.15, Attachment 6, p.1201, Q.89; Tr. 10/20/88, p.173)

40. The southern half of the site, including the area under the transmission lines, has been cleared of trees and now consists of exposed dirt and gravel with a ground cover of brush. The northern half, where the main facility buildings would be located, is wooded. A small clearing about 20 feet above the level of the river occupies the northern tip of the site. A stand of trees lies between the proposed facility and Interstate 395. (KELP 1, p.29; KELP 2, pp.6-10)

41. Predominant tree species on the site include various oak, especially on the sandier uplands where white oak dominate; shagbark hickory; red maple; and white pine; with lesser amounts of elm, pin cherry, and beech. Forest canopy height is about 70 feet in the floodplain and on the lower hillsides, and about 45 feet at the higher elevations closer to the interior of the site. (DEP Comments of 8/31/88)

42. Most of the site is hilly, with several pits and gullies. Most of the site would require clearing, with leveling and grading activities taking place in the plant proper area and the access road area. The terrain rises gradually from Louisa Viens Drive, and the Quinebaug River to a level of 260 to 270 feet above sea level, about 50 feet above the River's surface. (KELP 1, p.29; KELP 2, pp.6-10; DEP Comments of 8/31/88)

43. The 500-year flood elevation on the existing site is at 223 feet. (KELP 36, p.1; Tr. 10/21/88, p.74)

44. There is one small wetland depression located in the south central portion of the property. This depression is wet by virtue of past excavation, and fed by groundwater seepage from the east. No construction would take place in this area. (KELP 27, Letter from Enviro-Tech Consultants of 10/14/88, p.2)

45. The plant proper would occupy about 10.5 acres on the elevated wooded area. (KELP 1, p.29; DEP Comments of 8/31/88, p.4)

46. KELP has a 30-foot access right-of-way across a four-foot strip of land owned by the Town to Louisa Viens Drive. The 30-foot access over the four-foot strip would satisfy the operational needs of vehicular traffic and utilities that would utilize the access right-of-way. (KELP 4, Q.90)

47. The property is in a rural area, in which most of the abutting land is zoned as industrial. Stands of trees separate the parcel from residential and industrial buildings in the region. (KELP 1, pp.25, 30)

48. To the south of the property is the Killingly Industrial Park, which consists of about six light manufacturing and office buildings along Louisa Viens Drive and Lake Road. A Pepsi-Cola warehouse is located adjacent to the southern border of the site, and across Louisa Viens Drive a new building is under construction. Acme/Chaston, a medical supply manufacturer, is located less than 0.5 miles from the proposed site. A large food manufacturing plant operated by Frito-Lay is about 0.8 miles to the south. (KELP 1, pp.25, 30; Tr. 9/8/88, pp.37-38, 39)

49. The Town of Killingly has both an Industrial District Zone and a Light Industrial District Zone. The proposed site and the Killingly Industrial Park are in an Industrial District Zone. (KELP 1, p.27; KELP 4, Q.15, Attachment 6)

50. The Putnam Landfill lies 500 feet west of and adjacent to the site, on the west and opposite bank of the Quinebaug River. North of the landfill is forest which is zoned agricultural by the Town of Putnam. To the north and northeast of the site, east of the Quinebaug River, the land is zoned Industrial. About 0.5 miles northeast of the site is a large manufacturing plant operated by the International Paper Company. (KELP 1, pp.25, 30; KELP 4, Q.15; Tr. 9/8/88, p.162)

51. Five homes lie east of the Industrial Park on Lake Road and three homes lie along a dirt road about 0.5 miles southeast of the site. There is a residential area about 0.75 miles south of the property along the shore of Alexander Lake. (KELP 1, p.30)

52. The proposed site is approximately 6.5 miles from the edge of the Scituate Reservoir System Watershed. The site is 7.6 miles from Ponaganset Reservoir, 10.8 miles from Barden Reservoir, and 12.9 miles from the main Scituate Reservoir, all reservoirs of the Scituate Reservoir System Watershed. (PWSB 5, p.4)

53. Due east and approximately two-miles from the proposed site is a ridge approximately 700 feet high. This ridge is part of a high terrain that runs north-south along the Rhode Island border in Connecticut through the Town of Killingly. (Tr. 9/8/88, p.159; Record)

Archaeological Survey

54. A Phase I Archaeological Reconnaissance Survey was performed in the field north of the proposed facility location within the site. One prehistoric archaeological site (Site 69-2) was found. Historic period scatter was also found in the survey area, but was insignificant. (KELP 4, Q.66, Attachment 8)

55. If any of the Archaeological Area were to be disturbed for any reason, the applicant would first authorize a Phase II Intensive Survey of the area. (KELP 7. p.10; Tr. 10/21/88, p.122)

Geology

56. There has been no recorded seismic activity originating in the area of the proposed facility nor is there any active faulting in the area. (KELP 2, p.5)

Site Selection Process and Alternative Sites

57. Between 1985 and 1986 seven sites were screened for the proposed project. Technical, economic, and environmental factors for each site were evaluated. Six of these sites were eliminated upon completion of the initial evaluation. (KELP 1, pp.34-35; KELP 37; Tr. 10/20/88, pp.86-95)

Construction

58. The site access road would be configured to handle two trucks side by side; have turn-outs, parking areas, and other designs to facilitate ingress and egress, pending final design; and minimize site disturbance and construction on slopes. (KELP 34, p.2; KELP 4, Q.100)

59. During the construction phase, the 10.5-acre plant area would be leveled to an elevation of 250 feet. Soil from the high areas would be used to fill the low areas. No fill would be placed on the wetland areas. (KELP 4, Q.96)

60. Trees cleared from the site during construction would be donated to local residents or disposed of through the Still River Wood Company of which Mr. Hull is Vice President. (KELP 34, p.2; Tr. 10/21/88, p.121; Record)

Wetlands

61. No wetlands on site would be disturbed except during the construction of the discharge line from the retention pond to the Quinebaug River. There would be a 75-foot buffer kept from all other regulated wetlands. A 100-foot minimum buffer along the Quinebaug River would be left undisturbed for the entire frontage of the site. (KELP 4, Q.48, Attachment 3, p.7, Q.113; KELP 5, p.12; KELP 20, Q.4; KELP 32, p.6; Tr. 10/20/88, pp.173-174; Tr. 10/21/88, p.137; Tr. 12/8/88, p.91)

Plant Substation/Switchyard and Electrical Interconnection

62. Electrical power would be generated at 13.8-kV and transformed to 115-kV for supply to the CL&P transmission system. A CL&P right-of-way crosses the proposed site east to west, and the entire electrical connection system would be located on the proposed site. The system would consist of an electric generator, a transformer, a circuit breaker, and a 300-foot, 115-kV overhead line which would tie into the existing CL&P 115-kV Tunnel-Tracey transmission line. (KELP 1, p.21; KELP 19, pp.3-4)

63. The interconnection line would be 28 feet high at its lowest point and would be strung on two 50-foot H-frame, wooden structures. (KELP 19, p.3)

64. The substation/switchyard would measure 135 feet by 50 feet and would be located approximately 100 feet south of the electric generating portion of the plant. It would be enclosed by a 10-foot high chain link fence. (KELP 19, p.4)

65. The switchyard would include the following major equipment: A dead end structure; line grounding switch; gang-operated disconnect switch; outdoor power circuit breaker with bushing current transformers; high voltage potential transformers; three lightning arrestors; three-phase main power transformer; transformer neutral grounding resistor; auxiliary transformer No. 1, 13.8-kV to 4.16-kV, 3-phase with neutral grounding resistor; auxiliary transformer No.2 and No.3, 13.8-kV to 480-V, 3-phase; supports, insulators, conductors, etc.; and a grounding mat. (KELP 1, p.23)

66. The transformers would be oil-filled, located on concrete pads, and enclosed in a 110 percent capacity diked area based on the volume of oil in the transformer. The transformers would not contain Polychlorinated Biphenyls. (KELP 4, Q.45; KELP 9, pp.7-8)

67. On August 3, 1988, KELP submitted a petition for declaratory rulings concerning the proposed KELP project substation, switchyard, and interconnection. The petition was numbered 216 by the Council. (KELP 19)

68. In Petition 216, the applicant requested declaratory rulings by the Council that:
    a) No Certificate would be required for the substation or switchyard associated with the proposed KELP project since the substation or switchyard would not have a substantial adverse environmental effect, and is therefore not a facility as defined in Section 16-50i(a)(4) of the CGS; and
    b) No Certificate would be required for the electric interconnection line associated with the proposed project since such interconnection would not constitute a "modification" of an existing transmission line facility as defined in Section 16-50i(d) of the CGS. (KELP 19, pp.1-2)

69. The Council, at a meeting on August 19, 1988, ruled that Petition 216 would be processed concurrently with Docket 96. (KELP 19; Letter to Lawrence J. Golden from Gloria Dibble Pond of August 22, 1988)

Water Supply

70. The plant would require an annual average of 629,000 gallons of makeup water daily (gpd) of which 594,000 gpd would be for cooling tower use, and 35,000 gpd would be for process water. Drinking and sanitary water, representing two gpm and less than 3,000 gpd, would be provided by the Town water supply system from the adjoining Killingly industrial water supply lines. (KELP 3, p.1; KELP 4, Q.113; KELP 9, p.6)

71. All cooling and process water would be drawn from one on-site well. An adjacent backup well also would be installed to be used only when the primary well is out-of-service. Water would be drawn from the sedimentary unconsolidated stratified drift aquifer adjacent to the Quinebaug River. The withdrawal represents approximately 2.2 percent of the seven-day, ten-year low flow at the site, which is 28,400,000 gpd. (KELP 3, p.1; KELP 4, Q.48, Attachment 3, p.10, Q.113; KELP 9, p.6; KELP 20, Q.59; Tr. 11/17/88, p.76; Tr. 11/18/88, pp.59, 61, 123)

72. The groundwater for the site is classified by the DEP as "GA". This classification represents that the groundwater at this site may be suitable, or is presently being used, for public or private drinking water purposes without treatment. Class "GA" areas may be suitable to receive discharges of sewage or other minor cooling or clean water discharges. In general, it is the State's long-term goal to maintain groundwater supplies in "GA" areas at their present quality levels and not allow degradation to occur. (KELP 2, p.3; KELP 4, Q.48, Attachment 3, Exhibit 5, p.5)

73. In the area of the proposed facility, water percolation rates are high through the soil to the groundwater. (KELP 2, p.3)

74. The calculated reliable safe yield from the on-site well would be 800 gpm, which is in excess of the 720.3 gpm peak flow requirement for the plant. (KELP 4, Q.48, Attachment 3, Exhibit 5, Executive Summary)

75. The Quinebaug River would act as a hydraulic barrier, limiting the zone of influence of the well to the eastern side of the river and thus excluding the recharge from the direction of the Putnam Landfill. (KELP 4, Q.48, Attachment 3, p.11, Exhibit 5, Executive Summary; Tr. 10/20/88, pp.204-205; Tr. 11/17/88, pp.80, 87-88, 91-92; Tr. 11/18/88, pp.46, 57)

76. There are no other water supply wells within the zone of influence of the primary well or its backup well, and therefore they would not diminish water supply from any local municipal or industrial well. The cone of depression would not overlap any of the other existing wells in the area. The cone of depression of this well might overlap with the cones of depression of other wells in the area, but they would have no impact on one another unless the actual well border was within the cone of depression of one of the other wells. (KELP 4, Q.48, Attachment 3, p.11, Q.51; KELP 20, Q.59; Tr. 11/17/88, pp.84, 114, 116, 117)

77. The Town of Putnam has a Town-owned water department of which two wells are located some 4,000 feet north of the proposed site. (Tr. 9/8/88, pp.160-161)

78. The cooling and process water from the well used by the proposed project would be derived through induced recharge from the Quinebaug River, and would not draw on groundwater from the Alexander Lake area. (KELP 20, Q.59; Tr. 11/17/88, pp.79, 119-120; Tr. 11/18/88, pp.122, 126, 131-132)

79. The applicant ruled out using once-through cooling water directly from the Quinebaug River because the facility has a thermal cooling load of 220 million BTU's/hour, requiring a diversion of 110,000 gpm from the River. The 7Q10 low-flow of the River is 19,700 gpm, making this option unfeasible. (KELP 4, Q.48, Attachment 3, p.7)

Water Use

80. Boiler makeup water, which includes iron, manganese, copper, and other dissolved solids, would be demineralized with an ion exchange system prior to injection into the steam cycle. Internal boiler water would be continually treated for pH control and oxygen removal. (KELP 3, p.1; KELP 20, Q.34)

81. Cooling cycle water treatment would consist of periodic shock hypochlorite and/or chlorine treatment for control of biological growth, and sulfuric acid treatment to convert calcium bicarbonate, a compound that causes scaling, to calcium sulfate. Residual chlorine concentration in shock loads would not exceed 1 ppm in the cooling water. (KELP 3, p.1; KELP 4, Q.37)

82. Of the 629,000 gallons of water required daily, 509,000 gallons would either evaporate from the cooling tower or discharge to the town sewer. The quantity of water discharged to the Quinebaug River via the retention pond would average about 120,000 gpd. Wastewater generated by the Project would principally consist of (in annual averages):
    a) Cooling Tower Blowdown - 90,000 gpd to the river with a peak flow of 383,000 gpd,
    b) Steam Cycle Blowdown - 15,000 gpd to the river,
    c) Non-contact equipment Cooling - 15,000 gpd to the river,
    d) Water Treatment Regenerative Waste - 3,000 gpd to the sewer (2,500 gpd average, maximum design - 5,000 gpd),
    e) Sanitary Wastes - 3,000 gpd to the sewer,
    f) Incidental Floor Drainage - less than 100 gpd to the sewer,
    g) Stormwater Runoff - Storm events only to the river.

(KELP 3, pp.1, 4; KELP 4, Q.36, Attachment 2)

83. The maximum discharge rate of 8,000 gpd to the Killingly sewer system represents less than 0.2 percent of the Killingly Publicly Owned Treatment Works (POTW) capacity. The Killingly POTW is currently operating at 2,800,000 to 3,000,000 gpd. The design capacity of the Killingly POTW is 8,000,000 gpd.(KELP 3, p.4; KELP 4, Q.39; KELP 9, p.6)

Cooling Tower Impacts

84. A visible plume from the proposed wet cooling tower would rise more than 52 meters above ground approximately 133.33 days per year and would exceed 32 meters more than 250 days per year. No fogging or icing impacts would occur in the substation area or on Interstate 395. (KELP 26, p.23)

Cooling Tower Alternatives

85. Two cooling tower alternatives would be a 50 percent wet/50 percent dry cooling system consisting of a 50 percent cooling tower and a 50 percent air cooled condenser, and a 100 percent dry system consisting of an air cooled condenser. (KELP 31, Section III, pp.1-2)

86. The wet cooling system would use an average of 276,000 gpd more than the 50 percent wet/50 percent dry system and an average of 588,000 gpd more than the 100 percent dry system. (KELP 31, p.6)

87. Because of the thermodynamic advantages of eliminating waste heat by water rather than air, the proposed wet cooling system would be 9.3 percent more efficient than the combined 50 percent wet/50 percent dry system and the 100 percent dry system. This translates in burning approximately 35,000 tons of wood more per year, on average, to create the same amount of electricity. (KELP 31, p.4)

88. The construction cost, excluding interest, of a 50 percent wet/50 percent dry system would be $1.7 million more than the capital cost of the proposed system if the same amount of fuel were used, and $6.6 million more than the capital cost of the proposed system if power output were the same as proposed. The capital cost of the 100 percent dry system would be $2.3 more than the capital cost of the proposed system if the same amount of fuel were used, and $7.0 million more than the capital cost of the proposed system if power output were the same as proposed. (KELP 31, p.5, Table 1; Tr. 12/8/88, p.130)

Retention Pond

89. Cooling tower blowdown, boiler blowdown, equipment cooling water, and all stormwater runoff from the plant would be routed to a 150-foot by 150-foot by three-foot deep, 500,000 gallon capacity, polyethylene-lined retention pond with water tight extrusion welding and a minimum thickness of 20 mil. The maximum permeability would be 10^{-6} cm/second. An equivalent or better grade liner may be substituted in final design. The retention pond is where equalization and neutralization of any shock process water loads such as chlorination or acidification used in scale prevention would occur before reaching the retention pond. Sediment separation of storm flow solids prior to discharge to the Quinebaug River would also occur. (KELP 3, p.4; KELP 4, Q.26, Q.31, Q.94; KELP 6, p.20; KELP 20, Q.29; Tr. 10/20/88, p.139)

90. The retention pond would be located 6.5 feet above the 100-year flood elevation and 1.5 feet above the 500-year flood elevation. (KELP 4, Q.35)

91. The maximum daily flow of stormwater to the detention pond would be 324,000 gpd based on a projected two-year, 24-hour storm event. The design flow was calculated at 6,300 gpm. Detention time, based upon a design two-year 24-hour storm event, would be a minimum of ten hours and would extend to 2.5 days in dry weather periods. (KELP 3, p.4; KELP 4, Q.21, Q.36, Attachment 2, Q.48, Attachment 3, p.9)

92. The retention pond exists primarily as an equalization and mixing chamber. (KELP 4, Q.30)

93. Cleaning of the gross particle separator and retention pond would take place as needed after scheduled visual inspection of these facilities. The oil-water separator would be maintained in a similar manner. Water from the separator would be removed by a licensed hauler. (KELP 4, Q.36, Attachment 2, Attachment 5)

94. The applicant analyzed alternatives to the retention pond such as a storage tank or an inground vault. The alternatives were eliminated because:
    a) They were more expensive to build;
    b) They did not allow for atmospheric cooling of the discharge water; and
    c) In the case of the inground vault, it did not provide adequate protection to the aquifer.

    (KELP 4, Q.94)

95. Stream temperature fluctuation in the discharge mixing zone would be less than one degree F. The projected worst case stream temperature fluctuation in the zone of influence as a result of retention pond discharge to the Quinebaug River was calculated by KELP to be from 0.12 to 0.23 degrees F. (KELP 3, p.4; KELP 4, Q.21, Q.22, Supplemental Response to Interrogatory Nos. 22, 104, and 106, p.18; KELP 10, pp.4, 17; KELP 20, Q.41; Tr. 10/20/88, p.144)

96. Temperature deviation in the Quinebaug River within the mixing zone allowed by the Connecticut Water Quality Standards (25 percent of low stream flow) would be up to 4 degrees F. (KELP 10, p.4)

97. The maximum proposed peak discharge of 412,000 gpd to the Quinebaug River would cause negligible dissolved oxygen impacts in the River. (KELP 4, Q.21; KELP 10, p.3; Tr. 10/21/88, p.111; Tr. 11/18/88, p.43)

98. Because metals would concentrate in the cooling tower due to evaporation, discharge from the retention pond would elevate metals concentrations slightly in the Quinebaug River. (KELP 10, pp.5-6)

99. A discharge toxicity evaluation of the retention pond effluent would be undertaken to demonstrate that the discharge would not cause chronic toxicity in the Quinebaug River and that the discharge would achieve compliance with specific permit limits in effluent toxicity. The study would be submitted to the DEP for compliance approval. (KELP 10, pp.6-7; Tr. 10/20/88, p.139)

100. Cooling and process water discharges would be regulated by the DEP at the inlet to the retention pond. (KELP 4, Q.26, Q.31; Tr. 10/20/88, pp.140, 141)

Quinebaug River

101. The Quinebaug River is designated as Water Quality Class C/Bc in the vicinity of the proposed site, allowing cooling water and industrial treatment system water discharges. A "C/B"-designated surface body of water may be used for certain recreational activities, agriculture, industrial and other uses including navigation. However, swimming is usually precluded. The rating indicates that one or more class B criteria or designated uses may be impaired but it is the goal of the DEP to return this body of water to a B rating. The current C classification is due to upstream discharges of undertreated sewage and stormwater runoff resulting from combined sewer overflows. These result in unacceptable bacterial levels in the River. (KELP 2, p.3; KELP 3, p.5; KELP 4, Q.23)

102. The Quinebaug River currently has lead and copper concentrations above chronic criteria. (Tr. 11/18/88, p.85)

103. The Quinebaug River is lightly used for boating and fishing. To the north of the proposed project, a small hydroelectric plant is operating in Putnam. Another larger hydroelectric plant is being constructed in the Danielson area. (NU 4, Q.46)

104. The adjacent section of the River has been declared a protected habitat for salmon by the Connecticut Department of Fisheries. (KELP 2, p.3; KELP 3, p.5; KELP 4, Q.48, Attachment 3, p.10)

105. The area close to the proposed project serves as a migratory route for both adult salmon moving upstream to spawn and for smolts moving downstream to the sea. (KELP 4, Supplemental Response to Interrogatory Nos. 22, 104, and 106, p.18)

106. Temperature effects upon the salmon fishery within the river would be minimal due to dilution factors and seasonal fluctuations of the river water temperatures. (KELP 4, Supplemental Response to Interrogatory Nos. 22, 104 and 106, p.18)

Wood Chips as Fuel

107. The proposed facility would burn an average of 400,000, and up to 450,000 tons per year (TPY) of processed wood fuel produced from forest land management, land-clearing operations, sawmills, and recycling and demolition activities. Suppliers would deliver the wood to off-site segregation and processing facilities where it would be inspected, sorted, and chipped. (KELP 1, p.16; KELP 6, p.16; KELP 11, p.11)

108. Land clearing chips consist of wood that is harvested when forest land is converted to other uses, including agricultural activities, roads, housing lots, commercial operations, and other activities. (KELP 11, p.16)

109. The applicant would put in place a forest management chip procurement plan that would
    a) have foresters on its procurement staff to oversee all procurement activities;
    b) require that any loggers or chippers supplying chips from forest management activities be registered by boards to be established under the new DEP regulations governing the voluntary registration of foresters and loggers; and
    c) pay higher prices for chips being produced in accordance with sound forest management practices.

(KELP 6, pp.16-17; Tr. 10/6/88, pp.165, 166, 173-175, 176; Tr.10/21/88, p.94)

110. Although a market exists for all types of high value wood products and some low value wood products such as hardwood firewood, there is a lack of any significant markets for the lowest value wood products in Southern New England: biomass. (KELP 4, Q.54)

111. The development of a wood fuel market in southern New England would improve opportunities to supply high-quality wood products from the region. The improved ability to apply intermediate thinning treatments would lead to improved stand quality, increased growth, and enhanced species composition. (KELP 1, pp.37-38; KELP 11, p.37; Tr. 10/21/88, pp.141-142)

112. Wood chips from forest management would comprise 10-30 percent of the fuel stream, and combine with land clearing activities and sawmill operations, to comprise 30-80 percent of the fuel stream. Recycled wood chips from industries and construction companies would make up 20-70 percent of the fuel stream. Up to 25 percent of the recycled wood supply would be wooden demolition debris. (KELP 1, pp.18-19; KELP 6, p.16; Tr. 9/8/88, p.54; Tr. 10/20/88, pp.22, 23-24, 26, 183)

113. Under natural conditions, wood oxidizes as it decomposes releasing CO2 and organics. (Tr. 11/18/88, p.167)

114. The proposed facility would remove material from the waste stream to both conserve landfill capacity and to derive a useful product, energy, from material which would otherwise be discarded. (DEP Comments of 8/31/88; OPM 1; Tr. 11/17/88, pp.189-190)

115. When compared to other methods of power production, a woodburning electric plant offers environmental advantages including the low sulfur content of wood resulting in low SO2 emissions; the low chlorine content of wood resulting in low dioxin and hazardous emissions; the low metals or hazardous compound content of wood ash as compared to ash from solid waste; and the many nutrients of wood ash which stimulate plant growth. (KELP 1, pp.37, 48)

116. The applicant estimates that the amount of all nonwood material in demolition wood would be one-tenth of one percent. (Tr. 9/9/88, p.114; Tr. 10/21/88, pp.13, 45; Tr. 11/17/88, p.198)

117. The proposed facility would not receive demolition wood directly. It would receive wood chips from such debris after the debris had been sorted and the wood chipped at a site by a recycling operator. These wood chips would contain paint, varnish, glue, and other impurities that might be on the wood. (Tr. 9/8/88, p.54)

118. No creosote or pressure-treated wood would be accepted as wood fuel at the proposed facility. (KELP 21, Set 4, Q.13; Tr. 9/8/88, p.224; Tr. 11/17/88, pp.157, 159, 162, 164-165)

119. The KELP facility would not accept municipal solid waste (MSW), as defined in the DEP Solid Waste Management Plan: "composed of residential, commercial, industrial and institutional waste which is normally collected by conventional collection vehicles." The proposed facility would not be permitted as an MSW plant. (KELP 21, Set 1B, Q.34; Tr. 9/8/88, pp.53-54; Tr. 10/20/88, p.111)

120. The applicant would not be legally allowed to accept hazardous waste as fuel. (KELP 28, p.26; Tr. 10/6/88, p.142; Tr. 10/20/88, p.191)

121. The applicant would insist in its contracts with wood processors that wood suppliers make a hazardous waste determination on their wood. (KELP 28, p.22)

122. The applicant would require a certification by wood fuel suppliers that the incoming fuel wood did not contain separable materials, such as asbestos. (Tr. 10/6/88, p.93; Tr. 10/21/88, p.14)

123. According to the applicant, all of the wood used at the proposed facility would come from Connecticut, Massachusetts, and Rhode Island. (KELP 11, p.12)

124. A typical trailer truck delivering wood fuel chips would be a 40-foot box trailer, enclosed on the bottom, sides, and top. Contracts with wood suppliers would specify that deliveries be covered. (Tr. 10/6/88, pp.34-35)

125. Depending on the size of the truck/trailer combination, KELP expects to receive deliveries of 20-24 tons of wood chips per trailer load. (KELP 20, Q.30; Tr. 10/20/88, p.184)

126. The projected average fuel cost would be $17.32/ton in 1992 dollars. Final prices would be subject to changes resulting from actual wood supplier contract negotiations. (KELP 20, Q.14, Q.24)

127. The applicant would retain through contracts the right to reject construction and demolition waste wood in chips larger than two-inches square; chips having a moisture content greater than 30 percent; or chips being contaminated with metals, base neutrals, or halogenated volatiles. (KELP 4, Q.108)

128. All off-site wood supply processors would have to certify that they have legal disposal alternatives for non-wood products. (KELP 21, Set 4, Q.12)

129. The actual locations and nature of operations for the waste wood processing centers in Connecticut have not been established and would not be by the applicant. (KELP 4, Q.82)

130. Virgin, recycled, and demolition wood wastes, including construction and land-clearing debris, are currently being accepted for disposal at landfills and resource recovery facilities. (KELP 28, p.7)

131. Recycled wood is dryer, has a higher BTU value, and allows a greater boiler efficiency than virgin wood. (Tr. 9/9/88, pp.115, 173; Office of Policy Management Comments of 12/23/88)

132. Reducing the moisture content of the wood fuel by one percent would increase the proposed plant efficiency by 0.4 percent. (KELP 4, Q.81, Q.111)

133. In the tri-state region, there is nearly 10 times the amount of wood supply as would be annually required by the KELP facility. (KELP 6, p.15; KELP 11, pp.35-36; Tr. 9/8/88, p.142)

134. It is anticipated by the applicant that the Still River Wood Company would act as a broker to supply a significant portion of the proposed facility's wood chip fuel needs. (KELP 6, WH-1; KELP 20, Q.12)

On-Site Wood Handling

135. Normally, the wood chips would be stored a maximum of 30 days at the proposed facility during operating conditions, and in no case greater than 90 days. (KELP 32, p.36; Tr. 10/21/88, pp.114, 115; Tr. 11/18/88, p.101)

136. The applicant would normally have an on-site two to three week supply of wood chips since their energy purchase contract requires CL&P to purchase electricity when it is generated. (KELP 5, p.13)

137. Truck dumping of wood chips would take place between 5:30 A.M. and 9:30 P.M.. Wood would be stacked out by front-end loaders into two storage piles prior to reclaiming. A covered pile would be maintained for dry fuel received, the other pile would be uncovered and used for virgin wood chips received from forests. Each pile would measure about 550 feet long by 100 feet wide by 30 feet high, and each would have about 15,000 tons of wood chips. All chips would be stored on a man-made surface. (KELP 1, p. 15; KELP 6, p.19; KELP 20, Q.29; Tr. 10/6/88, p.104; Tr. 11/18/88, p.100)

138. No unchipped wood or unprocessed bulky waste would be accepted by the proposed facility. (KELP 4, Q.82; Tr. 12/8/88, p.22)

139. If a dry load of wood were delivered and created a dust problem, it would be watered down. (Tr. 9/9/88, p.218; Tr. 11/18/88, p.97; Tr. 12/8/88, pp.29, 39, 41)

140. Front-end payloaders would move wood from the storage piles to a small hopper which would convey the wood to a reclamation building. (Tr. 10/6/88, p.118)

141. In the wood reclamation building, the wood would be dropped on a belt conveyor at the rate of about 150 tons per hour and travel to the screen and hog building. (Tr. 10/6/88, p.118)

142. When chips enter the screen and hog building, the wood would pass under an electromagnetic separator to remove ferrous metals. The wood would then drop through a rotary screen to sort out chips larger than the nominal 2-inch by 2-inch wood size specification. Oversized wood, approximately five to 10 percent of the fuel, would be conveyed to the hog wood chipper, which would break down the size of the wood to the specifications. (KELP 1, p.15; Tr. 10/6/88, pp.118-120; Tr. 12/8/88, pp.22, 34)

143. Both the wood that passed through the rotary screen and the wood that passed through the hog would be recombined and transferred to the boiler building for burning at a rate of 50 tons per hour. (Tr. 10/6/88, pp.120-121; Tr. 11/17/88, p.194)

144. The wood fuel would be mixed to achieve uniform moisture in wood fuel entering the boiler. The actual mixing method has yet to be developed by the applicant. (Tr. 9/9/88, pp.219, 223; Tr. 10/6/88, pp.108, 110; Tr. 11/18/88, p.158)

145. The transfer points on the wood conveying system would all be enclosed. (Tr. 11/18/88, p.97)

Odor

146. Odor from the decay of the wood would not be expected due to a two to three week rotation of the wood storage piles and the fact that no wood would be on-site for more than 90 days. No odors are expected as a result from the burning of wood at the proposed KELP facility. (KELP 1, p.53; KELP 21, Set 1B, Q.29; Tr. 11/18/88, p.101; Tr. 12/8/88, pp.44, 46)

147. There would be no odor emanating from the retention pond. (Tr. 11/18/88, p.65)

Sampling

148. The applicant would be testing its fuel supply, with a particular focus on demolition wood, to assure that fuel specifications and quality were met and to assure compliance with air emissions and ash content limits. (KELP 28, p.14; KELP 32, p.36; Tr. 10/20/88, p.64; Tr. 10/21/88, p.175)

149. The sampling program would be initiated to prevent the regular introduction of large amounts of non-wood material, to protect the long-term fuel supply, and to eliminate fuel suppliers who do not adhere to fuel specifications. (KELP 20, Q.17, Q.18; KELP 21, Set 1A, Q.6; KELP 32, p.37; Tr. 10/20/88, pp.61, 66, 67-68, 79)

150. The sampling program would include a grab sample taken from each truck delivering wood chips to the proposed facility. The samples would be visually inspected and sniffed for detection of contaminants. The olfactory and visual inspection would be aimed at detecting the presence of obvious non-wood materials so that the load could be immediately rejected. Only after this preliminary inspection would the truck be allowed to deposit its load. The samples would be labeled to indicate supplier, truck number, time, date of delivery, and truck load weight. They would be retained for a maximum of six months and represent a history of the fuel that had been delivered to the proposed facility. (KELP 1, p.16; KELP 4, Q.40; KELP 20. Q.17; KELP 21, Set 1A, Q.2, Q.3; KELP 32, pp.36, 37; Tr. 9/8/88, p.200; Tr. 10/6/88, pp.111, 160; Tr. 10/20/88, pp.54-55, 58)

151. Wood would be visually and olfactorally inspected at the scales, when it was dumped, and when it was stacked out onto a fuel pile. If contamination were detected, the load could be isolated from the fuel supply piles. (Tr. 10/6/88, p.105)

152. For each supplier, selected samples would be taken on a random basis; sent to an independent, certified laboratory; and analyzed for EP Toxic metals, base neutrals, and halogenated volatiles. (KELP 1, p.16, 18; KELP 4, Q.40; KELP 20, Q.17; KELP 21, Set 1A, Q.3; Tr. 10/20/88, p.198; Tr. 11/17/88, p.143)

153. The failure of any sample test during the lab analysis would result in the lab testing of all remaining samples from the supplier in question. The failure of a second sample would result in the revocation of the supplier's certification. This loss of certification would be the first step in termination procedures the applicant has developed. (KELP 32, p.37; Tr. 10/6/88, p.122)

154. As part of an initial qualifying process, all suppliers of recycled wood would have to demonstrate that they had record keeping and handling procedures as well as adequate financial strength. (KELP 32, pp.36-37; Tr. 12/8/88, p.150)

155. The applicant would communicate with the Town of Killingly to provide progress reports and to schedule annual site inspections of the proposed facility by local government representatives. (KELP 20, Q.5; Tr. 9/8/88, p.57)

Air Emissions

156. The proposed site is within the Eastern Connecticut Air Quality Control Region (AQCR 41). This region is in attainment for sulfur dioxide (SO2), nitrogen dioxide (NO2), and particulate matter (PM), and is not in attainment for ozone. The State of Connecticut in not in attainment for carbon monoxide (CO). Connecticut has a high ambient background level for carbon dioxide (CO2): nearly 350 ppm. (KELP 1, p.40; KELP 21, Set 1B, Q.22; Tr. 9/9/88, p.75; Tr. 12/8/88, p.53)

157. Based on 8,000 hours per year of operation at 109 percent of rated boiler nameplate capacity, the estimated annual worst case air emission rates after control would not exceed the following values in tons per year (tpy): PM, 78.0 tpy; SO2, 45.9 tpy; CO, 1170.3 tpy; nitrogen oxides (NOx), 780.2 tpy; and hydrocarbons (HC), 99.87 tpy. (KELP 1, p.42; KELP 4, Q.9)

158. The amount of CO2 emitted from the proposed facility would be approximately 112,600 lbs/hour which is approximately 400,000 to 450,000 tpy. (Tr. 11/18/88, p.162)

159. The proposed facility could not exceed 100 tons a year of HC emissions because Connecticut is in non-attainment for ozone. (Tr. 9/9/88, pp.103, 104, 106, 107, 108)

160. Of the 45.9 tpy of Sulfur Dioxide emissions, more than half is based on a conservative modeling assumption that five percent of the total annual heat input is supplied by No.2 fuel oil with a sulfur content of 0.3 percent by weight. (KELP 1, p.42; KELP 4, Q.5)

161. The facility must meet the Connecticut dioxin ambient standards of 1.0 picograms/NM^3 and a maximum stack concentration of 1950 picograms/NM^3. (KELP 7, p.13)

162. The applicant's MASC (Maximum Allowable Stack Concentration) calculations for hazardous and toxic pollutants demonstrate that the facility would meet acceptable State and federal standards. (KELP 21, Set 1A, Q.12)

163. The MASC calculations performed in the Air Permit Application considered 50 percent creosote-treated railroad ties and 50 percent virgin wood as a worst case level of contamination for organics and hydrocarbon emissions from the KELP facility. (KELP 21, Set 1B, Q.37; Tr. 10/20/88, pp.34, 38)

164. Annual stack emissions testing would be conducted for PM, SO2, lead, and perhaps HC. The results would be reported to the DEP. (KELP 21, Set 4, Q.14)

165. CO, NOx, oxygen, opacity, and maybe SO2 emissions, depending on DEP determination of backup fuel oil use, would be continuously monitored and recorded. The continuous monitors, excluding oxygen, would be connected directly to the DEP, where they could take readouts of these emissions at any time. (KELP 20, Q.83; KELP 21, Set 4, Q.14; Tr. 10/20/88, pp.107-108; Tr. 11/18/88, p.179)

Air Emissions Controls

166. For PM, SO2, CO, NOx, and HC, the Best Available Control Technology (BACT) would be applied to reduce emissions. (KELP 1, p.42; KELP 4, Q.9)

167. The boiler and pollution control equipment would be designed to destroy and remove unacceptable emissions as a result of non-wood materials in the combustion process. (KELP 20, Q.19; KELP 21, Set 1A, Q.1)

168. Hydrocarbons would be reduced by a custom boiler designed to improve the combustion of unburned Volatile Organic Compounds (VOC's) in the area above the wood grate. (KELP 1, p.42)

169. High boiler temperatures, like that proposed for this facility, reduce CO and HC emissions, but increase NOx emissions. (Tr. 11/17/88, pp.205, 207; Tr. 11/18/88, p.152; Tr. 12/8/88, p.53)

170. The applicant is seeking to control NOx emissions through efficient boiler design. (Tr. 12/8/88, p.55)

171. Due to their nonattainment for ozone, California limits NOx emissions with Thermal DeNOx and Selective Catalytic Converters. (Tr. 11/18/88, p.151)

172. Large particulates would be removed by a mechanical dust collector, and fine particles would be captured in a multistage electrostatic precipitator (ESP) prior to discharge of the flue gas to the stack. (KELP 1, p.42; Tr. 9/9/88, p.197; Tr. 11/18/88, p.115; Tr. 12/8/88, pp.68-69)

173. The particulate collection devices would be designed to achieve greater than 97.5 percent collection efficiency of PM and a majority of the potential lead and metals emissions. (KELP 7, p.5; Tr. 10/21/88, p.42; Tr. 11/17/88, p.130; Tr. 11/18/88, pp.114, 138; Tr. 12/8/88, p.65)

174. Metals such as mercury, which have a very high vapor pressure, would be removed by the ESP at a 40 percent efficiency. (Tr. 11/18/88, p.138)

175. The ESP would be sized to prevent particulate emissions above 0.04 lb/mmBTU's, even during soot cleaning. (KELP 7, p.3; KELP 20, Q.83; Tr. 10/20/88, pp.215, 216, 219, 221; Tr. 11/18/88, p.191)

176. Baghouses can be more efficient on smaller sized particulates than an electrostatic precipitator. (Tr. 11/18/88, p.115)

177. The varying moisture content of the wood fuel may adversely effect the efficiency of the ESP proposed for the facility while such variations would not effect the efficiency of a baghouse system. (Tr. 10/20/88, p.216)

178. The specific boiler for the proposed facility has not yet been chosen. The emission factors, if approved by the DEP, would be used in negotiating a boiler contract with various manufacturers. (KELP 4, Q.8)

Air Emission Impacts

179. Water within the Scituate Reservoir and its tributaries is free of significant contamination. (PWSB 5, p.4)

180. The proposed facility's emissions would produce particulate deposition on the Scituate Reservoir ranging from 0.000006 to 3.6 percent of the current rate of particulate deposition. (KELP 5, pp.10-11)

181. Acme/Chaston, a party to this proceeding, requires a clean working atmosphere, free of air contaminants, for the production of medical products. Only if the proposed facility exceeds regulated air emission limits would it have the potential to force Acme/Chaston to invest in filtration equipment or relocate their operations. There are over 400 employees at the Acme/Chaston facility. (Acme/Chaston 2, p.7)

Wood Ash and Disposal of Wood Ash

182. The proposed facility would produce an average of about 50 tons of wood ash per day. This would be comprised of bottom ash from the boiler bed and fly ash from the mechanical dust collector and ESP. (KAPE 1, p.6; KELP 1, p.47; Tr. 9/8/88, p.63)

183. The 50 tons of wood ash produced per day at the proposed facility would be removed from the facility in two to three truck loads per day, Monday through Saturday. (KELP 20, Q.50; Tr. 9/8/88, p.96)

184. The facility would produce between 10,000 and 15,000 tons of wood ash per year. (KELP 8, p.4; Tr. 9/8/88, p.93)

185. The bottom ash would be water-quenched and conveyed by a submerged conveyor to be continuously discharged to a water tight roll-off container. Prior to discharge, the bottom ash would be dewatered to not exceed 50 percent moisture. (KELP 1, pp.47-48; KELP 9, p.4; Tr. 9/8/88, p.96; Tr. 9/9/88, p.225)

186. Fly ash would be continuously collected from the ESP hoppers, mechanical dust collector hoppers, and air heater hoppers, and conveyed in a dustless condition to a roll-off container. (KELP 1, pp.47-48; KELP 9, p.4; Tr. 9/9/88, p.225)

187. All of the ash would be conditioned to at least 30 percent water content to prevent dust problems and quench any potential embers. (Tr. 9/8/88, pp.76, 78-79)

188. Ash would not be stored on-site for more than 90 days. (Tr. 10/6/88, p.153)

189. The composition of wood ash varies, depending on the type of wood used for fuel and the design and operation of a wood-burning facility. (KELP 4, Q.58)

190. Fly ash would compose between 50 and 60 percent of the total ash production from the proposed facility. (Tr. 9/8/88, p.91)

191. Regardless of the fuel stream, the proposed facility would have an ongoing continuous testing program to characterize the ash for regulated metal standards and other contaminants through the use of an EP toxicity test for landfilling and a total metal mass test for land spreading. Should any ash not meet any one of the standards for utilization, the proposed facility would have landfill options for disposal. The applicant is willing to pay for the cost of soil analyses for farmers who participate in a proposed land application program. (KELP 20, Q.49; KELP 21, Set 1B, Q.27; KELP 28, p.15; Tr. 9/8/88, pp.204-205, 239-240; Tr. 10/6/88, p.156)

192. The range of pH for wood ash generated by the proposed facility would be between 10.5 and 12. (Tr. 9/8/88, p.73)

193. Wood ash has a significant liming ability for acidic New England soils, and is a source of potassium, phosphorus, magnesium, and other trace elements needed for plant growth. Concentrations of heavy metals in wood ash frequently fall below that found in many manures and fertilizers used in the Northeastern United States. Ash increases yields of grass and hay crops, corn, alfalfa, and vegetables. (KELP 8, p.6; KELP 12, pp.1-2; Tr. 9/8/88, pp.65, 66)

194. Wood ash from wood-fired power plants outside of Connecticut is regularly applied to agricultural soil in New England. (KELP 8, p.6)

195. Wood ash would be suitable for disposal in either a bulky waste landfill or a sanitary landfill. In the event a bulky waste landfill were utilized, the wood ash would require daily cover. (KELP 4, Q.60)

196. The landfilling of ash would cost an estimated 60 to 80 dollars per ton. (Tr. 9/8/88, p.82)

197. As much wood ash as possible would be sold by the applicant as a fertilizer supplement for agricultural and woodlands soils management. (KELP 5, p.14; KELP 12, p.5; Tr. 9/8/88, p.70)

198. The applicant does not intend to negotiate with parties interested in the reuse of wood ash until after land application standards for Connecticut have been developed by the DEP. (KELP 20, Q.45; Tr. 9/8/88, p.237)

199. The DEP has not yet made a determination as to the classification of wood ash for disposal. (KELP 8, pp.4, 6)

200. The applicant intends to have more than one contract for the receipt of wood ash disposal, to assure a continuous disposal outlet for the ash. (KELP 5, p.14)

201. There are procedures in Rhode Island for composting and in Maine, New Hampshire, and Vermont for land application of wood ash. If the ash met those standards, there would be no reason why an ash recycling program could not be carried out in those areas. (Tr. 9/8/88, pp.80, 206)

202. The applicant would not require that the Town of Killingly provide a solid waste facility for disposal of ash from the proposed facility. (KELP 20, Q.52; Tr. 10/20/88, pp.112, 113-114)

203. Other recycling options for wood ash include use in composting facilities to reduce odor, adding it to municipal waste treatment sludge as lime substitute to reduce pathogens and stabilize sludge, using it as a daily cover over landfills, and taking advantage of its high pH to treat and contain landfill leachate. (KELP 8, p.7; KELP 12, p.5; Tr. 9/8/88, p.75)

Noise

204. The major potential noise sources of the proposed facility would include the wood reduction hog, conveyors, truck dumpers, induction fans, and the cooling towers. (KELP 1, p.52)

205. The noise-emitting equipment installed at the proposed facility would be attenuated to meet the Connecticut noise control levels. Testing of overall noise levels and prominent discrete tones would be made upon start-up to verify compliance and to see if any adjustments in operation were necessary. (KELP 1, p.52; KELP 34, p.2; Tr. 11/17/88, pp.62-63)

206. The proposed facility would be designed to operate with a maximum on-site combined noise level not to exceed 90 dBA, as mandated by OSHA. If the noise level were at 90 dBA at the facility, the resulting noise level along the north shore of Alexander Lake (0.95 miles distant) and at the closest residence to the facility (0.6 miles distant) would be less than 40 dBA. (KELP 4, Q.64; KELP 7, pp.10-11; Tr. 11/17/88, pp.62-63)

207. The proposed facility would be designed so it would not have discrete tonal noises. (Tr. 11/17/88, p.65)

208. Connecticut State Regulations set a noise emission limit of 51 dBA (night) and 61 dBA (day) for the residential noise receptors. Noise emission to the adjacent Pepsi-Cola property would be less than 70dBA, which is the state limit for industrial noise receptors. (KELP 7, p.11)

Emergencies, Security and Fire Protection

209. A plan for emergency procedures and responsibilities would be prepared in consultation with the appropriate Town and regional departments prior to the commencement of construction. (KELP 4, Q.11)

210. Intentional and unintentional entry to the proposed facility would be prevented by an eight-foot chain link fence running around the perimeter of the proposed facility. The fenced area would be posted with "No Trespassing" and would include all areas associated with the operation, including the transmission line interconnect, the retention pond, and the water supply wells. (KELP 20, Q.3)

211. The only access into the proposed facility would be through a gate in the fence on the access road leading to Louisa Viens Drive. This gate would be open during hours when the facility would be receiving wood fuel. Access would be controlled by supervision at the scales and dumping area. During all other hours the gate would be locked and all access would have to be pre-arranged with the plant supervisor on duty at the time. (KELP 20, Q.3)

212. The plant proper would be encircled by a hydrant system. The system would be connected to both fire water pumps in the cooling tower pump room and the existing hydrant system located in Louisa Viens Drive. The cooling tower system would be utilized as a fire water storage facility. The cooling tower would be equipped with a sprinkler system. (KELP 1, p.61; KELP 9, p.7; KELP 25; Tr. 9/9/88, pp.202, 203)

213. The boiler building would be provided with hose risers throughout the building. Sprinklers would be provided at the burner in front of the boiler. The turbine-generator building would have one hose riser with sprinklers over the turbine lubricating oil system. The control room would be provided with a Halon fire protection system. The administration building would have sprinklers. (KELP 9, p.7; KELP 25)

214. The wood storage and fuel handling area would be encircled with a hydrant system, and the conveying system would have sprinklers. The oil tank, if used by the facility, would be located in a separate area and would be fitted with similar equipment. Standpipe hose stations would be provided in each building. (KELP 1, p.61; KELP 9, p.7; KELP 25)

215. In the event of a fire, the proposed facility would require personnel from the local fire fighting company. (KELP 9, pp.6-7)

216. Local fire fighting personnel would be given training in the operation of the fire fighting equipment at the proposed facility. Training seminars would be performed by the proposed facility personnel. Training seminars would familiarize local fire fighting personnel with the location, type, and operation of plant fire fighting equipment. Training seminars would also familiarize local fire fighting personnel with areas in the proposed plant where chemicals would be stored. (KELP 9, pp.6-7; KELP 20, Q.1; Tr. 9/9/88, p.229)

Traffic

217. Access to the proposed facility would be from Interchange 94 of Interstate 395, about 0.75 miles to the southeast. Trucks would travel about 0.75 miles along Lake Road from the Interchange before entering Louisa Viens Drive. Along Lake Road there are several residential homes, the Frito-Lay plant, the National Patent Development Office, and a few commercial buildings. The section of Lake Road from Interstate 395 to the west side of the Killingly Industrial Park has two lanes and has been recently widened to 40 feet by the Town of Killingly to accommodate increased traffic due to the Industrial Park. The road qualifies as a collector roadway for industrial traffic. (KAPE 2; KELP 1, p.30; KELP 14, p.6; KELP 27)

218. Lake Road is a 40-foot wide industrial highway which extends from Louisa Viens Drive easterly to an interchange with Interstate 395. (KAPE 2; KELP 14, p.6; KELP 27)

219. Lake Road is capable of carrying up to 2000 vehicles per hour during peak travel hours. Currently Lake Road is carrying 3500 vehicles per day on average, and up to 300 vehicles per hour during peak travel hours. (KELP 14, p.11, Exhibit FH-2; KELP 27; KAPE 2; Tr. 10/6/88, pp.15, 16)

220. The applicant estimates that 64 wood fuel trucks would come to and depart the facility each day. (KELP 14, p.10)

221. The present volumes of traffic along Lake Road are well below the capacity of the roadway, and is capable of accommodating a sizeable increase in traffic. During the few hours when the maximum additional traffic related to the facility would amount to eight to 10 trucks per hour, the level of service available to traffic on Lake Road would not be reduced by a measurable degree. (KELP 14, Exhibit FH-2, Conclusions and Recommendations; KELP 27; KAPE 2)

222. Louisa Viens Drive is a dead-end Town road that serves only the buildings in the Industrial Park. (KELP 1, p.31)

223. A Killingly Town ordinance prohibits trucks on area roads that are inadequate for truck travel. (KAPE 2; KELP 14, p.10; KELP 27; Tr. 10/6/88, pp.22-23, 29, 54-55)

224. The proposed project would receive an average of four fuel trucks per hour, during receiving hours between 5:30 A.M. to 9:30 P.M., six days per week. Each truck would deliver about 25 tons of chipped wood. All of the trucks would travel from Interchange 94 of Interstate 395 along a 0.75-mile stretch of Lake Road before turning into Louisa Viens Drive. (KELP 1, p.53; Tr. 10/20/88, p.184; Tr. 12/8/88, p.23)

225. Based on 13,000 tons per year of ash to be removed from the proposed facility during the same delivery hours, two to three trucks per day would be needed. (KELP 14, pp.10-11)

226. In total, over a 15-hour day, there would be an average of about 4.5 trucks per hour visiting the facility. KELP expects that 95 percent of the time there would be seven trucks per hour or less visiting the facility. (KELP 14, p.11)

227. There would be approximately 35 vehicles per day associated with employees and an additional 10 to 12 associated with visitors to the facility. (KELP 14, p.11)

228. Existing traffic control devices from Interchange 94 of Interstate 395 to the proposed facility now in place would be adequate to accommodate traffic from the proposed project. (Tr. 10/6/88, p.33)

229. The feasibility and costs of two alternative access routes were preliminarily studied by the Town of Killingly. One alternative would extend Louisa Viens Drive from the cul-de-sac back to Lake Road, creating a loop at a preliminary construction cost of $710,000 excluding new right-of-way costs, related engineering fees, and other non-construction costs. The other alternative would provide a separate roadway with a cul-de-sac to the proposed facility, instead of Louisa Viens Drive, at a preliminary construction cost of $875,000, excluding new right-of-way costs, related engineering fees, and other non-construction costs. (Town of Killingly 13, pp.6-7)

Community Visibility

230. The tallest structure of the proposed facility would be the stack, with a height expected to be less than 200 feet, and probably 175 feet, after DEP emissions analysis. The tallest building on the site would be the boiler house: 110 feet high. To provide screening, the southern end of the property would remain forested. Forest vegetation would border the property on all sides except along the CL&P right-of-way. In addition, the knoll on the southeast section of the property would obstruct the view of the plant from a small group of residences and commercial establishments near Interchange 94 on Interstate 395. (KELP 1, p.49; KELP 7, pp.11-12; Tr. 10/21/88, p.218; Tr. 11/17/88, p.129; Tr. 12/8/88, pp.73-74)

231. The stack and facility buildings would be visible along a short length of Interstate 395, from some locations within the Killingly Industrial Park, and from the area of the Putnam Landfill. The stack would be visible in certain locations along the south shore of Alexander Lake. From the south shore of Alexander Lake, as much as 155 feet of the stack would be visible under the good engineering practice stack height of 270 feet. The stack would conform to FAA requirements. (KELP 1, pp.49-51; KELP 7, pp.11-12)

232. To minimize the visual impact the applicant would build as short a stack as was environmentally acceptable to the DEP. (KELP 20, Q.9)

233. For night operations lighting would be concentrated around the truck unloading station, the wood piles, and the processing areas. Isolation from the nearest residences, and intervening sight barriers would keep such illumination visibility from being a problem. (KELP 1, p.51)

Cogeneration Possibilities

234. The applicant considered selling steam or hot water to nearby facilities in the Killingly Industrial Park, and providing thermal energy to an on-site vegetable greenhouse. (KELP 5, Exhibit PB-4)

235. Adjacent to the proposed plant no facilities were identified that could utilize waste heat from the facility on a year-round basis. (KELP 4, Q.111; Tr. 10/20/88, pp.159-160)

236. The applicant is considering an on-site vegetable green house that could use heat from the cooling tower. (KELP 5, p.15; Tr. 10/20/88, pp.154-155, 156, 157)

237. The applicant would be willing to supply waste heat from the facility to an outside user if the costs of supplying such heat were borne by the outside user. (Tr. 10/20/88, pp.163-166)

Recreational and Educational Possibilities

238. The applicant would consider providing public recreational access to the Quinebaug River, establishing secondary and vocational school training programs, providing tours of the facility, and other actions to benefit the local community. (KELP 5, Exhibit PB-4; KELP 20, Q.6; KELP 34, p.3)

239. The applicant would be willing to work with the State to swap riverbank land and wetlands for land owned by the State east of the proposed facility area. This would allow the applicant more flexibility in designing the project further away from the proposed 100-foot river setback. (KELP 4, Q.115; KELP 5, p.12; KELP 20, Q.4)

240. The DEP requested the DOT to deed over to the DEP some trolley line right-of-way, both adjoining and traversing the site, and also another five acres that the State owns next to Interstate 395, which was acquired during condemnation proceedings for the highway. DOT has no plans for this property, and they are willing to investigate a transfer to the DEP. (Tr. 9/9/88, pp.190-191)

241. The applicant would agree to hold informational meetings before, during, and after construction to advise residents of the project status. (KELP 20, Q.87)

Wildlife

242. There are no known populations of Federally Endangered and Threatened Species or Connecticut Species of Special Concern at the proposed site. (KELP 1, p.54, Exhibit F)

Historical Impacts

243. In a letter dated August 12, 1988, the Connecticut Historical Commission determined that the old trolley line right-of-way of the proposed site is not an historic or cultural resource. (KELP 21, Set 1B, Q.32)

244. The Connecticut Historical Commission determined that the proposed facility would have no effect on the Town of Killingly's historic and architectural heritage. (KELP 1, pp.53-54)

Procedural

245. The applicant filed materials requesting location approval on May 6, 1988, to both the Killingly Planning and Zoning Commission and Inland Wetlands Commission pursuant to Section 16-50x(d) of the CGS, but did not follow the standard application procedures for site plan review under Section 470 of the Killingly Zoning Regulations, nor did it apply for a permit to conduct activities in a regulated wetlands area under Section 6.1-6.2 of the Killingly Wetlands and Watercourses Regulations. (Letter from Town of Killingly Town Manager to the Siting Council of 12/2/88; Town of Killingly 5, p.1; KELP 4, Q.88, Q.89; Tr. 9/8/88, pp.186-187; Tr. 10/20/88, p.148)

246. The applicant contends that since they applied to the Killingly Planning and Zoning, and Inland Wetlands Commissions for location approval pursuant to section 16-50x(d) of the CGS, they did not also have to apply for site plan approval or permission to conduct a regulated activity in a regulated area. (KELP 4, Q.88, Q.89, Q.90; Tr. 9/8/88, pp.186-187)

247. On June 20, 1988, the Killingly Inland Wetlands Commission voted to notify KELP that "if any activity takes place, there should be a cease and desist order issued." (Town of Killingly 3; KELP 4, Q.91, Attachment 5)

248. At a Special Meeting of the Killingly Planning and Zoning Commission on June 3, 1988, the Commission approved the concept of developing a wood power project at the proposed site by a vote of three in favor and two opposed after considering KELP's application for location approval under Section 16-50x(d) of the CGS. The Commission further voted unanimously to regulate and restrict the project pursuant to CGS Section 16-50x(d) and conditioned such approval upon compliance with 23 specific conditions. (Town of Killingly 2; Town of Killingly 4, p.1; KELP 4, Q.91, Attachment 4)

249. The applicant, pursuant to the provisions of Section 16-50x(d) of the CGS, appealed to the Council on July 15, 1988, from the order issued by the Killingly Inland Wetlands Commission. (Town of Killingly 3; KELP 4, Q.91; KELP 17; KELP 18, pp.1-7)

250. The applicant, pursuant to the provisions of Section 16-50x(d) of the CGS, appealed to the Council on June 30, 1988, from the 23 conditions issued by the Killingly Planning and Zoning Commission. (KELP 4, Q.91; KELP 17, pp.1-6; KELP 18)

251. At a special meeting of the Killingly Town Council on 11/29/88, the Town Council unanimously adopted a resolution that "no negotiations have taken place between the Town of Killingly and the applicant with respect to the proposed project." (Letter from the Town of Killingly Town Manager to the Siting Council of 12/2/88)

252. On December 13, 1988, the Killingly Town Council unanimously voted that they are opposed to the proposed project. (Letter of 1/9/88 from R. Thomas Homan, Killingly Town Manager, to the Siting Council)

253. Pursuant to a motion of the Providence Water Supply Board of August 18, 1988, for an extension of time, on August 19, 1988, the Council declared that the Docket 96 schedule as noticed and served in the Norwich Bulletin, on June 1, 1988, and August 9, 1988; the Journal Transcript, on June 6, 1988, and August 1, 1988; and the Providence Journal, on June 3, 1988, and August 1, 1988, would be adhered to. (Record)

254. At a meeting of the Siting Council on December 19, 1988, the Siting Council ruled that the following requests and motions by Alan DiCara would be considered within the context of the Docket 96 proceeding:
    a) Request for a Declaratory Ruling that there is no public need for the proposed facility;
    b) Request that the Council undertake a more extensive investigation pursuant to RSA Section 16-50j-41;
    c) Request for a declaratory ruling that any and all Council decisions as to the issuance of Certificates of Environmental Compatibility and Public Need, are/would be revoked in response to the results of the previous Request; and
    d) A motion to strike testimony of the applicant regarding public need for the facility.

    (Record; Letter of 12/23/88 from Gloria Dibble Pond to Alan DiCara)

255. At a meeting of the Siting Council on January 29, 1989, a motion by Alan DiCara for a discovery/reopening of the Docket 96 hearing was denied. (Record)

Waste Wood as Hazardous Waste

256. Briefs were filed by the applicant, the Town of Killingly, and the Providence Water Supply Board, and a Limited Appearance was filed by the Connecticut Resources Recovery Authority regarding a determination of whether the wood fuel to be used at the proposed facility is a hazardous waste; whether the facility would be a hazardous waste facility; the legal basis for exemption and consequence of fuel wood testing as a hazardous waste; whether there are hazardous components in demolition wood; the testing of the wood; and a solid waste classification for the proposed facility. (Town of Killingly 9; Town of Killingly 10; PWSB 3; PWSB 4; KELP 28; Limited Appearance of 10/12/88 by the CRRA)

Permits

257. An application for an Air Permit to Construct the proposed project was submitted to the Air Compliance Unit of the DEP on April 29, 1988. On August 3, 1988, the DEP issued a letter indicating that the Application was complete. (KELP 5, p.16; KELP 7, Exhibit RA-2; KELP 21, Set 1B, Q.32; KELP 32, p.15)

258. An application for a Water Diversion Permit by the applicant was submitted to the Water Resources Unit of the DEP on September 8, 1988. (KELP 32, p.15)

259. An Application for a National Pollution Discharge Elimination System (NPDES) Permit and State Discharge Permit under CGS Section 22a-430 was submitted to the Water Compliance Unit of the DEP on September 1, 1988. (KELP 21, Set 1B, Q.30; KELP 32, p.15)

260. An application for a Solid Waste Permit by the applicant to the DEP was submitted on or about October 25, 1988, due to a DEP determination that wood chips used as fuel are a solid waste. The proposed facility would be subject to the DEP's solid waste management regulations. (KELP 5, p.17; KELP 28, p.15; KELP 32; Tr. 10/6/88, pp.128, 142; Tr. 10/20/88, p.112; Tr. 11/18/88, p.8)

261. The DEP has determined that the proposed facility is a resource recovery facility, although the solid waste to be burned at the facility has been determined not to be categorized as municipal solid waste. (KELP 32, p.27; Tr. 11/18/88, p.8)

262. The DPUC approved the executed Energy Purchase Agreement between the applicant and CL&P on April 19, 1988. (KELP 21, Set 1B, Q.1)

263. The Electricity Purchase Agreement between the applicant and CL&P obligates CL&P to buy and the applicant to sell electricity for 25 years starting with the proposed facility's in-service date. (KELP 20, Q.64)

264. The Army Corps of Engineers has indicated to the applicant that the proposed project would not require a permit for dredge and fill. (KELP 32, p.6; Tr. 10/20/88, p.174; Tr. 10/21/88, p.96)

265. An application was submitted to the Federal Aviation Administration concerning the stack by the applicant. If the stack is less than 200 feet, no lights would be required on it. (Tr. 10/21/88, p.219)

Project Cost and Schedule

266. Proposed project costs are estimated as follows, in millions of 1989 dollars:

Construction Costs	$52.40
Other Hard Costs	3.30
Construction Interest	6.20
Working Capital	1.40
Other Capital Costs	6.00
Land	1.10
TOTAL	$70.40

(KELP 1, p.56)

267. Construction of the proposed facility is expected to begin in June 1989, with mechanical erection commencing by August 1989. Commercial operation is expected to begin by January 1992. (KELP 1, p.68)