DOCKET NO. 11

AN APPLICATION SUBMITTED BY NORTHEAST UTILITIES SERVICE COMPANY, AS AGENT FOR THE HARTFORD ELECTRIC LIGHT COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED WITH RESPECT TO THE CONSTRUCTION OF AN OVERHEAD 345 KV ELECTRIC TRANSMISSION LINE AND THE CONSTRUCTION AND RECONSTRUCTION OF AN OVERHEAD 115KV ELECTRIC TRANSMISSION LINE ALONG A ROUTE BETWEEN THE MANCHESTER SUBSTATION, IN MANCHESTER AND THE NORTH BLOOMFIELD SUBSTATION, IN BLOOMFIELD	:	POWER FACILITY EVALUATION COUNCIL JANUARY 23, 1978

F I N D I N G S

I. PROCEDURES

1. The Hartford Electric Light Company (HELCO) acting by its agent, the Northeast Utilities Service Company, in accordance with the provisions of section 16-501 of the General Statutes of Connecticut, Revision of 1958, revised to 1977, as amended applied to the Power Facility Evaluation Council on March 23, 1977, for a certificate of environmental compatibility and public need for the construction of an overhead 345 kV electric transmission line along a route in the towns of Manchester, South Windsor, Windsor and Bloomfield with a partial alternative route through the northeasterly corner of East Hartford.
2. The fee prescribed in section 16-50v-1(b) of the Regulation of Connecticut State Agencies accompanied the application.
3. The application was accompanied by proof of service as required by section section 16-501(b) of said General Statutes of the State of Connecticut.
4. Affidavits of newspaper notice as required by Statute and section 16-501-1 of the Regulations of Connecticut State Agencies were also filed with the application.
   (NUSCO Ex. 1)
5. Pursuant to section 16-50m of said General Statutes of the State of Connecticut, the Power Facility Evaluation Council, after giving due notice thereof, held a public hearing at the Windsor Public Library, Meeting Room, 323 Broad Street, Windsor on July 19, 20, 21 and 27, 1977. Evening session was held on July 20, 1977. (Record)
6. The parties to the proceeding are the applicant, the Hartford Electric Light Company, and those other persons and organizations whose names are listed in the Decision and Order which accompanies these findings. (Record)
7. Upon receipt of the application, the Council retained R. W. Beck and Associates, consulting engineers of Wellesley, Massachusetts, to advise the Council. (Record)

8. The following state agencies filed written comments with the Council pursuant to section 16-50j(f) of the General Statutes of the State of Connecticut: Department of Environmental Protection, The State Department of Health, The Public Utilities Control Authority, The Department of Planning and Energy Policy and the Department of Commerce. (Record)

9. On June 20, 1977 members of the Council made a ground inspection of the proposed route and alternate routes for the proposed line. Council members made additional ground inspections of the proposed and alternate route during the course of the hearing. (Record)

II. NEED

10. The proposed 345 kV line will supply a 345/115 kV autotransformer at the North Bloomfield substation, providing a source of power for the 115 kV lines radiating outward from that substation to much of the greater Hartford area, the northwestern quadrant of Connecticut, and the southwestern quadrant of Massachusetts.
(NUSCO Ex. No. 1 pg. 7)

11. As loads increase on the Northeast Utilities system, the existing auto-transformers and 115 kV system will not be adequate to reliably transmit the required bulk power into the load area from the present supply points.
(TR. 7-19 pg. 15)

12. Load flow studies based on the 1-1-77 load forecast show that without the North Bloomfield autotransformer the single contingency outage of the 1810 circuit (Chippen Hill-Bristol-Southington) would result in the overload of the 1191 circuit (Frost Bridge-Campville) in both the summer and winter of 1980.
(NUSCO table IA and IIA)

13. Load flow studies based on the 1-1-77 load forecast show that without the North Bloomfield autotransformer the following double contingency outages will result in overloads:

A) the simultaneous outage of one Manchester autotransformer and the 1670 circuit (Southington-Berlin-Black Rock) will overload 1771 circuit (Southington-Berlin) in the summer of 1980;

B) the simultaneous outage of both Manchester autotransformers will: 1. overload the 1759 circuit (Portland-Hopewell) in the summer and winter of 1980, 2) overload the 1443 circuit (Middletown-Portland) in the winter of 1980, 3) overload the 1670 circuit (Southington-Berlin-Black Rock) in the winter of 1980, 4) overload the 1771 circuit (Southington-Berlin) in the winter of 1980;

C) the simultaneous outage of the 1771 circuit (Southington-Berlin) and the 1766 circuit (Middletown-West Side) will overload the 1670 circuit (Southington-Berlin-Black Rock) in the summer of 1980;

D) the simultaneous outage of one Manchester autotransformer and the 1443 circuit (Middletown-Portland) will overload the remaining Manchester autotransformer in the summer of 1980;

(NUSCO tables IA and IIA)

14. All of the potentially overloaded lines are located in the central area of Connecticut, close to Berlin.
(TR. 7-20 pg. 402; NUSCO Ex. No. 1 pg. 9, tables IA, IIA)

15. The Northeast Utilities system has never experienced the concurrent failure of two autotransformers at the same location.
(TR. 7-20 pg. 343)

16. The above overloads could result in loss of load on parts of the system due to cascading outages.
(NUSCO Ex. No. 1 pgs. 15, 17, 18)

17. Limited assessments of the costs of short duration power outages indicate a range of from $2 to $8 per kilowatt hour for commercial and industrial customers and from $1 to $3 per kilowatt hour for all classes of customers.
(TR. 7-27 pg. 949)

18. Load flow studies based on the 1-1-77 load forecast show that with the North Bloomfield autotransformer the above overloads will be avoided.
(NUSCO Ex. No. 1 pg. 7, NUSCO tables IA and IIA, TR. 7-19 pg. 19)

19. The planning guidelines used in the load flow studies are designed to provide a reliable electric power supply at reasonable cost and also to provide a consistent approach to the determination of local area needs.
(TR. 7-19 pg. 17)

20. The planning guidelines and the basis for defining acceptable loadings and acceptable voltage levels, with the possible exception of adopted coincident system peak percentages, represent standard utility practice.

(PFEC Ex. No. 1 pg. 3-12)

21. With the North Bloomfield autotransformer the transmission line losses will be reduced by an estimated $750,000 per year.

(TR. 7-19 pg. 136)

22. The estimated construction cost for the proposed line and associated substation projects can be broken down as follows:

$ 7,690,000	14 miles of 345 kV construction
1,800,000	widening of right-of-way
210,000	connection at Meekville Junction
550,000	replacement 115 kV
5,830,000	North Bloomfield autotransformer and terminal facilities
1,650,000	Manchester substation terminal facilities
$17,730,000	

(NUSCO Ex. No. 1, pg. 11)

23. The annual carrying charge on investment in transmission facilities is approximately 18%. For the proposed $17,730,000 investment the annual carrying charge would be $3,191,000.

(TR. 7-27 pg. 921)

24. No cost-benefit analysis of the proposed facilities has been undertaken by the applicant.

(TR. 7-27 pg. 947)

25. The alternative of supplying North Bloomfield via Berlin would involve a longer and more costly route than the proposed route via Manchester.

(NUSCO Ex. No. 1 pg. 21)

26. The alternative of expanding the area's 115 kV system would require a much larger number of lines and would be considerably more costly than the proposed line.

(NUSCO Ex. No. 1 pg. 20, TR. 7-19 pg. 19)

27. The alternative of constructing generating facilities at some or all of the area's 115 kV substations would entail greater costs than the proposed line.

(NUSCO Ex. No. 1 pg. 20)

28. Undergrounding a 345 kV line from Manchester to North Bloomfield would be $33,550,000 more expensive than the proposed overhead line.

(NUSCO Ex. No. 1 pg. 20)

29. An autotransformer at North Bloomfield, which is the hub of seven 115 kV circuits, will maximize the use of the 115 kV system.
(TR. 7-21 pg. 643)

30. The applicant's plans call for the establishment of 115/345 kV autotransformers at Agawam substation in Massachusetts in 1981 and at Berlin substation in 1983.
(NUSCO Ex. No. 1 pg. 12, TR. 7-19 pg. 20)

31. An autotransformer installed first at North Bloomfield, rather than at Agawam or Berlin, will provide the best opportunity to delay installation of the other autotransformers if future load forecasts should indicate any significant decrease in area loads.
(TR. 7-19 pg. 21; TR. 7-20 pg. 338)

32. An autotransformer at Berlin, if it could be installed in 1980, would perform about the equivalent function of reducing line overloads as would the North Bloomfield autotransformer and it would reduce line losses by about $700,000 per year.
(TR 7-21 pgs. 646, 651)

33. The Berlin autotransformer cannot be installed before 1982.
(TR. 7-21 pg. 647)

34. The proposed 345 kV line from Manchester to North Bloomfield has been submitted to the NEPOOL Planning Committee and has been approved.
(TR. 7-27 pg. 828; PFEC Ex. No. 1 pg. 3-6)

35. The proposed line conforms to a long range plan for expansion of the electric power grid of the electric system serving the State and interconnected utility systems and will serve the interest of the electric system's economy and reliability.
(NUSCO Ex. No. 1 pg. 12, Record, TR. 7-19 pg. 17)

36. The proposed 115 kV circuit to be constructed for 2.3 miles from Manchester Substation to Meekville Junction is necessary to continue in operation a 115 kV circuit which runs from Manchester to Northwest Hartford Substation and also to North Bloomfield Substation when the portion of that circuit from Manchester Substation to Meekville Junction prebuilt for 345 kV is converted to operation at 345 kV.
(TR. 7-19 pg. 24)

37. The 115 kV reconstruction proposed from South Windsor Junction to Bloomfield Junction is necessary to continue the operation of two 115 kV circuits presently operated as one circuit on lattice tower structures, which will be

removed primarily for visual reasons.
(TR. 7-19 pg. 25)

38. R. W. Beck, consultant for the PFEC, believes that the proposed facilities will: 1) help to relieve indicated overloads, 2) increase reliability of the 115 kV system, 3) decrease the usage of fuel resources, and 4) assist in the distribution of electricity at the lowest possible cost.
(R. W. Beck Final Report pg. 12)

39. R. W. Beck recommends approval of the proposed facilities.
(R. W. Beck Final Report pg. 12)

40. The Public Utilities Control Authority believes that the proposed facilities are necessary to avoid overloads on the 115 kV system.
(Record)

41. The Department of Planning and Energy Policy believes that the proposed facilities are justified by rising demand and grid system reliability considerations.
(Record)

42. The Department of Commerce favors the proposed facilities to further insure the fundamental need for an adequate supply of electric power in Connecticut.
(Record)

43. The Department of Environmental Protection made no comments on the need for the proposed facilities.
(Record)

44. No post hearing comments were submitted by the above mentioned agencies.
(Record)

45. Long range plans call for a new 345 kV circuit between Agawam, Massachusetts and Hampden Junction, Massachusetts to be constructed by 1981 and for a new 345 kV circuit between North Bloomfield, Connecticut and Agawam, Massachusetts to be constructed by 1983. These circuits together with the proposed circuit would complete the 345 kV loop between Meekville Junction, North Bloomfield, Agawam, and Hampden Junction. These circuits have been identified in the 10-20 Year Forecasts of Loads and Resources.
(NUSCO Ex. No. 1 pg. 13, 1-1-77 Forecast pg. III-18)

46. If a second 345 kV supply cannot reach North Bloomfield from the north because either the Hampden Junction - Agawam 345 kV circuit or the Agawam-North Bloomfield 345 kV circuit can not be built, then a second supply to North Bloomfield may be necessary from some other direction.
(TR. 7-21 pg. 757)

47. In the event that the second supply can not come from the north, the most logical alternative is a second 345 kV circuit between Manchester and North Bloomfield along the same route as that proposed for the first 345 kV circuit to North Bloomfield.
(TR. 7-21 pg. 757)

48. A second 345 kV circuit from Manchester to North Bloomfield will not be necessary during the forecast period if the North Bloomfield-Agawam and the Agawam-Hampden Junction 345 kV circuits are constructed.
(TR. 7-19 pg. 23)

49. The Massachusetts portion of the Agawam-Hampden Junction 345 kV circuit has been approved by the Massachusetts Energy Facilities Siting Council. It has not yet been submitted to the Massachusetts Department of Public Utilities, but their approval is also needed.
(TR. 7-21 pg. 658)

50. The applicant does not have any definite plans for and does not foresee a need for a second Manchester-North Bloomfield 345 kV circuit at this time.
(TR. 7-20 pg. 469; TR 7-19 pg. 86-87)

51. The need for a second Manchester-North Bloomfield 345 kV circuit has not been identified in the 10-20 Year Forecasts of Loads and Resources.
(TR. 7-20 pg. 476; Record)

52. The applicant believes it is prudent system planning to provide accommodations for a second 345 kV circuit between Manchester and North Bloomfield.
(TR. 7-20 pg. 469)

53. If no accommodation is made for a second 345 kV line between Manchester and North Bloomfield and if such a line should be needed in the future, residential and commercial development immediately adjacent to the right-of-way could make right-of-way widening significantly more expensive in the future. If this situation developes it may be necessary to remove and rebuild parts of the first 345 kV circuit and parts of the 115 kV circuit in order to construct two 345 kV circuits on the right-of-way.
(TR. 7-21 pg. 704-707)

54. In two other cases, Docket 1 and 5, the applicant received a certificate for an application which proposed to acquire land in contemplation of a future line for which there were no existing plans.
(TR. 7-21; pp. 755, 756)

III. ENVIRONMENTAL

Land-Use

55. The proposed route and facilities conform to the Federal Power Commission "Guidelines for the Protection of Natural, Historic, Scenic and Recreational Values in the Design and Location of Rights of Way and Transmission Facilities." (NUSCO Ex. No. 1)

56. The proposed route follows existing rights of way except for a short distance in the northwestern corner of Manchester.
(NUSCO Ex. No. 1 pp. 26, 27, Vol. II Plate 3)

57. The proposal includes acquisition of approximately 83 acres for the proposed line and for accommodating a second 345 kV line if necessary. A totally new route would most likely require the acquisition of 240-330 acres or more.
(TR. 7-21; pg. 709)

58. Much of the proposed acquisition involves land that is undeveloped or undevelopable because it is a flood control area, a flood plain, or used for agricultural purposes. Some widening may occur in areas zoned for industrial use.
(TR. 7-19; pg. 126)

59. The proposed construction will require the acquisition of guying rights outside the rights-of-way at some angles.
(TR. 7-19; pg. 39-40)

60. The HELCO proposal calls for the acquisition of the following residences:
    a. the residence at the intersection of the right-of-way and Ellington Road in South Windsor,
    b. the residence at the Northwest corner of the intersection of the right-of-way and Main Street in South Windsor,
    c. the residence at the Southwest corner of the intersection of the right-of-way and Filley Street in Bloomfield.

(NUSCO Ex. No. 1 plates 4 & 8, TR. 7-19 pg. 68 & 112)

61. No acquisition is proposed in segments 1 and 2.
(NUSCO Ex. No. 1; pg. 32)

62. In segment 3A no widening is necessary or proposed to accommodate the proposed 345 kV circuit.

In segment 3B, the applicant proposes to acquire 170' for the proposed 345kV line only.

No additional acquisition is proposed at this time for the accommodation of a possible 2nd 345 kV line anywhere in this segment.

(TR. 7-21-77 pg. 260) (NUSCO Ex. No. 1 pg. 34)

63. Manchester officials have requested that the proposed 345 kV line be built in segments 3A and 3B. Manchester officials also indicated that they would prefer the facilities in segments 3C and 3D to be incorporated into segments 3A and 3B.

(NUSCO Ex. No. 1, pg. 28)

64. Approximately 40 acres in Manchester's proposed industrial park can be released for industrial development if segments 3C and 3D can be consolidated into segments 3A and 3B; however, additional land, illustrated in NUSCO Exhibit No. 6, may have to be taken.

(TR. 7-19; pg. 127; NUSCO Ex. No. 6)

65. The applicant is willing to consolidate segments 3C and 3D into segments 3A and 3B if and when the Town of Manchester requests it at its expense.

(TR. 7-21; p. 721)

66. The conflict between the proposed transmission route and the proposed I-291 route in the Manchester Industrial Park area has been resolved between the Department of Transportation and the applicant.

(TR. 7-19; pp. 58,59)

67. The applicant requests flexibility in design in the areas where I-291 is proposed so that they may make modifications to avoid conflicts with the proposed highway.

(TR. 7-27; pg. 308)

68. In segment 4, the applicant proposes to acquire 100' for the proposed 345 kV line and for accommodation of a possible 2nd 345 kV circuit on a composite 345/115 steel pole line to be built without taking the existing 115 kV line out of service until the composite line is built. Only 75 feet would have to be acquired to accommodate the proposed 345 kV H-frame line and a possible future 345 kV circuit built on a 345/115 kV composite steel pole line, but this would require the 115 kV line to be taken out of service before it could be replaced on the new composite line. 55 feet must be acquired to construct only the proposed 345 kV line on a wood H-frame

(NUSCO Ex. No. 1 pg. 36 TR. 7-21;pg. 752 TR. 7-19; pg. 68)

69. The residence at Ellington Road must be taken to allow construction of the proposed line regardless of the type of structures used or widening necessary. Provision for a second 345 kV line would also require acquisition of this house.

(TR. 7-19; pg. 66-67; NUSCO Ex. No. 1 pg. 36, Vol. 2 plate 4)

70. The applicant proposes to acquire a home on Main Street in South Windsor. This house could be avoided by widening the right-of-way by 75' which would allow room for a future 345/115 kV line as long as the existing 115 kV line is taken out of service before the new line is built. A 55 foot widening would also avoid removing this house, but this would not accommodate any future additional 345 kV line. Finally, it appears that a porch and an ell more recently added to the original house could be removed, and the remainder, restored substantially to its historical design, would be located outside the right-of-way.

(NUSCO Ex. No. 1; pg. 35, 48, Vol. 2 plate 4; TR. 7-19; pg. 68,69)

71. The Connecticut Historical Commission indicated that the house proposed to be acquired on Main Street in South Windsor is a historic resource worthy of preservation.

(NUXCO Ex. No. 1A)

72. It would be possible to avoid acquiring the home on Main Street in South Windsor. However, this may be costly and may cause problems with the installation of a second 345 kV line if one is ever needed.

(TR. 7-21; pg. 752)

73. Several tobacco sheds in South Windsor may have to be acquired.

(NUSCO Ex. No. 1, Vol. 2, plate 3)

74. In segment 5, the applicant proposes to acquire 130' for the proposed 345 kV H-frame, the 115 kV H-frame rebuild, the accommodation of a 2nd possible future 345 kV H-frame, and to allow for the proper line-up of the proposed lines with the river crossing towers. If the proposed 345 kV line and 115 kV rebuild were constructed on a 345/115 kV composite pole, no widening would b necessary, but this would not provide room for a 2nd 345 kV line. If the 345 kV line and the rebuilding of the 115 kV line were constructed as proposed with no accommodation made for a possible 2nd 345 kV line, the applicant would have to acquire enough land to permit a 115 kV H-frame line to be built north of the existing lattice 115 kV line and prior to the removal of the 115 kV lattice line.

(NUSCO Ex. No. 1 pg. 36; June 16 Question No. 1; TR. 7-19; pg. 71-72)

75. The Connecticut Historical Commission indicated that the Connecticut River flood plain is known as a high density area for the existence of pre-historic archaeological resources and recommends that a reconnaissance survey be undertaken to locate and identify archaelogical resources in the project area.
(NUSCO Ex. No. 1A)

76. No widening of the right-of-way is proposed in Windsor. (Segments 6,7,8,9, and 10.)
(NUSCO Ex. No. 1; pp. 38, 40, 42; TR. 7-19; pg. 78)

77. There exist no land-use conflicts between the proposed line and right-of-way and the 30 unit elderly housing project proposed east of Deerfield Road in Windsor. Also, it appears that most of the proposed units will be screened from the right-of-way by existing vegetation.
(TR. 7-19; p. 97)

78. The Town of Windsor requested the Council to consider having the two 23 kV distribution lines in the Stroh Park area placed underground or on existing or proposed structures to increase the usability of the park. Various alternatives were discussed.
(TR. 7-20; pp. 420, 421, 430, 440, 445, 447, 449, 450; TR. 7-27; p. 950, 957)

79. Primarily for visual reasons, the applicant proposes to remove the existing 115 kV lattice line in segments 7, 9, 10 and 11 and replace it with a 115 kV line on a composite steel pole line.
(NUSCO Ex. No. 1, p. 38, 40, 42)

80. Steel pole structures are proposed for the right-of-way in Windsor and a part of Bloomfield to avoid land-use conflicts with residential areas.
(TR. 7-19; p. 129)

81. No acquisition is proposed in segment 11.
(NUSCO Ex. No. 1; p. 42)

82. In segment 12, HELCO proposes to acquire 80' additional right-of-way for the construction of a possible future 2nd 345 kV line on wood H-frames so the proposed line would not have to be taken out of service. Also the applicant proposes to acquire 180 feet for a 1350' section near Filley Street where the existing right-of-way is only 100' wide. This would accommodate both the proposed 345 kV line and a second 345 kV line on wood H-frames. If no accommodation was made for a 2nd 345 kV line in the Filley Street area, only 95 feet must be acquired for the proposed line. If a steel pole were used in this area, 100 feet must be acquired for the proposed line. Both

the proposed line and the possible future 345 kV line could be constructed on a 345 kV double circuit steel pole line with no acquisition throughout the segment except for 100' for the 1350' section near Filley Street.
(NUSCO Ex. No. 1; pg. 44,48, Vol. 2 plate 8; TR. 7-19; p. 111, 112)

83. If the applicant acquired only 95' near Filley Street, the house on Filley Street would still have to be acquired.
(TR. 7-19; p. 112)

84. Even if the proposed line were to be constructed on a composite 345/115 kV or double circuit 345 kV steel pole line, the house on Filley Street would still have to be taken.
(TR. 7-19; p. 112; 7-27 p. 816, 817)

85. The Connecticut Historical Commission indicated that the house proposed to be acquired on Filley Street in Bloomfield is a historic resource worthy of preservation.
(NUSCO Ex. No. 1A)

86. Alternatives were considered to avoid the house on Filley Street; however, the costs, land-use, visual and natural system impacts render the alternatives impractical.
(TR. 7-21; p. 722)

87. No acquisition is proposed in segment 13; however, the existing right-of-way is within approximately fifteen feet of the homes on Linwood Drive, Tiffany Lane and Hampton Lane.
(NUSCO Ex. No. 1; p. 44; Vol. 2 plate 9; TR. 7-20; p. 511)

88. A dog leg south of the Linwood Drive-Tiffany Lane Area would necessitate taking several houses or house lots approved by the Planning and Zoning Commission and would result in a situation similar to that on Linwood Drive and Tiffany Lane.
(TR. 7-27; p. 849)

89. Should a future additional circuit ever be needed in the existing right-of-way, none of the houses on Linwood Drive or Tiffany Lane would have to be removed. Only conductors would be added to the now proposed structures.
(TR. 7-19; p. 116, 152)

90. In segment 14, the applicant proposes to acquire 80 additional feet for a possible future 2nd 345 kV line. No acquisition is required in this segment for the proposed 345 kV line. If the proposed line were constructed on double circuit 345 kV steel poles, no additional widening would be required. This would provide the accommodation for the possible 2nd 345 kV line some time in the future.
(NUSCO Ex. No. 1 p. 46; TR 7-19; p. 122)

91. The 80 foot acquisition proposed in segment 14 includes a house on Duncaster Road. This house would be purchased only from a willing seller. It will not be necessary to remove this house unless an additional line is installed at some future date.

(TR. 7-19; p. 122)

92. In segment 15, the applicant proposes to acquire 215' for a 250' section of the right-of-way for the proposed line and the possible 2nd 345 kV line. Approximately 95' must be acquired for the proposed line, built on H-frames. 105 feet would be necessary if it were constructed on steel poles. Both the proposed line and the second 345 kV line could be built on H-frames if only 180' widening instead of 215' widening were acquired for the 250' section.

(NUSCO Ex. No. 1 p. 46 Vol. 2 plate 11; TR. 7-19; p. 124)

93. The establishment of a 345 kV autotransformer at North Bloomfield will not require additional lines emanating from the substation and traversing the Town of Bloomfield.

(TR. 7-20; pg. 487)

94. An insignificant amount of farmland would be removed from production by transmission structures.

(TR. 7-21; p. 728)

95. The land-use conflicts are less than those caused by creating a new route.

(TR. 7-19; pg. 128)

96. Unauthorized use of the right-of-way by motorcycles and snow mobiles continues to be a severe nuisance.

(TR. 7-20, p. 484, 492)

VISUAL/STRUCTURES

97. In connection with the proposed corridor widening, the Council's consultant does not believe that significant adverse visual impacts will occur.

(PFEC Ex. No. 1 p. 3-22)

98. The visual effects of the proposed line would be much less than if a new route were created.

(NUSCO Ex. 1, p. 50)

99. A wood pole H-frame line would be less visible and environmentally preferable to a steel pole line.

(TR. 7-19; pp. 124, 125, 129)

100. Wood H-frame structures are more compatible visually with rural and wooded landscapes, and therefore have lesser visual effects than steel poles. Also, simpler construction requirements result in lesser effects on natural systems than the construction of steel poles.
(TR. 7-19; pp. 38, 39)

101. Steel pole structures require less right-of-way width than do H-frames, and therefore must be considered for use particularly where housing and other existing land uses make right-of-way widening impractical.
(TR. 7-19; p. 766)

102. The tall steel poles proposed for sections of the line will be more visible from distant views than the existing structures; however, some near views will improve.
(TR. 7-21; p. 766)

103. In South Windsor the proposed line would be visible from all three road crossings.
(NUSCO Ex. 1, Vol. 2, plate 4)

104. In South Windsor, wherever the proposed line passes through agricultural fields, it would be more visible than the existing line.
(NUSCO Ex. No. 1, p. 49, plate 3)

105. If steel poles were used in segment 5, they would be visible from the Bissell Bridge.
(NUSCO Ex. No. 3, 6-16-77 Question 1)

106. The height of the proposed steel lattice tower at the Connecticut River crossing can be reduced from 215' to 195'.
(TR. 7-19; p. 77)

107. The Town of Windsor would like the proposed 130 foot steel poles to be lower; however, they prefer the tall steel poles to an addition of another line.
(TR. 7-20; pp. 419, 447)

108. In Windsor and parts of Bloomfield, the addition of a taller steel pole line will be somewhat offset visually by the removal of the old lattice line.
(NUSCO Ex. No. 1, Vol. 2, plate 6,7)

109. The proposed line will be visible where it crosses Blue Hills Avenue and Filley Street because of the open fields.
(NUSCO Ex. 1, Vol. 2, plate 7)

110. Where the proposed line will cross Tunxis and Woodland Avenues, it will be more noticable to the west than the existing line. It will remain screened to the east by the existing wooded areas.
(NUSCO Ex. Vol. 2, plate 9)

111. Between Woodland Avenue and the Railroad (near Tunxis Avenue) the proposed steel poles will be visible from a subdivision to the north (Hampton Lane) and somewhat visible from a subdivision to the south (Linwood Drive and Tiffany Lane) depending on the vegetative screening that must be removed. (NUSCO Ex. No. 1, Vol. 2, plate 9)

112. In segment 13, the Linwood Drive - Tiffany Lane area, the applicant proposes to install a double circuit 345 kV line of structures with the proposed circuit on the north side of the structures. Steel pole structures must be used because of the narrowness of the right-of-way and the infeasibility of widening it due to dense residential development immediately adjacent to the right-of-way. The installation of the proposed 345 kV circuit on the north side of the poles will permit the maximum amount of vegetation to remain in the back yards of the homes on Linwood Drive and Tiffany Lane. (TR. 7-19, p. 115; NUSCO Ex. No. 1 pg. 44, Vol. 2 plate 9)

113. The double circuit 345 kV steel pole structures proposed for the Linwood Drive-Tiffany Lane area would be about 130 feet high. (TR. 7-19, p. 115)

114. The steel pole structures to be constructed in the Linwood Drive-Hampton Lane area could be built 50 feet instead of 70 feet from the center of the existing 115 kV line; however, this would pose severe construction and maintenance problems and may increase any radio interference. The proposed line could be constructed 60 feet from the centerline of the existing 115 kV line while providing reasonable design freedoms. (TR. 7-19; p. 691; TR. 7-27; p. 952)

115. Selective clearing will be necessary 45 feet south of the center line of the proposed poles. Within the remaining 55 feet, only those trees which may come in contact with the conductor, if they fall, must be removed. (TR. 7-27; p. 952; NUSCO Ex. 7A)

116. In the Linwood Drive, Tiffany Lane area approximately 50% or more of the existing trees will have to be removed which will make the existing and proposed lines more visible. (TR. 7-19; p. 171)

117. The Duncaster Road Crossing is noticable to the east. The Adams Road crossing is visible only at the point of crossing. (NUSCO Ex. No. 1, Vol. 2, plate 10)

NATURAL SYSTEMS

118. The existing lines along the proposed route have had little if any adverse

impact.

(NUSCO Ex. No. 1, p. 51)

119. The proposed construction will have much less effect on the natural systems of the area than the creation of an entirely new route.

(TR. 7-21; p. 716)

120. The proposed construction may have no adverse environmental effects due to soil erosion because the proposed route is relatively level.

(TR. 7-21; p. 716)

121. Where necessary ground cover will be established and other steps taken to control erosion. Also, the proper steps will be taken to protect streams and small brooks.

(TR. 7-19; p. 131)

122. Some steel poles with foundations and some wood pole H-frame structures would be placed in wetland soils.

(NUSCO Ex. No. 1 Vol. 2, plates 1-11)

123. The clearing for the proposed line will probably have less effect than the impacts associated with commercial forestry.

(TR. 7-19; p. 131)

124. No evidence was presented to suggest that any rare or endangered species exist along the proposed route.

(TR. 7-21; p. 733)

125. The applicant stated that there are no known adverse health hazards related to transmission of electricity at 345 kV.

(TR. 7-20; p. 456)

126. Studies indicate that the ozone and oxides of nitrogen resulting from the operation of a 345 kV transmission line are well below state and federal standards.

(PFEC Ex. No. 1, p. 3-21)

127. The proposed line will result in no significant adverse environmental effects on air quality, according to the applicant.

(TR. 7-21; pp. 735, 736)

128. In general there should be no noticeable noise from the proposed line except during a driving rain or blizzard.

(TR. 7-19; pp. 150, 151)

129. There should be no interference with FM radio and television reception caused by the proposed line. There may be some minor interference with reception of distant AM radio stations.
(TR. 7-19; pp. 157, 158 TR. 7-20; pp. 460, 461)

130. Underground construction of the proposed 345 kV line would result in greater environmental effects and greater costs.
(NUSCO Ex. No. 1, pp. 59-61)