DOCKET NO. 317 - The United Illuminating Company application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a proposed 115-kV/13.8-kV electric substation and associated facilities located at 3-7 Wildflower Lane, Trumbull, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	February 13, 2007

Findings of Fact

Introduction

1. The United Illuminating Company (UI), in accordance with the provisions of Connecticut General Statutes (CGS) § 16-50g et seq., and § 16-50j-1 et seq. of the Regulations of Connecticut State Agencies (RCSA), applied to the Connecticut Siting Council (Council) on June 30, 2006 for the construction, operation, and maintenance of a new substation to be located on UI's 4.85-acre property located at 3-7 Wildflower Lane, Trumbull, Connecticut. (UI 1, Vol. I, pp.1-2, 11)

2. The purposes of the proposed facility are to provide increased distribution system capacity and to improve other aspects of electric system reliability in response to increasing load growth in the Town of Trumbull and surrounding communities. (UI 1, Vo1. I, pp. 2, 17)

3. The parties in this proceeding are the applicant, the Wildflower Coalition Petitioners (WCP), and the Town of Trumbull (Town). The intervenors in this proceeding are The Connecticut Light and Power Company (CL&P) and Mark Waggner. **(**Transcript 1 - 10/24/06 at 3:05 p.m. [Tr. 1], pp. 5-6)

4. Pursuant to General Statutes § 16-50m, the Council, after giving due notice thereof, held a public hearing on October 24, 2006, beginning at 3:00 p.m. and continuing at 7:00 p.m. The hearing was noticed for the Trumbull Town Hall, the Court Room, 2nd Floor, 5866 Main Street, Trumbull. However, the location was changed to the Madison Middle School, 4630 Madison Avenue, Trumbull prior to the hearing. **(**Council's Revised Hearing Notice dated October 12, 2006 (original notice dated September 22, 2006); Tr. 1, p. 3; Transcript 2 – 10/24/06 at 7:10 p.m. [Tr. 2], p. 3)

5. The Council and its staff made an inspection of the proposed substation site on October 24, 2006, beginning at 1:00 p.m. The Council and its staff also inspected the Quail Trail site (Site 6) and the Quarry Road site (Site 11). (Council's Revised Hearing Notice dated October 12, 2006; Tr. 1, p. 4)

6. The Council held continued public hearings at Ten Franklin Square, New Britain on October 26, 2006 and December 5, 2006, beginning at 10:20 a.m. and 10:30 a.m., respectively. (Transcript 3 – 10/26/06 [Tr. 3], p. 1; Transcript 4 – 12/05/06 [Tr. 4], p. 3; Tr. 2, p. 77)

7. UI utilized a bucket truck to simulate the height of proposed structure NB31A at Site 1 during the field review. (Tr. 3, p. 151)

8. Pursuant to CGS § 16-50*l* (b), public notice of the application was published in *The Connecticut Post*, *The Trumbull Times*, *The Bridgeport News*, and *The Stratford Star* on June 22, and 29, 2006. (UI 1, Vol. II, Exh. H)

9. Pursuant to CGS § 16-50*l* (b), notice of the application was provided to all abutting property owners by certified mail. UI and its attorney sent redundant letters dated June 21 and June 22, 2006. Return receipts were received from six out of the seven addresses. Return receipts were not received from Chet and Julie Jawor. (UI 1, Vol. II, Exh. H; UI 4, response 1)

10. Pursuant to CGS § 16-50*l* (b), UI provided notice to all federal, state and local officials and agencies listed therein. (UI 1, Vol. II, Exh. H)

11. UI erected a four-foot by six-foot sign on its property on Wildflower Lane, close to Huntington Turnpike, which provided a brief description of the proposal and notice of the Council's October 24, 2006 hearing. The sign also indicated that a copy of the application and additional information is available at the Council's website or by calling the Council's office. An identical sign was placed on Nichols Avenue near the current access road to the proposed site. The sign on Wildflower Lane was installed on October 10, 2006 and the sign on Nichols Avenue was installed on October 12, 2006. (UI 7)

12. UI also installed four signs at the Site 6 property (owned by the Town of Trumbull) on October 12, 2006. These signs also included a brief description of the proposal and notice of the Council's October 24, 2006 hearing. The sign indicated that a copy of the application and additional information is available at the Council's website or by calling the Council's office. The sign also noted that Site 6 was proposed as an alternative location for the substation by the WCP and the Town. (UI 7)

13. On or about June 30, 2006, UI sent copies of its application to the Connecticut Energy Advisory Board (CEAB). (UI 1, Vol. II, Exh. H).

14. On July 14, 2006, the CEAB issued a Request for Proposals (RFP) seeking alternatives to the proposed substation, pursuant to CGS § 16a-7c. (Council Admin. Notice, Item 33)

15. Proposals for alternatives to the proposed substation were to be submitted to the CEAB no later than September 12, 2006. None were received. (Council Admin. Notice, Item 33)

16. On October 26, 2006, the CEAB issued its final report indicating that the proposed substation conforms to the most relevant of the Preferential Criteria for this project, which is enhanced reliability. Thus, the CEAB views the proposed project favorably. (Council Admin. Notice, Item 33)

State Agency Comment

17. Pursuant to CGS § 16-50*l*, on September 22, 2006 and December 6, 2006, the following State agencies were solicited by the Council to submit written comments regarding the proposed facility: Department of Environmental Protection (DEP), Department of Public Health (DPH), Council on Environmental Quality (CEQ), Department of Public Utility Control (DPUC), Office of Policy and Management (OPM), Department of Economic

and Community Development (DECD), and the Department of Transportation (DOT). (Record)

18. The Council received responses from the DOT's Bureau of Engineering and Highway Operations on October 13, 2006, and from the DEP on October 20, 2006.

19. In its comments, DOT does not object to the proposed site. DOT states that if the proposed project involves any work to be performed in the state highway right of way, an encroachment permit is required. (DOT Comments dated October 13, 2006)

20. DEP states the primary site has no wetlands or watercourses. Site 1 is also level, largely cleared and already used for utility purposes. Most of the substation footprint has herbaceous or small shrub cover with principle species being milkweed, goldenrod, inkberry, scrub-oak, tree-of-heaven, sumac, pin cherry, poison ivy, and autumn olive. (DEP Comments dated October 20, 2006)

21. DEP visited the following streets adjacent to Site 1: Stella Drive, Wildflower Lane, Huntington Turnpike and Nichols Avenue to assess the potential for visual impacts to those areas. The two closest homes on Stella Drive are those at 45 and 52 Stella Drive, at the northern end of that street. DEP notes that those homes would benefit from ample deciduous screening. The homes at 40 and 46 Stella Drive are higher in elevation and may see more of the taller elements of the substation, such as the tap structures, through or above the upper portions of the intervening woods. (DEP Comments dated October 20, 2006)

22. DEP noted that the home at 6 Wildflower Lane would experience a significant loss of existing forest cover across the street. Proper landscape plantings could obscure much of the view of the substation, but the existing view would be significantly altered. DEP recommends that existing trees be preserved on this side of the substation. (DEP Comments dated October 20, 2006)

23. DEP states that the home at 1500 Huntington Turnpike would have a view of some elements of the substation. The homes at 1514 and 1526 Huntington Turnpike may experience seasonal views of the taller elements of the substation. The home at 1536 Huntington Turnpike would probably not see the substation. Homes north of this point and west of Huntington Turnpike would not see the substation. (DEP Comments dated October 20, 2006)

24. DEP notes that several homes along the south side of Nichols Avenue may have some view of the proposed substation, but the home at 2911 would be the only home significantly impacted. (DEP Comments dated October 20, 2006)

25. DEP notes that at least three homes on Quail Trail and two homes on Leffert Road would have views of Site 6A. (DEP Comments dated October 20, 2006)

26. DEP believes that Site 6B has the most screening from residential views of all the alternate sites within the search area. (DEP Comments dated October 20, 2006)

27. DEP believes that Site 11 would be an appropriate location for the substation. However, the soil there may be contaminated due to dumping activities or the site's close proximity to industrial areas. (DEP Comments dated October 20, 2006)

28. The DPH responded to the Council's solicitation for comments, but had no comments. (DPH Comments dated December 21, 2006)

29. The following agencies did not respond with comment on the application: CEQ, DPUC, OPM, and DECD. (Record)

Municipal Consultation

30. UI met with Trumbull's Planning and Zoning Administrator, First Selectman Raymond J. Baldwin, and UI's consultants in October 2002. (UI 3)

31. UI notified The Town of Trumbull of the proposal on November 28, 2005 by sending technical reports to First Selectman Raymond J. Baldwin. (UI 1, Exh. G)

32. Pursuant to CGS § 16-50*l*, UI notified the City of Bridgeport and the Town of Stratford of the proposal by sending technical reports to Mayor John M. Fabrizzi and Mayor James R. Miron, respectively, on December 21, 2005. Both the City of Bridgeport and the Town of Stratford are located within 2,500 feet of the proposed substation. (UI 1, Exh. G)

33. On June 30, 2006, UI filed applications with the following municipal agencies: Trumbull Inland Wetlands & Watercourse Commission, Bridgeport Zoning Department, Bridgeport Regional Planning Agency, Stratford Planning and Zoning Administrator, Stratford Inland Wetlands & Watercourse Commission, Trumbull Planning and Zoning Administrator, Trumbull Engineering Department, Bridgeport Office of Planning/Economic Development, Bridgeport Inland Wetland Agency, Stratford Zoning Commission, and Stratford Conservation Commission. (UI 1, Exh. H)

34. On July 19, 2006, the Trumbull Planning and Zoning Commission (Town P&Z) held a meeting and voted unanimously to deny the location and construction of UI's substation. On July 24, 2006, the Town P&Z notified UI of this result by a letter. (Town 1)

35. On August 9, 2006, UI responded by letter, stating that UI had not been informed of the meeting of the Town P&Z. UI also noted that it is willing to meet with the Town P&Z and address any concerns. (UI 3)

Need

36. The proposed substation is needed to provide the necessary substation capacity to meet the growing needs of the greater Trumbull region. Construction of the substation would eliminate the growing risk of overloads and associated load shedding and thereby maintain the overall system reliability in the greater Trumbull area. (UI 1, Vol. I, p. 23)

37. UI presently has no substation located in Trumbull. The Old Town Substation (Old Town) in Bridgeport supplies power to approximately half of Trumbull and the northernmost portion of Bridgeport. The Trap Falls Substation (Trap Falls) in Shelton

serves the easternmost section of Trumbull, the southern half of Shelton and the northernmost section of Stratford. These two substations serve over 95 percent of Trumbull's electric load and are currently operating over or near capacity. (UI 1, Vol. I, p. 23)

38. During the summer of 2005, Old Town had a peak load of 83.3 mega-volt-amperes (MVA), which is 97 percent of its maximum rated capacity of 86.5 MVA. Trap Falls had a peak load of 77.3 MVA in the summer of 2005, which is 101 percent of its maximum rated capacity of 76.5 MVA. Trap Falls is expected to reach 117 percent of its maximum rating by the summer of 2008. (UI 1, Vol. I, p. 5 and 23)

39. UI's design criteria require substations to be built with two transformers. The criteria stipulate that one transformer must be able to carry the load of the substation through one 24-hour load cycle and remain within the transformer rating. The peak load at Trap Falls Substation is currently above the transformer rating, and continues to grow. If one transformer at Trap Falls Substation failed, the remaining transformer would be overloaded. This would require immediate load shedding, which could result in several thousand customers in Trumbull, Shelton, Stratford, and Bridgeport experiencing outages. (UI 1, Vol. I, pp. 5-6)

40. The capacity problems at both Old Town and Trap Falls will increase in severity by the summer of 2007 due to the addition of new customer load, including a 5 megawatt customer on Research Drive in Shelton. Further load increases are expected in the next five years. (UI 1, Vol. I, p. 6)

41. UI has identified the potential for an additional 8 MVA of temporary load transfers from Trap Falls. These measures will need to be taken in the summer of 2007 to transfer load from Trap Falls to other neighboring substations if loads approach their forecast levels. Transferring load in this manner reduces the distribution system's performance and reliability by increased feeder lengths and degrading voltage levels. These temporary measures can allow UI to continue to provide service while the proposed substation is being constructed, but these measures are not sustainable in the long term. (UI 1, Vol. I, p. 8)

42. UI considered several alternatives to building a new substation. These included: distribution load transfers to adjacent substations; replacement of the existing substation transformers with larger units; the installation of a modular substation in the region; distribution automation; distributed generation; and conservation and load management. None of these alternatives would produce the required capacity increase in the greater Trumbull region. (UI 1, Vol. I, p. 8)

Site Alternatives

43. To ensure that the proposed substation location was a viable site, UI reviewed and evaluated a total of sixteen sites. Some of these sites are different locations on the same parcel. (UI 1, Vol. I, pp. 35-53)

44. In its site evaluations, UI used the following criteria to judge a particular location's viability: proximity of transmission to distribution; substation construction and access;

environmental impacts; and availability and cost of real estate. UI prefers to own property rather than lease. (UI 1, Vol. I, pp. 35-53; UI 1, Vol. II, p. 13)

45. The sixteen sites evaluated were: the proposed substation site at 3-7 Wildflower Lane (Site 1); Connecticut Route 8 (Site 2); 2878 Nichols Avenue (Site 3); Huntington Turnpike (Sites 4A and 4B); 1446 Huntington Turnpike (Site 5); Rocky Ridge Drive or Quail Trail (Sites 6A, 6B, 6C, and 6D); 330-336 White Plains Road (Site 7A); 364 White Plains Road (Site 7B); Unity Park (Site 8); Huntington Turnpike (Site 9); 1460 Huntington Turnpike (Site 10); and Quarry Road (Site 11). (UI 1, Vol. I, pp. 39-40)

46. UI determined that the proposed site would be the best site suited for both transmission and distribution system access. Site 1 is the only site that does not require dead end tap structures. (A dead end tap structure is a transmission structure that can structurally support the conductors on one side going slack.) (UI 1, Vol. I, p. 36)

47. Site 1 does not require the acquisition of distribution ductline right of way because it is adjacent to Wildflower Lane. Site 1 also requires the least amount of ductline construction since it is within 300 feet of the existing distribution feeders on Huntington Turnpike. Site 1 also has the lowest combined total transmission and distribution costs of all the evaluated sites. (UI 1, Vol. I, p. 36)

48. UI determined that Site 1 requires the least preparation and development work, as compared to other locations, due to its topography and existing improvements. Site 1 also can be accessed directly from Wildflower Lane and does not require the construction of access roads to the substation. (UI 1, Vol. I, p. 37)

49. UI also prefers Site 1 because no wetlands or streams are on or adjacent to the site. (UI 1, Vol. I, p. 37)

50. UI is current owner of Site 1. All other identified sites require the purchase of property and the acquisition of land rights for the associated right of way. (UI 1, Vol. I, p. 38)

51. UI determined that Site 2, located on DOT property adjacent to the Route 8/Merritt Parkway Interchange, was unsuitable because the topography is not suitable for substation construction and site preparation costs would be extraordinarily high. Access right of way to the site would not provide adequate street frontage width. (UI 1, Vol. II, p. 6)

52. UI determined that Site 3, located on the City Line Florist Property at 2878 Nichols Avenue, was unsuitable because: much of the useable portion of the property is heavily sloped, requiring a substantial amount of site preparation work; a stream traverses the center of the useable portion of the parcel and would have to be diverted; and the property owner expressed no interest in selling the property. (UI 1, Vol. II, p. 7)

53. UI determined that Site 5, located on the Bill Property at 1445 Huntington Turnpike, was unsuitable because: the site is south of the CL&P right of way, requiring a 115-kV crossing tap; the major portion of the southern area of this property is designated inland wetland; the property owner expressed no interest in selling the property. (UI 1, Vol. II, p. 8)

54. UI determined that Site 7B, located on the Chisarik Property on White Plains Road, was unsuitable because: a 250-foot transmission line extension from the CL&P right of way to the site would be required; the transmission line extension would be highly visible from White Plains Road and to surrounding residences; and the general topography consists of extreme slopes. (UI 1, Vol. II, p. 9)

55. UI determined that Site 8, located on the Town Property at Unity Park, was unsuitable because: the substation transmission tap and switchyard would be in the direct vicinity of the Town outdoor recreation facilities; portions of the site are located within a flood plain, requiring added substation grading and increased foundation costs; the useable area is located adjacent to wetlands, ponds and watercourses; and the transmission line crossing and extension to the site would be highly visible to residences. (UI 1, Vol. II, p. 9)

56. UI determined that Site 9, located on DOT property south of the Merritt Parkway, was unsuitable because: the most viable transmission route to the site would extend approximately 1,200 feet from a transmission line tap located within Site 6; a marsh and stream encumber the portion of the property where a substation might be constructed; and approximately 80 percent of the property is located within the boundaries of designated inland wetlands. (UI 1, Vol. II, p. 10)

57. UI determined that Site 10, located on the Armenian Church Property, 1460 Huntington Turnpike, was unsuitable because: routing the double circuit transmission line supply to the site would require the longitudinal occupation of public roadways or the crossing of developed residential properties; due to the significant slope at the rear of the property and the irregular configuration of the site, it would be difficult to place the substation at this site without demolishing the existing church building; the site is located in immediate proximity to a stream and sizeable inland wetland area to the north. (UI I, Vol. II, pp. 11-12)

58. Before deciding on Site 1, UI gave further consideration to the following sites: Site 4 (which includes two placement areas: 4A and 4B), Site 6 (which includes three placement areas: 6A, 6B, and 6C), and site 7A. (UI 1, Vol. II, p. 14; Tr. 1, pp. 20-22).

59. Site 4A is located on Town property on the west side of Huntington Turnpike south of Rocky Ridge Drive. The property is relatively level and mostly wooded, with an adjacent area designated as inland wetlands. The most direct distribution access route would be 800 feet to Huntington Turnpike. The total differential cost (including transmission and distribution) associated with this site relative to Site 1 is $2,117,000. (UI 1, Vol. II, pp. 17-19)

60. Site 4B is located adjacent to site 4A, also on Town property, and the total differential cost (including transmission and distribution) associated with this site relative to Site 1 is $1,441,000. (UI 1, Vol. II, pp. 19-20)

61. Site 6A, 6B, 6C, and 6D are all located on Town property off of Rocky Ridge Drive. This property is heavily wooded, with gentle to moderate slope. The CL&P 1710 and 1730 transmission lines are already on this property. The total differential costs of Sites 6A, 6B, and 6C (including transmission and distribution) associated with this site relative

to Site 1 are $1,557,000, $2,317,000, and $1,434,000, respectively. Site 6D was originally proposed by the Town. (UI 1, Vol. II, pp. 21-26; Town 3; Tr. 1, pp. 20-22)

62. All of the Site 6 properties were ultimately rejected by the Town and are no longer considered viable. (Tr. 4, p. 182; Tr. 1, p. 89)

63. Site 7A is located on the Chisarik Property at 330-336 White Plains Road. The site is flat, level and the northeastern portion is largely wooded. The CL&P 1710 and 1730 transmission lines are already on the property. The site is adjacent to a designated wetland. The total differential cost of Site 7A (including transmission and distribution) relative to Site 1 is $1,861,000. (UI 1, Vol. II, pp. 26-28)

Site 11: Quarry Road

64. UI determined that Site 11, located on the D'Addario Property, Quarry Road, was not suitable because: it would require the installation of two single-circuit deadend structures; differential distribution costs over Site 1 were estimated to be $3,612,000; the site is in the proximity of wetlands and the Pequonnock River; and UI does not own the property. (UI 1, Vol. II, p. 13; UI 14, p. 11)

65. Site 11 is the only site recommended by the Town, WCP, and Mr. Waggner. (Tr. 4, p. 182; Tr. 1, pp. 38-39; Tr. 4, p. 28)

66. Mr. D'Addario has offered to sell the property to UI for $7.5 million. (Town 7; Tr. 4, p. 38)

67. UI has not performed any formal environmental assessments of Site 11, but believes it is located within the 100-year flood plain. (UI 13, response 9)

68. The nearest home is roughly 1,000 feet to the east/southeast of Site 11. (UI 13, response 9)

69. The transmission reliability benefits of the Trumbull Substation project can be achieved at Site 11. (UI 14, p. 1)

70. Achieving a transmission reliability benefit at Site 11 would require relocating the 1730 transmission junction from Site 1 to Site 11. This would require a 115-kV transmission line between Site 1 and Site 11. (UI 14, p. 2)

71. A direct overhead transmission line from Site 1 to Site 11 over CL&P's existing right of way would cost approximately $3,168,182. (UI 14, p. 4)

72. Alternatively, a direct underground transmission line from Site 1 to Site 11 over CL&P's existing right of way would cost approximately $17,670,000. (UI 14, p. 5)

73. As another alternative, an underground transmission line from Site 1 to Site 11 under public roadways would cost approximately $23,720,000. (UI 14, p. 6)

74. Site 11 is not optimally suited to serve future load growth because UI predicts that a significant amount of future load growth will occur to the north and east of the proposed

site. Site 11 would also result in an additional 2.4 miles of distribution feeder exposure for each feeder that is routed in this northeasterly direction. (UI 14, p. 8)

75. Construction of the substation at Site 11 would reduce the Norwalk-Stamford transfer capacity by connecting to CL&P's 1730 line. This is an area of concern until the Middletown-Norwalk (M-N) project is completed. The M-N project is not expected to be complete until late 2009, which is estimated to be two years after the proposed substation is to be in service. (CL&P 1)

76. Considering the high costs of relocating the 1730 transmission junction, under any option, UI would not construct the system reliability benefit part of the proposed project if it were to be sited at Site 11. Further studies would be performed and a new project at Site 1 would likely be proposed to achieve this benefit. (UI 14, p. 6)

Description of Proposed Project

77. The proposed project would be located on a 4.85 acre parcel of land zoned Residence AA and located at 3-7 Wildflower Lane, Trumbull, immediately west of the Connecticut State Route 8/Nichols Avenue (Route 108) interchange. The property is situated on a cul-de-sac at the easterly terminus of Wildflower Lane within a triangular area bounded by Huntington Turnpike, Nichols Avenue and Route 8 in Trumbull. The junction of UI's 1710 and 1730 transmission lines with CL&P's 1710 and 1730 lines occurs at this site. (UI 1, Vol. I, pp. 2, 14, 63)

78. There are currently two transmission structures on the site that include two sets of motor-operated disconnect switches. Over half of the proposed site is within UI's existing transmission line right of way. UI's existing transmission line right of way and switch support structure border the eastern section of the site. UI's right of way is 200 feet wide and supports its 115-kV transmission lines (1710 and 1730) on a double circuit monopole structure in a vertical configuration and a double circuit lattice structure in a horizontal configuration. CL&P's existing transmission line right of way borders the northern portion of the site. CL&P's right of way is 110 feet wide and supports CL&P's 115-kV transmission lines (1710 and 1730) on lattice structures in a vertical configuration. (UI 1, Vol. I, p. 14)

79. The proposed substation would consist of an outdoor, air-insulated, low profile 115-kV switchyard and includes the following equipment: two 24/32/40 MVA, 115/13.8-kV power transformers with load tap changers; one 13.8-kV bus duct system connected to the power transformers; low profile 115-kV aluminum tubular bus work supported by station post insulators; three 115-kV SF_6 gas insulated circuit breakers; five vertical break disconnect switches; six center break disconnect switches; instrument transformers; three tubular steel H-frame takeoff structures within the fenced switchyard; miscellaneous steel structures for equipment and bus work support to be installed on concrete-filled drilled pier foundations; five shielding masts for lightning protection; one control/switchgear building; and two single pole tubular steel dead-end structures. (UI 1, Vol. I, p. 15)

80. UI proposes to erect a single-story prefabricated control/switchgear building on the western edge of the proposed site. The 13.8-kV metal-clad switchgear, the protection, control and metering equipment and the alternating current and direct current power equipment would be located in the control/switchgear building. The building would be

approximately 15-feet high above grade. The building, transformers, circuit breakers, and station post insulators will be specified with an American National Standards Institute light gray exterior color. (UI 1, Vol. I, p. 15)

81. The proposed substation's lightning shielding masts would extend approximately 55 feet above grade, and the takeoff structures would extend approximately 48 feet above grade. The three takeoff structures would be designed as tubular steel H-frame structures. The switchyard high voltage (115-kV) bus would be approximately 26 feet above grade. A new single pole tubular steel dead-end structure, located within the substation fenceline, would be approximately 75 feet above grade. A second new single pole tubular steel dead-end structure would be approximately 85 feet above grade and would be located within CL&P's existing transmission line right of way. (UI 1, Vol. I, p. 16)

82. No additional right of way or other property acquisition would be required to complete the proposed substation. The configuration of the UI 1710 line would remain unchanged. (UI 1, Vol. I, p. 16)

83. The proposed site is located at the junction of CL&P's east/west section and UI's north/south section of the 1730 line. This makes it possible to break down the existing three-terminal 1730 line (routed to Devon, Pequonnock, and Weston) into three two-terminal lines without significant investment in new transmission infrastructure. Sectionalizing the transmission line in this new way creates an alternative power flow, providing several reliability benefits. (UI 1, Vol. I, pp. 17-18)

84. Exposure to outages would be reduced for roughly half of the customers fed from the proposed substation by reducing transmission line exposure from 20.4 miles to 12.6 miles. (UI 1, Vol. I, p. 17)

85. Opportunities would increase to conduct maintenance on the greater Trumbull area 115-kV lines without unacceptably impairing the capacity or reliability of the system. (UI 1, Vol. I, p. 18)

86. Power quality would be improved for customers served by the 1730 line. (UI 1, Vol. I, p. 20)

87. The existing UI 1730 transmission line would be routed into and out of the substation, and the proposed change would be accomplished by adding 115-kV breakers at the north-south and east-west junction of the 1730 line. The new lines would be re-numbered after the substation is completed. The substation would have a three-position ring bus fed by three 115-kV transmission lines. Line 1714 to Weston and line 1730 from Devon (Milford) would enter the substation from the north, and the line 1713 to Pequonnock (Bridgeport) would enter the substation from the south. (UI 1, Vol. I, p. 18)

88. From the existing tap structure (833A) in CL&P"s right of way, CL&P's 1730 transmission line would be routed south for approximately 115 feet to one of the two proposed take-off structures inside the substation. The line would be routed through a circuit breaker and then exit the substation from the second takeoff structure. To reconnect to CL&P's transmission line, the line would span approximately 115 feet from the north takeoff structure to the new single pole tubular steel dead-end structure (833B) to be located within the CL&P right of way. (UI 1, Vol. I, pp. 18-19)

89. The nearest leg and foundation of CL&P's Trumbull Junction tap structure No. 833A is approximately 48 feet from the fence line of the proposed substation. (UI 1, Vol. II, Exhibit L)

90. UI's 1730 line would exit the substation from the southeast takeoff structure and span approximately 80 feet to UI's existing right of way via a new single pole tubular steel dead-end structure (NB 31A). (UI 1, Vol. I, p. 19)

91. Both the CL&P 1730 line and the UI 1730 line would transition from a vertical configuration to a horizontal configuration as the lines approach the substation's north takeoff structures. (UI 1, Vol. I, p. 19)

92. The proposed substation would have a "loop through" design in a ring bus configuration. The three shorter transmission lines would be created. This would improve power quality to customers served by the 1730 line, improve power flows during maintenance and contingency conditions, and provide UI and CL&P with more frequent opportunities to perform line maintenance. (UI 1, Vol. I, p. 20)

93. The substation would be designed for use of a mobile transformer in the event of the loss of one of the transformers. The substation would not be designed for a third transformer. (Tr. 3, p. 153)

94. The substation would be designed with provisions for ten distribution feeders. Initially, four of these would exit the proposed site in underground ductline onto Wildflower Lane. The ductline would continue north on Huntington Turnpike and tie into existing ductline that crosses the Merritt Parkway. (UI 8, response 1)

95. The protective relaying and related equipment, as well as a Supervisory Control and Data Acquisition (SCADA) system for remote control and equipment monitoring, would be located in the switchgear and control house, and would be monitored from a remote location. (UI 1, Vol. I, p. 20)

96. The service life of the substation equipment is expected to be 40 years or more. (UI 1, Vol. I, p. 21)

97. The proposed substation would be accessed directly from Wildflower Lane. Two 80-foot long access drives are proposed, because if a mobile transformer were to be needed in an emergency, the truck would need to be able to drive in and drive out. The mobile transformer truck is the size of a tractor-trailer, and it would be very difficult to back into the proposed substation. (UI 1, Vol. I, p. 37; Tr. 3, pp. 83-85, 153)

98. Access from Nichols Avenue currently exists over DOT property. UI has an easement across the property. The existing drive has an eight percent grade. A significant amount of work in re-grading the area would be required to utilize this access and to permit the mobile transformer to be driven in and out. (Tr. 3, pp. 105-107)

99. UI has evaluated three alternative access designs:

- Enter and exit from Nichols Avenue. This eliminates both entrances at Wildflower Lane. However, it would require 20 feet of vegetation to the north

and 20 feet of trees to the south to be removed. It would also require an additional easement from the DOT. The cost differential is approximately $278,000.

- Enter from Nichols Avenue and exit from Wildflower Lane. This eliminates one entrance on Wildflower Lane. However, it would require 20 feet of trees to the south to be removed. The cost differential is approximately $328,000.

- Enter from Nichols Avenue and exit from Wildflower Lane and move the substation 20 feet to the north. This eliminates one entrance on Wildflower Lane. However, it would require 20 feet of vegetation to the north to be removed. The cost differential is approximately $328,000. (UI 15, p. 18; Tr. 4, p. 87)

100. The Town prefers the Nichols Avenue access. (Tr. 4, p. 170)

101. The proposed substation would have a footprint approximately 335 feet by 200 feet. (UI 6, p. 2)

102. The tentative in-service date would be December 31, 2007. (UI 1, Vol. I, p. 83)

103. There are 40 residences within 1,000 feet of the proposed site. The nearest occupied residence is 220 feet west of the proposed site on Wildflower Lane. (UI 1, Vol. I, p. 70; UI 4, response 2)

104. The estimated construction cost of the proposed facility is:

Materials & Equipment	$9,049,000
Permitting, Engineering and Construction Management	$2,481,000
Construction	$5,770,000
Total	$17,300,000

(UI 1, Vol. I, p. 21)

105. UI has determined that the proposed substation could be shifted a maximum of 20 feet north if required by the Council. This would still comply with CL&P's clearance standard of 25 feet to the base of CL&P's transmission structures. (UI 14, p. 12)

106. Any alternative relocation on Site 1 to the north onto the CL&P easement cannot exceed 20 feet. (UI 15, p. 11)

107. Movement of a portion of the site into the CL&P right of way limits the available access and lift-vehicle working space between CL&P's tap structure No. 833A and the proposed substation. (UI 15, p. 11)

108. UI would have to develop with CL&P an agreement for the construction on CL&P's right of way of a new transmission dead-end pole structure and new line conductors. The scope of this agreement must be expanded if any portion of UI's substation were to extend onto CL&P's right of way. Any relocation of fenced substation area into CL&P's right of way is limited by line clearances, physical construction limitations, and

operational and maintenance limitations. (CL&P 1, p. 3; Tr. 3, pp. 121-123; Tr. 4, p. 152)

109. UI also evaluated alternative design configurations to minimize effects on the surrounding environment, particularly the visual impacts.

- Option A involves the construction of an architectural wall around all sides of the substation. The incremental cost of this configuration over UI's proposed configuration is $1,200,000.

- Option B involves the construction of the architectural wall around the substation and also includes the use of indoor gas-insulated substation (GIS) technology. The 115-kV substation equipment would be enclosed by a building on all sides to minimize the visual impacts. The incremental cost of this configuration over UI's proposed configuration is $3,100,000.

- Option C involves GIS equipment surrounded by a building that resembles a barn, along with a 14' high chain link fence. The 115-kV substation equipment would be enclosed inside the barn. The transformers would be located outside the barn. The incremental cost of this configuration is $2,300,000. (UI 1, Vol. I, pp. 77-78; Tr. 3, p. 165)

110. While the Town and the WCP do not support the proposed site, if the substation were approved at that site, the Town and WCP would prefer the barn design outlined in Option C, plus the architectural wall mentioned in Option A. (UI 1, Vol. I, pp. 77-78; Tr. 1, p. 26-27; Tr. 4, p. 171)

111. UI currently has no plans to add to or enhance the transmission or distribution infrastructure capability of the proposed substation within the next ten years. (UI 13, response 1)

Environmental Considerations

112. The Connecticut Commission on Culture and Tourism (formerly the Connecticut Historical Commission) has indicated that the proposed undertaking would have no effect on historic, architectural or archaeological resources listed on or eligible for the National Register of Historic Places. (UI 1, Vol. I, p. 72)

113. In the event prehistoric archaeological and/or historic resources were discovered during the construction of the substation, UI would stop work in the immediate area and notify the State Historic Preservation Officer. (UI 1, Vol. I, p. 72).

114. There are no known existing populations of federal or state endangered or threatened species, or any state special concern species at the proposed site. (UI 1, Vol. I, p. 68)

115. No regulated wetlands were identified on the proposed site. (UI 1, Vol. I, p. 56)

116. Approximately 60 trees with a diameter at breast height of six inches or greater would be removed for the proposed substation and access roads. (UI 4, Response 10)

117. UI would plant evergreens at the substation fence line for screening. UI is willing to work with surrounding residents to determine the type of plantings. (Tr. 3, pp. 142-144)

118. The proposed project would require approximately 450 cubic yards of cut and 1,800 cubic yards of fill. (UI 4, response 11)

119. After construction is complete, UI would landscape and re-vegetate to prevent soil erosion, provide screening and enhance the area's appearance. (UI 1, Vol. I, pp. 67-68)

120. Construction and operation of the proposed substation would not affect watercourses. (UI 1, Vol. I, p. 69)

121. Groundwater is probably non-existent or located at a significant depth, based on the shallow depth to bedrock. (UI 1, Vol. I, p. 55)

122. There are no designated floodplains in the vicinity of the proposed site. (UI 1, Vol. I, p. 67)

123. The nearest state-designated scenic road is the Merritt Parkway, which is located approximately 1,800 feet from the proposed substation property line. (UI 4, response 3)

124. No parks, designated recreational open spaces, or open space areas maintained by Trumbull or the state either abut or are located near the proposed site. Abraham Nichols Memorial Park, the closest recreation facility to the substation site, is approximately 0.8 miles north of the site. (UI 1, Vol. I, p. 60)

125. The proposed substation would meet the Town's noise ordinance, which specifies a limit of 55 dBA for daytime and 45 dBA for nighttime areas zoned Residence AA. The ordinance is more restrictive than the state's noise regulations. With low noise transformers, the substation would meet Trumbull's noise ordinance. (UI 1, Vol. I, p. 65)

126. If the proposed substation is shifted 20 feet to the north, the noise levels at the 1500 Huntington Turnpike property would increase from 41.6 dBA to 42.6 dBA. At 6 Wildflower Lane, the noise levels would decrease from 40.9 dBA to 40.0 dBA. At 45 Stella Street, the noise levels would decrease from 39.0 dBA to 38.3 dBA. (UI 14, p. 12)

127. An architectural wall around the proposed substation would result in a noise reduction in all directions. Specifically, the residence at 6 Wildflower Lane would experience a noise reduction of approximately 5 dBA. The residence at 45 Stella Street would experience a noise reduction of approximately 3 dBA. (Tr. 3, pp. 165, 198-199)

128. The barn option would not affect noise because the transformers would still be located outside. (Tr. 3, pp. 165-166)

129. Impulse noise, though rare, would be emitted from the 115-kV circuit breakers in response to system faults or transmission switching operations. The impulse noise level is 101 dBA. While these operations could occur at any time, UI expects the circuit breakers to operate fewer than five times per year, including maintenance operations. (UI 4, response 7)

130. The substation would have sufficient lighting to ensure that emergency work could proceed during nighttime or inclement weather. The lighting would generally be turned off. Routine, outdoor work at the substation would generally be scheduled for daylight hours. (UI 1, Vol. I, p. 20)

131. The transformers would be filled with non-polycholorinated biphenyl (non-PCB) mineral oil. UI would construct an oil containment pit around each transformer, which would be designed to contain 110% of the volume of transformer oil. (UI 1, Vol. I, p. 77)

132. The proposed substation would contain two banks of lead acid batteries. Each bank would be stored within a stationary rack. Each rack would be placed within an acid resistant drip tray that contains an acid neutralizing material to contain and neutralize any potential release from the batteries. UI would routinely inspect, test, and replace substation batteries. (UI 4, Response 4)

133. UI has no plans to install an emergency generator at the proposed substation because it would have battery backup power. (UI 4, Response 13)

134. UI would install erosion controls at the limits of the work area in accordance with the approved project plans, the Development and Management (D&M) Plan and the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*. (UI 1, Vol. I, p. 76)

135. No blasting would be required during the proposed substation construction. UI would utilize rock augers and/or jack hammers when rock needs to be removed. (UI 4, response 5)

136. The tallest structure inside the proposed substation would be a new 76-foot transmission structure. The tallest structure for the entire project would be an 85-foot transmission structure to be located in the CL&P right of way. (UI 1, Vol. I, p. 16; UI 6, p. 2; UI 4, response 14)

Visibility

137. Two residences located north of the existing CL&P right of way would have unobstructed year-round views of the proposed substation. One of those residences would have an unobstructed view of a new transmission structure. (UI 1, Vol. I, p. 73)

138. One residence on Wildflower Lane would have a seasonal obstructed view of the proposed substation. (UI 1, Vol. I, p. 73)

139. The residence to the northeast of the substation would have seasonal obstructed view of the proposed substation. (UI 1, Vol. I, p. 73)

140. To the south of the proposed substation, residences and visitors to the Armenian Church of the Holy Ascension would have seasonal obstructed views of the tops of some structures of the substation. (UI 1, Vol. I, p. 73)

141. The substation is not expected to be visible to motorists on Huntington Turnpike or the Merritt Parkway. (UI 1, Vol. I, p. 73)

142. Motorists on Nichols Avenue and the travel lanes and entry/exit ramps of Route 8 would have seasonal views of the substation. These would be similar to existing views of CL&P and UI transmission lines and the UI switch structure. (UI, 1, Vol. I, p. 73-74

Electric and Magnetic Field Levels

143. The primary sources of electric and magnetic fields (EMFs) at the proposed site are the existing transmission lines. (UI 1, Vol. I, p. 80; UI 1, Vol. II, p. 36; UI 4, response 17; Tr. 3, pp. 82-83, 115, 140)

144. Background magnetic levels are typically found in a range of from less than 10 mG to higher, depending on the source. (Tr. 3, p. 22)

145. The Bethel to Norwalk Project became operational on October 25, 2006. UI anticipates that the Middletown to Norwalk Project would be operational by December 2009. (Tr. 3, p. 20)

146. The proposed substation would cause the following changes in the magnetic field levels:

a) The maximum magnetic field along the entire fence line (points C-1 to C-8) is expected to be, after the Middletown/Norwalk project is operational, 41.8 mG for a normal load and 50.1 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk project was 76.3 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 51.0 mG for a normal load and 89.6 mG for a peak load.

b) The magnetic field along the driveway (point D-1) is expected to be, after Middletown/Norwalk, 1.0 mG for a normal load and 1.7 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 1.1 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 1.4 mG for a normal load and 2.5 mG for a peak load.

c) The magnetic field at the edge of the CL&P easement (point D-2) is expected to be, after Middletown/Norwalk, 15.3 mG for a normal load and 25.1 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 24.4 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 23.7 mG for a normal load and 40.9 mG for a peak load.

d) The magnetic field at the edge of the CL&P easement (point D-3) is expected to be, after Middletown/Norwalk, 11.8 mG for a normal load and 19.5 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 21.0 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 18.2 mG for a normal load and 32.1 mG for a peak load.

e) The magnetic field at the edge of the CL&P easement (point D-4) is expected to be, after Middletown/Norwalk, 3.8 mG for a normal load and 10.6 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 3.9 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the

magnetic field was calculated to be 7.5 mG for a normal load and 19.6 mG for a peak load.

f) The magnetic field at the northernmost property line of 39 Stella Street (point D-5) is expected to be, after Middletown/Norwalk, 0.2mG for a normal load and 0.3 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 0.2 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 0.3 mG for a normal load and 0.6 mG for a peak load.

g) The magnetic field at the northernmost property line of 45 Stella Street (point D-6) is expected to be, after Middletown/Norwalk, 0.3 mG for a normal load and 0.5 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 0.3 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 0.5 mG for a normal load and 0.8 mG for a peak load.

h) The magnetic field at the northernmost property line of 52 Stella Street (point D-7) is expected to be, after Middletown/Norwalk, 0.9 mG for a normal load and 1.0 mG for a peak load. In comparison, the existing condition prior to Bethel/Norwalk was 0.4 mG, and, post-Bethel/Norwalk but prior to Middletown/Norwalk (the actual current condition), the magnetic field was calculated to be 1.2 mG for a normal load and 1.3 mG for a peak load. (UI 14, p. 14; UI 1, Vol. II, Exh. F, p. 32; UI 6, p. 10; UI 9, response 10).

147. The magnetic fields resulting from the existing transmission lines and proposed substation would be less at the residence at 6 Wildflower Lane than at the driveway (point D-1), since the residence is located approximately 120 feet farther away from the source on the other side of Wildflower Lane. The nearest abutting property to the proposed substation on Stella Street is approximately 225 feet from the substation fenceline. Since magnetic fields decreases with distance from the source, the magnetic field at this Stella Street location would be less than that on Wildflower Lane. (UI 4, response 17).

148. The proposed substation is not predicted to increase the magnetic fields at any of the abutting residences. (UI 4, response 17)

149. Shifting the substation north 20 feet would result in no increase in magnetic fields over existing levels for points D-2 and D-3 before the Middletown to Norwalk Project is complete. After the Middletown to Norwalk Project is complete, the 20-foot shift would result in no increase in magnetic field levels over existing levels for points D-1, D-2, D-3, D-4, D-5, and D-6 (UI 14, p. 14)

150. The GIS design would result in lower magnetic fields at the substation fence line due to the more compact design. However, at distances of 10 to 20 feet from the fence line, whether the substation were GIS or had an air insulated design would not be a factor since the transmission line magnetic fields would dominate. (Tr. 3, pp. 38-39)

151. An architectural fence would not affect magnetic field levels. (Tr. 3, p. 111)

152. The barn would be made of metal panels, which could reduce magnetic fields slightly. (Tr. 3, p. 66)

153. The UI transmission lines are reverse-phased from the Trumbull Junction to Pequonnock. The CL&P lines are not. (Tr. 3. p. 120; Tr. 4, pp 189-190)

154. The magnetic field levels due to the proposed project would be further reduced (by 50% or more at the CL&P ROW edges) when CL&P implements an optimal phasing project for the 115-kV lines passing by the site. CL&P would likely do so when UI connects the new substation to the existing CL&P transmission lines. (Tr. 4, pp. 189-190, 211-212)

155. The proposed substation's design is consistent with the Siting Council's 1993 Best Management Practices for Electric and Magnetic Fields. (UI 1, Vol. I, p. 79).

Safety and Reliability

156. The proposed substation would be equipped with protective relaying equipment to automatically detect irregular system conditions and send a protective trip signal to the circuit breakers at each end of the line to segregate a faulted section. The protective relaying measures incorporate fully redundant primary and backup equipment. (UI 1, Vol. I, p. 20)

157. Two separate sources of alternating current (AC) station service would be provided to the proposed substation. If both sources of AC station service were lost, two sets of batteries in the substation control house would provide backup power for control equipment. (UI 4, response 13)

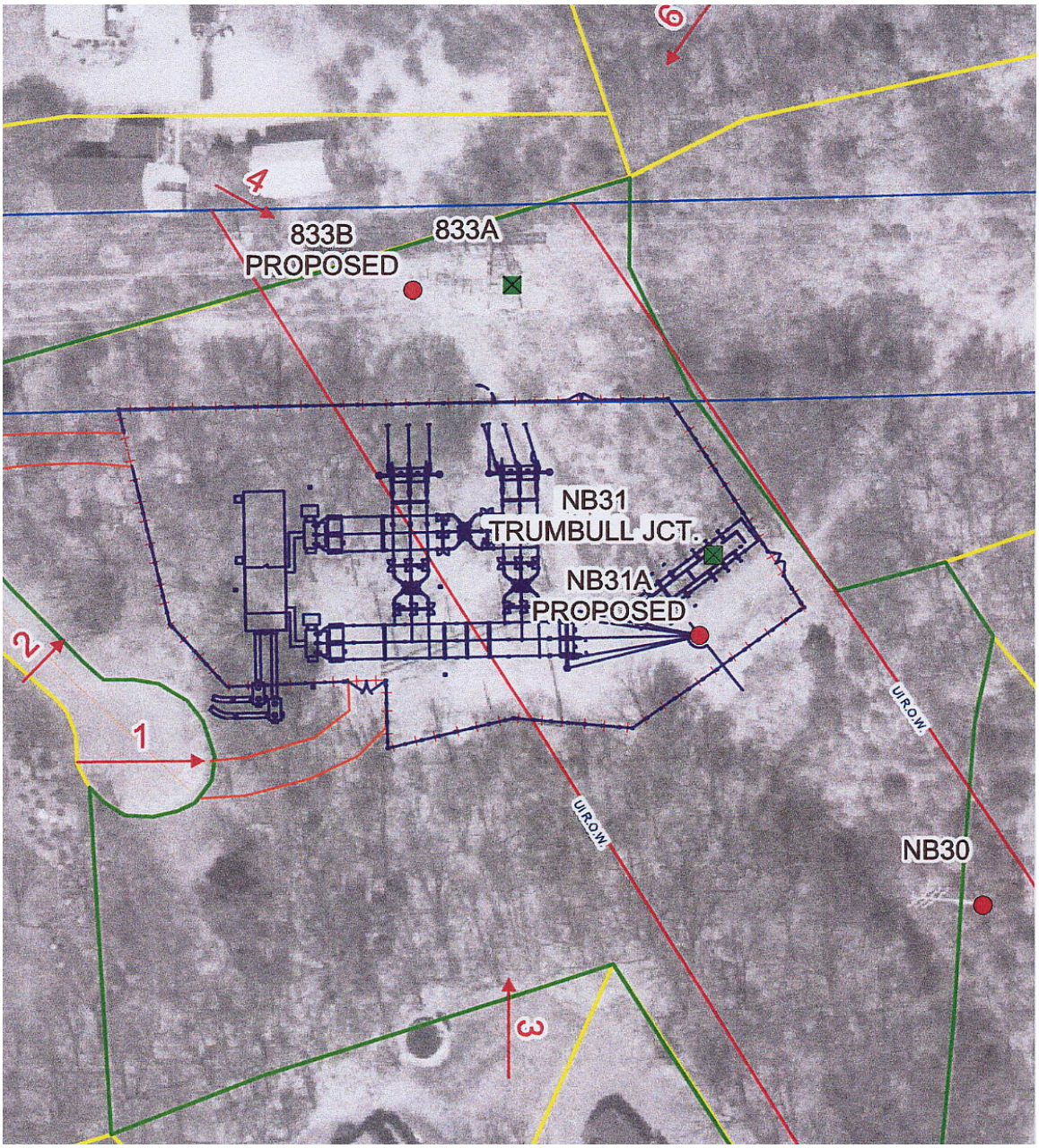
158. Smoke detectors would be installed in the switchgear and control house, and would be monitored from a remote location. The control house would be equipped with fire extinguishers. (UI 1, Vol. I, p. 20)

159. The proposed substation would be installed within a 14-foot high chain-link fence with one foot of barbed wire located at the top and slanted on a 45 degree angle. The substation would also be equipped with security cameras and motion detectors so UI can monitor unauthorized access to the substation. (UI 1, Vol. I, pp. 20-21; UI 4, response 16)

160. UI has several existing substations (and one currently under construction) that are located in or adjacent to residential areas. The Singer Substation in Bridgeport, which is currently under construction, is located 50 feet from a home. Hawthorne Substation in Fairfield shares a driveway with an existing home. Mix Substation in Hamden, Old Town Substation in Bridgeport, and Trap Falls Substation in Shelton are all located in residential areas. (Tr. 3, pp. 181-182)

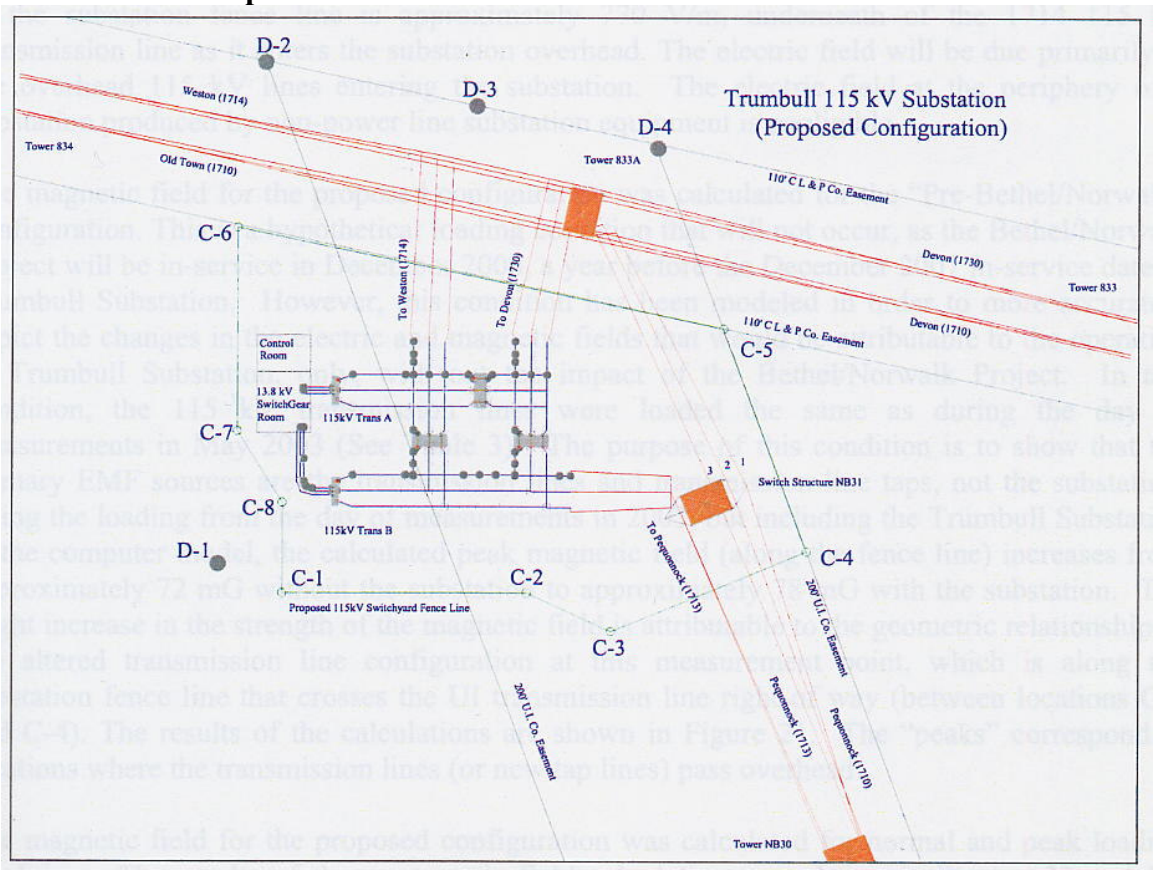
161. UI is not aware of any unauthorized individuals entering its substations and being injured in the past 36 years. (Tr. 3, p. 182)

Location Map



(UI 1, Vol. II, Exh. L)

Map of Locations for EMF Calculations/Measurements



(UI 16, p. 25)