STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
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Daniel F. Caruso
Chairman

February 10, 2010

TO: Parties and Intervenors

FROM: S. Derek Phelps, Executive Director

RE: **DOCKET NO. 370** – Consolidated proceeding pursuant to the Connecticut Energy Advisory Board (CEAB) Request for Proposal (RFP) process under C.G.S. §16a-7c. **Original application:** The Connecticut Light & Power Company application for Certificates of Environmental Compatibility and Public Need for the Connecticut Valley Electric Transmission Reliability Projects which consist of (1) The Connecticut portion of the Greater Springfield Reliability Project that traverses the municipalities of Bloomfield, East Granby, and Suffield, or potentially including an alternate portion that traverses the municipalities of Suffield and Enfield, terminating at the North Bloomfield Substation; and (2) the Manchester Substation to Meekville Junction Circuit Separation Project in Manchester, Connecticut. **Competing application**: NRG Energy, Inc. application pursuant to C.G.S. §16-50*l*(a)(3) for consideration of a 530 MW combined cycle generating plant in Meriden, Connecticut.

After the Council issues its draft findings of fact, parties and intervenors may identify errors or inconsistencies between the Council's draft findings of fact and the record; however, no new information, evidence, argument, or reply briefs will be considered by the Council.

Parties and Intervenors may file written comments with the Connecticut Siting Council on the Draft Findings of Fact issued on this docket by noon on Wednesday, February 17, 2010.

SDP/laf

Enclosure

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NOTICE OF SERVICE

I hereby affirm that a photocopy of this document was sent to each Party and Intervenor on the service list dated November 13, 2009 with method of service to each party and intervenor listed via either e-mail or hard-copy on February 10, 2010.

Dated: February 10, 2010

Lisa Fontaine
Custodian of Docket No. 370

DOCKET 370 – Consolidated proceeding pursuant to the Connecticut Energy Advisory Board (CEAB) Request for Proposal (RFP) process under C.G.S. §16a-7c. **Original application:** The Connecticut Light & Power Company application for Certificates of Environmental Compatibility and Public Need for the Connecticut Valley Electric Transmission Reliability Projects which consist of (1) The Connecticut portion of the Greater Springfield Reliability Project that traverses the municipalities of Bloomfield, East Granby, and Suffield, or potentially including an alternate portion that traverses the municipalities of Suffield and Enfield, terminating at the North Bloomfield Substation; and (2) the Manchester Substation to Meekville Junction Circuit Separation Project in Manchester, Connecticut. **Competing application**: NRG Energy, Inc. application pursuant to C.G.S. §16-50*l*(a)(3) for consideration of a 540 MW combined cycle generating plant in Meriden, Connecticut.	Connecticut Siting Council February 4, 2010

DRAFT Findings of Fact

INTRODUCTION

1. Pursuant to Connecticut General Statutes (CGS) §16-50g et seq., on October 20, 2008, The Connecticut Light and Power Company (CL&P) applied to the Connecticut Siting Council (Council) for Certificates of Environmental Compatibility and Public Need (Certificate) for the construction, operation and maintenance of the Connecticut portion of "The Connecticut Valley Electric Transmission Reliability Projects." These projects include the Greater Springfield Reliability Project (GSRP) and the Manchester to Meekville Junction Circuit Separation Project (MMP). The proposed CL&P project was assigned as Docket No. 370A. (CL&P 1, Vol. 1, p. ES-1)

2. Pursuant to CGS §16-50*l*(a)(3), on March 19, 2009, NRG Energy, Inc. (NRG) submitted an application to the Council for consideration of a 540 megawatt (MW) (nominal) combined cycle generating plant located off South Mountain Road in Meriden, Connecticut (the Meriden power facility) as a competing project to the GSRP/MMP proposed by CL&P in Docket 370A. The NRG proposal was assigned as Docket No. 370B. NRG proposed the Meriden power facility following review of the project by the Connecticut Energy Advisory Board (CEAB) pursuant to CGS § 16a-7c. (NRG 1, pp. 1, 12)

3. Pursuant to CGS §16a-7c, the Council designated the consolidated proceeding Docket 370. Docket 370 consists of Docket 370A and Docket 370B. (record)

4. The proposed GSRP involves the siting of facilities in both Connecticut and Massachusetts, which requires a decision by both state siting authorities. The Western Massachusetts Electric Company (WMECO) proposed the Massachusetts component of the GSRP to the Massachusetts Energy Facilities Siting Board (EFSB). The Massachusetts EFSB has jurisdiction of siting the Massachusetts portion of the proposed project. (CL&P 1, Vol., 1, pp. ES-18, ES-21)

5. CL&P and WMECO are wholly-owned subsidiary operating companies of Northeast Utilities (NU). The Northeast Utilities Service Company (NUSCO) is another wholly-owned subsidiary of NU that provides centralized and coordinated management and technical services to NU companies. (CL&P 1, Vol. 1, p. ES-1)

6. Parties and Intervenors to these proceedings include CL&P (the Applicant), NRG (the Competing Applicant), Connecticut Attorney General Richard Blumenthal, Town of East Granby, Town of Suffield, ISO New England Inc. (ISO-NE), Connecticut Office of Consumer Counsel (OCC), ICE Energy, Inc., Town of Enfield, City of Meriden, The United Illuminating Company (UI), the Connecticut Energy Advisory Board (CEAB), Connecticut Department of Transportation (CDOT), Farmington River Watershed Association, Citizens Against Overhead Power Line Construction (CAOPLC) and the Massachusetts Municipal Wholesale Electric Company (MMWEC). (Record)

7. Pursuant to CGS §16-50*l*(b), CL&P provided service and legal notice of the application. This included notice to municipalities through which the proposed project and alternative traverse; municipalities within 2,500 feet of the proposed line; federal, state, local and regional agencies, and elected officials; published notice in The Hartford Courant and The Journal Inquirer on September 12, September 16, 2008, October 8 and October 10, 2008; and a separate "Notice of Proposed Construction of a High Voltage Electric Transmission Line" included in one or more monthly bills to CL&P customers within Bloomfield, East Granby, Enfield, Manchester and Suffield. (CL&P 1, October 20, 2008 filing of notice)

8. Pursuant to CGS §16-50*l*(e), on June 16, 2008, CL&P provided draft application documents to the Chief Elected Official of the four towns that may potentially be affected by the proposed project, as well as the four towns located within 2,500 feet of the proposed project. The GSRP may traverse Bloomfield, East Granby, Suffield and Enfield. Granby, Simsbury, Somers and South Windsor are within 2,500 feet of the proposed route. The proposed MMP would be located entirely within Manchester. (CL&P 1, Vol. 1, Section II, p. 3; CL&P 2, CL&P Affidavits, October 28, 2008)

9. During the municipal consultation process three "open houses" were held in Connecticut including:
   - Tuesday, June 24, 2008 in Suffield
   - Wednesday, June 26, 2008 in East Granby
   - Thursday, June 26, 2008 in Enfield

   (CL&P 5, R. CSC-046)

10. Each open house consisted of four information stations. The first station provided visitors with project information, an explanation on how to participate in the siting process and a Route Locator that allowed residents to find the transmission line route on Google Earth maps. The second station included information on the need for the GSRP/MMP due to electricity demand. The third station included photosimulations of the proposed structures, and information on the construction process. The fourth station included environmental management of the transmission line right-of-way (ROW); an electric and magnetic field (EMF) video; and specific information on how the project would affect existing easements on properties. (CL&P 5, R. CSC-046)

11. Pursuant to CGS §16-50*l*(b), CL&P provided notice to landowners abutting the North Bloomfield Substation in Bloomfield. Community organizations and water companies were also provided notice consistent with the Council's Application Guide for Terrestrial Electric Transmission Line Facilities. (CL&P 1, October 20, 2008 filing of notice)

12. In accordance with CGS §16-50*l*(b), NRG provided service and notice of its application. A copy of the application was sent to municipal officials of the City of Meriden, Town of Berlin, state and federal officials and agencies, and community organizations. Notice of the application was sent to all abutting landowners and published in the Hartford Courant on March 18 and 19, 2009. (NRG 1, Tab D)

13. NRG did not consult with the City of Meriden and Town of Berlin 60 days prior to the filing of its application as specified in CGS §16-50*l*. NRG provided its application to the municipalities on March 19, 2009, which is the same day as filing its application with the Council. The City of Meriden waived its right for a municipal consultation. NRG met with Town of Berlin officials on April 20, 2009 to discuss the application. The Town of Berlin left it up to the Council to determine the completeness of the application. (Record)

14. Pursuant to General Statutes §16-50j (h), on April 28, 2009 and December 21, 2009, the following state agencies were requested to submit written comments regarding the proposed GSRP/MMP and the Meriden Power Facility: Department of Environmental Protection (DEP); Department of Agriculture (DOA); 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 CDOT. (Record)

15. On June 24, 2009, the CDOT submitted comments pertaining to Docket 370B. The DEP provided comments on Docket 370A on July 15, 2009. The DPH provided comments on Docket 370A on October 8, 2009. The United States Department of the Interior, National Park Service, submitted comments regarding Docket 370A dated July 28, 2009. (State Agency Comments, CDOT comments, dated June 24, 2009; DEP comments dated July 15, 2009; DPH comments dated October 8, 2009; Federal Agency Comments, U.S. Department of the Interior, National Park Service comments, dated July 28, 2009)

16. Pursuant to CGS §16-50m, the Council held public hearings for citizen comment on June 9, 2009 at the East Granby Community Center, East Granby; June 11, 2009 at the Suffield High School, Suffield; June 16, 2009 at the Lincoln Center, Manchester; and June 25, 2009 at Lincoln Middle School, Meriden. Each hearing commenced at approximately 6:30 p.m. (Transcript 1, June 9, 2009 [Tr. 1], p. 6; Transcript 2, June 11, 2009 [Tr. 2], p. 6; Transcript 3, June 16, 2009 [Tr. 3], p. 6; Transcript 4, June 25, 2009 [Tr. 4], p. 6)

17. The Council and its staff conducted public field reviews of the proposed Northern Route, the Southern Route Alternative, the MMP and the Meriden Power Plant. Each of the public field reviews was held on the same day as the public hearing in the associated municipality. (Council Hearing Notice)

18. The Council held public evidentiary hearings on July 21, 22, 28, and 29, 2009; August 13, 2009; September 2, 2009; October 21, 22, 27, and 28, 2009; and November 4, and 5, 2009 at Central Connecticut State University, Institute of Technology and Business Development, 185 Main Street, New Britain, Connecticut. The Council also held a limited joint evidentiary hearing with the Massachusetts Energy Facilities Siting Board (EFSB) on September 22, 2009 to hear evidence relating to the environmental impacts and relative costs and reliability concerns of the Northern and Massachusetts Southern Route Alternative, exclusive of need. The joint hearing with the Massachusetts EFSB was held at the Crowne Plaza Hotel, 1 Bright Meadow Boulevard, Enfield, Connecticut. (Transcript 5, July 21, 2009 [Tr. 5], p. 6; Transcript 6, July 22, 2009 [Tr. 6], p. 6; July 28, 2009 [Tr. 7], p. 6; Transcript 8, July 29, 2009 [Tr. 8], p. 6; Transcript 9, August 13, 2009 [Tr. 9], p. 6; Transcript 10, September 2, 2009 [Tr. 10], p. 6; Transcript 11, September 22, 2009 [Tr. 11], p. 8, 9; Transcript 12, October 21, 2009 [Tr. 12], p. 6; Transcript 13, October 22, 2009 [Tr. 13], p. 6; Transcript 14, October 27, 2009 [Tr. 14], p. 6; Transcript 15, October 28, 2009 [Tr. 15], p. 6; Transcript 16, November 4, 2009 [Tr. 16], p. 6; Transcript 17, November 5, 2009 [Tr. 17], p. 6)

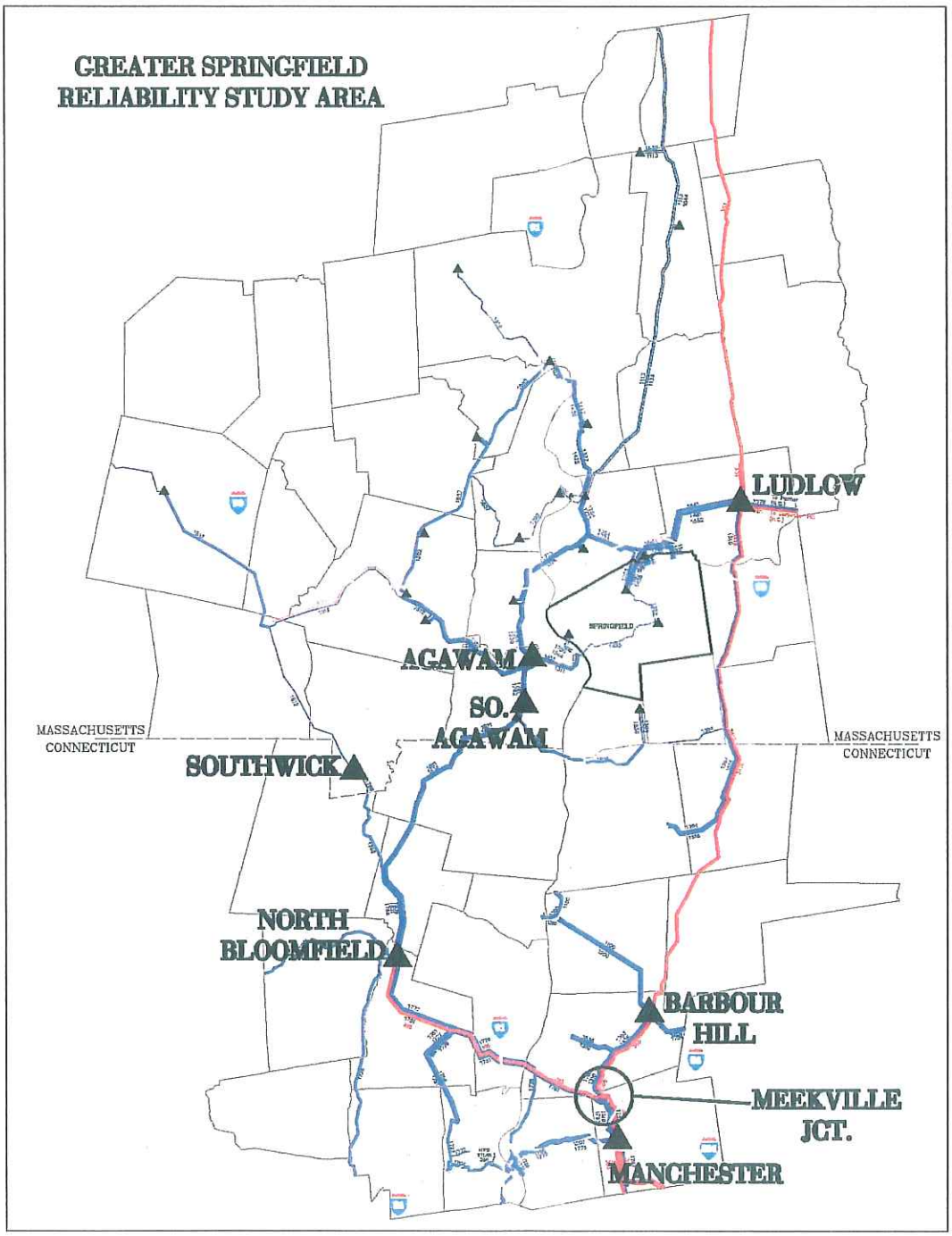
GSRP Route

19. The CL&P and WMECO preferred option for the GSRP is called the Northern Route. The GSRP Northern Route proposal consists of a new overhead 345-kV line over approximately 35 miles within Massachusetts and Connecticut. The GSRP Northern Route would begin at Ludlow Substation in Ludlow, Massachusetts and extend southwesterly around Springfield to Agawam Substation in Agawam, Massachusetts. From Agawam Substation the Northern Route would extend south into Connecticut and terminate at the North Bloomfield Substation in North Bloomfield, Connecticut. Several underground options and variations to the Northern Route have also been proposed. Refer to Figure 1. (CL&P 1, Vol. 1, pp. ES-3, ES-5)

20. In addition to the Northern Route, CL&P also proposed the Connecticut portion of the Southern Route Alternative, which connects with the WMECO proposed Massachusetts portion. The Southern Route Alternative of the proposed GSRP would begin at Ludlow Substation and extend south to Hampden Junction in Hampden, Massachusetts. From Hampden Junction the route would travel west through Enfield and Suffield before heading north into Massachusetts to the South Agawam Switching Station. The line would then extend north to Agawam Substation before traveling south along the Northern Route to the North Bloomfield Substation. Refer to Figure 1. (CL&P 1, Vol. 1, pp. ES-3, ES-7, ES-18)

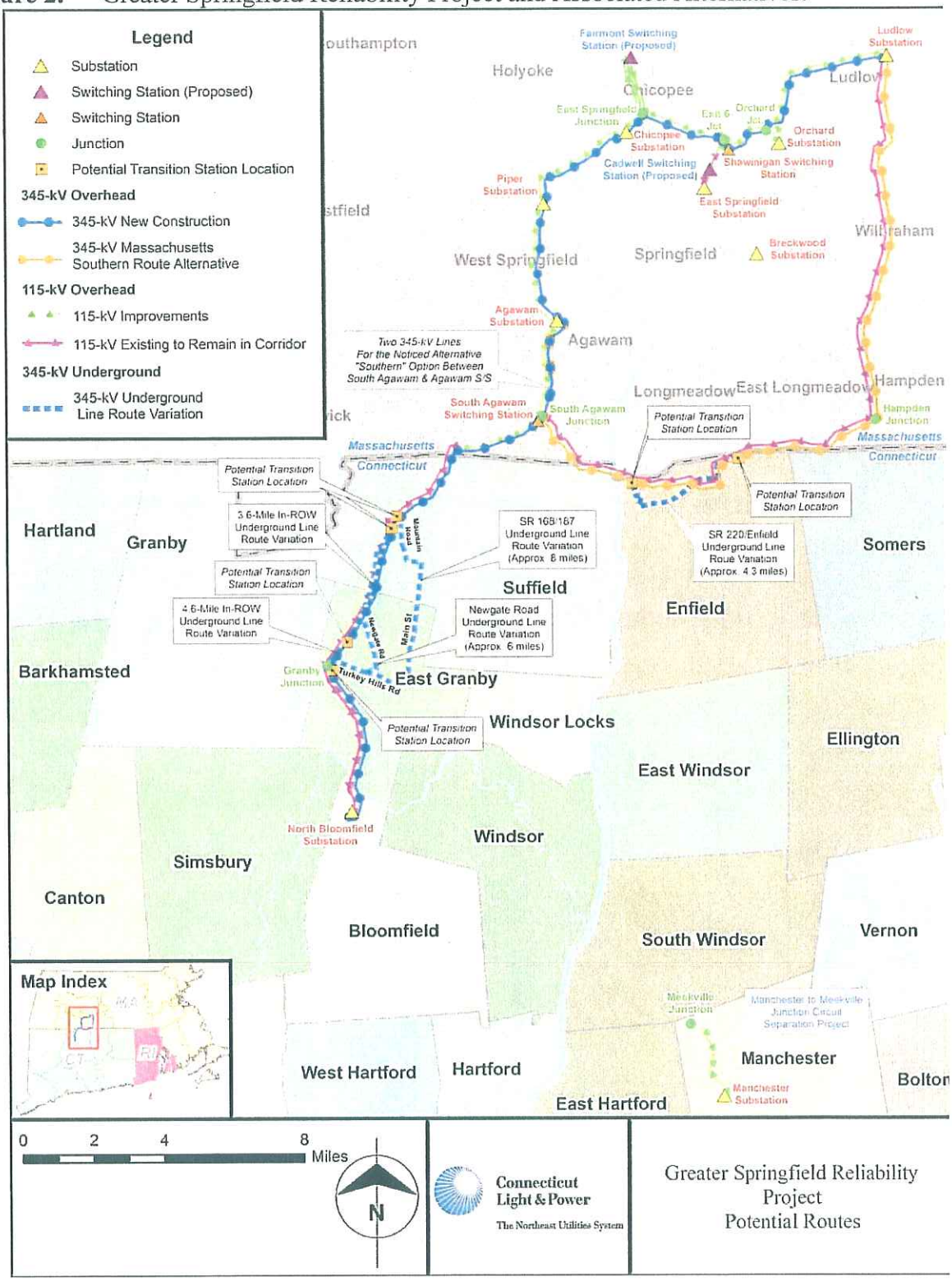
21. The 12-mile Connecticut portion of the proposed GSRP Northern Route begins at the North Bloomfield Substation and traverses Bloomfield, East Granby and Suffield to the Connecticut/Massachusetts border. The Connecticut portion of the Southern Route Alternative begins with the 12-mile Northern Route and adds 5.4 additional miles in Connecticut in Suffield and Enfield. Refer to Figure 1. (CL&P 1, Vol. 1, pp. ES-7, ES-18)

Figure 1. Greater Springfield Reliability Project Area.



(CL&P Ex. 15, Exhibit AWS-2)

Figure 2. Greater Springfield Reliability Project and Associated Alternatives.

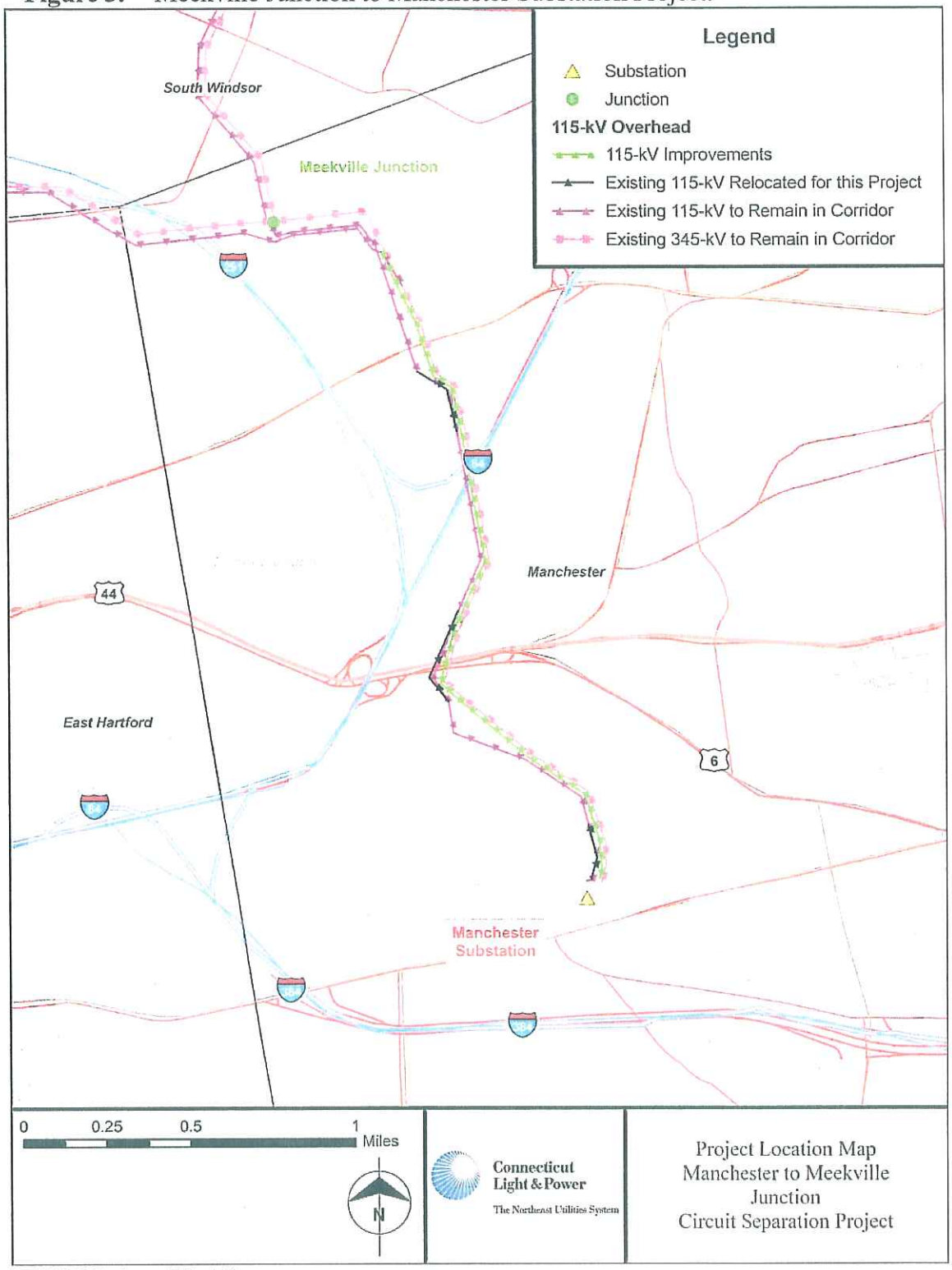


(CLP 1, p. ES-3)

MMP Route

22. The MMP would consist of the separation of a 345-kV and a 115-kV circuit for 2.2 miles between Manchester Substation and Meekville Junction, Manchester, Connecticut. Refer to Figure 2. (CL&P 1, Vol. 1, p.ES-5)

Figure 3. Meekville Junction to Manchester Substation Project.



(CL&P 1, p. ES-10)

DOCKET 370 A – GSRP AND MMP

PROJECT NEED

Background (Southern New England Region)

Lines of Authority for Planning/Reliability

23. The southern New England (SNE) area includes Massachusetts, Rhode Island and Connecticut and accounts for approximately 80 percent of the entire New England electrical load. The SNE load areas are concentrated in Boston and its suburbs, central Massachusetts, Greater Springfield, Rhode Island, Greater Hartford and southwest Connecticut. (CL&P 1, Vol. 1, p. F-19)

24. The electric power system in New England became regionalized during the 1960s, when the electric utility companies in New England, including CL&P, developed a plan for a 345-kV transmission grid that would integrate the dispatch of electricity from strategically located generating stations serving loads within and between the New England States and other regions. (CL&P 1, Vol. 1, p. F-1)

ISO-NE Authority for Planning and Reliability

25. ISO-NE is responsible for managing the New England region's bulk electric power system, operating the wholesale electricity market, administering the region's open access transmission tariff, and conducting centralized electrical power planning. (Council Admin. Notice No. 45, FOF #19)

26. Transmission planning and reliability standards have become more closely integrated on a regional basis since the 1960s. Driven by such events as the Northeast blackout of 1965, as well as nationwide electric industry restructuring during the 1990s, regulators and legislators gradually, over four decades, created and strengthened a clear chain of authority for both planning and reliability from the federal down to the regional level. The most recent significant development for New England came on February 1, 2005, when the Federal Energy Regulatory Commission (FERC) designated ISO-NE as a Regional Transmission Organization, with consolidated authority both to plan transmission systems and to maintain system reliability. (CL&P 1, Vol. 1, pp. F-1 to F-3)

27. Long-term system planning for New England is conducted by ISO-NE through a regional transmission planning process (RTEP). This process is continuous, resulting each year in a report developed by RTEP participants and reviewed by state regulators, New England Power Pool (NEPOOL). (Council Admin. Notice No. 45, FOF #20)

28. Consistent with RTEP findings, ISO-NE can require a transmission owner to build transmission infrastructure. Conversely, if a transmission owner were to make a transmission improvement without approval by ISO-NE, such an action may not meet regional cost allocation requirements: therefore, the cost would not be regionalized (distributed among New England ratepayers). Also, if ISO-NE were to find the improvement would not work with the system, it could order the transmission owner not to energize the equipment. (CL&P 1, Vol. 1 p. F-3; ISO-NE 1, p. 7; Tr. 14, pp. 151, 152)

29. In 2006, ISO-NE began a study on deficiencies and interrelated needs throughout the SNE electric supply system, and released a draft report later referred to as the "Southern New England Transmission Reliability Report (SNETR) – Needs Analysis, January 2008." Developed by the planning staffs of NUSCO and National Grid USA (National Grid), SNETR was the genesis of the New England East-West Solution (NEEWS). (CL&P 1, Vol. 1, pp. F-8, F-13, F-14)

30. NEEWS consists of four separate projects that would alleviate the deficiencies in the SNE transmission grid. The projects include:
    a. The GSRP and MMP – the subject of Docket No. 370A
    b. The Interstate Reliability project – a new 345-kV line from Millbury Switching Station in Massachusetts owned by National Grid to its West Farnum Substation in North Smithfield, Rhode Island, to CL&P's Lake Road Substation in Killingly, Connecticut and Card Street Substation in Lebanon, Connecticut.
    c. The Central Connecticut Reliability Project – a new 345-kV line from CL&P's North Bloomfield Substation to its Frost Bridge Substation in Watertown, Connecticut.
    d. The Rhode Island Reliability Project – A National Grid project entirely within the State of Rhode Island. This project would not come before the Council.
    (CL&P 1, Vol. 1, pp. F-10, F-11)

31. Following its "Needs Analysis," the SNETR working group analyzed transmission solutions to satisfy the identified needs for every concentrated load area of SNE. Their draft report, which discussed detailed solution options for each area, was published by ISO-NE on its website in April 2008 with the title "New England East-West Solutions (Formerly SNETR) Report 2, Options Analysis." (CL&P 1, Vol. 1, pp. F-8, F-13, F-14)

Planning Criteria and Reliability Standards

32. CL&P is obliged by binding tariff provisions to design and proposed transmission improvements that will assure the bulk power supply system complies with applicable reliability standards. (CL&P 1, Vol. 1, p. F-5)

33. ISO-NE's definition of reliability is governed by the North American Electric Reliability Corporation (NERC). NERC's definition of reliability encompasses two concepts: "adequacy" and "security." Adequacy is defined as the "ability of the system to supply the aggregate electric power and energy requirements of the consumers at all times", while security is defined as "the ability of the system to withstand sudden disturbances." (CL&P1, Vol. 1, p. F-4)

34. ISO-NE does not determine whether resource adequacy, the amount and availability of generation and load management facilities, could solve a given reliability problem more cost-effectively than transmission /security. It leaves that "choice" up to the market. If the market fails to bring forward a solution, then ISO-NE is obligated, per NERC planning criteria and reliability standards, to plan a transmission security solution. (CL&P 1, Vol. 1, p. F-4; Tr. 15, pp. 176, 177)

35. A key element in planning for and testing transmission reliability (in the sense of transmission security) is the concept of "contingency" events, wherein certain generation and/or transmission facilities are assumed to be out of service or otherwise unavailable. (CL&P 1, Vol. 1, p. F-5)

36. In accordance with ISO-NE Planning Procedure 3 (PP3), planners use the terms "N-1" and "N-1-1" to designate the contingency conditions in which the system must be capable of reliable operation. N-1 designates the state of the transmission system following the occurrence of a single contingency. N-1-1 designates the condition of the system following the occurrence of a second contingency, assuming that one element is already out of service. (CL&P 1, Vol. 1, p. F-6)

37. To evaluate compliance with the PP3 reliability criteria, these contingencies are simulated on computer models developed to represent actual and future system conditions. If the simulation shows that transmission lines will overload and/or voltage will not be maintained within specified limits under one or more contingencies, the electric system is judged to be unreliable, and a plan must be devised in order to bring the system back into compliance within 30 minutes of a first contingency, so that it will be able to operate reliably in the event of a second. (CL&P 1, Vol. 1, p. F-6)

38. The particular contingencies simulated during the computer modeling are overlaid on normal loads forecast for the future, peak loads that would occur in extreme weather, inter-regional power transfers, and "reasonably stressed" conditions, which are generally considered to be the unavailability of generation proximate to load—often with multiple units being unavailable. Regarding such extreme conditions as "reasonably stressed," acknowledges that generation units may be unavailable for many reasons, such as economics, equipment failure, lack of fuel, maintenance requirements, and environmental restrictions. (CL&P 1, Vol. 1, p. F-5)

39. Major unplanned outages of generating units have occurred in the electric industry. In Connecticut, for instance, outages involving thousands of MWs at a time have happened in 1996, 2003, and 2008. Transmission failures have also recently occurred, affecting Connecticut. Cables running underwater from Norwalk Harbor to Northport, New York were broken by a dragged anchor and out of service for eight months. (CL&P 1, Vol. 1, pp. F-6, F-7)

40. Notwithstanding such actual occurrences, the contingencies selected for any given planning simulation are "deterministic," that is, determined by planners' judgments of "reasonable stress", not calculated per statistical probability or historical evidence. (Tr. 14, pp. 87-90)

41. Contingency modeling under "reasonably stressed" conditions is meant to test the strength of the system in general. Planners do not try to design the system to meet particular contingencies. Rather, the conditions and contingencies represented in the simulations serve as proxies for multiple other potential future events that cannot be defined or predicted, but that the system should be able to survive. (Tr. 5, p. 67; Tr. 12, pp. 60, 61; Tr. 14, pp. 210, 211; Tr. 15, pp. 211, 212)

Background (GSRP/MMP)

42. The proposed GSRP/MMP is a stand-alone project that would meet the identified reliability needs regardless of whether the other components of NEEWS are undertaken. This has been established by several studies, the latest of which is the "2009 Addendum", which takes into account the forecasted loads in ISO-NE's 2009 Capacity, Energy, Loads and Transmission (CELT) Report; relevant new resources that cleared the second ISO-NE Forward Capacity Auction (December 2008); and new and proposed resources for which procurement contracts have been ordered by the DPUC. (CL&P 1, Vol. 1, p. F-15; CL&P 5, R. OCC-01-009-SP01, attached "2009 Addendum Report"; CL&P 15, Scarfone, pp. 4-21)

43. The proposed GSRP/MMP is the first of the Connecticut NEEWS projects filed with the Council because ISO-NE planning has determined the Greater Springfield bi-state load area has the greatest need for improved transmission reliability. (CL&P 4, R. 2)

44. The proposed GSRP/MMP are designed to address transmission security deficiencies in Greater Springfield and the adjacent portion of north-central Connecticut, which extends to Hartford and its suburbs, including Manchester, East Hartford, Hartford, West Hartford, Avon, South Windsor, Windsor, Bloomfield, Simsbury, East Windsor, Windsor Locks, East Granby, Enfield, Suffield, and Granby. (CL&P 1, Vol. 1, p. F-20)

45. From the point of view of transmission, Greater Springfield and the adjacent portion of north-central Connecticut are effectively the same load area. Since key transmission lines in the system serving Greater Springfield terminate at substations in Connecticut, the resolution of Springfield area problems necessarily involves improvements to parts of Connecticut's electric grid as well. At the same time, the need to resolve these Springfield area problems offers an opportunity to reinforce the reliability of electric supply within north-central Connecticut, and improve the power transfer capacity between Massachusetts and Connecticut. (CL&P, 1, Vol. 1, pp. G-2, F-20, F-21)

46. The proposed GSRP/MMP takes priority because improvements to Connecticut-Massachusetts transfers have been in the queue for a long time. As early as 1977, Council Docket No. 11 discussed long range plans for the bi-state transmission system and specifically stated that "a new 345-kV circuit between North Bloomfield, Connecticut and Agawam, Massachusetts" is needed. (Council Admin. Notice 61, FOF #45)

47. CL&P used the PP3 conditions and contingencies to "reasonably stress" the transmission infrastructure to establish the system reliability deficiencies and need for the proposed GSRP/MMP. The conditions and contingencies were initially established by the SNETR Working Group and approved by ISO-NE. (Tr. 5, p. 90)

48. The existing 115-kV lines that serve the Greater Springfield bi-state load area were found out of compliance with national and regional reliability criteria (PP3). The existing system has transmission security deficiencies even under normal conditions, which will be exacerbated as electricity usage increases and as older power generating plants are retired. (CL&P 1, Vol. 1, p. ES-2)

49. One set of reliability concerns regards thermal overloads, voltage issues – to the point of possible widespread voltage collapse – and short-circuits on 115-kV lines throughout the Greater Springfield area in Massachusetts, and associated thermal overloads at various points in Connecticut. (Tr. 5, pp. 51-52; Tr. 15, p. 80)

50. The North Bloomfield Substation serves an area of Connecticut with higher-than-average load growth. It is a major source of bulk power supply to north-central Connecticut. The Substation has three 115-kV transmission circuits that extend into the Greater Hartford area, and that interconnect with different substations. (CL&P 1, Vol. 1, pp. F-22, F-24, G-21)

51. Under contingency conditions, planners find that many of the 115-kV circuits in the Greater Springfield area would be above emergency ratings, including the lines to the North Bloomfield Substation. (Tr. 6, pp. 20, 21)

52. Contingency modeling predicts that, even under normal conditions, the 115-kV line from North Bloomfield Substation to Agawam Substation frequently must carry loads approximately 17 percent above its long-time emergency (LTE) rating. The LTE rating is the load that a line can carry for 12 hours before overheating and insulation failure. Overheating could cause sagging to the point that the line would arc and short out (Tr. 12, pp. 105, 106; Tr. 15, p. 92)

53. Another type of reliability problem in this load area is that power transfers between Connecticut and Massachusetts are limited, and, under certain contingencies modeled by SNETR and subsequent studies, would not be able to serve load in Connecticut. (CL&P 1, Vol. 1, pp. F-11, F-12)

54. CL&P has calculated that the GSRP/MMP alone would support an increase of the maximum transfer limits into Connecticut from the present 2,500 MW to between 2,700 and 2,800 MW. The Connecticut transfer limit range is determined by ISO-NE. (CL&P 10, R. OCC-027)

55. Increasing the transmission transfer capacity into an area generally lowers the amount of time the system is constrained, thereby increasing the amount of power that may be delivered from more distant, lower cost generation resources. Constraints on a transmission system may result in congestion that would require the running of higher cost generation within the local area. (CL&P 5, R. CSC-030)

56. The increased transfer capacity into Connecticut, associated with the proposed GSRP, may aid CL&P in achieving environmental and statutory compliance by enabling access to renewable and/or low emission power-supply sources. (CL&P 1, Vol. 1, pp. F-11, F-12)

57. The GSRP/MMP is not proposed solely for the purpose of increasing Connecticut's import capacity. System planners consider the 200-300 MW transfer capacity increase a marginal benefit. The main benefit is that, under contingency modeling, the GSRP/MMP would eliminate conditions that impair the transmission system's reliable maintenance of Connecticut's existing import capacity at 2500 MW. (Tr. 8, p. 67; Tr. 14, pp. 114, 124-130, 165; Tr. 15, p. 185, 186)

58. The proposed GSRP would create a new 345-kV loop in the north-central Connecticut and western Massachusetts areas. The new 345-kV line would connect the North Bloomfield Substation in Connecticut to the Agawam Substation in Massachusetts, and then to Ludlow Substation in Ludlow, Massachusetts. The remainder of the loop consists of the existing 345-kV line running from the North Bloomfield Substation to the Barbour Hill Substation in South Windsor, and then north to Ludlow. Refer to Figure 1. (CL&P 1, Vol. 1, pp. E-1, E-4; Tr. 14, p. 170)

59. The new 345-kV loop would greatly enhance reliability by lessening the loads to the 115-kV lines in the Greater Springfield bi-state load area and addressing the security insufficiencies in both Connecticut and Massachusetts. It would also establish a new 345/115-kV hub west of the Connecticut River and north of the North Bloomfield Substation at the Agawam Substation, which would improve the ability of both substations to handle contingencies and, in the process, make the established transfer capacity between Connecticut and Massachusetts more reliable. (Tr. 15, pp. 9-12)

60. The proposed GSRP would satisfy transmission reliability requirements in the Springfield area (including north-central Connecticut) for at least 20 years without further expansion of the 345-kV system, assuming no significant changes in projected future load growth or generation location and availability occur. (CL&P 4, R. 17)

61. In contingency modeling, the MMP component of GSRP/MMP is shown to improve reliability by eliminating a critical double-circuit contingency that creates overloads on a number of 115-kV underground cables in downtown Hartford. (Tr. 15, pp. 9-12)

PROJECT DESIGN (OVERHEAD IN RIGHT-OF-WAY)

GSRP – Northern Route

62. The Connecticut portion of the proposed GSRP would run from the North Bloomfield Substation to the Connecticut Massachusetts border—approximately 12 miles. It would be located predominantly within an existing ROW (36 percent on land owned by CL&P) that has been occupied by power lines for about 80 years. (CL&P 15, Carberry/Newland, p. 4)

63. The conductors for the new 345-kV overhead line would consist of three bundles of two 1,590-kcmil aluminum conductors with steel reinforcement (ACSR). An overhead lightning shield wire would be installed above the line for protection; it also would contain optical glass fibers for communication. (CL&P 1, Vol. 1, p. I-2)

64. The supports for the new lines would be steel or wood-pole H-frame structures with the conductors configured horizontally. They would be approximately 90 feet in height, and spaced 570 feet apart, on average, although the spans would vary, due to the terrain. The maximum span length proposed is 1,136 feet. (CL&P 1, Vol. 1, p. I-4; CL&P 5, R. CSC-036)

65. The length of the Connecticut portion of the proposed GSRP is divided into two segments consisting of:
    a. Segment 1 (North Bloomfield to Granby Junction); and
    b. Segment 2 (Granby Junction to the Connecticut/Massachusetts State Border).

    (CL&P 1, Vol. 1, pp. I-2, I-3)

Segment 1

66. The length of the Segment 1 ROW is 4.7 miles and generally 385 feet wide. The existing electric line facilities along the Segment 1 ROW consist of: a.) wood-pole H-frame structures, typically 60 feet in height that support one 115-kV circuit; b.) existing lattice-steel towers, typically 70 feet in height that support two 115-kV circuits; and c.) wood distribution line poles, typically 40 feet in height. (CL&P 1, Vol. 1, p. I-2)

67. The proposed new support structures along Segment 1 would be centered approximately 75 feet east of the existing lattice towers. Approximately 195 feet of the existing 385-foot ROW is currently used. Following installation of the new structures, approximately 290 feet of the ROW would be used: thus, about 95 feet of existing vegetation would be cleared. (CL&P 1, Vol. 1, p. I-3)

68. The existing 115-kV line would remain in-service during the construction of the proposed 345-kV line to maintain continuity of service. Following completion of the GSRP, CL&P would petition the Council to remove the 115-kV circuits from North Bloomfield Substation to Granby Junction if CL&P determines that the lines would not be useful in the near future. (CL&P 1, Vol. 1, p. I-3; Tr. 6, pp. 156-158)

Segment 2

69. The Segment 2 ROW is 7.2 miles in length and approximately 305 feet in width. The existing transmission line facilities along the Segment 2 ROW consist of lattice-steel towers approximately 70 feet in height supporting two existing 115-kV circuits. (CL&P 1, Vol. 1, p. I-3)

70. The existing Segment 2 ROW is 305 feet wide with approximately 110 feet currently being maintained for the existing transmission line. The addition of the proposed new 345-kV line would increase the maintained width of the ROW to approximately 205 feet. The remaining approximately 100 feet of the ROW would not be affected by the proposed project. (CL&P 1, Vol. 1, p. I-4)

71. As in Segment 1, the new support structures would be centered approximately 75 feet east of the existing lattice towers. In this segment, however, the lattice towers would remain in place. They would continue to support the existing double-circuit 115-kV lines, except that these two lines would be reconfigured as a split-phase line for a single circuit operating from Granby Junction to the Southwick Substation in Massachusetts. (CL&P 1, Vol. 1, p. I-4)

72. Most of the residences adjacent to the ROW in Segment 2 are along the western side of the ROW. The existing 115-kV line is approximately 50 feet from the western edge of the ROW. The proposed 345-kV line is 125 feet from the western edge. (Tr. 10, p. 82; Tr. 10, p. 81)

73. CL&P would expand the Segment 2 ROW by approximately three acres, including 100 feet of width for a distance of approximately 1,000 linear feet between Phelps Road and Mountain Road and for 400 linear feet east of Ratley Road. CL&P would acquire the additional three acres needed from two easements in the Town of Suffield from private landowners. (CL&P 1, Vol. 1, pp. I-4; N-37)

74. In Segment 2, CL&P has identified as a "Focus Area" approximately 3.2 miles in length – between the closest point of Country Club Lane in East Granby and the crossing of Phelps Road in Suffield – where the Council's Electric and Magnetic Field Best Management Practices (EMF BMPs) may need to be applied. See below under the "Electric and Magnetic Field" Section for further facts. (CL&P 1, Vol. 1, p. I-4)

Cost

75. The estimated capital cost of the Connecticut portion of the proposed GSRP facilities including the overhead 345-kV line from the state border to North Bloomfield Substation is approximately $41,290,000, not including substation improvements. (CL&P 1, Vol. 1, p. I-15)

Schedule

76. The proposed GSRP would begin construction of the overhead line during the third quarter of 2010 and would expect to finish by the end of 2013. The projected in-service date for the GSRP is by the end of 2013. (CL&P 1, Vol. 1, p. F-37, P-1; CL&P 15, Carberry/Newland, p. 16)

North Bloomfield Substation

77. The existing North Bloomfield Substation is located in the northwest portion of a 34-acre CL&P-owned parcel, near the intersection of Hoskins Road and Tariffville Road. The proposed GSRP would require the construction of a new 345-kV switchyard to interconnect the existing 345-kV line that extends into the substation from the south with the proposed 345-kV line that would extend into the substation from the north. It would also require a 345/115-kV, 600 megavolt ampere (MVA) autotransformer; space for future 345-kV connections; and expansion of the existing relay and control enclosure. (CL&P 1, Vol. 1, pp. E-2, I-13; CL&P 1, Vol. 7, site map)

78. The proposed substation modifications would require maintenance of existing secondary containment structures as well as the installation of new secondary containment structures for the two proposed autotransformers. The new autotransformers would have insulating fluid that requires the use of a secondary containment system. (CL&P 1, Vol. 1, p. N-48)

79. Within the 115-kV switchyard, a bus tie would be removed and the proposed new autotransformer would be connected to the bus via an existing circuit breaker. (CL&P 1, Vol. 1, p. I-13)

80. The existing seven acre substation would be expanded by approximately 2.7 acres within the existing CL&P property. The existing substation fence would be relocated approximately 32 feet to the northwest, 292 feet to the southeast, and 193 feet to the southwest. (CL&P 1, Vol. 1, p. I-14)

Cost

81. The estimated capital cost of the proposed substation construction is $92,080,000. (CL&P 1, Vol. 1, p. 1-15)

Schedule

82. The proposed additions to the North Bloomfield Substation would take approximately 18 months to complete. (CL&P 15, Carberry/Newland, p. 11)

GSRP - Southern Route Alternative

83. CL&P and WMECO have expressed a preference for approval of the Northern Route because it has fewer environmental impacts costs less than the Southern Route. The Northern Route would also offer a better opportunity for future system improvement and expansion. Since a portion of the Southern Route Alternative would be located in Connecticut, however, CL&P seeks approval for the Connecticut portion of the route if that is the route approved by the Massachusetts EFSB. (CL&P 1, Vol. 1, pp. H-54, H-55)

84. The Connecticut portion of the Southern Route Alternative would be approximately 5.4 miles long. This route would cross the Massachusetts border into Connecticut in Suffield, traverse Suffield for approximately 1.1 miles, cross the Connecticut River back into Massachusetts for approximately 0.5 miles, and then cross back into Connecticut again in Enfield, going east for approximately 4.3 miles before crossing back into Massachusetts to continue on to the Ludlow Substation. (CL&P 1, Vol. 1, p. E-5, Fig.E-3, p. E-8); CL&P Ex. 15, Carberry/Newland, p. 18)

85. The Connecticut portion for the Southern Route Alternative would lie entirely within an existing CL&P ROW that varies between 280 and 300 feet in width. It is occupied by a 115-kV line supported on wood-pole H-frame structures, 60 feet in height. The Connecticut River crossing structure in Suffield is much taller, approximately 215 feet in height. (CL&P 1, Vol. 1, p. O-38, Fig. O-12, p. O-39 and Fig. O-13, p. O-41; p. I-7)

86. The design for the new overhead 345-kV line would be steel or wood-pole H-frame structures, typically 90 feet tall, supporting 1,590-kcmil ACSR conductors, two per phase, which would be protected by an Optical Ground Wire cable and a second shield wire. (CL&P 1, Vol. 1, p. I-7; CL&P 15, Carberry/Newland, p. 18)

87. The existing ROW is wide enough to accommodate the new line of H-frames proposed. The existing 115-kV line on its wood-pole H-frame structures would remain. Of the 280-300 foot-wide ROW, approximately 110 feet are currently being maintained for the existing facilities. With the addition of the new line, approximately 205 feet would be maintained. The remainder of the ROW (approximately 75-95 feet) would not be affected. (CL&P 1, Vol. 1, pp. I-7, I-8)

88. The new 345-kV line would span Interstate 91 as well as 11 state and local roads in Connecticut. (CL&P 1, Vol. 1, p. N-74)

89. The Southern Route Alternative would traverse approximately 3.7 miles of densely developed neighborhoods in Enfield, which begin west of Interstate 91 and extend east past North Maple Street (Route 192) to Mayfield Road. In this area, the Council's EMF Best Management Practices may need to be applied. See below under "IV. EMFs" for further facts. (CL&P 1, Vol. 1, p. H-55, H-57)

Cost

90. The choice of the Southern Route Alternative over the proposed Northern Route would increase the overall project costs of GSRP, but since the choice between the Northern Route and the Southern Route Alternative for the Massachusetts section of the GSRP will be made on a whole-route basis, rather than on the cost of the facilities located in either state, CL&P has not presented a separate estimate of the Southern Route Alternative in Connecticut. (CL&P 1, vol. 5, Ex. 4, Solution Report, p. 3-25, Table 3-28; Tr. 11, Carberry, pp. 40, 51, 93, 94)

Schedule

91. Selection of the Southern Route Alternative would likely delay the GSRP schedule by 12 months, due to additional design and permitting efforts. This would mean beginning construction in the third quarter of 2011, with a completion and in-service date at the end of 2014. (Tr. 11, Carberry, pp. 41, 83)

MMP

92. The purpose of the MMP is to address some overloads that would occur in the Hartford area as a result of the proposal, in GSRP, to terminate the associated 115-kV circuits at the North Bloomfield Substation as proposed in the GSRP. (Tr. 6, p. 43)

93. The proposed MMP consists of separating two existing circuits that are currently on a shared transmission structure: a 115-kV line and a 345-kV line. The separation would take place over a 2.2-mile-long section of CL&P's existing ROW between Manchester Substation and Meekville Junction. (CL&P 1, Vol. 1, pp. E-8, E-9, I-5)

94. Currently, there are two double-circuit lines on the ROW. Along the western portion of the ROW is one line of lattice-steel towers, typically 105 feet tall, supporting two 115-kV circuits. Toward the eastern side of the ROW is another line of similar towers supporting the 115-kV and 345-kV circuits. These towers range between 120 and 195 feet in height, averaging 155 feet. Over some of this distance, in between the two rows of towers on the east and west, lies a row of 40-foot wood poles supporting a distribution circuit. (CL&P 1, Vol. 1, p. I-5; CL&P 15, Carberry/Newland, p. 56)

95. The proposed circuit separation would include constructing a new line of steel monopoles down the middle of the ROW. These structures would be approximately 155 feet tall, with a vertical configuration of the conductors. The 115-kV circuit on the easterly set of towers would be inactivated, and a circuit replacing it, using bundled 1,590-kcmil ACSR conductors, would be put onto the new monopoles. The 345-kV circuit that is also currently on the eastern towers would be left where it is. (CL&P 1, Vol. 1, pp. O-49, O-55, Fig. O-18, O-51; CL&P 15, Carberry/Newland, pp. 56, 57)

96. The distribution line that currently occupies some of the middle area would be shifted within the ROW toward the existing row of towers on the west. To accommodate this shift, three to four of the western towers would have to be moved. (CL&P, Vol. 1, pp. I-6, O-64)

97. Most of the existing ROW is sufficiently wide enough to accommodate the relocated 115-kV line between the existing double-circuit transmission lines. However, CL&P proposes an expansion area of the existing ROW consisting of an approximately 2,400 square-foot area located within a commercial development north of Tolland Turnpike. The expansion area consists of a paved parking lot. (CL&P 1, Vol. 1, p. I-6; CL&P 17, R. OCC-001-SP01)

98. Although the new replacement line would be operated initially at 115-kV, it would be built with the capability to operate at 345-kV, thus facilitating system upgrades in the future. (CL&P 1, Vol. 1, p. 1-10)

Cost

99. The proposed MMP would cost approximately $14 million. (Carberry/Newland, p. 55)

Schedule

100. Construction on the proposed MMP is expected to begin during the third quarter of 2010 and be completed in 2011. (CL&P 15, Carberry/Newland, p. 55)

MMP Variation

101. A variation to the proposed MMP was investigated during the proceedings. This variation would include the upgrade of the 115-kV line that would be placed on separate structures in the MMP, to 345-kV; thereby making the existing three terminal line into a two-terminal line. Additional findings on the MMP Variation are found in the "Alternatives" Section on page 45. (CL&P 26, p. 2, 3)

PROPOSED UNDERGROUND ALTERNATIVE ROUTES AND DESIGNS

Underground cable systems
Technical Features

102. Underground transmission systems consist of buried electric cables and splice vaults that are installed at specific intervals. Underground electric cables may be used in situations when overhead transmission lines are undesirable or impractical due to environmental, social, construction, or regulatory issues. (CL&P 1, Vol. 1, p. H-7)

103. There are several differences between the technologies of overhead lines and underground cables for electric transmission:
   a. Underground cables are typically installed over short distances in urban environments with strong electrical sources. Cables installed over long distances or in suburban and rural settings require consideration to prevent damage and disruptions to the transmission system and potential damage to customer equipment.
   b. Underground cables have a much lower current-carrying capacity compared with overhead lines. Therefore, multiple underground cables are required to achieve the same power-transfer capacity as an overhead line.
   c. The capacitive charging currents of an underground cable system (the currents necessary to maintain a high level of power transfer) are significantly higher than those of overhead lines. The higher capacitive currents, in turn, are associated with higher voltages. For medium and long length underground 345-kV cable systems, special switching devices and large shunt reactors may be required to compensate for this difficulty in order to prevent unacceptably high system voltages from disturbing power flows during normal operating conditions.
   d. For underground cables installed in isolated segments within an overhead 345-kV circuit, a two to four acre transition station must be installed at the location where the two technologies meet.
   e. Also, in such hybrid transmission circuits, the special devices necessary for managing the underground segments may affect the overall dynamics of power flow such that excessive voltages build up and damage the cable itself, other electrical equipment associated with the overhead portion of the system, and potentially customer equipment.
   f. The special charging and dynamic characteristics of underground and hybrid systems mean that whenever underground cables are contemplated for use in a given location special studies must be conducted to determine the maximum length of cable feasible to install without adverse effects on the New England transmission system overall.

   (CL&P 1, Vol. 1, pp. H-8, H-9; CL&P 15 Carberry/Newland, p. 25)

104. Typical operation of a transmission system includes daily energizing and de-energizing of the circuits, as well as frequent energizing/de-energizing transformers in response to customer loads. At these times, conditions on hybrid cables/lines can be particularly problematic for system operators, on account of their special characteristics, and the operators' response time is slow. (CL&P 1, Vol. 1, pp. H-10, H-11; CL&P 4, R. CSC-016)

105. The complexity of underground transmission cables by themselves, and especially when integrated with overhead lines in "hybrid" systems, merits special attention to system reliability. (CL&P 15, Carberry/Newland, p. 25)

106. The failure of an underground cable would result in extended repair time. A fault in an underground cable typically damages the cable. Following identification of the fault, the repair time for a cable can take weeks to complete, compared to hours or a few days for most overhead transmission lines. For this reason, a 345-kV underground circuit would be constructed with two cables per phase plus a spare cable that would be available if one was out of service. (CL&P 1, Vol. 1, p. H-11; Tr. 7, pp. 84, 85; CL&P 15, Carberry/Newland, p. 25)

Environmental Impacts

107. The construction of a new 345-kV underground cable would require a 40-foot to 60-foot wide work area. Additionally, splice vaults (approximately 10 feet wide x 10 feet deep x up to 32 feet long) would have to be located at approximately 1,600 foot intervals. (CL&P 1, Vol. 1, p. H-13)

108. While an overhead transmission line may span steep slopes, rock outcroppings, vegetation, wetlands and watercourses, an underground system requires a continuous trench and permanent access—that is, permanent vegetation clearing, including shrubs—along the entire length of the line during operation for maintenance and repairs. (CL&P 1, Vol. 1, pp. H-12, H-13, H-50)

109. Transmission engineers now prefer Crossed-link Polyethylene (XLPE) cable technology over high-pressure fluid-filled technology (HPFF) which was at one time a standard technology, in large part because it does not use insulating fluid, which can leak into the environment around the cables. (CL&P 1, Vol. 6, pp. 8-15; Administrative Notice Item 45)

110. Soil resources are significantly disturbed by the installation of an underground cable. An underground cable is installed in its trench in duct banks, and during the process the trench itself is amended to help make the cable work efficiently. The base of the trench and the area around the duct banks is filled with "flowable fill," a type of concrete material used for heat dissipation; then construction-grade backfill and native soil are placed on top. (Tr. 8, p. 117)

111. Underground cable systems installed in steep terrain may result in down-hill migration and overstressing of the cable and splices. (CL&P 1, Vol. 1, p. H-13)

112. The installation of an underground cable system, no matter what the setting, typically requires some in-water construction. Subsurface techniques, such as jack and bore or horizontal directional drill (HDD) may be used for some larger watercourse crossings. However, these techniques are costly and time-consuming and have significant temporary and permanent impacts on water resources, potentially including water quality. (CL&P 1, Vol. 1, p. N-55)

113. Most access roads will need to remain in place across existing wetlands and be properly maintained to provide access to splice vaults and transition stations, causing permanent impacts to wetlands. Also, where large embankments are needed for constructing wetland crossings, the width of wetland impacts may be 50 feet or greater. (CL&P 1, Vol. 1, p. H-51)

114. Underground transmission facilities, in any setting, have fewer visual impacts than overhead lines. However, the transition stations that are necessary for underground facilities do add visual impact. (CL&P 1, Vol. 1, p. H-51)

Underground Alternative Routes and Designs, with Environmental Impacts

All Underground In-ROW

Route and Design

115. An all-underground route along CL&P's existing overhead transmission line ROW was investigated and found to be technically feasible. (CL&P 1, Vol. 1, p. H-23)

116. An all-underground transmission facility would consist of cables and splice-vaults buried entirely within the existing ROW (305-385 feet wide), adjacent to the existing 115-kV overhead transmission line. The splice-vaults are typically 1,600 feet apart with PVC conduits running between them along a trench 5-7 feet wide and 7-10 feet deep. There are nine 8-inch conduits for the 345-kV XLPE cables, three 2-inch conduits for the grounding conductors; three 2-inch conduits for the fiber-optic relaying cables; and three 2-inch conduits for the temperature-sensing fiber cables. (CL&P 1, Vol. 1, pp. H-23, H-58)

Environmental Impacts

117. An all-underground in-ROW alternative would typically involve the disturbance to a 40-to-60-foot-wide section of the ROW along the 12 miles between the North Bloomfield Substation and the Connecticut/Massachusetts state border, as well as the excavation of a continuous trench and associated splice-vaults and would:
    a. Traverse numerous wetlands and watercourses, including the Farmington River;
    b. Disturb a total of about 100 acres of land;
    c. Adversely affect six acres of water resources by grading and trenching the permanent access road;
    d. Convert an additional two to four acres at the Massachusetts border end of the underground cable system segment to utility use for the development of a transition station to interconnect the overhead and underground components of the transmission line;
    e. Alter the vegetative community through permanent increase in clearing for the trench and access roads;
    f. Decrease wildlife habitat (permanent vegetation removal affects birds and others, particularly less mobile wetland species such as amphibians; water resource disturbance affects fisheries).

    (CL&P 1, Vol. 1, pp. H-51, N-58 to N-60)

118. Approximately 3.6 to 4.6 miles of permanent access roads would be required for the in-ROW underground cable variations, compared to approximately 3.4 miles of narrower and lower-quality access roads for the overhead route. (CL&P 1, Vol. 1, pp. H-50, H-51)

All Underground In-Street

119. An all underground in-street route was investigated for the installation of a 345-kV transmission cable system between North Bloomfield Substation and the Connecticut/Massachusetts border. The route would leave the North Bloomfield Substation, follow Tariffville Road east for approximately 600 feet; continue north along the existing transmission line ROW, crossing the Farmington River at Route 187/Main Street; then continue north along Route 187/Main Street for approximately 5.7 miles to Sheldon Street; east along Sheldon Street for approximately 0.5 miles to Grand Street; and north along Grand Street for approximately 4.5 miles to the Connecticut/Massachusetts border. Grand Street becomes Pine Street once it crosses the state border into Massachusetts; the route would continue north along Pine Street for approximately 0.2 miles to Barry Street; west along Barry Street for approximately 0.5 miles; and then terminate at a potential transition station south of Barry Street on WMECO property. (CL&P 1, Vol. 1, p. H-25)

120. An all-underground In-Street transmission facility typically consists of three splice-vaults (two per each set of three XLPE cables), 10 feet wide by 10 feet deep by 32 feet long, buried approximately 1,600 feet apart along the route; nine 8-inch PVC conduits for the 345-kV XLPE cables running between them; three 2-inch PVC conduits for the grounding conductors; three 2-inch PVC conduits for the fiber-optic relaying cables; and three 2-inch conduits for the temperature-sensing fiber cables. This equipment would be placed in a trench normally 5-7 feet wide and 7-10 feet deep, although the large amount of infrastructure usually already in streets makes these dimensions particularly variable. (CL&P 1, Vol. 1, pp. H-58, N-55)

121. Installing in-street underground transmission lines minimizes damage to natural resources to a certain extent. However, adverse impacts associated with water crossings cannot be avoided. (CL&P 1, Vol. 1, p. N-55)

122. Due to CDOT regulations, splice-vaults cannot be constructed in-street, meaning that any underground installation involving state highways would require substantial construction of such vaults on adjacent private property. (Tr. 16, pp. 80-82; CL&P 1, Vol. 1, pp. H-37, H-38)

Other Feasible Underground Route Variations for the GSRP Northern Route

General

123. There are four feasible underground line variations to a portion of the proposed overhead line GSRP—Northern Route between North Bloomfield and the Connecticut/Massachusetts state border. Each of the four would avoid locating the new 345-kV transmission line in an overhead line configuration on the existing ROW in the vicinity of certain residences, while leaving the existing 115-kV line on that section of ROW unchanged. Each of the four is an alternative to the others: that is, building more than one of them would be duplicative. (CL&P 1, Vol. 1, p. H-37)

124. CL&P investigated underground route variations that would substitute for the proposed overhead line along the ROW between Country Club Lane and Phelps Road. Potential route variations for this area include installation of an underground cable within the existing ROW for a distance of 3.6 to 4.6 miles or installation within or adjacent to public road ROWs for a distance of 6 to 8 miles. These route variations would replace a section of the proposed overhead 345-kV line over a distance of 3.6 to 5.1 miles. (CL&P 1, Vol. 1, pp. H-28, H-29)

125. The two underground line variations within or adjacent to road ROWs are referred to as the Newgate Road Underground Line Route Variation and the State Route 168/187 Underground Line Route Variation. The two underground line variations within portions of the existing transmission line ROW are referred to as the 4.6-Mile in-ROW Underground Line Route Variation and the 3.6-Mile in-ROW Underground Line Route Variation. Each variation is an alternative to the proposed overhead line and to the other underground variations. (CL&P 1, Vol. 1, p. H-37)

Newgate Road Underground Route Line Variation

Route and Design

126. The Newgate Road Underground Line Route Variation would include the installation of cables within the existing transmission line ROW for a distance of approximately 1,000 feet and then within or along Turkey Hills Road (Route 20), Newgate Road and Phelps Road. Transition stations would be located adjacent to the ROW near Granby Junction (on CL&P property) and near the ROW intersection with Phelps Road (partially on CL&P property, partially on private land). This variation would replace a 4.6 mile section of overhead line. (CL&P 1, Vol. 1, p. H-39)

127. Additional ROW would be required at the northern transition station near Phelps Road; temporary and permanent easements may also be required at the splice-vault locations due to conflicts with existing utility facilities or requirements of the CDOT. (CL&P 1, Vol. 1, p. H-39; CL&P 15, Carberry/Newland, p. 39)

Environmental Effects

128. The Newgate Road Underground variation would be installed directly in front of the NRHP-listed Old Newgate Prison, as well as another NRHP-listed structure and a historic cemetery. There is potential for significant adverse effects on these structures. (CL&P 1, Vol. 1, p. N-65)

129. A portion of the Newgate Road route would pass by Newgate Prison, which is listed on the National Register of Historic Places and designated as a National Historic Landmark. Underground copper mining tunnels that traverse Newgate Road are part of the historic site. Additionally, stone walls that comprise Newgate Prison are within ten feet of the edge of the Newgate Road pavement and may be affected by vibrations associated with construction. The variation would also pass Viet's Tavern, which is also listed on the National Register of Historic Places. Both Newgate Prison and Viet's Tavern are within nine feet from the edge of Newgate Road. (CL&P 1, Vol. 1, p. H-41, M-2; Tr. 7, pp. 181, 182)

Route 168/187 Underground Variation
Route and Design

130. The Route 168/187 Underground Line Route Variation would include the installation of cables within the existing transmission line ROW for approximately 1,000 feet and then within or along Turkey Hills Road (Route 20), North Main Street, South Stone Street (Route 187) and Mountain Road (Route 168). This variation would replace a 4.6 mile section of overhead line. (CL&P 1, Vol. 1, p. H-41)

Environmental Effects

131. See Findings of Fact above for "All Underground In-Street."

4.6 Mile In-ROW Underground Line Route Variation
Route and Design

132. The 4.6-Mile In-ROW Underground Line Route Variation would minimize long-term visual effects associated with an overhead 345-kV transmission line but would result in direct and significant impacts to environmental resources. Environmental impacts occur throughout the life of the project since a permanent access road would be required along the ROW to provide access to the entire cable system. The variation would cross a wetland that is approximately 1,500 feet long, located north of Turkey Hills Road. Crossing this wetland using HDD may be possible but would depend on subsurface conditions in the area. Also, HDDs are costly and there is a risk of the drilling fluid returning to the surface and affecting the wetland. (CL&P 1, Vol. 1, pp. H-43, H-44)

Environmental Effects

133. See Findings of Fact above for "All Underground In-Street."

134. Wetlands, including vernal pools, lie along this route. A large wetland, approximately 1,500 feet long, located north of Turkey Hills Road, would be crossed. This distance may exceed the upper limits of the HDD. Further geotechnical investigations would be needed. (CL&P 1, Vol. 1, p. H-43)

3.6 Mile In-ROW Underground Line Route Variation
Route and Design

135. The 3.6-Mile In-ROW Underground Line Route Variation was developed to reduce the wetland impacts that would be associated with the 4.6-Mile in-ROW variation. This variation would extend from a potential transition station site approximately 0.8 miles south of Newgate Road to a potential transition station north of Phelps Road in Suffield. The transition station north of Phelps Road would be located partially within the transmission line ROW and partially on land owned by the State of Connecticut (Newgate Wildlife Management Area). (CL&P 1, Vol. 1, p. H-46)

136. This variation could not be built unless CL&P were able to obtain the necessary rights to build a transition station on this state land. (CL&P 1, Vol. 1, p. H-46)

Environmental Effects

137. See Findings of Fact under the "All Underground In-ROW" section.

Southern Route Alternative Variation (Hybrid Variation)
Route and Design

138. A hybrid overhead-underground line route was investigated that would substitute an underground cable segment for the section of overhead line adjacent to the residential areas in Enfield. A 3.7-mile portion of the overhead 5.4 mile Southern Route Alternative would be replaced by an approximately 4.3 mile section of cable. (CL&P 1, Vol. 1, p. H-57; CL&P 15, Carberry/Newland, p. 53)

139. The hybrid variation would be installed primarily in and adjacent to state and local public roads. It would branch off from the existing overhead line ROW at Campania Road (west of Interstate 91) in Enfield, traverse Campania Road, Manning Road, U.S. Route 5, Brainard Road, and Mayfield Drive, and rejoin the ROW at its intersection with Mayfield Drive, also in Enfield. A 0.4-mile segment also would be located within the existing transmission line ROW. (CL&P 1, Vol. 1, pp. H-57, H-58)

140. The hybrid variation would require a transition station at each end. Each of the two would require two to four acres of fenced and graded area with above-ground termination facilities, and could be located primarily on CL&P property, but would also require some additional acquisition of private land. (CL&P 4, R. 5)

Environmental Effects

141. See Findings of Fact under the "All Underground In-ROW" section.

Cost Comparisons: Overhead Vs. Underground

142. A unique cost for underground transmission systems is associated with transition stations. Each one would cost approximately $15 million. (Tr. 6, p. 173)

143. The cost of construction of an underground transmission cable route along or adjacent to public roads is approximately $479 million. The estimated maintenance costs over the life of the facility would be approximately $682 million. (CL&P 1, Vol. 1, p. H-26)

144. The cost of the proposed overhead transmission line project versus the underground variations is shown in the table below.

Route	Total CT project Cost
CT portion of North Bloomfield to Agawam 345-kV overhead route (as proposed)	$133,370,000
CT portion of North Bloomfield to Agawam 345-kV route (incl. 3.6-mile in-ROW variation)	$286,957,000
CT portion of North Bloomfield to Agawam 345-kV route (incl. 4.6-mile in-ROW variation)	$317,817,000
CT portion of North Bloomfield to Agawam 345-kV route (incl. Newgate Road variation)	$380,631,000
CT portion of North Bloomfield to Agawam 345-kV route (incl. Route 168/187 variation)	$455,306,000
Southern Route Alternative Underground Variation	$184,000,000

(CL&P 1, Vol. 1, p. H-49; CL&P 15, p. 54)

145. Costs passed on to the Connecticut electricity consumer would be higher than that listed in the table because of the federal tariff provisions. The GSRP is expected to qualify for the New England regional transmission rates, which shares costs throughout New England. Since Connecticut uses approximately 27 percent of the New England load, Connecticut consumers would pay approximately 27 percent of the project's entire costs, regardless of how much of it is located in Connecticut. ISO-NE determines what costs would be eligible for regionalization based on specific tariff provisions. If it is feasible for a transmission line to be constructed overhead and it is instead installed underground at an additional cost, the excess cost would not be included in regional rates but would be "localized" to the ratepayers in Connecticut. Therefore, Connecticut consumers would pay 27 percent of the cost of the overhead design of the line plus 100 percent of the difference between the overhead line cost and the cost of undergrounding the line and adding transition stations. (CL&P 5, R. CSC-031; Tr. 6, p. 44)

146. For each of the underground variations along the GSRP, Connecticut consumers would pay:

Variation	Cost of Variation	Cost (above overhead)	Cost to CT consumer
3.6 miles in-ROW	$166,000,000	$153,600,000	$156,948,000
4.6 miles in-ROW	$200,300,000	$184,800,000	$188,985,000
Newgate Road	$262,800,000	$247,300,000	$251,485,000
Route 167/187	$337,500,000	$322,000,000	$326,185,000

(CL&P 5, R. CSC-031)

147. Construction costs of 345-kV underground cables along the ROW would range from approximately $37,260,000/mile to $46,104,000/mile. Installation of 345-kV underground cables within roads would cost approximately $37,742,500/mile. Construction of the proposed H-frame overhead line would cost approximately $3,440,800/mile. These cost estimates do not include substation or transition station costs. (CL&P 18, R. Suffield-005)

148. Currently, the typical CL&P residential customer pays 20.3 cents per kilowatt hour. The construction of the proposed overhead GSRP would increase the rate by about an eighth of a cent – 0.13 cents – to 20.43 cents per kilowatt hour. An underground variation would increase the rate by about half a cent – 0.49 cents – to 20.79 cents per kilowatt hour. (Tr. 8, pp. 276, 277)

149. An all overhead GSRP transmission line would increase a typical residential customer's monthly bill (700 kWh) by about $0.91 per month. An all underground variation would increase a typical residential customer's monthly bill by $3.43. (CL&P 18, R. Suffield-013; Tr. 8, p. 277)

150. A manufacturing or large-use electric customer (900,000 kWh) has a different rate from a residential customer: the electric bill would increase by $1,053 per month if the GSRP were built overhead, and $4,000 per month if it were built underground. (Tr. 8, p. 278)

ENVIRONMENT

General

151. Ground elevation within the GSRP project area ranges from 50 feet above mean sea level (amsl) to greater than 500 feet amsl at the point where the ROW crosses the West Suffield Mountain range, which exhibits variable terrain in the area. (CL&P 1, Vol. 1, p. L-3)

152. CL&P would hire an independent environmental inspector, if ordered by the Council, to inspect project construction. Additionally, CL&P would hire its own sub-consultants to monitor construction daily and ensure compliance with approved Development and Management plans. (CL&P 5, R. CSC-043)

Wetlands and Watercourses

153. CL&P's best management practices for wetlands and watercourses includes:

a. Installation, inspection and maintenance of erosion and sediment controls.
b. Limiting grading to the amount necessary to provide a safe workspace.
c. Installation of temporary timber matting or pads to cross wetlands and watercourses.
d. Restoration of wetlands to pre-construction conditions to the extent practicable.
e. Compliance with the conditions of federal and state permits
f. Avoidance of piling woody wetland vegetation.
g. Cutting of forested wetland vegetation without removing stumps.
h. Avoidance or minimization of access through wetlands.
i. Construction equipment refueling at 100 feet or more from a wetland.
j. Storage of petroleum products at 100 feet or more from a wetland.
k. Restoration of work sites and temporary access roads through wetlands.
(CL&P 1, Vol. 1, pp. N-15, N-16)

154. CL&P would locate new transmission structures in upland areas and to limit access road wetland crossings, where possible, to minimize impacts to wetlands. However, where wetland impact is unavoidable, CL&P would make an effort to reduce the size of the crane pad or reconfigure the crane pad, if practical, to avoid placement of temporary fill in wetlands. (CL&P 1, Vol. 1, p. N-14)

155. In locations where no upland alternatives are available, existing access roads through wetlands would be improved or new access roads through wetlands would be developed to provide access to the structure sites. Temporary timber mats may be used for temporary access during construction, and then removed from the wetlands. In some areas, gravel roads would be needed to provide safe access for construction and for the operation and maintenance of the transmission facilities. (CL&P 1, Vol. 1, p. N-10)

156. New wetland crossings would use a new gravel access road underlain by geotextile fabric or installation of a timber mat road. In wetland areas where there is a deep organic layer or the wetlands are prone to extended inundation, permanent gravel access roads would be used to provide a firm base for future access to the transmission facilities. (CL&P 1, Vol. 1, p. N-16)

157. Temporary poles may have to be installed within wetlands during conductor stringing to prevent the wires from sagging into the road travel lanes. The poles would be installed along the ROW at road crossings and would be removed following the completion of the conductor stringing operation. (CL&P 1, Vol. 1, p. N-11)

158. Vernal pools are small bodies of standing freshwater that coincide with spring snowmelt and precipitation but typically become completely dry due to evaporation and infiltration. Vernal pools are often habitat for amphibian species. (CL&P 1, Vol. 1, p. L-16)

159. CL&P has and will continue to coordinate with the DEP to identify appropriate measures to minimize or avoid adverse effects on these amphibians. (CL&P 1, Vol. 1, p. N-29)

160. Potential impacts to vernal pool-obligate amphibians may occur during construction, particularly if work activities are performed during critical amphibian breeding or migration periods. (CL&P 1, Vol. 1, p. N-28)

161. Some new structures may be placed within amphibian breeding areas that exist within large wetland systems currently containing one or more transmission line structures. Additionally, access to the structures is necessary, which may result in temporary effects to the function of amphibian breeding habitat. (CL&P 1, Vol. 1, p. N-28)

162. The spring migration and breeding period for adult male spotted salamander and Jefferson salamander is approximately from March 1st through May 1st. The migration and breeding period for the marbled salamander is approximately from September 1st through October 31st. (CL&P 1, Vol. 1, p. N-29)

Wildlife

163. Construction of the proposed project may temporarily displace wildlife from the area due to the initial disturbance from vegetation clearing and the operation of construction equipment. (CL&P 1, Vol. 1, p. N-23)

164. Impacts to birds from the proposed projects would result primarily from habitat modification due to vegetation clearing during construction and ROW vegetation management activities. The nesting season for a majority of breeding birds extends from May 1st through July 31st. Tree clearing during the nesting season could result in the loss of a breeding season for those species that have established nests within the proposed work area. (CL&P 1, Vol. 1, p. N-31)

165. CL&P would attempt to schedule line outages and other planning considerations so that clearing of the ROW could be done outside of the bird breeding season. (CL&P 1, Vol. 1, p. N-31)

166. CL&P does not intend to limit its construction schedule to seasons when there is no risk to the development of rare and endangered species because of concerns over compromising transmission system reliability and the timely completion of the proposed project. CL&P proposes to provide species awareness and identification training for construction contractors, to install barrier fencing as needed, and to conduct pre-construction sweeps at locations listed to have rare and endangered species. (CL&P 4, R. 23)

Habitat and Vegetation

167. Eight habitat types occur either within the maintained portions of the exiting ROW, or in adjacent, unmaintained portions, where some additional clearing would be required for construction of the proposed project. These eight habitat types include:
    1. Old Field/Shrub Land – includes abandoned fields, natural shrub lands and early successional forests.
    2. Mature Mixed Forest – includes deciduous/coniferous forests, typically tree species common to the area.
    3. Forested Wetland – generally red maple swamps dominated by a mature tree canopy.
    4. Scrub-Shrub Wetland – typically emergent marsh where shrub coverage is substantial.
    5. Emergent Wetland – marshes dominated by herbaceous wetland plant species.
    6. Open Water – includes substantial areas of open water such as lakes, ponds, etc.
    7. Agricultural Lands – includes cultivated fields, croplands, hayfields, pastures and orchards in active use.
    8. Urbanized Areas – includes suburban and urban residential developments, subdivisions, and other maintained areas.

    (CL&P 1, Vol. 1, pp. L-18, L-19)

168. Conversion of the land on the proposed ROW to old field and shrubland habitat would benefit wildlife species that are currently declining in the state and region. Much of the old field and shrubland habitat is gone because former agricultural land is being developed or allowed to revert to woodland. Application of herbicide and mechanical clearing of vegetation should be conducted outside of nesting season for potential resident species. (DEP comments dated July 15, 2009, p. 7; CL&P 1, Vol. 1, p. N-22)

ROW Clearing

169. Generally, the removal of all tall growing tree species from the ROW is required while low-growing tree species and taller shrub species would remain in the areas outside of the conductor zones, which is the area directly below the lines to 15 feet from the most outward conductors. (CL&P 1, Vol. 1, p. N-26)

170. Vegetation along the ROW would be maintained along the banks of the watercourses to provide shade. Vegetation would only be removed if required to maintain safe clearances and access to and from the transmission facilities. (CL&P 1, Vol. 1, p. N-27)

171. Vegetative clearing involves the selective removal of identified species within the ROW. Clearing practices specifically target tall growing tree species and occasionally some state listed invasive shrub species. Removal of the targeted species is done through cutting or herbicide applications. (Tr. 8, pp. 102, 103)

172. Vegetative clearing is performed every four years to allow for removal of plants before they grow to a large height or density. (Tr. 8, p. 103)

173. Vegetation within the conductor zone is required to be eight feet or less. Outside the conductor zone the height of the vegetation could be up to 30 feet. (Tr. 8, p. 176)

Noise

174. The proposed GSRP lines are designed to not be a significant source of audible noise. The conductors proposed for the GSRP have a larger diameter than those used on other 345-kV transmission lines, which reduces the production of corona-caused audible noise. (CL&P 23, R. CAOPLC-013)

175. Noise emissions associated with the construction of the proposed projects would be short-term and would generally be due to construction equipment, truck traffic, earth moving, vehicles and equipment, jackhammers and structure erection equipment. (CL&P 1, Vol. 1, p. N-46)

176. The impact of construction-related noise emissions would vary depending on the location of the noise source due to sound attenuation with distance and with the presence of vegetative buffers or other barriers. Operation of the 345-kV transmission line would create noise that ranges from inaudible levels during fair weather to barely audible levels in relatively dry snow or light fog to distinctly audible levels in rain or wet snow. (CL&P 1, Vol. 1, p. N-46)

Air Quality

177. Properly maintained construction equipment and vehicles would limit vehicular emissions. (CL&P 1, Vol. 1, p. N-45)

178. Fugitive dust emissions during construction of the proposed projects would be suppressed by watering on access roads. Crushed stone aprons would be installed at access road entrances to public roads to minimize tracking of soil onto the pavement. (CL&P 1, Vol. 1, p. N-45)

179. No long-term effects on air quality are associated with the operation of the transmission lines. (CL&P 1, Vol. 1, p. N-45)

Visual Resources

180. The National Park Service has expressed concern about the "potential environmental and scenic/recreational impact to the recently designated New England National Scenic Trail and Wild and Scenic River Study of the Lower Farmington River and Salmon Brook" due to the proposed GSRP. (NPS comments dated July 28, 2009)

Compliance with other State and Federal Agencies

181. CL&P proposes to coordinate with the DEP and United States Army Corps of Engineers (USACE) regarding compensatory wetland mitigation options. These options may include wetlands restoration and/or enhancement along the project ROWs, mitigation banking, wetlands creation, wetlands preservation, and conservation restrictions. (CL&P 1, Vol. 1, p. N-17)

182. CL&P would file an Individual Permit application with the USACE-New England District pursuant to Section 404 of the federal Clean Water Act and Section 10 of the Rivers and Harbors Act. The USACE would review the proposed project jointly with the DEP regarding the issuance of an individual water quality certification pursuant to Section 401 of the Clean Water Act. As part of this permit application, CL&P developed an "invasive species control plan," which was submitted to the USACE on June 19, 2009. (CL&P 1, Vol. 1, p. N-9; CL&P 18, R. FRWA-001)

183. CL&P filed an application for permits with the USACE in June 2009. The application for the Water Quality Certification, with the DEP, was filed in 2009; and the application for a Stream Encroachment Line Permit was filed with the DEP in 2009. Permits are expected to be issued in the second quarter of 2010. (CL&P 5, R. CSC-033)

184. CL&P would submit a General Permit Registration for the Discharge of Storm Water and Dewatering Wastewaters from Construction Activities to the DEP, and would prepare an associated project-specific Storm Water Pollution Control Plan. Both would be developed during and in conjunction with the preparation of the D&M Plans, as required by the Council if approved. (CL&P 1, Vol. 1, p. N-9)

185. CL&P may need to obtain a SCEL permit for the crossing for the Connecticut River at Suffield, if the Southern Route Alternative is approved. (DEP comments dated July 15, 2009, pp. 2, 3)

Mitigation

186. CL&P could temporarily take the existing 115-kV line out of service for short periods to allow for construction of the proposed 345-kV line. An outage of the 115-kV line would allow the proposed 345-kV line may be moved up to 25 feet closer to the existing 115-kV line. This would reduce clearing requirements by up to 25 feet by 4.7 miles along the ROW, which equates to 14 acres. (Tr. 8, p. 202)

Northern Route
Wetlands and Watercourses

187. Wetlands along the GSRP proposed route were identified and described by registered soil scientists during 2007 and 2008. (CL&P 1, Vol. 1, p. L-5)

188. Approximately 11 existing transmission structures along the Connecticut portion of the GSRP Northern Route are located in wetlands. (CL&P 1, Vol. 1, pp. N-9, N-10)

189. The GSRP Northern Route would require the removal of 26 acres of forested vegetation to clear an average of an additional 100 feet along the existing ROW. The forested wetland would be converted to shrub-scrub or emergent wetland. (CL&P 1, Vol. 1, p. N-11)

190. Vernal pool/amphibian breeding habitat surveys were performed in March and April of 2008. 18 wetlands functioning as vernal pools were identified along the Connecticut portion of the GSRP Northern Route. Of the identified vernal pools, one, which is in Suffield would be impacted by construction due to the installation of a new pole structure and temporary access road. (CL&P 1, Vol. 1, p. L-16; CL&P 18, R. FRWA-007)

191. Three vernal pools along the Northern Route support amphibian breeding habitat, all of which are in East Granby. CL&P does not propose to locate new structures, construction areas, or access roads within any of these vernal pools. However, the vernal pools may be impacted as a result of removal of vegetation and tree clearing. (CL&P 18, R. FRWA-007)

192. Amphibian species identified within the vernal pools along the GSRP Northern Route ROW include spotted salamanders, Jefferson salamanders, wood frogs, spring peepers and green frogs. A breeding population of the Jefferson salamander, which is a state-listed species of special concern, was confirmed in two wetlands along the ROW. (CL&P 1, Vol. 1, p. N-28)

193. The proposed GSRP route and existing ROW span seven perennial watercourses, the largest being the Farmington River, and 16 intermittent watercourses. (CL&P 1, Vol. 1, p. L-9)

194. The Connecticut portion of the GSRP ROW is within the 100-year Federal Emergency Management Agency (FEMA) floodplain of Griffin Brook, the Farmington River and Muddy Brook. CL&P would mitigate the loss of floodplain storage along the 100-year FEMA floodplain of Griffin Brook near the North Bloomfield Substation by creating new floodplain storage within the affected area. (DEP comments dated July 15, 2009, p. 2; CL&P 1, Vol. 1, p. L-17)

195. The Northern Route is not above or in the vicinity of public wells, aquifer protection areas, or aquifer protection public supply wells. (CL&P 1, Vol. 1, p. L-17)

Wildlife

196. The GSRP Northern Route traverses the Newgate Wildlife Management Area (WMA) in East Granby, a state-designated wildlife management area managed by the DEP. The proposed route would cross approximately 0.7 miles through the management area. (CL&P 1, Vol. 1, p. L-22)

197. The Connecticut portion of the proposed GSRP traverses 0.3 miles through property owned by the Suffield Sportsman's Association in Suffield. (CL&P 1, Vol. 1, pp. L-22, L-23)

198. Seven state-listed endangered, threatened and special concern species have been reported to occur within the vicinity of the proposed GSRP. State-listed species include:
    1. eastern box turtle (*Terrapene carolina*) – State Special Concern;
    2. Jefferson salamander (*Ambystoma jeffersonianum*) – State Special Concern;
    3. arrow clubtail dragonfly (*Stylurus spiniceps*) – State Special Concern;
    4. eastern pearlshell mussel (*Margaritifera margaritifera*) – State Special Concern;
    5. dwarf wedge mussel (*Alasmidonta heterodon*) – Federal Endangered and State Endangered;
    6. eastern pond mussel (*Ligurnia nasuta*) – State Special Concern; and
    7. Bush's sedge (*Carex bushii)* – State Special Concern.

    (CL&P 1, Vol. 1, p. L-30)

199. Two additional state-listed special concern species are the eastern hognose snake (*Heterodon platirhinos*); and wood turtle (*Clemmys insculpta)*. (DEP Comments dated July 15, 2009, p. 4)

Eastern Box Turtle

200. The DEP recommended habitat characterization surveys for the eastern box turtle to determine areas of potentially suitable habitats; pre-construction sweep surveys to locate and remove box turtles from active work areas; pre-construction reconnaissance surveys for nesting habitat; installation of turtle exclusion fencing; contractor awareness training and the parking of equipment on established roadways and other designated areas at night (as opposed to areas that could potentially serve as box turtle habitat); all equipment be staged on roadways and not turtle habitat; early morning or evening work should be conducted with special care so as not to harm basking or foraging turtles; construction not be done in old field habitat from June through October; minimization of the removal of low-growth vegetation in mapped eastern box turtle habitats during clearing activities; and implementation of erosion and sedimentation controls to limit the deposition of sediment into wetland habitats. (CL&P 1, Vol. 1, pp. L-32, N-34; DEP comments dated July 15, 2009, p. 5)

201. CL&P would not agree to comply with the DEP recommendation of staging of all equipment on roadways rather than in eastern box turtle habitat. CL&P would comply with that recommendation to the extent feasible; however, it may not be feasible to mobilize certain pieces of equipment, such as cranes supporting new structures, multiple times a day to locate it outside potential turtle habitat. Also, CL&P is evaluating the feasibility of working within the seasonal restrictions recommended by the DEP. (CL&P 1, Vol. 1, p. N-35)

202. The DEP recommends that vegetative clearing in the areas of the eastern box turtle habitat be conducted during the active period for the turtle (late spring, summer and early fall) to avoid disturbance to the turtles when they are dormant. (CL&P 1, Vol. 1, p. N-34)

Jefferson Salamander

203. CL&P, in accordance with recommendations from the DEP, performed Jefferson salamander surveys along the ROW in East Granby. The presence of the salamanders has been confirmed within a portion of the existing ROW. (CL&P 1, Vol. 1, pp. L-30, L-31)

204. The CT DEP recommendations for construction within the vicinity of the Jefferson salamander include: performing construction activities in these areas from October through February during the dormant season; avoiding the installation of new structures within amphibian breeding pools; limiting the removal of canopy covering, which shades the breeding pools and regulates the temperature; use of effective erosion and sedimentation controls to minimize deposition of sediment into breeding areas; and placement of wood chip ramps on either side of sediment and erosion controls and/or openings in the erosion control barriers to allow amphibian access to and from vernal pool habitat. Additionally, all silt fencing should be removed from the area following soil stabilization so movement of the species between uplands and wetlands is not restricted. (CL&P 1, Vol. 1, pp. N-32, N-33; CL&P 4, R. 14; DEP comments dated July 15, 2009, p. 4)

205. CL&P has committed to comply with the seasonal restriction for the Jefferson salamander for the clearing of the ROW. However, the remainder of construction activities would continue due to outage constraints and other engineering and construction limitations. (CL&P 1, Vol. 1, p. N-33)

Arrow Clubtail Dragonfly

206. The arrow clubtail dragonfly, which may occur near the proposed GSRP, is not expected to be affected by the project because no in-water work activities are proposed. The DEP has emphasized the importance of proper installation and maintenance of erosion and sediment controls and maintenance of an undisturbed riparian buffer zone to the waterbodies. (CL&P 1, Vol. 1, p. L-33)

207. To mitigate impacts to the arrow clubtail dragonfly, dwarf wedge mussel and eastern pond mussel, which are found near the proposed crossing of the Farmington River, the DEP recommends: performing a rare mussel survey and relocating any rare mussels found to a suitable habitat; performing tree removal activities on the banks of the Farmington River and on an associated island using crews on foot rather than with mechanized equipment; minimizing the removal of low-growth vegetation adjacent to the river during clearing; and installing erosion and sedimentation controls to minimize the deposition of sediment into riverine habitats. (DEP comments dated July 15, 2009, p. 5)

208. A reduction in water quality of the watercourses that are used by the arrow clubtail dragonfly may affect the species. CL&P would maintain a vegetated riparian buffer and implement an erosion and sediment control plan to avoid sedimentation or runoff into these watercourses and to minimize potential impacts on the dragonfly. (CL&P 1, Vol. 1, pp. N-35, N-36)

Eastern Pearlshell Mussel, Dwarf Wedge Mussel, and Eastern Pond Mussel

209. DEP recommends mitigation measures to protect the eastern pearl shell mussel by minimizing removal of low-growth vegetation in wetland areas that are tributary to Muddy Brook during initial vegetative clearing; and applying effective erosion and sedimentation controls to minimize the deposition of sediments into wetland areas. (DEP comments dated July 15, 2009, p. 5)

210. The three species of mussels identified on the CT NDDB as potentially occurring near the area of the proposed project are not expected to be impacted because the proposed GSRP has no in-water work proposed within the major watercourse where these species may occur. (CL&P 1, Vol. 1, p. L-32)

211. The preservation of vegetated riparian buffer zones and the proper installation and maintenance of erosion and sediment controls would avoid and/or minimize effects on watercourses that support the freshwater mussel species. (CL&P 1, Vol. 1, p. N-35)

Eastern Hognose Snake

212. Mitigation measures for the eastern hognose snake include a DEP-approved snake ecologist/monitor present on the ROW between Tunxis Avenue and Hatchett Hill Road during the active period of the species whenever construction takes place; removal of the snakes encountered from the active work area; and contractor awareness training to ensure proper identification of the snakes and proper handling and care procedures for the snakes. (DEP comments July 15, 2009, p. 6)

Wood Turtle

213. To mitigate impact on the wood turtle the DEP recommends habitat characterization surveys to determine areas of potentially suitable habitats; pre-construction sweep surveys to locate and remove turtles from active work areas; contractor awareness training to identify the species; minimization of the removal of low-growth vegetation in mapped turtle habitats during clearing activities; and implementation of erosion and sedimentation controls to limit the deposition of sediment into wetland habitats. (DEP comments dated July 15, 2009, pp. 5, 6)

Habitat and Vegetation

214. The GSRP Northern Route has an approximately 485 acre footprint, of which approximately 102 acres are forested (upland and wetland). The dominant habitat type along the Connecticut portion of the GSRP ROW is comprised of open field/shrub land within the maintained portion of the ROW (comprising approximately 131 acres) and upland forest along unmaintained portions of the ROW (comprising approximately 211 acres). (CL&P 1, Vol. 1, p. L-20)

215. The GSRP Northern Route would require the widening of the maintained portion of the existing ROW by approximately 100 feet, which includes approximately 103 acres of upland deciduous and coniferous

forest. Additionally, removal of the vegetation of approximately 26 acres of palustrine forested wetland would be required. The proposed projects would have long-term, but incremental and localized effects on vegetation and associated wildlife habitats in areas of vegetation removal. (CL&P 1, Vol. 1, pp. N-21, N-22)

216. The primary vegetation within the non-maintained portions of the Northern Route ROW is deciduous (hardwood) and mixed hardwood forest, intermixed with agricultural areas, and maintained lawns and wetlands. (CL&P 1, Vol. 1, p. L-18)

217. Bush's Sedge, a state species of special concern, is a plant species that may be in the vicinity of the proposed GSRP Northern Route. CL&P would comply with the DEP recommendation to conduct a pre-construction sweep of the area to identify any Bush's Sedge plant locations and mark them for avoidance during construction. If CL&P could not avoid the plants, the affected plants would be transplanted to a location outside of the construction area. (CL&P 1, Vol. 1, pp. L-33, N-36)

218. Potential effects on Bush's Sedge may occur due to damaging and/or destroying the plant communities through the expansion of the existing access roads or by equipment travel over the ROW. However, CL&P asserts that periodic disturbances associated with management and maintenance of the ROW can create early successional habitats that may encourage the further establishment of Bush's Sedge on the ROW. (CL&P 1, Vol. 1, p. N-36)

Open Space

219. The town-owned Marion Wilcox Park, located in Bloomfield, is approximately 740 feet west of the North Bloomfield Substation and approximately 1,200 feet from the proposed transmission line. Expansion of the North Bloomfield Substation would extend south to accommodate new equipment and is not expected to impact the park. Vegetation clearing associated with the proposed construction would allow a buffer of trees to remain between the park, the substation and transmission lines. (CL&P 1, Vol. 1, p. L-36)

220. The Newgate WMA is located in East Granby and is bisected by the transmission line corridor north of Turkey Hills Road. The area is also crossed by land owned by CL&P and leased to the CT DEP on the north and south sides of Turkey Hills Road. Clearing of an approximately 100 foot width of vegetation for approximately 8,300 linear feet through the Newgate WMA would be required for the construction of an overhead transmission line. Construction of an in-ROW underground transmission cable would require the clearing of at least a ten-foot width of vegetation through the Newgate WMA. (CL&P 1, Vol. 1, p. L-36; CL&P 4, R. 10)

221. The Farmington Valley Greenway in East Granby is located west of Granby Junction (south of Turkey Hills Road). The nearest portion of the proposed GSRP line is approximately 280 feet west of the greenway. Vegetation removal associated with the construction of the proposed project would not impact the existing tree buffer between the 115-kV transmission lines and the trail. (CL&P 1, Vol. 1, p. L-36; CL&P 4, R. 10)

222. Spencer Woods Wildlife Preserve is located east of the transmission line ROW near Phelps Road in Suffield. It is owned and maintained by the Suffield Land Conservancy. The property is approximately 120 feet from the edge of the existing ROW and approximately 300 feet from the centerline of the proposed transmission line. Vegetation clearing associated with the construction of the proposed transmission line would not affect the existing tree buffer between the transmission line ROW and the Spencer Woods property. (CL&P 1, Vol. 1, p. L-37; CL&P 4, R. 10)

223. The Fox Run at Copper Hill Golf Course is located west of the transmission line ROW on Copper Hill Road in East Granby. The edge of the golf course property is approximately 340 feet from the west edge of the ROW at its closest point and approximately 460 feet from the proposed transmission lines. Vegetation clearing associated with the construction of the proposed transmission line would not affect the existing tree buffer between the ROW and the golf course. (CL&P 1, Vol. 1, p. L-37; CL&P 4, R. 10)

Air Quality

224. All ambient background air concentrations are less than the National Ambient Air Quality Standard for all pollutants and averaging periods with the exception of 8-hour ozone (O_3). East Granby, Suffield and Bloomfield are within a non-attainment area for 8-hour O_3. However, non-attainment is considered to be moderate in the area. (CL&P 1, Vol. 1, p. L-47)

Visual Resources

225. Talcott Mountain State Park in Bloomfield is located approximately 0.3 miles west of the Connecticut portion of the proposed GSRP. The proposed GSRP facilities are not expected to be visible from Talcott Mountain State Park due to topography obstructions. (CL&P 1, Vol. 1, p. L-35; CL&P 4, R. 8)

226. The Connecticut portion of the proposed GSRP route crosses the Metacomet Trail in Suffield, where the trail traverses through the Spencer Wildlife Management Area. (CL&P 1, Vol. 1, p. L-36)

227. The Metacomet Trail was designated a New England National Scenic Trail in March of 2009. (NPS letter dated July 28, 2009)

228. The transmission line ROW crosses the Metacomet Trail at Hatchet Hill Road in East Granby and proceeds along the CL&P access road north of Hatchet Hill Road. (Tr. 8, p. 19)

229. The proposed 345-kV structures would be slightly more visible than the existing 115-kV structures from the Metacomet Trail. (Tr. 10, pp. 83, 84, 86)

Historic and Cultural Resources

230. Three historic cemeteries, which began use between c.1740-1784, were identified within approximately 0.25 miles of the proposed GSRP route, which include St. Andrew's Cemetery in Bloomfield; and a smallpox cemetery and Newgate Prisoners Cemetery both in East Granby. There would be no known or likely adverse visual impact on these cemeteries. (CL&P 1, Vol. 1, pp. L-46, N-45, Vol. 3, p. 33)

231. Along the Northern Route there are no documented archaeological sites; however five Native American archaeological sites are within one mile of the proposed line. (CL&P 1, Vol. 1, p. N-45, Vol. 3, pp. 28, 29)

232. Approximately 6.7 miles of the proposed GSRP route appears sensitive for undocumented Native American archaeological resources. Any sites determined to be eligible for the national Register of Historic Places would be avoided, to the extent possible. If avoidance is not possible, a mitigation strategy would be developed for review and approval by the State Historic Preservation Office (SHPO). (CL&P 1, Vol. 1, p. N-45)

233. Old Newgate Prison is a national landmark and is listed on the National Register of Historic Places. The proposed overhead structures would not be visible from the Prison location. (Tr. 7, pp. 179, 180)

North Bloomfield Substation

General

234. The existing seven acre substation would be expanded by approximately 2.7 acres within the existing CL&P property. The existing substation fence would be relocated approximately 32 feet to the northwest, 292 feet to the southeast, and 193 feet to the southwest. (CL&P 1, Vol. 1, p. I-14)

Wetlands and Watercourses

235. There are four inland wetlands in the vicinity of the North Bloomfield Substation. Two of these wetlands would be impacted by the proposed substation expansion. CL&P would install temporary erosion and sedimentation controls around disturbed areas within the station to minimize potential sedimentation into nearby water resources. (CL&P 1, Vol. 1, p. N-47)

236. The proposed substation expansion would permanently affect approximately 0.78 acres of wetland area, including 0.76 acres of forested/scrub-shrub wetland and 0.02 acres of isolated forested wetland. The majority of the wetland area that would be affected by the expansion is in areas of previous disturbance associated with an approved expansion of the original substation to its current configuration. (CL&P 1, Vol. 1, pp. N-47, N-48)

237. Approximately 400 cubic yards of flood storage capacity within the 100-year FEMA floodplain of Griffin Brook would be permanently displaced as a result of the proposed substation expansion. The loss of flood storage would be offset by the creation of compensatory flood storage volume along Griffin Brook, which would also mitigate for the loss of wetland function and value. Additional wetland mitigation would be incorporated into a wetland mitigation plan for the GSRP. (CL&P 1, Vol. 1, p. N-48)

Wildlife

238. During field investigations, a wood turtle and a box turtle were observed in the vicinity of the North Bloomfield Substation. (CL&P 1, Vol. 1, p. N-49)

239. To mitigate impact on the wood turtle the DEP recommends habitat characterization surveys to determine areas of potentially suitable habitats; pre-construction sweep surveys to locate and remove turtles from active work areas; contractor awareness training to identify the species; minimization of the removal of low-growth vegetation in mapped turtle habitats during clearing activities; and implementation of erosion and sedimentation controls to limit the deposition of sediment into wetland habitats. (DEP comments dated July 15, 2009, pp. 5, 6)

240. The DEP recommended habitat characterization surveys for the eastern box turtle to determine areas of potentially suitable habitats; pre-construction sweep surveys to locate and remove box turtles from active work areas; pre-construction reconnaissance surveys for nesting habitat; installation of turtle exclusion fencing; contractor awareness training and the parking of equipment on established roadways and other designated areas at night (as opposed to areas that could potentially serve as box turtle habitat); all equipment be staged on roadways and not turtle habitat; early morning or evening work should be conducted with special care so as not to harm basking or foraging turtles; construction not be done in old field habitat from June through October; minimization of the removal of low-growth vegetation in mapped eastern box turtle habitats during clearing activities; and implementation of erosion and sedimentation controls to limit the deposition of sediment into wetland habitats. (CL&P 1, Vol. 1, pp. L-32, N-34; DEP comments dated July 15, 2009, p. 5)

241. CL&P would not agree to comply with the DEP recommendation of staging of all equipment on roadways rather than in eastern box turtle habitat. CL&P would comply with that recommendation to the extent feasible; however, it may not be feasible to mobilize certain pieces of equipment, such as cranes supporting new structures, multiple times a day to locate it outside potential turtle habitat. Also, CL&P is evaluating the feasibility of working within the seasonal restrictions recommended by the DEP. (CL&P 1, Vol. 1, p. N-35)

Habitat and Vegetation

242. Approximately two acres of mostly deciduous upland forest would have to be removed for the expansion of the substation. (CL&P 1, Vol. 1, p. N-49)

Visual Resources

243. The visual impact of the proposed substation modifications would be minor. The new 345-kV line structure would be approximately 90 feet tall, which is similar to the height of the existing structures. The substation is not visible from private residences or public areas. (CL&P 1, Vol. 1, pp. N-49, N-50)

Historic and Cultural Resources

244. The St. Andrews Cemetery, which is a protected historic cemetery, is located across the street from the North Bloomfield Substation. There is not expected to be a significant adverse visual effect on the cemetery from the proposed substation modifications. (CL&P 1, Vol. 1, N-50)

Noise

245. Noise emissions from the substation would be generated from the transformers, the transformer cooling fans, and the control house air conditioning units. All three pieces of equipment would not be expected to operate simultaneously because it would represent an overload condition on the system. CL&P would incorporate measures to minimize noise into the design of the modified substation. (CL&P 1, Vol. 1, pp. N-50, N-51)

246. Sound level measurements were taken at two locations around the existing fenceline of the North Bloomfield Substation. The locations were selected because they are representative of existing environmental conditions, are near sensitive noise receivers and were accessible. Ambient A-weighted sound levels ranged from a low of 36.5 decibels during the night to a high of 49.6 decibels during the early evening. (CL&P 1, Vol. 1, p. L-52, L-55)

247. The State of Connecticut noise control regulations for residential areas are 55 dBA during the day and 45 dBA at night. (CL&P 1, Vol. 1, p. L-52, L-55)

248. The proposed transformer is the only equipment at the North Bloomfield Substation that would result in a new noise source. The estimated noise level following the addition of the proposed equipment at the substation would be not higher than 50 dBA during the day and 43 dBA at night. (CL&P 1, Vol. 1, p. L-58)

Southern Route Alternative

Wetlands and Watercourses

249. The Southern Route Alternative traverses five perennial watercourses, the largest of which is the Connecticut River. All of these watercourses are currently crossed by the existing overhead transmission lines. The Connecticut River is part of the CT DEP Stream Channel Encroachment Line (SCEL) program. (CL&P 1, Vol. 1, pp. M-36, M-37)

250. The Southern Route Alternative would traverse an undeveloped area with many wetlands and would require a second crossing of the Connecticut River. The Connecticut River would be crossed in Massachusetts, near the Connecticut border and would require cutting riparian vegetation in an area called the Enfield Cove, which has habitat extending from Massachusetts into Connecticut. (Tr. 8, p. 71)

251. There are 27 wetlands and three vernal pools identified along the Southern Route Alternative. (CL&P 1, Vol. 1, p. M-37)

252. The Southern Route Alternative would traverse the 100-year FEMA floodplain of the Connecticut River, Four Mile Brook and Waterworks Brook. (CL&P 1, Vol. 1, p. M-39)

253. CL&P would attempt to locate new structures in upland areas to avoid the permanent alignment of access roads through wetlands; however, this may not be possible in some cases. In these cases the structure footings and access roads would represent permanent fill, which would be mitigated or compensated for. (CL&P 1, Vol. 1, p. N-72)

Wildlife

254. There are four species listed on the Natural Diversity Database (NDDB) that are associated with the Connecticut River: the endangered Shortnose sturgeon (*Acipenser brevirostrum*), the endangered Bald Eagle (*Haliaeetus leucocephalus*), the threatened Riverine clubtail dragonfly (*Stylurus amnicola*) and the species of special concern Arrow clubtail dragonfly (*Stylurus spiniceps*). Since in-water activities are not associated with this area of the proposed project, the above-referenced species are not expected to be impacted. However, CT DEP requires erosion and sediment controls, as well as maintenance of an undisturbed riparian buffer zone to the subject waterbodies. (CL&P 1, Vol. 1, pp. M-41, M-42)

255. If construction activities would involve tree clearing within 300 feet of the Connecticut River, pre-construction field surveys would be required to determine if potential roost trees and nest sites for bald eagles are present in the area and, if so, appropriate mitigation measures would be taken. (CL&P 1, Vol. 1, p. N-73)

Habitat and Vegetation

256. Land use in the vicinity of the Southern Route Alternative is predominately agricultural, forested and residential. The alternative route would be aligned near various residential subdivisions and multiple dwelling units, such as condominiums and apartment complexes. (CL&P 1, Vol. 1, p. M-42)

257. Construction of the Southern Route Alternative within Connecticut would require approximately 36 acres of vegetation clearing and approximately 6.8 acres of wetland impact. (Tr. 11, p. 154)

Historical and Cultural Resources

258. Two Native American archaeological sites are located within approximately one mile of the Southern Route Alternative. One is a surface find and the other a cemetery that appears to have been located in Longmeadow, Massachusetts. Two Euro American archaeological sites are located within approximately one mile of the alternative route, the nearest of which is 4,500 feet away. Neither site would be eligible for the National Register of Historic Places. (CL&P 1, Vol. 1, pp. M-45, M-51, M-52)

Air Quality

259. Air Quality in the vicinity of the Southern Route Alternative is similar to that found along the Northern Route, as stated in Finding of Fact number 224. (CL&P 1, Vol. 1, p. M-45)

MMP
Wetlands and Watercourses

260. The MMP route spans five perennial waterbodies, the largest of which is the Hockanum River, and two intermittent watercourses. (CL&P 1, Vol. 1, p. L-61)

261. Existing structures associated with the MMP are within the Stream Channel Encroachment Lines (SCEL) of the Hockanum River. The DEP Bureau of Water Protection and Land Reuse's Inland Water Resources Division regulates the placement of structures within a river's SCEL to lessen risk of hazards to property due to flooding. (CL&P 1, Vol. 1, p. L-62)

262. There are 13 wetland systems along the MMP line route. Of the wetlands that exist along the ROW, two areas were identified and confirmed as amphibian breeding habitats/vernal pools. (CL&P 1, Vol. 1, p. L-64)

263. Amphibian species identified within the vernal pools along the MMP include the spotted salamander and wood frog. (CL&P 1, Vol. 1, p. N-28)

264. Approximately nine existing structures along the MMP ROW are located in wetlands. Some new structures would be located in wetlands, requiring permanent fill. Permanently disturbed wetland areas would be compensated for through mitigation efforts, such as wetland creation. (CL&P 1, Vol. 1, pp. N-10, N-17)

265. The MMP would require the conversion of approximately 1.4 acres of forested wetland vegetation along the existing ROW to shrub-scrub or emergent wetland. (CL&P 1, Vol. 1, p. N-11)

266. The MMP route traverses 2.1 miles of the Love Lane/New State Road Aquifer Protection Area. The nearest public water supply well associated with the Aquifer Protection Area is located near Love Lane, approximately 0.5 miles north of the Manchester Substation. (CL&P 1, Vol. 1, pp. L-64, L-65)

267. The proposed MMP line would cross the 100 year flood boundary of the Hockanum River. (CL&P 1, Vol. 1, p. L-65)

Habitat and Vegetation

268. Approximately 3.7 acres of forested upland vegetation would be cleared and maintained in shrub or grass cover types along the existing ROW. (CL&P 1, Vol. 1, p. N-22)

Wildlife

269. There is no designated wildlife management areas found in the vicinity of the proposed MMP route; however, the Hockanum River corridor is a state-designated trout management area that is overseen by the CT DEP. (CL&P 1, Vol. 1, p. L-66)

270. The state-listed endangered species the barn owl (*Tyto alba*) has been documented in the vicinity of the MMP route. During the spring of 2008, an inspection of the entire length of the MMP was performed to search for potential barn owl nesting habitat. No active barn owl nest sites were found at that time; however two areas along the MMP route were identified as potential foraging habitat for barn owls, one of which was located within the CL&P transmission line ROW. (CL&P 1, Vol. 1, pp. L-67, L-68)

271. The proposed construction activities along the MMP corridor may temporarily disturb potential foraging habitat of the barn owl; however, CL&P expects that re-establishment of vegetation on the ROW following the completion of construction would provide continued foraging habitat for the barn owl. The DEP recommends that clearing of large diameter trees be prohibited in the area along the Hockanum River that is located within the transmission corridor. (CL&P 1, Vol. 1, pp. N-36, N-37; CL&P 4, R. 14)

Historic and Cultural Resources

272. Eight Native American sites have been reported within approximately one mile of the proposed MMP route. None of the sites would be eligible to be listed on the National Register of Historic Places. Although no sites have been found within the ROW, there are sites within 500 feet of the MMP. (CL&P 1, Vol. 1, p. L-71)

273. The c1835 Charles Bunce House, located approximately 0.25 miles from the MMP route, is eligible for the National Register of Historic Places. (CL&P 1, Vol. 1, p. L-72)

Air Quality

274. All ambient background air concentrations are less than the National Ambient Air Quality Standard for all pollutants and averaging periods with the exception of 8-hour O_3. Manchester is within a non-attainment area for 8-hour O_3. (CL&P 1, Vol. 1, p. L-73)

ELECTRIC AND MAGNETIC FIELDS

General

275. Electric and magnetic fields (EMF) are two forms of energy that surround an electrical device. Transmission lines are a source of EMF. (CL&P 1, Vol. 1, p. K-3)

276. Electric field is a result of voltages applied to electrical conductors and equipment. Magnetic fields are produced by the flow of electric currents. The magnetic field at any point depends on the characteristics of the source, including the arrangement of conductors, the amount of current flow through the source, and its distance from the point of measurement. (CL&P 1, Vol. 1, p. O-2)

277. Agencies, including the World Health Organization and the Committee on Electromagnetic Safety have researched the scientific evidence regarding EMF. These agencies have determined a maximum level of occupational exposure for working environments, as well as for exposure for the general public. The International Committee on Non-Ionizing Radiation Protection has the strictest standard of 833 milligauss (mG) for a 60-hertz magnetic field. (Tr. 7, p. 108)

278. The Council's *"Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut"* (EMF BMPs) were issued in December 2007 to address concerns regarding potential health risks from exposure to EMF from transmission lines. (Council Admin. Notice 3; CL&P 1, Vol. 1, p. K-3)

279. The Council's EMF BMPs support the use of effective no-cost and low-cost technologies and management techniques to reduce magnetic field (MF) exposure to the public while allowing for the development of electric transmission line projects. (Council Admin. Notice 3; CL&P 1, Vol. 1, p. K-3)

280. The Council's guidelines seek to achieve MF reductions at ROW edges of 15% or more as compared with the levels associated with a base line design, with an investment of up to 4% of the estimated project cost using the base line design (including the cost of each project's related substation work). (Council Admin. Notice 3; CL&P 1, Vol. 1, p. O-8)

281. CL&P calculated pre- and post-construction EMF levels. The pre-construction calculation included a system to be modeled in 2012, which included transmission system changes already approved by ISO-NE and included in the system reliability models that have expected in-service dates before 2012. The post-construction modeling included a system in 2017 that includes all four of the NEEWS projects designed. (CL&P 1, Vol. 1, p. O-11)

282. CL&P calculated MF using three loading conditions; Annual Peak Load (APL), which is ISO-NE's projected 90/10 system peak loads; peak daily average loads (PDAL), which uses the estimated average load over a 24-hour period on the 90/10 peak load days; and annual average loads (AAL), which are based on a 61% annual load factor of the New England transmission system. (CL&P 1, Vol. 1, p. O-12)

283. EMF modeling is done for an assumed midspan height above ground level for the lowest conductors of 30 feet for the 115-kV line and 35 feet for the 345-kV line. Although the modeling is done at a uniform height, conductors are higher at support structures than they are along the spans between the structures. (CL&P 23, R. CAOPLC-002)

284. EMF levels at annual average loading for the proposed H-frame configuration at ROW edges for the section of ROW between North Bloomfield and Granby Junction were calculated to be:

	Magnetic Fields (mG)		**Electric Fields (kV/m)**	
	west/north ROW	east/south ROW	west/north ROW	east/south ROW
Pre-construction	16.0	0.5	0.46	0.00
Post-construction	10.2	13.4	0.01	0.18

(CL&P 1, Vol. 1, p. O-20)

Statutory Facilities

285. CGS Section 16-50p(i) designates a group of land uses (called "Statutory Facilities") that the Council must consider in its review of new electric transmission facilities. "Statutory Facilities" include:

a. Private or public schools
b. Licensed child day-care facilities
c. Licensed youth camps
d. Public playgrounds
e. Residential areas
(CL&P 1, Vol. 1, pp. H-26, H-27)

286. CGS Section 16-50p(i) states that electric transmission lines with a voltage of 345-kV or greater shall be constructed underground if they are adjacent to Statutory Facilities, unless burying the lines is infeasible for technical or economic reasons. If undergrounding the transmission lines is deemed infeasible, the Council may approve overhead construction provided that it is installed within a buffer zone that is adequate to protect health and safety. (CL&P 1, Vol. 1, pp. H-27, H-28)

287. CL&P would provide a Field Management Design Plan, in accordance with the EMF BMPs, that would identify measures to reduce MF levels that would otherwise occur along an electric transmission line ROW, specifically where the line is adjacent to "Statutory Facilities." (CL&P 1, Vol. 1, p. K-4)

GSRP-Northern Route

288. The proposed GSRP route would not be adjacent to any public or private school, licensed child day-care facility, licensed youth camp or public playground. There are a group of homes along the section of the existing ROW between the point where Country Club Lane in East Granby comes closest to the ROW and where Phelps Road in Suffield intersects with the ROW. This group of homes may be sufficiently dense enough to qualify as a statutory "residential area," which is referred to as the "focus area." CL&P proposes to construct the proposed 345-kV line in a delta configuration in the residential area to reduce EMF levels in accordance with the EMF BMPs. (CL&P 1, Vol. 1, pp. H-28, O-62, O-63)

289. The proposed 345-kV line would be constructed east of the existing 115-kV circuits. (CL&P 1, Vol. 1, pp. O-24, O-25)

290. In the "focus area" from Country Club Lane to Phelps Road (in Suffield) there are 25 homes within 100 feet of the edge of the ROW and 50 additional homes within 101 and 300 feet of the edge of the ROW. (Tr. 10, pp. 79, 80)

291. The delta configuration would not require the widening of the existing ROW for the construction of the new 345-kV structures, while the proposed design in this portion of Segment 2 would require an expansion of the existing ROW. The delta configuration would include 110-foot monopoles centered 75 feet east of the centerline of the ROW. (CL&P 1, Vol. 1, pp. O-62, O-63)

292. The delta configuration would reduce magnetic field levels under modeled system average loading conditions by 22% to 24% at ROW edges, as compared to the magnetic field levels of the proposed H-frame line design. (CL&P 1, Vol. 1, p. O-63)

293. EMF levels at annual average loading at ROW edges for the section of ROW between Granby Junction and the Connecticut/Massachusetts state border are calculated to be:

	Magnetic Fields (mG)		**Electric Fields (kV/m)**	
	west/north ROW	east/south ROW	west/north ROW	east/south ROW
Pre-construction	8.7	0.1	0.09	0.00
Post-construction	23.5	12.6	0.11	0.15
EMF BMP	17.9	9.8	0.15	0.14

(CL&P 1, Vol. 1, p. O-30)

294. The delta configuration would cost approximately $2.2 million more than the proposed configuration. This expenditure equates to approximately 1.6% of the total project cost. (CL&P 1, Vol. 1, p. O-64)

295. Options to reduce magnetic fields along the 3.2-mile "focus area" of the GSRP Northern Route include:

Configuration	Max. level on ROW* (mG)	% reduction-west edge	% reduction-east edge	% cost increase
Base line	269.2	-	-	-
H-Frame +20'	179.5	3%	2%	0.4%
Delta	173.4	24%	22%	1.6%
Delta +20'	82.8	33%	27%	3.0%
Vertical	149.7	34%	24%	2.6%
Vertical +20'	72.5	45%	29%	3.5%
Split phase	77.0	90%	85%	10.1%
345/115-kV composite	132.0	20%	34%	11.0%

(CL&P 1, Vol. 1, Appendix O-1, p. 12; CL&P 19, R. OCC-001-SP02)
*Typical location on the ROW for maximum magnetic field levels is directly underneath the conductor midspan between the structures.

296. Although the split-phase configuration would provide the greatest reduction in magnetic field levels, it is a 10.1% increase over the cost of the base line configuration for the same section of ROW. (CL&P 1, Vol. 1, Appendix O-1, p. 13)

297. The split phase design is two 345-kV vertically configured lines installed side by side on one structure. The height of the structure is determined by the height above ground of the conductor at its low point, which is mid-span between structures. The height above ground of the conductors must be in compliance with the National Electrical Safety Code at emergency operating temperature, which results in greater sag on the conductor. (Tr. 6, pp. 191, 192)

298. To decrease the height of the structures used for a split-phase configuration, the distance between the structures would have to decrease thereby shortening the spans of the conductors. Transmission line structures are typically 500 to 800 feet apart. The trade-off would result in double the amount of transmission structures, more access roads and a greater cost. (Tr. 6, p. 197; Tr. 8, pp 90, 91)

299. In transitioning to a split-phase design from an H-frame design, there would be additional conductors. At the transition point, additional pole structures would be required to dead end the conductors. (Tr. 8, pp. 76, 77)

300. Most of the homes along the proposed GSRP transmission lines are not close enough to existing statutory facilities to raise a potential health concern. There are homes along Newgate and Phelps Road in Suffield and East Granby that are very close to the edge of the ROW and construction of the proposed GSRP would result in increased magnetic fields at these residences. Installing the overhead lines in a split phase configuration in this area of concern would reduce field levels to 2.4 mG at the western edge of the ROW at a cost above that of the delta configuration. Increasing the distance of the proposed transmission lines, by moving the lines farther east within the ROW in the area along which the homes are closest to the ROW edge, in addition to using the delta configuration, would reduce the EMF levels. (DPH comments dated October 8, 2009)

301. DPH recommends minimizing the increase of EMF levels above current levels to the greatest extent possible. (DPH comments dated October 8, 2009)

302. Underground line variations to the GSRP would replace sections of the Granby Junction to the Connecticut/Massachusetts state border. Magnetic fields (in mG) from the underground line variations were calculated (at a distance of 25 feet from the underground cable centerline) to be:

	West/north ROW	East/south ROW
Post-Construction	23.5	12.6
In-ROW Variations	3.2	0.5
In-Road Variations	2.6	5.6

(CL&P 1, Vol. 1, pp. O-38)

303. Magnetic fields from underground cables, when standing directly above, would generally be the same or greater than the magnetic fields directly below some overhead lines. (Tr. 8, p. 188)

304. Predictions for underground magnetic field levels are for the duct banks only. In the vicinity of splice vaults, due to the wider spacing of the cables, the magnetic field levels would be comparable to that of the overhead lines. (Tr. 8, p. 81)

GSRP-Southern Route Alternative

305. Since the total length of the Southern Route Alternative is longer than the proposed GSRP Northern Route, there would be different electrical impedance and the system load flows would be affected. Also, any other line route variations, such as undergrounding, would cause changes in line impedances and forecasted load flows. (CL&P 1, Vol. 1, p. O-11)

306. There are three statutory "residential areas" adjacent to the Southern Route Alternative transmission ROW in Enfield. CL&P did not develop an overhead BMP line-design alternative for these areas but has evaluated an underground variation (the Route 220/Enfield Variation). (CL&P 1, Vol. 1, p. O-43)

307. The Route 220/Enfield Underground Variation would replace a portion of the overhead Southern Route Alternative with an in-ROW or in-street underground cable. (CL&P 1, Vol. 1, pp. O-46, O-47)

308. EMF levels at annual average loading at ROW edges for the section of the Southern Route Alternative ROW and Variations (with underground cable calculations at 25 feet from the centerline) were calculated to be:

	Magnetic Fields (mG)		Electric Fields (kV/m)	
	west/north ROW	east/south ROW	west/north ROW	east/south ROW
State border to CT River (XS-S05) – Pre	3.8	0.3	0.31	0.01
State border to CT River (XS-S05) – Post	12.5	15.2	0.42	0.22
CT River to Franconia Jct. (XS-S07) – Pre	7.0	0.3	0.66	0.01
CT River to Franconia Jct. (XS-S07) – Post	17.3	15.2	0.81	0.22
CT River to Franconia Jct. (XS –S07) In-ROW Underground	17.4	4.6	None	None
CT River to Franconia Jct. (XS-S07) In-road Underground	2.6	5.7	None	None

(CL&P 1, Vol. 1, pp. O-43 to O-49)

MMP

309. The existing MMP ROW would extend past three "statutory facilities," which include the Howell Cheney Vocational Training School, Leber Field/Playground and East Catholic High School. (CL&P 1, Vol. 1, p. O-55)

310. Due to the presence of statutory facilities, CL&P evaluated line-design alternatives to reduce magnetic fields. CL&P would recommend that the existing 345-kV line be configured as a split-phase line to comply with the EMF BMPs. Calculated EMF associated with the MMP project is:

	Magnetic Fields		Electric Fields	
	west/north ROW	east/south ROW	west/north ROW	east/south ROW
Pre-const.	4.8	27.4	0.06	0.15
Post-const.	3.2	12.2	0.07	0.15
BMP	2.2	4.9	0.05	0.14

(CL&P 1, Vol. 1, pp. O-56 to O-58)

311. The BMP design for the MMP line was identified because a section of the ROW is near a public school and playground. The BMP configuration would include approximately 3,500 feet of the existing 115-kV circuit on the double-circuit lattice tower to be replaced with a bundled 954-kcmil ACSR conductor bundle; approximately three structures at each end of the project would require insulation upgrades; and installation of connecting conductors in some locations to connect the opposite side conductors together allowing bundled circuit operation. (CL&P 1, Vol. 1, pp. O-66, O-67)

312. The BMP configuration for the MMP would reduce the magnetic field levels at the west edge of the ROW by 25% and on the east edge by 61% at average system loading. This design would increase the cost of the project by approximately $520,000. (CL&P 1, Vol. 1, p. O-67)

313. Options to reduce magnetic fields along the MMP include:

Configuration	Max. level on ROW (MG)*	% reduction-west edge	% reduction-east edge	% cost increase
Base line	30.0	-	-	-
Vertical +20'	29.0	3%	0%	23.7%
395 bundled circuit	34.4	-6%	13%	3.8%
395 split phase	34.1	25%	61%	3.8%
115-kV design	29.0	12.1%	1%	-18.6%

(CL&P 1, Vol. 1, Appendix O-1, p. 40)
*Typical location on the ROW for maximum magnetic field levels is directly underneath the conductor midspan between the structures.

314. The option to reconfigure the existing 345-kV circuit as a split-phase would result in the greatest reduction in MF levels at the ROW edges and is less than 4% cost increase over the base line, which is in accordance with the Council's BMPs. (CL&P 1, Vol. 1, Appendix O-1, p. 41)

SAFETY

315. The design of the proposed project incorporates protective relaying equipment to automatically detect abnormal system conditions and send a protective trip signal to the associated circuit breaker(s) at each end of a line to isolate the faulted section of the transmission system. (CL&P 1, Vol. 1, p. K-1)

316. Carrier signals are impressed upon the overhead conductors to provide electronic communications between substations with overhead transmission facilities. (CL&P 1, Vol. 1, p. K-2)

317. Fire/smoke detection systems would be installed within the proposed control and relay enclosure at the North Bloomfield Substation. These systems would automatically activate an alarm at Connecticut Valley Electric Exchange (CONVEX). (CL&P 1, Vol. 1, p. K-2)

ALTERNATIVE PROJECT DESIGNS

System Alternatives
Non-Transmission Alternatives

318. One non-transmission alternative is no action; that is, making no transmission improvements. Planners rejected this alternative because it would not correct reliability violations. Additionally, import capacity to Connecticut would not be increased. (CL&P 1, Vol. 1, p. G-2)

319. The other non-transmission alternatives are resource alternatives: demand-side management (DSM), which includes load reduction and distributed generation; large scale generation; and combined heat and power. (CL&P 1, Vol. 1, p. G-3)

320. The non-transmission alternatives were tested by ICF Resources, LLC (ICF), per certain determined scenarios, to measure their capability of providing reliability benefits compared with the proposed GSRP. (Tr. 5, p. 61)

321. Certain specific resource alternatives modeled by ICF were:

a. Reduce Connecticut zonal demand by 1,000 MWs
b. Reduce Western Massachusetts zonal demand by 1,000 MWs
c. West Springfield and Berkshire power plants operational and a new 400-MW facility located at Berkshire Power for a total of 854 MW in Greater Springfield
d. West Springfield and Berkshire power plants operational, a new 200-MW facility located at Berkshire Power, and a new 200-MW facility at Mount Tom for a total of 1,054 MW in Greater Springfield
e. West Springfield and Berkshire power plants operational, Connecticut zonal demand reduced by 500 MWs, and limit load at Chicopee, Clinton, East Springfield, Agawam and Breckwood Substations
f. Reduce Connecticut zonal demand by 500 MWs, and limit load at Chicopee, Clinton, East Springfield, Agawam and Breckwood Substations
(CL&P 1, Vol. 1, p. G-9)

DSM

322. An aggressive DSM reduction modeled at approximately 1,000 MW in the Springfield area and western Massachusetts would not resolve all the Greater Springfield and north-central Connecticut overloads. (CL&P 1, Vol. 1, p. G-11)

323. It is unlikely that an actual reduction of more than the modeled 1,000 MW could be made in the Greater Springfield load area within the planned time horizon for GSRP, since the ISO-NE Forward Capacity Auction (FCA) indicates only 4,200 MW of DSM will be available through all of New England for 2011-2012. (CL&P 1, Vol. 1, p. G-5)

Large Scale Generation

324. The establishment of generation alone would not eliminate the reliability need for the GSRP, partially because the reliability problem exists throughout the transmission system in the Greater Springfield area. (Tr. 6, p. 78)

325. Large scale generation that is proposed north of Ludlow, Massachusetts would intensify the system reliability problems in Greater Springfield and north-central Connecticut, such that ISO-NE would require transmission system improvements in order for the proposed generation to be built. Any potential generation resources located in downtown Springfield would have the same effect. (CL&P 1, Vol. 1, p. G-14)

326. When ICF modeled the transmission system under contingent conditions, the operation of existing and new generators within Connecticut but outside of the north-central region had little impact on the need to import into Connecticut. (CL&P 4, R. 4)

327. CL&P performed an additional analysis specifically focusing on power flows in modeled cases of contingent conditions where either the NRG plant in Meriden, Connecticut or the GE Financial Services' plant in Oxford, Connecticut were producing electricity. The results of the study indicated that neither case resolved the transmission reliability problems in the Greater Springfield load area. (CL&P 4, R. 18)

328. Overall, no non-transmission alternatives to the GSRP were found to be satisfactory or sufficient to replace or defer the need for the proposed project. Many transmission facility overloads were shown to occur under modeled contingencies that the electric transmission system would not fully comply with the mandated national and regional system reliability criteria. (CL&P 1, Vol. 1, p. G-10)

Transmission Alternatives
Options A, B and C

329. In its Options Analysis, the ISO-NE Working Group identified two other potential 345-kV connections other than the proposed GSRP to resolve the Greater Springfield load area reliability issues. The options were:
    a. The proposed GSRP (Option A)
    b. a 345-kV line between North Bloomfield and Ludlow Substations that did not tie into the Agawam Substation (Option B); and
    c. a 345-kV line from Manchester Substation in Manchester, Connecticut to the Ludlow Substation (Option C).

(CL&P 1, Vol. 1, pp. G-18, G-19)

330. Like Option A (the proposed GSRP), Options B and C would each provide a new 345-kV connection between western Massachusetts and Connecticut but they were rejected by CL&P on the grounds that they each had disadvantages in terms of reliability, length, and cost. (CL&P 1, Vol. 1, pp. G-18, G-19)

High Voltage Direct Current (HVDC)

331. An HVDC option to deal with reliability problems in the Greater Springfield load area, among others in the tri-state area covered by NEEWS, was examined and rejected in the ISO-NE "Options Analysis," June 2008. (CL&P 1, Vol. 5, "Options Analysis", pp. 20-22)

332. HVDC transmission lines typically are not introduced into the middle of an existing grid because they have different electrical characteristics from normal transmission lines that carry Alternating Current (AC). Every connection point between HVDC and AC lines requires a converter station, and these are expensive, both because of the technical equipment and the extra space involved. Also, if a line is out of service in an AC system, the electricity immediately and automatically flows on the remaining AC lines to get to the customer, whereas an HVDC line has to be manually operated. For these reasons, HVDC systems limit flexibility, and tend to be used only in special cases, such as the connection of power systems that differ operationally, asynchronous systems, and underwater cables. (Tr. 7, p. 84; Tr. 10, p. 118)

333. Each HVDC converter station would cost approximately $200 million. Three or Four converter stations would be needed along the GSRP Northern Route. (Tr. 7, pp. 85, 86)

334. A conventional HVDC system for 1,200 MW of capacity would cost approximately $2.3 billion. An HVDC "Light" system from Ludlow to Agawam to North Bloomfield would provide up to approximately 1,000 MW of capacity and would cost approximately $2.4 billion. Either cost would be directly comparable – and far higher – than the GSRP cost of $714 million. (Tr. 10, pp. 74-76)

335. Estimated costs for HVDC systems include the installation of an HVDC system include 35 miles of HVDC underground, the 115-kV overhead work that would still be required in Greater Springfield and three converter stations. The estimate also includes spare HVDC transformers because lag time in acquiring these transformers is more than a year. The spare transformers would cost approximately $62 million. (Tr. 10, p. 103)

336. CL&P has concerns about whether an HVDC converter station could fit into the available land at Ludlow, Agawam, and North Bloomfield Substations. (Tr. 10, p. 118)

MMP Variation

337. The MMP Variation (MMP-V) consists of the reconfiguration an existing 2.6 mile section of 115-kV transmission lines between Manchester Substation and Meekville Junction. The MMP-V includes upgrading the existing 115-kV line to 345-kV. (CL&P 26, pp. 2, 3)

338. The MMP-V entails the construction of new steel monopoles and conductors the entire length of ROW between Manchester Substation and Meekville Junction, which is 0.4 miles longer than the proposed MMP. The MMP-V also includes the installation of a new 345-kV circuit breaker and associated equipment at the Manchester Substation, which is not necessary as part of the proposed MMP. (CL&P 26, p. 3)

339. There is currently a 345-kV circuit from Meekville Junction to Barbour Hill Substation in South Windsor, a 345-kV circuit from Meekville Junction to North Bloomfield Substation and a 345-kV circuit from Meekville Junction to Manchester. These three 345-kV circuit sections comprise a 3-terminal line (the 395 circuit). The MMP-V would split the existing 3-terminal line into two 2-terminal circuits. One circuit would extend from North Bloomfield Substation to Manchester Substation and the other from Barbour Hill Substation to Manchester Substation. (CL&P 26, p. 3)

340. There are many wetland areas along the MMP ROW, increasing the amount of construction as associated with the MMP-V would increase wetland impact. CL&P has not determined the extent of additional wetland impact. (CL&P 26, p. 4)

341. Construction of the MMP-V would require the crossing of several 115-kV lines, some of which are double-circuit. Many existing 115-kV structures would have to be relocated to allow the crossing of the new 345-kV MMP-V line. This relocation would require line outages. (CL&P 26, p. 4)

342. The MMP-V, with the GSRP, would eliminate violations on the transmission system. In power flow studies the MMP-V were less heavily loaded under contingencies than the MMP, which indicates that the MMP-V is a more robust and longer lasting solution. (CL&P 26, p. 6)

Cost

343. The additional MMP-V cost is approximately $10 million bringing the total cost of construction of the MMP to approximately $24 million. The additional cost may not qualify for regionalization. (CL&P 26, p. 5)

DOCKET 370B – NRG MERIDEN POWER PLANT

PROJECT DESCRIPTION

344. On April 27, 1999, the Council approved Docket 190 and issued a Certificate of Environmental Compatibility and Public Need to PDC-El Paso Meriden, LLC. (NRG 1, p. 36, Tab A)

345. NRG acquired the Meriden Facility in December 2000. Since that time, NRG has maintained contact with the municipal officials of Meriden and Berlin. (NRG 1, p. 36)

346. In 2006, in compliance with the Council's approval, NRG transferred approximately 700 acres of land to Meriden and Berlin. The land included "30 acres of trap rock ridges under a conservation restriction, 60 acres for use as open space for recreation and education and 14.6 acres under conservation restriction for vernal pool protection." (NRG 1, p. 36)

PROJECT AREA

347. The Meriden Project is located on a 36-acre parcel off of South Mountain Road in Meriden. Approximately 11 of the 36 acres would be used for the footprint of the facility. Additionally, transmission corridor (for gas and electricity) would cross the site. (NRG 1, p. 12)

348. The original size of the NRG parcel was 821 acres. (Admin. Notice 44, Docket 190, FOF #11)

349. Additional ROWs would be acquired in the future for gas and water pipelines. (NRG 1, p. 12)

350. The facility would interconnect to two existing 345-kV electric transmission lines that cross the property. (NRG 1, p. 12)

PROJECT NEED

351. Through the CEAB "Reactive RFP" process, NRG Energy, Inc. (NRG) has proposed the 540 MW (nominal) Meriden Power Plant as an alternative to the CL&P proposed GSRP and MMP. (Tr. 13, p. 187)

Competing Definitions and Assessments of Need
CEAB

352. The reactive RFP process under which CEAB reviewed the NRG project is intended to encourage competing solutions that would meet the need identified by an applicant filing for a Certificate of Environmental Compatibility and Public Need. (NRG 1, p. 1)

353. CEAB felt that a resource solution to the need would be generally feasible. According to CEAB, each of the three RFP proposals for thermal storage or generation is situated near major load centers in Connecticut. Power flow assessments have suggested that additional generation in Southwest Connecticut may have an effect on the reliability conditions GSRP is designed to address by offsetting north-to-south power flows, particularly during peak summer hours. (CEAB 1, p. 2, 3)

354. CEAB found that the addition of new, efficient combined-cycle capacity in Connecticut would help lower marginal prices for electricity. (CEAB 1, p. 3)

355. In its report to the Council, CEAB did not consider the Meriden Plant by itself as an alternative to GSRP, but evaluated it as part of a potential portfolio of projects that would include the other projects proposed in the RFP responses. (CEAB 1, p. 3; CEAB 4, R. CL&P-01-007; Tr. 16, pp. 88, 89)

356. CEAB did not analyze the proposed GSRP as a whole and did not do an independent load flow analysis or stability studies to determine if any non-transmission alternatives in Connecticut could replace some portions of the GSRP. (Tr. 16, p. 169)

357. At the time of its February 2009 report to the Council, the CEAB determined that the ISO-NE's Needs Assessment (January 2008), which had been used to support the need for GSRP, did not include new supply sources resulting from the ISO-NE Forward Capacity Market, Connecticut's Energy Independence Act (2005), or its Electricity and Energy Efficiency Act (2007). (CEAB 1, p. 2)

358. CEAB felt that further study was needed to ascertain if NRG or the other RFP respondents would address the needs identified by GSRP. (CEAB 1, p. 3)

ISO-NE and NUSCO

359. ISO-NE and NUSCO define the reliability need in terms of transmission security, not resource adequacy. See Finding of Fact # 33 and 34. (CL&P1, Vol. 1, p. F-4)

360. Since the CEAB report was issued, ISO-NE has published updated assessments that continue to show a need for GSRP. (See above #FOF 42). (CL&P 1, Vol. 1, p. F-15; CL&P 5, R. OCC-01-009-SP01, attached "2009 Addendum Report"; CL&P 15, Scarfone, pp. 4-21)

361. Studies by NUSCO and ISO-NE have found that no resource (generation) solutions—in Connecticut or anywhere else—can solve the reliability problems addressed by GSRP. (CL&P 15, Scarfone, pp. 53, 54; CL&P 4, R. to CSC-018; Tr. 5, pp. 106-112)

362. The Meriden Power Plant is not located near the Springfield/Hartford load center. This would make it infeasible as an alternative to the GSRP/MMP. The power plant would not influence the system to eliminate the transmission capacity issue that the GSRP/MMP would address. (Tr. 15, pp. 17, 18)

NRG

363. NRG has not analyzed the power-flow simulations provided in CL&P's application, and has not itself provided material demonstrating that its project would eliminate any of the particular thermal overloads, voltage violations, or other reliability issues that GSRP is proposed to solve. (NRG 4, R. to OCC-01-006, 007; Tr. 13, p. 193)

364. NRG did perform a "preliminary" in-house power-flow simulation to evaluate a Connecticut resource solution to GSRP. They modeled 750 MW of new generation in Middletown, 750 MW in Meriden, and 300 MW in Torrington. The results did not show any appreciable reliability criteria violations that would be eliminated by such generation. An ICF study confirmed this result. (NRG 5, R. to CL&P-01-010; Tr. 13, pp. 206-209; CL&P 15, Scheller, pp. 18, 19)

365. NRG estimates a net range of levelized costs for a 540 MW plant, on an annual basis, to be $26 million to $78 million. NRG is not pursuing capital financing for the Meriden project in the current market environment. (Tr. 13, pp. 225, 226, 243)