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ATTORNEYS AT LAW

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July 6, 2017

Via Electronic Filing and Overnight Mail

Attorney Melanie Bachman,
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: ***Docket No. 461A - Eversource Energy application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a 115-kilovolt (kV) bulk substation located at 290 Railroad Avenue, Greenwich, Connecticut, and two 115-kV underground transmission circuits extending approximately 2.3 miles between the proposed substation and the existing Cos Cob Substation, Greenwich, Connecticut, and related substation improvements. Town of Greenwich Interrogatories.***

Dear Attorney Bachman:

I've enclosed one (1) original and fifteen (15) copies of the Town of Greenwich's Interrogatories to Eversource Energy.

I certify that a copy has been sent on this date to all participants of record as reflected on the Council's service list.

Please do not hesitate to contact me if you have any questions regarding this filing.

Very truly yours,

David A. Ball

DAB/lcc
Enclosures

cc: Service List

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STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

EVERSOURCE ENERGY APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF A 115-KILOVOLT (KV) BULK SUBSTATION LOCATED AT 290 RAILROAD AVENUE, GREENWICH, CONNECTICUT, AND TWO 115-KV UNDERGROUND TRANSMISSION CIRCUITS EXTENDING APPROXIMATELY 2.3 MILES BETWEEN THE PROPOSED SUBSTATION AND THE EXISTING COS COB SUBSTATION, GREENWICH, CONNECTICUT, AND RELATED SUBSTATION IMPROVEMENTS.

DOCKET NO. 461A

DATE: JULY 6, 2017

INTERROGATORIES OF THE TOWN OF GREENWICH

The Town of Greenwich ("Town") directs the following interrogatories to Eversource Energy:

1. Reference Figure 1 of Pre-filed Direct Testimony of Kenneth B. Bowes dated May 5, 2017 ("Pre-Filed Testimony") at p. 4. For each feeder segment identified on the spreadsheet entitled "Existing 27.6-kV Feeders – Greenwich" attached hereto as Exhibit 1, please provide the information requested in each column corresponding to each feeder segment.

2. Reference Figure 1 of Pre-Filed Testimony at p. 4, and Figure 5 at p. 10. Since feeders 11R51, 11R52, 11R55 and 11R58 each concurrently feed both the Prospect Substation and Greenwich Network, if it becomes necessary to deenergize one of those feeders to accommodate work to be done within the Greenwich Network, what is the impact of that feeder's service to the Prospect Substation? Do any of those feeders have the ability serve just one of those two load components? How many times in a typical year does it become necessary to deenergize those feeders to accommodate the Greenwich Network? Would the Prospect Substation be better served if those feeders were severable, allowing the Prospect Substation portion of the feeder to remain energized when it would be necessary to deenergize the Greenwich Network segment of the same feeder?

3. Under both the Proposed Modified Project and the Alternate Modified Project, if the need arises to shut down any of the four 27.6-kV distribution feeders (11R51, 11R52, 11R55, or 11R58) supplying electricity to the Greenwich Network, explain how the shutdown of any of those feeders will affect the supply of electricity to the Prospect Substation.

4. Explain the purpose and capability of the distribution line identified as 12H59 on Figure 1 on page 4 of the Pre-Filed Testimony.

5. Reference Figure 5 of Pre-Filed Testimony at p. 10. Figure 5 depicts a 115-kV transmission line identified as "1750" supplying electricity to the Tomac Substation. However, this tap to the 115-kV transmission line is not shown on Figure 1 on page E-4 of the original Application dated June 2015 in Docket 461 ("2015 Application"), or on Figure 1 on page 4 of the Pre-Filed Testimony. Explain whether this transmission tie to the Tomac Substation currently exists or whether Eversource intends to build that transmission tie in conjunction with either the Proposed Modified Project or the Alternate Modified Project.

6. If the response to the preceding interrogatory is that the 115-kV 1750 transmission line's connection to the Tomac Substation currently exists, please provide an accurate Figure 1 on page 4 of the Pre-Filed Testimony reflecting this tap. Please furnish a one line drawing to show how the Tomac Substation has the capability of being supplied either by the 115-kV 1750 transmission line or by the 27.6-kV feeders originating from the Cos Cob Substation. Please include feeder 12H59 in that one line drawing.

7. Identify, by the number of days for each month since January 1, 2011, when the Tomac Substation was supplied electricity from its 115-kV 1750 transmission line tap. For each month, identify the recorded peak load at the Tomac Substation, and on those dates, indicate whether the Tomac Substation was fed by its 115-kV tap or by the 27.6-kV feeders originating from the Cos Cob Substation.

8. Identify, by the number of days for each month since January 1, 2011, when the Mianus Substation was supplied electricity from the 12H59 feeder from the Tomac Substation, or from the 27.6-kV feeders originating from the Cos Cob Substation. For each month, identify the recorded peak load at the Mianus Substation, and on those dates, indicate whether the Mianus Substation was fed by the 12H59 feeder from the Tomac Substation, or from the 27.6-kV feeders originating from the Cos Cob Substation.

9. Identify the planning criteria by which: (a) the Tomac Substation is fed from the 115-kV 1750 transmission line, and (b) the Mianus Substation is fed from feeder 12H59. For each of (a) and (b) above, how far in advance of the actual switching is the switching order given under non-emergency conditions?

10. Reference Eversource's Response to Q-OCC-065 dated December 22, 2015. In that response, in footnote "a," Eversource notes that the Tomac Substation's "Load transferred to Waterside" in 2013 and 2014. Neither Figure 1 nor Figure 5 of the Pre-Filed Testimony depicts the supply of electricity from the Waterside Substation to the Tomac Substation. According to Figure 5 of Pre-Filed Testimony at p. 10, the Tomac Substation is tied to the "1750 115-kV" line "to South End." Please explain how the Tomac Substation tie to the 115-kV 1750 transmission line, which is shown being fed from "South End" on Figure 5, allows the load from the Tomac Substation to be "transferred to Waterside?"

11. Please explain whether Eversource has considered a solution to address the projected overloads of the 27.6-kV transformers at the Cos Cob Substation and the claimed reliability deficiencies in the 27.6-kV distribution feeder network that involves feeding the Tomac Substation from the existing 115-kV transmission lines originating in Stamford, and in turn feeding the Mianus Substation from the Tomac Substation, thus eliminating the Mianus and Tomac Substations' loads served by the Cos Cob Substation. Please explain why Eversource has never presented such a solution.

12. Describe the criteria that have changed from the time the Greenwich distribution system was initially designed so as to justify why it is no longer feasible to feed the proposed new substation at 27.6-kV? Why does Eversource contend that the only plausible alternative is to feed the proposed substation at 115-kV? More specifically, assuming that the original design consisting of multiple 27.6-kV feeders to the Prospect Substation (the majority of which, 11R51, 11R52, 11R55, and 11R58, also fed the Greenwich Network), was a functional, reliable and cost-effective concept when it was designed, what criteria have changed to now require a new 115-kV feed into a new substation whose purpose is to replace the existing Prospect Substation?

13. Reference 2015 Application at p. E-16. In 2012, $8.4 million was spent to "Add an aerial feed to North Greenwich Substation and upgrade right of way." In 2010-2012, $14.0 million was spent to, "Replace three distribution transformers." According to Eversource's Response to Q-CSC-013 dated June 12, 2017, the North Greenwich Substation has 75 MVA of "Transformer Capacity." According to Figure 1 of the Pre-Filed Testimony, the North Greenwich Substation is presently fed from two 27.6-kV feeders, 11R53 and 11R54, and a backup 27.6-kV feeder, 22E36. Please explain why the proposed new substation, which is described as being of a smaller capacity than the present North Greenwich Substation, cannot be fed by a pair of paralleled 27.6-kV feeders and a 27.6-kV backup feeder just as the larger North Greenwich Substation is presently being fed? Realizing the condition of the existing 27.6-kV feeders to the Prospect Substation may be compromised, please explain why reconductoring two of the existing parallel feeders serving the Prospect Substation is not a viable means to feed the proposed new substation, particularly if these feeders are converted to "express feeders" and do not feed the Greenwich Network as well.

14. Reference Petition for Reconsideration dated May 5, 2017 ("Petition") at p. 1. What conditions changed to justify your proposal for a smaller, less costly modification of the project and one that specifically eliminates any work at the Byram Substation?

15. Reference statement in Petition at p. 1 that the Proposed Modified Project and Alternate Modified Project are designed to address needs in the Town "based on a peak load that has already occurred…" Identify the "peak load that has already occurred" referenced in the Petition. Please identify what the loads were at the Prospect, Byram, North Greenwich, Mianus, Tomac, and Cos Cob Substations and the Greenwich Network at that specific date and time that contributed to the "peak load that has already occurred" referenced in the Petition.

16. For each substation depicted in Figure 1 of the Pre-Filed Testimony, i.e., Prospect, Byram, North Greenwich, Mianus, Tomac, Cos Cob and the Greenwich Network, identify the recorded peak load in 2016, including the date and time of such recorded peak load. Identify any anomaly that may be associated with such recorded peak load such as switching surges, use of backup feeders, etc.

17. With respect to the 115-kV outage event in August 2012, the 27.6-kV outage events of July 2015, and the Tomac Substation outage of April 2016, for each of those events individually, please answer the following:

    a) Describe the cause of each outage event and identify all feeders affected;
    b) Identify the Customer Average Interruption Duration Index for each outage;
    c) Explain how the Proposed Modified Project would have prevented each outage;
    d) Explain how the Alternate Modified Project would have prevented each outage;
    e) Identify the recorded peak loads on each of the dates of such outages; and
    f) Explain how the new Greenwich substation (under either the Proposed Modified Project or the Alternate Modified Project) would be used to restore power to customers affected by similar outages in the future.

18. Reference Lines 241-243 at p. 8 of the Pre-Filed Testimony. Describe how the Proposed Modified Project would eliminate this problem.

19. For each year beginning January 1, 2011, identify:

    a) the recorded peak load for all Eversource customers located within the Town of Greenwich;
    b) the percentage of the recorded peak load attributable to residential customers;
    c) the percentage of the recorded peak load attributable to commercial customers; and
    d) the percentage of the recorded peak load attributable to the Metro-North Railroad ("MNRR").

20. Please identify all the customers whose incoming service currently supplied by Eversource is at 27.6-kV. Please identify which customers will no longer be supplied at 27.6-kV upon completion of the Proposed Modified Project. For those customers that are presently fed at 27.6-kV and after the construction of the proposed substation will no longer be fed at 27.6-kV, which of these customers are presently being fed under normal conditions by any of the following feeders: 11R51, 11R52, 11R55, or 11R58?

21. Reference Lines 273-275 at p. 9 of the Pre-Filed Testimony.

    a) What loads that are presently fed from 27.6-kV cables that originate at the Cos Cob Substation will continue to be fed from the Cos Cob Substation upon completion of the Proposed Modified Project?
    b) Identify the "certain large customers" referenced on Line 275, and identify the recorded peak load for each such customer for each year beginning January 1, 2011.

22. In the usage figure for the Town of Greenwich stated on the table in Eversource's Response to Q-OCC-064 dated December 22, 2015, identify the usage or load attributable to the MNRR.

23. Reference Petition, Ex. A, p. A-9, section A.4.1. Provide the pull tension calculations, including sidewall pressures, for the two underground segments of the transmission line in the Proposed Modified Project.

24. Reference Petition, Ex. B, p. A-8, section A.3.1. Provide the pull tension calculations, including sidewall pressures, for the nine underground segments of the transmission line in the Alternate Modified Project.

25. Please explain how it is that in the Proposed Modified Project, the underground cable is planned as one continuous run of approximately 2,640 feet without any intermediate splice vaults, whereas in the Alternate Modified Project, the circuit length of approximately 12,144 feet requires eight intermediate splice vaults, or one every 1,349 feet.

26. Under normal operating conditions, how many customers are served by the Byram Substation?

27. Reference Response to Field Point Estate Townhouses Interrogatory #010 dated November 18, 2015 (Q-FPET-010). Please explain whether Eversource continues to contend that Byram Substation's transformers are "vintage and obsolete." If not, please explain what has occurred since November 18, 2015 that has caused Eversource to abandon its earlier assertion that Byram Substation's transformers are "vintage and obsolete," since both proposals do not include any modifications to the existing Byram Substation, whereas the 2015 Application included the retirement of

all the 27.6-kV to 13.2-kV transformers at Byram Substation and the shifting all of the 13.2-kV circuits to the new substation located on Railroad Avenue.

28. Other than construction of the 13.2-kV exit feeders, 13.2-kV construction associated with the proposed substation, and the installation of 13.2-kV equipment within the confines of the proposed substation, what other 13.2-kV-related construction will be performed as part of the Proposed Modified Project or the Alternate Modified Project? Identify the locations of any such improvements.

29. In the event of the loss of the 4800 volt transformer at the Tomac Substation, is there any way the 4800 volt circuits fed by that transformer can be fed from any of the existing 13.2-kV circuits? Please describe how this situation would change with the construction of a new substation under both the Proposed Modified Project and the Alternate Modified Project.

30. Within the Town of Greenwich, list any 13.2-kV circuits that presently do not have at least one tie to another 13.2-kV circuit. Describe how this situation will change under the both the Proposed Modified Project and the Alternate Modified Project.

31. Identify all improvements or other system changes performed on the Greenwich distribution system that explain why recorded peak loads have declined since 2013. In addition, specifically identify all steps taken to remove or replace the feeders to the Prospect Substation.

32. For the existing force main and the new force main:

    a) Identify all limitations and restrictions that will be imposed on the Town's access to the force mains during construction of the Proposed Modified Project, including but not limited to requirements of advance notice, payments of fees or other charges, and safety requirements.
    b) Identify all limitations and restrictions that will be imposed on the Town's access to the force mains after construction of the Proposed Modified Project, including but not limited to requirements of advance notice, payments of fees or other charges, and safety requirements.
    c) Explain how the Proposed Modified Project ensures the Town's access to the force mains during construction of the Proposed Modified Project.
    d) Explain how the Proposed Modified Project ensures the Town's access to the force mains after construction of the Proposed Modified Project.
    e) After construction of the Proposed Modified Project, how will the installation of the proposed new 115-kV transmission line impact the Town's ability to access the force mains with heavy equipment such as a crane or large excavator?
    f) If after the construction of the Proposed Modified Project the Town needs to employ lifting equipment such as a crane or large excavator to perform work on its force mains and the vertical extensions of these devices would not comply with the Occupational Safety and Health Administration's regulations

regarding operations of equipment near power lines, including 29 CFR 1926.1408, could both the proposed overhead 115-kV transmission lines be de-energized at the same time to facilitate the Town's work?

g) If not, what measures would you employ to ensure the Town complete and full access to the force mains once the overhead wires and their poles are installed?
h) Explain how the Force Main Variation changes the answers to (a)-(g) above.

33. Identify on a Greenwich town map all roads, streets and highways Eversource expects to use during construction of the Proposed Modified Project to transport the necessary material and equipment to the work site in the MNRR right-of-way, and for the underground portions of the Proposed Modified Project.

34. If the construction of the transmission lines in the MNRR right-of-way increases the costs to the Town of maintaining and repairing the existing and new force mains, how does Eversource plan to reimburse the Town for those increased costs?

35. For each of the Proposed Modified Project and the Alternate Modified Project, describe the relay protection scheme designed to protect the entire 115-kV transmission circuit between the Cos Cob Substation and the proposed new substation, including a description of the inputs these relays would receive and from what location along the circuit. Is the relay scheme of a hybrid overhead-underground circuit deemed to be as effective as the relay protection on a non-hybrid circuit in protecting the entire circuit? Would the Proposed Modified Project feature reclosers on the transmission circuits? If so, would these reclosers adversely impact the protection of the underground portions of those circuits?

36. Identify the total number of structures supporting overhead transmission lines within Eversource's Connecticut service territory, the number of such structures that exceed 190 feet in height, and for each such structure exceeding 190 feet in height, identify its height and location and whether it contains aircraft warning lights.

37. Identify by date and location each Eversource project in the last ten years in which helicopters were used in the construction of an overhead transmission line. Compare the conditions of those projects to the conditions of the Proposed Modified Project relative to the route's proximity to active railroad tracks and residential and commercial structures.

38. See photograph attached hereto as Exhibit 38. Please provide representative photos and/or photo-simulations of the eastward view standing on Steamboat Road south of the railroad tracks: (a) under present conditions, (b) during construction of the Proposed Modified Project, and (c) after construction of the Proposed Modified Project.

39. Reference Petition, Ex. A, p. A-27, section A.4.5. State with specificity the basis for the estimate that the transmission line in the Proposed Modified Project will cost approximately $36.3 million, with transmission totaling approximately $33.4 million and distribution $2.9 million, and provide an itemized breakdown of the work to be done, and the costs for each specific item. Identify all documents, including estimates and quotes from third-parties, used to arrive at those figures.

40. Provide a detailed list of all estimated costs associated with the Proposed Modified Project, including a description of each item of cost, an explanation for how you arrived at the estimated cost, and copies of all documents upon which you relied to arrive at the estimated cost, including estimates and quotes from third-parties, broken down as follows:

    a) For the underground segments originating at the Cos Cob Substation referenced on lines 285-287 at p. 9 of the Pre-Filed Testimony and all related improvements, identify the following estimated costs:
        i. for trenching and conduit (include the costs of temporary restoration and proofing of ducts);
        ii. for materials including cables, cable accessories, and lightning arresters for the Cos Cob Substation;
        iii. for costs, including labor, involved in installing cables and cable accessories;
        iv. for permanent restoration; and
        v. for all other estimated costs.

    b) For the overhead segment adjacent to the MNRR tracks referenced on lines 288-291 at p. 9 of the Pre-Filed Testimony and all related improvements, identify the following estimated costs:
        i. for clearing vegetation;
        ii. for building and removing both temporary and permanent roads;
        iii. for grading;
        iv. for drilling shafts for direct embedded poles;
        v. for drilling shafts for concrete caisson foundations;
        vi. for pouring concrete caisson foundations (including all reinforcing steel and anchor bolts);
        vii. for all materials, including ladders and associated work-related items, used in the construction of all poles, and other associated items such as davit arms, bolts, etc., as needed for a completed transmission pole assembly;
        viii. for all wire, insulators, line hardware, lightning arresters and any other line hardware needed to construct a complete overhead transmission line;
        ix. for setting all poles (include any offloading/reloading in any laydown facility), all trucking and crane costs;
        x. for stringing and clipping in all wire;

xi. for making taps between overhead and underground cables at transition structures;
xii. for railroad flagging personnel and fees or other charges imposed by the MNRR;
xiii. for the presence of police and lane closure costs along I-95 due to construction;
xiv. for all lost and non-productive time associated with any inability to access MNRR tracks or closures of any portion of I-95 during construction; and
xv. for all other estimated costs.

c) For the underground segment originating at the proposed substation referenced on lines 285-287 at p. 9 of the Pre-Filed Testimony and all related improvements, identify the following estimated costs:
   i. for trenching and conduit installation (including the costs of temporary restoration and proofing of ducts);
   ii. for relocating existing utilities;
   iii. for materials including cables, cable accessories, and lightning arresters at the proposed substation;
   iv. for costs, including labor, involved in installing cables and cable accessories;
   v. for maintenance and protection of traffic (including police detail);
   vi. for additional costs associated with construction at night;
   vii. for permanent restoration; and
   viii. for all other estimated costs.

41. Reference Petition, p. A-27, section A.4.5. State with specificity the basis for the estimate that the proposed substation in the Proposed Modified Project will cost approximately $28.2 million with transmission totaling approximately $14 million and distribution $14.2 million, provide an itemized breakdown of the work to be done, and the costs for each specific item. Identify all documents, including estimates and quotes from third-parties, used to arrive at those figures.

42. Reference Petition, Ex. A, p. A-27, section A.4.5 & Ex. B, p. A-17, section A.6. State with specificity the basis for the estimate that proposed modifications to the Cos Cob substation will cost approximately $12.7 million, provide an itemized breakdown of the work to be done, and the costs for each specific item. Identify all documents, including estimates and quotes from third-parties, used to arrive at those figures.

43. Reference Petition, Ex. B, p. A-17, section A.6. State with specificity the basis for the estimate that the cable system in the Alternate Modified Project will cost approximately $57.1 million, $52.5 million for transmission and $4.6 million for distribution, provide an itemized breakdown of the work to be done, and the costs for each specific item. Identify all documents, including estimates and quotes from third-parties, used to arrive at those figures.

44. Provide a detailed list of all estimated costs associated with the Alternate Modified Project, including a description of each item of cost, an explanation for how you arrived at the estimated cost, and copies of all documents upon which you relied to arrive at the estimated cost, including estimates and quotes from third-parties, broken down as follows:

    a) trenching and conduit installation (including the costs of temporary restoration and proofing of ducts);
    b) splice vaults;
    c) installation of conduit across I-95 (including all costs associated with installing ducts and the means by which the ducts are to be installed);
    d) crossing the water at Davis Avenue (including all costs associated with installing ducts and the means by which the ducts are to be installed);
    e) relocating existing utilities;
    f) materials including cables, cable accessories, and lightning arresters at the Cos Cob Substation and the proposed substation;
    g) pull cable, splice cable, and terminate cable;
    h) costs, including labor, involved in installing cables and cable accessories;
    i) maintenance and protection of traffic (including police detail);
    j) additional costs associated with construction at night;
    k) permanent restoration; and
    l) all other estimated costs.

45. For each of the Proposed Modified Project and the Alternate Modified Project, provide a detailed list of the estimated costs associated with general conditions, including a description of each item of cost, an explanation for how you arrived at the estimated cost, and copies of all documents upon which you relied to arrive at the estimated cost, including estimates and quotes from third-parties, broken down as follows:

    a) insurance;
    b) constructing and maintaining field offices, storage facilities or other temporary facilities;
    c) on-site oversight and supervision of construction;
    d) on-site support staff;
    e) inspection and testing;
    f) monitoring of existing facilities;
    g) documentation and blueprinting; and
    h) all other estimated costs.

46. Reference Petition, Ex. B, p. A-17, section A.6. State with specificity the basis for the estimate that the proposed substation in the Alternate Modified Project will cost approximately $29 million with transmission totaling approximately $12.3 million and distribution $16.7 million, and provide an itemized breakdown of the work to be done, and the costs for each specific item. Identify all documents, including estimates and quotes from third-parties, used to arrive at those figures.

47. For the 115-kV transmission lines in each of the Proposed Modified Project and the Alternate Modified Project, identify and provide copies of all constructability studies upon which Eversource relied to develop its cost estimates for each of the projects.

48. Identify with specificity all estimated costs of the Proposed Modified Project that are attributable to working in the proximity of the MNRR right-of-way. Specifically, identify how much the same set of circuits would have cost to construct if, instead of the construction's proximity to the Town of Greenwich's force main and the active MNRR tracks, the circuits would be located in an unencumbered right of way, the underground portion did not require night work, and the construction did not involve highly congested streets such as Railroad Avenue between Steamboat Road and Arch Street.

49. Please state whether Eversource intends to create a paved thoroughfare in the MNRR right-of-way to facilitate traversing it with trucks, equipment and personnel during construction of the Proposed Modified Project. If not, identify all measures Eversource will take to keep public roads free of mud and other droppings generated by equipment and vehicles when they exit the right of way during construction of the Proposed Modified Project, and the estimated cost of those measures.

50. With respect to the Proposed Modified Project, state the total cost for:

    a) any required purchase of real property;
    b) any payments to be made to MNRR; and
    c) for each of (a) and (b), state whether such costs are included in your $78 million estimate identified on page 11 of the Pre-Filed Testimony.

51. Reference p. 11 of the Pre-Filed Testimony. Explain in detail the cost savings between your Preferred Route in Docket 461 (the "2015 Preferred Route") and each of the Proposed Modified Project and the Alternate Modified Project realized as a result of Eversource's current proposal to not make any modifications to the Byram Substation.

52. Reference Lines 333-339 at p. 11 of the Pre-Filed Testimony. Now that the price of the 115-kV transmission circuit feeding the proposed new substation has been reduced from $72 Million (see FOF # 465), please answer the following:

    a) Is the sole basis for the reduction in cost related to the elimination of horizontal directional drilling?
    b) If there are other cost savings, please identify them.
    c) Describe how solid XLPE cables could be more expensive than fluid filled HPFF cables, and whether that is the case for this project.

53. Reference Eversource's Response to Q-LF-003 dated October 6, 2015. Since Eversource submitted that response, Eversource has reduced its estimated cost for a hybrid underground/overhead transmission line to a new substation on Railroad Avenue from approximately $50 million to $36.7 million, a reduction of 36.2%. During the same time period, the estimate for the all-underground line has been reduced from $72 million to $57.1 million, a reduction of only 26%. Please list all the items and identify the cost reduction of each, which resulted in the cost savings of the hybrid scheme in the present application.

54. Reference FOF #465, which identifies the cost of the transmission line portion of the 2015 Preferred Route as $72 million. In the current Petition, the transmission line portion of the Alternate Modified Project is estimated to have a cost of $57.1 million. See Petition, Ex. B, p. A-17, section A-6. Provide a detailed list of each deletion, addition or change made to the design of the 2015 Preferred Route (such as directional drilling, cable material costs, duct bank material costs, pedestrian bridge costs, cable installation costs, etc.), that explains the reduction in the estimated cost for the transmission line portion of the Alternate Modified Project. For each such deletion, addition or change, please identify the estimated cost of the affected item for each of the 2015 Preferred Route and the Alternate Modified Project so as to permit an accurate comparison of the two different design alternatives and their respective costs on a "line by line" basis.

55. Reference Lines 363-367 at p. 12 of the Pre-Filed Testimony. Identify the costs of all temporary easements required for the Proposed Modified Project, and state whether such costs are included in your $78 million estimate.

56. Reference Petition, Exhibit A, Section A.4.1.1, Figure 2 at p. A-10. Identify the manufacturer of the 3500-kcmil cable depicted. In addition, please explain whether the depiction of the cable as being 4.5 inches in diameter is accurate, or whether your statement in Petition, Exhibit B, Section A.3.1, p. A-8 is accurate, where you state that "Each cable would be approximately 4.6 inches in diameter." What is the accurate diameter of each cable for each of the Proposed Modified Project and the Alternate Modified Project?

57. Reference Pre-Filed Testimony, Attachment A, at p. 26. In the Proposed Modified Project, the permissible load capacity of the proposed substation is approximately 50% of the load capacity of the proposed substation in the 2015 Preferred Route. However, the size and capacity of the copper conductors in the proposed 115-kV transmission lines in the Proposed Modified Project remain the same, at 3500-kcmil. Explain why the size and capacity of the conductors in the proposed 115-kV transmission lines in the Proposed Modified Project were not reduced accordingly.

58. Reference Petition, Exhibit A, Section A.4.2, "Line Design Voltage and Capacity", at p. A-12. The underground cable portion has been described as having 192 MVA of capacity and the overhead line has been described as having 225 MVA of capacity. For each of the Proposed Modified Project and the Alternate Modified Project,

please explain why such values are appropriate for the proposed new substation, which will have a capacity of 60 MVA.

59. Reference Petition, Exhibit B, Section A.3.1, Figure A-3 at p. A-9.

    a) Please state whether the 6" pipes depicted in Figure A-3 are accurate, or whether you intend to use 8" pipes as stated on p. 7 of the Petition, and state which cost you assumed in your $100 million estimate for the Alternate Modified Project. See Pre-Filed Testimony at p. 19.
    b) Please state whether you intend to include the "Dynamic Temperature Sensing" for the Alternate Modified Project, and if so, what the cost is, and whether that cost is included in your $100 million estimate for the Alternate Modified Project.
    c) In the Alternate Modified Project, please state whether your trenches for the underground duct bank will be 3' 7 1/8" wide as depicted in Exhibit B, Figure A-3, or 3' 6" wide as stated in Exhibit A, Section A.4.4.1 at p. A-13.
    d) In your $100 million estimate for the Alternate Modified Project, did you assume your trenches for the underground duct bank would have a width of 3' 7 1/8" as depicted in Exhibit B, Figure A-3?
    e) In your $78 million estimate for the Proposed Modified Project, did you assume your trenches for the underground duct bank would have a width of 3' 6" as stated in Exhibit A, Section A.4.4.1 at p. A-13?

60. Railroad Avenue between Steamboat Road and Arch Street is one of the most congested streets in Greenwich with a myriad of buried utilities, including electric, gas, water, cable television, sewer, both mains and laterals. Please describe what provisions are included in the costing for the underground portion of the Proposed Modified Project to address these conditions? Is this same route to be used in the Alternate Modified Project?

61. Identify what customer outages, if any, have been caused by transformer failures in any of the following substations:

    a) Prospect
    b) Byram
    c) Tomac
    d) North Greenwich
    e) Mianus

62. Outages on the 13.2-kV circuit identified as "11R3" impact Parsonage Road, the street where The Nathaniel Witherell, the Town's nursing and long term care facility, is located. Assuming no damage to the Cos Cob, North Greenwich or Mianus Substations, please explain how a new substation on Railroad Avenue would reduce the outage time on circuit 11R3, and on Parsonage Road as well, in the event of a weather-related outage?

63. Reference the diagram entitled "Simplified 13.2kV Proposal" attached to Eversource's Response to Q-CSC-024 dated June 12, 2017. Please provide a revised diagram indicating the circuit identifying numbers (e.g., "11R3") for each circuit identified on the diagram.

    a) Other than the new exit feeders coming out of the proposed substation, what changes will be made to the 13.2-kV circuits on this diagram?
    b) Identify all differences between the "Simplified 13.2kV Proposal" attached to Eversource's Response to Q-CSC-024 dated June 12, 2017, and the diagram entitled "Simplified Greenwich 13.2KV System Proposed Design" attached to Eversource's Response to Q-OCC-058 dated December 22, 2015.

    Aside from not combining the existing Byram Substation and the existing Prospect Substation into a new substation, on a marked up drawing with descriptions, describe all the differences between Eversource's responses to Q-OCC-04 and Q-OCC-058 in 2016 and Eversource's responses to Q-CSC-01 and Q-CSC-024 dated June 12, 2017.

64. In the description of the new substation proposed in the 2015 Preferred Route, the existing Byram and Prospect Substations were shown as being merged into a single new substation on Railroad Avenue. That new substation was shown to have nine 13.2-kV feeders exiting from it. Under the present scheme, the existing Byram Substation is to remain as is, and a new substation on Railroad Avenue will take the place of the existing Prospect Substation. Eversource's responses to Q-CSC-01 and Q-CSC-024 dated June 12, 2017 show three 13.2-kV feeders exiting Byram Substation, but now seven feeders exiting the new substation that is to replace the existing Prospect Substation. That is a total of ten 13.2-kV feeders exiting the two substations, where only nine presently exist. Please explain the purpose of the addition of this tenth circuit. Please show all costs associated with adding this tenth circuit, and explain whether this circuit is part of either the Proposed Modified Project or the Alternate Modified Project.

65. Reference Eversource's Response to Q-CSC-027 dated June 12, 2017. In your communications with the manufacturers, did you specifically request that the manufacturers "custom design" to meet your specifications (including tap changers), to fit within the existing space in the Cos Cob Substation? Provide copies of all such communications between Eversource and the manufacturers.

66. Reference the diagram entitled "Vertical Steel Pole Design" attached to Eversource's Response to Q-CSC-029 dated June 12, 2017. Please provide a revised diagram that (a) depicts the location of the existing force main, and (b) accurately draws the vegetation to-scale.

67. Reference the diagrams attached to Eversource's Response to Q-CSC-036 dated June 12, 2017. Describe Eversource's process for preserving the existing force main in light of the construction depicted on those diagrams, including how Eversource will address the effects on the force main of vibrations from drilling in its vicinity. In addition, please:

    a) Identify and produce the results of all geotechnical analyses, including soil boring investigations and tests of subsurface strata, in the area in or around the existing force main and the proposed force main;
    b) Identify how you will protect the existing force main, including the impacts of drilling and vibration during construction; and
    c) Identify and produce the result of all studies and testing you performed in order to conclude that the Proposed Modified Project will not interfere with either the existing force main or the proposed force main.

68. Reference Eversource's Response to Q-CSC-039 dated June 12, 2017. Please provide: (a) all specifications and drawings relating to the infrastructure of the Stamford, CT sewer main referenced in Eversource's response, including the piping materials used in that sewer main, and (b) an accurately-dimensioned diagram, depicting as-built conditions showing the relationship between the Caisson foundations and the sewer main referenced in Eversource's response.

69. Reference Eversource's Response to Q-CSC-042 dated June 12, 2017. Provide copies of all communications with CDOT where CDOT indicated it is "heavily opposed" to this attachment.

70. Reference Eversource's Response to Q-CSC-057 dated June 12, 2017. Explain why the "Distribution Feeder Relocation" for the Alternate Modified Project is $4,586,275, but for the Proposed Modified Project, it is $2,890,743. Please provide drawings showing the length of the feeders in question.

71. Working in the MNRR right-of-way will require every contractor doing work in those environs to have railroad protective liability insurance. Does Eversource intend to incur this cost for each of its contractors and subcontractors? How has the cost for this insurance coverage been included in the cost estimate for the various components of the Proposed Modified Project? What have you estimated the cost of this coverage to be?

Respectfully submitted,

Town of Greenwich

By: _____

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EXHIBIT 1

Existing 27.6-kV Feeders - Greenwich

Feeder designation (per Fig. 1)	Segment	Segment length	Installation Date	Overhead or Underground?	Conductor size (note if not copper)	Duct size (if applicable)	Normal rating (specify whether amperes or MVA. Include load factor for all underground circuits)
12H59	Tomac-Mianus						
11R50	Cos Cob-Mianus						
11R56	Cos Cob-Byram						
11R56	Tap to Network						
11R53	Cos Cob-N. Greenwich						
11R54	Cos Cob-N. Greenwich						
22E36	Prospect-N. Greenwich						
22E36	Tap to Byram						
22E35	Prospect-Byram						
11R58	Cos Cob-Prospect						
11R58	Tap to Network						
11R55	Cos Cob-Prospect						
11R55	Tap to Network						
11R52	Cos Cob-Prospect						
11R52	Tap to Network						
11R51	Cos Cob-Prospect						
11R51	Tap to Network						

EXHIBIT 38

EXHIBIT 38

CERTIFICATE OF SERVICE

I hereby certify that on this day a copy of the foregoing was delivered by electronic mail to all parties and intervenors of record, as follows:

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