

**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

NOVEMBER 2, 2017

**TOWN OF GREENWICH WRITTEN COMMENTS TO DRAFT FINDINGS OF FACT**

The Town of Greenwich ("Town") submits the following comments to the draft findings of fact issued by the Siting Council on October 27, 2017.

**Introduction**

The Town urges the Siting Council to re-examine its draft findings of fact because the findings are not supported by the record in this docket, nor are they directed to the new claim of need put forth by Eversource at the July 25<sup>th</sup> hearing. Rather, the draft findings of fact appear to be based on a false premise that the project should be built to reduce load. While that was indeed Eversource's argument for need in Docket 461, **in this docket Eversource has abandoned that argument.**

Accordingly, the multitude of draft findings focused on load reduction as a supposed benefit from this project are misplaced and are not relevant to Eversource's new claim that the project is needed solely for purposes of "reliability." The draft findings fail to

recognize that the reliability issues in the Town's distribution system are not solved by Eversource's \$100 million transmission project.

There are critical reliability issues which Eversource acknowledges must be addressed, but which are not solved by the proposed project, including: 1) the need to repair and replace deficient 27.6-kV feeders which are failing for reasons that have nothing to do with load, and which are not functioning properly even when load levels are low; 2) the need to immediately address poor-performing 13.2-kV cables, 3) the need to replace older equipment and transformers at the Byram Substation, 4) the need to address the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town, and 5) the need to address the isolation of customers served by Tomac at 4.8-kV, and the dependence of the Tomac Substation on a single 4.8-kV transformer.

Moreover, Eversource has attempted to validate its new rationale for the project on computerized simulations that purport to show overloads on 27.6-kV feeders during single contingency events. However, when the contingency events occurred in real-life, they revealed that the computerized simulations grossly overstated the projected load levels on the feeders. Indeed the simulations were proven unreliable by the fact that there were no outages when one of the feeders actually went down. Unfortunately, the draft findings of fact do not acknowledge that Eversource's projected load levels did not materialize. As a result, the findings do not reflect the fact that Eversource's new justification for this project is based on false data and unreliable simulations.

Finally, the draft findings appear to ignore the fact that this project proposes a \$100 million expenditure by Connecticut residents to solve a local distribution problem

in Greenwich. The Town did not ask for this project. The State should not have to pay for it, especially considering the outrageously high bills Connecticut rate-payers already pay. Without making findings as to this critical policy issue, the draft findings would ignore the most obvious reason that this project should never be approved.

### Procedural Matters

22. The following intervenors did not submit any pre-filed testimony or exhibits, but availed themselves of opportunities to cross examine the applicant and other parties and intervenors during the evidentiary hearing sessions: Cecilia Morgan and Field Point Estate Townhouses, Inc. (Tr. 2, pp. 180-190; Tr. 3, p. 120; Tr. 4 pp. 10-11, 48, 71, 81; Council Hearing Programs dated July 13, 2017; July 25, 2017; August 29, 2017; September 5, 2017)

**Comment: This finding presents an incomplete statement of the opportunities made available to intervenors. Cecilia Morgan and Field Point Estate Townhouses, Inc. were prevented from asking questions of the Town's witnesses that related to their concerns as citizens of the Town, and each of them has asserted that their rights were abridged by their inability to ask questions. See Field Point Estate Townhouses, Inc.'s Post-Hearing Brief dated October 5, 2017; Cecilia Morgan's Post-Hearing Brief dated October 3, 2017. (9-5-17 Tr. pp. 71-89).**

24. The Connecticut Supreme Court acknowledges that constitutional principles permit an administrative agency to organize its hearing schedule so as to balance its interest in reasonable, orderly and non-repetitive proceedings against the risk of erroneous deprivation of a private interest. (Concerned Citizens of Sterling v. Connecticut Siting Council, 215 Conn. 474 (1990); Pet v. Department of Public Health, 228 Conn. 651 (1994); FairwindCT, Inc. v. Connecticut Siting Council, 313 Conn. 669 (2014))

**Comment: This finding presents an incomplete statement of scope of the administrative agency's right to organize its hearing schedule. An administrative agency cannot deny due process rights to intervenors such as Cecilia Morgan and Field Point Estate Townhouses, Inc., and it must afford all parties and intervenors fundamental fairness and the opportunity to cross-examine witnesses. The Council denied the intervenors those rights.**

## Municipal Consultation and Community Outreach

25. Prior to submitting the Modified GSLP, Eversource, in consultation with the Town, reconsidered both distribution and transmission solutions that would meet the redefined need. Additionally, proposals for demand side measures to mitigate future load growth were discussed. (Eversource 1, Vol. 1, PFT p. 15)

**Comment: This finding is incomplete and inconsistent with the record. During meetings prior to submitting the Modified GSLP, Eversource insisted on a transmission-based project and never disclosed that it had redefined the alleged need for this project until the July 25, 2017 hearing. (Town 1, p. 3-4; Council Admin. Notice 43, RECORD; 7-25-17 Tr. p. 11-12). The Town questioned the need for a transmission-based project and sought a better explanation for why Eversource has not proposed alternative measures that would get to the heart of the electric needs in Greenwich, including improvements to the 27.6-kV feeders and the 13.2-kV distribution system, replacing older equipment and transformers in the existing substations, load-shifting, reliance on the 115-kV tap to the Tomac Substation, and improvements to the Tomac Substation. (Town 1, p. 3; 8-29-17 Tr. p. 158; Eversource 1, Vol. 1, Pre-Filed Testimony, p. 17 lines 528-529. See also Town of Greenwich Proposed Findings of Fact (“PFOF”) ¶¶ 101-137, 166-184).**

27. During the consultation process, eight potential distribution alternatives, with variations, were discussed. Eversource, with various Town’s representatives and consultant, Mr. Mitchell Mailman, reviewed all of the distribution solutions and determined they were impractical, ineffective, or unreasonably expensive. These rejected alternatives are discussed in the Project Alternatives section of this document. (Eversource 1, Vol. 1, PFT p. 17)

**Comment: This finding is incomplete and inconsistent with the record. Neither the Town nor its expert determined that all of the distribution alternatives were impractical, ineffective, or unreasonably expensive. (Town 1, p. 3; 8-29-17 Tr. p. 158; Eversource 1, Vol. 1, Pre-Filed Testimony, p. 17 lines 528-529). Moreover, Eversource did not adequately review or explain its rejection of distribution alternatives, including reconductoring the current 27.6-kV feeder cables in the existing ducts with same-sized modern cables that can be operated at higher temperatures and can carry more ampacity. (Eversource 2, Resp. to Q-CSC-026; 8-29-17 Tr. pp. 59, 181. See also PFOF ¶¶ 101-137, 166-184.)**

28. Two transmission line routes were ultimately developed and submitted as part of the Modified GSLP; the PMP, preferred by Eversource, consisting of an overhead-underground transmission line route and a new air insulated substation at 290 Railroad Avenue, and the AMP, preferred by the Town, consisting of an all underground transmission route extending from Cos Cob Substation to a new “indoor substation” at 281 Railroad Avenue. (Eversource 1, Vol. 1, PFT pp. 17-18)

**Comment: This finding is inconsistent with the record for the following reasons:**

**First, the Town has consistently opposed a transmission-based project and did not “prefer” the AMP. (Town 1, 8-29-17 Tr. p. 158). Before the Modified GSLP was submitted, the Town informed Eversource that until Eversource could demonstrate the need for a transmission-based project and provide more details about the AMP, the Town could not endorse the AMP. After Eversource conceded that, unlike in Docket 461, there were options which could mitigate the environmental impact concerns that were central to the Town’s opposition in Docket 461, all of the communications with the Town related only to the details of the AMP. (Town 1, pp. 4-5; 8-29-17 Tr. pp. 162, 166-167). In April 2017, Eversource surprised the Town by announcing for the first time that it intended to file a petition to have the PMP approved without first obtaining approval of the Connecticut Department of Transportation. (8-29-17 Tr. p. 158, 162). See also Town of Greenwich Proposed Findings of Fact (“PFOF”) ¶¶ 101-137, 166-184.**

**Second, the Town has always insisted on an indoor substation for safety and security reasons, whether at 290 Railroad Avenue or 281 Railroad Avenue.**

#### **Changed Conditions**

34. Eversource’s Motion to Reopen identifies the following changed conditions since the Council’s May 12, 2016 denial without prejudice decision:
- a. Altered the design of the GSLP to account for current electric needs rather than to provide improvements with a 30 to 40 year planning horizon;
  - b. Designed a system to meet reliability needs based on 130.5 MVA of peak load on the Greenwich 27.6-kV system;
  - c. No longer use a ten year load growth forecasting that anticipated one percent load growth per year;
  - d. Two potential GSLP project routes and substation sites were developed for consideration (Modified GSLP); the PMP which was developed based on inquiries from the Council during the Docket 461 proceeding, and the AMP which was developed upon Eversource’s consultation with the Town after the Council’s Docket 461 decision;
  - e. Developed a transmission line route that avoids, to the extent possible, environmental impact to the Town-owned Bruce Park;
  - f. Reduced costs of both the PMP and AMP from than the original GSLP presented in Docket 461;
  - g. Redesigned the GSLP substation that does not use costly Gas-insulated switchgear;
  - h. Use of Cross-linked Polyethylene (XLPE) cable instead of a High Pressure Fluid Filled cable design for all underground transmission line installations;
  - i. Consultations with the Town to develop a feasible GSLP route; and



- j. Consultations with the Town to develop demand side management programs to promote energy efficiency. (Eversource 1, Vol. 1 Motion to Reopen pp. 1-8, PFT p. 15; Vol. 1, Ex. B, p. C-12; Tr. 2, pp. 88-89; Tr. 3, pp. 15-22)

**Comment: This finding is inconsistent with the record for the following reasons:**

**First, the Modified GSLP does not address the current electric needs in Greenwich. Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91). Because Eversource has abandoned its claim that there is a need for added capacity as a justification for this project, the Modified GSLP will not address the real electric system reliability issues in the Town, including: 1) the need to repair and replace deficient 27.6-kV feeders, 2) the need to immediately address poor-performing 13.2-kV cables, 3) the need to replace older equipment and transformers at the Byram Substation, 4) the need to address the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town, and 5) the need to address the isolation of customers served by Tomac at 4.8-kV, and the dependence of the Tomac Substation on a single 4.8-kV transformer. (See PFOF ¶¶ 59-100).**

**Second, the Modified GSLP is more expensive than the GSLP in Docket 461 in that it provides a total permissible load capacity of 60 MVA at a cost of approximately \$100 million, or \$1.67 million per MVA, compared to approximately \$1 million per MVA in Docket 461. (Eversource 1, Resp. to Q-CSC-023; Eversource 1, Vol. 1, Exh. B, p. A-17; Eversource 1, Vol. 1, Exh. A, p. A-27). In addition, when taking into account that the existing Prospect Substation would be retired, along with its 55 MVA of transformer capacity, the new project proposes spending approximately \$100 million for a net increase of only 5 MVA of permissible load capacity, or \$20 million per additional MVA. (Eversource 1, Resp. to Q-CSC-013, Q-CSC-023; Eversource 1, Vol. 1, Ex. B, p. A-17; Eversource 1, Vol. 1, Ex. A, p. A-27. See also PFOF ¶¶ 101-109).**

### **System Planning**

41. Reliability can be looked at in three parts - assuring adequate supply; frequency of interruptions; and duration of outages. The existing electric system in the Town of Greenwich is unacceptable in all three aspects. (Council Administrative Notice 43, FOF #110)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, Eversource admits there is no longer a need for additional capacity in Greenwich and therefore there is adequate supply. (8-29-17 Tr. p. 91; See also PFOF ¶¶ 1-15).**

Second, with regard to frequency of interruptions and duration of outages, the record shows that issues with the 13.2-kV system are the cause of the unacceptable frequency of interruptions and durations of outages in Greenwich. (Eversource 14, Resp. to Q-TOWN-080 Appendix 11, 12). The Modified GSLP, if approved, would not do anything to improve the deficient 13.2-kV circuits in Greenwich. (8-29-17 Tr. p. 88; See also PFOF ¶¶ 95-100).

Third, the record also shows that outdated 27.6-kV feeder cables which are not functioning properly are a cause of unacceptable frequency of interruptions and duration of outages in Greenwich. Eversource admits that the failures of the 27.6-kV feeders were not caused by their being overloaded at the time they failed. (Council Admin. Notice 43, Eversource Resp. to OCC-042; Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. pp. 54-57; See also PFOF ¶¶ 39-58). Rather, the failures resulted from the age and physical condition of the cables or, in the case of newly-installed cables, improper installation or maintenance. (8-29-17 Tr. pp. 49, 54-57, 64. Town 1, p. 18; See also PFOF ¶¶ 39-58). The Modified GSLP does not involve replacing, repairing or upgrading these feeders, and the Mianus, Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers would all be susceptible to the same cable failures and potential outages as they are today. (8-29-17 Tr. p. 61-63; Town 1, p. 16; See also PFOF ¶¶ 59-66).

42. The distribution network in Greenwich is under PURA regulatory authority. PURA periodically reviews electric system operations. If reliability concerns are not addressed, PURA could open a docket to determine if certain measures are necessary to ensure the distribution system is operated appropriately. The North American Electric Reliability Corporation has jurisdiction over the reliable operation of a transmission system. (Tr. 2, pp. 107-108)

**Comment:** This finding is an incomplete statement of Connecticut state agency regulatory authority over the distribution network in Greenwich. The Connecticut Siting Council has jurisdiction to consider distribution networks in determining whether transmission projects should be approved. In addition, the Connecticut Siting Council has authority to consider distribution system reliability and distribution system alternatives before granting approvals for transmission projects. Finally, Eversource claims that a transmission solution is required to solve a distribution problem, and so a determination of public need necessarily involves a determination of distribution system reliability.

## Public Need

### *Greenwich Area Electric System*

43. The electric distribution system in Greenwich was designed over 50 years ago to serve much lower load levels than those that exist today. (Council Administrative Notice 43, FOF #49)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, this finding is not relevant to a finding of need for the Modified GSLP because Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91; See also PFOF ¶¶ 1-15).

Second, the Greenwich distribution system is designed to avoid customer outages even if one feeder is lost from service. (8-29-17 Tr. p. 34). Taking into account the Normal and Alternate feeders identified by Eversource and the normal ratings of those feeders, the Greenwich distribution system is designed so that any one feeder to any load center can go down and there would be sufficient feeder capacity to feed that load center. (Eversource 14, Resp. to Q-TOWN-076; Eversource 9, Resp. to Q-TOWN-001; 8-29-17 Tr. p. 34 lines 3-6; 8-29-17 Tr. p. 35 lines 1-3).

Third, Eversource has the capability to install modern cables that can be operated at higher temperatures and can carry more ampacity than older cables of the same size. (8-29-17 Tr. pp. 59, 181; See also PFOF ¶¶ 110-137).

44. Greenwich is at the farthest extent of Eversource's electric network in southwest Connecticut. Greenwich is electrically isolated and relies heavily on one bulk substation, to the Cos Cob Substation, to provide power to three distribution substations in Greenwich; the Prospect, Byram and North Greenwich Substations. (Council Administrative Notice 43, FOF # 50)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, Cos Cob Substation also provides power at 27.6-kV to eleven large industrial and commercial customers and the Greenwich Secondary Network. (Council Admin. Notice 43, Eversource 1, p. E-3; Eversource 9, Resp. to Q-TOWN-020; Eversource 14, Resp. to Q-TOWN-076; 8-29-17 Tr. pp. 61-63).



**Second, contrary to the finding that Greenwich is “electrically isolated,” it is apparent from the record that Eversource wants this project in order to tap into the New York market for its own profitability reasons. (Eversource 1, Vol. 1, Pre-Filed Testimony, p. 2; See also PFOF ¶¶ 153-157).**

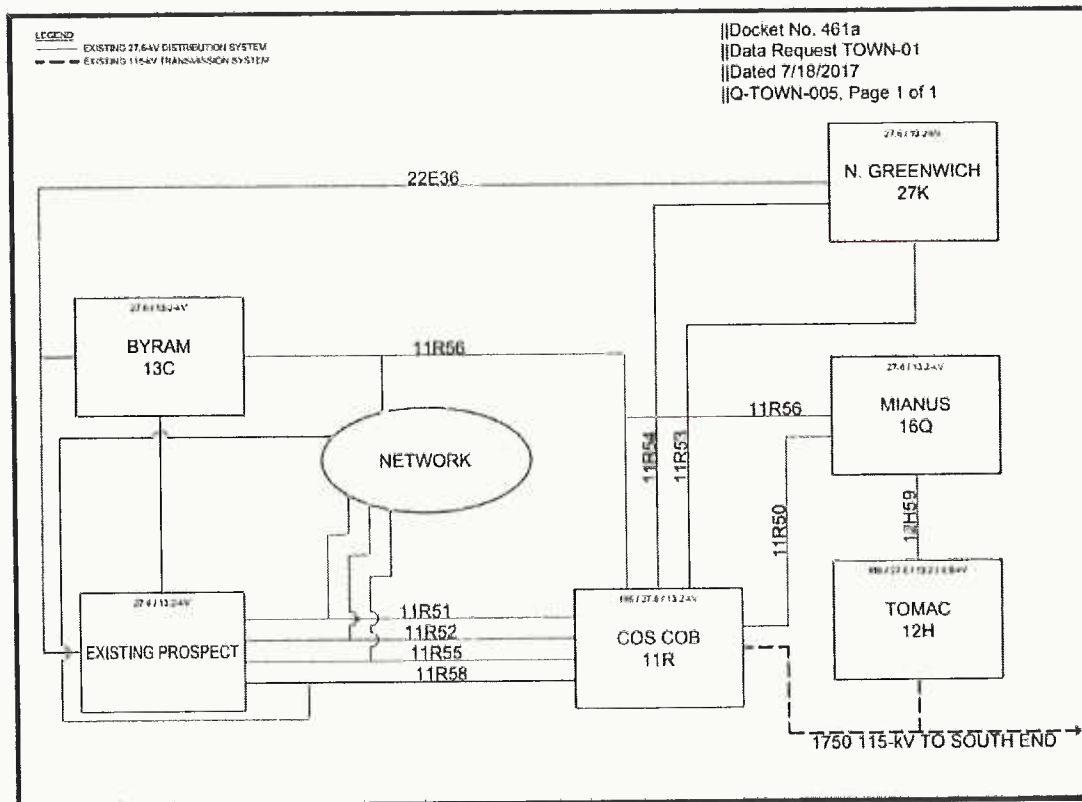
45. A small portion of Greenwich load, in the southeast area of Town, is served by the Tomac Substation from a single 115-kV to 13.2-kV transformer. The Tomac Substation was added in the early 1990's to alleviate load at the Cos Cob Substation. It was designed as a temporary installation that did not incorporate a standard design. (Council Administrative Notice 43, FOF # 51; Tr. 3, p. 37)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, the Tomac Substation has one 4.8-kV transformer, which supplies approximately 1,200 customers in Old Greenwich. (Eversource 9, Resp. to Q-TOWN-004, Q-TOWN-008; 8-29-17 Tr. pp. 71, 76) 82. There is no backup transformer for the 4.8-kV transformer at Tomac. (8-29-17 Tr. p. 72. See also PFOF ¶¶ 80-86).**

**Second, even if Tomac was designed initially as a temporary installation, Eversource no longer considers the installation temporary as it is planning upgrades at the substation. (Eversource 9, Resp. to Q-TOWN-017).**

46. A simplified line drawing of the existing Greenwich area electric system is presented below:



A diagram depicting the approximate service territory of each substation in Greenwich is provided in Attachment 1. (Eversource 9, Response Town 5)

**Comment:** The diagram is incomplete and inconsistent with the record as it does not depict the lines that feed the eleven large industrial and commercial customers who are served at 27.6-kV. (Council Admin. Notice 43, Eversource 1, p. E-3; Eversource 9, Resp. to Q-TOWN-020; Eversource 14, Resp. to Q-TOWN-076; 8-29-17 Tr. pp. 61-63).

47. The diagram above does not depict the 1740 115-kV transmission line that also feeds the Cos Cob Substation from Stamford. Both the 1740 and 1750 lines are located on common structures. The loss of both the 1740 and 1750 lines servicing the Cos Cob Substation would also result in the loss of electric service to the almost all of Greenwich. An outage in 2012 interrupted service for both the 1740 and 1750 lines. (Council Administrative Notice 43, FOF #123; Tr. 3, pp. 11, 65-69).

**Comment:** This finding is incomplete for the following reasons:

First, because the 1740 and 1750 115-kV transmission lines exist on common structures, both lines are vulnerable to the same contingency event and this situation hampers Eversource's ability to maintain both lines if maintenance work is required. (8-29-17 Tr. pp. 66-67, 69).

Second, the loss of one of the common structures would cause the loss of both the 1740 and 1750 lines servicing the Cos Cob Substation, which would result in the loss of electric service to 99.5% of Greenwich. In August, 2012, tree contact caused an overlapping outage of the 1740 and 1750 lines, causing 99.5% of Greenwich customers to lose power. (Council Admin. Notice 43, Eversource Resp. to Q-PANTRY-046; Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. p. 68).

Third, in addition to 2012, in November 2011, outages on the 1740 and 1750 lines caused a similar total blackout of Greenwich customers. (Council Admin. Notice 43, Eversource Late Filed Exhibit LF-024).

Fourth, the supply of electricity to the proposed Greenwich substation would also be completely dependent on the supply of electricity from the 1740 and 1750 lines. (8-29-17 Tr. p. 69; Eversource 2, Resp. to Q-CSC-024). Therefore, the Modified GSLP would not have prevented these outages. (Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. pp. 69-70).

#### *Existing Cos Cob Substation*

48. The Cos Cob Substation serves approximately 176 megavolt ampere (MVA) of load, and as such, is the most heavily loaded substation in Connecticut. It provides 130.5 MVA of peak load at 27.6-kV to the Prospect, North Greenwich and Byram Substations, 29.5 MVA of peak load to 13.2-kV distribution feeders and 16.4 MVA of peak load at 115-kV to an adjacent Metro North Railroad (MNRR) substation. (Council Administrative Notice 43, FOF # 54, #55)

**Comment:** This finding is incomplete and inconsistent with the record for the following reasons:

First, although Eversource claims that the 2013 peak load on the Cos Cob transformers was 130.5 MVA, the sum of the 2013 peak loads for the loads served by the 27.6-kV transformers at Cos Cob Substation equals only 126.7 MVA. (Eversource 9, Resp. to Q-TOWN-015; Eversource 2, Resp. to Q-CSC-013; Council Admin. Notice 43, Eversource 1, p. E-3; See also PFOF ¶¶ 33-38). As a result, Eversource's representation of the peak load in 2013 as 130.5 is not supported by the record.

Second, Cos Cob also supplies electricity at 27.6-kV to eleven industrial and commercial customers and the Greenwich Secondary Network, which will continue to be supplied at 27.6-kV if the Modified GSLP is built. (Council Admin.

**Notice 43, Eversource 1, p. E-3; Eversource 9, Resp. to Q-TOWN-020; Eversource 14, Resp. to Q-TOWN-076; 8-29-17 Tr. pp. 61-63).**

50. Typically, areas with large customer load have two or more bulk substations with multiple transmission supply lines to serve that load. Such a design allows for the transfer of load from one station to another if one of the transmission sources were interrupted. (Council Administrative Notice 43, FOF #61)

**Comment: This finding is incomplete and inconsistent with the record. There is insufficient evidence in the record to support the finding that it is typical for areas with large customer load to have two or more bulk substations with multiple transmission supply lines to serve that load. Instead, the record reflects that the Con Edison distribution system, as it exists today, in Queens, Brooklyn, Staten Island and the Bronx mirrors exactly what is in existence today in Greenwich by having a single transmission source, which is then converted to lower voltage and distributed to customers through a number of distribution substations. (8-29-17 Tr. pp. 192-193; Town 1, p. 16).**

55. In addition to the Prospect Substation, these four feeders are designed to also feed the Greenwich Network, certain large customers, and the Byram Substation. (Eversource 9, Response Town 5; Tr. 3, pp. 28, 36).

**Comment: This finding is incomplete and inconsistent with the record. The normal feeders to Byram are 11R56 and 22E35, with 22E36 as an additional alternate feeder. (Eversource 9, Resp. to Q-TOWN-076). Proof of the fact that the four feeders are not designed to feed Byram is that when an outage occurred on July 20, 2017 on the 27.6-kV 11R56 feeder, which is the normal 27.6-kV feeder to Byram, load had to be shifted onto the 13.2-kV system, which caused an overload on the Prospect 2X transformer. (8-29-17 Tr. p. 44; Eversource 14, Resp. to Q-TOWN-076; See also PFOF ¶¶ 16-32).**

### ***Existing Prospect Substation***

56. The current design of having distribution feeders to collectively serve substation load, network load, and large individual customer load is unique and not a good design. It was designed approximately 40 years ago to defer electric system investments. Eversource acquired the rights to the 290 Railroad Avenue location in 1971 in anticipation of a new substation in the future. (Tr. 3. pp. 36-37)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, the record demonstrates that the Con Edison distribution system, as it exists today, in Queens, Brooklyn, Staten Island and the Bronx mirrors exactly what is in existence today in Greenwich by having a single transmission source, which is then converted to lower voltage and distributed to customers through a number of distribution substations. (8-29-17 Tr. pp. 192-193; Town 1, p. 16).**

**Second, the Greenwich distribution system is designed to avoid customer outages even if one feeder is lost from service. (8-29-17 Tr. p. 34). Taking into account the Normal and Alternate feeders identified by Eversource and the normal ratings of those feeders, the Greenwich distribution system is designed so that any one feeder to any load center can go down and there would be sufficient feeder capacity to feed that load center. (Eversource 14, Resp. to Q-TOWN-076; Eversource 9, Resp. to Q-TOWN-001; 8-29-17 Tr. p. 34 lines 3-6; 8-29-17 Tr. p. 35 lines 1-3).**

**Third, Eversource has the capability to install modern cables that can be operated at higher temperatures and can carry more ampacity than older cables of the same size. (8-29-17 Tr. pp. 59, 181).**

**Fourth, although Eversource acquired the rights to 290 Railroad Avenue, it does not own 290 Railroad Avenue and purchasing it will add costs to the Modified GSLP. On the other hand, 281 Railroad Avenue is already owned by Eversource.**

**Fifth, the evidence in the record demonstrates that Eversource continues to rely on the 27.6-kV system as the Mianus, Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers will all continue to be fed by the current 27.6-kV system. (See PFOF ¶¶ 59-66).**



58. If a common distribution feeder is de-energized to accommodate work at either the Prospect Substation or within the Greenwich Network, it affects both the substation and the network. The feeders cannot be isolated so that they can serve one or the other. (Eversource 9, Response Town 2)

**Comment: This finding is incomplete. Eversource has the capability to correct this inability to isolate the feeders but has not proposed doing so. (Docket 461A, RECORD).**

59. Eversource regularly schedules outages on the feeders typically once every 24 months to perform maintenance on the 22 transformers associated with the Greenwich network. (Eversource 9, Response Town 2; Tr. 2, p. 25)

**Comment: This finding is incomplete. When Eversource schedules these outages, there is no evidence in the record that customers lose power.**

60. Certain sections of the four distribution feeders were installed in the 1950's to 1960's and are at the end of their useful life. Once the Project is operational, the feeders would continue to be repaired/replaced on an as needed basis. (Tr. 2, pp. 23-25)

**Comment: This finding is incomplete. Many of the 27.6-kV feeders other than 11R51, 11R52, 11R55, and 11R58 were installed in the 1950s to 1960s. (Eversource 9, Resp. to Q-TOWN-001). In addition, according to Eversource's response to Q-TOWN-001, those four feeders were installed after 2009. (Eversource 9, Resp. to Q-TOWN-001).**

61. In general, outages on feeders can be caused by age, loading, operational history, especially related to temperature, and weather events such as lightning. (Tr. 3, pp. 49-51)

**Comment: This finding is incomplete and inconsistent with the record. Outages on feeders can also be caused by poor workmanship or improper installation. (8-29-17 Tr. p. 50; See also PFOF ¶¶ 39-58). Eversource has not conducted any forensic analysis or provided any forensic analysis relating to the cause of outages on the 27.6-kV feeders. (8-29-17 Tr. p. 50; Council Admin. Notice 43, RECORD; Docket 461A, RECORD).**

62. An overload on a feeder results in a loss of service life of two percent per occurrence. (Tr. 4, p. 67)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, Eversource admitted that the failures on the 27.6-kV feeders were not caused by their being overloaded at the time they failed. (Council Admin. Notice 43, Eversource Resp. to OCC-042; Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. pp. 54-57; See also PFOF ¶¶ 39-58). Rather, the failures resulted from the age and physical condition of the cables or, in the case of newly-installed cables, improper installation or maintenance. (8-29-17 Tr. pp. 49, 54-57, 64. Town 1, p. 18; See also PFOF ¶¶ 39-58).

Second, Eversource did not present the information necessary to determine the cause of all of the feeder failures they cite in this docket, including the age of the feeders, the loads before failure, the duration the feeder was out of service, the number of customers who lost power as a result of each failure, and the length of time the customers were out of service. (Eversource 14, Resp. to Q-TOWN-073, -074). As a result, it cannot be found that any overload on any of the 27.6-kV feeders resulted in a loss of service life of two percent per occurrence.

Third, Eversource has not identified the feeders that were allegedly overloaded as a result of cable faults on other feeders, the amount of the load on those feeders, or the age of those feeders. (Eversource 14, Resp. to Q-TOWN-073, -074; Eversource 9, Resp. to Q-TOWN-001). As a result, it cannot be determined whether or not the feeders that Eversource claims are being overloaded are modern cables that can be loaded at much higher levels than older cables. (8-29-17 Tr. pp. 59, 181). Without this information, which Eversource refused to reveal, the record does not support a finding that an overload on a feeder results in a loss of service life of two percent per occurrence.

### ***GSLP Background***

63. Eversource identified a need for a new substation in Greenwich in 1989. At that time, it was projected that the Cos Cob Substation would reach capacity in 1994. Many reliability and load demand measures subsequently were undertaken by Eversource to delay the need for a substation. In 2011 Eversource determined there were no more measures that could be undertaken to further delay the need for a new substation closer to the load in central Greenwich. (Council Administrative Notice 43, FOF # 63 – 68; Tr. 2, pp. 99-100)

**Comment: This finding is incomplete and inconsistent with the record. When Eversource determined that there was a need for a new substation, it was based on projected load growth in the Town. The record demonstrates that Eversource's load projections were false and overstated, that Eversource now admits it is no longer projecting load growth, that there is no longer a need for additional capacity in Greenwich, and increasing capacity is no longer the basis for the alleged need for the Modified GSLP. (8-29-17 Tr. p. 91; See also PFOF ¶¶ 1-15).**

64. Eversource publically announced its intent to construct a new substation west of Indian Harbor in 2011 in response to reliability concerns that were exposed by storm events in June 2011, before the Cos Cob Substation peak load of 130.5 MVA on the 27.6-kV system occurred in 2013. (Council Administrative Notice 43, FOF # 70; Tr. 2, pp. 13, 15)

**Comment: This finding is incomplete and inconsistent with the record for the same reason stated in the comment to draft Finding of Fact #48.**

65. The June 2011 event interrupted service to over 5,000 customers due to multiple outages on the underground circuits emanating from Cos Cob Substation. (Council Administrative Notice 43, FOF # 71; Tr. 2, 13-15)

**Comment: This finding is incomplete and inconsistent with the record. The 2011 event resulted in the loss of power supply to North Greenwich Substation as a result of lightning strikes. (Council Admin. Notice 43, Eversource 1, p. E-10 to E-11; Eversource 44, Q-LF-024). There is no evidence in the record as to the distribution of the loads on the 27.6-kV feeders during the June 2011 event. (Docket 461A, Record). In addition, there is no evidence in the record as to how the Modified GSLP would have avoided this outage, especially since even after the Modified GSLP is built, the North Greenwich Substation will remain reliant on the 27.6-kV feeders from Cos Cob. (8-29-17 Tr. p. 61-63; Town 1, p. 16; See also PFOF ¶ 59).**

66. This event demonstrated to Eversource an inadequate supply of power during contingency events, an unacceptable interruption of service (over 5,000 customers lost power) and cascading effects from the interruption in service, and the inability to recover from the interruption in a timely manner (75 minutes to 18 hours). (Council Administrative Notice 43, FOF #74 – Tr. 3, pp. 40-41)

**Comment: This finding is incomplete and inconsistent with the record for the same reason stated in the comment to draft Finding of Fact # 65. There is also no evidence in the record to support a finding that the Modified GSLP would have prevented the June 2011 outage.**

67. The GSLP was submitted to the Council on June 26, 2015 as a reliability project to provide immediate load relief and add transformer capacity to the electric distribution supply system in the Town of Greenwich by establishing a new bulk substation near the center of the customer electrical demand to avoid overloads on existing electric system equipment. The new substation at 290 Railroad Avenue would be connected to the Cos Cob Substation by installing two separate 115-kV transmission circuits that extended approximately 2.3 miles from Cos Cob Substation. (Council Administrative Notice 43, FOF #1, #2)

**Comment: This finding is incomplete and inconsistent with the record. The record demonstrates that Eversource’s load projections were false and overstated, and Eversource now admits it is no longer projecting load growth, there is no longer a need for additional capacity in Greenwich, and increasing capacity is not the basis for the alleged need for the Modified GSLP. (8-29-17 Tr. p. 91; See also PFOF ¶¶ 1-15). Indeed, the new substation, whether at 290 Railroad Avenue or 281 Railroad Avenue, would not add significant transformer capacity to the electric distribution supply system in Greenwich. (Eversource 1, Resp. to Q-CSC-013, Q-CSC-023; Eversource 1, Vol. 1, Ex. B, p. A-17; Eversource 1, Vol. 1, Ex. A, p. A-27; See also PFOF ¶¶ 101-108).**

69. The peak load on the Cos Cob 27.6-kV system from 2008 to 2016 is presented in the table below:

Cos Cob 27.6-kV System Peak - actual values												
2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
96.8	117.9	125	116.1	112.1	107.7	119.7	121.8	128.2	130.5	107.7	114.8	115.6

(Eversource 2, response 11)

**Comment: This finding is incomplete and inconsistent with the record for the same reason stated in the comment to draft Finding of Fact #48 as peak load did not reach 130.5 in 2013.**



70. The 2013 peak occurred over a sustained period of high temperatures combined with high humidity. Year 2012 also experienced several days of high heat and humidity resulting in a peak load of 128.2 MVA. Although 2016 was extremely hot, based on average temperature, there were no sustained days of high temperatures coupled with high humidity, to cause a similar spike in peak load. (Eversource 2, response 2; Tr. 2, pp. 15-16, 19-20)

**Comment: This finding is incomplete and inconsistent with the record for the same reason stated in the comment to draft Finding of Fact #48. In addition, 2016 was the hottest summer on record. (8-29-17 Tr. p. 16).**

71. There was a short duration heat wave starting around July 19, 2017 throughout the State that caused a cable fault on a 27.6-kV feeder (11R56) to Byram Substation on July 20. It occurred early in the morning with a load below the cable's normal rating. The cable fault caused an overload on the Prospect 2X transformer causing a load to be shed that affected 477 customers for approximately 2 hours. For this weather event, Eversource experienced outages throughout the State, but Greenwich was the only location where customers could not be restored because the feeder capacity was not available. (Tr. 2, pp. 16-19; Tr. 3, pp. 46-47, 51).

**Comment: This finding is inconsistent with the record for the following reasons:**

First, the record does not support the finding that a heat wave caused the cable fault on 27.6-kV feeder 11R56, where the outage occurred at 4 AM when load on the feeder was likely at its lowest. (8-29-17 Tr. pp. 48, 51). Eversource has not conducted any forensic analysis relating to the cause of the outage. (8-29-17 Tr. p. 50). The outage occurred when the feeder was not overloaded and was a result of the feeder's age and physical condition and the fact that it was not functioning properly. (8-29-17 Tr. pp. 49, 54-57, 64. Town 1, p. 18).

Second, Eversource admits that if feeder 11R56 had been functioning properly, it should not have failed because there was still capacity according to its normal rating. (8-29-17 Tr. p. 51). Feeder 11R56 was not overloaded when it failed. (See PFOF ¶¶ 39-58).

Third, taking into account the Normal and Alternate feeders identified by Eversource and the normal ratings of those feeders, when 11R56 feeder went out of service, there should have been sufficient capacity on the alternate feeders (22E35 and 22E36) to serve the load at Byram. (Eversource 14, Resp. to Q-TOWN-076; Eversource 9, Resp. to Q-TOWN-001). If the cables had been functioning properly, there would have been no outages. (See PFOF ¶¶ 39-66).

Fourth, there is no evidence in the record of the actual loads on the other feeders at the time of this cable fault that would support a finding that "customers could not be restored because the feeder capacity was not available."



Eversource did not provide the loads on the feeders it claims were overloaded despite being ordered by the Council to produce all of the load data for the other feeders on the 27.6-kV system for three years. (8-29-17 Tr. at 43; Eversource 14, Resp. to Q-TOWN-073, -074; Eversource 15, Supp. Resp. to Q-TOWN-077). In addition, see the above comment to Draft Finding of Fact # 62.

Fifth, even if the Modified GSLP is built, feeder 11R56 will remain the normal feeder to the Byram Substation. (Eversource 14, Resp. to Q-TOWN-076; 8-29-17 Tr. p. 98).

72. Cable failures also occurred under other non-peak load conditions. Several recent distribution feeder failures not related to loading occurred as follows:
- a) The 11R52 feeder failed in July 5, 2015 at 25 MVA, below its normal rating of 33.5 MVA;
  - b) The 11R56 feeder failed on July 27, 2015 at a load of 7.5 MVA, below its cable rating of 15.9 MVA;
  - c) The 11R55 feeder failed on July 28, 2015 at a load of 14 MVA, below its normal rating of 32.5 MVA.
- A cable failure causes the other cables remaining in operation to carry more load. (Eversource 9, response Town 17; Tr. 3, pp. 52-57)

**Comment: This finding is incomplete and inconsistent with the record for the same reason as stated in the comment to draft Finding of Fact #71.**

#### *Modified GSLP Objectives*

73. Unlike the original project, Eversource is no longer projecting load growth in this area and load growth is not part of the need for the Modified GSLP. (Eversource 1, Vol. 1, PFT, p. 15)

**Comment: This finding is incomplete. Unlike in the original project, Eversource is no longer claiming as a basis for the Modified GSLP a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15).**

74. The Modified GSLP is designed to address the need for reliability improvements to the electric distribution system in Greenwich as previously identified by the Council in its Docket 461 decision. (Eversource 1, Vol. 1, PFT pp. 1-3)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

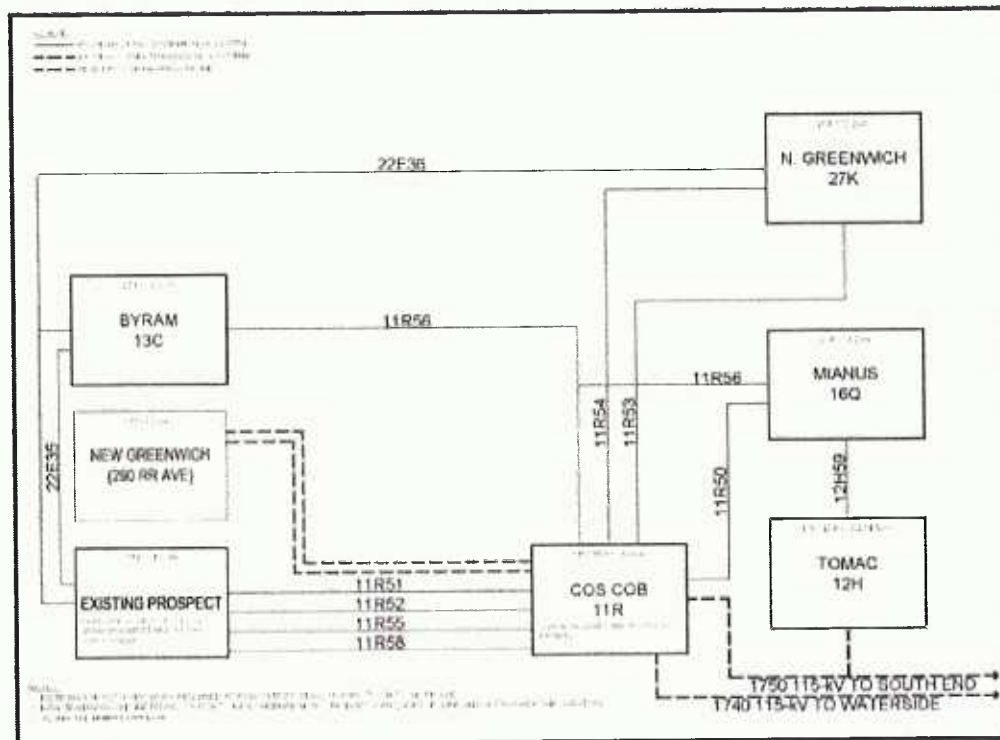
First, in Docket 461, the focus of Eversource's claim of the need for a 115-kV transmission line and substation in Greenwich was the risk of the 27.6-kV

transformers at the Cos Cob Substation being overloaded. (Council Admin. Notice 43, Eversource 1, p. E-1). That claim of need has now been abandoned. The record demonstrates that Eversource's load projections were false and overstated, and Eversource now admits it is no longer projecting load growth, there is no longer a need for additional capacity in Greenwich, and increasing capacity is no longer the basis for the alleged need for the Modified GSLP. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15).

Second, in Docket 461, Eversource did not present the results of any computer modeling or simulations regarding the 27.6-kV feeders in Docket 461. (Council Admin. Notice 43, RECORD). The issue of the "reliability" of the distribution system was an afterthought in Docket 461.

Third, the Modified GSLP is essentially the same design as the GSLP, only with costs deferred to a later date, because Eversource continues to propose two 115-kV transmission lines and a 115-kV substation. Even if the Modified GSLP is built, in order to address the real electric system reliability issues in the Town, Eversource will still need to: 1) repair and replace deficient 27.6-kV feeders, 2) immediately address poor-performing 13.2-kV cables, 3) replace older equipment and transformers at Byram, 4) address the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town, and 5) address the isolation of customers served by Tomac at 4.8-kV, and the dependence of the Tomac Substation on a single 4.8-kV transformer. (Eversource 1, Vol. 1, Pre-Filed Testimony, p.11; 8-29-17 Tr. p. 96; Council Admin. Notice 43, Eversource 1, p. E-16 Table E-4; see also PFOF ¶¶ 59-100). In addition, even though additional capacity is not needed in Greenwich, Eversource has plans to engage in costly upgrades of the transformers at the new substation. (Eversource Resp. to Q-TOWN-058; see also PFOF ¶¶ 101-109).

75. The Modified GSLP would establish a new 115-kV to 13.2-kV substation west of Indian Harbor (Greenwich Substation), and a new 115-kV transmission line connection between the existing Cos Cob Substation and the new Greenwich Substation, as shown below:



(Eversource 10a, pp. D-4)

**Comment:** The diagram is incomplete because it does not depict the 27.6-kV lines that feed the eleven commercial and industrial customers and the Greenwich Network, all of whom will continue to be served at 27.6-kV even if the Modified GSLP is approved. (Council Admin. Notice 43, Eversource 1, p. E-3; Eversource 9, Resp. to Q-TOWN-020; Eversource 14, Resp. to Q-TOWN-076; 8-29-17 Tr. pp. 61-63).

76. The Modified GSLP would function reliably with peak loads of approximately 195 MVA, representing a permissible load of 135 MVA at Cos Cob and a permissible load of 60 MVA at the new Greenwich Substation. (Eversource 1, Vol. 1, PFT pp. 8-9; Eversource 2, response 23)

**Comment:** This finding is incomplete and inconsistent with the record for the following reasons:

First, the finding that the Modified GSLP would function reliably is not supported by the record because the 27.6-kV feeders are not failing because of overloads, but rather because of the age and physical condition of the cables.

Therefore, even after construction, the Mianus, Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers would all be susceptible to the same cable failures and potential outages as they are today. (8-29-17 Tr. p. 61-63; Town 1, at 16; see also PFOF ¶¶ 59-66).

Second, the finding that the Modified GSLP would function reliably is not supported by the record because the Modified GSLP does not include improvements to the failing 27.6-kV feeders, the 13.2-kV distribution system, the vintage and obsolete equipment at Byram, the isolation of Tomac, the lack of backup to the 4.8-kV transformer at that substation, and the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town. (See PFOF ¶¶ 59-100).

Third, the record demonstrates that Eversource has abandoned its claim that the risk of overloads on the 27.6-kV transformers at Cos Cob is the basis for the need for the Modified GSLP. (See PFOF ¶¶ 1-15).

77. It would allow Eversource the capability to transfer load between the Cos Cob Substation and proposed Greenwich Substation at the transmission level and provide automatic electric supply backup to most of the customers in Greenwich in the event of an outage. There is no capability in the current electric system for this redundancy. This capability is consistent with Eversource's current electric system design in that if one power supply source is unavailable, the remaining bulk substation would be able to supply necessary power. (Council Administrative Notice 43, FOF # 118)

**Comment: This finding is incorrect and inconsistent with the record for the following reasons:**

First, the Modified GSLP would not provide automatic electric supply backup to most of the customers in Greenwich in the event of an outage on the Cos Cob Substation's 27.6-kV transformers. The Modified GSLP replaces Prospect Substation's 55 MVA of permissible load with the proposed Greenwich Substation's 60 MVA of permissible load, a net increase of only 5 MVA. (Eversource 1, Resp. to Q-CSC-013, Q-CSC-023; Eversource 1, Vol. 1, Ex. B, p. A-17; Eversource 1, Vol. 1, Ex. A, p. A-27). After the Modified GSLP is built, North Greenwich, Byram, the Greenwich Network, and the 11 large commercial and industrial customers would continue to be fed from Cos Cob Substation's 27.6-kV transformers. (Eversource 9, Resp. to Q-TOWN-020; Eversource 14, Resp. to Q-TOWN-076; 8-29-17 Tr. pp. 61-63). Their average combined peak loads for 2011-2016 is 75.17 MVA. (Eversource 2, Resp. to CSC-013). As a result, if Cos Cob Substation is out of service, there will be insufficient capacity from the Greenwich Substation to serve the customers regularly supplied from the Cos Cob Substation. (See also PFOF ¶¶ 101-109).



**Second, the Modified GSLP would not provide automatic electric supply backup if one of the common structures upon which the 1740 and 1750 lines reside goes down or both lines go down. Eversource's proposed new substation would be completely dependent on the supply of electricity from the 1740 and 1750 lines. (8-29-17 Tr. p. 69; Eversource 2, Resp. to Q-CSC-024). The Modified GSLP does nothing to provide a contingency in the event the 1740 and 1750 lines go down. (8-29-17 Tr. p. 69; see also PFOF ¶¶ 67-79).**

**Third, there is insufficient evidence in the record to make this finding because the Modified GSLP will rely on unreliable overhead 13.2-kV feeders that Eversource is not proposing to improve. (8-29-17 Tr. p. 88; see also PFOF ¶¶ 95-100).**

80. In the event of the loss of a single transformer (and N-1 condition) at Cos Cob Substation under 2013 peak conditions, load would be automatically transferred to the new Greenwich Substation, and the capacity of the remaining transformers at Cos Cob and the transformers at the new Greenwich Substation could serve 100 percent of the load. (Eversource 1, Vol. 1, PFT pp. 9-10)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, this finding is incomplete and inconsistent with the record for the same reason stated in the comment to draft Finding of Fact #48.**

**Second, the evidence in the record demonstrates that in the event of the loss of one 27.6-kV transformer at Cos Cob Substation, and if Tomac and Mianus are required to be served by the remaining transformers at Cos Cob, there would be insufficient capacity to serve the loads of the Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers. The total average peak loads of those load centers for 2011-2016 is 137.45 MVA. (Council Admin. Notice 43, FOF Att. 1; Eversource 2, Resp. to CSC-013; Eversource 9, Resp. to Q-TOWN-013; 7-25-17 Tr. pp. 30-31)).**

82. In the event that two transformers were lost at either the Cos Cob or the new Greenwich Substation, approximately 80 percent of the load would automatically be transferred to other substations and the remaining 20 percent of the load could be restored quickly by operator adjustment. (Eversource 1, Vol. 1, PFT pp. 10-11)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**



First, in the event of the loss of the two largest 27.6-kV transformers at Cos Cob Substation, there would be insufficient capacity to serve the loads of the Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers. (Council Admin. Notice 43, FOF Att. 1; Eversource 2, Resp. to CSC-013; Eversource 9, Resp. to Q-TOWN-013; 7-25-17 Tr. pp. 30-31)).

Second, the evidence in the record demonstrates that in the event of the loss of the transformers at the proposed Greenwich Substation, there would be insufficient capacity to serve the loads served by the new Greenwich Substation and the loads of the Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers. (Council Admin. Notice 43, FOF Att. 1; Eversource 2, Resp. to CSC-013; Eversource 9, Resp. to Q-TOWN-013; 7-25-17 Tr. pp. 30-31)).

Third, Eversource does not explain how the remaining 20 percent of the load could be restored quickly by operator adjustment. (Eversource 1, Vol. 1, PFT pp. 10-11).

Fourth, Eversource currently has the ability to make adjustments to avoid outages, for example in the event one of the four feeders from Cos Cob to Prospect goes out of service. (9-5-17 Tr. p. 61-62; see also PFOF ¶¶ 16-32).

Fifth, there is no evidence in the record that Eversource has ever lost two of the 27.6-kV transformers at the Cos Cob Substation, and Eversource does not plan for such double-contingency events (as evidenced by the fact that the Modified GSLP contemplates a new substation with only two transformers). (Eversource 2, Resp. to Q-CSC-026).

83. The transmission level connection between the two substations is an improved design in that the new transmission line would provide a direct connection to the new Greenwich Substation, reducing the loading on the 27.6-kV feeder system. (Eversource 9, Response Town 2)

**Comment:** This finding is incomplete and inconsistent with the record for the following reasons:

First, the Modified GSLP is not an improved design because the 27.6-kV feeders are not failing because of overloads, but rather because of the age and physical condition of the cables. Therefore, even after construction, the North Greenwich Substation, Byram Substation, The Greenwich Network, and the 11 large commercial and industrial customers would all be susceptible to the same cable failures and potential outages as they are today. (8-29-17 Tr. p. 61-63; Town 1, at 16; see also PFOF ¶¶ 59-66).

**Second, the finding that the Modified GSLP is an improved design is not supported by the record because the Modified GSLP does not include needed improvements to the 27.6-kV feeders, the 13.2-kV distribution system, the vintage and obsolete equipment at Byram, the reliance on the single 115-kV tap to the Tomac Substation, the lack of backup to the single 4.8-kV transformer at the Tomac substation, and the Town's continued reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town. (See PFOF ¶¶ 59-100).**

84. This project is similar to other projects in the State to improve system reliability. In the last ten years, Eversource has constructed new substations and rebuilt others throughout the State, including in areas near the State boundary line. The new substations have been built in mostly rural areas and did not have the same physical property constraints as the two proposed locations. (Tr. 2, pp. 105-107, 114-115)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, the proposed new substation is not similar to other projects in the State to improve system reliability and is unique because it will be located extremely close to residential and commercial customers, whereas Eversource usually builds substations in rural areas with much larger acreage. (7-25-17 Tr. p. 84; 8-29-17 Tr. p. 115; see also PFOF ¶¶ 190-199).**

**Second, building an open air substation in close proximity to any form of occupied building – with or without a fence – has become rare due to the noise and safety issues posed by substations. (Town 1, at 25; see also PFOF ¶¶ 190-199).**

**Third, the record does not contain evidence of any other projects in the State where the cost is so great compared to the benefit received from the project. Unlike other projects in the State, the Modified GSLP consists of overbuilding at an unacceptable cost of \$100 million, with minimal benefit in return. (See PFOF ¶¶ 101-109, 138-142, 153-157).**

**Fourth, this project is not similar to other projects in the State because Eversource proposes a \$100 million transmission solution to what is purely a distribution problem.**

85. In most cases, the new substations are adjacent to existing transmission lines. The new Greenwich Substation is different in that a new transmission line would be extended to the new substation. (Tr. 2, pp. 106-107)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, the new Greenwich Substation is also different in that the underground transmission cables are sized to provide more capacity than is necessary for the new substation, even though Eversource admits there is no longer a need for additional capacity in Greenwich and therefore there is adequate supply. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15, 101-109).**

**Second, the new Greenwich Substation is also different in that it does not address the failing 27.6-kV feeders that are the cause of the outages Eversource has cited, or the other reliability issues facing the Town described in the other comments to the draft Findings of Facts. (See, e.g., comment to draft Finding of Fact #84; see also PFOF ¶¶ 59-100).**

**Third, the new Greenwich Substation is also different in that the new transmission line would extend Eversource's ability to supply electricity at 115-kV approximately 2.3 miles closer to the border with New York, for the obvious purpose of allowing Eversource to tap into the New York market for its own profitability reasons. (Eversource 1, Vol. 1, Pre-Filed Testimony, p. 2; see also PFOF ¶¶ 153-157).**

86. After the Modified GSLP is constructed, Eversource would still operate and maintain the 27.6-kV distribution feeders to serve 11 large customers out of the Prospect Substation and the Greenwich Network. From 2011 to 2016, the average annual peak load from the 11 large customers is 18.4 MVA. (Eversource 9, Response Town 20, response 21)

**Comment: This finding is incomplete and inconsistent with the record. After the Modified GSLP is constructed, Eversource would also still operate and maintain the 27.6-kV distribution feeders to also serve the Mianus, Byram and North Greenwich Substations. (See PFOF ¶¶ 59-66).**

88. It is anticipated that by significantly offloading demand on the distribution feeders, the feeders would be able to operate with enough capacity to operate normally even under N-1 conditions, reducing the likelihood of outages that have historically occurred with this electric supply configuration. There would be enough capacity to operate in a N-2 condition. (Eversource 1, Vol. 1, PFT pp. 9-10; Council Administrative Notice 43, FOF #41, #76; Eversource 9, Response Town 3, response 20; Tr. 2, p. 23; Tr. 3, p. 64, 97-98)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, offloading demand on the distribution feeders does not increase reliability because Eversource admitted that none of the feeders have failed due to being overloaded. Indeed, these feeders have failed during low load conditions. (Council Admin. Notice 43, Eversource Resp. to OCC-042; Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. pp. 54-57). Rather, the cable failures resulted from the age and physical condition of the cables or, in the case of newly-installed cables, improper installation or maintenance. (8-29-17 Tr. pp. 49, 54-57, 64. Town 1, p. 18). The Modified GSLP does not involve replacing, repairing or upgrading these feeders, and the Mianus, Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers would all be susceptible to the same cable failures and potential outages as they are today. (8-29-17 Tr. p. 61-63; Town 1, p. 16). See also PFOF ¶¶ 39-66.

Second, there is insufficient evidence in the record to determine whether the Modified GSLP would reduce the likelihood of outages that have historically occurred because Eversource did not identify the ages of the 27.6-kV feeders, all the failures on the 27.6-kV feeders, the loads on the other feeders, nor did it provide sufficient information to determine the causes of outages, despite requests to do so. (Eversource 14, Resp. to Q-TOWN-073, -074; 8-29-17 Tr. at 43; Eversource 15, Supp. Resp. to Q-TOWN-077).

Third, there is insufficient evidence in the record to find that the Modified GSLP will reduce the likelihood of outages because the only evidence in the record showing the loads on the 27.6-kV feeders in actual N-1 conditions makes clear that Eversource has been able to avoid customer outages. (8-29-17 Tr. p. 44; Eversource 14, Resp. to Q-TOWN-076; Eversource 15, Supp. Resp. to Q-TOWN-077; see also PFOF ¶¶ 16-32).

89. Eversource ultimately intends to serve load in Greenwich at the 13.2-kV level and retire other voltages. The Project serves as a foundation to accomplish this goal. For example the Byram Substation is not included within the Modified GSLP. Eversource would continue to examine load at both the new Greenwich Substation and the Byram Substation. If load is stable or declines due to energy efficiency measures, demand response and distributed generation initiatives, the Byram substation may be retired with the load served from the new Greenwich Substation. If load increases significantly, Eversource could recondition the substation to meet demand needs. (Tr. 2, pp. 26-27, 148-149)

**Comment: This finding is incomplete and inconsistent with the record.**

First, Eversource has no plans to retire the 27.6-kV system. To the contrary, even if the Modified GSLP is built, 27.6-kV feeders will continue to serve the Mianus, Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers. The Modified GSLP does



nothing to address the deficiencies in the 27.6-kV feeder cables, and the exact same outages occurring today will occur even after Eversource's \$100 million Modified GSLP is built. (See PFOF ¶¶ 59-66).

Second, this finding is not relevant to a finding of need for the Modified GSLP because Eversource now admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15).

Third, even if load is stable, the record does not support a finding that Byram is likely to be retired. The proposed Greenwich Substation is expected to serve 51 MVA of load and have a permissible load of only 60 MVA. (Eversource 9, Resp. to Q-TOWN-013; Tr. 2, pp. 30-31; Eversource 2, Resp. to Q-CSC-023). The proposed Greenwich Substation would thus be unable to serve the load normally served by the Byram Substation, which has an average peak load of 19.8 MVA from 2011-2016. (Eversource 2, Resp. to Q-CSC-013).

90. The new Greenwich Substation would be connected through the Cos Cob Substation. The loss of both the 1740 and 1750 lines from Stamford would still cause the loss of service to most of Greenwich, including customers served by the new Greenwich Substation. (Tr. 3, pp. 67-69)

**Comment: This finding is incomplete for the same reasons stated in the comment to draft Finding of Fact #47.**

### ***Eversource Reliability Planning***

92. Eversource used the 2013 peak load of 130.5 MVA on the 27.6-kV system served by the Cos Cob Substation as a baseline to conduct contingency planning studies to design the project since it was a recently recorded value that has the potential to reoccur. The 2013 peak load occurred over a sustained period of high temperatures combined with high humidity. (Council Administrative Notice 43, FOF #84; Eversource 1, Vol. 1, PFT p. 4)

**Comment: This finding is incomplete and inconsistent with the record for the same reason stated in the comment to draft Finding of Fact #48. As a result, Eversource's use of the claimed 2013 peak load as a baseline is unreliable.**

94. The results of those simulations confirmed the same reliability deficiencies in the existing electric system identified in the original Docket: potential transformer overloads at both the Cos Cob and Prospect Substations and potential overloads of the 27.6-kV distribution feeders supplying power to Prospect Substation. (Eversource 1, Vol. 1, PFT p. 4)



**Comment:** This finding is incomplete and inconsistent with the record for the following reasons:

First, the computerized simulations are unreliable because each simulation overstated the projected load on each feeder, and the simulations are therefore not a basis on which to make a finding of need. (Town of Greenwich Proposed Findings of Fact ¶¶ 16-32). The computer simulations do not reflect reality because they fail to take into account the shifting of load that reduces load on the feeders in service, and avoids customer outages. (9-5-17 Tr. p. 61, lines 18-20). In actuality, Eversource has the ability to shift load in order to avoid the full extent of the projected loads predicted by the computerized simulations. (9-5-17 Tr. p. 62). When feeder 11R52 was lost from service on the day of the 2015 peak load, the loads on the remaining three 27.6-kV feeders to Prospect were significantly less than Eversource's projected loads in its computerized simulations, and no customer outages occurred. (Eversource 1, Resp. to Q-TOWN-001; Eversource 15, Supp. Resp. to Q-TOWN-077; 9-5-17 Tr. p. 61). See also PFOF ¶¶ 16-32.

Second, Eversource admits that the outages on the 27.6-kV feeders were not caused by their being overloaded at the time they failed. (Council Admin. Notice 43, Eversource Resp. to OCC-042; Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. pp. 54-57). Rather, the outages resulted from the age and physical condition of the cables or, in the case of newly-installed cables, improper installation or maintenance. (8-29-17 Tr. pp. 49, 54-57, 64. Town 1, p. 18). As a result, the contingency simulations do not accurately reflect the reliability issues posed by the deficient 27.6-kV feeders, a problem which the Modified GSLP does not address. See PFOF ¶¶ 16-58.

Third, Eversource has not identified the feeders that were overloaded as a result of cable failures on the 27.6-kV feeders, the amount of the load on those feeders, or the age of those feeders. (Eversource 14, Resp. to Q-TOWN-073, -074; Eversource 9, Resp. to Q-TOWN-001). As a result, there is insufficient evidence in the record to confirm the cause of the reliability deficiencies Eversource claims in this Docket 461A. See also comment to draft Finding of Fact # 62.

95. The Town concurs that utilities should plan for multiple contingencies. (Town 1, p. 15)

**Comment:** This finding is incomplete. While the Town concurs that utilities should plan for multiple contingencies, the evidence in the record demonstrates that the current 27.6-kV system is consistent with such a plan and works as designed. (Eversource 14, Resp. to Q-TOWN-076; Eversource 9, Resp. to Q-TOWN-001; 8-29-17 Tr. p. 34 lines 3-6; 8-29-17 Tr. p. 35 lines 1-3). In addition, Eversource has not planned for multiple contingencies as it will continue to rely on the 1740 and 1750 lines as the sole supply of electricity at 115-kV, and it has not addressed the isolation of Tomac and its reliance on a single 4.8-kV

transformer. The Modified GSLP does not address these issues. See PFOF ¶¶ 67-86.

96. To measure reliability, Eversource predominately uses two metrics; the frequency of interruptions and the duration of interruptions. The analysis is based on circuits, not by Town. Based on these metrics, Town of Greenwich customers experience reliability far below the state average. The average customer in Connecticut has an interruption every 16 months with an average interruption time of approximately 85 minutes. Greenwich customers experience an interruption average below ten months with an average interruption time of approximately 110 minutes. (Tr. 2, pp. 102-104)

**Comment: This finding is incomplete because the record demonstrates that the Modified GSLP will not reduce the frequency and duration of interruptions for the following reasons:**

First, Eversource admitted that none of the 27.6-kV feeders have failed due to being overloaded. These feeders also fail during low load conditions. (Council Admin. Notice 43, Eversource Resp. to OCC-042; Eversource 9, Resp. to Q-TOWN-017; 8-29-17 Tr. pp. 54-57). Rather, the cable failures resulted from the age and physical condition of the cables or, in the case of newly-installed cables, improper installation or maintenance. (8-29-17 Tr. pp. 49, 54-57, 64. Town 1, p. 18). Because the Modified GSLP does nothing to address the deficient 27.6-kV feeder cables, it does not address the frequency and duration of interruptions caused by these deficient cables. (See PFOF ¶¶ 39-66).

Second, the evidence in the record demonstrates that a significant cause of interruptions is the poor-performing overhead 13.2-kV circuits, which the Modified GSLP does not address. (Eversource 14, Resp. to Q-TOWN-080 Appendix 11, 12; 8-29-17 Tr. pp. 86, 88; Eversource 9, Resp. to Q-TOWN-028; see also PFOF ¶¶ 95-100).

Third, the Modified GSLP will not address the real electric system reliability issues in the Town, including: 1) the need to repair and replace deficient 27.6-kV feeders, 2) the need to immediately address poor-performing 13.2-kV cables, 3) the need to replace older equipment and transformers at Byram, 4) the need to address the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town, and 5) the need to address the isolation of customers served by Tomac at 4.8-kV, and the dependence of the Tomac Substation on a single 4.8-kV transformer. (See PFOF ¶¶ 59-100).

97. Approximately half of the outages in Greenwich are related to storm events affecting the overhead 13.2-kV distribution system. The 13.2-kV distribution system is regulated by PURA and is not the subject of the Modified GSLP. (Tr. 3, pp. 81-88, 98-99)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comment to draft Finding of Fact #42 and 96.**

### ***Contingency Modeling - Cos Cob Substation***

99. Electric power at 27.6-kV cannot be transferred to another substation to reduce power demand on the transformers; however, 6 MVA of load can be transferred to the 115-kV to 13.2-kV transformers within the substation. This small amount of load transfer is currently sufficient to relieve overloads on the two remaining transformers to enable them to operate within their normal ratings. This small reliability margin could be reduced or entirely disappear with load growth on the 13.2-kV system served directly from the Cos Cob Substation. (Eversource 1, Vol. 1, PFT pp. 6, 7)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, this finding is not relevant to a finding of need for the Modified GSLP because Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15). Eversource has abandoned its claim that this project is needed because of a risk of transformer overloads.**

**Second, there is no evidence in the record to support a finding that an outage on one of the 27.6-kV transformers at Cos Cob is likely to occur. (Docket 461A, RECORD).**

100. In the event of a transformer outage requiring a prolonged repair, only a 30 MVA (maximum) mobile transformer can be temporarily installed within the substation, which is insufficient to support the 2013 peak loading on either the 2X or 3X transformers. Under this circumstance, the substation would have to be manually reconfigured to redistribute loading. (Eversource 1, Vol. 1, PFT pp. 7, 8)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact #48 and 99. In addition, because the Project only adds 5 MVA of additional permissible load capacity to the Town, there is insufficient evidence in the record to support a finding that the need to manually reconfigure the substation to redistribute loading would not be avoided by the Modified GSLP.**

101. The permissible load rating at Cos Cob is 135 MVA for the 27.6-kV system based on a 2-hour emergency rating. It is based on the loss of the largest transformer (50.4 MVA) where the remaining two transformers would have to operate 145 percent above their nameplate rating in order to maintain electric service. After two hours, the load on the remaining two transformers must be reduced to a 22 hour rating. Although Eversource is willing to operate equipment above nameplate ratings for short intervals, it cannot operate its equipment in their emergency ratings for extended periods of time without permanent damage to equipment. (Council Administrative Notice 43, FOF #88, #89; Tr. 3, p. 18)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact #48, 99 and 100.**

***Contingency Modeling - Prospect Substation***

103. The Modified GSLP would be able to provide 100 percent backup in the event the Prospect Substation was lost from service. (Tr. 2, p. 144)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

**First, the 27.6-kV transformers at Prospect Substation will be retired from service. (See PFOF ¶ 105).**

**Second, the finding is incomplete and inconsistent with the record for the same reasons stated in the comment to draft Findings of Fact # 79.**

**Third, this finding is not relevant to a finding of need for the Modified GSLP because Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15).**

104. When the loss of one of Cos Cob to Prospect feeders (N-1) was modeled at the peak load of 130.5 MVA, the remaining cables would be overloaded, as shown below:

Feeders	Load relative to Normal cable ratings			
11R51	O.O.S.	151%	140%	122%
11R52	117%	O.O.S.	109%	95%
11R55	114%	117%	O.O.S.	97%
11R58	73%	73%	69%	O.O.S.

Normal ratings are based on a 75 percent load factor. Contingency modeling does not account for load redistribution to other circuits in the Greenwich electric



system that can occur to protect system elements. (Eversource 1, Vol. 1, PFT p. 5; Tr. 3, p. 32; Tr. 4, pp. 61-62)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact #62, 92 and 94.**

105. The length and impedance differences of the parallel feeders limit the capability of each feeder to accept flow from another feeder that is out of service. (Eversource 1, Vol. 1, PFT p. 5)

**Comment: This finding is incomplete and inconsistent with the record. There is insufficient evidence in the record to explain the length and impedance differences, the extent to which these differences limit the capability of each feeder to accept flow, or how these differences may be addressed cost-effectively. (Docket 461A, RECORD). In addition, the record demonstrates that Eversource did not consider any remedial measures, such as the use of current limiting reactors, to address this issue. (Eversource 2, Resp. to Q-CSC-026; see also PFOF ¶¶ 110-137).**

106. Overloads on one or more of the feeders occur on loads as low as approximately 82 MVA. (Eversource 1, Vol. 1, PFT p. 5; Eversource 2, response 1)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, Eversource's admission proves that overloads are not causing feeders to fail. This admission proves that the 27.6-kV cables are failing because they are not operating properly, and not because they are overloaded. (See also PFOF ¶¶ 39-58). The fact that cable failures are occurring even under low load conditions supports a finding that the Modified GSLP will not improve the reliability of the 27.6-kV system.

Second, Eversource did not disclose any data or the results of any simulations or modeling to support this statement.

Third, this finding is incomplete and inconsistent with the record for the same reasons stated in the comment to draft Findings of Fact #62, 71 and 94.

107. If two of the circuits are out, load would have to be shed to protect system components. (Council Administrative Notice 43, FOF #79)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact #62, 71 and 94.**



108. In 2015, the Cos Cob peak demand reached 114.8 MVA a cable fault occurred on the 11R52 feeder. Under contingency modeling the loads on the remaining three feeders would have been as follows:
- 11R51 - overloaded by 36 percent.
  - 11R55 - overloaded by 5 percent.
  - 11R58 - loading at 65 percent of cable rating.

In actual conditions with the loss of the 11R52 feeder, the load was redistributed to the three remaining feeders as well as to the 11R53 and the 11R54 feeders serving North Greenwich Substation. Eversource accepted overloads on the 11R53 and 11R54 feeders to minimize overloads on the 11R51 and 11R55 feeders. Even though the load was re-distributed in this fashion, the 11R51 feeder was overloaded by 17 percent. No customers lost service during this fault event. (Eversource 2, response 1; Tr. 4, pp. 55-62)

**Comment: This finding is incomplete and inconsistent with the record because all of Eversource's contingency modeling overstated overloads on these feeders. Therefore, these computerized simulations are unreliable. In addition, this finding is incomplete and inconsistent with the record for the same reasons stated in the comment to draft Finding of Fact #62, 71 and 94.**

### ***Project Alternatives***

109. Project Alternatives were examined in detail during the original Docket 461 proceeding and included transmission, distribution, interconnection, generation, demand side management alternatives as well as energy efficiency measures. (Council Administrative Notice 43, FOF #s 132- 210)

**Comment: This finding is incomplete and inconsistent with the record. In Docket 461, the focus of Eversource's claim of the need for a 115-kV transmission line and substation in Greenwich was the risk of overloads on the Cos Cob 27.6-kV transformers. Eversource has now abandoned this argument, and now projects no load growth in the Town. (Council Admin. Notice 43, Eversource 1, p. E-1; 8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15). The project alternatives examined in Docket 461 were reviewed in light of that claimed need, not the redefined need in this Docket 461A. In addition, see comment to draft Finding of Fact #25 and 111.**

110. In OCC's Docket 461 Post-Hearing brief of April 11, 2016, the OCC mentioned two potential alternatives they believed were not addressed sufficiently during the original proceeding: replacing the existing transformers at Cos Cob Substation with larger transformers, and retrofit the Prospect Substation in conjunction with switching some load to other substations. These potential alternatives were rejected as described below:

- a. Eversource examined the feasibility of replacing the existing Cos Cob 46.7 MVA and 50.4 MVA transformers with two 80 MVA transformers but after contacting four different manufacturers, determined there is not enough space within the substation to accommodate the physically larger replacement transformers.
- b. There is not enough room within the Prospect Substation to install an additional transformer and associated bus connection. Any load transfer to another distribution substation supplied from Cos Cob would not reduce the load on the Cos Cob 115-27.6 kV transformers. Transfer of load to Byram is not practical since it does not relieve load on the 27.6 kV circuits from Cos Cob. Transfer of load to North Greenwich is not practical since it would add load to the North Greenwich 13.2 kV feeders which would reduce the ability to accept load during contingencies. In addition, additional feeders would need to be installed to transfer load to the substation due to existing feeder constraints.

(Eversource 2, response 27; Council Administrative Notice 43 – OCC brief)

**Comment: This finding is not relevant to a finding of need for the Modified GSLP because Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15). In addition, the record demonstrates that because the 27.6-kV feeders are not failing because of overloads, but rather because of the age and physical condition of the cables. Even if the Modified GSLP is built, 27.6-kV feeders will continue to serve the Mianus, Byram and North Greenwich Substations, the Greenwich Network, and the 11 large commercial and industrial customers, all of whom would remain susceptible to the same cable failures and potential outages as they are today. (8-29-17 Tr. p. 61-63; Town 1, at 16). In addition, see PFOF ¶¶ 39-66.**

111. After the Council's final May 2016 decision, Eversource consulted with the Town to examine potential projects to improve reliability in Greenwich. Eight distribution alternatives were examined, but were found to be inferior to the proposed project due to cost concerns, inferior reliability, or engineering difficulties. These rejected distribution alternatives are provided in Attachment 3. (Eversource 1, Vol. 1, PFT p. 17; Eversource 2, response 26)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comment to draft Findings of Fact # 25, 27 and 28, and the following reasons:**

**First, the document identified as Attachment 3 containing the eight distribution alternatives was only provided to the Town in response to Q-CSC-026.**

Second, Eversource rejected many of the distribution alternatives because the configurations result in a loss of load in the event two or more of the 27.6-kV transformers at the Cos Cob Substation fail. This is not a proper criterion on which to reject a distribution alternative because Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich. In addition, there is no evidence in the record that Eversource has ever lost two of the 27.6-kV transformers at the Cos Cob Substation, and Eversource does not plan for such double-contingency events (as evidenced by the fact that the Modified GSLP contemplates a new substation with only two transformers). (Eversource 2, Resp. to Q-CSC-026).

Third, Eversource did not provide a cost estimate for Distribution Option 1, including the feasibility or cost of addressing the length and impedance differences in the 27.6-kV feeders from Cos Cob to Prospect, and based its rejection of the option on contingency simulations that have been proven false and not reflective of real conditions. (Eversource 2, Resp. to Q-CSC-026; Eversource 2, Resp. to Q-CSC-001; Eversource 9, Resp. to Q-TOWN-001; Eversource 15, Supp. Resp. to Q-TOWN-077; 9-5-17 Tr. pp. 58, 61).

Fourth, Eversource did not adequately examine a distribution option involving the reconductoring of same-sized 27.6-kV cables in their existing ducts with modern cables that provide more ampacity, a substation with 60-MVA permissible load capacity, and no upgrades to Byram. (Eversource 2, Resp. to Q-CSC-026; see also PFOF ¶¶ 101-137).

Fifth, due to the minimal increase in capacity after the project is built, the Modified GSLP would also result in a loss of load in the event two or more of the 27.6-kV transformers at the Cos Cob Substation fail. See Comment to draft Finding of Fact # 82.

112. Rebuilding the existing 27.6-kV system in Greenwich, as examined in the eight distribution alternatives, would cost more, and offer less electric system flexibility when compared to the Project, and is incompatible with Eversource's plan to convert 27.6- kV system to a multi-grounded system at 23-kV or 13-kV across its service territory in Connecticut. (Eversource 9 – Response Town 12)

**Comment:** This finding is incomplete and inconsistent with the record for the reasons stated in the comment to draft Finding of Fact #111 and the following reasons:

First, the Modified GSLP is much more expensive than the distribution alternatives because the Town's reliability issues are not addressed in this project. Therefore, in addition to the \$100 million expenditure for this project, Eversource would still incur significant costs to address: 1) the need to repair and replace deficient 27.6-kV feeders, 2) the need to immediately address poor-

performing 13.2-kV cables, 3) the need to replace older equipment and transformers at Byram, 4) the need to address the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town, and 5) the need to address the isolation of customers served by Tomac at 4.8-kV, and the dependence of the Tomac Substation on a single 4.8-kV transformer. (See PFOF ¶¶ 59-100).

Second, Eversource grossly inflates the estimated costs of the distribution alternatives. According to Eversource's own data, the total cost to increase distribution feeder capacity and build a new substation with two 60 MVA transformers on Railroad Avenue would be approximately \$62 - \$66 million. (Eversource 1, Vol. 1, Ex. B, p. A-17; Eversource 1, Vol. 1, Ex. A, p. A-27; Council Admin. Notice 43, Eversource Late Filed Exhibit Q-LF-001; see also PFOF ¶¶ 130-137).

### *Energy Efficiency Measures*

114. Eversource cannot undertake distributed generation and energy efficiency projects. The Town and its businesses and residents can only be made aware of the different programs available to assist in development of these types of projects. (Tr. 2, pp. 127-129)

**Comment:** This finding is incomplete and inconsistent with the record. Eversource admits it has undertaken distributed generation and energy efficiency projects. (Eversource 14, Resp. to Q-STACY-003). In addition, Public Act 15-5, § 103 requires each utility to submit proposals to the Connecticut DEEP for pilot programs to build grid-side system enhancements, such as energy storage systems. Even though Eversource was aware of the Town's eagerness to implement such projects, Eversource did not use the opportunity to work with the Town on submitting a proposal for such a pilot project in the Town after the close of Docket 461. (9-5-17 Tr. p. 87).

121. Energy efficiency measure alone cannot solve electric system reliability issues and does not eliminate the need for the Project. These measures would extend the life of the Project so that additional projects necessary to accommodate future load growth would be delayed. (Eversource 9, Response Stacy 1, slide 2; Tr. 2, pp. 93-94)

**Comment:** This finding is incomplete and inconsistent with the record. Eversource admits it is no longer projecting load growth and there is no longer a need for additional capacity in Greenwich, in part because of the success of the Town's energy efficiency measures. (8-29-17 Tr. p. 91; see also PFOF ¶¶ 1-15). Because Eversource has abandoned the need for added capacity as a justification for this project, the Modified GSLP will not address the real electric system reliability issues in the Town, including: 1) the need to repair and replace



deficient 27.6-kV feeders, 2) the need to immediately address poor-performing 13.2-kV cables, 3) the need to replace older equipment and transformers at Byram, 4) the need to address the Town's reliance on the 1740/1750 115-kV lines as the sole supply of 115-kV electricity for the Town, and 5) the need to address the isolation of customers served by Tomac at 4.8-kV, and the dependence of the Tomac Substation on a single 4.8-kV transformer. (See PFOF ¶¶ 59-100).

### ***Demand Response – Distributed Generation***

127. Non-transmission alternatives must be able to provide reliable power. For this project, non-transmission alternatives do not provide a viable alternative to improve the reliability issues that currently exist. (Eversource 13, response Stacy 3)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact # 111.**

133. Based on the DEEP docket, Eversource, along with United Illuminating, submitted proposals for energy storage projects in the State but the proposals were rejected for being too costly. (Tr. 4, pp. 30-31)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact # 114.**

### ***115-kV Underground Transmission Line***

206. The size of the conductors would enable Eversource to eventually loop feed the Cos Cob Substation and the Tomac Substation. A smaller cable could be used (3,000 kcmil) to supply only the needs of the new Substation, but would not allow for a future loop feed. This proactive installation at a nominal cost (approx. \$120,000) is consistent with other Eversource projects, such as Docket 474, to reduce the potential for more costly upgrades in the future. (Tr. 3, pp. 93-95).

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, the record reveals that the proposed circuits will consist of 6 cables, each with a length of 12,000 feet, for a total of 72,000 feet. (Eversource 1, Vol. 1, Ex. B, p. A-17; see also Town 1, p. 33). Using Eversource's figure of \$5 per foot in additional cost (see 8-29-17 Tr. p. 93), the record demonstrates that installation of the 3,500 kcmil cables instead of 3,000 kcmil increases the cost of the Modified GSLP by \$360,000 – not \$120,000. Moreover, Eversource did not provide any



documents supporting the statement that the \$5 per foot estimate is accurate. (Docket 461A, RECORD).

Second, the evidence reflects that a 2,000 kcmil cable would have sufficient capacity to supply the proposed Greenwich Substation. (See 8-29-17 Tr. p. 94-95). As a result, installing 3,500 kcmil cables instead of 2,000 kcmil cables provides more capacity than is necessary while at the same time increasing the cost of the Modified GSLP even more.

Third, there is insufficient evidence in the record relating to how or when the loop feed will be built, including the criteria for that design and what it will cost. In addition, the description of the proposed new Greenwich Substation does not include any indication it is designed to include the necessary switching equipment to allow such a loop feed to be built.

### *Interstate 95 Crossing*

226. Two options to cross I-95 at Field Point Road were initially presented; an above ground crossing where the transmission line is attached to the underside of the I-95 overpass bridge or a pipe jacking crossing where the transmission line would be installed under the highway. (Eversource 1, Vol. 1, App. B, pp. A-11, A-12)

**Comment: This finding is incomplete and inconsistent with the record for the following reasons:**

First, the Town preferred the crossing of I-95 by attaching it to the underside of the I-95 overpass bridge. (Town 2, Resp. to Q-11).

Second, if the Town's preference had been accepted, it would save \$2.8 million. (Eversource 1, Vol. 1, Pre-Filed Testimony p. 20 line 648).

### *Indian Harbor Crossing*

236. The Town requested the transmission line/pedestrian bridge crossing to avoid disturbance to Indian Harbor. The bridge would be composed of steel and concrete and would require on-site assembly. The bridge itself would have a lifespan of 50 years. The wood pedestrian decking would be approximately eight feet wide and would have a lifespan of 10 years. (Eversource 1, Vol. 1, p. A-11; Eversource 1, Vol. 2, App. 11; Eversource 2, response 48; Tr. 2, pp. 67, 69, 87)

**Comments: This finding is inconsistent with the record because the record for the following reasons:**

First, the Town did not request the pedestrian bridge. During discussions with Eversource in the winter and spring of 2017, the Town's representatives questioned how Eversource would limit the impact on the surrounding environment with the use of a coffer dam and further discussed the approval process that would result from the need for Eversource to obtain permitting from the U.S. Army Corps of Engineers, which it acknowledged in Docket 461. During these discussions, the Town also suggested that Eversource explore attaching the transmission line to a pedestrian bridge that the Town already had plans to build. (Town 2, Resp. to Q-CSC Q-12; Admin. Notice 43, 12-1-15 Tr. p. 164; Eversource 1, Vol. 1, Pre-Filed Testimony, p. 20 line 653). The Town never opposed a coffer dam, nor has it ever insisted on a pedestrian bridge. (Town 2, Resp. to Q-12; 8-29-17 Tr. p. 159). The Town has consistently stated that the use of a coffer dam may present a viable construction option at a cost savings if Eversource was able to construct it in a way that minimizes the adverse environmental impact to surrounding areas. (Town 2, Resp. to Q-12). Until the July 25th hearing, the Town had not received details from Eversource as to how it proposed to build a coffer dam crossing of Indian Harbor. (Town 2, Resp. to Q-CSC Q-12). At the July 25th hearing, Eversource stated for the first time that it would use a floating barge ("floating work platforms") in order to construct the coffer dam. (7-25-17 Tr. p. 67). In addition, see PFOF ¶¶ 158-184.

Second, Eversource's statement that the pedestrian bridge would increase the cost of the project is not supported by the record because it does not take into account the fact that the Town already had plans to build such a pedestrian bridge. (Town 2, Resp. to Q-12).

238. The Town is not opposed to a coffer dam installation as long as it can be accomplished without the use of large cranes placed along the shoreline. (Tr. 3, p. 242)

**Comment: This finding is incomplete and inconsistent with the record for the same reasons stated in the comments to draft Findings of Fact # 236.**

### **Noise**

301. Post-construction noise levels adjacent to the 281 Railroad Avenue "indoor substation" would not exceed regulatory levels at abutting commercial properties (62 dBA) or abutting residential properties (55 dBA daytime/45 dBA nighttime). The transformer firewalls and a sound attenuation baffle installed along the north edge of the roof opening above the transformers would mitigate sound levels at adjacent residential properties. (Eversource 1, Vol. 1, Ex. B, p. C-12; Eversource 1, Vol. 2, App. 9; Eversource 2, response 54)

**Comment:** This finding is incomplete and inconsistent with the record. If an open-air substation is built at 281 Railroad Avenue, additional noise mitigation efforts may be required in order to comply with the Greenwich noise ordinance. There is no evidence in the record of the costs of such measures. Moreover, a fully-enclosed substation would not require any additional noise mitigation efforts. (Eversource 1, Vol. 1, Ex. A, p. F-2; Eversource 1, Resp. to Q-CSC-054). In addition, see PFOF ¶¶ 190-199.

### ***Public Safety***

307. A fully-enclosed indoor substation would have a higher level of security than an open air substation. (Eversource 14, Response Town 82)

**Comment:** This finding is incomplete. Building an open air substation in close proximity to any form of occupied building – with or without a fence – has become rare due to the noise and safety issues posed by substations. (Town 1, at 25). If the substation is located at 290 Railroad Avenue, it will be adjacent to an Airgas facility that stores compressed flammable gasses. (Town 1, at 26). In addition, it is undisputed that an open-air design would leave the substation equipment exposed to the elements and that a fully-enclosed indoor design would contain external elements “very nicely.” (7-25-17 Tr. p. 52). Moreover, Eversource admits that if a fully-enclosed indoor substation is built, no security fence would be required. (7-25-17 Tr. p. 51). In addition, see PFOF ¶¶ 190-199.

309. The indoor substation would be designed in accordance with applicable safety codes. Additional training for Town emergency responders would be necessary to ensure safe entry into the indoor substation and for proper response to certain emergencies. (Tr. 2, pp. 49-50)

**Comment:** This finding is incomplete for the same reasons stated in the comment to draft Finding of Fact # 307. Further, Eversource admits that a fully-enclosed indoor substation at either location would be feasible and satisfactory. (Eversource 8, p. 3; 8-29 Tr. p. 111). In addition, Eversource admits it could be designed safely and with the right training can be operated and responded to during emergencies safely. (7-25-17 Tr. p. 50). There is no evidence in the record that additional training for emergency responders is a reason not to require a fully-enclosed indoor substation. In addition, see PFOF ¶¶ 190-199.

313. There are no codes that would prevent an open air substation at from being constructed at 290 Railroad Avenue, adjacent to the AIRGAS commercial property. (Tr. 2, pp. 58-61, 126; Tr. 3, pp. 244-245).

**Comment:** This finding is incomplete for the same reasons stated in the comment to draft Finding of Fact # 307 and 308. Further, the undisputed evidence in the record on this matter is from the Town’s consultant, who testified that the National Fire Prevention Association position is that placing an open-air substation next to a facility that stores compressed flammable gasses is an unacceptable safety risk. (8-29-17 Tr. p. 245). In addition, the Town’s expert stated that building an open air substation in close proximity to any form of occupied building – with or without a fence – has become rare due to the noise and safety issues posed by substations. (Town 1, at 25). In addition, see PFOF ¶¶ 190-199.

***Project Cost and Cost Allocation***

328. The estimated costs of the Modified GSLP with certain variations are summarized below:

- a) Transmission line with pipe jacking and coffer dam installation to 281 Railroad Avenue - Indoor Substation is approx. \$99.4 million.
- b) Transmission line with pipe jacking and coffer dam installation to 290 Railroad Avenue - Open Air Substation is approx. \$97.8 million.
- c) Transmission line with the pipe jacking and coffer dam installation to 290 Railroad Avenue - Indoor Substation is approx. \$99.2 million

The Table below presents a breakdown of the Modified GSLP with variations. Please note the “XLPE AMP Route” cost includes attachment to the Indian Field Road overpass (DOT is owned) and the pedestrian bridge over Indian Harbor:

Component	Currently Proposed GSLP (XLPE AMP Route) - Term at 281 RR Ave (Pole Yard)	Currently Proposed GSLP (XLPE AMP Route)- Term at 290 RR Ave (Pet Pantry)
Transmission Line	\$52,515,678	\$53,415,678
Cos Cob Modifications / Distribution upgrades (incl Prospect)	\$18,208,282	\$16,512,750
New Greenwich S/S	\$28,992,801	\$28,136,749
<b>Total</b>	<b>\$99,716,761</b>	<b>\$98,065,177</b>
Project Component	Additional Cost to GSLP	Additional Cost to GSLP
Pipejacking Underneath I-95 (Vol 1, Ex. B, sec. A.5.1.1)	\$1.5M	\$1.5M
Architectural Building to replace wall enclosure	\$0 (incl)	\$1.4M
Project Component	Reduced Cost to GSLP	Reduced Cost to GSLP
Cofferdam Variation (Vol 1, Ex. B, sec. A.4)	\$1.8M	\$1.8M
Wall Enclosure only - no architectural building	\$1.2M	\$0 (incl)

**Comment:** This finding is incomplete and inconsistent with the record for the following reasons:

First, the finding does not include the cost of Eversource's upgrades of 27.6-kV equipment at the Byram Substation. (Eversource 1, Vol. 1, Pre-Filed Testimony, p.11; 8-29-17 Tr. p. 96; Council Admin. Notice 43, Eversource 1, p. E-16 Table E-4). In addition, see PFOF ¶¶ 101-109.

Second, the finding does not include the cost of Eversource's plans to engage in upgrades of the transformers at the new substation. (Eversource Resp. to Q-TOWN-058). In addition, see PFOF ¶¶ 101-109.

Third, the finding does not include the cost to Eversource of purchasing the fee interest of 290 Railroad Avenue.

Fourth, the finding does not include the cost to Eversource of designing and building the loop feed it states it intends to build if the Modified GSLP is approved. (8-29-17 Tr. pp. 93-95).

Fifth, there is insufficient evidence in the record demonstrating that Eversource can in fact build the Modified GSLP for the cost it has estimated. (Eversource 9, Resp. to Q-TOWN-043, -044, -045, -046; 8-29-17 Tr. pp. 100-103).

Sixth, the finding is incomplete and inconsistent with the record for the reasons stated in the comment to draft Finding of Fact # 206 and 301.

Respectfully submitted,

Town of Greenwich

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## CERTIFICATE OF SERVICE

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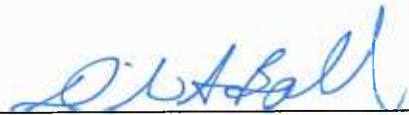
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