STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET DE 20-020

IN THE MATTER OF: Unitil Energy Systems, Inc.
2020 Least Cost Integrated Resource Plan.

DIRECT TESTIMONY

OF

Kurt Demmer
Utility Analyst NHPUC

September 23, 2020

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I. INTRODUCTION

Q. Please state your full name.

A. Kurt Demmer.

Q. By whom are you employed and what is your business address?

A. I am employed as a Utility Analyst in the Electric Division of the New Hampshire Public Utilities Commission (Commission or PUC). My business address is 21 South Fruit St., Suite 10, Concord, NH, 03301.

Q. Please summarize your education and professional work experience.

A. I graduated from Merrimack College in North Andover, Massachusetts with a Bachelor of Science degree in Electrical Engineering in 1987. In 2002, I received a Master's degree in Electrical Engineering and Power Systems Management from Worcester Polytechnic Institute in Worcester, Massachusetts. Since 1996, I have been a registered professional engineer in the State of New Hampshire.

In June 1988, I joined Massachusetts Electric Company as an Operations Field Engineer. In 1996, I became a Senior Engineer for Massachusetts Electric Company. In 1999, my area of responsibility expanded to include distribution planning engineering. In 2000, I accepted a position as Area Supervisor for the Salem NH area of National Grid USA and was responsible for all distribution engineering, distribution overhead/underground/substation construction, substation operations, and warehousing in the Salem/Pelham area. In 2002, I was the Superintendent of Electric Operations in the Salem/Beverly/Cape Ann Massachusetts area. As Superintendent, I was responsible for distribution engineering immediate oversight, distribution overhead/underground/substation construction, substation operations, and warehousing. From 2003 to 2004, I was a project

manager for a 14-mile, $19 million subtransmission 34.5kV underground distribution project consisting of manhole and duct construction housing (1) 34.5kV distribution supply circuit and (1) 34.5kV distribution circuit connecting East Beverly substation to a downtown Gloucester distribution substation. In 2005, as Superintendent of electric overhead distribution operations, I was assigned to the Merrimack Valley district area in Massachusetts. In 2008, I was the Manager of Electric Operations in New Hampshire for National Grid, responsible for the operations, construction, and maintenance functions for the electric distribution organization. In 2012, I became Director of Electrical Operations in New Hampshire for Liberty Utilities (Liberty). My continued areas of responsibility were to oversee the construction, maintenance, and operation of the electric distribution system. Since 2017, I have been employed as a Utility Analyst in the Electric Division for the Commission.

Q. What is the purpose of your testimony?

A. My testimony in this proceeding will review and evaluate the Unitil Energy Systems (Unitil) Least Cost Integrated Resource Plan (LCIRP) submittal as required in Order No. 26,098. This evaluation will determine whether Unitil's LCIRP is consistent with the provisions of RSA 378:38, and recommend next steps to the Commission for the Company's 2024 full LCIRP submittal.

Q. What is your general conclusion regarding the Unitil LCIRP?

A. I have concluded that Unitil's March 2020 LCIRP generally meets the requirements set forth in RSA 378:37, 378:38, and 378:39. However, there are some minor concerns that Staff has in the Company's available distribution data that may lead to premature equipment replacement due to the lack of real-time distribution system data. Having real-time

distribution system data may allow either deferral of an asset replacement, or a lesser asset expenditure, in order to mitigate the criteria exceedance. I also make several other recommendations regarding distribution system planning and certain planned capital projects.

II. LCIRP ANALYSIS

Q. What does RSA 378:38 require Unitil to include in its LCIRP?

A. RSA 378:38 requires LCIRPs to include, *as applicable*, the following:

> I. A forecast of future demand for the utility's service area.
> II. An assessment of demand-side energy management programs, including conservation, efficiency, and load management programs.
> III. An assessment of supply options including owned capacity, market procurements, renewable energy, and distributed energy resources.
> IV. An assessment of distribution and transmission requirements, including an assessment of the benefits and costs of "smart grid" technologies, and the institution or extension of electric utility programs designed to ensure a more reliable and resilient grid to prevent or minimize power outages, including but not limited to, infrastructure automation and technologies.
> V. An assessment of plan integration and impact on state compliance with the Clean Air Act of 1990, as amended, and other environmental laws that may impact a utility's assets or customers.
> VI. An assessment of the plan's long- and short-term environmental, economic, and energy price and supply impact on the state.
> VII. An assessment of plan integration and consistency with the state energy strategy under RSA 4-E:1.

RSA 378:38.

Q. Are all of these requirements still applicable?

A. The least cost planning statute was written and amended at a time when New Hampshire's largest utility still owned large-scale electric generating facilities.[1] New Hampshire recently completed its decades-long journey toward electric utility restructuring. This new context means the Commission must review LCIRP filings using a different lens, one that recognizes

[1] The statute appears to have been enacted in 1990 and was most recently amended in 2015.

the waning applicability of some of the factors required in the statute. The statute recognizes the potential evolution of least cost planning in New Hampshire, and qualifies the above enumerated requirements by stating "Each such plan shall include, but not be limited to, the [above enumerated factors], *as applicable*." RSA 378:38 (emphasis added). In light of this evolution, it would be an efficient allocation of resource for the Commission to shift the focus of its LCIRP analyses to distribution planning processes and planned distribution system investments.[2]

Q. Are you suggesting the provisions of RSA 378:38 focusing on energy supply options are no longer relevant to the Commission's review of LCIRPs?

A. No. While RSA 378:38, III and IV are clearly intended to authorize the Commission's review of the supply portfolio of a vertically integrated utility, there are some scenarios where they might still bear relevance for restructured utilities. For example, RSA 374-G allows for company ownership of distributed energy resources which, if deployed, might bear relevance to RSA 378:38, III and IV. Similarly, the New Hampshire Supreme Court recently found that the "functional separation" of generation services from transmission and distribution services should not be elevated above the other interdependent policy principles in the restructuring statute. *Appeal of Algonquin Gas Transmission, LLC*, 170 N.H. 763, 774, 186 A.3d 865, 874 (2018). It is conceivable that this interpretation of the restructuring statute might lead to electric distribution company investments which, if deployed, might bear relevance to RSA 378:38, III and IV.

In the instant case, no such scenarios are presented for the Commission to evaluate, so RSA 378:38, III and IV are not applicable. Therefore, Staff's analysis of Unitil's LCIRP

[2] The Commission proposed a full framework for least cost integrated resource planning in Order No. 26,358, which at the time of this testimony's writing is suspended.

focuses on the other factors within the statute. Staff recommends that Unitil's next LCIRP should have a similar focus, unless facing a scenario where the aforementioned provisions are somehow applicable. Staff also recommends that Unitil should participate in the processes set forth by the Commission in Order No. 26,358 to develop its next LCIRP, and that the substance of that LCIRP should align with the expectations expressed by the Commission in Order No. 26,358.

<u>RSA 378:38, I – Demand Forecast</u>

Q. Does Unitil's LCIRP include a forecast of future demand for the utility's service area?

A. Unitil's system planning, which includes the Company's 34.5kV subtransmission supply lines, is a 10-year timeframe forecast using historical load, versus temperature and humidity, to establish a correlation for future forecasting. A Monte Carlo simulation creates the random peak estimates from which three different probabilistic forecasts can be derived. The average peak load which is based on a 50/50 probability (1 in 2 year probability), the peak design load which is based on a 90/10 probability (1 in 10 year likelihood), and an extreme peak load forecast which is based on a 96/4 probability (1 in a 25 year likelihood). Contingency analysis utilizes the peak design load to calculate the asset loading.[3]

Unitil does not own any generating facilities, distributed energy resources (DERs) within either of its NH operating systems. Therefore, the Company removes beneficial load contribution from its largest non-utility generating facility, the largest DER, and one additional DER, and models them "offline" for peak system contingency analysis.

[3] Docket No. DE 20-002, Report on LCIRP at 9-11, 115-117. Note: The references throughout this testimony are to the Bates pages, which are displayed in the center of each page, rather than the other number included in the footer on the right side of each page.

The distribution circuit forecast is based on the previous historical five-year peak load. The future loading uses a trend line from the previous five years. A significantly increased, or decreased, load forecast is "tempered" using the system load-growth rate as a proxy.[4]

Q. Do you have any general concerns about how the company evaluates load on its circuits?

A. Yes. In two instances where the Company was planning a load-related distribution system upgrade, Staff asked for the power factor on the circuit.[5] The Company responded that it uses an assumed power factor of on the circuits at issue, with the assumption being 0.985 in one case and 0.95 in the other. This is because the Company only owns monitors that it can use to record interval current loading of the transformer or circuit. In some cases this could be a drag hand meter,[6] also known as a thermal amp meter. The Company does not own load monitoring equipment that can be temporarily applied to distribution circuits or transformers to record real (kW) and reactive (kVAR) power or power factor.

This is problematic because a low power factor can cause the peak demand on a circuit to be higher than it would be if the power factor were closer to unity.[7] On circuits where the Company has identified an upgrade necessitated by peak loading, but the Company does not know the actual power factor on that circuit, it is possible that a small investment in

[4] Docket No. DE 20-002, Report on LCIRP at 9-11, 115-117.

[5] Attachment KFD-1, Power Factor and Power Monitoring Equipment, Docket No. DE 20-02, Staff Data Request Responses Staff 3-7 and Staff 3-16.

[6] Thermal amp meters are also called drag hand meters which may denote instantaneous amp readings along with a maximum amp reading for the circuit. Unlike a SCADA monitored system with real time data and various power quality measurements. Thermal amp meters require multiple assumptions of power factor, kW, kVAR, and line voltage if those parameters are not measured coincident with the load.

[7] Unity power factor is defined as kW/kVA = 1 or the real power (kW) is equal to the apparent power (kVA). Since Amperage (current) is derived from kVA, under a unity power factor scenario, the current is at its minimum draw.

a capacitor bank that would improve power factor could defer or alleviate the need for a much more expensive transformer or reconductor/line upgrade. In such a case, the Company's investment in temporary equipment it can deploy on a given circuit to measure power factor would benefit ratepayers. Other New Hampshire utilities have similar equipment. The Company has suggested that it plans to review types, and the availability of, power monitoring equipment (with real and reactive power measurements) that can be temporarily applied to distribution circuits[8] These can be installed either during estimated peak times or for a short duration that closely represents the same weather/load pattern. For the reasons given above, Staff recommends that the Company invest in this equipment immediately.

<u>RSA 378:38, II – Demand Side Management</u>

Q. Does Unitil's LCIRP include an assessment of demand-side energy management programs, including conservation, efficiency, and load management programs?

A. The Company has offered energy efficiency (EE) and other demand side management (DSM) programs to its customers for several years. In the latest LCIRP submittal, Unitil has provided extensive information regarding the Company's ratepayer funded EE programs, a recent EE baseline/potential study, and a description of Active Demand Reduction (ADR) offerings embraced by several of its Commercial and Industrial customers. *Id*. at 20-33.

Q. Do you have anything else to add regarding targeted DSM and non-wire solutions?

[8] Attachment KFD-1, Power Factor and Power Monitoring Equipment, Docket No. DE 20-02, Staff Data Request Response Staff 4-21.

A. Yes. The Company solicited bids for potential non-wire solutions for a pending distribution system need on its distribution "37 Line." Future efforts at targeted DSM could be improved by using this solicitation as a learning process.

While the Company did provide an initial assessment of large customers on that circuit who had participated in the energy efficiency programs, it did not consider active demand reduction offerings for that same need due to the timing and size of the need, and the fact that the one large customer in the area already participates in the Company's ADR offerings.[9] This issue is discussed further below when addressing the planned capital projects, but Staff recommends that the Company's targeted DSM efforts more fully embrace targeted ADR.[10]

The Company provided a copy of its non-wire solution solicitation and a copy of a similar solicitation from a New York utility.[11] Unlike the New York solicitation, Unitil's RFI did not include detailed information relating to the hourly loading on the circuit, or the costs and benefits that would be considered, as part of the proposal evaluation. Staff recommends that future non-wire solution solicitations include details on hourly circuit loading, and the costs and benefits that will be considered in scoring the proposals. This information should better inform potential bidders and likely result in successful responses to these solicitations. Peak loading granular power quality data may be provided from the power monitoring equipment that is stated in the aforementioned recommendation.

[9] Attachment KFD-2, Targeted DSM and Non-Wire Solutions, Docket No. DE 20-02, Staff Data Request Response Staff 1-1.

[10] Some states have encouraged an embrace of targeted DSM, including ADR, through the use incentive the utility may earn based on a percent of a shared savings that accrue to ratepayers from such strategies.

[11] Attachment KFD-2, Targeted DSM and Non-Wire Solutions, Docket No. DE 20-02, Staff Data Request Response Staff 1-1 Attachment 1 and Staff 1-1 Attachment 3(a).

It is also worth noting that the Company does not include overheads/burdens in its assessment of capital project costs that might be avoided by a non-wire solution.[12] On average, the Company suggest overheads/burdens can increase the cost of capital projects by about 60%. There is some logic to this approach because those overheads/burdens would have to be paid by ratepayers regardless of whether the Company pursues a non-wire solution or a traditional capital project to satisfy a distribution system need. It is worth noting however, that the Company only assigns overheads/burdens to capital projects and would not likely assign overheads/burdens to most non-wire solutions, which would likely be booked as expenses. Staff makes no recommendations regarding this issue, but sees it as helpful to observe this nuance.

<u>RSA 378:38, III – Supply Options</u>

Q. Does Unitil's LCIRP include an assessment of supply options including owned capacity, market procurements, renewable energy, and distributed energy resources?

A. As stated earlier, Unitil presently does not own any generating assets in its NH service territory. The Company addresses the DER growth in their system planning applying 5-year historical data to project small 5-year DER load growth. Medium to large DERs are considered on a case by case method similar to any new added large commercial load on a circuit. In addition to DER load projections, the Company is also in the process of developing a hosting capacity map and heat maps in order to optimize placement for 3rd party DER providers.[13]

[12] Attachment KFD-2, Targeted DSM and Non-Wire Solutions, Docket No. DE 20-02, Staff Data Request Response Staff 4-20...
[13] Docket No. DE 20-02, Report on LCIRP at 19-20.

RSA 378:38, IV – Distribution and Transmission Requirements

Q. Does Unitil's LCIRP include an assessment of distribution and transmission requirements?[14]

A. Yes. The LCIRP includes an assessment of distribution and transmission requirements, described in further detail below.

Transmission

Since Unitil does not own any transmission assets in their NH service territory, the Company participates in joint system planning process to establish an integrated least cost plan of wholesale delivery facilities that affect both utilities' systems. The Company also attends meetings of the ISO – NE Reliability Committee, which advises ISO New England about design and oversight of reliability standards for the New England bulk power system.[15]

Distribution

Unitil's LCIRP describes, in comprehensive detail, the Company's planning process which includes distribution system, distribution circuit, and distribution/supply substation planning, including contingency analysis and least cost options for resolving criteria violation(s). Unitil's service territory consists of two electric distribution systems: the Capital system which serves the Concord area, and the Seacoast system which serves the Hampton area. The two systems are geographically separate and operate independently of

[14] As noted above, the statute requires specifies that the assessment should include, as applicable, an assessment of the benefits and costs of "smart grid" technologies, and the institution or extension of electric utility programs designed to ensure a more reliable and resilient grid to prevent or minimize power outages, including but not limited to, infrastructure automation and technologies. RSA 378, IV.

[15] Docket No. DE 20-02, Report on LCIRP at 17.

each other. Unitil includes a separate ten-year system planning study for each system in its LCIRP filing.[16]

A. Distribution Planning Guide Changes

Q. Did Unitil make any changes to its distribution planning criteria since its last LCIRP?

A. Yes. The company made several changes, a few of which are worth noting .[17] First, the Company updated its substation loading criteria and protective device loading criteria. Second, the Company lowered the threshold at which it evaluates load-related distribution system needs from 90% to 80% of a piece of equipment's seasonal normal rating. Third, the Company revised its planning assumption to differentiate between customer-owned DERs and company-owned DERs, and how the two are treated within the Company's planning assumptions. I make no recommendations regarding these changes, but see it as helpful to observe them in my testimony.

B. Smart Grid Technology

Q. Has the Company invested in smart grid technology in recent years?

A. The Company has been actively investing in smart grid technology in Massachusetts which will cross into NH as the IT infrastructure is upgraded or modified in order to accommodate additional Smart Grid technology. The Company has submitted in its LCIRP plans for more Advanced Metering Infrastructure (AMI) with outage prediction software to reduce false positives and identify locations of nested outages.[18] Since the Outage Management System

[16] Docket No. DE 20-02, Report on LCIRP at Appendices F and G.

[17] Attachment KFD-3, Distribution Planning Guide Changes, Docket No. DE 20-02, Staff Data Request Response Staff 3-3 Attachment 2.

[18] Docket No. DE 20-02, Report on LCIRP at 28.

(OMS) and Customer Information System (CIS) are a system architectural application, any upgrades in the application(s) will affect both Unitil Energy Systems in NH and Fitchburg Gas and Electric in Massachusetts.[19] The Company also has increased its supervisory control and data acquisition (SCADA) capability to some of its NH substations, with further plans to increase that coverage to include all of the substations in NH. Unitil is the only investor owned electric utility in NH that has AMI meters.

This functionality will allow for more real time data availability due to the automatic retrieval of load data at the customer level on a more frequent basis.

C. Planned Investments

Q. Did you conduct an assessment of the planned distribution system investments described in Unitil's LCIRP?

A. While it would be impractical to evaluate all of the planned distribution system identified in the LCIRP, Staff conducted a preliminary assessment or issued discovery regarding several of the Company's investments. These include the: (1) the 3348, 3350, and 3359 Line Right of Way (ROW) Rebuild; (2) the Concord Downtown Conversion; (3) the Company's Seacoast Facility; and (4) the 37 Line Reconductoring project.

1. <u>3348, 3350, and 3359 Line ROW Rebuild</u>

Q. Do you have any recommendations related to the 3348, 3350, and 3359 Line ROW Rebuild?

A. Yes, attached are several discovery responses related to this issue in this testimony.[20] During the course of this docket, it became clear that the Company should evaluate the costs and

[19] Attachment KFD-4, Smart Grid Technology Investments, Docket No. DE 20-02, Staff Data Request Response Staff 1-8.
[20] Attachment KFD-5, 3348,3350, and 3359 Line ROW Rebuild, Docket No. DE 20-02, Staff Data Request Response Staff 1-5 ; Staff 1-5 Attachment 1 ; Staff 1-5 Attachment 2 ; Staff 1-7 ; Staff 1-7 Attachment 1 ; Staff 1-7

benefits of repairing the ROW, in addition to the costs and benefits associated with rebuilding the ROW. The former is estimated by the Company to cost approximately $2.2-2.5 million, and the latter is estimated by the Company to cost approximately $7 million. The Company has offered to revise the scope of work it has developed for the consultant who will provide recommendations for the ROW to include a full assessment of the repair option, rather than just the repair option. The Company has further offered to collaborate with the parties to this proceeding to further develop the revised scope of work for its consultant. Staff looks forward to working with the Company on this issue and has no further recommendations related to the 3348, 3350, and 3359 Line ROW Rebuild, but reserves the right to file further recommendations, if necessary, as a result of subsequent collaboration on the contractor's scope of work.

2. <u>Concord Downtown Conversion</u>

Q. Do you have any recommendations related to the Concord Downtown Conversion?

A. Unitil provided several discovery responses related to the Concord Downtown Conversion, many of which I have attached to my testimony.[21] I reviewed these responses in light of the fact that this is one of the larger investments referenced during the five years covered by the LCIRP. However, I have focused my recommendations in this docket on *planned* distribution system investments and distribution system planning processes. Since the Concord Downtown Conversion has essentially been completed by the Company during the

Attachment 2 ; Staff 2-7 ; Staff 2-8 ; Staff 2-9 ; Staff 2-10 ; Staff 3-5 ; Staff 4-11 ; Staff 4-12 ; Staff 4-13; and Staff 5-3.

[21] Attachment KFD-6, Concord Downtown Conversion, Docket No. DE 20-02, Staff Data Request Response Staff 1-2 ; Staff 2-4 ; Staff 2-4 Attachment 1 ; Staff 2-5 ; Staff 3-4.

course of this docket, the more appropriate venue for any recommendations related to that project is in Unitil's next rate case.

3. Unitil Headquarters

Q. Do you have any recommendations related to the Unitil Headquarters?

A. Unitil provided several discovery responses related to its new headquarters, many of which is attached to this testimony.[22] Staff reviewed these responses in light of the fact that this is the highest cost single investments referenced during the five years covered by the LCIRP. However, Staff has focused the recommendations in this docket on distribution planning processes and *planned* distribution system investments. Since the Unitil Headquarters is well on its way to completion, the more appropriate venue for any recommendations related to that project is in Unitil's next rate case.

4. 37 Line

Q. Do you have any recommendations related to the 37 Line Reconductoring project?

A. Yes, and I have included several discovery responses on this issue as attachments to my testimony.[23] The 37 Line reconductoring is a project planned for construction in early 2021 with a projected in-service date of June 2021. The Company estimates it will cost approximately $750,000, without burdens/overheads, which according to the Company's

[22] Attachment KFD-7, NH Seacoast Facility, Docket No. DE 20-02, Staff Data Request Response Staff 3-6 ; Staff 3-6 Attachment 1 ; Staff 3-6 Attachment 2 ; Staff 3-6 Attachment 3 ; Staff 3-6 Attachment 4 ; Staff 3-6 Attachment 5 ; Staff 3-6 Attachment 6 ; Staff 4-14 ; Staff 4-14 Attachment 2 ; Staff 4-14 Attachment A ; Staff 4-15 ; Staff 4-15 Attachment 1 ; Staff 4-15 Attachment 2 ; Staff 4-16 ; Staff 4-17 ; Staff 4-18 ; Staff 4-19 ; and Staff 5-2.

[23] Attachment KFD-8, 37 Line Reconductoring, Docket No. DE 20-02, Staff Data Request Response Staff 2-1 ; Staff 2-1 Attachment 1 ; Staff 3-1 ; Staff 3-2 ; Staff 3-2 Attachment 1 ; Staff 3-2 Attachment 2 ; Staff 3-2 Attachment 3 ; Staff 3-2 Attachment 4 ; Staff 3-2 Attachment 5 ; Staff 4-4 ; Staff 4-4 Attachment 1 ; Staff 4-4 Attachment 2 ; Staff 5-1.

general estimates for overhead/burdens would result in a total project cost of approximately $1.2 million.[24]

The 37 Line reconductoring was the grid need associated with the Company's non-wire solution RFI discussed above. In Staff's review of the load data associated with the constraint, it appears that the load of a single very large customer who participated in the Company's ADR program (reducing its load by 700kW) has been reconstituted into the projected load for the purposes of forecasting future loading constraints on the 37 Line. Assuming the Company's ADR programs continue into the future, it is possible this would inflate the loading on that circuit beyond what the actual future loading is likely to be during times of the transmission system peak, which appear to coordinate roughly with the peaking times on the 37 Line. It also appears possible that this single customer may have additional load available to curtail. The Company never reached out to this customer to gauge whether it had further interest in curtailing load during distribution system peaks, possibly at a compensation structure supplemental to the one currently offered by the ADR program, which targets only a few hours of distribution system peaks. Recognizing that time is of the essence for the 37 Line, Staff recommends the Company reach out to that customer immediately and inquire its interest in enhanced load curtailment opportunities. If the customer has no interest in such an arrangement, Staff recommends that the Company work with the parties to identify another project that might be an attractive non-wire solution candidate at the Company's new 80% threshold.

A major driver of the demand growth necessitating this investment is a development planned for the vicinity of I-93's Exit 17 that will include a Market Basket and State of New

[24] With overheads/burdens, the total cost of this project would be approximately $1.2 million.

Hampshire Liquor Store. The Market Basket plans to install several electric vehicle charging stations, including two Tesla superchargers, which would account for the vast majority of the load at the development. More specifically, the Company is planning on up to two (2) 1MW Tesla V3 Superchargers and two (2) to six (6) universal level 2 (150kW) chargers. The Company has not yet assessed whether the Market Basket would need to provide a contribution in aid of construction (CIAC) based on its usage and revenue projections, but in order to avoid unreasonable cost shifting, it will be important that any CIAC calculation developed by the Company utilizes a reasonable electric vehicle charging equipment realistic utilization rate. Given that the superchargers will be located just a few exits North of several charging stations which are also located on that same interstate, it is possible — even likely — that the utilization rate will be very low. Staff recommends that the Commission direct the Company to work with the parties to the proceeding to ensure that the CIAC calculations associated with the Exit 17 development utilize a reasonable utilization rate.

<u>RSA 378:38, V – Environmental Compliance</u>

Q. Does the Unitil LCIRP include an assessment of plan integration and impact on state compliance with the Clean Air Act of 1990, as amended, and other environmental laws that may impact a utility's assets or customers?

A. As stated earlier, the applicability of this provision of the statute is questionable given that the Company no longer owns generating assets. I'll note however that Unitil does provide limited consideration of environmental impacts in its Project Evaluation Procedure PR-DT-DS-11.[25]

[25] Attachment KFD-9, Environmental Compliance, Docket No. DE 20-02, Staff Data Request Response Staff 1-1 Attachment 4(b).

RSA 378:38, VI – Environmental, Economic, and Energy Price and Supply Impact

Q. Does the Unitil LCIRP include an assessment of the plan's long- and short-term environmental, economic, and energy price and supply impact on the state?

A. Unitil's project planning process employs a cost benefit analysis template which uses a weighted scoring methodology that is used to calculate an overall ranking of alternatives and considers "functionality, environmental impacts, reliability, feasibility, cost and value added benefits of DER," of planned investments and alternatives.[26] The LCIRP also includes an analysis of the economics of planned investments and potential alternatives.

RSA 378:38, VII– Consistency with State Energy Strategy

Q. Does the Unitil LCIRP include an assessment of plan integration and consistency with the state energy strategy under RSA 4-E:1?

A. Yes. In my assessment, Unitil's LCIRP is generally consistent with the state energy strategy.

III. CONCLUSION AND RECOMMENDATIONS

Q. Please summarize your recommendations.

A. I recommend that:

- The Company's next LCIRP should focus on the provisions of RSA 378:38 which are relevant to distribution system investments, unless facing a scenario where RSA 378, III, and IV are somehow applicable.

[26] Docket No. DE 20-02, Report on LCIRP at 17.

- The Commission should direct the Company to participate in the processes set forth by the Commission in Order No. 26,358 to develop its next LCIRP and that the substance of that LCIRP should align with the expectations expressed by the Commission in Order No. 26,358.
- The Commission should direct the Company to invest in equipment that can be temporarily applied to distribution circuits or transformers to record real and reactive power, or power factor.
- The Commission should direct the Company to more fully embrace targeted ADR and EE within its targeted DSM efforts.
- The Commission should direct the Company to ensure that future non-wire solution solicitations include details on hourly circuit loading, and the costs and benefits that will be considered in scoring the proposals. This information should better inform potential bidders and likely result in successful responses to these solicitations.
- The Commission should direct the Company reach out to the largest customer on its distribution "37 Line" immediately and inquire about that customer's interest in enhanced load curtailment opportunities. If the customer has no interest in such an arrangement, Staff recommends that the Company work with the parties to identify another potential project that would serve as an attractive non-wire solution considering the Company's new 80% threshold.
- The Commission should direct the Company to work with the parties to the proceeding to ensure that the CIAC calculations associated with the Exit 17 development utilize a reasonable utilization rate.

Q. Does this conclude your testimony?

A. Yes.

Attachment - KFD -1

Power Factor and Power Monitoring Equipment

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-7 Witness: Jacob Dusling

Request:

Reference Unitil 2020 Grid Needs Assessment, Row 25, and LCIRP pages 18 and 49 (row 43), describing a loading constraint of the Dow's Hill substation transformer in summer 2022 and the Company's plan to "to convert a portion of circuit 20H1 to 34.5kV operation and transfer the load to circuit 28X1," the Company's decision not to review the project for non-wire alternative because the project cost "less than $250,000 without construction overheads," the Company's projection of project costs as $446,140, and the projected circuit loading as 89% in 2020, and growing by 1% each year thereafter.

a. Please explain why the construction overheads for the project appear to double the project costs.

b. Please provide a map of the area served by the transformer at issue (20T1).

c. Please describe any foreseeable spot loads planned to add to the load on the transformer at issue in the next five years.

d. Please indicate the power factor on the transformer and feeders at issue and whether it was modeled or derived from actual SCADA data.

    i. If actual SCADA was utilized, please describe the duration interval of reporting and provide the set of data.

    ii. If the Company does not possess actual SCADA data, please indicate whether the Company has access to power quality monitors it could use to determine the actual power factor and current data.

    iii. If a power monitor was utilized, please provide the data relevant to the capacity condition.

e. Please provide any analysis including reliability impact and cost of alternatives the Company considered.

f. Please provide the hourly loading (kW, kVa, and amperage) on the transformer at issue for the top ten days during the past year and peak load on the peak day during each of the past five years.

g. Please describe the mix of customers served by the transformer at issue, including the number of customers by class and the kW served by class.

Unitil Energy Systems, Inc.
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h. Please describe the five largest customers served by the transformer at issue, the peak demand of those customers at the time of the transformer peak, whether those customers currently participate in any of Unitil's load curtailment programs or have participated in any of Unitil's demand response programs in the past five years.

Response:

a. The overhead rate is typical for most of the Company's capital projects. Unitil's typical electric overhead rate is approximately 160% (Electric Overheads and General Overheads Electric). This includes costs that are not directly applied to the project, such as wages and benefits of centralized corporate staff (engineering, accounting, etc.), property taxes, office expenses, etc.

b. The area shaded in yellow on Staff 3-7 Attachment 1 is the area served by transformer 20T1.

c. There were no known or assumed spot loads added to the load of the transformer throughout the five years under study. Additional load was due to general load growth not a specific spot load.

d. The assumed power factor of the feeder and circuit it supplies was derived to be 0.985. This was calculated as part of the process to create a historical system peak snap shot model. However, Unitil utilizes historical amp readings to forecast and allocate load.

    i. The Dow's Hill 20T1 transformer and associated circuit do not have SCADA control or telemetry installed because it is a relatively small substation (1500kVA nameplate capacity). Load data used for the distribution load projections that identified the constraint were from thermal demand metering at the substation.

    ii. The Company owns monitors that it can use to record interval current loading of the transformer or circuit. The Company does not own load monitoring equipment that can be temporarily applied to distribution circuits or transformers to record real and reactive power or power factor. This could be achieved by replacing or installing substation equipment.

    iii. A power monitor has not been utilized at this location.

e. Alternatives considered and their associated costs are included below. Given the timing of the constraint and the needed in-service date of the resolution, this

Unitil Energy Systems, Inc.
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constraint and associated options will be reviewed and updated annually as part of Unitil's distribution planning efforts. This effort may result in a change to the in-service date, scope of the project and/or proposed option.

Alternatives Considered for the 20T1 Loading Constraint:

Option 1 (Currently Budgeted in 2022)

Rebuild Exeter Road from Pole 12/124 to pole 93/37 to 35 kV and convert to 34.5 kV operations. Pole 12/143 to Pole 93/37 will be reconductored with 336 spacer cable (Pole 12/124 to Pole 12/143 was previously rebuilt with 35kV spacer cable).

A bank of stepdown transformers will be installed in the vicinity of Ashbrook Road pole 8/21 and the new open point between 28X1 and 20H1 will be at Hampton Road pole 92/42.

Total Project Cost: $225,000

Option 2

Remove all 4kV equipment from Dow's Hill Substation and install three 19.9kV, 335A regulators and a 35kV recloser.

Rebuild the following line sections to 35kV construction and convert to 34.5kV operations: ROW from Dow's Hill Substation to Hampton Rd, Hampton Rd Pole 37 to Pole 49, and Ashbrook Rd Poles 1 and 2

Two banks of 500kVA stepdowns transformers will be installed: one in the vicinity of Hampton Rd pole 49 and one in the vicinity of Ashbrook Rd pole 2.

Total Project Cost: $420,000

Option 3

Replace the existing 1500kVA transformer at Dow's Hill Substation with a larger transformer.

Total Project Cost: To be determined

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Both options 1 and 2 work towards the master plan for this area, which is to create a 34.5kV mainline between the Dow's Hill, Munt Hill, Guinea Road Tap and Guinea Switching areas.

It is expected that all the options above have similar reliability impact. Since January 1, 2018, circuit 28X1 has had marginally better SAIDI performance than 20H1.

f. Hourly loading (kW, kVa, and amperage) of the transformer is not available.

g. At the time of model creation, the circuit supplied 440 customers, 423 of which are residential (kWh only) customers and 17 were small commercial customers. The largest commercial customer on the circuit had a peak demand of 63 kW during the peak month in 2018.

h. The five largest customers on circuit at the time of model creation were:

Customer	Peak Demand (kW) During Peak Month
ChemTan Hampton Road, Exeter	63
Brookside Market Hampton Road, Exeter	30
Port City Events Hampton Road, Exeter	21
Stephen D. Exeter Road, Hampton	11
Heronfield Academy Exeter Road, Hampton Falls	10

These customers do not currently participate in any of Unitil's load curtailment programs or have participated in any of Unitil's demand response programs in the past five years.

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Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-16 Witness: Jacob Dusling

Request:

Reference Bates Page 460, Section 8.10, Circuit 23X1, Convert Portion of South Road, stating "Circuit analysis has identified that the 333 kVA stepdown transformer and 175QA lowside stepdown fuse is expected to exceed 90% of their normal limits during summer conditions in 2024."

a. What is the Company's procedure once an area such as South Road is identified through Circuit Analysis?

b. Please indicate the power factor on the transformer and feeders at issue and whether it was modeled or derived from actual SCADA data.

   i. If actual SCADA was utilized, please describe the duration interval of reporting and provide the set of data.

   ii. If the Company does not possess actual SCADA data, please indicate whether the Company has access to power quality monitors it could use to determine the actual power factor and current data.

   iii. If a power monitor was utilized, please provide the data relevant to the capacity condition.

c. Considering a 1-2% annual load increase, would it be more cost efficient to perform the work when the loading is closer to 97% or perform the work in 2027 or 2028 assuming construction can be executed within one construction season?

Response:

a. In situations which telemetry information is not available, such as South Road, the Company will typically take field measurements (manual reading with amp meter, installation of load loggers or installation of permanent metering) to verify the condition the year prior to the commencement of construction. If the condition is verified in the field the project will move forward as planned. In the event the condition is deemed to not be as severe as indicated by circuit models the project is deferred or cancelled.

b. The assumed power factor of the stepdown transformer was derived to be 0.95. This was calculated as part of the process to create a historical system peak snap shot model. However, Unitil utilizes historical amp readings to forecast and allocate load.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-16 Witness: Jacob Dusling

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i. There was no SCADA telemetry available for the South Road stepdown transformer or the circuit that supplies the South Road stepdown transformer.

ii. The Company owns monitors that it can use to record interval current loading of the transformer or circuit. The Company does not own load monitoring equipment that can be temporarily applied to distribution circuits or transformers to record real and reactive power or power factor.

iii. A power monitor has not been utilized at this location.

c. Given the timing of the constraint and the needed in-service date of the resolution, this constraint and associated resolution options will be reviewed in additional detail and updated annually as part of Unitil's distribution planning efforts. This effort may result in a change to the in-service date, scope of the project and/or proposed option.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-21 Witness: Jacob Dusling

Request:

Reference Response 3-7(d)(ii) stating "The Company does not own load monitoring equipment that can be temporarily applied to distribution circuits or transformers to record real and reactive power or power factor. This could be achieved by replacing or installing substation equipment."

a. Please compare the costs of replacing or installing the aforementioned substation equipment that would enable recording of real and reactive power or power factor against the costs of purchasing load monitoring equipment that can be used that can be temporarily applied to distribution circuits or transformers to record real and reactive power or power factor.

b. Please describe any plans the Company may have to determine the real and reactive power or power factor between now and planned 2022 in-service date.

Response:

a/b. The Company plans to review types and availability of power monitoring equipment (with real and reactive power measurements) that can be temporarily applied to distribution circuits. Additionally, Unitil plans to determine and estimate what will be required to install permanent real and reactive power monitoring equipment at this location.

This effort is required to be able to provide the costs associated with installing temporary real and reactive power monitoring equipment. Unitil anticipates that three-phase permanent installations will range between $15,000 and $40,000 per location to be monitored.

Attachment - KFD - 2

Targeted DSM and Non-Wire Solutions

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 1

Received: May 20, 2020 Date of Response: June 4, 2020
Request No. Staff 1-1 Witness: Jacob Dusling

Request:

Reference Company Least Cost Integrated Resource Plan at Page 18 of 590 describing the UES-Capital Line Loading Constraint and the processes undertaken by the Company to consider non-wire alternatives (NWA). Please provide all internal communications (and related attachments) between Company Staff discussing the potential viability of energy efficiency or load curtailment for the purposes of considering non-wire alternatives for this project.

Response:

Attached are the Company's internal communications discussing the potential viability of energy efficiency or load curtailment for the purposes of considering non-wire alternatives (NWA) for this project.

This topic was also discussed during a meeting on March 13th, 2019. During the meeting the topic of implementing additional energy efficiency and load curtailment to defer the traditional option was discussed and it was determined that the Company would include this in the definition of Distributed Energy Recourses (DER) in the Request for Information (RFI – included in response) allowing vendors to propose these solutions. However, the Company determined that they would not do a detailed review of energy efficiency or load curtailment due to the amount load reduction required (3.5MW by 2022 and 0.3MW per year thereafter), the limited time frame and that the majority of the customers served in the area are residential and the one large commercial/industrial customer in the area already participates in load curtailment.

The reasons stated above and lessons learned through the RFI process are the reasons the Company concluded that the review of NWA projects would be trigged when equipment loading is expected to exceed 80% of its normal rating during the first five years of study and exceed 90% of its normal rating in year five of the study period. This has since been added to both the electric system and distribution system planning guidelines.

Unitil Energy Systems Request for Information

37 Line / 4X1 Non-Wires Alternative Project for Distribution Load Relief

Issued March 29, 2019

Request for Information

37 Line/4X1Non-Wires Alternative Project for Distribution Load Relief

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Unitil energy for life

Request for Information

37 Line/4X1Non-Wires Alternative Project for Distribution Load Relief

1 INTRODUCTION

Unitil Energy Systems (Unitil) is requesting conceptual/high level information from qualified and experienced developers with the capability to deliver innovative non-wires alternative (NWA) solutions that provide distribution system load relief.

2 INFORMATION ABOUT UNITIL

Unitil Corporation is a public utility holding company with electric and gas utility operations in New Hampshire, Massachusetts and Maine. Unitil Corporation is the parent company of three wholly-owned distribution utilities.

Unitil Energy Systems, Inc. provides electric service in the southeastern seacoast and state capital regions of New Hampshire, including the capital city of Concord, New Hampshire;

Fitchburg Gas and Electric Light Company provides both electric and natural gas service in the greater Fitchburg area of north central Massachusetts; and,

Northern Utilities, Inc. provides natural gas service in southeastern New Hampshire, and parts of southern and central Maine, including the city of Portland, which is the largest city in Northern New England.

Together, these 3 distribution utilities serve approximately 102,700 electric customers and 77,900 natural gas customers in their service areas.

3 DEFINITIONS

Non-Wires Alternative (NWA) – a solution proposed in an identified area as an alternative to a traditional infrastructure improvement project to resolve a distribution planning violation. Non-wires alterative projects may be a singular project or portfolio of multiple Distributed Energy Resource (DER) projects.

Distributed Energy Resource (DER) – targeted energy efficiency, demand response, distributed generation, energy storage, or other resource that prove to be feasible to address the identified constraint(s).

Traditional Infrastructure Project – Conventional electric system upgrades such as reconductoring, voltage conversion, equipment upgrades, etc.

4 PURPOSE

Unitil is issuing this request for information (RFI) to determine the feasibility of implementing NWA projects to defer the costs of traditional infrastructure improvements.

This RFI is open to all DER approaches that display the potential to provide the load relief described in this RFI.

Each RFI response shall outline the suggested approach, load relief impact, conceptual/high level cost estimate of completing the project, project schedule and any additional benefits the suggested approach provides above and beyond the load reduction. Developer(s) may submit multiple proposals that utilize a combination of DER technologies.

Along with traditional alternatives, the RFI responses will be evaluated by Unitil to determine if a request for proposals will be issued for NWA project(s).

5 SCHEDULE

The following lists the activities relevant to the RFI process. Unitil reserves the right to change these dates and will notify Vendors in such a case.

Key Dates		
Release of RFI	3:00 PM	03/29/2019
Intent to Submit	5:00 PM	04/05/2019
Deadline for Questions	5:00 PM	04/19/2019
Responses to Questions	5:00 PM	04/26/2019
Submission Due Date	5:00 PM	05/17/2019

6 CONTACT INFORMATION

All questions, including requests for clarification and additional information as it relates to this RFI, must be directed via e-mail to the following;

Penny Jett - Manager, Unitil Procurement ProcurementRFX@unitil.com

7 37 LINE / 4X1 AREA

The 37 Line / 4X1 area is located in the northern portion of Unitil's Capital service territory shown in diagram 1 below. It includes the following towns in New Hampshire; Salisbury and Boscawen and portions of Canterbury, Webster, Penacook and Concord. This area serves approximately 18 MW of load under peak load times and supplies approximately 4,500 residential customers, 400 commercial customers and one large commercial/industrial customer. Additionally, four "large" generators are interconnected to this portion of the Unitil system.

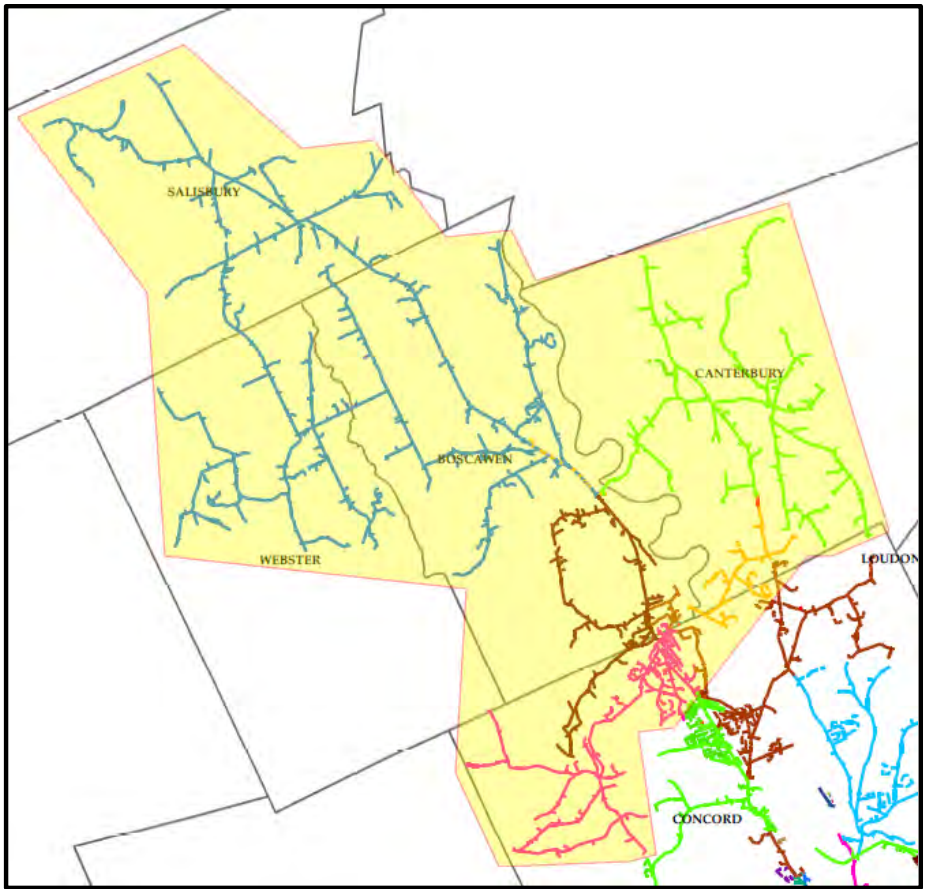

Diagram 1 – 37 Line / 4X1 Load Area

This portion of the Unitil system typically peaks in the late afternoon between the hours of 3PM and 7PM during the months of July and August.

Unitil has identified a possible overload of the 37 line conductor following the switching to restore all load for contingent loss of the 4X1 supply. The recommended traditional option to resolve this constraint is to rebuild approximately 1.6 miles of the 37 line.

8 37 LINE / 4X1 NWA LOAD REDUCTION REQUIREMENTS

Unitil has elected to issue this RFI for NWA alternative projects to possibly defer the implementation of the traditional infrastructure improvement project. In order for the NWA project/portfolio of projects to be considered the project(s) must reduce load in the area by approximately 3.5 MW by 2022 and 0.3 MW per year from 2023 to 2029 at the time of peak.

9 RESPONSE REQUIREMENTS

Each response shall include the following information at a conceptual/high level.

- Executive summary of the proposal
- Examples of prior industry specific work that is similar in nature to the proposed project(s)
    - Relevant project experience
    - Specific locations of successful project deployment
- Proposed Solution Description
    - Technology/solution description
    - Performance characteristics of technology (including peak capacity and duration of time the peak capacity is available)
    - Reliability, availability and expected lifespan of the proposed solution
    - Description and estimate of the annual operating costs
    - Seasonal and hourly load reduction impact provided by the solution
    - Community and environmental impacts of the proposed solution
    - Possible risks/challenges with implementing proposed solution
    - Permitting requirement
    - Detailed description of non-energy benefits associated with the proposed solutions
    - Ability of solution to increase and/or decrease in scale
    - Description of the ownership model (i.e. utility ownership, customer owned, other)
- Requirements of Unitil to implement the proposed solution (i.e. detailed breakdown of the work require to be completed by Unitil and the work to be completed by the bidder.)
- Measurement and Verification plan for verifying the project's load reduction.
- Proposed cost of the proposal and payment terms
- Include other sources of funding, such as incentives e.g. Unitil EE programs and/or any statewide SOLAR if applicable.
- Maintenance requirements and costs
- Information required from Unitil to further refine the proposal
- Proposed Schedule
    - Market the installation of DER to customers (if applicable)
    - Design
    - Implementation
    - Measurement and verification
- Additional benefits the suggested approach provides above and beyond load reduction

Orange and Rockland Utilities, Inc.

Request for Proposal (RFP)

Monsey Non-Wires Alternative Project to Provide Solutions for Distribution System Reliability and Load Relief

ISSUED: AUGUST 23, 2017
SUBMISSION DEADLINE: OCTOBER 24, 2017

Orange & Rockland

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1. Introduction

Orange and Rockland Utilities, Inc. ("O&R" or the "Company") is requesting proposals from qualified and experienced respondents with the capability to deliver innovative non-wires alternative ("NWA") solutions that provide electric distribution system load relief and reduce generation capacity requirements in the Monsey substation area.

1.1. Background

O&R is a subsidiary of Consolidated Edison, Inc., one of the nation's largest investor-owned energy companies. O&R, which provides electric and gas service to Orange County, Rockland County, and parts of Sullivan County, New York, is regulated by the New York State Public Service Commission ("NYSPSC").

1.2. Definitions

Non-Wires Alternative ("NWA"): A solution proposed in an identified area as an alternative to a traditional infrastructure resolution for a distribution or transmission problem. Non-wires alternatives may be a singular or portfolio of multiple DERs.

Distributed Energy Resource ("DER"): Energy efficiency, demand response, distributed generation, energy storage or other resources that prove to be feasible for the identified area of need.

Respondent: A person and/or entity, or a representative thereof, replying to this RFP.

Benefit-Cost Analysis ("BCA"): A BCA will be applied to potential NWA solutions. O&R developed a BCA Handbook in collaboration with the New York Joint Utilities to provide consistent and transparent statewide methodologies that calculate the benefits and costs of potential projects and investments. The BCA Handbook can be found as Appendix A of the "Orange & Rockland Initial Distributed System Implementation Plan" filed June 30, 2016 with the NYS Dept. of Public Service.

1.3. Purpose

This RFP solicits responses from Respondents that state an interest and have qualifications to supply O&R with solutions for load relief for the NWA project described below. To assist Respondents, this RFP provides information on the specific NWA project and also provides requirements that Respondents must comply with when submitting their proposals.

This RFP is open to all DER approaches that display the potential to provide load relief in the areas identified. Proposed solutions should decrease peak load demand and increase reliability at the lowest reasonable cost possible. O&R will attempt to build a portfolio of projects that will also serve to diversify project execution risks and maximize benefits to customers.

Each RFP response should at a minimum outline a Respondent's suggested approach, load relief impact, cost for completing the project, project plan or proposal, and a timeline for implementation as outlined in the Non-Wires

Alternative Solution Requirements section of this RFP. Responses must also include an hourly impact analysis resulting from the proposed DER solution, as well as a fully completed **Non-Wires Alternative Solution Questionnaire (Attachment A)**.

Respondents are expected to be financially and technically capable of developing, constructing and operating their proposed projects such that the anticipated benefits can be realized. O&R will evaluate each Respondent's proposed solution in a manner that balances that solution against the solutions proposed by other Respondents. If O&R enters into a contract with a Respondent, then the Respondent will be subject to defined milestones so that O&R can verify that the Respondent is on track to provide the contracted load relief. With regard to any contract entered into with a Respondent to implement a solution, such contract will provide that O&R may terminate that contract if O&R deems that demand reduction goals are not likely to be achieved or if load demand changes in a way that the solution is no longer needed or will not be effective as intended.

1.4. General Guidelines

O&R reserves the right to make changes to this RFP by issuance of one or more addenda or amendments and to distribute additional clarifying or supporting information relating thereto. O&R may ask any or all Respondents to elaborate or clarify specific points or portions of their submission. Clarification may take the form of written responses to questions or phone calls or in-person meetings for the purpose of discussing the RFP, the responses thereto, or both.

It is the sole responsibility of each Respondent to include all pertinent and required information in its submission. O&R reserves the right to determine in its sole discretion whether a submission is incomplete or non-responsive.

Respondents should clearly state all assumptions they make about the meaning or accuracy of information contained in their response to this RFP. If a Respondent does not ask questions or identify its assumptions, O&R will assume that the Respondent agrees with and understands the requirements in this RFP. While O&R has endeavored to provide accurate information to Respondents, O&R makes no warranty or representation regarding the accuracy of the information contained in this RFP.

Respondents are encouraged to provide and release necessary authorizations for O&R to verify any of such respondent's previous work, except where it is contractually prohibited from doing so.

This RFP shall not be construed to establish an obligation on the part of O&R to enter into any contract, or to serve as a basis for any claim whatsoever for reimbursement of costs for efforts expended by Respondents.

Furthermore, the scope of this RFP may be revised at the option of O&R at any time, or this RFP may be withdrawn or cancelled by O&R at any time. O&R shall not be obligated or bound by any responses or by any statements or representations, whether oral or written, that may be made by the Company or its employees, principals or agents in connection with this RFP.

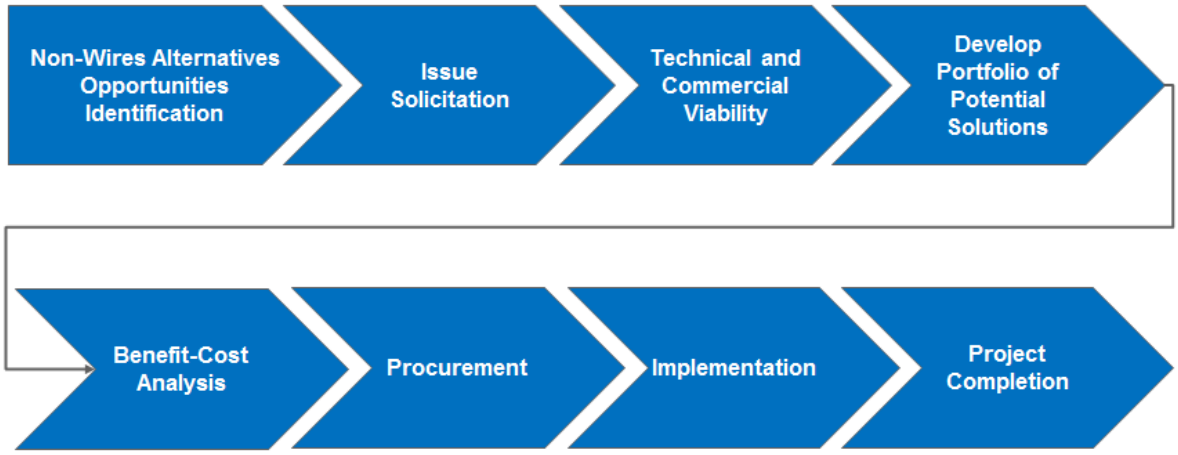
Any exceptions to the terms, conditions, provisions and requirements herein must be specifically noted and explained by a Respondent in its response to this RFP. O&R will assume that any response to this RFP expressly

accepts all of this RFP's terms, conditions, provisions and requirements, except as expressly and specifically stated otherwise by a Respondent in its response to this RFP.

1.5 Non-Wires Alternatives High Level Process

The process shown below is an example of the high-level steps that occur during the identification of NWA solutions, as well as the evaluation, implementation, and verification of the identified solutions. Please note that there are multiple actions that take place between each step to move NWA projects forward to implementation and verification of load relief achieved.

Figure 1: O&R NWA Process Flow



2. Monsey Non-wires Alternative Project Description

2.1. Project Description

O&R is proposing to implement a NWA program in order to defer capital infrastructure investments required to upgrade its Monsey Substation and associated distribution circuits in order to meet short- and long-term customer energy needs. The Company is focusing on NWAs that will reduce peak demand in areas where substantial capital investments are needed to improve system reliability and resiliency. These alternatives may include DERs such as energy efficiency ("EE"), demand response ("DR"), clean (i.e., gas fired and solar) distributed generation ("DG"), and energy storage ("ES"), a combination of which may allow the Company to delay the construction of needed infrastructure. The Company will leverage its existing EE and DR programs to lower the amount of DER that needs to be procured. The Company may entertain proposed EE and DR solutions that have the potential to enhance its existing programs.

O&R will use this NWA program to support the NYSPSC's regulatory initiative Reforming the Energy Vision ("REV").[1] REV aims to reorient both the electric industry and the ratemaking paradigm toward a consumer-centered approach that harnesses technology and markets.

O&R's Monsey Substation is comprised of two 138kV-13.2kV, 25 MVA transformer banks (Banks 144 and 244), each serving three distribution circuits. These banks have experienced significant load growth which has begun to overload the banks and associated distribution circuits during system contingencies (i.e., loss of service of a substation transformer bank). The Monsey NWA seeks to achieve the following two distinct goals:

I. For bank contingency purposes, reduce peak electric load within the area served by the Monsey Substation and Banks 144 and 244; and
II. For single distribution circuit contingency purposes, reduce peak electric load on Monsey distribution circuits 44-2-13, 44-3-13, 44-6-13 and associated distribution circuit ties.

Peak electric load reduction in the Monsey area currently served by all six Monsey distribution circuits will contribute to reducing the load during bank contingencies. However, reducing load on the above mentioned distribution circuits and their associated circuit ties has the potential to alleviate not only bank contingency issues but also single distribution circuit contingency issues. DERs placed in areas that serve both purposes will be given priority.

The Monsey Substation presently serves approximately 9,100 customers, the majority of which are residential, while the remaining customers are commercial and industrial ("C&I"). See Table 2 below for the customer breakdown by bank and circuit. Considering the historic load data as well as current new business applications in process, the growth rate per year for the Monsey area is projected to be as shown below in Table 1:

Table 1: Monsey Area Projected Load Growth

[1] Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*.

2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
1.26%	1.37%	1.48%	1.59%	1.70%	1.81%	1.92%	2.04%	2.15%	2.26%

Table 2: Customer Breakdown by Bank and Circuit

Monsey Bank	Distribution Circuit	Customers		
		Residential	C & I	Total
Bank 144	44-1-13	1,217	274	1,491
	44-2-13	1,268	293	1,561
	44-3-13	1,911	157	2,068
Bank 244	44-4-13	1,532	170	1,702
	44-5-13	684	32	716
	44-6-13	1,494	104	1,598

*Above numbers are approximate as of July 6, 2017.

2.2. Substation Bank Contingency Analysis and Requirements

Based on O&R system planning studies, portions of the electric delivery system in the Monsey substation area are projected to not meet the Company's design standards by 2020. The objective is to explore the potential for reducing load on the Monsey bank and distribution circuits through potential non-wires alternatives ("NWA"), including Distributed Energy Resources (DER").

Bank 144 and Bank 244 each have ratings that guide the assessment and determination of acceptable system operating performance with respect to risk for both ability to serve load and for attendant customer hours of outage exposure. Starting in 2020, even with the transfer of load to adjacent tie circuits, the load on Bank 144 during a Bank 244 contingency would exceed the normal rating of Bank 144. The area has experienced growth that has led to highly loaded circuits and substation transformer banks. Consequently, the circuits have limitations in providing backup during contingencies. Of the circuits in Monsey, 44-2-13, 44-3-13 and 44-6-13 have limited backup in contingencies. Below is the summary of the MW reduction needed for the Loss of Bank 244 and the Loss of 44-2-13, 44-3-13 and 44-6-13 for the respective years.

The table below indicates the cumulative circuit MW reduction needed by year, which aggregates from the individual MW reduction for each circuit contingency and at the specific geographical area. Also the Loss of 44-6-13 on 51-3-13 and loss of 44-6-13 on 19-10-13 would factor in for the Loss of Bank 244 as well.

Loss of Bank 244										
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total MW Reduction	0.08	0.84	1.67	2.57	3.54	4.59	5.71	6.91	8.20	9.58

Circuit Contingencies										
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
MW Reduction for Loss of 44-2-13 on 44-1-13	1.27	1.45	1.66	1.88	2.12	2.38	2.66	2.97	3.30	3.65
MW Reduction for Loss of 44-3-13 on 19-11-13	0.00	0.08	0.26	0.46	0.68	0.91	1.17	1.44	1.74	2.06
MW Reduction for Loss of 44-6-13 on 51-3-13	0.62	0.79	0.99	1.20	1.43	1.68	1.95	2.24	2.55	2.89
MW Reduction for Loss of 44-6-13 on 19-10-13	0.32	0.50	0.69	0.89	1.12	1.36	1.63	1.91	2.22	2.55
TOTAL MW Reduction needed	2.21	2.82	3.6	4.43	5.35	6.33	7.41	8.56	9.81	11.15

Figure 2 below shows the area where load reduction is required which includes area served by Bank 144 and Bank 244 and the associated circuit ties of Bank 244 during the above mentioned contingency. Table 3 indicates the required load reductions by year and the associated time frames when load relief is required. Figure 3 below graphs the typical weekday peak load profile of the Monsey substation with the loss of Bank 244, as forecasted for years 2020, 2022 and 2029.

Figure 2 - Monsey Area

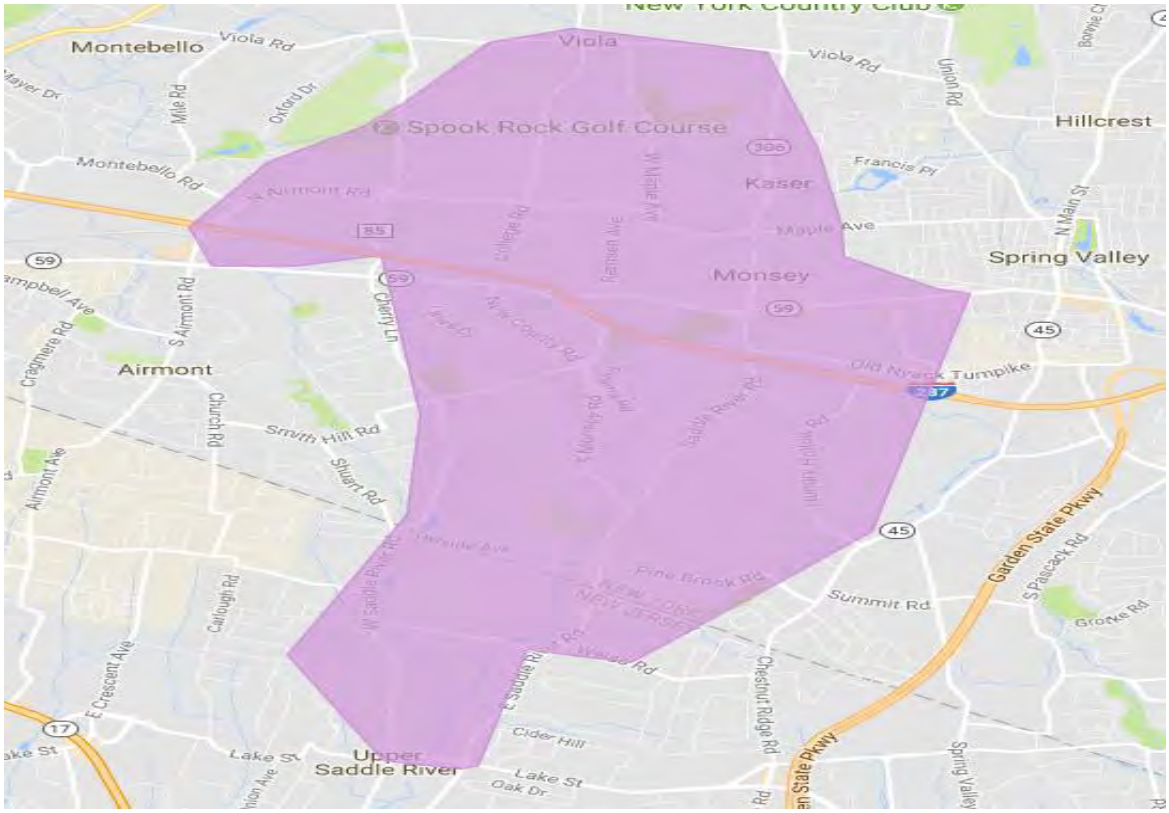
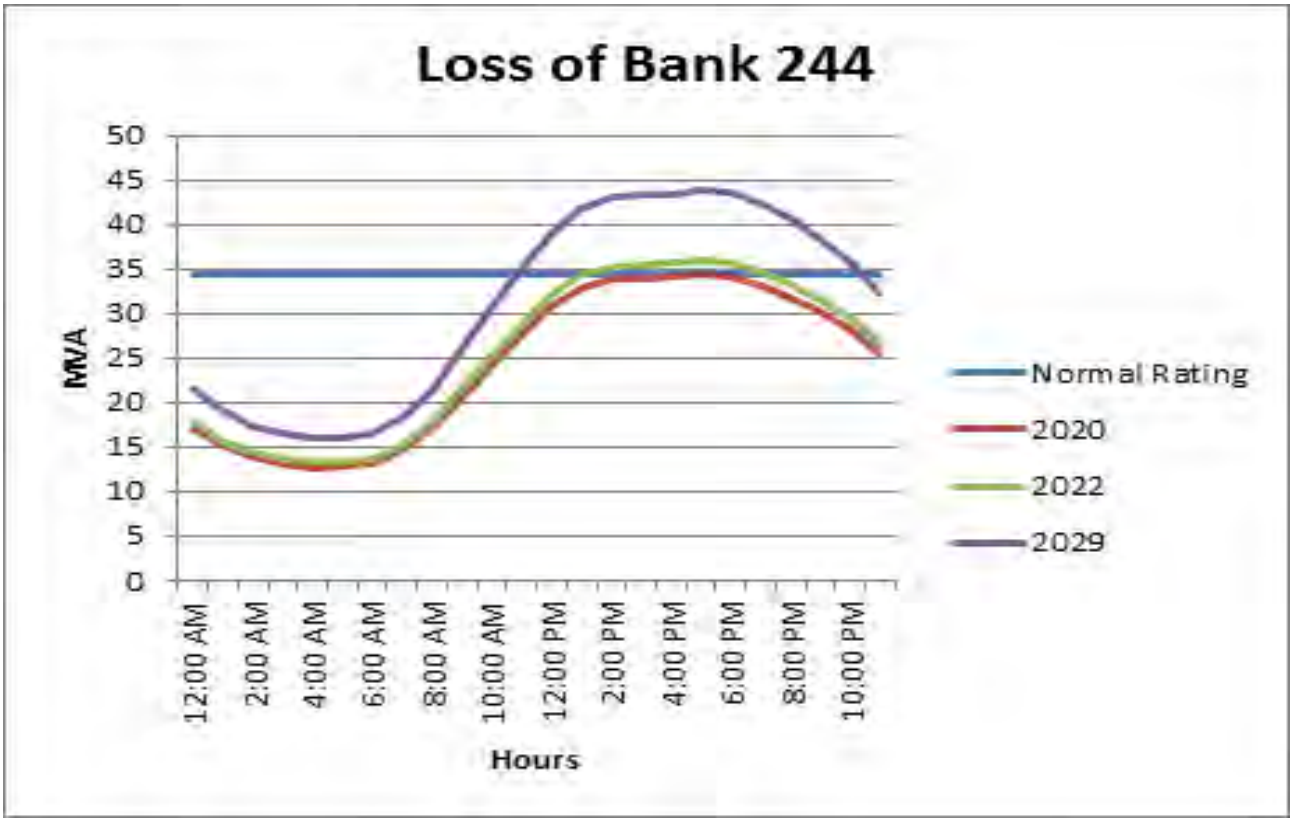


Table 3: Required Load Reduction and Hours of Need for Bank 244 Contingency

Loss of Bank 244										
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total MW Reduction	0.08	0.84	1.67	2.57	3.54	4.59	5.71	6.91	8.20	9.58
Days of Need in a Year	3	4	4	7	12	18	23	26	33	38
Hours of need based on load profile	4p.m. to 5p.m.	2p.m. to 6p.m.	1p.m. to 7p.m.	1p.m. to 7p.m.	1p.m. to 8p.m.	12p.m. to 8p.m.	12p.m. to 9p.m.	12p.m. to 9p.m.	12p.m. to 10p.m.	11a.m. to 10p.m.

Figure 3: Typical Peak Day Load Profiles for Bank 244 Contingency



2.3. Distribution Circuit Contingency Analysis and Requirements

There are six existing Monsey circuits. In the case of the heavily loaded Monsey circuits, adjacent circuits needed to tie at peak time will also be heavily loaded and are incapable of providing 100% backup. Transferring load would simply transfer the problem to other local circuits, which could exacerbate the circuit loading concern. Among the six Monsey circuits, single circuit contingencies on the 44-2-13, 44-3-13 and 44-6-13 are the worst and will not pass design standards with 100% backup. Adjacent circuits that tie at peak time will also be heavily loaded beyond the point that they are not capable of providing 100% backup. As the load growth continues on these circuits, the number of hours of risk for the contingencies will continue to grow or worsen.

Circuit 44-2-13 Contingency

With the loss of circuit 44-2-13, Monsey circuit 44-1-13 can only be used to pick-up a portion of the 44-2-13 circuit without exceeding its allowable ratings. Table 4 indicates the required MW load reduction and hourly need to maintain the load on 44-1-13 below its normal rating.

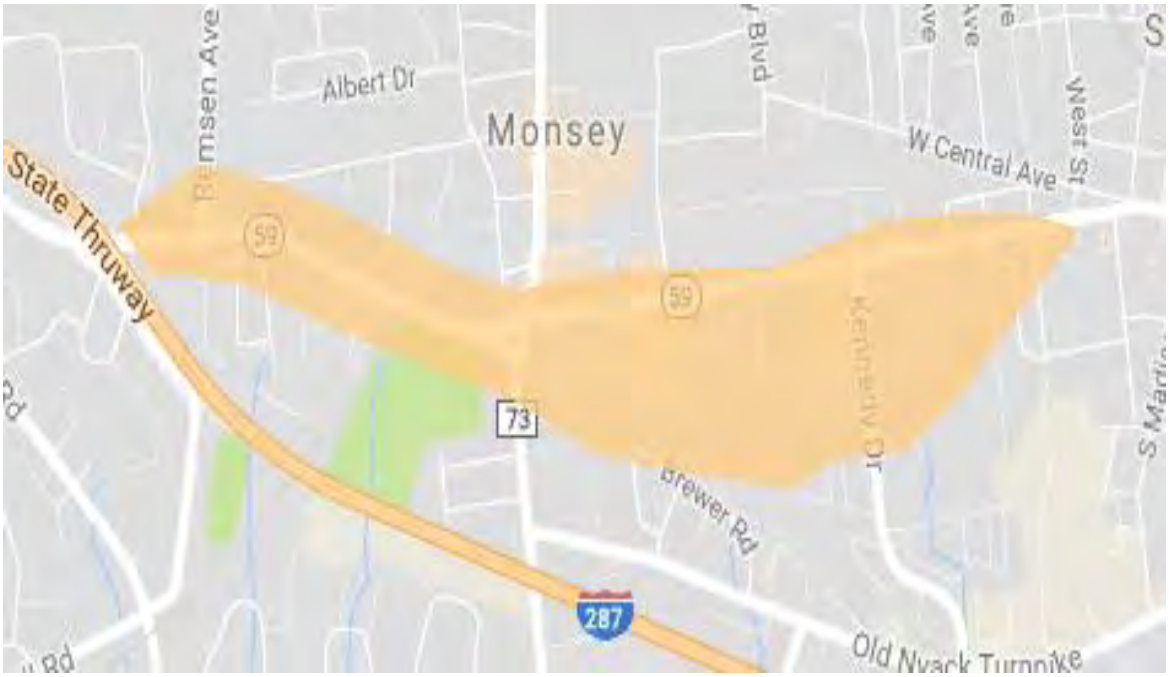
Table 4: MW Load Reduction and Hourly Need for a Circuit 44-2-13 Contingency with 44-1-13 Backup

Loss of 44-2-13 on 44-1-13										
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total MW Reduction	1.27	1.45	1.66	1.88	2.12	2.38	2.66	2.97	3.30	3.65
Days of need in a year	10	10	14	19	20	24	28	30	41	45
Hours of need based on load profile	1p.m. to 3 p.m.	1p.m. to 4p.m.	12p.m. to 5p.m.	12p.m. to 5p.m.	12p.m. to 6p.m.	12p.m. to 6p.m.	12p.m. to 7p.m.	11a.m. to 7p.m.	11a.m. to 7p.m.	11a.m. to 8p.m.

The load profiles for the loss of 44-2-13 on 44-1-13 on a peak day are shown in Figure 4 for years 2020, 2022 and 2029. A geographical map of the area served by 44-1-13and portions of 44-2-13 is shown in Figure 5.

Figure 4: Typical Peak Day Load Profiles for Circuit 44-2-13 Contingency on Circuit 44-1-13

Figure 5: Area Served by Circuits 44-1-13 and some portion of 44-2-13



Circuit 44-3-13 Contingency

With the Loss of circuit 44-3-13, Burns Substation circuit 19-11-13 can only be used to pick-up a portion of the 44-3-13 circuit without exceeding its allowable ratings. Table 5 indicates the required MW load reduction and hourly need to maintain the load on 19-11-13 below its normal rating.

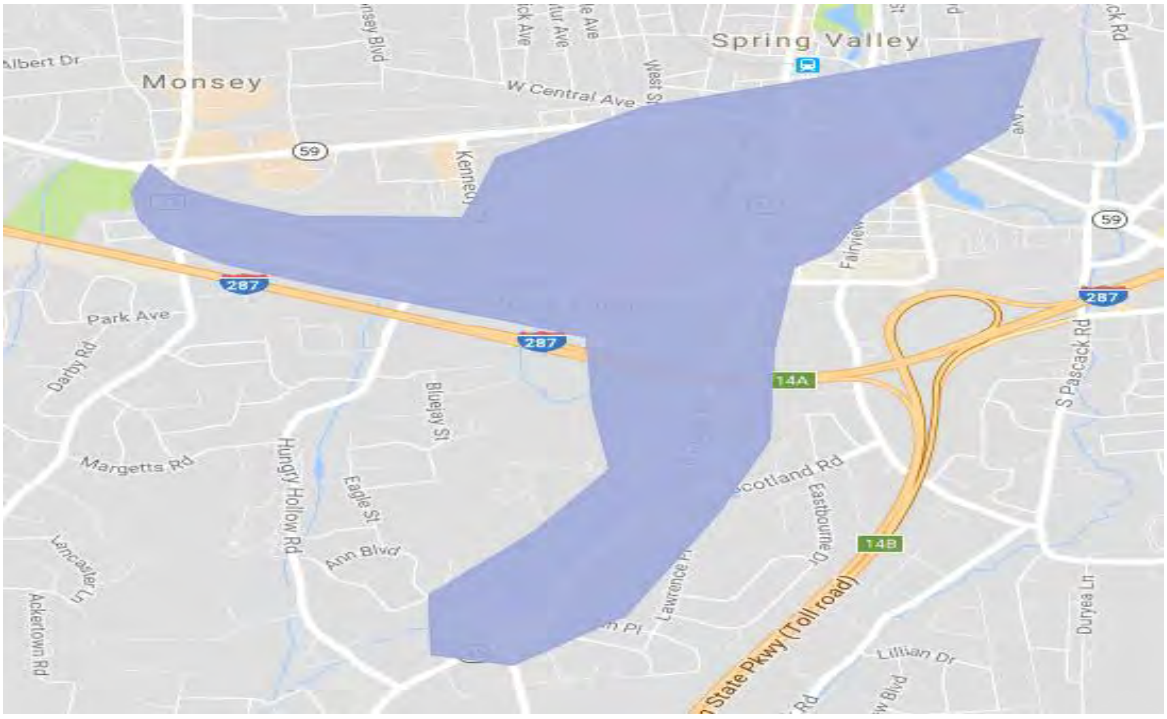
Table 5: MW Load Reduction and Hourly Need for a Circuit 44-3-13 Contingency with 19-11-13 Backup

Loss of 44-3-13 on 19-11-13										
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total MW Reduction	0.00	0.08	0.26	0.46	0.68	0.91	1.17	1.44	1.74	2.06
Total MW Reduction	0	1	1	3	5	5	7	8	12	17
Hours of need based on load profile	N/A	3p.m. to 4p.m.	3p.m. to 4p.m.	2p.m. to 4p.m.	2p.m. to 5p.m.	1p.m. to 5p.m.	1p.m. to 6p.m.	1p.m. to 6p.m.	12p.m. to 7p.m.	12p.m. to 7p.m.

The load profiles for the loss of 44-3-13 on 19-11-13 on a peak day are shown in Figure 6 for years 2020, 2022 and 2029. A geographical map of the area served by 19-11-13 with 44-3-13 is shown in Figure 7.

Figure 6: Typical Peak Day Load Profiles for Circuit 44-3-13 Contingency on Circuit 19-11-13

Figure 7: Area Served by Circuits 19-11-13 and portions of 44-3-13



Circuit 44-6-13 Contingency

With the loss of 44-6-13 on a peak load day, circuits 51-3-13 and 19-10-13 would be needed to pick up portions of the 44-6-13 circuit. Only a portion of the load can be picked up by the 51-3-13 without exceed its allowable ratings. Table 6 indicates the required MW load reduction and hourly need to maintain the load on 51-3-13 below its normal rating.

Table 6: MW Load Reduction and Hourly Need for a Circuit 44-6-13 Contingency with 51-3-13 Backup

Loss of 44-6-13 on 51-3-13										
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total MW Reduction	0.62	0.79	0.99	1.20	1.43	1.68	1.95	2.24	2.55	2.89
Days of need in a year	2	3	3	3	5	6	7	10	15	18
Hours of need based on load profile	3p.m. to 7p.m.	3p.m. to 7p.m.	3p.m. to 7p.m.	2p.m. to 7p.m.	2p.m. to 8p.m.	2p.m. to 8p.m.	1p.m. to 8p.m.	1p.m. to 8p.m.	1p.m. to 9p.m.	1p.m. to 9p.m.

The load profiles for the loss of 44-6-13 on 51-3-13 on a peak day are shown in Figure 8 for years 2020, 2022 and 2029. A geographical map of the area served by 51-3-13 with 44-6-13 is shown in Figure 9.

Figure 8: Typical Peak Day Load Profiles for Circuit 44-6-13 Contingency on Circuit 51-3-13

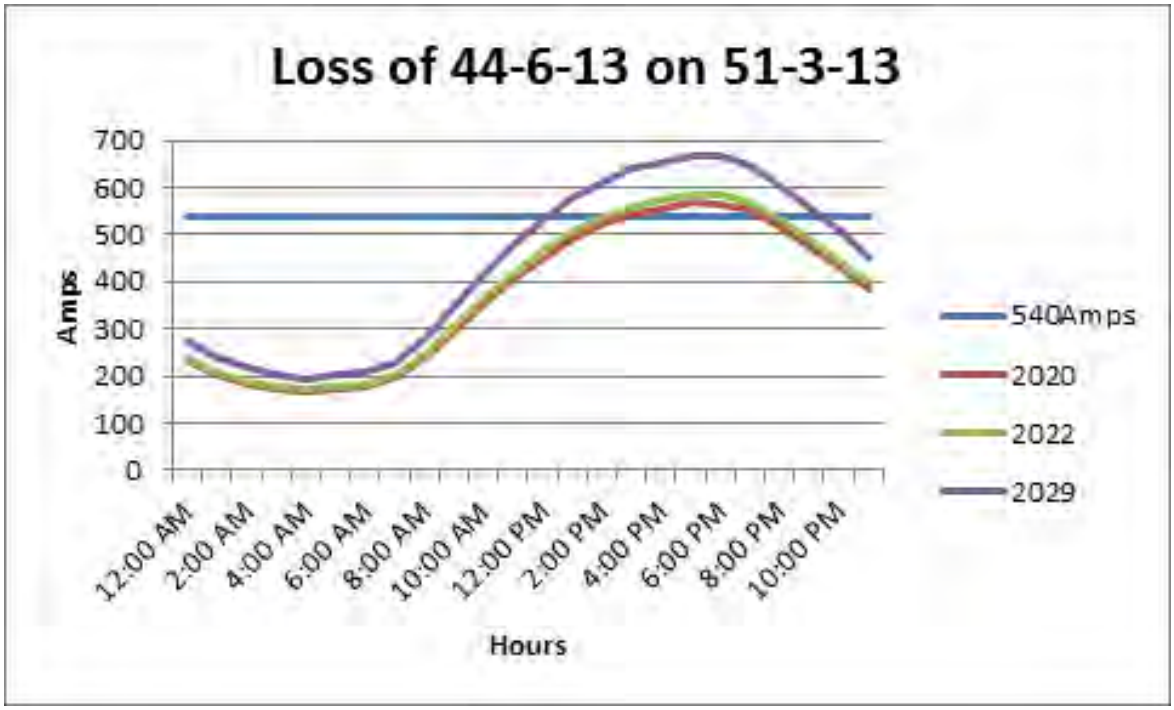
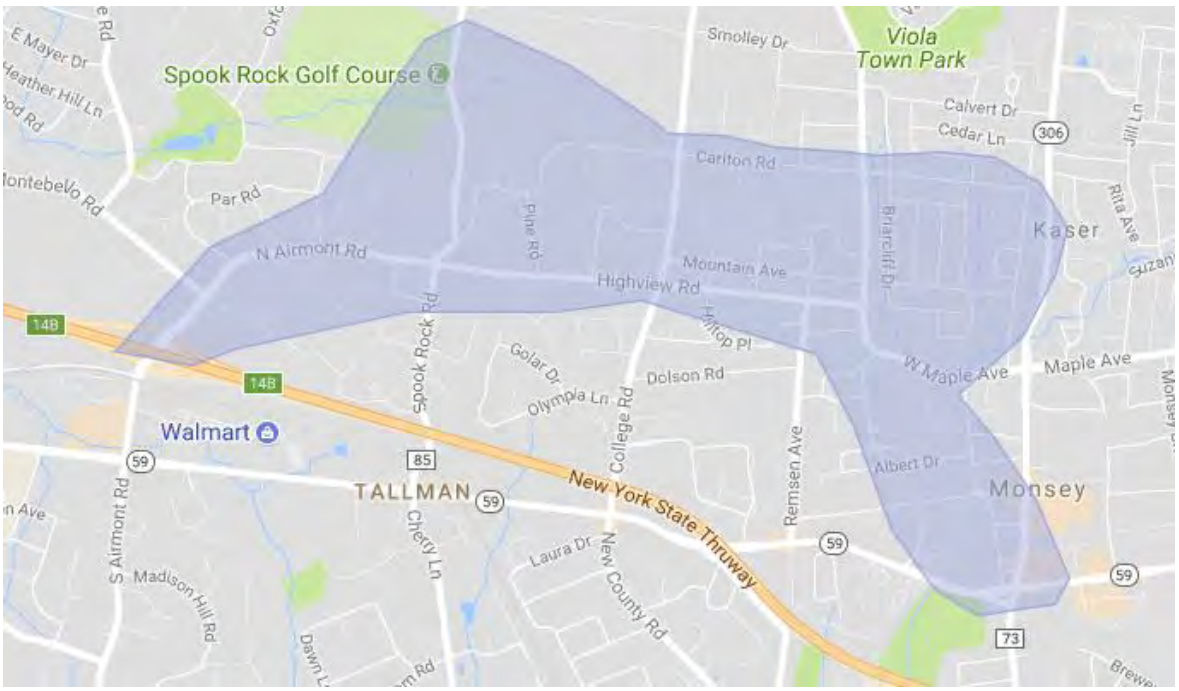


Figure 9: Area Served by Circuits 51-3-13 and portions of 44-6-13



19-10-13 cannot pick up additional portions of the 44-6-13 as it would exceed the allowable ratings on 19-10-13. Table 7 indicates the required MW load reduction and hourly need to maintain the load on 19-10-13 below its normal rating.

Table 7: MW Load Reduction and Hourly Need for a Circuit 44-6-13 Contingency with 19-10-13 Backup

Loss of 44-6-13 on 19-10-13										
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total MW Reduction	0.32	0.50	0.69	0.89	1.12	1.36	1.63	1.91	2.22	2.55
Days of Need in a year	1	1	1	1	1	1	1	3	4	4
Hours of need based on load profile	5p.m. to 7p.m.	5p.m. to 7p.m.	4p.m. to 7p.m.	4p.m. to 8p.m.	3p.m. to 8p.m.	3p.m. to 9p.m.	2p.m. to 9p.m.	2p.m. to 9p.m.	2p.m. to 10p.m.	1p.m. to 10p.m.

The load profiles for the loss of 44-6-13 on 19-10-13 on a peak day are shown in Figure 10 for years 2020, 2022 and 2029. A geographical map of the area served by 19-10-13 with 44-6-13 is shown in Figure 11.

Figure 10: Typical Peak Day Load Profiles for Circuit 44-6-13 Contingency on Circuit 19-10-13

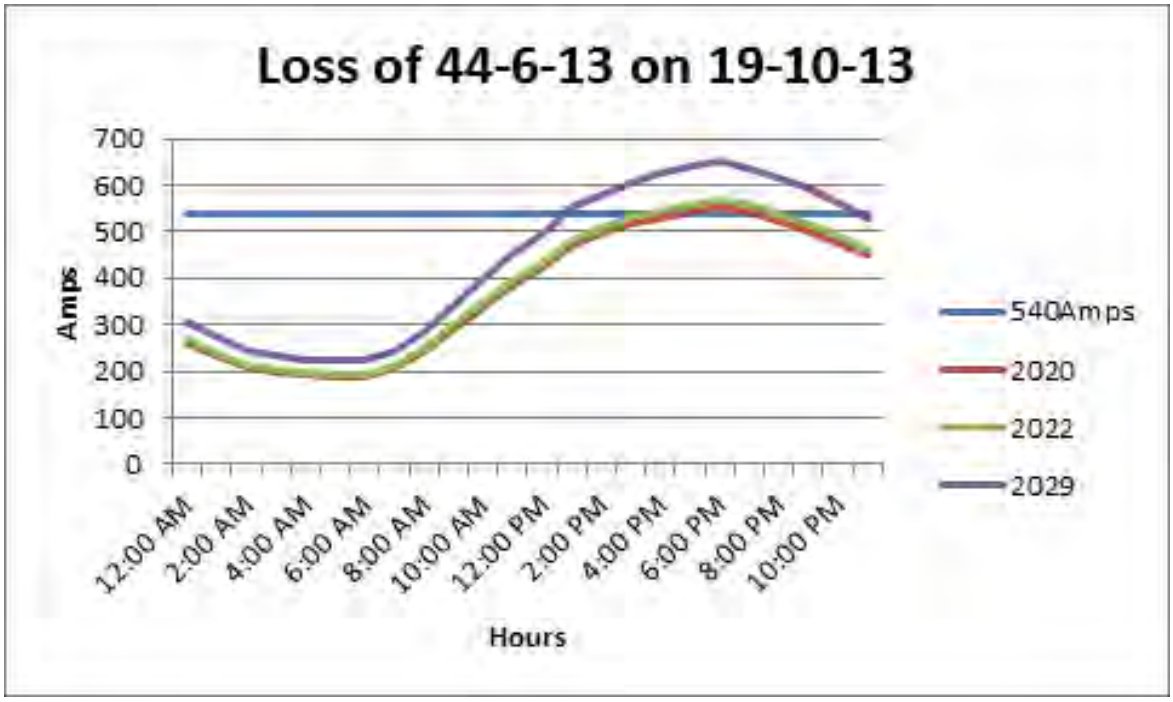


Figure 11: Area Served by portion of Circuit 44-6-13 and 19-10-13

Traditional solution:

The Company anticipates the traditional wires solution to include the upgrade of the Monsey Substation, which will require the replacement of the two 25MVA transformers with two 40MVA transformers and the addition of three distribution circuits by 2022. The Bank upgrade will provide additional capacity for load growth in the Monsey area and provide relief and improved backup to the Burns and Tallman Substations.

To defer the station upgrade, the capacity reductions identified in the tables above will be needed by 2022(refer to summary table is section 2.2). This amount of load reduction in the area has been identified on the specific geographical areas and it would provide sufficient capacity reduction to defer the traditional alternative. O&R conducts an annual planning cycle to monitor substation needs and will adjust capacity requirements based on actual growth, block load additions and other factors. The capacity requirements may be adjusted to include factors that would provide equivalent reliability of the traditional solution.

3. Solution Requirements

This section outlines the requirements for responses to the RFP. Respondents should submit their responses to the functional questions included in Attachment A, as part of their proposals. Respondents are encouraged to include, as an attachment (maximum size – 2 MB), any additional information that will clarify how their proposed solution(s) will achieve the required demand reduction. Review priority will be given to the information submitted within the provided format.

3.1. Professional Background and Experience with the Proposed Solution

Respondents should provide the following:

- Executive Summary of proposal;
- Firm's core business and organizational structure;
- Project organizational chart and project team resumes;
- Financial statements for the past three years, and services offered;
- Examples of prior industry specific work that is similar in nature and relevant to the NWA solution requirements, with particular emphasis on implementation of the solution, such as at other utilities, large municipalities, co-ops, or any other applicable facilities;
- Relevant project experience;
- Contact information of customers where the solutions have been implemented (at least three references);
- Letters of support from customers who plan to implement the solution at their site in the applicable area of need identified (**Note:** O&R will need to verify customer qualifications);
- References which shall include any authorizations necessary for O&R to verify;
- Respondent's related previous work;
- Specific location of successful technology deployment; and
- Any other relevant information deemed appropriate and noteworthy supporting and validating the proposed solution.

Respondents should address any estimated costs associated with implementing the proposed technology/solution, including customer and utility costs, as well as any other relevant costs. Respondents should also describe in detail non-energy benefits associated with the proposed solutions.

Respondents should identify and provide contact information for customers who have implemented the technology/solutions. Respondents should note whether O&R can contact these customers for additional information and follow-up questions.

3.2. Proposed Solution Description

Project proposals must demonstrate how the proposed solution will achieve the demand reductions sought and maximize value to O&R's customers. Detailed project information should include:

- Technology/Solution description (tested and proven or innovative technology);
- Type of contract (e.g., shared savings, performance contract, sale, lease-purchase, power purchase agreement);
- Performance characteristics of the technology;
- Description of the flexibility and applicability of the technology;
- Hourly electric load reduction impact provided by the solution;
- Community and environmental impacts derived from the solution;
- Innovation, risks, barriers, challenges;
- Specification and details associated with implementing the proposed solution (e.g., permitting requirements); and
- Detailed description of non-energy benefits associated with the proposed solution.
- Ability of solution to increase or decrease in scale.

The proposal must specify the data (e.g., detailed calculations) and methodology used to determine the estimated demand reduction and annual kWh savings attributable to each DER measure proposed to be installed.

3.3. Project Proposal Requirements

Respondents are encouraged to submit alternative, creative proposals for marketing, sales, financing, implementation, and maintenance, or transaction structures and pricing formulas that will achieve the demand reductions sought and maximize value to O&R's customers.

The selected Respondents, if subsequently contracted with to provide their solutions, will be required to provide full facility and equipment access to the Company and its representatives for pre- and post-installation inspections to verify the installations and the demand reductions, and for subsequent inspections (which may be performed at

the Company's discretion), to verify continued operation and maintenance of the DM measures for the applicable term.

The new DER measures must be in service, and the pledged demand reduction must be guaranteed to commence, by the respective need dates for the applicable load area, to address forecasted summer overloads. The type of compensation structure must be included (upfront payment/rebate, pay for performance, loan program or other).

Vendors must provide any and all methods and procedures required to comply with technical, safety and operational requirements for the interconnection and operation of their equipment with the Company's electric delivery system, as well as performance measurement and verification (i.e., are kW actually reduced). For any proposed renewable generation, it is particularly important to verify that any stated demand reduction coincides with the Company's peak loading period. The Company reserves the right to require periodic witness testing on any proposed protective systems and electric system interconnections that could adversely affect the Company's electric delivery system should they fail.

Financial assurances will be required so that the committed amount of demand reduction measures will be installed and the committed in-service date for each measure will be met. Failure to achieve the committed demand reductions or to meet the committed in-service dates will result in liquidated damages and/or other consequences which will be established during the contracting process.

The proposal should specify the data and methodology used to determine the estimated demand reduction, annual kWh savings attributable to each measure/solution proposed to be installed, and methods/proposals to confirm measurement and verification of delivered demand reductions.

Respondents proposing to market the installation of demand management measures to others should include a full and complete assessment of the opportunities. At a minimum, this assessment should include a description of the markets, such as one-to-four family homes, multifamily buildings, small commercial (e.g., retail stores, restaurants), large commercial (e.g., office buildings, industrial) and government or institutional (e.g., hospitals, hotels, schools, colleges), and the applicable demand management measures and technologies to be directed at each selected market or customer segment. In addition, Respondents should illustrate the marketing and sales strategies that they will employ to capture the selected market or customer segment and to deliver the demand reductions included in their proposals. Preference will be given to Respondents which have pre-existing customer agreements to deploy (previously and successfully deployed) the solution.

Respondents may also include proposals that require deployment on utility property or ownership models involving utility ownership, or operation and maintenance, or both, by the Company.

Of key importance to the review of any proposal is consideration of community impact. Proposals must provide information on elements of the proposal that affect the community (both positively and negatively) including, but not limited to, associated greenhouse gas ("GHG") emissions, waste streams and management, job creation potential and community disruption.

The Company is interested in proposals which will take advantage of funding available from other funding streams. In order to mitigate the cost impact on the Company's customers it will be important to maximize the use

of existing municipal, State and Federal funding opportunities. Respondents should also identify their ability to unleash private sector funding. Respondents are expected to provide detailed explanations and validation of such funding strategies, including examples which are provable and repeatable.

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3.4. Functional Requirements

Respondents have been provided a detailed Non Wire Alternative Solution Questionnaire in Attachment A. Please provide your responses in the document and submit with the RFP proposal. Major categories within the functional questions include:

- Respondents go-to-market strategy;
- Measurement & Verification confidence plan;
- Other Funding Sources Available;
- Environmental and Community Impacts;
- Respondents Market Understanding;
- Proposed Solution Benefits;
- Other Funding Opportunities; and
- Other Additional Information to clarify or further explain the RFP proposal.

3.5. Detailed Project Plan and Timeline to Implement Solution

Proposed DER measures must be in service, and the pledged demand reduction must be guaranteed to commence, by the date(s) specified in the Non-Wires Alternative Project Description section above.

- Responses must contain a detailed plan to implement the solution including:
  - General scope of work;
  - Customer acquisition and marketing plan;
  - Financing, including transaction structures and pricing formulas;
  - Implementation plan and project schedule; and
  - Operation and Maintenance plan (if, applicable).
- Respondents proposing to market the installation of DER measures to customers should include a full and complete assessment of the DER opportunities. At a minimum, this assessment should include a description of the markets, such as one-to-four family homes, multifamily buildings, small commercial buildings (e.g., retail stores, restaurants), large commercial buildings (e.g., office buildings, industrial) and government or institutional buildings (e.g., hospitals, hotels, schools, colleges), and the applicable DER measures and technologies to be directed at each selected market or customer segment.
- Respondents must illustrate the marketing and sales strategies that will be employed to capture the selected market or customer segment and to deliver the demand reductions included in their proposals. Preference will be given to Respondents with pre-existing customer agreements to deploy the solution upon confirmation by the Company. Marketing and sales plans must be expressly approved by the Company.
- The response must contain a detailed measurement and verification ("M&V") plan for verifying the solution's load reduction. The plan must include provisions for access by the Company and/or its representatives for quality control and quality assurance. Independent M&V may be performed at the

Company's discretion. The Company's M&V will include, but not be limited to, verification of continued operation and maintenance of the DER measures for the applicable term.

- Proposals must provide information on elements of the proposal that affect the community (both positive and negative) including, but not limited to, associated GHG emissions, waste streams and management, job creation potential, and community disruption.
- Proposals must outline a detailed timeline from contracting, to implementation and completion of the proposed solution.

3.6. Detailed Costs Associated with Proposed Solution

- Respondents must provide a detailed cost breakdown. Respondents are expected to provide detailed explanations and validation of such funding strategies, including examples which are provable and repeatable.
- Respondents should identify other funding streams that may be used to mitigate cost impact to the Company's customers (i.e., City, State, and Federal funding opportunities). Respondents should also identify if private sector funding will be used.

4. Proposal Evaluation Approach

Solutions proposed in response to this RFP will be reviewed in detail by O&R. O&R will use an evaluation framework to develop the optimal portfolio to address the identified need. Some primary review criteria to be applied to qualified proposals received are listed below. The review process is intended to be fair and equitable, with the objective of achieving the greatest overall value. Respondent should note that although O&R will be reviewing Respondent's solution if the submission criteria are met, there is no guarantee that Respondent's solution will be selected.

Respondents should also note that each measure of any proposal submitted, whether part of a single-measure proposal or a multiple-measure proposal, will be evaluated against other like measures for equal comparison. Thereafter, the Company may evaluate all measures in the aggregate in a manner that considers the overall benefit to the Company based on the criteria set forth in this RFP, and to include considerations that could allow for the selection of individual measures across multiple proposals.

4.1. Evaluation Criteria

O&R will review all solutions proposed in response to this RFP. Some of the main review criteria are listed below. The review process is designed to be fair and equitable, with the objective of identifying potential solutions that provide the greatest overall value to customers.

Evaluation criteria will include but not limited to:

1. Proposal content – Information requested has been provided and is comprehensive to allow for

evaluation;
2. Viability - the extent to which the Respondent's proposed solution would address the needed solution;
3. Functionality - the extent to which the proposed solution would provide the needed load reductions;
4. Environmental and community impacts associated with the proposed solution;
5. Unit Cost – total cost, and $/MW at peak required for the proposed solution;
6. Benefit-cost analysis ("BCA") – a BCA of the proposed solution will be performed in accordance with O&R's BCA Handbook as filed with the NYPSC; a BCA will be applied to the portfolio of solutions to determine feasibility of implementing a NWA solution;
7. Timeliness - the ability to meet O&R's schedule and project deployment requirements, also with a mind that the detailed project schedule from contract execution to implementation and completion of projects is important for determination of feasibility;
8. Price and reliability, particularly as compared to other proposed solutions along with the dependability and benefits that would be provided to the grid;
9. Respondent Qualifications - the Respondent's relevant experience and success providing these solutions to other locations, including reference checks and documented results;
10. Applicability to REV- supports the goals and objectives outlined in the REV proceedings;
11. Execution risk - the expected ease of project implementation within the timeframe required for the non-wire alternative solution (e.g., permitting, construction risks, operating risks);
12. Community impact - the positive or negative impact that the proposed solution may have on the community in the identified area (e.g., noise, pollution).

Respondents should note that by reviewing the solution, O&R is not guaranteeing that the solution will be selected.

4.2. Proposal Response and Submittal Instructions

A Respondent is strongly encouraged to submit a proposal in accordance with the summary instructions outlined in this section, with the proposal also to focus on the requirements of the Non-Wires Alternative Solutions Requirements section (and as well as a required submittal of a fully completed **Non-Wires Alternative Solution Questionnaire (Attachment A)** as a separate attachment), and such other requirements set forth in this RFP. Respondents are required to submit their bid response through the Company's Procurement System ("Oracle RFQ System"). Any limitation regarding Respondent's ability to supply information requested in this RFP (or to support or perform a particular function or service) should be explicitly stated in the proposal response. Any partnering with other solution providers to perform a particular function or service must be explicitly stated.

All proposals must be submitted through the Oracle RFQ System on or prior to the due date and time. Respondents who fail to submit by the due date and time will be locked out of the Oracle RFQ System and unable to submit their proposals. Therefore, Respondents are encouraged to upload their proposals well in advance of the closing time to avoid any potential issues that may occur, including due to unfamiliarity with the Oracle RFQ System, or otherwise. Respondents must take the following actions to complete their proposal submission:

1. Download this Non-Wires Alternative RFP, Non-Wires Alternative Questionaire (Attachment A), and Supplier Enablement Template.

2. Become enabled in the Oracle RFQ System by submitting the below items to Michael Heaton at heatonm@coned.com (note that if respondent has previously been enabled in the Oracle RFQ System as part of a separate bid event then they do not have to do it again, but should email Mike Heaton to notify him of participation interest for this RFP):
    a. W-9 form (version last updated); and
    b. Supplier Enablement Template (Select 'Sourcing' under Oracle responsibility field).
3. Receive Formal RFQ response request (will be same information downloaded from non-wires alternative website).
4. Submit response and fully completed questionnaire to Oracle RFQ System.

Responses delivered by hand or fax, regular mail, or any other method will not be accepted. O&R will not be responsible for late, lost, illegible or misdirected submissions.

Review of responses submitted to this RFP will be coordinated through the O&R Utility of the Future and other Company departments as necessary. O&R, at its option, may contact Respondents with additional questions or information requests. Additional action by O&R related to this RFP is solely at the Company's option. As such, the Company has no obligation to address questions, comments, or information requests related to this RFP after receipt of Respondents responses.

Contact Information and Questions

All Respondents should direct questions during the clarification question timeframe via email to Michael Heaton, heatonm@coned.com, of O&R's/Con Edison's Supply Chain Department. All questions and answers deemed essential for the viable submission of a bid response will be publicly posted at **https://www.oru.com/en/business-partners/non-wires-alternatives.** Respondent's identities will be kept confidential.

The Company will have no obligation to evaluate late submissions, nor be responsible in any way for any consequences associated with late submissions.

4.2.1 RFP Schedule

Below is the expected schedule to be followed for this solicitation:

RFP Solicitation Milestones	Completion Date*
RFP Issued	August 23, 2017
Pre-bid conference call (see details below)	August 31, 2017 1pm EDT
Deadline to submit clarification Questions	**September 5, 2017**
Responses to Clarification Questions Due	September 19, 2017
Deadline to become enabled in O&R/Con Edison Procurement System	**September 29, 2017**
Qualified Respondents Proposals Due	**October 24, 2017, 3PM EDT**

***O&R reserves the right to change any of the above dates.**

Pre-bid conference call details:

Date: August 31, 2017

Time: 1pm EDT

Join by phone

Dial-in Number: **(646) 679-1825**

Meeting ID: **775773722**

Smartphone link: (646) 679-1825,,775773722#

Join by web browser

Follow this link for video conference and screen sharing.

Can't join the meeting? Contact support.

4.3. Proposal Response Format

Note: The Oracle RFQ System is only capable of accepting individual documents no larger than 5 MB in size. Respondents may find it necessary to split up large documents into smaller files due to these system constraints. The written proposal response for the NWA solution should be organized as follows:

Proposal Section	Proposal Section Title
N/A	Cover Letter
N/A	Respondent Checklist (Appendix)
N/A	Table of Contents
1	Professional Background, Financials and Experience with the Proposed Solution (as described in section 3)
2	Proposed Solution Response & Project Plan (as described in Section 3)
3	Cost Associated with Proposed Solution (as described in Section 3)
4	Assumptions and Expectations
Appendix	Glossary of Terms
Attachment	Non-Wires Alternatives Solutions Questionnaire Response

4.3.1. Cover Letter and Checklist

The cover letter shall include the following:

- The legal name and address of Respondent;
- The name, title and telephone number of the individual authorized to submit information and execute the Agreement;
- The signature of a person authorized to contractually bind Respondent's organization; and
- Statement that the Respondent has read, understands, and agrees to all provisions of the RFP or alternatively, indicating that exceptions will be taken to the RFP and identifying such exceptions.

4.3.2. Respondent Checklist

Respondent checklist: Respondent should provide to the Company the properly completed Respondent Checklist (Appendix) as part of the proposal.

4.3.3. Table of Contents

Include a clear identification of the proposal by section and by page number as identified above.

4.3.4. Professional Background & Experience with the Proposed Solution

This section is for the Respondent to provide an executive overview and summary of your company and general description of the key features of Respondent's proposed solution. It should include the items outlined in Section 2.1 of the RFP. Respondent shall also identify all subcontractors that it will employ to complete the proposed solution.

4.3.5. Proposed Solution & Project Plan

This is a response to the solution requirements as outlined in this document. Respondents should also provide a proposed project plan for the solution.

4.3.6. Costs Associated with the Proposed Solution

Respondents should provide a detailed breakdown of the costs associated with implementing the proposed solution.

4.3.7. Assumptions and Exceptions

Respondent should provide a list of assumptions made in developing the response to this RFP that should be considered when evaluating the response. Respondent should provide a stand-alone section listing any exceptions to the RFP (i.e., indicate which deliverables of the RFP Respondent cannot meet).

4.3.8. Glossary of Terms

Respondent should provide a glossary of terms that is specific to the Respondent's solution.

4.3.9. Non-Wires Alternative Solution Questionnaire

Respondents should attach the responses to the Non-Wires Alternative Solution Questionnaire (Attachment A), including as much detail possible, with the RFP submittal.

5. RFP Terms and Conditions

Each Respondent is solely responsible for including all pertinent and required information in its submission. O&R reserves the right to determine, at its sole discretion, whether a submission is incomplete or non-responsive.

Respondents should state clearly all assumptions made with respect to this RFP. In the absence of an explicit statement to the contrary, each Respondent shall be deemed to have agreed with and understood the requirements of this RFP. While O&R has endeavored to provide accurate information, O&R makes no warranty or representation of accuracy.

Any exceptions to the terms, conditions, provisions, and requirements herein must be specifically noted and explained by Respondent in Respondent's response to this RFP. O&R will assume that any response to this RFP expressly accepts all the RFP terms, conditions, provisions and requirements, except as expressly and specifically stated by a Respondent in Respondent's response to this RFP.

Respondents agree to keep confidential all information provided by O&R in connection with this RFP.

5.1. Qualifications of Respondents

The Company may make such investigation as the Company deems necessary to determine the qualifications of Respondent and proposed subcontractors to perform the work. A Respondent should promptly furnish any information and data for this purpose as may be requested by the Company. The failure of a Respondent to produce timely information and data requested by the Company may provide a basis for rejection of the proposal.

5.2. Proprietary Information

If a proposal includes any proprietary data or information that a Respondent does not want disclosed to the public, Respondent must specifically designate such data or information on on each page on which it is found. O&R shall be held harmless from any claim arising from the release of proprietary information not clearly identified as such by a Respondent. Because of the need for public accountability, the following information regarding the proposal shall not be considered proprietary, even if such information is designated as such: pricing terms and non-financial information concerning compliance with RFP specifications.

5.3. Cost of proposal preparation

The cost of preparing a proposal in response to this RFP, including, but not limited to, the cost associated with site visits and preliminary engineering analysis, is solely Respondent's responsibility and will not be reimbursed by O&R.

5.4. Right to Reject

This RFP shall not be construed to establish an obligation on the part of O&R to enter into any contract, or to serve as a basis for any claim whatsoever for reimbursement of costs for efforts expended by Respondent. Furthermore, the scope of this RFP may be revised at the option of O&R at any time, or this RFP may be withdrawn or cancelled by O&R at any time. O&R shall not be obligated by any statements or representations, whether oral or written, that may be made by the Company, its employees, principals, or agents in connection with this RFP.

O&R reserves the right to accept any responsive proposal, to reject any and all proposals, and to waive irregularities or formalities if deemed to be in the best interests of the Company. Any such waiver shall not modify any remaining RFP requirements nor excuse any Respondent from full compliance with all other RFP specifications and contract requirements if the Respondent is awarded the contract. O&R shall reject the proposal of any Respondent that the Company determines not to be a responsible bidder, or whose proposal the Company determines to be non-responsive.

O&R reserves the right to withdraw this RFP at any time and for any reason, and to issue such clarifications, modifications, and/or amendments as it may deem appropriate. Receipt by the Company of a response to this RFP confers no rights upon a Respondent, nor any obligations upon the Company.

5.5. Revision to the RFP

O&R reserves the right to make changes to this RFP by issuance of one or more addenda or amendments and to distribute additional clarifying or supporting information relating thereto. O&R may ask any or all Respondents to elaborate or clarify specific points or portions of their submission. Clarification may take the form of written responses to questions or phone calls or in-person meetings for the purpose of discussing the RFP, the responses thereto, or both.

If it becomes necessary to clarify or revise this RFP, such clarification or addendum shall be issued by the Company by letter, email or written addendum to the RFP. Any RFP addendum shall be delivered by hand, certified mail, facsimile, e-mail or delivery by courier service which certifies delivery. Only those respondents that have already received the proposal documentation directly from the Company will be provided the clarification. Any addendum to, and/or clarification or revision of this RFP shall become part of this RFP and, if appropriate, part of the Agreement that derives from the RFP.

5.6. Basis of Contract Award

Any contract award(s) that may be made by the Company shall be made to the most responsive and responsible respondent meeting the specifications, price and other factors considered, as determined by the Company, in its sole discretion. The proposal evaluation criteria are set forth within this RFP.

5.7. Duration of the Contract

The duration of the Agreement will be for a term agreed to by O&R and the Respondent during contract negotiations and will depend on the parameters of the proposed solution(s) (e.g., the ability to defer traditional capital investments for as long as possible while meeting BCA criteria). Agreements will typically commence upon the completion of construction and commencement of operation of the solution unless otherwise provided herein. In the event that the Company determines not to proceed with the project, the successful Respondent will be paid in accordance with the amounts as agreed by the Respondent and the Company.

5.8. Underperformance

Respondents should note that failure to deliver load relief committed to as part of any solution may result in liquidated damages and/or other consequences provided for by the contract between Respondent and O&R.

5.9. Security

Respondents are put on notice that if a Respondent's solution is selected, then Respondent will be required to furnish security to O&R that demonstrates, among other things, financial capability to pay liquidated damages in the event that the Respondent fails to satisfy its Load Reduction Guaranty during the period required.

5.10. Subcontracting and Assignment

No portion of the work associated with any project resulting from a successful response to this RFP by a Respondent may be delegated, subcontracted, assigned, or otherwise transferred without the prior written approval of the Company in each case.

Appendix: Respondent Checklist

The Respondent must provide the following checklist which must be properly completed with the proposal and submitted to the Company as part of the proposal.

Checklist Item	Initial
REVIEWED ALL RFP DOCUMENTS AND LAWS AND REGULATIONS THAT IN ANY MANNER MAY AFFECT COST, PROGRESS, OR PERFORMANCE	
FULLY COMPLETED PROPOSAL ADHERING TO THE FORMAT PROVIDED WITHIN THIS RFP	
ENABLED IN CON EDISON PROCUREMENT SYSTEM	
FULLY COMPLETED NON-WIRES ALTERNATIVE SOLUTION QUESTIONNAIRE (ATTACHMENT A)	
• Summary	
• Energy	
• Financials	
• Additional Review Criteria	

NOTE: FAILURE TO COMPLY WITH RFP PROCESS, COMPLETION AND SUBMITTAL OF ALL THE ABOVE DOCUMENTS ON THE FORMS PROVIDED HEREIN, WILL RESULT IN A REJECTION OF YOUR BID.

By placing my initials in the boxes provided above, I acknowledge having read and that I understand fully all of the requirements of this RFP, including with regard to each of the documents referenced herein.

RESPONDENT (SIGNATURE):

RESPONDENT (PRINT NAME):

DATE:

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-20 Witness: Jacob Dusling

Request:

Reference Response 3-7(a) describing the Company's typical electric overhead rate as approximately 160%.

a. Please explain how the Company determines the amount of overheads that should be assessed upon individual projects.

b. Please explain whether these same overheads are applied to non-capital projects, such as a contract with a customer to reduce load or geographically targeted energy efficiency measures, and why.

c. If those same overheads are not applied to non-capital projects, please explain why they are not included in estimate of the wired solution against which the Company compares non-wire solutions.

Response:

The response to 3-7(a) was incorrectly worded and should have been a rate of 60% not 160%.

a. The Company estimates the amount of Engineering and Operations (E&O) Overheads and General Overheads during the capital budgeting process. The total dollars of these E&O and General overheads are divided by the total base capital spending to calculate the budgeted overhead rate to be applied to capital construction projects.

b. These overheads are applied to all capital construction projects only. The charges to the overhead pool include supervisor/manager and administrative labor, and benefit costs related to the capital construction efforts not directly assigned to individual capital projects.

c. The Company typically evaluates projects, both traditional and non-wires solutions utilizing project costs without E&O and General Overheads. The E&O and General overheads are applied after the completion of project evaluations and the recommended project is selected as part of the capital budgeting process.

Attachment - KFD - 3

Distribution Planning Guide Changes

Unitil	Guidelines	Procedure No.	GL-DT-DS-02
	Distribution Engineering	Page No.	Cover
		Revision No.	56
	Distribution Planning Guide	Revision Date	11/14/2019~~09/17/2018~~
		Supersedes Date:	09/17/2018~~08/22/2017~~

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Style Definition: TOC 2: Indent: Left: 0.31", Right: -0.25", Tab stops: 0.75", Left + 7.5", Right,Leader: ... + Not at 1" + 7.49"

FOREWORD

The purpose of this document is to outline the distribution planning process and design criteria.

Any questions or inquiries regarding information provided in this document should be referred to the ~~Director of~~Manager, Distribution Engineering.

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Kevin E. Sprague Date
~~Director~~Vice President, Engineering

_____ _____

John J. Bonazoli Date
Manager, Distribution Engineering

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REVISION HISTORY

Date of Review:

Revision #	Date	Description of Changes
0	03/10/2014	Initial Issue
1	12/29/2014	Revised DG/DER Planning Guidelines (Sec 3.2)
2	12/10/2015	Revisions to Sections 3.3, 3.4 & 3.5
3	2/9/2016	Created new document number
4	8/22/2017	Removed procedure for projecting loads of circuits with DG from Sec 3.2
5	09/17/2018	Revisions to entire document and title change

Current copies of this procedure can be found on the Hampton Shared Drive. Hard copies are not version controlled.

	Guidelines	Procedure No.	GL-DT-DS-02
Unitil	Distribution Engineering	Page No.	Cover
		Revision No.	~~5~~6
	Distribution Planning Guide	Revision Date	11/14/2019~~09/17/2018~~
		Supersedes Date:	09/17/2018~~08/22/2017~~

	6	11/14/2019	Updated substation transformer loading criteria and protective device loading criteria in section 3.1. Modified section 4.3 to include reviewing NWA for loading above 80%. Added paragraph regarding Unitil owned DG. All references to Director, Engineering updated to Vice President, Engineering. Revised Updating Guideline (section 1.3) to Responsibilities Removed Request for Procedure/Change Form

Unitil	Guidelines	Procedure No.	GL-DT-DS-02
	Distribution Engineering	Page No.	TOC
		Revision No.	~~5~~6
	Distribution Planning Guide	Revision Date	09/~~17/2018~~19/2019
		Supersedes Date:	~~08/22/2017~~09/17/2018

Table of Contents

~~List of Appendices~~

Current copies of this procedure can be found on the Hampton Shared Drive. Hard copies are not version controlled.

Unitil	Guidelines	Procedure No.	GL-DT-DS-02
	Distribution Engineering	Page No.	TOC
		Revision No.	~~5~~6
	Distribution Planning Guide	Revision Date	09/~~17/2018~~19/2019
		Supersedes Date:	~~08/22/2017~~09/17/2018

Current copies of this procedure can be found on the Hampton Shared Drive. Hard copies are not version controlled.

Unitil	Guidelines	Procedure No.	GL-DT-DS-02
	Distribution Engineering	Page No.	1
		Revision No.	5
	Distribution Planning Guide	Revision Date	09/17/2018
		Supersedes Date:	08/22/2017

1.0 Introduction

1.1 Purpose

The intent of this guideline is to define study methods and design criteria used to assess the adequacy of Unitil's distribution circuits and distribution substation equipment. The purpose is to ensure appropriate and consistent planning and design practices to satisfy applicable criteria and reasonable performance expectations.

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1.2 Applicability & Scope

This document applies to the planning of distribution circuits and distribution substation equipment (distribution substation transformers, distribution circuit terminal equipment, etc.) operating at nominal primary voltages of 34.5Y/19.92kV or less. This guideline does not apply to the design and planning of subtransmission systems and/or substations design.

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1.3 ~~Updating~~Responsibilities

~~1.3~~ This procedure is written and maintained by the ~~Guideline~~

~~The Director,~~**Distribution Engineering** ~~is responsible for maintaining this guideline~~**Department to** ~~ensure this guideline is current with changes in the company's organization, policies~~**whom any questions relating to its content or** ~~to capture good utility practices. All revisions and/or additions shall detail a revision date and number on the top right corner of each page within the header, as well as a brief description in the Revision History section on the cover.~~

~~Comments are welcomed and~~application should be ~~documented (using the *Request for Procedure/Change Form* reference in Appendix A) and~~ addressed ~~to the Director, Engineering. All documented comments should be retained in a separate file and reviewed each time this procedure is revised. These comments will keep the contents of the procedure current and enhance its usefulness.~~.

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1.4 Availability

Current copies of this procedure can be found on the Hampton Shared Drive. Hard copies are not version controlled.

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NOTE: Only up-to-date versions of the documents are posted on the Hampton Shared Drive. All other revisions (both electronic and hardcopy) should not be referenced.

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2.0 General Information

2.1 Abbreviations and Acronyms

DG	Distributed Generation
DER	Distributed Energy Resources

2.2 Definitions

Major Equipment	Any piece or pieces of equipment that would require more $250,000 (without overheads) of capital investment to replace or upgrade.

Unitil	Guidelines	Procedure No.	GL-DT-DS-02
	Distribution Engineering	Page No.	3
		Revision No.	5
	Distribution Planning Guide	Revision Date	09/17/2018
		Supersedes Date:	08/22/2017

3.0 Distribution Planning Criteria

The follow design criteria shall be used as a guide for the planning and design of the distribution system.

3.1 Loading of Distribution Equipment

Distribution systems shall be designed using the following constraints and equipment loading limitations under peak load operating conditions:

- Loading on distribution circuit conductors and other elements not otherwise specified below should not exceed their seasonal Normal rating.
- Loading on substation transformers should not exceed ~~their seasonal Normal rating.~~the following:
  - Normal Configuration:
    - In service transformer – seasonal normal limit
  - Normal Configuration after switching load to adjacent transformers – the lower of the following:
    - System Spare Transformer – seasonal normal limit
    - Mobile substation (including ancillary equipment such as protective devices, regulators, switches, etc.) – seasonal normal limit
  - Abnormal Configuration
    - In service transformer – seasonal normal limit
- Loading on distribution stepdown transformers should not exceed 120% of their nameplate rating.
- Loading on regulators during summer months should not exceed 120% of the nameplate rating for the set regulation range. Winter loading is limited 145% of nameplate[1].
- Loading on breakers, switches, CTs and isolating devices should not exceed their nameplate rating.
- Protective devices (fuse, relays, etc.) should not exceed the follow:
  - Fuses – continuous current rating or 74%[2] of minimum melt, whichever is lower.
  - Relay Protection Settings - 74%[3] of phase pick-up or 100% of the load encroachment limit, whichever is lower~~.~~ in normal configurations and 88%[4] of phase pick-up or 100% of the load encroachment limit in contingency scenarios.

3.2 Current Unbalance

All distribution circuits and distribution substation transformers shall be reviewed for phase balance on an annual basis. In general, the goal for phase balancing is 10%. Circuits or

[1] ANSI/IEEE C57.95-1984 is used as a guide for determining the maximum allowable loading of regulators for normal loss of life. Higher loading may be allowed on a short term contingency basis (LTE) or as indicated on the nameplate when the regulation range is temporarily limited (load bonus). In no case shall loading exceed the maximum load amps indicated on the nameplate
[2] 110% of 67% of minimum melt.
[3] 110% of 67% of pick-up.
[4] 110% of 80% of pick-up.

transformers with an average phase imbalance greater than 20% are considered severe and shall be reviewed to determine if remediation is required.

3.3 Steady State Distribution Voltages and Regulation

The following outlines the required ranges for steady state RMS nominal system voltages. In all cases where system voltages are found to be outside of these limits, a detailed engineering analysis should be performed in order to determine corrective measures.

3.3.1 Low Voltage Services

Electric distribution systems should be designed and constructed such that low voltage services (600 V and below) supplied to customers operate within the following range under steady state conditions, as measured at the point of delivery:

Nominal Voltage	120/240 V	208Y/120 V	480Y/277 V
(A) Upper limit (105%)	126 / 252 V	218 / 126 V	504 / 291 V
(A) Lower limit (95%)	114 / 228 V	197 / 114 V	456 / 263 V

Practical design considerations or unusual operating circumstances may occasionally result in service voltages below the (A) lower limit conditions shown above. When these situations arise, the following extended lower limit may be tolerated:

Nominal Voltage	120/240 V	208Y/120 V	480Y/277 V
(B) Lower limit (91.7%)	110 / 220 V	191 / 110 V	440 / 254 V

Although such (B) lower limit conditions are occasionally part of practical utility design and operation, they shall be limited in extent, frequency, and duration.

(A) - corresponds to ANSI C84.1 Range A Service Voltage
(B) - corresponds to ANSI C84.1 Range B Service Voltage

Steady state service voltages operating below the (B) lower limit are unacceptable under normal conditions. Normal conditions include common system activity such as ordinary variations in loads and supply, voltage regulator or load tap changer actions, routine system maintenance configurations, and emergency configurations after equipment failures or system faults have been removed.

Abnormal conditions beyond Unitil's immediate control (including area voltage reduction actions, and during active system faults) may result in infrequent and limited periods when steady state voltages above the (A) upper limit or below the (B) lower limit occur. When voltages occur outside these limits, prompt corrective action shall be taken.

3.3.2 Primary Voltage Services

Electric distribution systems should be designed and constructed such that primary voltage services operate within the following range under steady state conditions, as measured at the point of delivery:

Nominal Voltage	4160Y/2400 V	13800Y/7970 V	34500Y/19920 V
(A) Upper limit (105%)	4370 / 2520 V	14490 / 8370 V	36230 / 20920 V
(B) Lower limit (95%)	3950 / 2280 V	13110 / 7570 V	32780 / 18930 V

(A) - corresponds to ANSI C84.1 Range A Utilization and Service Voltage
(B) - corresponds to ANSI C84.1 Range B Service Voltage
Variations outside these limits shall be brief and infrequent.

3.3.3 Primary System Voltage Regulation

In order to meet the service voltage objectives described above, primary distribution systems should be designed and constructed to the following operating ranges for steady state conditions:

Steady state primary voltages operating below 125 V (on 120 V base, or 104%) and above 117 V (on 120 V base, or roughly 97.5%) shall be considered adequate to support all service voltage objectives. A combined voltage drop of 2.5% (3 V on 120 V base) through the service transformer and the secondary and service conductors to the point of delivery will result in satisfactory service voltage. Primary system improvements will not be necessary to remedy low service voltages if the primary system operates within this range.

Steady state primary voltages operating below 115 V (on 120 V base, or roughly 96%) are unacceptable under normal conditions. Steady state primary voltages operating as low as 115 V (on 120 V base, or roughly 96%) are tolerable if they do not result in extensive, frequent, or long lasting service voltage concerns. Primary system improvements may be necessary to resolve lengthy, recurring, widespread low service voltages.

3.3.4 Voltage Unbalance

Electric distribution systems should be designed and operated to limit the maximum voltage unbalance to any three phase customer to no more than 3% as measured at the point of delivery under no load conditions.

Voltage unbalance of a three phase system is expressed as a percentage of deviation from the average voltages.

$$\text{Voltage Unbalance} = (100) \times \frac{\text{(max deviation from average voltage)}}{\text{(average voltage)}}$$

3.4 Transient Voltage Fluctuations (Flicker)

One of the most common sources of voltage flicker on the primary distribution system is switched customer load such as starting of large motors. The following shall be used as a general guideline for acceptable levels of voltage flicker. When the calculated voltage fluctuation exceeds these limits, remedial actions must be taken to reduce flicker to within acceptable levels in order to mitigate nuisance lamp flicker or other potential adverse effects experienced by the customer or other Unitil customers.

3.4.1 Voltage Flicker Criteria

The table below prescribes the acceptable voltage fluctuation due to the starting of a single motor. Unitil's ideal philosophy is to maintain flicker at a level below the Border Line of Visibility1 but will accept levels above this limit but below the Border Line of Irritation as long as the resultant system conditions do not adversely affect other customers.

[1] IEEE Std 241-193 (Gray Book)

Maximum Acceptable %Voltage Fluctuation

Typical Motor Load Type/Description	Frequency of Motor Starts	Max % Fluctuation At Customer XFMR	Max % Fluctuation on Primary System
Fire Pumps	1 Start per Month	5%	4%
Pumps, air conditioning equipment, compressors, elevators, etc.	Multiple starts per hour	3%	2%

Note: the table above does not address all types of switched loads such as arc furnaces, welding equipment, etc. This type of equipment may cause multiple fluctuations per minute or even second. Prior to connecting customer load fluctuating at these rates, a detailed engineering evaluation should be performed to determine the effects to the distribution system.

In cases where voltage flicker exceeds the prescribed limitations above, remedial actions must be taken. As a first step, the customer's service transformer may be increased one standard size than is required to serve the steady state load. If the resulting condition still violates this guideline, the customer should employ some type of soft-starting method. In extreme cases where one or both of these measures still result in unacceptable conditions, a detailed engineering analysis should be performed to develop options for the most economical solution such as reconductoring, voltage conversion, static VAR compensation, etc.

4.0 Planning of the Distribution Study

The goal of distribution planning is to forecast projected peak loads and to perform circuit analysis on a routine basis to ensure the overall objectives of this guideline are met.

4.1 Distribution Load Projections

The Unitil distribution system shall be planned and designed to meet applicable criteria up to projected peak load levels. Five year summer and winter peak load projections shall be created for each distribution circuit and substation transformer per Unitil's *Distribution Load Projection Guideline* (GL-DT-DS-09).

The five year distribution load projections shall be compared to the distribution substation transformer and circuit position ratings~~. The transformers and circuit positions that are projected to reach 90% of their rating shall be reviewed in more detail and have project scope(s) developed and evaluated per Unitil's *Project Evaluation Procedure* (PR-DT-DS-11).~~ and be evaluated per sections 4.3 (*Addressing System Constraints*) and 4.4 (*Development and Evaluation of Options*) below.

4.2 Distribution Circuit Analysis

Distribution circuit analysis shall be performed per Unitil's *Distribution Circuit Analysis Procedures* (PR-DT-DS-03) on an annual basis and as needed to review customer additions and other ad hawk needs.

4.2.1 DG Facilities and DER

The distribution planning process shall include the impact of interconnected DG facilities as well as the output or load offset by other DER projects.

For the purposes of this guideline, a large DG facility shall be considered to be any facility where the aggregate nameplate generation at the point of common coupling is ≥ 500kW.

DG facilities that are proposed for new installation are studied under a separate effort during the application process.

4.2.2 Peak Load Analysis

All circuits on the Unitil system will be evaluated annually for primary voltage, equipment load and protection sensitivity violations using project peak loads. Circuits that are summer peaking are evaluated using summer projected loads and summer ratings. Circuits that are winter peaking will be evaluated under summer peak and winter peak conditions.

4.2.2.1 DG Dispatch

When performing peak load ~~circuit analysis of~~analysis Unitil owned DG (PV and energy storage) facilities shall be assumed to be on-line and fully operational. Unitil owned DG shall be reviewed to confirm that the load in which they are designed to serve or off-set can be restored utilizing traditional methods (load transfers to adjacent supplies, spare equipment, mobile substation, etc.) in the event the facility becomes unavailable.

Additionally, any circuit with only one large DG interconnection, the DG interconnection shall be modelled offline. Due to the uncertainty of the availability of a single DG site, the circuit must be planned in order to provide electric service to all customers that meets planning criteria with or without the DG online.

When performing circuit analysis of any circuit with 2 or more large DG sites, the following parameters and generation output scenarios shall be studied:

- Load allocation shall be performed with all DG sites disconnected from the system
- All Large DG facilities shall be modeled at their typical historical AC output at the point of interconnection during the circuit peak hour.
- Voltage analysis shall be performed with all combinations of possible DG site status (online/offline, peak load/light load)
- Substation equipment loading constraints shall be analyzed with at least 100% of the cumulative output of all DG interconnections offline. DG output shall not be scaled to meet this requirement. Rather each sit

Small DG is inherent in peak load projections and small DG facilities shout not be or be modelled off-line in peak load models.

4.2.3 Minimum Load Analysis

~~All circuits~~Each circuit on the Unitil system ~~with~~that has aggregate downline DG ~~facilities (large and/~~of more than 500kW or ~~small~~15% of the circuit (whichever is smaller) shall be evaluated annually under minimum load conditions for voltage and loading violations. PV facilities shall be evaluated using minimum daytime load (30% of annual peak), unless otherwise specifically known. Other DG facilities will be evaluated using circuit minimum load (25% of annual peak).

4.2.3.1 DG Dispatch

When performing minimum load circuit analysis all large and small DG interconnections shall be modeled at 100% of their AC rating at the point of interconnection.

4.2.4 Other Analysis

4.2.4.1 Customer Load Addition

Peak load models shall be used to evaluate new customer additions to confirm the distribution circuit can accommodate the added load.

4.2.4.2 Protection Review

Peak load models shall be used to review protective device coordination. These reviews will be performed at the request of the manager of Distribution Engineering or as needed due to load additions, reliability improvements, etc.

4.2.4.3 Circuit Tie Analysis

Analysis shall be performed on all mainline distribution circuit ties on a regular basis. Circuit ties shall be evaluated using projected summer peak loads for the first year of the study period. Circuit ties shall be assessed for loading, voltage and protection sensitivity violations.

It is understood that marginal low voltage and protection coordination concerns may exist while circuits are tied. For the purposes of this review all elements may be operated up to their long term emergency ratings while circuits are tied.

4.3 Addressing System Constraints

Distribution planning should clearly identify results that fail to satisfy criteria. All identified constraints should be reviewed in additional detail and verified against available field measurements to determine the severity of the concern.

System modification options shall be evaluated when any of the following planning thresholds are reached:

- Loading of substation transformers, stepdown transformers, protective devices and other distribution circuit elements are anticipated to reach 90% of their respective limits outlined within this guideline.
- Current imbalance at the distribution circuit supply point is recorded to be greater than 20%.
- Steady state primary voltage levels cannot be maintained within the limits outlined within this guideline.
- Steady state primary voltage imbalance is anticipated to exceed the limits outlined within this guideline.
- Protective device sensitivity does not meet the requirements set forth in Unitil's *Distribution Protection Guideline* (Guideline #GL-DT-TC-09).

Non-Wires Alternative (NWA) projects should be reviewed for any piece of Major Equipment that is expected to exceed 80% of its seasonal normal rating during the five year study period and exceed 90% of its seasonal normal rating in year five of the study period during normal operating conditions.

Under planned contingency configurations NWA projects should be reviewed anytime Major Equipment is expected to exceed 90% of its seasonal normal rating during the five year study period and exceed 100% of its seasonal normal rating in year five of the study period.

4.4 Development and Evaluation of Options

If the performance of the system does not or is not projected to conform to applicable criteria then alternative solutions shall be developed and evaluated per Unitil's *Project Evaluation Procedure* (PR-DT-DS-11).

4.4.1 Performance

The system performance with the proposed options should meet or exceed all applicable planning criteria for the duration of the five-year planning horizon. This does not preclude incremental system upgrades or modifications that are implemented as part of a multi-phase project to meet this overall objective.

4.4.2 Capacity

All equipment should be sized based on economics, operating requirements, standard sizes, and engineering judgment. Engineering judgment should include recognition of

realistic future constraints that may be avoided with minor incremental expense. As a rough guide, unless the equipment is part of a staged expansion, the capability of any new equipment or facilities should be sufficient to operate without constraining the system and without additional major modifications for at least ten years.

4.4.3 Recommendation

Every identified violation of design criteria should have a proposed recommended action.

5.0 Distribution Planning Studies

Distribution planning study reports shall be created to document the results of distribution load projections, annual distribution circuit analysis and circuit tie analysis. The studies should detail modelling assumptions, analysis procedures, identified constraints, options for system upgrades or modifications considered and final recommendations.

In additional to reporting on the results of distribution load projections and circuit analysis distribution planning studies should contain the following:

5.1 Master Plan

A long range master plan should be included in the distribution planning studies. The purpose of this plan is to provide strategic direction for the development of the electric distribution system as a whole. It is not intended to be a cost-benefit justification for major system investments, but is meant to guide design decisions for various individual projects to work towards comprehensive system objectives.

The master plan should consist of the following:

- Master Plan Map
  - Existing and future mainline backbone.
  - Existing and future sectionalizing devices to work towards achieving the requirements detailed in Unitil's *Reliability Construction Guidelines* (GL-DT-DS-11).
  - Vision (including device locations) for the implementation of distribution automation and "self-healing" of existing and future mainline backbones.
- Detailed Description of the Master Plan by area

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Unitil Unitil	Guidelines	Procedure No.	GL-DT-DS-02
	Distribution Engineering	Page No.	~~A-1~~1
		Revision No.	~~5~~6
	Distribution Planning Guide	Revision Date	11/14/2019
		Supersedes Date:	09/17/2018~~08/22/2017~~

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~~Appendix A – Request for Procedure/Change Form~~

~~Requestor:~~ _____ ~~Item(s)/Section to be changed (if applicable):~~

~~Title:~~ _____ ~~Section:~~ _____

~~Department:~~ _____ ~~Page:~~ _____

~~Location/DOC:~~ _____ ~~Figure:~~ _____

~~Date:~~ _____ ~~Appendix~~ _____

~~Procedure No.:~~ _____ ~~Other:~~ _____

~~For New Procedures~~

~~Description of new procedure to be developed:~~ _____

~~Reason for new procedure:~~ _____

~~For Changes to Existing Procedures~~

~~Description of requested change(s):~~ _____

~~Reason for requested change(s):~~ _____

~~Instructions:~~ ~~The individual requesting a new procedure or change(s) to existing procedures shall complete this form and submit it to the Director of the applicable department. For changes to procedures please attach a copy of the existing procedure with revisions marked on the copy.~~

~~Requestors Signature:~~ _____ ~~Date:~~ _____

~~For Reviewers Use Only~~			
~~Change(s) Approved?~~	~~YES~~ ~~NO~~	~~If No, briefly explain~~	_____
~~Changes Implemented?~~	~~YES~~ ~~NO~~	~~Date Implemented:~~	_____
~~Reviewers Signature:~~		~~Date:~~	

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Attachment - KFD - 4

Smart Grid Technology Investments

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 1

Received: May 20, 2020 Date of Response: June 4, 2020
Request No. Staff 1-8 Witness: Jacob Dusling

Request:

Reference Company Least Cost Integrated Resource Plan at Page 25 of 590, Section 12.3, describing existing and planned smart grid technology. Please describe the process, impact, and timing as it relates to New Hampshire Grid mod and ultimately New Hampshire Unitil customers, if the Company's plan in Massachusetts is to "improve the integration of outage information from AMI into the OMS prediction engine" and "It is Unitil's intention to implement the improvement to this AMI/OMS integration in its FG&E and UES subsidiaries."

Response:

The effort to improve the integration of outage information from AMI into the OMS prediction engine is on-going as part of the Company's Grid Modernization plan in Massachusetts. This effort is currently expected to be completed by the end of 2020. This improvement will be implemented in FG&E and UES at the same time. The Company has one model used within its OMS system that includes both the UES and FG&E service territories. Therefore, it is not possible to implement this project for FG&E and not for UES.

This enhancement requires the creation and implementation of algorithm(s) and logic to improve the integrity of outage/lost meter information from AMI endpoints. OMS will utilize this information to verify outages and improve its ability to identify nested outages.

This will result in shorter outages as the Company will be able to locate outages more quickly and improve the detection of nested outages before crews leave the area. The description of this project excerpted from Fitchburg Gas and Electric Company's Grid Modernization Plan is attached as Staff 1-8 Attachment 1.

Attachment - KFD - 5

3348, 3350, and 3359 Line ROW Rebuild

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 1

Received: May 20, 2020 Date of Response: June 4, 2020
Request No. Staff 1-5 Witness: Jacob Dusling

Request:

Reference Company Least Cost Integrated Resource Plan at Page 49 of 590 describing a $5,377,669 investment in 2021 under DPB 23 ("3348/50 Lines – Rebuild). Please provide any supporting documentation describing this project.

Response:

This is year one of a two year project to rebuild 4.5 mile of 35kV subtransmission line that runs from Hampton to Seabrook across the salt marsh. This project is being performed to address condition concerns associated with the existing lines.

Attached as Staff 1-5 Attachment 1 is a document discussing the concerns and describing the options reviewed for the 3348 and 3350 line replacement. Also attached as Staff 1-5 Attachment 2 is an email that describes the estimated cost to repair the structures identified in the condition assessment referenced in the response to Staff 1-7.

3348, 3350 and 3359 Line – Concerns and Options

8/24/18

The 3348, 3350 and a small portion of the 3359 lines are constructed across the salt marsh in Hampton, Hampton Falls and Seabrook. There are condition related concerns associated with the aging infrastructure and significant accessibility and permitting challenges exist due to the location of the lines. This can cause the line(s) to be out of service for several months at a time when structure damage occurs.

In addition to the concerns associated with the condition and location of the lines the following concerns have also been identified. Based on 2018 peak loads it is possible that some of these constraints could be in the ten year planning horizon when planning studies are completed in 2019.

Pre-Existing Concerns

- All load cannot be restored for damage to the 3348/3350/3359 tap structure
- Load must be switched from the 3353 line to the 3342 line at Hampton Beach substation prior to restoring load following the loss of the 3359 line.
- Load must be switched from the 3348 line to the 3359 line prior to restoring load for the loss of the 3353 line or the 3342 line from Guinea to Hampton.

2024-2029

- Expected to exceed phase pick-up of 15X1 for loss of the 3350 line.

2030-2040

- 3359 line loading is expected to violate planning criteria for loss of the 3348 line (and loss of the 3353 line or loss of the 3342 line due to the need to transfer 3348 line load to the 3359 line)
- 3348 line loading is expected to violate planning criteria for loss of the 3359 line

OPTIONS

The following options have been considered to resolve the constraints associated with the 3348, 3350 and 3359 Lines. All cost estimates below assume overhead construction and are based on estimates provided in 2013 and/or past similar projects and do not include overheads. Underground constructions may be a viable alternative to many of the options below and will be reviewed in more detailed if the need arises.

1. **Rebuild 3350/3348 Lines**

   Reconstruct the 3348/3359 Line from Hampton substation to the 3359J3 switch with 795AA conductor. Reconstruct the 3350 Line from the 3350 tap to Seabrook substation with 336AA conductor. All associated switches and other current carrying shall be replaced with 1200A equipment.

   Install protective devices at the 3350 tap that will operate as follows:

   - Fault on 3359 Line – 3348 and 3350 will remain energized
   - Fault on 3348 Line – Automatically restore 3350 Line from the 3359 Line
   - Fault on 3350 Line – 3348 and 3359 remain energized

Cost Estimate: $7,700,000

Pros

- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.
- Does not require constructing subtransmission lines in town/state RoW.
- Addresses 3348 loading concerns.
- Can provide redundant supply to Seabrook Substation by constructing subtransmission along town/state roads from Cemetery Lane substation to Seabrook substation in the future.
- Seabrook Station retains redundancy.
- Seabrook substation retains distribution backup.

Cons:

- Does not address accessibility and permitting concerns associated with lines being constructed on the salt marsh.
- 3342, 3353 and 3359 loading concerns remain.

2. Construct New Line in the 3359 RoW

Construct a 2nd line in the 3359 right-of-way from Guinea switching station to the vicinity of Provident Way. To accommodate the new line the Guinea Bus will be reconfigured to allow the new line to terminate on the north bus (opposite bus to the 3359 line). Additionally, the 3359 line will need to be reconstructed to provide space for the new line. Due to narrow portions of the 3359 line RoW portions of the new line and 3359 line may need to be double circuited.

A new subtransmission tap will be constructed along Provident Way to supply Seabrook Station and allow a new subtransmission line to be constructed from Dow's Lane to Seabrook substation. The new subtransmission line will be double circuited with the existing 7X2 distribution circuit.

The 3348 and 3350 lines would be removed once the new lines are constructed.

Cost Estimate: $9,750,000

OTHER ROUTE OPTIONS

a. Construct the new line in the 3359 RoW to the intersection of the railroad RoW and Provident Way. The new subtransmission line will continue in the railroad RoW from Provident Way to Route 286 and a double circuit subtransmission/distribution line will be constructed from the railroad RoW to Seabrook substation along Route 286.

   Cost Estimate: $8,600,000

b. End the new line at Lafayette Road/Cemetery Lane substation and construct double circuit subtransmission/distribution line from Lafayette Road to Seabrook substation via Route 1, Walton Rd, Washington St and Route 286.

Cost Estimate: $10,300,000

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses loading concerns on the 3342, 3348, 3353 and 3359 lines.

Cons:

- Requires reconstruction of 3359.
- Narrow 3359 corridor could introduce additional tree exposure and may require portions of double circuit subtransmission.
- Requires the construction of double circuit subtransmission/distribution lines in town/state RoW.
- Seabrook station redundancy is reduced.
- Reduces distribution backup for Seabrook substation

3. Construct New Line in the Railroad RoW

Construct a new subtransmission line in the railroad RoW from Hampton substation to Route 286 and construct a new double circuit subtransmission/distribution line from Route 286 to Seabrook substation. A new subtransmission tap will be constructed where the 3359 line crossed the railroad RoW.

Unitil will need to acquire easement to construct a line in the railroad RoW and will need to assess how this area will be accessed for construction and maintenance.

The 3348 and 3350 lines would be removed once the new lines are constructed.

Cost Estimate: $6,050,000

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.
- Seabrook Station retains redundancy.

Cons:

- Requires easement acquisition. Past research has indicated that this easement would need to be acquired from Eversource. Unitil approached Eversource a few years ago about acquiring the necessary easement and at that time Eversource did not have any interest in relinquishing rights.
- Requires the construction of double circuit subtransmission/distribution lines in town/state RoW.
- 3342, 3353 and 3359 loading concerns remain.
- Reduces distribution backup for Seabrook substation

4. Construct New Line in the I-95 RoW

Construct a new subtransmission line in the I-95 RoW from the 3342/53 corridor to Folly Mill Road. A new subtransmission line will be constructed from Guinea to I-95 and a new double circuit subtransmission/distribution line will be built from Folly Mill Road to Seabrook substation. Additionally, the Guinea Bus will be reconfigured to allow the new line to terminate on the north bus (opposite bus to the 3359 line).

Unitil will need to acquire rights to construct a line in the I-95 RoW and will need to assess how this area will be accessed for construction and maintenance.

The 3348 and 3350 lines would be removed once the new lines are constructed.

Cost Estimate: $8,800,000

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.
- Addresses loading concerns on the 3342, 3348 and 3353 lines.

Cons:

- Requires land rights acquisition in I-95 corridor.
- Requires the construction of double circuit subtransmission/distribution lines in town/state RoW.
- Seabrook station redundancy is reduced.
- Reduces distribution backup for Seabrook substation

5. "Distribution Route" Option

There are several options to supply this area via double circuit subtransmission/distribution lines and remove the 3348 and 3350 lines from the marsh. Below are three general options that will require field survey to determine the ultimate routes of construction.

a. Route 1

Construct a double circuit subtransmission/distribution line from Hampton substation to Railroad along Route 1 and from Railroad Ave to Seabrook S/S via Railroad Ave, Centennial Rd, Washington St and Route 286.

The new subtransmission line will tie into the existing 3359 line where the 3359 line crosses Route 1.

Cost Estimate: $10,250,000

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.

Cons:

- 3342, 3353 and 3359 loading concerns remain.
- Requires the construction of double circuit subtransmission/distribution lines in town/state RoW.
- Seabrook station redundancy is reduced.
- Reduces distribution backup for Seabrook substation
- Guying challenges due to narrow state/town ROW

b. Hampton Beach

Construct a double circuit subtransmission/distribution line from Hampton Beach substation to Cemetery Lane substation via Ashworth Ave, Route 1A, Route 286, Washington St, Centennial Rd, Railroad Ave and Route 1.

A new tap will be constructed along the new subtransmission line to supply Seabrook substation.

Cost Estimate: $12,250,000

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.
- Provides full redundancy to Seabrook substation.

Cons:

- 3342, 3353 and 3359 loading concerns remain.
- Requires the construction of double circuit subtransmission/distribution lines in town/state RoW.
- Seabrook station redundancy is reduced.
- Reduces distribution backup for Seabrook substation
- Would require the reconstruction of the 3342/53 lines from the 3346 Line tap to Hampton Beach substation in the near future.
- Places 34.5 kV subtransmission along the immediate coastline.
- Requires the crossing of Hampton Harbor Canal
- May have future voltage violations due to the distance from Guinea to Mill Lane in this configuration.
- Guying challenges due to narrow state/town ROW

c. Route 1 to Cemetery Lane Hampton, Beach to Seabrook S/S

Construct a double circuit subtransmission/distribution lines from Hampton substation to the intersection of Route 1 and the 3359 line and from Hampton Beach substation to Seabrook S/S via Ashworth Ave, Route 1A.

Cost Estimate: $8,500,000

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.
- Defers the need to address 3359 line loading concerns.
- Distribution back to Seabrook S/S remains.

Cons:

- 3342 and 3353 loading concerns remain.
- Requires the construction of double circuit subtransmission/distribution lines in town/state RoW.
- Seabrook station redundancy is reduced.
- Reduces distribution backup for Seabrook substation
- Requires the crossing of Hampton Harbor Canal
- Guying challenges due to narrow state/town ROW

6. Seabrook System Supply

Construct a new 345-34.5kV system supply in the vicinity of Cemetery Lane substation. Construction to include two transformers and six 34.5 kV circuit positions, including two distribution circuits, the 3359 line, a new subtransmission line, a supply to Seabrook Station and one future position.

The 3359 line will be normally open at Guinea and the new subtransmission line will be double circuited with a distribution line to supply Seabrook substation. One distribution circuit will supply circuit 15X1 and the other will supply circuit 2X3 with 2X3 normally open at Hampton.

Additional study will be required to confirm the number of transformers needed. It could be possible to upgrade the distribution system to allow all load to be restored via other sources for loss of a transformer.

Unitil will need to acquire land rights to construct the new substation and Eversource and/or NextEra will need to build transmission facilities to accommodate the new supply station.

The 3348 and 3350 lines would be removed once the new lines are constructed.

Cost Estimate: $TBD ($17,500,000+)

Pros

- 3348 and 3350 lines will be removed from the Marsh
- Addresses the condition related concerns associated with the 3348 and 3350 lines without rebuilding the 3359 line.
- Addresses loading concerns on the 3342, 3348, 3353 and 3359 lines.
- Transfers load to Unitil owned system supply
- Provides for long-term capacity and voltage support for the Seabrook area.

Cons:

- Requires land rights to construct substation.
- Requires construction by Eversource and/or NextEra
- Introduces 345kV equipment to Unitil
- Seabrook station redundancy is reduced.
- Requires the construction of double circuit subtransmission/distribution construction.
- Reduces distribution backup for Seabrook substation

A. Options to Supply Seabrook Substation

Several of the options above require the construction of a new double circuit subtransmission/distribution lines Seabrook substation. An alternative to the construction of a new subtransmission line is to upgrade and reconfigure the existing distribution system to supply Seabrook substation. For example,

a. In Option 2 above circuit 59X1 could be reconfigured to supply 15X1 up to Railroad Ave and Railroad Ave could be converted to 34.5 kV. Circuit 15X1 would supply circuit 7X2 and Seabrook substation via Railroad Ave.
b. In option 2a or 3 a new subtransmission tap could be constructed at the intersection of the railroad ROW and Route 286. Route 286 would be rebuilt and the new circuit would supply 7X2 and Seabrook substation. In this scenario the 7X2 regulators would be removed and the 7X2 reclosers could be used for high-side transformer protection.

Additional analysis will need to be completed to confirm the viability of these types of options and to detail the work required to maintain distribution switching availability.

NEXT STEPS

Based on this review the following next steps are recommended:

- Perform a condition assessment of the 3348 and 3350 lines.
- Complete a preliminary design and develop a detailed cost estimate to rebuild the 3348 and 3350 lines in their existing ROW.
- Complete a preliminary design and develop a detailed cost estimate to construct a 2nd subtransmission line in the 3359 line ROW from Guinea to the Cemetery/Provident Way area.
    - Reconfigure Guinea bus to allow new line to be supplied from opposite bus half as the 3359 line
    - Double Circuit subtransmission/distribution line from Provident Way to Seabrook substation via Dow's Lane, Centennial Road, Washington Street and Route 286
    - New subtransmission line in the railroad ROW from Provident Way to Route 286 and double circuit subtransmission/distribution line from railroad ROW to Seabrook substation along Route 286.
- Explore the feasibility of acquiring the following easements:
    - Along the railroad corridor from Hampton S/S (traffic circle) to Provident Way
    - Along the railroad corridor from Provident Way to NH stateline
    - Provident Way to Dow's Lane
- Perform detailed circuit analysis to determine if distribution modifications can be made to allow Seabrook substation to be permanently supplied via distribution circuits.

Due to the challenges associated with the options to construct a line in the I-95 RoW, the distribution options and the Seabrook system supply it is recommended that the steps above be performed prior to evaluating these options. The I-95, distribution options and Seabrook system supply options will be reviewed if the other options are deemed unfeasible or the detailed estimates are more costly than expected.

Dusling, Jacob

From: Dusling, Jacob
Sent: Tuesday, July 2, 2019 9:08 AM
To: Wade, Scott
Subject: RE: 3348-50 Discussion

Both are on the 50 line and in Seabrook.

From: Wade, Scott
Sent: Tuesday, July 2, 2019 9:07 AM
To: Dusling, Jacob
Subject: RE: 3348-50 Discussion

And what town(s) are they in?
Putting the budget item together.

From: Wade, Scott
Sent: Tuesday, July 02, 2019 9:06 AM
To: Dusling, Jacob
Subject: RE: 3348-50 Discussion

Is 2064 and 2085 on the 48 line?

From: Dusling, Jacob
Sent: Monday, July 01, 2019 1:58 PM
To: Sprague, Kevin; Bonazoli, John; Wade, Scott; Aquilina, Patrick; Letourneau, Raymond
Subject: RE: 3348-50 Discussion

As discussed a did a review of the reject poles and below is a list of structures in which both poles of the structure are rejects and at least one of the poles has less than 50% remaining strength.

Structure	Remaining Strength Pole 1	Remaining Strength Pole 2
2014	23%	63%
2015	38%	59%
2029	49%	61%
2057	45%	66%
2064	25%	52%
2066	46%	62%
2084	49%	59%
2085	25%	54%

-----Original Appointment-----
From: Dusling, Jacob
Sent: Thursday, June 13, 2019 10:43 AM
To: Dusling, Jacob; Sprague, Kevin; Bonazoli, John; Wade, Scott; Aquilina, Patrick; Letourneau, Raymond
Subject: 3348-50 Discussion
When: Monday, July 1, 2019 10:00 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: Hampton - Main South

Meeting to discuss next steps in addressing concerns associated with the 3348 and 3350 lines.

Osmose has completed the inspection of the 3348 and 3350 lines and have identified 39 reject poles on 25 different structures. Pat has completed a very preliminary estimate based on the cost of previous structure replacements on the 3348 lines. The high-level estimated cost to replace the 25 structures is approximately $2M.

Addressing the rejected structures will not necessarily address all the condition based concerns associated with the lines. There are a significant number of splices, aging insulators, rotting crossarm and corroded anchors throughout the line. Addressing these concerns is not included in the $2M estimate above. Historically, we have had a mixed bag of failures along the 3348/50 ranging from failed splices, burned down conductor, failed insulators, broken ties and failed structures.

Also, it should be noted that based on this inspection 165 of the of the 217 poles inspected are class 4 poles (there is also one class 5 pole).

For discussion purposes I have attached a document that was created a while ago that discusses potential options for rebuilding/relocating the 3348/50 lines. The high-level cost estimate for rebuilding the 3348-50 lines in place is $7.7M. There could be other options to upgrade the distribution system and eliminate the 3350 and/or 3348 lines that are not discussed in this document, such as creating new circuits at Cemetery Lane and Stard Road to allow 15X1 to supply Seabrook substation load or creating ties 27X1 and 28X1 to allow load to be shifted off the 3359 line to the 43/54 corridor to allow distribution ties to restore all load for loss of the 3359 line.

<< File: 3348 and 3350 Line Options.docx >>

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 1

Received: May 20, 2020 Date of Response: June 4, 2020
Request No. Staff 1-7 Witness: Jacob Dusling

Request:

Reference Company Least Cost Integrated Resource Plan at Page 587 of 590 stating "In 2019 a detailed assessment of the present condition of these [3348 and 3350] lines was completed. Following the completion of the assessment options for repairs, replacement, or relocation of these lines will be evaluated to mitigate the identified concerns." Please provide the 2019 condition assessment and any other assessments that may have been completed since 2016 regarding options for repairs, replacement, or relocation of the 3348 and 3350 lines.

Response:

Attached as Staff 1-7 Attachments 1 and 2 are the results of the condition assessment the Company contracted Osmose Utility Services to complete. This assessment identified 39 reject poles on 25 different two pole structures.

Unitil elected to replace eight of the identified structures with temporary single-pole structures while a permanent line replacement could be designed and constructed. These structures are defined in the email provided in Staff 1-5 Attachment 2.

Options for replacement and relocation are provided in the response to Staff 1-5 Attachment 1.

DE 20-002
Staff 1-5 Attachment 1
Page 14 of 67

PROJECT TO DATE - CONDITIONS

Unitil Service Corporation

Job Number: 1028562

1028562

Starting 05/16/2019 Through 05/18/2019

POLE CONDITIONS

Serviceable Poles		Quantity	% of Total Poles
No Decay		11	31.4%
Decayed but Serviceable		23	65.7%
	Total	**34**	**97.1%**
Reject Poles			
NonPriority Groundline Rejects		1	2.9%
	Total	**1**	**2.9%**
	Total Pole Conditions	**35**	**100.0%**

REJECT POLES

Restorable Poles		Quantity	% of Total Poles	% of Reject Poles
CTRUSS Standard - NonPriority		1	2.9%	100.0%
	Total	**1**	**2.9%**	**100.0%**
	Total Reject Poles	**1**	**2.9%**	

OTHER CONDITIONS

	Quantity	% of Total Poles
Not In Field	2	5.7%

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_18_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2107 Customer Data ID:2108	1978	45/3	Southern Pine/Penta	46.00	46.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839258 y: 42.869302										
2108 Customer Data ID:2109	1978	45/3	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839220 y: 42.869330										
2106 Customer Data ID:2107	1978	45/3	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**		Mechanical Damage Below 5ft	
x: -70.839273 y: 42.869636										
2106PB Customer Data ID:2107B	1978	45/3	Southern Pine/Penta	41.00	41.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839283 y: 42.869631										
2105 Customer Data ID:2106	1978	45/3	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839301 y: 42.869889										
2105PB Customer Data ID:2106PB	1978	45/3	Southern Pine/Penta	37.50	37.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839300 y: 42.869897										
2104 Customer Data ID:2105	1987	40/3	Southern Pine/Penta	34.00	31.43	PD - Partial Excavate w/ Decay	**Non Reject**	**79.00**		**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *3* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *3* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *3* **Orientation:** *-LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *3* **Orientation:** *+LOL* **Shell Rot Depth:** *0.32*
x: -70.839407 y: 42.871200										
2102PB Customer Data ID:2105PB	1978	40/3	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839408 y: 42.871190										
2101PB Customer Data ID:2104PB	1988	40/4	Southern Pine/Penta	32.00	32.00	P - Partial Excavate	**Non Reject**			
x: -70.839441 y: 42.871734										
2100PB Customer Data ID:2103PB	1989	35/4	Southern Pine/Penta	33.00	33.00	P - Partial Excavate	**Non Reject**		Guy Slack or Broken	
x: -70.839482 y: 42.872316										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_18_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2101 Customer Data ID:2103	1989	40/4	Southern Pine/Penta	35.50	35.50	P - Partial Excavate	**Non Reject**			
x: -70.839501 y: 42.872300										
2100 Customer Data ID:2102	1989	40/4	Southern Pine/Penta	37.00	37.00	P - Partial Excavate	**Non Reject**		Guy Slack or Broken	
x: -70.839543 y: 42.872954										
2099PB Customer Data ID:2102PB	1989	40/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839554 y: 42.872923										
2099 Customer Data ID:2101	1989	40/4	Southern Pine/Penta	35.00	35.00	P - Partial Excavate	**Non Reject**			
x: -70.839591 y: 42.873502										
2098PB Customer Data ID:2101PB	1989	40/4	Southern Pine/Penta	32.00	32.00	P - Partial Excavate	**Non Reject**			
x: -70.839609 y: 42.873516										
2098 Customer Data ID:2100	1989	40/4	Southern Pine/Penta	34.00	34.00	P - Partial Excavate	**Non Reject**			
x: -70.839637 y: 42.874143										
2097PB Customer Data ID:2100PB	1989	40/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839620 y: 42.874141										
2097 Customer Data ID:2099	1989	40/4	Southern Pine/Penta	35.00	35.00	P - Partial Excavate	**Non Reject**			
x: -70.839705 y: 42.874692										
2096PB Customer Data ID:2099PB	1989	40/4	Southern Pine/Penta	30.50	30.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839654 y: 42.874695										
2096 Customer Data ID:2098	1989	40/4	Southern Pine/Penta	35.00	35.00	P - Partial Excavate	**Non Reject**			
x: -70.839725 y: 42.875295										
2095PB Customer Data ID:2098PB	1989	40/4	Southern Pine/Penta	33.50	33.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839685 y: 42.875316										
2096PB Customer Data ID:2097PB	1989	40/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839719 y: 42.875990										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_18_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2095 Customer Data ID:2097	1989	40/4	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839739 y: 42.875965										
2095 Customer Data ID:2096	1989	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839850 y: 42.877144										
2095PB Customer Data ID:2096PB	1989	35/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839823 y: 42.877137										
2096PB Customer Data ID:2095	1989	35/4	Southern Pine/Penta	0.00		V - Visual Report	**Non Reject**			**Not Inspected Reason:** Not in Field
x: -70.839779 y: 42.875956										
2096 Customer Data ID:2095PB	1989	35/4	Southern Pine/Penta	0.00		V - Visual Report	**Non Reject**			**Not Inspected Reason:** Not in Field **Notes:** Duplicate
x: -70.839744 y: 42.875957 Location: black water rd										
2095 Customer Data ID:2094PB	1989	35/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839746 y: 42.875926										
2095PB Customer Data ID:2094	1988	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.839762 y: 42.875916										
2093PB Customer Data ID:2092	1989	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			**Image Name:** *2093PB_4_Customer Required_Other.jpg*
x: -70.839836 y: 42.877115										
2093 Customer Data ID:2092PB	1989	35/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839837 y: 42.877090										
2092PB Customer Data ID:2091	1953	40/4	Southern Pine/Creosote	35.00	30.47	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:***3* **Width:***4* **Orientation:***-135* **Shell Rot Depth:***0.48* **Image Name:** *2092PB_3_Customer Required_Other.jpg*
x: -70.839908 y: 42.877718 Location: black water rd										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_18_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2092 Customer Data ID:2091PB	1959	35/4	Southern Pine/Creosote	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.839887 y: 42.877720									
2094 Customer Data ID:2093PB	1988	35/4	Southern Pine/Penta	35.50	35.50	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.839796 y: 42.876512									
2094PB Customer Data ID:2093	1988	40/4	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.839825 y: 42.876507									

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_18_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2106 Customer Data ID:2107	1978	45/3	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**		Mechanical Damage Below 5ft	
x: -70.839273 y: 42.869636										
2100PB Customer Data ID:2103PB	1989	35/4	Southern Pine/Penta	33.00	33.00	P - Partial Excavate	**Non Reject**		Guy Slack or Broken	
x: -70.839482 y: 42.872316										
2100 Customer Data ID:2102	1989	40/4	Southern Pine/Penta	37.00	37.00	P - Partial Excavate	**Non Reject**		Guy Slack or Broken	
x: -70.839543 y: 42.872954										
2095PB Customer Data ID:2094	1988	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.839762 y: 42.875916										
2092PB Customer Data ID:2091	1953	40/4	Southern Pine/Creosote	35.00	30.47	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3* **Width:** *4* **Orientation:** *-135* **Shell Rot Depth:** *0.48* **Image Name:** *2092PB_3_Customer Required_Other.jpg*
x: -70.839908 y: 42.877718 Location: black water rd										

Osmose Utilities Services, Inc.

Restorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_18_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2092PB Customer Data ID:2091	1953	40/4	Southern Pine/Creosote	35.00	30.47	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *3* **Width:** *4* **Orientation:** *-135* **Shell Rot Depth:** *0.48* **Image Name:** *2092PB_3_Customer Required_Other.jpg* **Photo Description:** *Customer Required|Other*
x: -70.839908 y: 42.877718 Location: black water rd										

Osmose Utilities Services, Inc.

PROJECT TO DATE - CONDITIONS

Unitil Service Corporation

Job Number: 1028562

1028562

Starting 05/19/2019 Through 05/22/2019

POLE CONDITIONS

Serviceable Poles		Quantity	% of Total Poles
No Decay		26	14.3%
Decayed but Serviceable		118	64.8%
	Total	**144**	**79.1%**
Reject Poles			
NonPriority Groundline Rejects		38	20.9%
	Total	**38**	**20.9%**
	Total Pole Conditions	**182**	**100.0%**

REJECT POLES

Restorable Poles		Quantity	% of Total Poles	% of Reject Poles
CTRUSS Standard - NonPriority		22	12.1%	57.9%
	Total	**22**	**12.1%**	**57.9%**
Non-Restorable Poles				
Top of Truss Shell Only		16	8.8%	42.1%
	Total	**16**	**8.8%**	**42.1%**
	Total Reject Poles	**38**	**20.9%**	

OTHER CONDITIONS

	Quantity	% of Total Poles
Not In Field	1	0.5%

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2071PB Customer Data ID:2070	1989	40/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840561 y: 42.890212										
2071 Customer Data ID:2070PB	1989	35/4	Southern Pine/Penta	31.00	31.00	PD - Partial Excavate w/ Decay	**Non Reject**			**Image Name:** *2071_78_Customer Required.jpg*
x: -70.840533 y: 42.890213										
2070PB Customer Data ID:2069	1957	40/4	Southern Pine/Creosote	33.50	28.25	PX - Partial Excavate Reject	**Restorable Reject**	**60.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3* **Width:** *6.5* **Orientation:** *-45* **Enclosed Pocket Depth:** *4* **Width:** *8* **Minimum Shell:** *2.5* **Orientation:** *-90* **Shell Rot Depth:** *0.24*
x: -70.840524 y: 42.890671 Location: farm ln										
2070 Customer Data ID:2069PB	1957	40/4	Southern Pine/Creosote	31.00	26.43	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *2* **Width:** *2* **Orientation:** *-135* **Shell Rot Depth:** *0.64*
x: -70.840492 y: 42.890686 Location: farm ln										
2069PB Customer Data ID:2068	1957	40/4	Southern Pine/Creosote	34.00	28.99	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Enclosed Pocket Depth:** *4* **Width:** *7.5* **Minimum Shell:** *1.5* **Orientation:** *-90* **Shell Rot Depth:** *0.4*
x: -70.840504 y: 42.891183 Location: farm ln										
2069 Customer Data ID:2068PB	1957	40/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken Pulled Anchor	
x: -70.840485 y: 42.891214										
2068PB Customer Data ID:2067	1989	40/4	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840534 y: 42.891802										
2068 Customer Data ID:2067PB	1989	35/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840517 y: 42.891791										
2067PB Customer Data ID:2066	1957	35/4	Southern Pine/Creosote	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840522 y: 42.892383										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2067 Customer Data ID:2066PB	1957	35/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840496 y: 42.892382										
2072 Customer Data ID:2071PB	1957	40/4	Southern Pine/Creosote	36.00	28.76	PX - Partial Excavate Reject	**Restorable Reject**	**51.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *5* **Width:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5.5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Shell Rot Depth:** *0.48* **Image Name:** *2072_93_Customer Required.jpg*
x: -70.840463 y: 42.889635 Location: farm ln										
2072PB Customer Data ID:2071	1957	40/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840492 y: 42.889623										
2074PB Customer Data ID:2073	1989	40/4	Southern Pine/Creosote	40.00	40.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840501 y: 42.888433										
2074 Customer Data ID:2073PB	1989	40/4	Southern Pine/Creosote	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840486 y: 42.888441										
2073PB Customer Data ID:2072	1989	40/4	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840515 y: 42.888982										
2073 Customer Data ID:2072PB	1989	35/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			**Image Name:** *2073_72_Customer Required.jpg*
x: -70.840491 y: 42.888994										
2075 Customer Data ID:2074PB	1989	40/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840468 y: 42.887719										
2075PB Customer Data ID:2074	1989	40/4	Southern Pine/Penta	37.50	37.50	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840492 y: 42.887675										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2076 Customer Data ID:2075PB	1989	40/4	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840487 y: 42.887201										
2076PB Customer Data ID:2075	1989	40/4	Southern Pine/Penta	31.00	31.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840473 y: 42.887216										
2077 Customer Data ID:2076PB	1957	40/4	Southern Pine/Creosote	31.50	27.00	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.72*
x: -70.840473 y: 42.886692 Location: farm In										
2077PB Customer Data ID:2076	1957	40/4	Southern Pine/Creosote	32.00	27.58	PX - Partial Excavate Reject	**Restorable Reject**	**64.00**	Restoration Recommended	**Decay: Enclosed Pocket Depth:** *4.5* **Width:** *7* **Minimum Shell:** *3* **Orientation:** *-90* **Enclosed Pocket Depth:** *4.5* **Width:** *7* **Minimum Shell:** *3* **Orientation:** *+90* **Shell Rot Depth:** *0.64*
x: -70.840499 y: 42.886701 Location: farm In										
2078PB Customer Data ID:2077	1989	35/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840460 y: 42.886088										
2078 Customer Data ID:2077PB	1989	40/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840476 y: 42.886078										
2079PB Customer Data ID:2078	1957	40/4	Southern Pine/Creosote	33.00	28.73	PX - Partial Excavate Reject	**Non Restorable Reject**	**66.00**	Replacement Recommended Guy Slack or Broken Pulled Anchor	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Image Name:** *2079PB_21_Customer Required.jpg 2079PB_22_Customer Required.jpg 2079PB_23_Customer Required.jpg*
x: -70.840466 y: 42.885479 Location: farm In										
2079 Customer Data ID:2078PB	1957	35/4	Southern Pine/Creosote	33.00	28.00	PX - Partial Excavate Reject	**Restorable Reject**	**61.00**	Restoration Recommended Pulled Anchor	**Decay: Shell Rot Depth:** *0.8* **Image Name:** *2079_71_Customer Required.jpg*
x: -70.840441 y: 42.885504 Location: farm In										
2080PB Customer Data ID:2079	1989	40/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840416 y: 42.884865										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2080 Customer Data ID:2079PB	1989	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840397 y: 42.884869										
2081PB Customer Data ID:2080	1957	40/4	Southern Pine/Creosote	30.00	29.00	PD - Partial Excavate w/ Decay	**Non Reject**	**90.00**		**Decay: Shell Rot Depth:** *0.16*
x: -70.840379 y: 42.884286										
2081 Customer Data ID:2080PB	1957	40/4	Southern Pine/Creosote	31.50	31.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840381 y: 42.884274										
2082PB Customer Data ID:2081	1957	40/4	Southern Pine/Creosote	31.50	26.00	PX - Partial Excavate Reject	**Restorable Reject**	**56.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.88*
x: -70.840323 y: 42.883664 Location: farm ln										
2082 Customer Data ID:2081PB	1957	40/4	Southern Pine/Creosote	31.00	27.00	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840302 y: 42.883674 Location: farm ln										
2083 Customer Data ID:2082PB	1957	40/4	Southern Pine/Creosote	35.50	35.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840303 y: 42.883232										
2083PB Customer Data ID:2082	1957	35/4	Southern Pine/Creosote	32.00	26.84	PX - Partial Excavate Reject	**Non Restorable Reject**	**59.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.16*
x: -70.840299 y: 42.883222 Location: farm ln										
2084PB Customer Data ID:2083	1957	35/4	Southern Pine/Creosote	33.00	26.02	PX - Partial Excavate Reject	**Non Restorable Reject**	**49.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *0.5* **Orientation:** *-90* **Shell Rot Depth:** *0.16*
x: -70.840237 y: 42.882615 Location: farm ln										
2084 Customer Data ID:2083PB	1957	40/4	Southern Pine/Creosote	33.00	27.68	PX - Partial Excavate Reject	**Restorable Reject**	**59.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *4* **Width:** *4.5* **Orientation:** *-45* **Shell Rot Depth:** *0.48* **Image Name:** *2084_77_Customer Required_Restoration Obstruction_Other.jpg*
x: -70.840267 y: 42.882611 Location: farm ln										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2085PB Customer Data ID:2084	1957	35/4	Southern Pine/Creosote	33.00	26.87	PX - Partial Excavate Reject	**Non Restorable Reject**	**54.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *2* **Orientation:** *-LOL*
x: -70.840210 y: 42.881998 Location: farm In										
2085 Customer Data ID:2084PB	1957	35/4	Southern Pine/Creosote	31.00	19.53	PX - Partial Excavate Reject	**Non Restorable Reject**	**25.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *0.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840227 y: 42.881976 Location: farm In										
2091PB Customer Data ID:2090	1957	35/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839975 y: 42.878342										
2091 Customer Data ID:2090PB	1957	35/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.839960 y: 42.878338										
2090PB Customer Data ID:2089	1989	40/4	Southern Pine/Penta	35.50	35.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839997 y: 42.878975										
2090 Customer Data ID:2089PB	1989	40/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.839999 y: 42.878978										
2089PB Customer Data ID:2088	1957	35/4	Southern Pine/Creosote	33.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**	**91.00**		**Decay: Shell Rot Depth:** *0.16*
x: -70.840053 y: 42.879551										
2089 Customer Data ID:2088PB	1957	40/4	Southern Pine/Creosote	33.50	24.48	PX - Partial Excavate Reject	**Non Restorable Reject**	**39.00**	Replacement Recommended	**Decay: Exposed Pocket Depth:** *3.5* **Width:** *3.5* **Orientation:** *+135* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-90* **Shell Rot Depth:** *0.24*
x: -70.840053 y: 42.879558 Location: farm In										
2088 Customer Data ID:2087PB	1957	35/4	Southern Pine/Creosote	30.50	23.54	PX - Partial Excavate Reject	**Restorable Reject**	**46.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *4.5* **Width:** *4.5* **Orientation:** *-LOL* **Exposed Pocket Depth:** *4.5* **Width:** *5* **Orientation:** *+135* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-45* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-90*
x: -70.840098 y: 42.880152 Location: farm In										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2088PB Customer Data ID:2087	1960	40/4	Southern Pine/Creosote	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840094 y: 42.880167										
2087 Customer Data ID:2086PB	1989	35/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840152 y: 42.880733										
2087PB Customer Data ID:2086	1989	40/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840131 y: 42.880754										
2086 Customer Data ID:2085PB	1989	35/4	Southern Pine/Penta	34.50	34.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840175 y: 42.881386										
2086PB Customer Data ID:2085	1989	40/4	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840198 y: 42.881389										
2031	1989	70/H2	Western Red Cedar/Penta	72.00	72.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840780 y: 42.914982										
2031PB	1989	70/H2	Western Red Cedar/Penta	59.00	59.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840760 y: 42.915002										
2032	1992	50/3	Southern Pine/Penta	40.00	40.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840760 y: 42.914485										
2032PB	1992	50/3	Southern Pine/Penta	40.50	40.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840723 y: 42.914516										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2033	2017	45/2	Southern Pine/Penta in Petroleum	45.00	45.00	P - Partial Excavate	**Non Reject**			
	x: -70.840757 y: 42.913863									
2033PB	2018	45/2	Southern Pine/Penta in Petroleum	40.50	40.50	P - Partial Excavate	**Non Reject**			
	x: -70.840713 y: 42.913868									
2034	2018	45/2	Southern Pine/Penta in Petroleum	43.00	43.00	P - Partial Excavate	**Non Reject**			
	x: -70.840749 y: 42.913164									
2034PB	2017	45/2	Southern Pine/Penta in Petroleum	41.00	41.00	P - Partial Excavate	**Non Reject**			
	x: -70.840737 y: 42.913164									
2035PB	1989	35/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840724 y: 42.912491									
2035	1989	35/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840753 y: 42.912501									
2036PB	1957	40/4	Southern Pine/Creosote	33.00	31.00	PD - Partial Excavate w/ Decay	**Non Reject**	**82.00**		**Notes:** neutral line on ground **Decay: Shell Rot Depth:***0.32*
	x: -70.840708 y: 42.911906									
2036	1957	40/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840700 y: 42.911921									
2037PB	1957	40/4	Southern Pine/Creosote	32.50	28.30	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:***1.5* **Width:***2* **Orientation:***-90* **Shell Rot Depth:***0.56*
	x: -70.840710 y: 42.911280 Location: depot rd									

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2037	1957 x: -70.840725 y: 42.911265	35/4	Southern Pine/Creosote	32.00	30.00	PD - Partial Excavate w/ Decay	**Non Reject**	**82.00**		**Decay: Shell Rot Depth:** *0.32*
2038PB	1957 x: -70.840679 y: 42.910612 Location: depot rd	45/4	Southern Pine/Creosote	34.00	27.86	PX - Partial Excavate Reject	**Restorable Reject**	**55.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3* **Width:** *2.5* **Orientation:** *-135* **Exposed Pocket Depth:** *3* **Width:** *2* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+135* **Shell Rot Depth:** *0.48*
2038	1957 x: -70.840687 y: 42.910642	40/4	Southern Pine/Creosote	35.00	33.50	PD - Partial Excavate w/ Decay	**Non Reject**	**87.00**		**Notes:** neutral line on ground **Decay: Shell Rot Depth:** *0.24*
2039PB	2018 x: -70.840663 y: 42.909998	45/3	Southern Pine/Penta in Petroleum	41.00	41.00	P - Partial Excavate	**Non Reject**			
2039	2018 x: -70.840697 y: 42.910019	45/3	Southern Pine/Penta in Petroleum	42.00	42.00	P - Partial Excavate	**Non Reject**			
2040PB	2018 x: -70.840687 y: 42.909453	45/3	Southern Pine/Penta in Petroleum	42.00	42.00	P - Partial Excavate	**Non Reject**			
2040	2018 x: -70.840724 y: 42.909442	45/4	Southern Pine/Penta in Petroleum	40.00	40.00	P - Partial Excavate	**Non Reject**			
2041PB	1989 x: -70.840685 y: 42.908843	40/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			**Image Name:** *2041PB_40_Customer Required.jpg*
2041	1989 x: -70.840693 y: 42.908838	40/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			

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Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2042PB	1989	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840655 y: 42.908190									
2042	1989	40/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840716 y: 42.908179									
2043PB	1989	40/4	Southern Pine/Penta	39.00	39.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840686 y: 42.907508									
2043	1989	40/4	Southern Pine/Penta	42.00	42.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840679 y: 42.907512									
2044PB	2018	40/4	Southern Pine/Penta in Petroleum	43.00	43.00	P - Partial Excavate	**Non Reject**			
	x: -70.840671 y: 42.906924									
2044	2018	40/4	Southern Pine/Penta in Petroleum	41.00	41.00	P - Partial Excavate	**Non Reject**			
	x: -70.840690 y: 42.906881									
2045PB	1989	40/4	Southern Pine/Penta	38.00	38.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840613 y: 42.906323									
2045	1989	40/4	Southern Pine/Penta	42.00	42.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840670 y: 42.906290									
2046PB	2015	35/5	Southern Pine/Penta in Petroleum	41.00	41.00	P - Partial Excavate	**Non Reject**			
	x: -70.840642 y: 42.905546									

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Poles Inspected

Unitil Service Corporation

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Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2046	1989	40/4	Southern Pine/Penta	41.00	41.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840671 y: 42.905545										
2047PB	1989	40/4	Southern Pine/Penta	41.00	41.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840613 y: 42.905008										
2047	1989	40/4	Southern Pine/Penta	41.00	41.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840652 y: 42.904999										
2048PB	2008	40/4	Southern Pine/Penta	43.00	43.00	P - Partial Excavate	**Non Reject**			
x: -70.840639 y: 42.904464										
2048	2008	40/4	Southern Pine/Penta	41.00	41.00	P - Partial Excavate	**Non Reject**			
x: -70.840637 y: 42.904461										
2030	1989	50/2	Douglas Fir/Penta	73.00	73.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840745 y: 42.916344										
2030PB	1989	50/2	Douglas Fir/Penta	70.50	68.00	PD - Partial Excavate w/ Decay	**Non Reject**	**89.00**		**Decay: Shell Rot Depth:** *0.4* **Image Name:** *2030PB_80_Customer Required.jpg*
x: -70.840723 y: 42.916365										
2029a Customer Data ID:2029	1957	50/2	Southern Pine/Creosote	44.00	34.69	PX - Partial Excavate Reject	**Non Restorable Reject**	**49.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-90* **Shell Rot Depth:** *0.48*
x: -70.840740 y: 42.916714 Location: depot rd										
2029 Customer Data ID:2029PB	1957	40/4	Southern Pine/Creosote	44.00	37.32	PX - Partial Excavate Reject	**Non Restorable Reject**	**61.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-135* **Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.48*
x: -70.840751 y: 42.916718 Location: depot rd										
2028 Customer Data ID:2028PB	1989	35/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840759 y: 42.917196										

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Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2028a Customer Data ID:2028	1989	35/4	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840766 y: 42.917201									
2027a Customer Data ID:2027	1957	35/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**		Groundwire Needs Attention	
	x: -70.840757 y: 42.917735									
2027 Customer Data ID:2027PB	1957	35/4	Southern Pine/Creosote	36.50	36.50	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840772 y: 42.917750									
2026a Customer Data ID:2026	1989	35/4	Southern Pine/Penta	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840787 y: 42.918375									
2026 Customer Data ID:2026PB	1989	35/4	Southern Pine/Penta	35.50	35.50	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840779 y: 42.918380									
2025a Customer Data ID:2025	1980	55/2	Southern Pine/Creosote	45.00	45.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
	x: -70.840801 y: 42.919037									
2025 Customer Data ID:2025PB	1980	55/3	Southern Pine/Creosote	47.00	47.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840781 y: 42.919024									
2024 Customer Data ID:2024PB	1980	55/3	Southern Pine/Creosote	44.00	44.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
	x: -70.840763 y: 42.919498									
2024a Customer Data ID:2024	1980	55/3	Southern Pine/Creosote	45.00	45.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840798 y: 42.919515									

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Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2023a Customer Data ID:2023	1992	35/3	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840818 y: 42.920061										
2023 Customer Data ID:2023PB	1992	35/3	Southern Pine/Penta	37.00	37.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840784 y: 42.920057										
2022a Customer Data ID:2022	1975	35/4	Southern Pine/Creosote	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840811 y: 42.920675										
2022 Customer Data ID:2022PB	1975	35/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840788 y: 42.920667										
2021a Customer Data ID:2021	1957	35/4	Southern Pine/Creosote	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840814 y: 42.921250										
2021 Customer Data ID:2021PB	1957	35/4	Southern Pine/Creosote	33.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**	**91.00**		**Decay: Shell Rot Depth:***0.16*
x: -70.840785 y: 42.921257										
2020a Customer Data ID:2020	1957	35/4	Southern Pine/Creosote	32.50	32.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840825 y: 42.921871										
2020 Customer Data ID:2020PB	1980	40/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840788 y: 42.921859										
2019a Customer Data ID:2019	1957	35/4	Southern Pine/Creosote	31.00	30.00	PD - Partial Excavate w/ Decay	**Non Reject**	**90.00**		**Decay: Shell Rot Depth:***0.16*
x: -70.840801 y: 42.922503										

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Poles Inspected

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Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2019 Customer Data ID:2019PB	1957	40/4	Southern Pine/Creosote	33.00	31.00	PD - Partial Excavate w/ Decay	**Non Reject**	**82.00**		**Decay: Shell Rot Depth:** *0.32*
x: -70.840768 y: 42.922511										
2018a Customer Data ID:2018	1960	40/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840829 y: 42.922944										
2018 Customer Data ID:2018PB	1960	35/4	Southern Pine/Creosote	36.00	31.50	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.72*
x: -70.840844 y: 42.922941 Location: Hampton river boat club										
2017a Customer Data ID:2017	1980	55/2	Douglas Fir/Penta	57.00	57.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840838 y: 42.923055										
2017 Customer Data ID:2017PB	1980	55/2	Douglas Fir/Penta	54.00	54.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840784 y: 42.923042										
2016a Customer Data ID:2016	2002	55/2	Southern Pine/Penta in Petroleum	59.00	59.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840850 y: 42.924018										
2016 Customer Data ID:2016PB	2001	55/2	Southern Pine/Penta in Petroleum	53.00	53.00	PD - Partial Excavate w/ Decay	**Non Reject**		Fire Damage	
x: -70.840815 y: 42.924024										
2015a Customer Data ID:2015	1957	40/4	Southern Pine/Creosote	39.00	32.71	PX - Partial Excavate Reject	**Non Restorable Reject**	**59.00**	Replacement Recommended	**Decay: Exposed Pocket Depth:** *6* **Width:** *2* **Orientation:** *+45* **Exposed Pocket Depth:** *6* **Width:** *4* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *6* **Width:** *9* **Minimum Shell:** *2* **Orientation:** *+90* **Enclosed Pocket Depth:** *6* **Width:** *9* **Minimum Shell:** *2* **Orientation:** *+LOL* **Shell Rot Depth:** *0.32*
x: -70.840843 y: 42.924416 Location: Hampton river boat club										
2015 Customer Data ID:2015PB	1957	40/4	Southern Pine/Creosote	38.00	27.52	PX - Partial Excavate Reject	**Non Restorable Reject**	**38.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *2* **Orientation:** *-90* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840816 y: 42.924457 Location: Hampton river boat club										

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Poles Inspected

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Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2014a Customer Data ID:2014	1957	35/4	Southern Pine/Creosote	33.00	28.29	PX - Partial Excavate Reject	**Restorable Reject**	**63.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3.5* **Width:** *2* **Orientation:** *-90* **Shell Rot Depth:** *0.48*
x: -70.840850 y: 42.924988 Location: Hampton river boat club										
2014 Customer Data ID:2014PB	1957	40/4	Southern Pine/Creosote	34.00	20.83	PX - Partial Excavate Reject	**Non Restorable Reject**	**23.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *0.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *-LOL*
x: -70.840832 y: 42.924978 Location: Hampton river boat club										
2013 Customer Data ID:2013PB	1957	35/4	Southern Pine/Creosote	35.00	29.84	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *1.5* **Width:** *1* **Orientation:** *-135* **Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *+135* **Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *+135* **Shell Rot Depth:** *0.32*
x: -70.840838 y: 42.925623 Location: Hampton river boat club										
2013a Customer Data ID:2013	1957	35/4	Southern Pine/Creosote	38.00	32.92	PX - Partial Excavate Reject	**Restorable Reject**	**65.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *-135* **Exposed Pocket Depth:** *4* **Width:** *6* **Orientation:** *-LOL* **Shell Rot Depth:** *0.56*
x: -70.840839 y: 42.925624 Location: Hampton river boat club										
2012a Customer Data ID:2012	2005	40/2	Southern Pine/Pentain Petroleum	39.50	39.50	P - Partial Excavate	**Non Reject**			
x: -70.840845 y: 42.926252										
2012 Customer Data ID:2012PB	2015	40/2	Southern Pine/Pentain Petroleum	40.00	40.00	P - Partial Excavate	**Non Reject**			
x: -70.840842 y: 42.926252										
2011 Customer Data ID:2011PB	2018	40/2	Southern Pine/Pentain Petroleum	39.00	39.00	P - Partial Excavate	**Non Reject**			
x: -70.840866 y: 42.926766										
2011a Customer Data ID:2011	2018	40/2	Southern Pine/Pentain Petroleum	41.00	41.00	P - Partial Excavate	**Non Reject**			
x: -70.840857 y: 42.926755										
2010a Customer Data ID:2010	1989	35/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840899 y: 42.927256										

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Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2010 Customer Data ID:2010PB	1989	40/4	Southern Pine/Penta	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840869 y: 42.927252										
2009 Customer Data ID:2009PB	1957	35/4	Southern Pine/Creosote	32.00	28.00	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended Guy Slack or Broken	**Decay: Shell Rot Depth:** *0.64*
x: -70.840851 y: 42.927738 Location: Hampton river boat club										
2009a Customer Data ID:2009	1957	35/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**67.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840875 y: 42.927728 Location: Hampton river boat club										
2002	1974	40/4	Southern Pine/Creosote	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.842841 y: 42.930681										
2003	1974	35/4	Southern Pine/Creosote	34.50	33.50	PD - Partial Excavate w/ Decay	**Non Reject**	**91.00**		**Decay: Shell Rot Depth:** *0.16*
x: -70.842294 y: 42.930493										
2004	1989	50/2	Southern Pine/Penta	42.00	42.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.841472 y: 42.930269										
2005 Customer Data ID:2005b	1962	60/3	Southern Pine/Creosote	46.00	46.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840986 y: 42.930089										
2005a Customer Data ID:2005	1960	60/3	Southern Pine/Creosote	45.00	45.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840955 y: 42.930115										
2005b Customer Data ID:2005a	1960	60/3	Southern Pine/Creosote	43.50	43.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840880 y: 42.930137										

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Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2008A Customer Data ID:2008	1960	55/3	Southern Pine/Creosote	46.00	46.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken Pulled Anchor	
x: -70.840964 y: 42.929610										
2008 Customer Data ID:2008PB	1960	55/3	Southern Pine/Creosote	46.00	46.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840860 y: 42.929588										
2007A Customer Data ID:2007	2014	40/2	Southern Pine/Pentain Petroleum	39.00	39.00	P - Partial Excavate	**Non Reject**			
x: -70.840923 y: 42.929030										
2007 Customer Data ID:2007PB	2014	40/2	Southern Pine/Pentain Petroleum	38.00	38.00	P - Partial Excavate	**Non Reject**			
x: -70.840959 y: 42.929051										
2006A Customer Data ID:2006	1957	35/4	Southern Pine/Creosote	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840891 y: 42.928397										
2008 Customer Data ID:2006PB	1957	35/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840895 y: 42.928410										
2001	1974	40/4	Southern Pine/Creosote	38.00	38.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.843274 y: 42.930908										
2066 Customer Data ID:2065PB	1989	35/4	Southern Pine/Creosote	33.00	25.47	PX - Partial Excavate Reject	**Non Restorable Reject**	**46.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *2* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840522 y: 42.892917 Location: depot rd										
2066PB Customer Data ID:2065	1972	35/4	Southern Pine/Creosote	34.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.8*
x: -70.840540 y: 42.892913 Location: depot rd										

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Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2064 Customer Data ID:2063PB	1972	40/4	Southern Pine/Creosote	39.50	24.88	PX - Partial Excavate Reject	**Non Restorable Reject**	**25.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1* **Orientation:** *-90* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1* **Orientation:** *-LOL* **Shell Rot Depth:** *0.4* **Image Name:** *2064_85_Customer Required.jpg*
x: -70.840520 y: 42.894204 Location: depot rd										
2064PB Customer Data ID:2063	1972	40/4	Southern Pine/Creosote	34.50	27.74	PX - Partial Excavate Reject	**Non Restorable Reject**	**52.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.24*
x: -70.840559 y: 42.894194 Location: depot rd										
2063 Customer Data ID:2062PB	1972	35/4	Southern Pine/Creosote	32.50	32.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840529 y: 42.894897										
2063PB Customer Data ID:2062	1972	35/4	Southern Pine/Creosote	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840542 y: 42.894885										
2062 Customer Data ID:2061PB	1989	35/4	Southern Pine/Penta	33.50	33.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840512 y: 42.895538										
2062PB Customer Data ID:2061	1989	40/4	Southern Pine/Penta	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840551 y: 42.895543										
2060PB	1972	40/4	Southern Pine/Creosote	35.50	35.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840569 y: 42.896190										
2060	1972	40/4	Southern Pine/Creosote	32.00	26.69	PX - Partial Excavate Reject	**Restorable Reject**	**58.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3.5* **Width:** *6* **Orientation:** *-45* **Enclosed Pocket Depth:** *5* **Width:** *7.5* **Minimum Shell:** *2* **Orientation:** *+90* **Shell Rot Depth:** *0.32*
x: -70.840571 y: 42.896203 Location: depot rd										
2059PB	1972	40/4	Southern Pine/Creosote	32.50	32.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840535 y: 42.896758										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2059	1950	35/4	Southern Pine/Creosote	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840548 y: 42.896755										
2058PB	1950	40/4	Southern Pine/Creosote	32.50	32.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840541 y: 42.897371										
2058	1950	40/4	Southern Pine/Creosote	32.50	31.00	PD - Partial Excavate w/ Decay	**Non Reject**	**86.00**		**Decay: Shell Rot Depth:** *0.24*
x: -70.840577 y: 42.897378										
2058a Customer Data ID:2057	1950	40/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**67.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840566 y: 42.897990 Location: depot rd										
2058 Customer Data ID:2057PB	1950	40/4	Southern Pine/Creosote	34.50	34.50	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840557 y: 42.897972										
2056A Customer Data ID:2056C	1950	40/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840597 y: 42.899222										
2056PB Customer Data ID:2056B	1950	40/4	Southern Pine/Creosote	34.00	34.00	PD - Partial Excavate w/ Decay	**Non Reject**			
x: -70.840575 y: 42.899218										
2055PB	2015	45/2	Southern Pine/Pentain Petroleum	40.00	40.00	P - Partial Excavate	**Non Reject**			
x: -70.840516 y: 42.899807										
2055	2015	45/3	Southern Pine/Pentain Petroleum	42.00	42.00	P - Partial Excavate	**Non Reject**			
x: -70.840533 y: 42.899816										

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2054PB	1937 x: -70.840460 y: 42.900386	40/4	Southern Pine/Creosote	37.00	37.00	PD - Partial Excavate w/ Decay	**Non Reject**			
2054	1950 x: -70.840477 y: 42.900385	40/4	Southern Pine/Creosote	38.00	38.00	PD - Partial Excavate w/ Decay	**Non Reject**			
2053PB	1972 x: -70.840599 y: 42.901264	55/3	Southern Pine/Creosote	44.00	44.00	PD - Partial Excavate w/ Decay	**Non Reject**			
2053	1972 x: -70.840621 y: 42.901261	55/3	Southern Pine/Creosote	45.00	45.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken Pulled Anchor	
2056 Customer Data ID:2056A	x: -70.840540 y: 42.899224	0/	/	0.00		V - Visual Report	**Non Reject**			**Not Inspected Reason:** Not in Field
2052PB	2015 x: -70.840591 y: 42.901915	70/1	Southern Pine/Penta in Petroleum	53.00	53.00	P - Partial Excavate	**Non Reject**			
2052	2015 x: -70.840611 y: 42.901931	70/1	Southern Pine/Penta in Petroleum	52.00	52.00	P - Partial Excavate	**Non Reject**			
2051	1989 x: -70.840635 y: 42.902535	40/4	Southern Pine/Penta	42.00	42.00	PD - Partial Excavate w/ Decay	**Non Reject**			
2051PB	1989 x: -70.840658 y: 42.902523	40/4	Southern Pine/Penta	42.00	42.00	PD - Partial Excavate w/ Decay	**Non Reject**			
2050	2015 x: -70.840655 y: 42.903221	40/4	Southern Pine/Penta in Petroleum	42.00	42.00	P - Partial Excavate	**Non Reject**			

Osmose Utilities Services, Inc.

Poles Inspected

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2050PB	2015	40/4	Southern Pine/Penta in Petroleum	44.00	44.00	P - Partial Excavate	**Non Reject**			
	x: -70.840641 y: 42.903229									
2049PB	2015	40/4	Southern Pine/Penta in Petroleum	42.00	42.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840652 y: 42.903791									
2049	2015	40/4	Southern Pine/Penta in Petroleum	39.50	39.50	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840644 y: 42.903790									
2065 Customer Data ID:2064PB	1989	40/4	Southern Pine/Penta	31.00	31.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840532 y: 42.893475									
2065PB Customer Data ID:2064	1989	40/4	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.840563 y: 42.893484									
2103a Customer Data ID:2104	1972	40/4	Southern Pine/Penta	33.00	33.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.839418 y: 42.871169									
2303	1972	35/4	Southern Pine/Creos ote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**			
	x: -70.839429 y: 42.871171									
2057a	1950	40/4	Southern Pine/Creos ote	33.00	29.00	PX - Partial Excavate Reject	**Non Restorable Reject**	**67.00**	Replacement Recommended	**Decay: Shell Rot Depth:** *0.64*
	x: -70.840683 y: 42.898876 Location: depot rd									
2057	1950	40/4	Southern Pine/Creos ote	32.50	24.91	PX - Partial Excavate Reject	**Non Restorable Reject**	**45.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-LOL* **Work Completed:** *Daily Boat Rate 5.000*
	x: -70.851597 y: 42.911829 Location: depot rd									

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2070PB Customer Data ID:2069	1957	40/4	Southern Pine/Creosote	33.50	28.25	PX - Partial Excavate Reject	**Restorable Reject**	**60.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3* **Width:** *6.5* **Orientation:** *-45* **Enclosed Pocket Depth:** *4* **Width:** *8* **Minimum Shell:** *2.5* **Orientation:** *-90* **Shell Rot Depth:** *0.24*
x: -70.840524 y: 42.890671 Location: farm In										
2070 Customer Data ID:2069PB	1957	40/4	Southern Pine/Creosote	31.00	26.43	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *2* **Width:** *2* **Orientation:** *-135* **Shell Rot Depth:** *0.64*
x: -70.840492 y: 42.890686 Location: farm In										
2069PB Customer Data ID:2068	1957	40/4	Southern Pine/Creosote	34.00	28.99	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Enclosed Pocket Depth:** *4* **Width:** *7.5* **Minimum Shell:** *1.5* **Orientation:** *-90* **Shell Rot Depth:** *0.4*
x: -70.840504 y: 42.891183 Location: farm In										
2069 Customer Data ID:2068PB	1957	40/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken Pulled Anchor	
x: -70.840485 y: 42.891214										
2072 Customer Data ID:2071PB	1957	40/4	Southern Pine/Creosote	36.00	28.76	PX - Partial Excavate Reject	**Restorable Reject**	**51.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *5* **Width:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5.5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Shell Rot Depth:** *0.48* **Image Name:** *2072_93_Customer Required.jpg*
x: -70.840463 y: 42.889635 Location: farm In										
2075PB Customer Data ID:2074	1989	40/4	Southern Pine/Penta	37.50	37.50	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840492 y: 42.887675										
2077 Customer Data ID:2076PB	1957	40/4	Southern Pine/Creosote	31.50	27.00	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.72*
x: -70.840473 y: 42.886692 Location: farm In										
2077PB Customer Data ID:2076	1957	40/4	Southern Pine/Creosote	32.00	27.58	PX - Partial Excavate Reject	**Restorable Reject**	**64.00**	Restoration Recommended	**Decay: Enclosed Pocket Depth:** *4.5* **Width:** *7* **Minimum Shell:** *3* **Orientation:** *-90* **Enclosed Pocket Depth:** *4.5* **Width:** *7* **Minimum Shell:** *3* **Orientation:** *+90* **Shell Rot Depth:** *0.64*
x: -70.840499 y: 42.886701 Location: farm In										
2079PB Customer Data ID:2078	1957	40/4	Southern Pine/Creosote	33.00	28.73	PX - Partial Excavate Reject	**Non Restorable Reject**	**66.00**	Replacement Recommended Guy Slack or Broken Pulled Anchor	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Image Name:** *2079PB_21_Customer Required.jpg 2079PB_22_Customer Required.jpg 2079PB_23_Customer Required.jpg*
x: -70.840466 y: 42.885479 Location: farm In										

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2079 Customer Data ID:2078PB	1957	35/4	Southern Pine/Creosote	33.00	28.00	PX - Partial Excavate Reject	**Restorable Reject**	**61.00**	Restoration Recommended Pulled Anchor	**Decay: Shell Rot Depth:** *0.8* **Image Name:** *2079_71_Customer Required.jpg*
x: -70.840441 y: 42.885504 Location: farm In										
2082PB Customer Data ID:2081	1957	40/4	Southern Pine/Creosote	31.50	26.00	PX - Partial Excavate Reject	**Restorable Reject**	**56.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.88*
x: -70.840323 y: 42.883664 Location: farm In										
2082 Customer Data ID:2081PB	1957	40/4	Southern Pine/Creosote	31.00	27.00	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840302 y: 42.883674 Location: farm In										
2083PB Customer Data ID:2082	1957	35/4	Southern Pine/Creosote	32.00	26.84	PX - Partial Excavate Reject	**Non Restorable Reject**	**59.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.16*
x: -70.840299 y: 42.883222 Location: farm In										
2084PB Customer Data ID:2083	1957	35/4	Southern Pine/Creosote	33.00	26.02	PX - Partial Excavate Reject	**Non Restorable Reject**	**49.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *0.5* **Orientation:** *-90* **Shell Rot Depth:** *0.16*
x: -70.840237 y: 42.882615 Location: farm In										
2084 Customer Data ID:2083PB	1957	40/4	Southern Pine/Creosote	33.00	27.68	PX - Partial Excavate Reject	**Restorable Reject**	**59.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *4* **Width:** *4.5* **Orientation:** *-45* **Shell Rot Depth:** *0.48* **Image Name:** *2084_77_Customer Required_Restoration Obstruction_Other.jpg*
x: -70.840267 y: 42.882611 Location: farm In										
2085PB Customer Data ID:2084	1957	35/4	Southern Pine/Creosote	33.00	26.87	PX - Partial Excavate Reject	**Non Restorable Reject**	**54.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *2* **Orientation:** *-LOL*
x: -70.840210 y: 42.881998 Location: farm In										
2085 Customer Data ID:2084PB	1957	35/4	Southern Pine/Creosote	31.00	19.53	PX - Partial Excavate Reject	**Non Restorable Reject**	**25.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *0.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840227 y: 42.881976 Location: farm In										
2091 Customer Data ID:2090PB	1957	35/4	Southern Pine/Creosote	32.00	32.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.839960 y: 42.878338										

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2089 Customer Data ID:2088PB	1957	40/4	Southern Pine/Creosote	33.50	24.48	PX - Partial Excavate Reject	**Non Restorable Reject**	**39.00**	Replacement Recommended	**Decay: Exposed Pocket Depth:** *3.5* **Width:** *3.5* **Orientation:** *+135* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-90* **Shell Rot Depth:** *0.24*
x: -70.840053 y: 42.879558 Location: farm ln										
2088 Customer Data ID:2087PB	1957	35/4	Southern Pine/Creosote	30.50	23.54	PX - Partial Excavate Reject	**Restorable Reject**	**46.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *4.5* **Width:** *4.5* **Orientation:** *-LOL* **Exposed Pocket Depth:** *4.5* **Width:** *5* **Orientation:** *+135* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-45* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-90*
x: -70.840098 y: 42.880152 Location: farm ln										
2037PB	1957	40/4	Southern Pine/Creosote	32.50	28.30	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *1.5* **Width:** *2* **Orientation:** *-90* **Shell Rot Depth:** *0.56*
x: -70.840710 y: 42.911280 Location: depot rd										
2038PB	1957	45/4	Southern Pine/Creosote	34.00	27.86	PX - Partial Excavate Reject	**Restorable Reject**	**55.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3* **Width:** *2.5* **Orientation:** *-135* **Exposed Pocket Depth:** *3* **Width:** *2* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+135* **Shell Rot Depth:** *0.48*
x: -70.840679 y: 42.910612 Location: depot rd										
2029a Customer Data ID:2029	1957	50/2	Southern Pine/Creosote	44.00	34.69	PX - Partial Excavate Reject	**Non Restorable Reject**	**49.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-90* **Shell Rot Depth:** *0.48*
x: -70.840740 y: 42.916714 Location: depot rd										
2029 Customer Data ID:2029PB	1957	40/4	Southern Pine/Creosote	44.00	37.32	PX - Partial Excavate Reject	**Non Restorable Reject**	**61.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-135* **Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.48*
x: -70.840751 y: 42.916718 Location: depot rd										
2027a Customer Data ID:2027	1957	35/4	Southern Pine/Creosote	36.00	36.00	PD - Partial Excavate w/ Decay	**Non Reject**		Groundwire Needs Attention	
x: -70.840757 y: 42.917735										
2025a Customer Data ID:2025	1980	55/2	Southern Pine/Creosote	45.00	45.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840801 y: 42.919037										
2024 Customer Data ID:2024PB	1980	55/3	Southern Pine/Creosote	44.00	44.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840763 y: 42.919498										

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2023a Customer Data ID:2023	1992	35/3	Southern Pine/Penta	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840818 y: 42.920061										
2023 Customer Data ID:2023PB	1992	35/3	Southern Pine/Penta	37.00	37.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840784 y: 42.920057										
2018 Customer Data ID:2018PB	1960	35/4	Southern Pine/Creosote	36.00	31.50	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.72*
x: -70.840844 y: 42.922941 Location: Hampton river boat club										
2017 Customer Data ID:2017PB	1980	55/2	Douglas Fir/Penta	54.00	54.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840784 y: 42.923042										
2016 Customer Data ID:2016PB	2001	55/2	Southern Pine/Penta in Petroleum	53.00	53.00	PD - Partial Excavate w/ Decay	**Non Reject**		Fire Damage	
x: -70.840815 y: 42.924024										
2015a Customer Data ID:2015	1957	40/4	Southern Pine/Creosote	39.00	32.71	PX - Partial Excavate Reject	**Non Restorable Reject**	**59.00**	Replacement Recommended	**Decay: Exposed Pocket Depth:** *6* **Width:** *2* **Orientation:** *+45* **Exposed Pocket Depth:** *6* **Width:** *4* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *6* **Width:** *9* **Minimum Shell:** *2* **Orientation:** *+90* **Enclosed Pocket Depth:** *6* **Width:** *9* **Minimum Shell:** *2* **Orientation:** *+LOL* **Shell Rot Depth:** *0.32*
x: -70.840843 y: 42.924416 Location: Hampton river boat club										
2015 Customer Data ID:2015PB	1957	40/4	Southern Pine/Creosote	38.00	27.52	PX - Partial Excavate Reject	**Non Restorable Reject**	**38.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *2* **Orientation:** *-90* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840816 y: 42.924457 Location: Hampton river boat club										
2014a Customer Data ID:2014	1957	35/4	Southern Pine/Creosote	33.00	28.29	PX - Partial Excavate Reject	**Restorable Reject**	**63.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3.5* **Width:** *2* **Orientation:** *-90* **Shell Rot Depth:** *0.48*
x: -70.840850 y: 42.924988 Location: Hampton river boat club										
2014 Customer Data ID:2014PB	1957	40/4	Southern Pine/Creosote	34.00	20.83	PX - Partial Excavate Reject	**Non Restorable Reject**	**23.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *0.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *-LOL*
x: -70.840832 y: 42.924978 Location: Hampton river boat club										

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2013 Customer Data ID:2013PB	1957	35/4	Southern Pine/Creosote	35.00	29.84	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *1.5* **Width:** *1* **Orientation:** *-135* **Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *+135* **Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *+135* **Shell Rot Depth:** *0.32*
x: -70.840838 y: 42.925623 Location: Hampton river boat club										
2013a Customer Data ID:2013	1957	35/4	Southern Pine/Creosote	38.00	32.92	PX - Partial Excavate Reject	**Restorable Reject**	**65.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *-135* **Exposed Pocket Depth:** *4* **Width:** *6* **Orientation:** *-LOL* **Shell Rot Depth:** *0.56*
x: -70.840839 y: 42.925624 Location: Hampton river boat club										
2009 Customer Data ID:2009PB	1957	35/4	Southern Pine/Creosote	32.00	28.00	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended Guy Slack or Broken	**Decay: Shell Rot Depth:** *0.64*
x: -70.840851 y: 42.927738 Location: Hampton river boat club										
2009a Customer Data ID:2009	1957	35/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**67.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840875 y: 42.927728 Location: Hampton river boat club										
2002	1974	40/4	Southern Pine/Creosote	35.00	35.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.842841 y: 42.930681										
2008A Customer Data ID:2008	1960	55/3	Southern Pine/Creosote	46.00	46.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken Pulled Anchor	
x: -70.840964 y: 42.929610										
2008 Customer Data ID:2008PB	1960	55/3	Southern Pine/Creosote	46.00	46.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken	
x: -70.840860 y: 42.929588										
2066 Customer Data ID:2065PB	1989	35/4	Southern Pine/Creosote	33.00	25.47	PX - Partial Excavate Reject	**Non Restorable Reject**	**46.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *2* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840522 y: 42.892917 Location: depot rd										
2066PB Customer Data ID:2065	1972	35/4	Southern Pine/Creosote	34.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.8*
x: -70.840540 y: 42.892913 Location: depot rd										

Osmose Utilities Services, Inc.

Poles Needing Maintenance

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2064 Customer Data ID:2063PB	1972	40/4	Southern Pine/Creosote	39.50	24.88	PX - Partial Excavate Reject	**Non Restorable Reject**	**25.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1* **Orientation:** *-90* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1* **Orientation:** *-LOL* **Shell Rot Depth:** *0.4* **Image Name:** *2064_85_Customer Required.jpg*
x: -70.840520 y: 42.894204 Location: depot rd										
2064PB Customer Data ID:2063	1972	40/4	Southern Pine/Creosote	34.50	27.74	PX - Partial Excavate Reject	**Non Restorable Reject**	**52.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.24*
x: -70.840559 y: 42.894194 Location: depot rd										
2060	1972	40/4	Southern Pine/Creosote	32.00	26.69	PX - Partial Excavate Reject	**Restorable Reject**	**58.00**	Restoration Recommended	**Decay: Exposed Pocket Depth:** *3.5* **Width:** *6* **Orientation:** *-45* **Enclosed Pocket Depth:** *5* **Width:** *7.5* **Minimum Shell:** *2* **Orientation:** *+90* **Shell Rot Depth:** *0.32*
x: -70.840571 y: 42.896203 Location: depot rd										
2058a Customer Data ID:2057	1950	40/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**67.00**	Restoration Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840566 y: 42.897990 Location: depot rd										
2053	1972	55/3	Southern Pine/Creosote	45.00	45.00	PD - Partial Excavate w/ Decay	**Non Reject**		Guy Slack or Broken Pulled Anchor	
x: -70.840621 y: 42.901261										
2057a	1950	40/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Non Restorable Reject**	**67.00**	Replacement Recommended	**Decay: Shell Rot Depth:** *0.64*
x: -70.840683 y: 42.898876 Location: depot rd										
2057	1950	40/4	Southern Pine/Creosote	32.50	24.91	PX - Partial Excavate Reject	**Non Restorable Reject**	**45.00**	Replacement Recommended	**Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.851597 y: 42.911829 Location: depot rd										

Osmose Utilities Services, Inc.

Restorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2070PB Customer Data ID:2069	1957	40/4	Southern Pine/Creosote	33.50	28.25	PX - Partial Excavate Reject	**Restorable Reject**	**60.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *3* **Width:** *6.5* **Orientation:** *-45* **Enclosed Pocket Depth:** *4* **Width:** *8* **Minimum Shell:** *2.5* **Orientation:** *-90* **Shell Rot Depth:** *0.24*
x: -70.840524 y: 42.890671 Location: farm ln										
2070 Customer Data ID:2069PB	1957	40/4	Southern Pine/Creosote	31.00	26.43	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *2* **Width:** *2* **Orientation:** *-135* **Shell Rot Depth:** *0.64*
x: -70.840492 y: 42.890686 Location: farm ln										
2069PB Customer Data ID:2068	1957	40/4	Southern Pine/Creosote	34.00	28.99	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Enclosed Pocket Depth:** *4* **Width:** *7.5* **Minimum Shell:** *1.5* **Orientation:** *-90* **Shell Rot Depth:** *0.4*
x: -70.840504 y: 42.891183 Location: farm ln										
2072 Customer Data ID:2071PB	1957	40/4	Southern Pine/Creosote	36.00	28.76	PX - Partial Excavate Reject	**Restorable Reject**	**51.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *5* **Width:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5.5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Shell Rot Depth:** *0.48* **Image Name:** *2072_93_Customer Required.jpg* **Photo Description:** *Customer Required*
x: -70.840463 y: 42.889635 Location: farm ln										
2077 Customer Data ID:2076PB	1957	40/4	Southern Pine/Creosote	31.50	27.00	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.72*
x: -70.840473 y: 42.886692 Location: farm ln										
2077PB Customer Data ID:2076	1957	40/4	Southern Pine/Creosote	32.00	27.58	PX - Partial Excavate Reject	**Restorable Reject**	**64.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Enclosed Pocket Depth:** *4.5* **Width:** *7* **Minimum Shell:** *3* **Orientation:** *-90* **Enclosed Pocket Depth:** *4.5* **Width:** *7* **Minimum Shell:** *3* **Orientation:** *+90* **Shell Rot Depth:** *0.64*
x: -70.840499 y: 42.886701 Location: farm ln										
2079 Customer Data ID:2078PB	1957	35/4	Southern Pine/Creosote	33.00	28.00	PX - Partial Excavate Reject	**Restorable Reject**	**61.00**	Restoration Recommended Pulled Anchor	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.8* **Image Name:** *2079_71_Customer Required.jpg* **Photo Description:** *Customer Required*
x: -70.840441 y: 42.885504 Location: farm ln										
2082PB Customer Data ID:2081	1957	40/4	Southern Pine/Creosote	31.50	26.00	PX - Partial Excavate Reject	**Restorable Reject**	**56.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.88*
x: -70.840323 y: 42.883664 Location: farm ln										
2082 Customer Data ID:2081PB	1957	40/4	Southern Pine/Creosote	31.00	27.00	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.64*
x: -70.840302 y: 42.883674 Location: farm ln										

Osmose Utilities Services, Inc.

Restorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2084 Customer Data ID:2083PB	1957	40/4	Southern Pine/Creosote	33.00	27.68	PX - Partial Excavate Reject	**Restorable Reject**	**59.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *4* **Width:** *4.5* **Orientation:** *-45* **Shell Rot Depth:** *0.48* **Image Name:** *2084_77_Customer Required_Restoration Obstruction_Other.jpg* **Photo Description:** *Customer Required|Restoration Obstruction|Other*
x: -70.840267 y: 42.882611 Location: farm ln										
2088 Customer Data ID:2087PB	1957	35/4	Southern Pine/Creosote	30.50	23.54	PX - Partial Excavate Reject	**Restorable Reject**	**46.00**	Restoration Recommended	**Primary Reject Reason:** *Exposed Pocket* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *4.5* **Width:** *4.5* **Orientation:** *-LOL* **Exposed Pocket Depth:** *4.5* **Width:** *5* **Orientation:** *+135* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-45* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-90*
x: -70.840098 y: 42.880152 Location: farm ln										
2037PB	1957	40/4	Southern Pine/Creosote	32.50	28.30	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *1.5* **Width:** *2* **Orientation:** *-90* **Shell Rot Depth:** *0.56*
x: -70.840710 y: 42.911280 Location: depot rd										
2038PB	1957	45/4	Southern Pine/Creosote	34.00	27.86	PX - Partial Excavate Reject	**Restorable Reject**	**55.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *3* **Width:** *2.5* **Orientation:** *-135* **Exposed Pocket Depth:** *3* **Width:** *2* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+135* **Shell Rot Depth:** *0.48*
x: -70.840679 y: 42.910612 Location: depot rd										
2018 Customer Data ID:2018PB	1960	35/4	Southern Pine/Creosote	36.00	31.50	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.72*
x: -70.840844 y: 42.922941 Location: Hampton river boat club										
2014a Customer Data ID:2014	1957	35/4	Southern Pine/Creosote	33.00	28.29	PX - Partial Excavate Reject	**Restorable Reject**	**63.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *3.5* **Width:** *2* **Orientation:** *-90* **Shell Rot Depth:** *0.48*
x: -70.840850 y: 42.924988 Location: Hampton river boat club										
2013 Customer Data ID:2013PB	1957	35/4	Southern Pine/Creosote	35.00	29.84	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Primary Reject Reason:** *Exposed Pocket* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *1.5* **Width:** *1* **Orientation:** *-135* **Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *+135* **Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *+135* **Shell Rot Depth:** *0.32*
x: -70.840838 y: 42.925623 Location: Hampton river boat club										
2013a Customer Data ID:2013	1957	35/4	Southern Pine/Creosote	38.00	32.92	PX - Partial Excavate Reject	**Restorable Reject**	**65.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *4* **Width:** *3* **Orientation:** *-135* **Exposed Pocket Depth:** *4* **Width:** *6* **Orientation:** *-LOL* **Shell Rot Depth:** *0.56*
x: -70.840839 y: 42.925624 Location: Hampton river boat club										

Osmose Utilities Services, Inc.

Restorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2009 Customer Data ID:2009PB	1957	35/4	Southern Pine/Creosote	32.00	28.00	PX - Partial Excavate Reject	**Restorable Reject**	**66.00**	Restoration Recommended Guy Slack or Broken	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.64*
x: -70.840851 y: 42.927738 Location: Hampton river boat club										
2009a Customer Data ID:2009	1957	35/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**67.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.64*
x: -70.840875 y: 42.927728 Location: Hampton river boat club										
2066PB Customer Data ID:2065	1972	35/4	Southern Pine/Creosote	34.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**62.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.8*
x: -70.840540 y: 42.892913 Location: depot rd										
2060	1972	40/4	Southern Pine/Creosote	32.00	26.69	PX - Partial Excavate Reject	**Restorable Reject**	**58.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Exposed Pocket Depth:** *3.5* **Width:** *6* **Orientation:** *-45* **Enclosed Pocket Depth:** *5* **Width:** *7.5* **Minimum Shell:** *2* **Orientation:** *+90* **Shell Rot Depth:** *0.32*
x: -70.840571 y: 42.896203 Location: depot rd										
2058a Customer Data ID:2057	1950	40/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Restorable Reject**	**67.00**	Restoration Recommended	**Primary Reject Reason:** *Shell Rot* **Recommended Restoration Method:** *CTRUSS - Standard* **Decay: Shell Rot Depth:** *0.64*
x: -70.840566 y: 42.897990 Location: depot rd										

Osmose Utilities Services, Inc.

NonRestorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2079PB Customer Data ID:2078	1957	40/4	Southern Pine/Creosote	33.00	28.73	PX - Partial Excavate Reject	**Non Restorable Reject**	**66.00**	Replacement Recommended Guy Slack or Broken Pulled Anchor	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Image Name:** *2079PB_21_Customer Required.jpg* **Photo Description:** *Customer Required 2079PB_22_Customer Required.jpg* **Photo Description:** *Customer Required 2079PB_23_Customer Required.jpg* **Photo Description:** *Customer Required*
	x: -70.840466 y: 42.885479 Location: farm ln									
2083PB Customer Data ID:2082	1957	35/4	Southern Pine/Creosote	32.00	26.84	PX - Partial Excavate Reject	**Non Restorable Reject**	**59.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.16*
	x: -70.840299 y: 42.883222 Location: farm ln									
2084PB Customer Data ID:2083	1957	35/4	Southern Pine/Creosote	33.00	26.02	PX - Partial Excavate Reject	**Non Restorable Reject**	**49.00**	Replacement Recommended	**Primary Reject Reason:** *Enclosed Pocket* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *0.5* **Orientation:** *-90* **Shell Rot Depth:** *0.16*
	x: -70.840237 y: 42.882615 Location: farm ln									
2085PB Customer Data ID:2084	1957	35/4	Southern Pine/Creosote	33.00	26.87	PX - Partial Excavate Reject	**Non Restorable Reject**	**54.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *2* **Orientation:** *-LOL*
	x: -70.840210 y: 42.881998 Location: farm ln									
2085 Customer Data ID:2084PB	1957	35/4	Southern Pine/Creosote	31.00	19.53	PX - Partial Excavate Reject	**Non Restorable Reject**	**25.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *0.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *4.5* **Width:** *7.5* **Minimum Shell:** *1* **Orientation:** *-LOL*
	x: -70.840227 y: 42.881976 Location: farm ln									
2089 Customer Data ID:2088PB	1957	40/4	Southern Pine/Creosote	33.50	24.48	PX - Partial Excavate Reject	**Non Restorable Reject**	**39.00**	Replacement Recommended	**Primary Reject Reason:** *Shell Rot* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Exposed Pocket Depth:** *3.5* **Width:** *3.5* **Orientation:** *+135* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-90* **Shell Rot Depth:** *0.24*
	x: -70.840053 y: 42.879558 Location: farm ln									
2029a Customer Data ID:2029	1957	50/2	Southern Pine/Creosote	44.00	34.69	PX - Partial Excavate Reject	**Non Restorable Reject**	**49.00**	Replacement Recommended	**Primary Reject Reason:** *Shell Rot* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-90* **Shell Rot Depth:** *0.48*
	x: -70.840740 y: 42.916714 Location: depot rd									

Osmose Utilities Services, Inc.

NonRestorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2029 Customer Data ID:2029PB	1957	40/4	Southern Pine/Creosote	44.00	37.32	PX - Partial Excavate Reject	**Non Restorable Reject**	**61.00**	Replacement Recommended	**Primary Reject Reason:** *Shell Rot* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-135* **Enclosed Pocket Depth:** *6.5* **Width:** *10* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.48*
x: -70.840751 y: 42.916718 Location: depot rd										
2015a Customer Data ID:2015	1957	40/4	Southern Pine/Creosote	39.00	32.71	PX - Partial Excavate Reject	**Non Restorable Reject**	**59.00**	Replacement Recommended	**Primary Reject Reason:** *Shell Rot* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Exposed Pocket Depth:** *6* **Width:** *2* **Orientation:** *+45* **Exposed Pocket Depth:** *6* **Width:** *4* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *6* **Width:** *9* **Minimum Shell:** *2* **Orientation:** *+90* **Enclosed Pocket Depth:** *6* **Width:** *9* **Minimum Shell:** *2* **Orientation:** *+LOL* **Shell Rot Depth:** *0.32*
x: -70.840843 y: 42.924416 Location: Hampton river boat club										
2015 Customer Data ID:2015PB	1957	40/4	Southern Pine/Creosote	38.00	27.52	PX - Partial Excavate Reject	**Non Restorable Reject**	**38.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *2* **Orientation:** *-90* **Enclosed Pocket Depth:** *6* **Width:** *9.5* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840816 y: 42.924457 Location: Hampton river boat club										
2014 Customer Data ID:2014PB	1957	40/4	Southern Pine/Creosote	34.00	20.83	PX - Partial Excavate Reject	**Non Restorable Reject**	**23.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *0.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8.5* **Minimum Shell:** *1.5* **Orientation:** *-LOL*
x: -70.840832 y: 42.924978 Location: Hampton river boat club										
2066 Customer Data ID:2065PB	1989	35/4	Southern Pine/Creosote	33.00	25.47	PX - Partial Excavate Reject	**Non Restorable Reject**	**46.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *2* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-LOL*
x: -70.840522 y: 42.892917 Location: depot rd										
2064 Customer Data ID:2063PB	1972	40/4	Southern Pine/Creosote	39.50	24.88	PX - Partial Excavate Reject	**Non Restorable Reject**	**25.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1* **Orientation:** *-90* **Enclosed Pocket Depth:** *5.5* **Width:** *9* **Minimum Shell:** *1* **Orientation:** *-LOL* **Shell Rot Depth:** *0.4* **Image Name:** *2064_85_Customer Required.jpg* **Photo Description:** *Customer Required*
x: -70.840520 y: 42.894204 Location: depot rd										
2064PB Customer Data ID:2063	1972	40/4	Southern Pine/Creosote	34.50	27.74	PX - Partial Excavate Reject	**Non Restorable Reject**	**52.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *-LOL* **Shell Rot Depth:** *0.24*
x: -70.840559 y: 42.894194 Location: depot rd										

Osmose Utilities Services, Inc.

NonRestorable Reject Poles

Unitil Service Corporation

Job Number: 1028562 Week Ending: 05_25_19

Structure Number	Year	Length Class	Species Treat	Orig Circ	Eff Circ	Insp Type	Reject Status	Rem Strength	Reported Items	Additional Information
2057a	1950	40/4	Southern Pine/Creosote	33.00	29.00	PX - Partial Excavate Reject	**Non Restorable Reject**	**67.00**	Replacement Recommended	**Primary Reject Reason:** *Shell Rot* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Shell Rot Depth:** *0.64*
	x: -70.840683 y: 42.898876 Location: depot rd									
2057	1950	40/4	Southern Pine/Creosote	32.50	24.91	PX - Partial Excavate Reject	**Non Restorable Reject**	**45.00**	Replacement Recommended	**Primary Reject Reason:** *Hollow* **Non Restorable Reason:** *Top of Truss Shell* **Decay: Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1.5* **Orientation:** *+LOL* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-90* **Enclosed Pocket Depth:** *5* **Width:** *8* **Minimum Shell:** *1* **Orientation:** *-LOL*
	x: -70.851597 y: 42.911829 Location: depot rd									

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-7 Witness: Jacob Dusling

Request:

Reference Company Response to Staff 1-5 Attachment 1. Please state which of the proposed options the Company chose to move forward with for the 3348, 3350, and 3359 Line and why.

Response:

The Company elected to move forward with Option 1 in Staff 1-5 Attachment 1 to rebuild the 3350/3348 lines. This option provides the greatest system operating flexibility of all the options and has the second lowest expected cost of all the options. Additionally, Unitil plans to utilize a more robust design for the rebuilt lines that should better withstand the conditions along the salt marsh.

The lowest cost option (Option 3 – Construct New Line in the Railroad RoW) was removed from consideration for the following reasons:

- Unsuccessful in obtaining land rights
- Cost of reoccurring licensing costs
- Difficulty of constructing a double circuit subtransmission/distribution line in an area with limited rights for guying and
- Inability to provide backup for Seabrook substation.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-8 Witness: Jacob Dusling

Request:

Reference Company Response to Staff 1-5 Attachment 1, Page 1 of 8, stating "The 3348, 3350 and a small portion of the 3359 lines are constructed across the salt marsh in Hampton, Hampton Falls and Seabrook. There are condition related concerns associated with the aging infrastructure and significant accessibility and permitting challenges exist due to the location of the lines. This can cause the line(s) to be out of service for several months at a time when structure damage occurs." Please describe any instances in the past ten years when the line has been out of service for several months due to structural damage.

Response:

The below list includes the instances in which the 3348/3350 line was out of service for more than one month in the past ten years.

- 6/5/2020 – Scheduled 7/6/2020 – currently out of service – caused by a broken static wire and discovery of an osprey nest.
- 9/10/18 to 10/15/18 – caused by failed splice
- 3/10/18 to 6/8/18 – caused by a failed structure that occurred during a snow event
- 9/2/17 to 11/1/17 – caused by a broken conductor
- 2/25/10 to 7/14/10 – caused by the failure of multiple structures that occurred during a wind event

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-9 Witness: Jacob Dusling

Request:

Reference Company Response to Staff 1-7 Attachment 2, Page 1 of 33, describing 118 of the poles as "decayed but serviceable."

a. Please describe how decayed poles would be serviced, the cost associated with servicing, and how long servicing would extend the useful life of an existing pole/structure.

b. Please compare this to the cost of replacement, which Staff 1-5 Attachment 2 appears to indicate would be $2.2 million..

Response:

a. "Decayed but Serviceable" poles are poles that have experienced strength degradation, but still have 67% or more strength remaining and are serviceable (i.e. have adequate strength characteristics) for the time being without any improvements.

b. The cost estimate to replace the rejected structures is approximately $2 million (without overheads) versus $7.7 million (without overheads) to rebuild the lines. However, replacing only the rejected structure does not address all condition based concerns with the 3348/3350 lines, including but not limited to aging insulators, decaying crossarms and corroded anchors. Additionally, in the event 118 "decayed but serviceable" poles continue to decay they may require replacement in the near future.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-10 Witness: Jacob Dusling

Request:

Reference Company Response to Staff 1-7 stating "Unitil elected to replace eight of the identified structures with temporary single-pole structures while a permanent line replacement could be designed and constructed." Please describe the cost of deploying the temporary replacements and what happens to the replacements when the permanent replacement is designed and constructed.

Response:

The estimated cost to replace the eight H-Frame structures with temporary single pole structures is approximately $370,000 with overheads. All new structures will be evaluated when the line is rebuilt to determine if the structures can be reused in the new design.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-5 Witness: Jacob Dusling

Request:

Reference Response 2-7, 2-8, 2-9, 1-5, and related attachments, describing the Company's planned 3348, 3350, and 3359 Line Replacement.

a. Please provide any assessment of alternatives to rebuilding the line in the existing right of way that was prepared by the Company, including any maps/drawings of the existing right of way or maps/drawings of other rights of way that were considered.

b. Please provide all maintenance and emergency repair records for the 3348, 3350, and 3359 Line corridor over the past 10 years, or 20 years if possible. If the line was inspected by helicopter, please provide any records of those inspections. If the line was inspected on foot, please provide any records of those inspections.

c. Please provide all of the pole inspection records, including pole integrity, performed either internally or externally on the said lines for the past 10 years. If possible, please indicate if a structurally unacceptable pole was either replaced or reinforced.

d. If access to the corridor at issue limited the Company's ability to provide service to customers, please explain how this is the case and provide any documentation associated with the costs, permitting, or seasonal constraints concerning the Company's access to this right of way. Please also provide any petitions, easements, or licenses applicable to these lines.

e. The Company states that "replacing only the rejected structure does not address all condition based concerns with the 3348/3350 lines, including but not limited to aging insulators, decaying cross arms and corroded anchors." Please provide any further evidence the Company has that have led to its concerns over the aging insulators, decaying cross arms, and corroded anchors at issue, including but not limited to maintenance records, replacement costs, and any analysis formed to consider replacing those assets without fully rebuilding the corridor.

f. Please provide any and all cost benefit analysis completed by the Company regarding whether to replace or rebuild the 3348, 3350, and 3359 Lines.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-5 Witness: Jacob Dusling

Response:

a. Staff 3-5(a) Attachment 1 is a map highlighting the options considered in Staff 1-5 Attachment 1. Additionally Staff 3-5(a) Attachment 2 provides aerial imagery of the existing line location during lower tide conditions.

b. Staff 3-5(b) Attachment 1 is a listing of all the material installed to replace damaged equipment along the 3348, 3350 and the 3359 (where applicable) corridors dating back to 2011. This information was obtained from Unitil's electronic data base. Prior material and replacement records for sub-transmission facilities were hand written onto index cards.

   Staff 3-5(b) Attachment 2 reflects records (invoices from vendor) of scheduled helicopter patrols for the same aforementioned lines.

   Staff 3-5(b) Attachments 3 through11 are records of scheduled foot* patrols for the same aforementioned lines.

   * Making a direct pole to pole inspection by foot on a regular basis is very impractical and has many inefficiencies due to the hazards and field conditions that exist such as tidal waters, embankments, creeks, mud conditions and unknown walking conditions. That said, the annual scheduled visual inspections "by foot" are performed from several access points that allows the inspector to become close to the lines for viewing from a distance with the use of binoculars.

c. As indicated in Staff 3-5(b) the direct pole to pole inspection on a regular basis is very impractical. Furthermore, the equipment Unitil utilizes to check the integrity of a pole cannot be utilized on a pole that has any water content or in wet conditions therefore there are not any records to provide in this regard except for those provided in Staff 3-5(b).

d. The access to the corridor of lines at issue does not necessarily limit the Company's ability to provide or restore service upon a fault along the lines. This is due to the fact that we have the ability to service all the customers normally supplied from these lines through an alternate source of supply or the ability to service our customers through distribution circuit ties. However, such alternate sources of supply are only temporary in nature due to the exposure that exists under such a contingency configuration. For example on June 16th, 2020 a motor vehicle accident occurred along Route 286 in Seabrook. This resulted in an outage to 3,926 customers and totaled 294,340 customer-minutes of interruption. At the time the 3348 and 3350 lines were out of service for repair. Had these

lines been in service, the outage on Route 286 would have only affected 1,805 customers and totaled approximately 140,000 customer minutes of interruption.

The access issues that present the challenges after a failure or scheduled work is that the corridor the lines reside in is within a tidal salt marsh area that require boats, barges and/or specialized off road equipment to access the vast majority of the facilities. Due to the tides, the work has to be performed at specific and varied times and sometimes the work has to be delayed for a week until the tides become more ideal for daylight working conditions. See Staff 3-5(e) for pictures that will provide for some level of the challenges that present themselves with access. Furthermore, State of NH wetlands permitting is also required for much of the work and under some circumstances, access through the Seabrook nuclear plant can take several hours due to security measures. Another obstacle is having to obtain an excavation permit from the State of NH in order to remove part of a guardrail in order to gain access to a small portion of one of the lines.

e. Staff 3-5(e) Attachments 1 through 6 are pictures of various failures that have occurred over the past ten (10) years, all of which have led to the concerns. In addition to these failures the other concerning factor is the limitation of the wooden structures to withstand tropical or hurricane force winds which was clearly evident during an event in 2010 (see Staff 3-5(e) Attachments 7 through 9 for pictures) Additionally, the below table represents the vast majority of the replacement costs for pole structures, crossarms and other material over the past several years:

Description	Year	Costs
Remove failed static wire and install new guy wire	2020	$8,000
Replace damaged and deteriorated wire and failed splice	2019	$9,600
Replace failed insulator and guy wire	2019	$13,200
Replace Damaged Structure due to Failed Insulator	2018	$60,000

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020
Request No. Staff 3-5

Date of Response: August 4, 2020
Witness: Jacob Dusling

Replace two damaged structures as a result of a high wind/snow event	2018	$75,000
Replace Damaged Structure, due to Conductor/Splice Failure	2018	$100,000
Replace Damaged Structure, due to Lightening or Insulator Failure	2018	$78,000
Replace insulator and installed splice in wire	2017	$17,700
Replace one deteriorating structure	2016	$30,000
Replace structure, due to insulator failure	2015	$39,400
Replace neutral wire	2014	$6,000
Replace three (3) corroded anchors and guys	2014	$5,300
Replace corroded anchor and guy	2013	$11,530
Replace one deteriorating structure and two anchors and guys	2012	$27,000
Replace conductor tap wires due to failed salt contaminated connectors	2012	$11,800
Replace two anchors and guys and replace cribbing	2011	$7,500

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020
Request No. Staff 3-5

Date of Response: August 4, 2020
Witness: Jacob Dusling

Replace nine (9) fallen structures as a result of a high wind event.	2010	$250,000

f. All information regarding this was supplied in response to Staff 1-5.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-11 Witness: Jacob Dusling

Request:

Reference Response 3-5(b), Attachments 3-11, providing visual inspection reports from 2010 to 2019, associated with the 3348, 3350 and the 3359 (where applicable) corridors, conducted twice annually. Please confirm that with rare exception, the visual inspections resulted in confirmation that the state of equipment in those corridors was "all okay."

Response:

Correct, the visual inspections that are being referred to resulted in an "all okay" with some exceptions where denoted on said reports. These results were at the time in which the inspection took place. See Reply to 4-13 (c) and (d) to further provide other associated inspection information.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-12 Witness: Jacob Dusling

Request:

Reference Response 3-5(e), describing "the vast majority of replacement costs for pole structures, cross-arms, and other material over the past [10] years."

a. Please confirm that replacement costs associated with the 3348, 3350 and the 3359 (where applicable) corridors has been approximately $500,000 over the last ten years, with the exception of the high wind event in 2010, which resulted in replacement costs of $250,000. If this is not the case, please explain why.

b. Please describe the 2010 high wind event and how it affected the Company's overall distribution system, including the number of overall fallen structures and costs of replacement.

Response:

a. Correct, the replacement costs associated with the 3348, 3350 and the 3359 (where applicable) corridors has been approximately $500,000 over the last ten years with the exception of the high wind event in 2010 which resulted in replacement costs of $250,000.

b. The 2010 high wind event impacted the UES area on the evening of February 25th through the morning of February 26th, 2020. The UES Seacoast area experienced sustained wind speeds of approximately 33-48 mph with gusts up 76 mph. The UES Capital are experienced sustained with speeds of approximately 14-34 mph with gusts as high as 67 mph. This resulted in the following damage/impact:

   61,602 customers interrupted (40,602 Seacoast / 21,000 Capital)
   137 poles replaced (101 Seacoast / 36 Capital)
   66 transformers replaced (40 Seacoast / 26 Capital)
   325 crossarms replaced (210 Seacoast / 115 Capital)

   Additional detailed can be found in the Company's After Action Report, Staff 4-12 Attachment 1. The cost indicated in the report was an estimate when the report was finalized. The total final cost associated with UES restoration and repairs was $7.17 million, including capital costs and deferred costs.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-13 Witness: Jacob Dusling

Request:

Reference Response 3-5(f), stating that any and all cost benefit analysis completed by the Company regarding whether to replace or rebuild the 3348, 3350, and 3359 Lines was provide in response to Staff 1-5, and Staff 1-5 Attachment 2 stating "The high-level estimated cost to replace the 25 [reject pole] structures [rather than rebuild the corridor] is approximately $2M," and that "[t]here are a significant number of splices, aging insulators, rotting crossarm and corroded anchors throughout the line. Addressing these concerns is not included in the $2M estimate above."

a. Please provide any underlying analysis or materials in supporting the Company's $7.7M cost estimate (provided in Staff 1-5 Attachment 1) for rebuilding the 3350/3348 lines. If no underlying analysis was developed for this cost estimate, please explain why this is the case. Please also explain who developed this $7.7M figure.

b. Please provide any underlying analysis or materials supporting the Company's $2M cost estimate for replacing the reject poles. If no underlying analysis was developed for this cost estimate, please explain why this is the case. Please also explain who developed this $2M figure.

c. Please describe the efforts taken by the Company to identify the particular "splices, aging insulators, rotting crossarm[s] and corroded anchors" and assess the cost of replacement or repair of these structures.

d. Please reconcile the ten years of visual inspection results consistently identifying the 3348, 3350 and the 3359 (where applicable) corridor structures as "all okay" with the Company's assertion that "there are significant number of splices, aging insulators, rotting crossarm[s] and corroded anchors throughout the line."

Response:

a. The cost estimate of $7.7M for the rebuilding of the 3350/3348 lines was established by the Company and was based on estimates of similar projects and conversion with construction contractors. Pursuant to these conversations and experience with other projects, the Company developed per mile estimates based on engineering and operational judgement in order to create the estimates in Staff 1-5 Attachment 1.

   The Company is currently in the process of performing detailed analyses, including surveying and geotechnical evaluations, and will be partnering with a design firm who will assist with determining the material to be utilized and with developing the line design. Once these detailed analyses are complete the Company will develop

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-13 Witness: Jacob Dusling

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a detailed estimate utilizing the actual design requirements for the reconstruction. In the event that the detailed estimate is more than the preliminary estimate of $7.7M, the Company will reassess the decision to rebuild the lines in their existing locations.

b. The cost estimate of $2M was developed by the Company and was based on: 1) similar structure replacements in 2018; 2) utilizing these historical expenditures as a base line, coupled with engineering and operational judgement and knowledge of the location, plus a separate estimate was derived for the replacement of a unique existing six (6) pole structure; and 3) permitting costs based on a conversation with a surveying and permitting contractor.

Cost per Typical Structure – $62,500 x 24 Structures
Cost to Rebuild Six Pole Structure – $225,000
Permitting – $75,000
Contingency and Inflation – 10%
Total $1,980,000

c/d. As previously stated in Staff 3-5(b), making direct pole to pole inspections by foot on a regular basis is very impractical and has many challenges due to the hazards and field conditions such as tidal waters, embankments, creeks, mud conditions and unknown walking conditions. That said, the annual scheduled visual inspections “by foot” are performed from several access points that allows the inspectors to get close enough to the lines for viewing from a distance with the use of binoculars. These viewings will provide for finding obvious failures that have already or are about to occur, such as broken crossarms, failed and/or severed insulators or guy wires completely detached from their anchors, or in other words, failures that need immediate attention.

Due to the distance from which the “by foot” inspections are performed, it is extremely difficult to identify minor damage to insulators, rotting crossarms and corroding anchors. This being the case, the Company based the assertion that there are a significant number of splices, aging insulators, rotting crossarms and corroded anchors throughout the line on the conditions typically experienced and observed when repairs or replacements of equipment are made, historical failures and the age of the equipment.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 5

Received: September 14, 2020 Date of Response: September 23, 2020
Request No. Staff 5-3 Witness: Kevin Sprague

Request:

Reference Response 4-13, stating "The Company is currently in the process of performing detailed analyses, including surveying and geotechnical evaluations, and will be partnering with a design firm who will assist with determining the material to be utilized and with developing the line design." Please provide the scope of work i.e. request for proposal (RFP) and any revised scope of work associated with the design firm who will be engaging in this analysis.

Response:

Reference Staff 5-3 Attachment 1 for the request for proposal issued by the Company for engineering services associated with the complete line design, survey and permitting for the replacement of the 3348 and 3350 34.5kV sub-transmission lines in Hampton and Seabrook New Hampshire. Subsequent to the RFP, the Company selected TRC to provide the engineering services.

Reference Staff 5-3 Attachment 2 (Confidential) for TRC's proposal to the RFP.

As a follow-up to the discussion during the Technical Session held on September 11, the Company requested an updated scope of work from TRC to provide engineering series to determine the estimated costs of both repairing and rebuilding the 3348 and 3350 lines. Reference Staff 5-3 Attachment 3. This document is in draft form and the Company is open to feedback from the Staff and OCA on any additions or modifications to the scope of work. TRC will provide an estimated cost for these services once the scope of work if finalized.

Please note that Staff 5-3 Attachments 2 and 3 are Confidential and are being provided pursuant to the provisions of Puc 203.08(d) and (e). The Company submits that it has a good faith basis for treating these attachments as Confidential as they contain customer specific information.

Attachment - KFD - 6

Concord Downtown Conversion

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 1

Received: May 20, 2020 Date of Response: June 4, 2020
Request No. Staff 1-2 Witness: Jacob Dusling

Request:

Reference Company Least Cost Integrated Resource Plan at Page 18-19 of 590, describing the Concord Downtown Conversion project as necessary to accommodate unforeseen customer load additions in the downtown area. Please provide a narrative describing the unforeseen load additions and whether that load actually materialized. Please also provide any supporting documentation that is available relating to the load increases.

Response:

The below table details the unforeseen customer additions and the current status of each of these load additions. At this time the Company cannot confirm if the expected load increase for the locations in service has materialized. These loads were placed in service after typical peak load times and many of the locations are not fully occupied.

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Location	Expected Load (kVA)	Current Status of Project
16-18 South Main Street Concord Theatre	250	In-Service
20 South Main Street Restaurants and Luxury Apartments	500	Planned In-Service Late 2021/Early 2022
5-7 Pleasant Street Apartments	800	In-Service
32-34 South Main Street Retail, Restaurants, Apartments	1000	Cancelled
97 Storrs Street Retail and Luxury Apartments	500	On Hold
80 Storrs Street Restaurants	500	Company currently working with development of plan to serve
34-42 North Main Street Phoenix Hall	300	Company currently working with development of plan to serve
76-82 North Main Street Bank, Restaurant, Offices and Apartments	280	In-Service
1 Eagle Square Offices	300	Under construction
Dubois Ave South Side Lot 7 Story Mixed Use Building	700	Proposed plans received by City
8-14 Dixon Ave Retail	200	On Hold
120-146 North Main Street Mixed Used	300	On-going

In addition to projects listed above there are three other projects that Unitil has been made aware of that are expected to be placed in-service within the next five to eight years. These projects are expected to total approximately 1,000kVA of additional load in the area.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-4 Witness: Jacob Dusling

Request:

Reference Company Response to Staff 1-2 describing 5,630kVA expected load associated with customer additions necessitating the Concord Downtown Conversion project, including 1,700 kWA of expected load which has been cancelled or is on hold.

a. Please provide an update on the status of the Concord Downtown Conversion as of June 2020.

b. Please provide any planning documents associated with the Downtown Conversion project (business cases, solutions selection forms, etc.)

c. Please describe how the 1,700 kVA of expected load that has been cancelled or placed on hold impacts the need for the Concord Downtown Conversion.

d. Please provide a narrative describing the 1,000kVA project which has been cancelled.

e. Please provide the annual peak loading in the area associated with the Concord Downtown Conversion for each of the past five years.

f. Please provide the hourly loading in the area associated with the Concord Downtown Conversion on the peak day during 2019.

Response:

a. As of June 15, 2020, the Concord Downtown Conversion is essentially complete. The expansion to Gulf Street substation is in service and all conversion from 4.16kV to 13.8kV operation is complete. Some minor cleanup work remains (switching to place circuits into their new normal configurations, final signage and equipment labelling, etc.) and is expected to be complete by the end of the June.

b. Unitil's Concord Downtown Area Study is attached as Staff 2-4 Attachment 1.

c. This would have reduced the anticipated loading on substation equipment as follows:

- 1T2 transformer to approximately 95% of normal instead of 115%
- 1H1 Circuit Position to approximately 136% of normal instead of 167%
- 1H6 Circuit Position to approximately 96% of normal instead of 126%

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Additionally, many of the distribution loading and voltage violations are expected to remain, but be less severe without the load that was cancelled or placed on hold

d. 32-34 South Main Street in Concord's Central Business District and was acquired from the State of NH by the City for the purposes of economic development. The City desires to sell the property to a private developer for redevelopment in order to expand the City's tax base, job base, housing base, and overall economic vitality.

In January of 2018, the City entered into a Purchase and Sales / Development Agreement with The Dolben Company to develop a 180,000SF, $30M mixed use building featuring 125 apartments, an internal parking garage and 5,000 SF restaurant at 32-34 South Main Street.

Unitil worked with the City and Dolben to develop a plan to relocate aerial utilities underground to support development of 32-34 South Main Street, as well as abutting properties affected by the development.

As the Dolben Company conducted its due diligence and prepared development permitting applications, it was determined that additional financial support would be required from the City, in an amount of upwards of $3.5 million, to make the developer's project economically viable.

In August of 2019, the City Council voted to not amend its Purchase and Sales / Development Agreement with The Dolben Company to provide the additional financial support for the developer's project. Consequently, The Dolben Company subsequently terminated the Purchase and Sales / Development Agreement and withdrew from the project.

The City continues to actively market the property. However, the onset of the COVID 19 "Coronavirus" Pandemic – and associated economic challenges related thereto, has complicated efforts to find a suitable partner for development of the property.

e. The table below displays the historical summer peak loading of the Concord Downtown area as defined in the attached study. Combined loading is provided for circuits 21W1A and 21W1P, because these are underground circuits that are designed to back one another up for an underground fault.

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Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-4 Witness: Jacob Dusling

	Load (kVA) / % or Normal Rating				
	2015	2016	2017	2018	2019
1T1 Transformer	3,868 / 47.2%	4,032 / 49.2%	no data	4,266 / 51.2%	3,055 / 37.3%
Circuit 1H3	1,505 / 64.3%	1,578 / 67.4%	1,518 / 64.8%	1,518 / 64.8%	1,429 / 61.0%
Circuit 1H4	no data	980 / 45.9%	no data	no data	620 / 29.1%
Circuit 1H5	1,536 / 51.4%	1,573 / 52.6%	1,525 / 51.0%	1,669 / 55.8%	1,189 / 39.8%
1T2 Transformer	4,323 / 52.8%	4,150 / 50.7%	4,266 / 52.1%	4,611 / 56.3%	3,747 / 45.7%
Circuit 1H1	2,435 / 81.6%	no data	2,306 / 77.2%	2,407 / 80.6%	2,024 / 67.8%
Circuit 1H2	1,153 / 49.2%	1,038 / 44.3%	1,009 / 43.1%	1,326 / 56.6%	922 / 39.4%
Circuit 1H6	1,110 / 37.2%	no data	1,052 / 35.2%	1,196 / 40.1%	893 / 29.9%
3T1 Transformer	3,094 / 61.1%	3,267 / 64.6%	2,959 / 58.5%	3,266 / 64.5%	2,613 / 51.6%
Circuit 3H1	1,815 / 81.1%	1,830 / 64.6%	1,701 / 76.0%	1,816 / 81.1%	1,499 / 66.9%
Circuit 3H2	1,254 / 56.0%	1,355 / 60.5%	1,239 / 55.3%	1,369 / 61.1%	1,023 / 45.7%
3T2 Transformer	no data	1,059 / 25.6%	949 / 23.0%	992 / 24.0%	656 / 15.9%
Circuit 3H3	no data	1,059 / 45.2%	949 / 40.5%	992/ 42.4%	656 / 28.0%
Circuits 21W1A/21W1P Combined Load (Downtown Underground)	4,064 / 103.0%	4,160 / 105.5%	4,240 / 107.5%	4,112 / 104.3%	3,298 / 83.6%

f. Hourly load data is not available for the Concord Downtown area, because Unitil does not have SCADA telemetry information for the associated circuits.

Unitil Energy Systems - Capital

Concord Downtown Area Study 2018

Prepared By:

Tyler Glueck
Unitil Service Corp.
1/7/2019

1. Executive Summary

This study is an evaluation of the Unitil Energy Systems-Capital (UES-Capital) electric system in the vicinity of downtown Concord. This study was performed separate from the annual distribution planning study, because these additional loads were brought to Unitil's attention after the annual analysis was complete.

The purpose of this study is to identify system constraints due to unanticipated customer load additions that are expected to be in service by the end of spring, 2020. In addition, this study details project options and proposes system improvement projects to resolve the identified planning violations. This study covers examines the known, expected loading within the five year period from 2019 to 2023.

The following system improvements are recommended as detailed in section 6:

1. Combine circuits 1H6 and the underground portion of 1H1
2. Convert combined circuits to 15kV construction
3. Transfer circuit 3H3 to 7X1
4. Install a new 34.5kV/13.8kV transformer at the Gulf St S/S
5. Install two new 13.8kV circuit positions at Gulf St
6. Populate one circuit position to supply the converted 1H6 and 1H1 as a new circuit, "3W4"

The following table is a comparison of capacity versus expected load in 2019.

	Present Peak Load	**Present available Capacity**	**Expected Additional Load**	**% Load over Avail. Capacity**	**Total load after Addition**
1T2	4698	3492	4750	115%	9448
1H1	2453	775	2950	167%	5403
1H6	1110	1196	1800	126%	2910

2. Study Focus

This study is an extension of the UES-Capital 2019-2023 distribution planning process. It is an area review of the downtown Concord area that is being performed due to the identification of additional customer growth that was not known when the analysis for the 2019-2023 planning process was completed.

This study is primarily focused on the planned load expected to require service by the spring of 2020. The first objective of this study is to identify the system constraints that do not meet planning criteria. The second objective is to develop options and recommendations to serve the downtown Concord area over the next five years. The final objective is to effectively develop an improvement plan that will accommodate the immediate load increases, as well as enable future system load growth. The projects proposed are based upon economy, reliability, and potential for future development.

This study does not attempt to identify or address all loading and/or voltage concerns throughout the entire downtown Concord area; however some of the recommendations within this report will provide added benefit to the overall distribution system in this area.

3. Area Description

For the purposes of this study, the UES-Capital downtown Concord area is comprised of the power transformer and distribution circuit positions at Bridge Street, Gulf Street, Storrs Street and Montgomery Street substations (S/S) and the distribution circuits they supply.

The subtransmission system was not reviewed in detail as part of this study. The anticipated load increase is not anticipated to cause subtransmission planning violations. Alternatives were reviewed to determine if subtransmission upgrades could be required for any of the options to address distribution constraints.

Load projections within this report are based on the 2019-2023 five year distribution load forecasts that were developed as part of the 2019-2023 distribution planning process. Additional details regarding the load projections can be found in the UES Capital 2019-2023 Distribution Planning Study.

The 2019 and 2023 projections were increased based upon that anticipated customer load additions. The estimated load is approximately 4.75MW, split up between 1H1 and 1H6. The projected annual load can be found in Appendix A.

4. Analysis and Findings

This section details the results from a detailed review of the UES-Capital Concord downtown Area. It describes concerns associated with the distribution substation and mainline distribution equipment. It does not attempt to identify all loading and voltage concerns throughout the area. Isolated concerns, such as low voltage on a lateral that is not associated with the customer load addition will be addressed under the UES-Capital Distribution Planning Study. The projections listed here are a summation of potential new load and the load projected in the UES-Capital Distribution Planning Study.

a. Distribution Substation Loading Concerns

Distribution substation elements which are expected to exceed their normal summer ratings are listed in the table below.

	Projected KVA	Rating of Overloaded Elements					
	2019	Element	Rating	% of rating	Element	Rating	% of rating
1T2	9448	Xfmr	8186.4	115%	-	-	-
1H1	5403	Trip	3225.6	168%	REG	3456	156%
1H6	2910	Trip	2304	126%	REG	3456	84%

	Projected KVA	Rating of Overloaded Elements					
	2019	Element	Rating	% of rating	Element	Rating	% of rating
1T2	9448	-	-	-	-	-	-
1H1	5403	Wire	3823.2	141%	Recloser	4032	134%
1H6	2910	-	-	-	-	-	-

b. Distribution Circuit Loading and Voltage Concerns

The following summarizes mainline distribution equipment which is expected to be loaded above normal ratings during the study period. It also identifies the lowest voltage on the circuit.

	Element	Projection	Rating	% of rating
1H1	336 AA	5403	3823	136%
1H6	336 AA SP	2910	3226	90%

	Element	Projection	Rating	% of rating
1H1	1/0 Al UG	1159	1080	107%
1H6	2/0 ACSR	2748	2038	135%

	Element	Projection	Rating	% of rating
1H1	#2 Al UG	1159	828	140%
1H6	#2 Cu	2748	1728	159%

	Lowest Voltage
1H1	-
1H6	112.8V

c. Other Concerns

The following additional concerns shall be considered when developing system improvement options and evaluating alternatives

i. I-93

The concord downtown area is in the close proximately of I-93. The State of NH is currently in the process of evaluating options for the widening of I-93. The widening project has the potential to impact Unitil infrastructure, including Bridge Street and Gulf Street substations.

ii. Downtown Underground

The downtown underground was built to have a primary (21W1P) and alternate (21W1A) feed to allow one of the circuits to back the other one up completely. Due to load growth in the area this is no longer the case. Depending on the fault location, portions of the downtown underground need to be restored from overhead distribution circuits. The Capital Master Plan details the future goal of returning the downtown underground to its original purpose.

iii. Space Constraints

Available land in the downtown Concord is very limited. Combined with the unknowns of the I-93 widening and the timeframe in which upgrades are required, finding locations for new substation infrastructure will be extremely difficult.

5. Improvement Options

This section details improvement options that were considered to address the identified constraints above.

5.1 Option 1 – Replace Gulf St. 3T2 with 34.5kV/13.8kV Transformer
5.2 Option 2 – Create a 13.8kV Transformer "Grid"
5.3 Option 3 – Upgrade the Bridge St. S/S or Build a New S/S
5.4 Option 4 – Add Transformation at the Iron Works S/S
5.5 Option 5 – Upgrade 21W1A and 21W1P

All projects detailed below address the identified constraints for the duration of the five-year planning horizon.

5.1 Option 1 – Replace Gulf St. 3T2 with 34.5kV/13.8kV Transformer

The main portion of this plan is to install a new 13.8kV transformer, build two new circuit positions, and run two 13.8kV circuits from the new transformer to connect one with 1H1 and the other 1H6. Both of these 4kV circuits will be converted to 13.8kV. The following options are proposed to eliminate one of the 4kV transformers at Gulf St.

Option 1A – Transfer 3H2

The first option is to transfer 3H2 to the Langdon S/S using 14H1. 14H1 will be extended for four spans to tie in to 14H2 at a new location, removing load from 14H2. 14H2 will now close the tie with 3H2 and assume its load. 3H2 will be removed from the Gulf St S/S. 3H3 will be transferred from 3T2 to 3T1. 3T2 will be replaced with a new 13.8kV transformer.

Option 1B – Transfer 3H3

The second option is to transfer 3H3 to Bow Junction S/S using 7X1. 3H3 will be connected to new step down transformers at the junction of 3H3 and 7X1. 3H3 will be removed from Gulf St S/S. An alternative is to convert 3H3 to 34.5kV and create a 34.5kV position at Gulf St, as well as a tie with 7X1. The 3T2 transformer will be replaced with a 13.8kV transformer.

5.2 Option 2 – Create a 13.8kV Transformer "Grid"

The 374 and 34 corridor through Concord may allow enough space to create several new 34.5-13.8 kV transformer locations. Instead of trying to rebuild an entire substation or trying to find space to locate a new substation, several "substation-style" padmount transformers can be installed along the 374/34 corridor. There are four locations where existing circuits extend out of the transmission corridor to serve load in the city. This project would involve installing one 12,400 kVA transformer at each of these locations and converting the existing 4.16 kV distribution infrastructure in the area to 13.8 kV operations. A one-line is located in Appendix A. Bridge St can be used as a switching station.

Distribution upgrade information is located in the following table:

	1H6	**1H2**	**1H1**
Transformers	33	25	29
Poles	57	30	27
Conversion (ft)	6,300	9,300	7,000
Reconductor (ft)	2,050	3,500	700

Benefits

New property rights would be minimal. This proposal can easily be done in pieces, as needed. This proposal fits the timeline set forth by incoming load.

Constraints

There are many unknowns related to a newer type of project like this. I-93 expansion is an unknown at this time. Other constraints include the purchase of land and/or easement rights.

Open Questions

Would transmission poles need to be replaced? Can power transformers fit in the ROW? What else would be needed to complete this project?

What would be needed for regulation? High-side regulation or should we consider low-side regulators or LTCs?

Long-term Plan

This would ultimately accommodate the removal or conversion of the 4.16 kV portions of Bridge Street, Gulf Street and West Concord substations and the conversion of all the 4.16 kV downtown

circuits to 13.8 kV operations. An alternative to converting these stations is to remove the existing 4 kV infrastructure and install padmounted transformers.

5.3 Option 3 – Upgrade an existing S/S to 13.8 kV or Build a new 13.8kV S/S

Option 2 involves the conversion of an existing substation to 13.8 kV or constructing a new 34.5-13.8 kV substation in the downtown area. . The following sections discuss various options where the construction would take place.

This option sets the stage for converting/rebuilding all the substations (Gulf Street, Bridge Street and West Concord) and distribution circuits in the downtown area to 13.8 kV.

Option 3A –Bridge Street S/S

Upgrade the 1T2, 1H1, 1H2, 1H1 portion of Bridge St S/S from 4kV to 13.8kV. The new equipment ratings shall be set to accommodate the existing load, switching capabilities, and leave room for growth. The peak amp load is expected to be 395A. Therefore, the transformer size will need to be 12,400 kVA. To accommodate the rebuild of this portion of Bridge Street S/S circuits, 1H1, 1H2 and 1H6 will be converted to 13.8 kV operations.

Distribution upgrade information is located in the following table:

	1H6	**1H2**	**1H1**
Transformers	33	25	29
Poles	70	30	27
Conversion (ft)	8,600	9,500	7,000
Reconductor (ft)	2,050	3,500	700

Benefits

No new substation locations would need to be found. The affected circuits would be immediately targeted. Bridge St is an ideal location, being right in the middle of the north and south ends of Concord. There are right-of-ways and easements established, eliminating the immediate need for more land access. The three affected circuits are on one transformer, so only half of Bridge St would need to be upgraded within the shorter timeframe.

Constraints

There may not be enough space in the current S/S footprint to upgrade. How to serve existing load while upgrades are completed? Can the 1T1, 1H3, 1H4, 1H5 remain until future load deems upgrades are required? How do we back-up / install mobile for failure of 1T1 or new transformer? I-93 expansion is an unknown at this time.

Open Questions

Rights granted by easements or Rights of Way need to be investigated

Option 3B– Construct a New S/S

Due to space limitations at Bridge St, it may be preferable to find a new location for a substation. Space for a new S/S in Concord is limited and would require purchase of land or rights. The S/S would be built for 13.8kV and three circuits. The distribution equipment would need to be upgraded to 13.8kV as well.

This option is not viable due to land space and timeframe.

5.4 Option 4 – Add Transformation at Iron Works S/S

Install a 2nd 7.5/10.5 MVA, 34.5-13.8 kV transformer at Iron Works S/S, construct a fourth circuit position and upgrade the existing circuit regulators at Iron Works S/S. 22W3 will be split into two circuits and significant reconstruction of multiple distribution circuits will be required as part of this project.

Distribution upgrade information is located in the following table:

	1H6	1H2	1H1	22W1	22W2	3H1
Transformers	33	25	29	-	-	34
Poles	57	30	27	-	-	65
Conversion (ft)	6,300	9,300	7,000	-	-	6,800
Reconductor (ft)	2,050	3,500	700	5,000	12,500	6,800

The combination of 22W1, 21W1P (OH portion), 1H2, and half of 1H1 will cause the new 22W1 circuit to be loaded at 10.5MW, which is the upper rating of the new transformer. The other three circuits, 22W2 (and part of 7W4, 3H1, 1H6, and half of 1H1) and 22W3 will overload the original transformer. The total loading at this location will be 22.3 MW. For these reasons, the Ironworks option is not viable.

5.5 Option 5 – Upgrade 21W1P and 21W1A

Upgrading 21W1P and 21W1 and transferring additional load to the downtown underground was considered as an option to address the identified constraints. The issue is that the purpose of the downtown circuits is to back each other up. The max rating we can achieve in the existing infrastructure is 300A per cable. There is already 200A on the underground circuits. The new and transferred load will total about 400A. This would leave the circuits both fully loaded to their rating, eliminating tie capability completely and leaving no room for growth. There are not spares enough to run more circuits. The additional load would also require a new substation transformer and a location for it, as well as a place to tie it in, but there are not enough empty conduits to utilize another circuit configuration.

6. Selected Proposal Details

The selected proposal is a reduced version of option 1 (outlined in section 5.1.B), which is converting part of the Gulf St S/S. The planned project will convert part of Gulf St and re-organize the leftover 4kV portion. Note that the second load transfer, option B, has been selected. Therefore, 3H3 will be shifted to 7X1 with a set of step down transformers. 1H6 and half of 1H1 will be converted to 13.8kV and fed from a single new circuit at Gulf St.

Distribution Plan:

1. Install stepdown transformers on 7X1 and transfer 3H3 to 7X1. Consider adding a recloser on the low side of the step down transformers.
2. Install stepdown transformers on 1H6 at the intersection of Pleasant St. and S. State St. in the western direction on Pleasant St. This is due to a customer owned transformer on this lateral.
3. Rebuild 1H6 from P.13 S. Main St. to P.4 Warren St. to 15kV insulation and 336AAC conductor. The portion from P.13 S. Main St. to P.1 N. State St. must be completed by summer 2019 to meet loading and voltage requirements. It will remain 4kV until the substation work is complete.
4. Transfer a portion of 1H1 from P.13 S. Main St. to P.3 Storrs St. onto the new 13.8kV circuit (designation to be determined). This section of 1H1 is already built to 15kV standards.
5. Replace all affected distribution transformers with dual 4.16kV/13.8kV transformers.
6. Extend 3H1 and 3H2 from where they currently exist to the new 4kV circuit positions in the new 3T1 position.
7. Build a new tie between 3H1 and 3H2 right outside the substation or in the substation. The existing tie between 3H3 and 3H2 will remain.
8. Develop a plan to allow for conductor isolation in the underground portion of the new circuit.

Substation Plan:

9. Move 3T1 to the 3T2 position, removing 3T2.
10. Build a new 4kV position and re-tool the current 3H3 position. The circuits located on these two positions will be 3H1 and 3H2. The existing circuit, 3H3, will be transferred to 7X1.
11. Install new breaker/reclosers and regulators in the new 3H1 and 3H2 positions.
12. Purchase and install a new 34.5kV/13.8kV transformer, to be located in the existing 3T1 position.
13. Build one new 13.8kV bus and two new 13.8kV circuit positions with new breaker/reclosers and regulators.
14. The existing maintenance project of replacing all 34.5kV pin and cap insulators, substation fence, and a new recloser for 3H3 will be encompassed in this project.

Right of Way Plan:

15. Build one new 13.8kV circuit from a new 13.8kV position at Gulf St S/S to the crossover to Theatre St.
16. Cutover 1H6 to the new circuit (this includes the portion of 1H1 being transferred as well).
17. Build a new tie between the remnant of 1H6 (it will only go from Bridge St S/S to the crossover location) and 3H1.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-5 Witness: Jacob Dusling

Request:

Reference Company Response to Staff 1-2 stating "In addition to projects listed above there are three other projects that Unitil has been made aware of that are expected to be placed in-service within the next five to eight years. These project are expected to total approximately 1,000kVA of additional load in the area." Please describe the amount of new load the area will be able to accommodate after the Concord Downtown Conversion has been completed.

Response:

The downtown conversion is expected to accommodate up to 10MVA of additional load without substation upgrades. Depending on where load enters the area additional work could be required to connect the load to this capacity.

In addition to the 10MVA of additional capacity, Gulf Street substation was designed to accommodate the future conversion of the remaining 4.16 kV circuit, the future installation of a second 14MVA transformer and the future installation of a fourth circuit position.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-4 Witness:John Bonazoli

Request:

Reference Response 2-4 and related attachments describing the Concord Downtown Area Study

a. The Concord Downtown Area Study does not provide cost estimates for the various alternatives considered. Please explain how the Company arrived at an informed decision regarding the least-cost and best fitting solution for the need without this information. If the Company used its engineering and procurement expertise to approximate costs and determine which alternative provided the best-fitting, least-cost solution for the need, possible replicate those estimates in response to this request.

b. Please provide any other studies for projects considered outside the annual distribution planning study process in the past five years and a brief narrative of any projects the Company plans to consider through similar processes in the next five years.

c. Similar to Question 3-2:

   i. Please provide all of the load sheet data associated with the additional load in Downtown Concord that was utilized to justify this project.

   ii. Please provide all final load determinations that were utilized in the Circuit Analysis, Windmil or otherwise, and the incremental contribution (kW, kVA, amperage) this load had on Concord Downtown circuits.

Response:

a. Options 2 -5 listed in the Concord Downtown Area Study were presented to and discussed among the engineering and operations departments and were not selected as the recommended solution for the following reasons:

   Option 2 - Create a 13.8kV Transformer “Grid”:

   This option was outside of the Company’s distribution design practices and it was determined the required land and/or easements could not be acquired within the required timeline for the project. Additionally, it was thought some of these transformers may need to be relocated again in the near future due to the potential widening of Interstate highway I-93.

   Option 3 - Upgrade or replace Bridge St. substation:

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-4 Witness:John Bonazoli

There were a number of concerns with the option of upgrading the existing Bridge St. substation.

1) The available space within the Bridge St. Substation would not accommodate a 15kV upgrade without rebuilding the entire substation. The scope (and cost) of rebuilding the entire substation (13.8kV and 4 kV), was much greater than building a new substation at Gulf St. because there are fewer number of circuits at the Gulf St. substation.
2) The available land at the Gulf St. location allowed a new substation to be built beside the existing one, while the existing substation was left In service. This was not an option at Bridge St. location.
3) The time required to locate and procure adequate land for a new substation was outside the required timeline for project. Additionally, a new location for the Bridge St substation would require four subtransmission lines to be re-routed.
4) It is unknown how the widening of Interstate Highway I-93 will affect the Bridge St. substation.

Option 4 – Install a second transformer at Iron Works Substation:

It was determined that the added capacity of a second transformer installed at Iron Works Substation (of the same rating as the present transformer), would not be adequate for the expected needed load. A transformer of a greater rating was not feasible, because it would not be able to be backed-up by the existing mobile substation or spare substation transformer. Therefore, a new mobile substation and spare transformer would also need to be purchased.

Option 5 – Upgrade 21W1P and 21W1A lines:

21W1A and 21W1P are underground lines located in downtown Concord. It was determined that rebuilding these lines would not be adequate to serve the required load and allow expansion for future load. There are no spare conduits in the existing conduit bank and the size of the existing conduit does not allow the installation of adequate cable size. Therefore a new a new conduit bank with underground vaults and switchgear would need to be constructed downtown Concord. With past experience of designing and constructing underground circuits in downtown Concord, it was determined that the required time to design this option, receive required approval from the City, and construct the necessary facilities would be more than the allowed timeline. The cost was also expected to be greater than the selected substation option. The final design would also allow less flexibility for future load growth in the area.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-4 Witness:John Bonazoli

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b. The only other studies for projects considered outside the annual distribution planning study process in the past five years were System Impact Studies performed for specific requests to interconnect customer owned generator facilities. Please reference Staff 3-4 Attachment 1, Staff 3-4 Attachment 2, and Staff 3-4 Attachment 3 for studies that were performed for large generator interconnection requests. These studies are confidential as they include confidential customer information.

c. Staff 3-4 Attachment 4 through Staff 3-4 Attachment 8 contain load information Unitil received from customers for new load to be served.

   Staff 3-4 Attachment 4 is electrical load analysis provided by the customer indicating 374 kVA of demand.

   Staff 3-4 Attachment 5 is electrical load analysis provided by the customer indicating 1,255 kVA of demand.

   Staff 3-4 Attachment 6 is electrical load analysis provided by the customer indicating 305 kVA of demand.

   Staff 3-4 Attachment 7 is electrical load analysis provided by the customer indicating 175 kW of connected load.

   Staff 3-4 Attachment 8 is electrical load analysis provided by the customer indicating 384 kVA of demand.

Attachment - KFD - 7

NH Seacoast Facility

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-6 Witness: John Closson

Request:

Reference Unitil Least Cost Integrated Resource Plan at Bates 52 describing costs associated with the new NH Seacoast Regional Facility, including $10 million in 2020, and $2 million in 2021.

a. Please provide any business cases, cost benefit analysis, project approval forms, change order forms, or any other relevant project planning and development documentation relating to the new facility.

Response:

Please see the following attachments:

1. Staff 3-6 Attachment 1 – Unitil internal document outlining business case for NH Seacoast Regional Facility project.

2. Staff 3-6 Attachment 2 – Unitil Sustainability Goals for NH Seacoast Regional Facility

3. Staff 3-6 Attachment 3 – Unitil Energy Systems, Inc. Construction Authorization for Land Acquisition

4. Staff 3-6 Attachment 4 -– Unitil Energy Systems, Inc. Construction Authorization for construction of new NH Seacoast Regional Facility

5. Staff 3-6 Attachment 5 – Completed Project Change Order No. 1

6. Staff 3-6 Attachment 6 – Completed Project Change Order No. 2

In addition to Attachments 5 and 6 the Company is currently reviewing additional project change orders for approval.

June 17, 2019

(updated on 6/18/19 w/decision)

Proposed Seacoast Region Facility Project
Decision Document

♦ ♦ ♦ ♦ ♦

submitted to

John F. Closson

VP, People/Shared Services/Organizational Effectiveness

prepared by

Jacqueline D. Agel

Manager, Fleet & Facilities

♦ ♦ ♦ ♦ ♦

New Seacoast Region Facility Build-to-Suit Project
Decision Document

Table of Contents

Unitil

New Seacoast Region Facility - Decision Document
June 17, 2019

I. Introduction. Following the early 2017 decision to move forward with the planning for a new seacoast region facility the following work has been done.

- A search committee was formed and included representatives from Facilities, Electric Operations, Sr. Management, and a commercial real estate broker. A kick off meeting was held in February 2017.
- The commercial real estate market in Unitil's Seacoast service territory was vetted. There were very few viable options. A commercial building in the Industrial Drive area of Exeter was located but the owner did not want to sell.
- In June 2018 Unitil Energy Systems, Inc. entered into a purchase & sales (P&S) agreement with Garrison Glen, LLC for land in the Continental Drive industrial park in Exeter, NH.
- Following the P&S, Unitil contracted with PROCON, LLC, a design/build (D/B) construction management firm, and Stibler Associates, an interior design firm, to begin preliminary survey(PS) work. The PS work included developing a space program for Unitil's NH Seacoast Region Electric Distribution Operations Center's (DOC) functions, as well as, for some USC functions including Electric Engineering, Central Electric Dispatch, OQ Testing & Training, and business continuity space for Central Gas Control & Field Services. Section III includes brief descriptions of the current status and business requirements of the functions that are slated to move to the new facility.
- A space program was completed by the designers in close collaboration with the managers of each of the functions, in early 2019. The new Exeter facility space program includes 53,940 square feet. *See attachment H for square foot detail.*
  - ✓ DOC (office, conf rms, shops, IT, common, warehouse, garage, wash bay)– 43,448 sf
  - ✓ USC (office, conf rms, OQ Testing/Training Rm, Common, CED, BC) – 10,492 sf
- Unitil has received all permitting approvals from the State of NH and the Town of Exeter. The appeal period has ended for the State permits. The appeal period for the Town of Exeter is anticipated to end on or about July 10th.
- Approximately $600K in preliminary survey costs have been incurred for the Exeter project on legal/permitting, preconstruction/planning engineers & designers, estimating, etc.

II. Purpose. The purpose of this document is to request final approval to construct a new 53,940 sf Unitil Seacoast region facility in Exeter, NH. Specifically, I am seeking approval to close on the purchase and sales agreement for the land in Exeter and enter into a Design/Build Agreement with PROCON. These next steps are included in Section VII.

III. Current Status/Business Requirements

A. Seacoast Region Electric Operations Distribution Center (DOC) – 43,448 sf. The current DOC, located in Kensington, NH, was constructed in the 1954. A small addition was constructed in the 1960s. Due its age and its size this building no longer meets current day operational needs. The size of and quantity of trucks and materials has increased greatly since the 1950s to support the Seacoast region's growing customer base. The garage is too small for contemporary line trucks and the stockyard is tight. The building's electrical, heating, and plumbing infrastructure is antiquated and many systems are in need of replacement including emergency power systems infrastructure (UPS and Generator). The building does not have a fire suppression system which places the operation and company assets at risk. The windows throughout the building are as old as the building and provide no thermal insulation causing the areas adjacent to the windows to be very cold and uncomfortable in the winter. In addition, conference space is inadequate and space for Emergency Operations Center (EOC) activities is very tight.

B. USC/Central Electric Dispatch (CED) – 1100 sf. The current CED space is undersized and is located in Unitil's NH Gas Distribution DOC in Portsmouth, NH. Constructing a new facility in Unitil's Seacoast region is an opportunity to solve CED's deficiencies. The new CED location will provide the space, furniture, and equipment best suited to perform the CED functions. The space will include a restroom and a breakroom directly adjacent to the CED room in support of CED staff with responsibility to monitor Unitil's Electric System 24x7x365. Currently CED personnel must leave the CED space to use the restroom and break room leaving the CED operation unmanned for a period of time because typically one staff member covers a shift, unless staffed for emergencies. The current Portsmouth CED space would remain intact and will provide Unitil with a business continuity solution for CED.

C. USC/Gas Control and Field Services Business Continuity Space – 271 sf. The Gas Control (GC) function is located in Unitil's NH Gas Distribution DOC in Portsmouth. GC supports Unitil's ME, NH & MA Gas Transmission and Distribution Operations. GC has business continuity (BC) space located in a closet at the corporate office in Hampton. The BC space is tiny and is inadequate for a long duration use. The BC space will be used if the primary GC room in Portsmouth could not be used due to fire or other impact to the Portsmouth facility. Constructing a new facility in Unitil's Seacoast region is an opportunity to solve a Unitil business continuity need for its mission critical Gas Control function in addition to a solution for Field Services' BC space requirements. These two functions work very closely together and will occupy the same BC space in the new facility.

D. USC/OQ Testing & Training Room - 1334 sf. The National Gas Associations (NGA) has defined requirements for Operator Qualification (OQ) testing facilities. A Unitil OQ testing space is needed for Unitil's NH Gas Distribution and Transmission operations employees. Most OQ testing is completed between December and April each year. When the space is not in use for OQ Testing it will be available for use by other Unitil departments for training and/or conference space. In addition, the space could be used for business continuity purposes for employees and/or a backup to the System EOC operations currently located in Hampton, NH.

E. USC/Engineering Department - 3236 sf. Moving the electric engineering team from Hampton to the new facility, where the team will be with Seacoast Electric DOC personnel, will work well because the electrical engineers work closely with electric operations personnel. The gas engineering department has occupied the same facility as Unitil's NH Gas DOC personnel, in Portsmouth, for the past 10 years. This adjacency has proven to be efficient because the gas engineers work closely with gas operations personnel. Moving electric engineering out of the Hampton office, which is at capacity, will provide the space needed for new IT FTEs hired to support of Unitil's IT infrastructure, business systems, projects, and cyber security in addition to other USC space needs.

IV. Options. The following four (4) options were evaluated. The benefits and risks for each option are included following the introduction of the options below. Back up information and more detail in connection with these options can be found in Attachments A & D.

Option #1: Renovate 21,000 sf at existing DOC building and build a 10,500 sf addition at the Hampton office. This option does not include the space required (43,448 sf) to efficiently operate a current day DOC per the space program that has been developed for Business Requirement A above.

Option #2: Renovate existing 21,000 sf DOC and construct a 10,500 sf addition on the existing building. This option also does not include the space required (43,448 sf) to efficiently operate a current day DOC per the space program that has been developed for Business Requirements A above.

Option #3: Remove the existing, 21,000 sf DOC building and construct a new Seacoast region facility in its place. This option includes the total sf (53,940) from the space program that was developed to address Unitil's Business Requirements outlined in A through E above.

Unitil

New Seacoast Region Facility - Decision Document
June 17, 2019

Option #4: Purchase land and construct a new Seacoast region facility. This option includes the total sf (53,940) from the space program that was developed to address Unitil's Business Requirements outlined in A through E above.

Notes:

- Options 1, 2, and 3 were vetted at a high level. Preliminary Survey costs incurred for Option 4 were used for estimating soft costs for options 1, 2 and 3.
- Option 4 has been vetted over the past year.

OPTION #1	Total sf	Cost	Cost/sf
	31,500	$ 12,385,100	$393.18

Scope

Renovate Existing Seacoast DOC - 21K sq ft (See Attachment A - Kensington Study)

Build Addition on Existing Hampton Office - 10.5K sq ft (See Attachment D - Hampton Addition)

Benefits

1	No land or building acquisition costs.

Risks

1	The Town of Kensington's zoning may not support this option. See zoning section on page 1 of Attachment A.
2	The existing 21K sf DOC building footprint would not change and would not include all of the DOC space program (43K sf) defined for current day DOC operational needs.
3	Abatement of asbestos containing materials. Asbestos is present in the existing facility but the extent of the presence of these materials is unknown.
4	No municiple water or sewer is available and the cost for a compliant leach field and the infrastructure needed to support a fire suppression sprinkler system will be costly.
5	Relocation of operations during renovations will be required and the availabilty of commercial lease options within the service territory are scarce (see Attachment B).
6	Costs for a temporary NNN lease (see Attachment E). A NNN lease costs include monthly rent *plus* property taxes, insurance, CAM, utilities.
7	Costs for fit up, furniture, furnishing, for a commercial lease space.
8	Costs and business disruption to relocate to leased space (movers, DOC staff time, IT and Facilities staff time, telecomm, etc.)
9	Disruption to Hampton office during construction of an addition.
10	Soft costs nearly doubled for designers/legal/permitting in connection with pre-construction and construction administration services for the renovation of the Kensington building and an addition to the Hampton building.
11	Cost and availability of additional Unitil resources needed to manage and administer (2) large facilities projects

Unitil

New Seacoast Region Facility - Decision Document
June 17, 2019

OPTION #2	Total sf	Cost	Cost/sf
	31,500	$ 11,869,200	$376.80

Scope

Renovate Existing Seacoast DOC - 21K sq ft (See Attachment A - Kensington Study)
Build Addition on Seacoast DOC - 10.5K sq ft (See Attachment A)

Benefits

1 No land or building acquisition costs.

Risks

1 The Town of Kensington's zoning may not support this option. See zoning section on page 1 of Attachment A.

2 The existing 21K sf DOC building footprint would not change and would not include all of the DOC space program (43K sf) defined for current day DOC operational needs.

3 Abatement of asbestos containing materials. Asbestos is present in the existing facility but the extent of the presence of these materials is unknown.

4 No municiple water or sewer is available and the cost for a compliant leach field and the infrastructure needed to support a fire suppression sprinkler system will be costly.

5 Relocation of operations during renovations will be required and the availabilty of commercial lease options within the service territory are scarce (see Attachment B).

6 Costs for a temporary NNN lease (see Attachment E). A NNN lease costs include monthly rent *plus* property taxes, insurance, CAM, utilities.

7 Costs for fit up, furniture, furnishing, for a commercial lease space.

8 Costs and business disruption to relocate to leased space (movers, DOC staff time, IT and Facilities staff time, telecomm, etc.)

OPTION #3	Total sf	Cost	Cost/sf
	53,940	$ 17,224,200	$319.32

Scope

Construct New Facility on Existing Seacoast DOC parcel in Kensington, NH

Benefits

1 No land or building acquisition costs.

2 Ability to construct all requirements of the DOC space program (43K sf) and additional 10.5K sf for USC space needs.

Risks

1 The Town of Kensington's zoning may not support this option. See zoning section on page 1 of Attachment A.

2 The undeveloped land surrounding the existing DOC is wet and subsurface conditions could make the cost of construction higher than estimated. It may be determined that none of the land is suitable for this use.

3 Cost of demolishing existing DOC

OPTION #4	Total sf	Cost	Cost/sf
	53,940	$ 15,398,319	$285.47

Scope

Construct New Facility on Land in Exeter, NH

Benefits

1. Land is zoned for commercial use.
2. Municiple water or sewer is available.
3. Construct all requirements of the DOC space program (43K sf) & additional 10K sf space needs.
4. Implement best environmental storage practices for poles and transformers.
5. Sell existing DOC. Estimated value is $800K.
6. State and Town permits have been issued and construction can start in late July/early August.

Risks

1. Unitil does not own the land. P&S cost is $1M
2. Although unsuitable subsurface conditions are not anticipated, due to geotech borings/testing, there is still a chance that they exist and could add unanticipated site work costs.

V. Recommendation. Option #4. This option poses the least amount of risks due to the following: the land is zoned for commercial use, the subsurface conditions are known because geotechnical borings have been studied and therefore unforeseen unsuitable conditions are not anticipated. The estimated cost/sf is the lowest of all of the options, the location is more central within Unitil's NH Seacoast Electric service territory and is less than one (1) mile from Rte 101 which is a main corridor and easily connects to other main corridors in the service territory. See attachment I.

Option #4 Costs
Estimated 2019 Spend: $7,470,578.00 (Land, PS&I, Road, Construction & Construction Admin)
Estimated 2020 Spend: $7,927,741.00 (Construction & Construction Admin, Furniture, etc.)
Total: $15,398,319.00

VI. Decision/Approval: On June 18, 2019 Unitil's CFO and CEO approved proceeding with the recommendation outlined in section V. above.

VII. Next Steps/Schedule. If the recommendation is approved the next steps include;

1. June 21 – GMP (Guaranteed Maximum Price) submitted to Unitil by PROCON
2. June 28 – Conclude GMP negotiations
3. July 1 - Road dedication approval from the Select Board
4. July 2 – Finalize Design/Build Construction Management Contract w/ final GMP
5. July 3 – Initiate Authorization for 2019 construction budget item
6. July 10 – The final permitting appeal period ends following Planning Board approvals
7. July 18/19 – Close on Purchase & Sales Agreement
8. July 22 – Mobilize for ground breaking

Attachment

PROCON
CONNECT • CREATE • CONSTRUCT

T 603.623.8811
F 603.623.7250
P.O. Box 4430
Manchester, NH 03108

To: Jacquie Agel – Unitil/Manager, Fleet & Facilities
Cc: Mark E. Beliveau – Partner/Pierce Atwood LLP
From: Mike Lawrence – Sr. Architect Project Manager
Date: March 26, 2019
RE: Unitil Energy Systems, Inc. – Kensington Study

INTENT OF THE STUDY

The intent of this analysis is to understand if any of three options are permissible and/or could be permitted given the constraints of the site and the condition of the current facility, as well as, what the advantages and disadvantages of each option are and to identify the potential costs for each option.

Option 1: Fully renovate the existing building including the building systems, exterior building envelope and interior fit-up. The layout of the site would remain the same with some site improvements such as pole storage, a new leach field, and new well.

Option 2: Fully renovate the existing building including the building systems, exterior building envelope and interior fit-up and add a 10,000 square foot addition to the facility. The addition would include space for Engineering, OQ Testing/Training Rm, CED, and Back up Gas Control & Field Services. The site would be expanded to accommodate the new addition, new storage areas, canopies, and building utility services.

Option 3: Remove in its entirety the existing facility and build a 55,000 square foot facility per Unitil's programming requirements. This would include a full redesign of the existing site.

ZONING

Address: 114 Drinkwater Rd, Kensington, NH 03833
Lot: 1,159,048 sf or 26.6 acres
District: Located in the Residential – Agricultural (RA) Zoning District
Based on September 2017 Alta Survey: A portion of the parcel is in a special flood hazard area, zone A.

Setbacks:	**(single family residence)**	**(prohibited use)**
	Front: 25 feet	As a business 100 feet
	Side: 25 feet	As a business 50 feet
	Rear: 25 feet	As a business 50 feet

Summary: Unitil's current use of the site is a prohibited use within this district, and any significant upgrade or addition to this building would require a special exception by the town zoning board, per the Board of Adjustment, section 3.3 of the Town's Zoning Ordinance. If an approval is granted the application would then be referred to the Planning Board for site plan review and a permit would be issue by the Planning Board if acceptable. *From Section 3.3: …no use will be permitted if: 2. the use is not compatible to the nature and quality of the neighborhood; or 3. the use if offensive to the public because of noise, vibration, excessive traffic, unsanitary conditions, noxious odors, smoke, nature of the activity or other similar reasons.*

Unitil Energy Systems, Inc., formally known as Exeter & Hampton Electric Company (E&H), acquired the property by way of three deeds; one in 1954 and two in 1968. The original portion of current building was built in 1955 and in 1962 a 900 sf addition was constructed. . Kensington adopted zoning in 1959 but we don't know how this property was zoned/regulated when E&H developed it. For purposes of this zoning

analysis, the assumption made by Unitil's attorney, Mark Beliveau, is that the development of the property was consistent with applicable zoning and, therefore, the use of the building and property today is a lawful non-conforming use.

Under the Kensington ordinance, a lawful non-conforming use or building may not be expanded "for a purpose or in a manner which is substantially different from the use to which it was put before the alteration…." Which means, that the use or building may be expanded as long as such expansion is not "substantially different" from the use to which it was put before the alteration. Substantially different is not defined and is subject to interpretation.

For the Town to grant a special exception, Unitil would need to convince the town that the use (1) would not cause any adverse impacts to health, safety, morals, welfare of the residents of the town or neighborhood property values, (2) is compatible with the nature and quality of the neighborhood, and (3) is not offensive to the public because of noise, vibration, excessive traffic, etc.

EXISTING CONDITIONS

Site

The current facility at 114 Drinkwater Road in Kensington is located within a residential neighborhood, with single family residences on both sides and across the street. The site is relatively flat and surrounded by wetlands. To the north of the existing building there is an open body of water. The building is served by a well to the north of the existing vehicle storage garage and a leach field located to the west of the building. Both the well and leach field are located out of wetland areas, but not wetland boundaries.

If a renovation, addition, or a new facility were to be built at the Kensington site several key site issues would need to be addressed including;

- To provide a sprinkler system to the building a large underground storage tank or a pond would be required due to the building' water being supplied by a well. Without adequate groundwater information our recommendation would be to develop a pond onsite for this requirement.

- A new leach field would be required and could prove difficult with the extent of wetlands on the site. We do not know what the seasonal groundwater level is, but with wetlands surrounding the site it is assumed to be relatively high. This would make installing a leach field with today's regulations difficult and more expensive.
- Current storm water regulations are more restrictive than when the building was originally built and will require more treatment and storage onsite. This may be difficult to achieve with a potentially high seasonal groundwater level and the amount of wetlands onsite.
- Depending on the extent of a renovation, addition or new construction the impact to the surrounding wetlands could be considerable. While the State permitting process is straight forward we do not know how the local conservation committee will react to developing on the wetlands. If the local conservation committee would like to limit development in these areas it would complicate any approvals process. The cost of wetlands mitigation and professional design services should be considered when developing an overall project budget.
- The current circulation through the existing site is not ideal and a renovation or addition would not improve this substantially unless the whole site is redesigned. We would anticipate limiting the site development in the first two options to reduce wetlands impact and improve the potential that the project could get town approvals.
- The existing site does not have transformer and pole storage containment areas, a best environmental practice today. Due to the current size and elongated shape of the yard providing containment for the transformers would be difficult and costly and involve several additional large catch basins and water quality units.
- Geotechnical investigations would be required to determine the soil structure. Due to having extensive wetlands on the site we would anticipate that the soils are not ideal to build upon and potentially require some type of soil improvements.

Photos of the existing yard; including pole and transformer storage areas:

Building

The existing facility consists of a vehicle garage, offices, shops, and warehouse spaces. The office portion of the building is a brick veneer exterior with CMU back-up and a flat membrane roof. The exterior building envelope does not meet the current building codes and lacks proper building insulation. The vehicle garage, shops and warehouse consists of metal siding exterior wall and a flat membrane roof. Built in approximately 1968 the building is antiquated and does not meet the needs of current day operations. Due to the date the

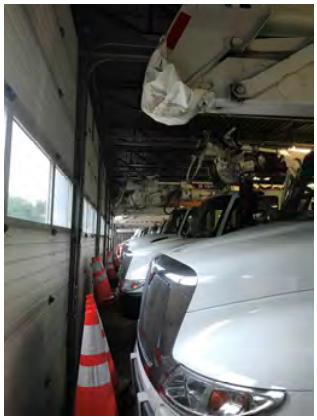
building was built construction materials containing asbestos are known to be present. These products would need to be determined and a mitigation plan developed in any of the three options.

Photo of the existing entrance to the building.

Vehicle Garage

The vehicle garage is too small for modern utility trucks currently in use at the facility. The larger vehicles are difficult to drive into the garage due to the low ceiling height and lack of space. It is difficult to work on the trucks in the garage due to the low ceiling height and limited circulation space around the utility trucks. The floor of the garage doesn't have proper drainage and the space lacks proper ventilation. There are 10 large overhead doors, one for each of the utility trucks. This overhead door arrangement is less energy efficient due to the lack of insulation in the doors and the gaps around the opening that allow heat to escape; compared with a layout with only 2 overhead doors (one for inbound and one for outbound) that can be found at Unitil's Concord and Lunenburg DOC facilities.

Photos of the existing vehicle garage



Warehouse and Shops

The warehouse is inadequate for the current inventory needs. The height of the space prevents utilizing larger pallet racks and the floor area inhibits proper circulation with a forklift. The interior is dark and lacks proper ventilation. The space serves several needs including as a storage area, hazardous materials collection area, metering lab/workshop, and meter storage within one space. Over time the spaces has been retrofitted to include a fluids storage area, rubber goods storage, locker area, and other miscellaneous storage areas..

Workshop space is limited to metering. Other workshop activities have been created either outside or created within the warehouse space and are inefficient. .

Photos of the existing warehouse

Exterior Building Envelope

A lack of building insulation and single pane windows makes operating the existing building expensive. Abestos is present in wall materials in the restrooms and server room and due to the age of the building we would anticipate that the caulking around the windows, pipe insulation, and flooring may contain asbestos which would need to be remediated. The roof was replaced in 2008. If a renovation to the building was undertaken we would anticipate having to remove the existing exterior metal panels, windows, and doors and replacing them with products that meet the current building code. We would anticipate leaving the exterior brick façade in place and furring the wall out on the inside to provide insulation.

Photos of existing single pane windows

Building Systems

There is a lack of ventilation in the vehicle garage and warehouse areas. In addition, the building's heating system, which consists of cast iron piping, is deteriorating. The deterioration of these pipes requires constant attention and repair and replacement costs. The electrical systems are inadequate for the building's use and do not meet current codes. There is no sprinkler system within the facility, and though it may not be specifically required, it is a best life safety practice to ensure the safety of employees, as well as, building and inventory assets

Photos of the existing MEP components

DESIGN OPTION SUMMARIES

OPTION 1 - Renovation

We are confident that any renovation would require bringing the building up to the current building code. This would mean upgrading all the building MEP and life safety systems, updating the structural building systems, and upgrading the exterior building envelope to meet the current energy code. This option would involve utilizing the sub-structure of the building in some capacity and gutting the rest of the building. The site would keep the same layout with the addition of a new well, new septic system, a pond to hold water for the fire suppression system, and upgrading the transformer and pole storage areas.

The cost of this type of extensive renovation and upgrading would be substantial. Based on historical data and our understanding of the project you could anticipate a cost of $265 to $283 per square foot. The facility is approximately 21,000 square feet and we would anticipate the cost of construction to be approximately $5,600,000 to $6,000,000 and could exceed this estimate (see below).

Key Concepts to Keep in Mind:

- There are a significant number of unknowns that could dramatically affect the cost of the project.
- Based on the scope of the project we would expect at least a year or more to get approvals and prepare the design documents. Due to this we have included an escalation cost of 6% into our construction cost assessment numbers above.
- The project will require Unitil's Kensington personnel to relocate for 12 months. We would anticipate a 10 month construction schedule and 1 month at the beginning and end of construction to move out and then back in. During this time Unitil would need to operate out of another facility and the cost of this needs to be accounted for. The size of the building and site, does not lend itself to a phased project while remaining occupied. We typically see spaces leased for two years, and not only one year. It should be noted that during this transition time there is the potential of not providing the level of service your customers expect due to several factors. These factors include the proximity of a leased space to your customers, inadequate space within the new building and the potential for needing to spread employees and equipment out to different locations. We would anticipate that any leased space would also require additional cost for tenant fit-up and may not be able to accommodate outside material storage areas for transformers, poles, wire reels, etc.

  Potential Additional Costs

  - Moving costs, including cost to relocate site items including poles and transformers.
  - Cost of lease

- Cost of lease search
- Legal fees for lease agreements
- Tenant fit-up costs
- Down time to move; potentially additional employee costs such as overtime

- There is a significant amount of wetlands on the site and the project is a prohibited use in the zoning district it is in. Having a well and onsite septic system complicate the process even further. Due to the extended time for permitting and approvals for this project we would anticipate significant legal fees, engineering and site exploration fees to move this project through the state and local approvals process.

  Potential Additional Costs
  - Legal Costs
  - Wetlands specialists
  - Geotechnical costs
  - Civil Engineering costs
  - Wetlands Mitigation Costs
- Soft costs including professional design services are not accounted for in our cost assessment.
- Renovating the existing facility would not make a significant improvement in the overall functionality of Unitil's NH Electric – Seacoast region's Distribution Operations services. The project does not enlarge the building or the site and would not improve the function of day to day operations dramatically. In addition spaces such as utility rooms and bathrooms may need to get larger due to current code requirements and reduce the size of the operational spaces you currently have and that already has very limited meetings and other spaces
- The road outside of the building, Drinkwater Road, floods during large rain events.

Summary – Option 1: The time and cost to renovate the existing building will exceed any gain in operational improvements and less long-term value versus what Unitil would gain in operational improvements and value with a new building. We would anticipate a difficult time obtaining approvals, although out of the three options this option would have the best chance to be granted a special exception from the Zoning Board. In this option Unitil would need to relocate to another facility for 12 months, which may create operational inefficiencies, potentially affecting customer service. The option does not resolve the functional issues currently in the existing facility; including inadequate vehicle storage, poor warehouse space and inadequate space to efficiently run EOC activities.

OPTION 2 – Renovation and Addition

This would mean upgrading all the building MEP and life safety systems, updating the structural building systems, and upgrading the exterior building envelope to meet the current energy code. This option would involve utilizing the sub-structure of the building in some capacity and gutting the rest of the building. The site would keep the same layout with the addition of a new well, new septic system, a pond to hold water for the fire suppression system, and upgrading the transformer and pole storage areas.

Building a 10,000 square foot addition and renovating the existing facility would require bringing the building up to the current building code. This would mean upgrading all the building MEP and life safety systems, updating the structural building systems and upgrading the exterior building envelope to meet the current energy code.

This option would involve renovating the existing building by utilizing the sub-structure of the building in some capacity and gutting the rest of the building. Adding a 10,000 square addition to add offices, CED, OQ Testing and Training, along with expanding other operational spaces would affect the site significantly. The layout of the site would have to be completely redone including providing additional parking, The site would adding a new well, new septic system, a pond to hold water for the fire suppression system, new pole storage, trailer storage, bulk material bins, and providing a new transformer containment storage area(s).

The cost of this type of extensive renovation and addition would be substantial. Based on historical data and our understanding of the project we feel you could anticipate a cost of $269 to $288 per square foot. The existing facility is approximately 21,000 square feet, with a 10,000 square foot addition; we would anticipate the cost of construction to be approximately $8,500,000 to $9,000,000.

Key Concepts to Keep in Mind:

- There are a significant number of unknowns that could dramatically affect the cost of the project.
- . Based on the scope of the project we would expect at least a year or more to get approvals and prepare the design documents. Due to this we have included an escalation cost of 6% into our construction cost assessment numbers above.
- The project will require Unitil's Kensington personnel to relocate for 14 months. We would anticipate a 12 month construction schedule and 1 month at the beginning and end of construction to move out and then back in. During this time Unitil would need to operate out of another facility and the cost of this needs to be accounted for. The size fo the building and site, the same as in Option 1, does not lend itself to an phased project while remaining occupied. We typically see spaces leased for two years, and not only one year. It should be noted that during this transition time there is the potential to not providing the level of service your customers expect due to several factors. These factors include the proximity of a leased space to your customers, inadequate space within the new building and the potential for needing to spread employees and equipment out to different locations. We would anticipate that any leased space would also require additional cost for tenant fit-up and may not be able to accommodate outside material storage areas for transformers, poles, wire reels, etc.
    - Potential Additional Costs
        - Moving costs, including cost to relocate site items including poles and transformers.
        - Cost of lease
        - Cost of lease search
        - Legal fees for lease agreements
        - Tenant fit-up costs
        - Down time to move; potentially additional employee costs such as overtime
- There is a significant amount of wetlands on the site and the project is a prohibited use in the zoning district it is in. Having a well and having an onsite septic system complicate the process even further. Due to the extended time for permitting and approvals for this project we would anticipate significant legal fees, engineering and site exploration fees to move this project through the state and local approvals process.
    - Potential Additional Costs
        - Legal Costs
        - Wetlands specialists
        - Geotechnical costs
        - Civil Engineering costs
        - Wetlands Mitigation Costs
- Soft costs including professional design services are not accounted for in our cost assessment

- Renovating the existing facility, and adding 10,000 sf, for non-DOC space requirements would not make a significant improvement in the overall functionality of Unitil's NH Electric – Seacoast region's distribution operations services. The project does not enlarge the operations portion of the building or the site and would not improve the function of day to day operations dramatically. In addition spaces such as utility rooms and bathrooms may need to get larger due to current code requirements and reduce the size of the operational spaces you currently have.
  The road outside of the building, Drinkwater Road, floods during large rain events.

Summary – Option 2: The time and cost to renovate the existing building and build a new addition would be substantial and resulting in only a minor improvement in operational efficiencies. We would anticipate a difficult time obtaining approvals, especially with the Town due to the substantial change in use. With this option Unitil would need to relocate to another facility for 14 months, which may create operational inefficiencies, potentially affecting customer service. This options also does not resolve the functional issues currently in the existing facility; including in adequate vehicle storage, poor warehouse space, and inadequate space to efficiently run EOC activities.

OPTION 3 – New Building

This option would involve removing the existing building and construction a new 55,000 square DOC in its place. The building would contain all the operational and functional efficiencies developed during the 2018 & 2019 programming process. The layout of the site would include new parking, a new well, new septic system, a pond to hold water for the fire suppression system, new pole storage area, trailer storage, bulk material bins, and providing onsite transformer containment/storage area(s).

Based on historical data and our understanding of the project the cost for the demolition of the existing building and the construction of the new facility we feel could be done for $234 to $251 per square foot. We would anticipate the cost of construction to be approximately $12,870,000 to $13,805,000.

Key Concepts to Keep in Mind:

- There are a significant number of unknowns that could dramatically affect the cost of the project.
- . Based on the scope of the project we would expect at least a year or more to get approvals and prepare the design documents. Due to this we have included an escalation cost of 6% into our construction cost assessment numbers above.
- The project will require Unitil's Kensington personnel to relocate for 13 months. We would anticipate an 11 month construction schedule and 1 month at the beginning and end of construction to move out and then back in. During this time Unitil would need to operate out of another facility and the cost of these needs to be accounted for. We typically see spaces leased for two years, and not only one year. It should be noted that during this transition time there is the potential to not providing the level of service your customers expect due to several factors. These factors include the proximity of a leased space to your customers, inadequate space within the new building and the potential for needing to spread operations employees and equipment out to different locations. We would anticipate that any leased space would also require additional cost for tenant fit-up.
  Potential Additional Costs
  - Moving costs, including cost to relocate site items including poles and transformers.
  - Cost of lease
  - Cost of lease search
  - Legal fees for lease agreements
  - Tenant fit-up costs

- Down time to move; potentially additional employee costs such as overtime

- There is a significant amount of wetlands on the site and the project is a prohibited use in the zoning district it is in. Having a well and having an onsite septic system complicate the process even further. Due to the extended time for permitting and approvals for this project we would anticipate significant legal fees, engineering and site exploration fees to move this project through the state and local approvals process.

  Potential Additional Costs
  - Legal Costs
  - Wetlands specialists
  - Geotechnical costs
  - Civil Engineering costs
  - Wetlands Mitigation Costs
- Soft costs including professional design services are not accounted for in our cost assessment
- The road outside of the building, Drinkwater Road, floods during large rain events impacting services.
- If a new building was to be built onsite it would want to be built in a location similar to where the current facility is. There is the potential to move the building further into the site though there would be a significant increase in the cost for wetland mitigation. If the building moved further into the site it is possible that the existing facility could remain operational during construction.

Summary-Option 3: It should be anticipated that this option would have the greatest difficulty receiving approval from the Town. If constructed it would provide Unitil with a facility that is able to meet the company's needs well into the future.

Overall Summary:
The existing facility, constructed between 1955 and 1962, no longer serves the functional requirements of a 21st century public utility company. The cost of bringing the building up to code is not worth the investment and does not solve the functional issues with the existing building. Proposing a new facility on the existing site poses several challenges, including receiving Town approvals for prohibited use within the district it is in. The recommended solution, in support of Unitil's NH Electric Distribution Operations Center and other company space requirements, is to build a facility on a more suitable site that is properly zoned, has less wetlands impact, and that is located adjacent to a major artery where operations response can be efficiently distributed to Unitil's NH Electric – Seacoast region's Distribution Operations customer base. In addition, A newly constructed facility on a new site will be used and useful for decades longer than a renovation or addition to the existing facility on a site where zoning and wetlands would likely be barriers to project approvals or add significant cost if variances could be acquired.

Agel, Jacquie

Subject: FW: Commercial Lease Rates & Availability (Kensington Study)
Attachments: Mimecast Attachment Protection Instructions; 21086863_9 _Batchelder_Road_Brochure.pdf; Portsmouth, 68 NH Ave - Brochure.pdf

From: Margaret O'Brien [mailto:margaret@bowstcommercial.com]
Sent: Wednesday, March 27, 2019 9:48 AM
To: Agel, Jacquie
Subject: RE: Commercial Lease Rates & Availability

Mimecast Attachment Protection has deemed this file to be safe, but always exercise caution when opening files.

Jacquie,
As we discussed, there is currently no inventory for the garage and laydown requirement within your service area. We conducted an exhaustive search initially before landing on the build to suit option in Exeter, NH. The industrial market has gotten even tighter since that effort. The former Vapotherm space at 22 Industrial Drive that we looked at is now leased. The owner of that property did not add on to the building as per his permits.
The attached property in Seabrook is now on the market for sale only. This building is owned by Corium who just relocated to a larger facility and is looking to sell. It would not fit your requirement for garage space and would need extensive renovation to retrofit for Unitil's use.
Outside of your service area, there is one building at 68 New Hampshire Ave at Pease. This space has 6,025 SF of office and 12,500 SF of warehouse/manufacturing space with 3 loading dock doors. Attached is the marketing brochure. This building is currently under contract for sale.

The current market rent for is in the $6.25 to $8.95 PSF NNN range, if we could find a property that fits your requirement.

The lack of inventory coupled with your unique use and layered with looking for an option for Until to occupy for 12 to 14 months presents a very challenging requirement.

Please let me know if you need anything further.

Margaret O'Brien
bow street LLC
111 Bow Street
Portsmouth, NH 03801
Office: 603.427.0700
Cell: 603.828.7245
margaret@bowstcommercial.com

From: Agel, Jacquie <agel@unitil.com>
Sent: Tuesday, March 26, 2019 6:16 PM
To: Margaret O'Brien <margaret@bowstcommercial.com>
Subject: Commercial Lease Rates & Availability

Hi Margaret,
As we discussed just now, I'm preparing a document that includes costs for (3) possible options for staying in Kensington. All 3 options include moving out of the space for 12 to 14 months. We'd need approximately 12,000 sf of garage and warehouse space and 6,000 to 8,000 for office space and parking for 50+/- plus an acre or more for material

laydown areas. Please advise re: available inventory (or not) within Unitil's service territory and/or costs for a similar space in the greater seacoast market.

Thank you,

Jacquie

Jacqueline D. Agel
Manager, Fleet & Facilities

Unitil

6 Liberty Lane West
Hampton, NH 03842
T 603.773.6531 M 603.812.7873
www.unitil.com

Attachment

Agel, Jacquie

Subject: FW: Sale of Kensington - $800K

From: Margaret O'Brien [mailto:margaret@bowstcommercial.com]
Sent: Friday, April 05, 2019 10:41 AM
To: Agel, Jacquie
Subject: RE: Sale of Kensington - $800K

Jacquie,
The ballpark estimate for the Kensington facility is in the range of $800,000. This price was based on an “as-is” use both for re use of the industrial building as well as the potential for a residential subdivision or other similar use.
The site, as we know is impacted with a fair amount of wetlands, the majority at the lower half of the site, but also an area at the top of the site. This coupled with the shape of the site, does not leave a large developable site for a developer to subdivide.

Margaret O’Brien
bow street LLC
111 Bow Street
Portsmouth, NH 03801
Office: 603.427.0700
Cell: 603.828.7245
margaret@bowstcommercial.com

From: Agel, Jacquie <agel@unitil.com>
Sent: Thursday, April 4, 2019 4:01 PM
To: Margaret O'Brien <margaret@bowstcommercial.com>
Subject: Sale of Kensington

Hi Margaret,
Although we haven’t finished the ALTA survey for the Kensington facility can you provide a ball park estimate of what we might get for the property.
Would an as is use cost be different than a developers cost who would remove the building and possibly do a subdivision.
My recollection is that out of the 26 acres maybe 10+/- are usable?
Jacquie

Jacqueline D. Agel
Manager, Fleet & Facilities

Unitil

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PROCON

T 603.623.8811
F 603.623.7250
P.O. Box 4430
Manchester, NH 03108

Unitil Energy Systems, Inc. – Hampton Addition Initial Budget
February 1, 2019

We are providing the below conceptual costs for the construction of a 10,000 square foot, two story addition to your existing Hampton headquaters building. The program is based off of the second floor of the proposed Unitil/NH Electric Operations DOC – Seacoast Region and includes the CED, Engineering Department, OQ Testing, Back-up Field Services & Gas Cont. Room, archive storage, production area, toilets and conference room. The costs for the project are conceptual due to lack of documentation of the existing conditions but based on probable and historic cost data. If the project were to move forward a compresheive existing conditions analysis will need to be completed and a full construction cost be determined. The estimate is based on Spring 2019 pricing, and does not include probable escalation due to a later start date.

Hampton Addition:

Projected Cost Range	**$2,930,000 - $3,100,000**
Cost /Sqft Range	**$293/sqft - $310/sqft**

The projected savings to the Unitil/NH Electric Operations DOC – Seacoast Region project of removing the second floor and associated spaces is as follows:

	Project Cost (1.11.2019)	Projected Cost Saving	Revised Cost:
Projected Savings (+/-9,700sqft):	**$11,140,507**	**($965,246)**	**$10,175,261**

Project Scope Hampton Addition:
The information below is what we based the cost of the new addition on. Exclusions and items that have not been considered are also stated below.

Building: 65' x 80'; 10,000 sqft, (2) Story Addition onto existing facility proposed at south facing façade

1. Site excavation and backfill
2. Frost wall/slab on grade construction
3. Structural steel with cold formed metal framing exterior wall system
4. Single enclosed stair tower with wall mounted pipe rail
5. Demo of existing façade to accept addition
6. Exterior façade to be brick
7. Flat, single pitch roof system
8. Windows at exterior
9. Wood veneer doors in HM frames
10. Carpet at common and office areas, sheet goods at bathrooms
11. ACT ceiling system throughout
12. Light gauge metal framing and drywall interior partitions
13. Office space to be painted throughout

PROCON

14. Tie into existing sprinkler system
15. (2) single stall bathrooms at each floor +(1) single stall bathroom in CED
16. Kitchenette assumed in CED
17. VAV HVAC system
18. Troffer lighting throughout
19. Standard office wiring for cubicle layout
    a. Electrical considerations included for CED (power/wiring, no equipment)

Additional Items/Not considered

1. Additional upgrades or requirements of the existing building to meet newer building code requirements are excluded.
2. Existing systems assumed to accept additional load
    a. No replacement or upgrading of existing plumbing systems, electrical service, sprinkler, fire alarm,
    b. Existing services assumed already to temp'd to addition
    c. New/existing security/tele/data systems excluded
3. No work assumed in existing building at this time
    a. No consideration for tie backs into existing systems
    b. No Saw cutting/trenching to upgrade or bring new services or lines to area of addition
4. All work to be performed during standard business hours
    a. No off hours/ afterhours work considered
    b. No cost carried for relocation of neighboring personnel
5. Finished access from existing building to addition to be single man door, (1) at each floor
6. No Structural alteration to existing building
7. No Tie in of existing finish
    a. Brick to be cold joint (not toothed), mansard roof not included in addition
8. No site considerations included
    a. Budget based off ideal site conditions, (generally flat, good soils, no blasting)
    b. Loam and seed only, no landscaping, no addition or alteration to existing parking/site drainage/man house/utilities
9. All interior/exterior finish materials carried at budget/allowance until existing materials can be confirmed
10. Does not include MEP closets/fire rated assemblies

Attachment

Agel, Jacquie

From: Michael Lawrence <mlawrence@proconinc.com>
Sent: Tuesday, May 21, 2019 11:41 AM
To: Agel, Jacquie
Subject: UNITIL - Demo costs - Kensington Property

Hi Jacquie,

The costs you have for the three options include the demo costs. Option 3 where we take the whole building down is shows a cost of essentially $300,000, though you should add 10% for general conditions/builders risks/fees, etc. The costs associated with this are below and the abatement costs are an educated guess since there wasn't a study conducted.

02-0000.000 Abatement Cost	21,000.00 SQFT	N/A	$ 7.75 /sqft	$	162
02-0000.000 Building Demo	21,000.00 SQFT	N/A	$ 6.50 /sqft	$	136

Thanks,
Mike

Michael Lawrence
Senior Project Manager - Architecture

PROCON

603.518.2201
mlawrence@proconinc.com
Please visit our new **website!**

Attachment F

Unitil Seacoast Region Facility

Options' Estimates

Created: 4/3/19 jda

Last Update: 6/17/19 jda

Options	Description	SF	Land Cost	Land Sale Estimate	Estimated Soft Costs	Estimated Construction Costs	Estimated Non-Construction Costs [8c]	Temporary DOC Lease Costs [9] SF	Cost PSF +NNN	Months	Est Cost/Mo	Total Occupancy Cost	Lease Fit Up [10]	Move Costs [11] # of Moves	Estimate	Demolition Estimate [12]	Total Cost	Cost/SF
#1	Kensington DOC Reno (21K sf) + Hampton Addition (10.5K sf)	31,500 [1]	$ - [3]	$ -	$ 1,327,500 [6]	$ 9,100,000 [8a]	$ 1,373,000	21,000	$ 7.60	12	$ 13,300	$ 159,600	$ 250,000	2	$ 175,000	$ -	**$ 12,385,100**	$ 393.18
#2	Kensington DOC Reno (21K sf) & Kensington Addition (10 5K sf)	31,500 [1]	$ - [3]	$ -	$ 885,000 [7]	$ 9,000,000 [8a]	$ 1,373,000	21,000	$ 7.60	14	$ 13,300	$ 186,200	$ 250,000	2	$ 175,000	$ -	**$ 11,869,200**	$ 376.80
#3	Kensington - Build New & Remove Existing	53,940 [2]	$ - [3]	$ -	$ 885,000 [7]	$ 14,005,000 [8a]	$ 1,373,000	21,000	$ 7.60	14	$ 13,300	$ 186,200	$ 250,000	2	$ 175,000	$ 350,000	**$ 17,224,200**	$ 319.32
#4	New - Exeter, NH	53,940 [2]	$ 1,203,000 [4]	$ (800,000) [5]	$ 885,000 [7]	$ 12,562,319 [8b]	$ 1,460,500	0	$ -	$ -	$ -	$ -	$ -	1	$ 87,500	$ -	**$ 15,398,319**	$ 285.47

NOTES:

1. Kensington 21K sf is size of existing bldg. Hampton Addition SF (10.5K): See SF calculations on proposed new Seacoast Region Bldg drawings LE1.1 & LE1.2.

2. Total SF (53,940). See SF calculations on proposed new Seacoast Region Bldg drawings LE1.1 & LE1.2.

3. Land Cost. Land is owned by Unitil.

4. Land Cost. $1M for land + fees (legal, Phase I ESAs, closing costs, current use tax). See Decision Document Attachment G (Purchase & Sales Agreement).

5. Land Sale. Estimate was provided by Commercial Realtor Margaret O'Brien, owner of Bow Street, LLC and is based on her knowledge of the property via recent DRAFT ALTA survey process and the market.

6. Soft Costs. (2) Project Locations (Kensington & Hampton) for this options so additional costs will be incurred for Architect/ID/Security/Electrical/Civil designers and fees for conceptual/schematic/design development services, estimating services, permitting, legal, etc.

7. Soft Costs. (1) Project, same fees as listed above - except for one project location.

8a. Estimated Construction Cost. Provided by PROCON, LLC for all options. See Attachments A (costs for Options 1, 2, and 3) and D (Hampton cost for Option 1) of Decision Document. Plus $200K for Cat IV building construction (See Attachment L).

8b. Estimated Construction Cost. Provided by PROCON. See Attachment J, 4/17/19 "Evolution of Costs to Date". Includes $208K for private road upgrade costs before turn over to Town. Plus $200K for Cat IV building construction (See Attachment L).

8c. Estimated Non-Construction Costs. $1,548,000. Includes; Furniture/Furnishings/Finishes, USC PM Payroll, Warehouse and Shop Material Handling, and IT. Move costs are in a separate column.

9. Temporary DOC Lease. The Kensington building cannot be occupied for Options 1, 2 & 3. The bullet points below are from Realtor Margaret O'Brien
* No inventory exists that would suit requirements for garage and exterior layout areas.
* An exhaustive search for existing commercial buildings was undertaken in 2017/2018 and there was no inventory.
* The commercial market has gotten tighter since the 2017/2018 search.
* There is a property currently in Seabrook that could work but not without extensive and expensive fit up of the space and would not meet requirements for garage space.
* If a property were available in Unitil's Seacoast territory, the current market rent for is in the $6.25 to $8.95 PSF NNN range.
* The lack of inventory coupled with Unitil's unique use and layered w/seeking an option for Until to occupy for 12 to 14 months presents a very challenging requirement
* NNN costs are unknown and are in addition to the lease cost. NNN include property taxes & insurance, and CAM fees. Utilities would be in addition to NNN.

10. Lease Fit Up. Assuming a viable commercial space with a generator, for power back up for normal and EOC operations, was available the estimate to fit up 21,000 SF could be substantially less but could be substantially more. Security alone could cost $50K+.

11. Move Costs. Estimate is based on actual moving costs for relocation of Unitil's MA Gas & Electric DOC in May 2018

12. Demolition. Estimate provided by PROCON, LLC. See Attachment E of Decision Document.

PURCHASE AND SALE AGREEMENT

THIS AGREEMENT (this "Agreement") is entered into as of the 15 day of June, 2018 (the "Effective Date"), by and between **GARRISON GLEN** LLC, a New Hampshire limited liability company with a usual place of business at 141 Main Street, Nashua NH 03061, ("Seller"), and **UNITIL ENERGY SYSTEMS, INC.**, or its nominee, a New Hampshire corporation having an address of c/o Unitil, 6 Liberty Lane West, Hampton, NH 03842, ("Purchaser").

1. Purchase and Sale. In consideration of their mutual covenants and agreements set forth in this Agreement, Seller agrees to sell to Purchaser, and Purchaser agrees to purchase from Seller, for the Purchase Price (as hereinafter defined) subject to and on the terms and conditions set forth herein, the following:

(a) A certain parcel of land situated in the Town of Exeter, New Hampshire, presently known as and numbered **20 Continental Drive**, and as described as "Lot 6" in a certain deed recorded with the Rockingham County Registry of Deeds in Book 4404, Page 2738 and shown as the parcel labeled "Lot 6" on the plan entitled "Lot Consolidation/Resubdivision Plan Garrison Glen Corporate Park" prepared by Holden Engineering & Surveying, Inc. dated January 8, 1998 with revisions through July 22, 1998 recorded at the Rockingham County Registry of Deeds as Plan D-26568 (the "Plan"), consisting of approximately 10.75 acres, together with all rights, easements and rights of way appurtenant to **20 Continental Drive** and, approximately one (1) additional acre of land (the "Additional Acre") to be added to **20 Continental Drive,** by way of a lot line adjustment, from the approximately 22.9 acre parcel of land presently known as and numbered **60 Gourmet Place**, Exeter, New Hampshire, and as described as "Lot 8" in a certain deed recorded with the Rockingham County Registry of Deeds in Book 4404, Page 2738, and shown as "Lot 8" on the Plan. The preliminary location and shape of the Additional Acre shall be determined upon the mutual discussion and consent of the Purchaser and the Seller during the Due Diligence Period. The final location of the Additional Acre is subject to (i) further engineered site design and layout by Purchaser of its Intended Use (defined below) of the Real Estate (defined below) during the Permitting Diligence Period and (ii) the review and approval by all local, state and federal authorities with jurisdiction over Purchaser's development of the Real Estate. In the event that the location of the Additional Acre needs to be modified during the Permitting Diligence Period as described in the foregoing sentence, such new location will be subject to the review and approval of the Seller, which approval shall not be unreasonably withheld, conditioned or delayed. (All of the real property described in this Paragraph 1 (a) is collectively referenced in this Agreement as the "Land").

(b) Non-exclusive easement rights in common with others and subject to obligations shared by others in a private way across 60 Gourmet Place as described above

TKM 6/8/2018

(which private way is hereinafter sometimes referred to as "Private Drive') which Private Drive may, in Purchaser's sole discretion, serve as the primary ingress and egress to the Land. The preliminary location and shape of access to the Private Drive, along with the terms and conditions of use of the Private Drive, shall be determined by discussion and consent of the Seller and the Purchaser during the Due Diligence Period. The final location and shape of access to the Private Drive, along with the terms and conditions of use of the Private Drive, is subject to (i) further engineered site design and layout by Purchaser of its Intended Use of the Real Estate during the Permitting Diligence Period and (ii) the review and approval by all local, state and federal authorities with jurisdiction over Purchaser's development of the Real Estate. In the event that the location and shape of access to the Private Drive and/or the terms and conditions of use of the Private Drive need to be modified during the Permitting Diligence Period as described in the foregoing sentence, such new location and/or terms and conditions of use will be subject to the review and approval of the Seller, which approval shall not be unreasonably withheld, conditioned or delayed.

(c) All structures, buildings, improvements and fixtures located on and/or forming a part of the Land, whether above or below ground (collectively, the "Improvements").

(d) Seller's interest in all transferable licenses, approvals, variances, permits and warranties now in effect with respect to the Real Estate and the Improvements, if any, (collectively, the "Permits and Warranties") to the extent the same are in effect at Closing (the Permits and Warranties being referred to herein as the "Intangible Property"), all of which shall be transferred to Purchaser pursuant to an assignment agreement in form and substance acceptable to the Purchaser ("Assignment of Intangible Property").

Attached hereto as **Exhibit A** and made a part of this Agreement is a Plan entitled "Existing Conditions Plan Map 46 Lot 3 Proposed Operations Facility 20 Continental Drive Exeter NH" dated May 11, 2018 which Plan shows the metes and bounds of 20 Continental Drive. Also attached hereto as **Exhibit B** and made a part of this Agreement is a Plan entitled "Sketch Plan Lot Line Relocation 16 May 2018 Scale 1"-120'" which Plan shows the approximate area for consideration as the Additional Acre which is a portion of the Land.

The Land, the Improvements, the "Private Drive" and the Intangible Property are sometimes collectively referred to herein as the "Real Estate".

2. Purchase Price; Earnest Money. The purchase price for the Real Estate shall be **ONE MILLION AND 00/100 DOLLARS ($1,000,000.00)** (the "Purchase Price"), subject to adjustment for prorations as contemplated by Section 9 hereof. The Purchase Price shall be payable as follows:

(a) Upon complete execution of this Agreement and the Escrow Agreement (hereinafter defined), the sum of **THIRTY THOUSAND Dollars ($30,000.00)** shall be tendered as earnest money (the "Earnest Money") in immediately

available funds in the form of Purchaser's certified check (or wire transfer) made payable to Bow Street LLC ("Escrow Agent"), as escrow agent under this Agreement. The Earnest Money shall be applied to the Purchase Price at Closing or disbursed as otherwise contemplated by this Agreement. The Earnest Money shall be deposited with and held by Escrow Agent in accordance with an Escrow Agreement substantially in the form attached hereto as **Exhibit C**, executed by Seller, Escrow Agent and Purchaser ("Escrow Agreement"). Except in the event of termination of or failure to close this transaction by reason of Purchaser's default, any interest earned on the Earnest Money shall belong to Purchaser and may, at Purchaser's option, be applied to the Purchase Price at the Closing.

(b) Not later than 11:00 a.m., Eastern Daylight Time, on the Closing Date (as hereinafter defined), Purchaser shall pay to the Seller the Purchase Price, plus or minus prorations as hereinafter provided, and subject to application of the Earnest Money, by wire transfer to such bank account as the Seller may designate.

3. Closing.

(a) The consummation of the purchase and sale of the Real Estate ("Closing") shall, subject to the other terms and conditions contained herein, take place at 10:00 a.m. on a date determined by Purchaser which is more than thirty (30) days but less than forty-five (45) days following the expiration of the Permitting Diligence Period, defined below, (the "Closing Date") at the offices of Purchaser's counsel, **PIERCE ATWOOD, LLP**, One New Hampshire Avenue, Suite 350, Portsmouth, NH 03801. Notwithstanding the foregoing, the Closing Date may be extended according to the provisions contained in this Agreement or by written agreement signed by the parties hereto. The terms "Closing" and "Closing Date" shall include any agreed upon extensions thereof.

(b) At the Closing, Seller shall cause to be delivered to Purchaser, the following documents, together with evidence of the authority for the individual(s) executing the same on behalf of Seller:

(1) A good and sufficient Warranty Deed in form and substance customary and usual for the conveyance of commercial real property located in New Hampshire in recordable form properly executed on behalf of Seller, conveying to Purchaser, or to a nominee designated by Purchaser by written notice to Seller at least five (5) business days prior to Closing, the Real Estate and the Improvements in fee simple, subject to the Permitted Exceptions (hereinafter defined);

(2) A duly executed Seller's Title Insurance Affidavit, dated even with the Closing Date, in form and substance satisfactory to the Purchaser and such other documents that the Purchaser's title insurance company may reasonably require in order to issue a title policy in accordance with the provision of this Agreement;

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(3) An affidavit sworn by an authorized representative of Seller to the effect that Seller is not a "foreign person" as that term is defined in section 1445(f)(3) of the Internal Revenue Code of 1954, as amended, together with so-called "1099S Tax Reporting Forms" for reporting the conveyance contemplated hereby to the Internal Revenue Service;

(4) The Assignment of Intangible Property;

(5) A Closing Statement in form reasonably satisfactory to the parties reflecting the prorations and apportionments of the Purchase Price as required by the terms and provisions contained in this Agreement (the "Closing Statement") and,

(6) Such other documents and instruments as are reasonably necessary in order to effectuate the intent of this Agreement.

(c) At the Closing, Purchaser shall cause to be delivered to Seller the following:

(1) The balance of the Purchase Price, by confirmed wire transfer;

(2) Evidence satisfactory to Seller's counsel, of the identity and authority of the person executing documents on behalf of Purchaser;

(3) Executed originals of the Assignment of Intangible Property and the Closing Statement and,

(4) Such other documents and instruments as are reasonably necessary in order to effectuate the intent of this Agreement.

4. Conditions to Closing. In addition to all other conditions to the completion of the transaction described in this Agreement, Seller and Purchaser agree that the closing of transactions contemplated by this Agreement is subject to the satisfaction, approval or waiver by Purchaser, in Purchaser's sole discretion, of the following conditions:

(a) The Purchaser and its agents, contractors, engineers, surveyors, attorneys, and employees will have a period of time (the "Due Diligence Period"), commencing on the day after the Effective Date and ending on or before 5:00 p.m., on that date which is Ninety (90) days thereafter, to inspect and investigate the Real Estate in order to determine, in Purchaser's sole discretion, whether the Real Estate is suitable for the Purchaser's intended use. Such inspections and investigations may include, without limitation, a survey, environmental site assessments, engineering studies, wetland delineation and soil studies, geotechnical studies, zoning and land use analysis, cost of development and construction analysis, availability of utilities and access, title review and any other investigation the Purchaser may deem necessary. For the purpose of conducting on-site inspections and investigations, Seller agrees to provide Purchaser or its authorized agents, reasonable access to the Real Estate at all reasonable times during the Due

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Diligence Period upon at least twenty-four (24) hours prior notice to Seller. Notice may be delivered by email or verbally to Seller's representative Thomas F. Monahan. Purchaser hereby agrees to indemnify Seller and to hold Seller and Seller's agents harmless from and against any and all losses, costs, damages, claims or liabilities including, but not limited to, mechanic's and materialmen's liens and attorneys' fees, arising out of Purchaser's access to or entry upon the Real Estate under this Agreement. Purchaser will not, however, be liable under the foregoing indemnity for matters discovered by, as opposed to caused by, Purchaser. Purchaser's indemnity and hold harmless pursuant to this Section 4(a) shall survive the Closing, or earlier termination of this Agreement, for a period of one (1) year.

(b) No later than five (5) business days after the Effective Date, the Seller shall deliver to Purchaser the items set forth on **Exhibit D** attached hereto to the extent they are in Seller's possession or can be reasonably obtained by Seller (the "Seller's Disclosure Documentation"). During the Due Diligence Period, the Purchaser and its agents, contractors, engineers, surveyors, attorneys, and employees will review and inspect the Seller's Disclosure Documentation in order to determine, in Purchaser's sole discretion, whether the Real Estate is suitable for the Purchaser's intended use. Purchaser hereby acknowledges and agrees that the Seller's Disclosure Documentation is being made available to Purchaser for Purchaser's convenience only, and without representation or warranty by Seller of any kind, express or implied.

(c) The Purchaser and its agents, contractors, engineers, surveyors, attorneys, and employees will have a period of time (the "Permitting Diligence Period"), commencing at the end of the Due Diligence Period and ending on or before 5:00 p.m., on that date which is One Hundred Eighty (180) days thereafter, or as may be extended by Purchaser as provided herein, to apply for and obtain any and all necessary licenses, variances, special exceptions, permits and approvals, including without limitation, approvals related to zoning, site plan review, lot line adjustment, wetlands, NH Department of Environmental Services jurisdictional requirements, U.S. Army Corps jurisdictional requirements, building and construction permits, driveway permits and such other approvals and certificates required for Purchaser's intended use of the Real Estate which may include, but is not limited to, administrative offices, training areas, indoor storage/warehouse of utility company related equipment and supplies, outdoor storage, outdoor parking, and indoor parking of utility vehicles ("Intended Use"), from any and all state, local, municipal and federal authorities. Purchaser's obligation to purchase the Real Estate is expressly contingent upon Purchaser procuring during the Permitting Diligence Period all final non-appealable approvals, licensing, and permits as described herein necessary for the Intended Use. Such contingency shall not be deemed satisfied if Purchaser, by virtue of any such approvals, is required to construct off-site improvements or contribute to the cost of off-site improvements or infrastructure or such approvals impose any other conditions which, in Purchaser's sole discretion, are unacceptable to Purchaser, unless Purchaser agrees to any such off-site improvements, contribution, or conditions.

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In the event any of the conditions set forth in this Section 4 are not satisfied or waived by Purchaser within the Due Diligence Period or the initial Permitting Diligence Period, as applicable, Purchaser may notify Seller and Escrow Agent in writing of the termination of this Agreement prior to expiration of the Due Diligence Period or Permitting Diligence Period, as applicable ("Purchaser's Termination Notice"). In the alternative, the Purchaser may, no later than 10 days prior to the expiration of the initial Permitting Diligence Period, elect to extend the initial Permitting Diligence Period by One Hundred Eighty (180) days in order to obtain all necessary permits, licenses and approvals as described herein. Upon timely receipt of Purchaser's Termination Notice, the Earnest Money shall be refunded to Purchaser by Escrow Agent, both Seller and Purchaser shall be released and discharged from all further obligations under this Agreement to sell and purchase (as applicable) the Real Estate, and neither Seller nor Purchaser shall be subject to any claim by the other for damages of any kind except Purchaser's indemnity and hold harmless agreements as provided in this Agreement. If no Purchaser's Termination Notice has been delivered upon Seller and Escrow Agent within the time periods provided in this Section 4, as may be extended, all conditions to Purchaser's obligations under this Agreement shall be deemed to have been satisfied or waived and Purchaser's obligations to close shall be firm for all purposes under this Agreement. **THE SELLER ACKNOWLEDGES AND AGREES THAT THE PURCHASER MAY TERMINATE THIS AGREEMENT WITHIN THE DUE DILIGENCE PERIOD OR THE PERMITTING DILIGENCE PERIOD, AS MAY BE EXTENDED AS PROVIDED HEREIN, FOR ANY REASON OR NO REASON. IN ADDITION, SELLER ACKNOWLEDGES AND AGREES THAT THE PURCHASER'S PERFORMANCE HEREUNDER IS CONTINGENT UPON PURCHASER OBTAINING ALL SUCH NECESSARY PERMITS AND APPROVALS DESCRIBED HEREIN.**

Notwithstanding anything contained in this Section 4 to the contrary, with respect to any intrusive inspection or test at the Real Estate (e.g., investigation of soil and bedrock conditions, core sampling, soil and groundwater sampling, etc.) desired by Purchaser, the following terms and conditions shall apply: (a) Purchaser must obtain Seller's prior written consent (which consent shall not be unreasonably withheld, conditioned or delayed) as to the scope of the proposed inspection or test and the firm or person performing the same; (b) prior to performing any such inspection or test, Purchaser must deliver to Seller a certificate of insurance to Seller evidencing that Purchaser and its contractors, agents and representatives have in place reasonable amounts of comprehensive general liability insurance and workers compensation insurance for their activities on the Real Estate upon terms and amounts reasonably satisfactory to Seller, covering an accident arising in connection with the presence of Purchaser, its contractors, agents and representatives on the Real Estate, which insurance shall name Seller and such other Seller affiliated parties as Seller may designate as additional insureds thereunder; and (c) Purchaser shall bear the cost of all such inspections or tests and shall be responsible for and act as the generator with respect to any wastes generated by those inspections or tests. Notwithstanding the foregoing, Purchaser shall not be required to indemnify Seller or be liable to Seller for matters discovered by, as opposed to caused by, Purchaser during such intrusive investigations and sampling.

Seller shall cooperate with Purchaser, at no cost to Seller, during the Due Diligence Period, by providing one or more interviews regarding the past and current use of the Real Estate as part of Purchaser's environmental investigation.

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5. Evidence of Title. The Real Estate is to be conveyed by the Deed referred to in Section 3(b) (1) above. Subject to the terms and provisions contained in this Agreement, said Deed shall convey good, clear record, marketable and insurable title to the Real Estate and the Improvements, free from all liens, municipal betterments, assessments, agreements, and encumbrances except: (a) provisions of building and zoning laws; (b) such real and personal property taxes for the then current tax period as are not yet due and payable on the Closing Date; and (c) any easements, restrictions, covenants, agreements and other matters of record, provided that none of such easements, restrictions, covenants, agreements or other matters of record interfere with or prohibit the Purchaser's intended use of the Real Estate and the Improvements as determined by Purchaser in its sole discretion. In addition, title to the Real Estate and the Improvements shall be insurable for the benefit of Purchaser by a title insurance company licensed to do business in New Hampshire in a fee owner's policy of title insurance, in an amount equal to the Purchase Price, at normal premium rates, in the American Land Title Association form currently in use, subject only to exceptions to title that are acceptable to the Purchaser.

During the Due Diligence Period, Purchaser shall, at its sole cost and expense, satisfy itself that title to the Real Estate and the Improvements is satisfactory to Purchaser and complies in each and every respect with the terms and provisions contained in the first paragraph of this Section 5. If the results of any title examination and/or survey conducted by Purchaser disclose that title to the Real Estate and the Improvements does not comply, Purchaser, on or before expiration of the Due Diligence Period, shall deliver to Seller written notice of Purchaser's objections if any, to such title, describing its objections in reasonable detail (the "Title Objection Notice"). All Purchaser's title objections properly set forth in the Title Objection Notice, together with any title exceptions arising from and after the last Title Objection Notice which are either monetary liens or cause title to the Real Estate and the Improvements to not comply with the requirements described herein, are collectively referred to as "Unpermitted Exceptions". Notwithstanding any term or provision contained in this Agreement to the contrary, any exceptions to title existing prior to the last Title Objection Notice which are not properly and timely set forth in the last Title Objection Notice, shall be conclusively deemed to have been accepted and waived by Purchaser for all purposes under this Agreement and are referred to herein as the "Permitted Exceptions."

Seller shall, prior to Closing, use reasonable efforts to cure any Unpermitted Exceptions properly and timely objected to by Purchaser, provided, however, that anything to the contrary in this Agreement notwithstanding, Seller shall have no obligation hereunder to either: (a) expend any funds and/or to incur any direct or contingent liabilities which, in the aggregate, exceed the sum of Fifty Thousand Dollars ($50,000.00) in order to cause any Unpermitted Exceptions to be cured. Notwithstanding the foregoing, Seller shall, prior to or at Closing, pay or discharge any Unpermitted Exception consisting of a lien or encumbrance voluntarily created or assumed by Seller and not created by or resulting from the acts of Purchaser or any other party not controlled by Seller. By written notice to Purchaser at any time prior to Closing, Seller may extend the Closing Date hereunder by up to thirty (30) days in order to cure any Unpermitted Exceptions which it either elects to cure or is required to cure under the terms and provisions of this Section 5. If Purchaser properly and timely objects to any Unpermitted Exceptions, or if any Unpermitted Exceptions first arising from and after the last Title Objection Notice are found to exist prior to the Closing, and all of the same are not cured by Seller or waived by Purchaser prior to the Closing, as it may be extended, then Purchaser shall, at its election, either: (a) accept

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title as it then is, without reduction of the Purchase Price; or (b) terminate this Agreement, in which event the Earnest Money shall be returned to Purchaser as Purchaser's sole remedy under this Agreement. So long as Seller has not willfully failed to perform its obligations contained in this Section 5 or elsewhere in this Agreement, Purchaser's termination of this Agreement and return of the Earnest Money shall be its sole and exclusive remedy on account of Seller's default hereunder.

6. Seller Representations. Seller represents and warrants to the Purchaser that as of the date hereof and as of the Closing Date:

(a) Seller is a New Hampshire limited liability company, duly organized, and is in good standing under the laws of the State of New Hampshire, with the power to own real property. Seller has all requisite power and authority to enter into this Agreement and perform its obligations hereunder. The execution and delivery of this Agreement by Seller and the performance of Seller's obligations hereunder have been duly authorized. This Agreement constitutes a valid and binding obligation of Seller, enforceable in accordance with its terms against Seller, subject to bankruptcy, reorganization, insolvency and other similar laws affecting the enforcement of creditors' rights generally and to general principles of equity.

(b) To the knowledge of Seller, as of the date hereof, there are no leases or other agreements for occupancy in effect with respect to the Real Estate, except rights of others including a lease to Gourmet Gift Basket, as it may apply to the Private Drive, a copy of which will be delivered to the Purchaser as part of Seller's Disclosure Documentation;

(c) The execution and delivery of this Agreement and the consummation of the transactions contemplated hereunder on the part of Seller do not and will not (i) violate any applicable law, ordinance, statute, rule, regulation, order, decree or judgment binding upon Seller, or (ii) conflict with or result in the breach of any terms or provisions of, or constitute a default under, or result in the creation or imposition of any lien, charge, or encumbrance upon any of the Real Estate by reason of the terms of any contract, mortgage, lien, lease, agreement, indenture, instrument or judgment to which Seller is a party or which is or purports to be binding upon Seller or which otherwise affects Seller, which will not be discharged, terminated or released at Closing. No action by any federal, state or municipal or other governmental department, commission, board, bureau or instrumentality is necessary to make this Agreement a valid instrument binding upon Seller in accordance with its terms.

(d) Seller has not received any written notice of and to Seller's knowledge there is no pending or contemplated condemnation, eminent domain or similar proceeding or special assessment or betterment assessment with respect to all or any portion of the Real Estate.

(e) No person or other entity has any agreement (oral or written), right or option to acquire any interest in all or any portion of the Real Estate from or through Seller.

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(f) No lien, other than a lien for real estate taxes not yet due and payable, encumbers or affects title to the Real Estate. There is no claim, action, litigation, arbitration or other proceeding pending or, to Seller's knowledge, threatened against Seller which relates to the Real Estate or the transactions contemplated hereby or which could result in the imposition of a lien against the Real Estate or an action against Purchaser.

(g) There is no action, proceeding or governmental investigation or litigation pending or, to Seller's knowledge, threatened against the Real Estate or Seller, which could, in any manner, adversely affect the transactions contemplated in this agreement or affect the purchase of the Real Estate by Purchaser or the ownership by the Purchaser of the Real Estate after Closing.

(h) Seller is not delinquent in the payment of any tax (real estate or otherwise) bills, utility bills or bills or invoices actually received from any vendor or contractor providing goods or services to the Real Estate, or otherwise arising out of the ownership, operation and/or maintenance of the Real Estate.

(i) Seller has not, and, to Seller's knowledge, no other person or entity has, generated, stored, manufactured, processed, treated, spilled, released or disposed of any Hazardous Substances on the Real Estate, or transported Hazardous Substances to or from the Real Estate, or installed, used, abandoned in place or removed any underground or aboveground storage tanks on the Real Estate or is otherwise aware of the existence of any such tanks. Seller has not caused or to its knowledge permitted to occur, and will not permit to exist, any conditions on the Real Estate which may cause a release of Hazardous Substances at, upon, under or within the Real Estate. Neither Seller nor, to Seller's knowledge, any other party, has been, is or will be involved in operations at or adjacent to the Real Estate, which operations could lead to (1) the imposition of liability on Seller, Purchaser or any other subsequent or former owner of the Real Estate under Environmental Laws, or (2) the creation of a lien on the Real Estate under Environmental Laws. Seller has not received any notice from any governmental authority inquiring about, seeking to investigate, or claiming the existence of any Hazardous Substances on, under or about the Real Estate. "Environmental Laws" shall mean all federal, state or local laws, statutes, common law rulings, ordinances, rules or regulations relating to pollution, contamination, protection of human health or the environment, occupational safety and health or the generation, manufacture, disposal, treatment, release, use, transportation or exposure to chemicals or Hazardous Substances, including, without limitation, the Comprehensive Environmental Response Compensation and Liability Act, as amended; the Resource Conservation and Recovery Act, as amended; the Clean Water Act, as amended; the Toxic Substances Control Act, as amended; the Clean Air Act, as amended; the Occupational Safety and Health Act of 1970, as amended and all state law analogs. "Hazardous Substances" shall mean any product, material, chemical, compound, solid, semi-solid, gas, liquid, waste, pollutant, contaminant or substance whose presence, use, storage, manufacture, disposal, transportation or release, either by itself or in combination with other

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substances (i) is potentially injurious to the public health, safety or welfare or the environment, (ii) is regulated under any Environmental Laws or by any governmental authority; or (iii) is a basis for liability or potential liability to any governmental authority or third party under any Environmental Laws. Hazardous Substances include, without limitation, hazardous waste, hazardous materials, solid waste, demolition materials, petroleum or petroleum products or fractions thereof, asbestos and asbestos containing materials, polychlorinated biphenyls, molds, pesticides, lead paint and other hazardous or toxic substances, pollutants and contaminants.

(j) To Seller's knowledge, there currently exists no adverse subsurface conditions affecting the Real Estate such as underground mines, landfills, caves or unusual rock formations.

(k) Seller is the owner of the Real Estate.

(i) No petition in bankruptcy (voluntary or otherwise), assignment for the benefit of creditors, or petition seeking reorganization or arrangement or other action under federal or state bankruptcy law is pending or, to the best of Seller's knowledge, threatened against Seller.

For purposes of this Agreement, the phrases "knowledge of Seller", "to the best of Seller's knowledge" or words of like import shall mean the actual, knowledge of Thomas F. Monahan as of the date hereof. Seller shall be presumed to have knowledge of (i) any and all information regarding the real estate contained in the books and records of the Seller and (ii) any fact, matter or circumstance which any such individual, as an ordinary and prudent business person, should have known.

7. Purchaser Representations. Purchaser represents and covenants to Seller that as of the date hereof and as of the Closing Date:

(a) Purchaser is a New Hampshire corporation duly organized, validly existing and in good standing under the laws of the State of New Hampshire. Purchaser has all requisite power and authority to enter into this Agreement and perform its obligations hereunder. The execution and delivery of this Agreement by Purchaser and the performance of Purchaser's obligations hereunder have been duly authorized. This Agreement constitutes a valid and binding obligation of Purchaser, enforceable in accordance with its terms against Purchaser, subject to bankruptcy, reorganization, insolvency and other similar laws affecting the enforcement of creditors' rights generally and to general principles of equity.

(b) The execution and delivery of this Agreement and the consummation of the transactions contemplated hereunder on the part of Purchaser do not and will not (i) violate any applicable law, ordinance, statute, rule, regulation, order, decree or judgment binding upon Purchaser. No action by any federal, state or municipal or other governmental department, commission, board, bureau or instrumentality, except the New Hampshire Public Utilities Commission, is necessary to make this

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Agreement a valid instrument binding upon Purchaser in accordance with its terms.

(c) No petition in bankruptcy (voluntary or otherwise), assignment for the benefit of creditors, or petition seeking reorganization or arrangement or other action under federal or state bankruptcy law is pending or, to the best of Purchaser's knowledge, threatened against Purchaser.

The provisions of this Section 7 shall survive the delivery of the deed hereunder and shall not merge with any closing documents.

8. Seller's Covenants. Between the date of the execution of this Agreement and the Closing, Seller shall:

(a) Maintain the Real Estate in a commercially reasonable manner. Seller will not, without the prior written approval of Purchaser, make or permit to be made any material change, alteration or modification to any part of the Real Estate;

(b) Maintain commercially reasonable liability insurance coverage with respect to the Real Estate;

(c) Provide to Purchaser, immediately upon the receipt thereof, any and all notices in any manner relating to the Real Estate received by Seller or its agents or representatives from any governmental or quasigovernmental authority, insurance company, or from any other person, entity or party;

(d) Not, without the prior written consent of Purchaser, enter into any new contract or lease affecting the Real Estate or the maintenance, repair or operation thereof; and

(e) Seller acknowledges and agrees that Purchaser will make applications necessary for the development of the Real Estate with governmental agencies and other parties. Seller will cooperate, at no cost to Seller, with Purchaser's efforts to obtain governmental and other approvals for the development of the Real Estate, such as by joining in and executing such applications and documents in providing such information as Purchaser may reasonably request.

9. Prorations and Current Use Tax. The following adjustments to the Purchase Price paid hereunder shall be made between Seller and Purchaser and shall be prorated (as applicable) on a per diem basis up to and including the Closing Date:

(a) All real estate taxes and installments of special assessments or other municipal charges or liens, shall be adjusted as of the Closing Date. If the Closing shall occur before the tax rate or assessed valuation is fixed for the municipal fiscal year in which the closing occurs, the apportionment of real estate taxes shall be upon the basis of the tax rate for the preceding year applied to the most recent assessed valuation of the Real Estate, subject to further and final adjustment when the tax rate and/or assessed valuation is fixed.

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(b) Utility charges and deposits made by Seller with respect to utilities shall be applied to the benefit of Seller.

(c) A portion of the Real Estate is subject to current use taxation by the Town of Exeter. The parties acknowledge that the Real Estate will come out of current use classification and there will be a land use change tax assessed either after the execution of this Agreement or after the transfer of the Real Estate to the Purchaser. The Seller shall pay fifty percent (50%) of the portion of any land use change tax assessed against the Real Estate, up to a maximum of Ten Percent (10%) of the portion of the Purchase Price allocated to land subject to current use taxation; and the Purchaser shall pay the balance of the land use change tax assessed against the Real Estate, whether the tax is assessed before or after the transfer of the Real Estate to the Purchaser. As of the Effective Date of this Agreement, Seller is negotiating the land use change tax for 20 Continental Drive with the Town of Exeter. Seller shall give Purchaser the opportunity to review any proposed agreement with the Town of Exeter concerning the land use change tax for 20 Continental Drive before such agreement is finalized. Notwithstanding anything contained in this Agreement to the contrary, Purchaser may terminate this Agreement if, in its sole discretion, it is not satisfied with the proposed land use change tax agreement with the Town of Exeter.

(d) The Seller shall pay any other special tax/penalty on the Real Estate, as it becomes due and payable. This provision shall survive the Closing and the Purchaser shall be entitled to receive security, in a form satisfactory to the Purchaser, from the Seller for this commitment, at the time of Closing.

10. Transfer Taxes; Other Costs. Seller and Purchaser shall each pay one-half of the New Hampshire Transfer Tax. Each party shall pay its own attorneys' fees. Purchaser shall pay for any surveys, title examinations and/or title insurance required or desired by Purchaser.

11. Risk of Loss. Except as provided in any indemnity or other provisions of this Agreement, Seller shall bear all risk of loss with respect to the Real Estate until Closing. Seller may, but shall not be required, to maintain insurance on the Real Estate against fire and hazards given that the Real Estate is unimproved land; provided, however, in the event there is a fire or other hazard at the Real Estate that substantially destroys the wooded areas, if any, the Purchaser, in its discretion, may terminate this Agreement, upon written notice to the Seller, in which case the Earnest Money with any interest earned thereon shall be returned to the Purchaser and all other obligations of the parties hereto shall cease and this Agreement shall be void and without recourse to the parties hereto.

12. Condemnation. In the event between the date of this Agreement and the Closing Date, the Real Estate is subject to a potential or actual condemnation or eminent domain proceeding, Purchaser may:

(a) terminate the obligations of the parties hereunder to purchase and sell the Real Estate by written notice to Seller as contemplated by the final paragraph of this Section 12, and upon the exercise of such option by Purchaser the obligations of

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the parties hereunder to sell or purchase the Real Estate shall become null and void, the Earnest Money shall be returned to Purchaser, and neither party shall have any further liability or obligations hereunder except for Purchaser's indemnification and hold harmless obligations set forth in this Agreement; or

(b) proceed with the Closing, in which event Seller shall assign to Purchaser all of Seller's right, title and interest in and to any award made in connection with such condemnation or eminent domain proceedings, and Purchaser shall receive no credit against or deduct from the Purchase Price incident to such taking.

Seller shall promptly notify Purchaser in writing of any threatened or actual commencement or occurrence of any condemnation or eminent domain proceedings against the Real Estate. In such event, Purchaser shall then notify Seller, within thirty (30) days of Purchaser's receipt or deemed receipt of Seller's notice, whether Purchaser elects to exercise its rights under subparagraph (a) or subparagraph (b) of this Section 12.

13. Default. If the transactions contemplated by this Agreement are not consummated due to a default by Purchaser hereunder, then Seller shall retain the Earnest Money and all interest thereon as liquidated damages and as its sole monetary remedy (it being acknowledged by Purchaser that the actual damages which will be sustained by Seller in such event are not easily quantifiable at this time, and that retention by Seller of the Earnest Money under such circumstances is reasonable under such circumstances, and does not constitute a penalty or forfeiture as concerns Purchaser), except that Seller shall additionally be entitled to exercise any rights or remedies it may have by virtue of any indemnity created or granted herein. If this transaction is not consummated due to a default by Seller hereunder, Purchaser may either: (a) declare this Agreement terminated, in which event the Earnest Money and all interest thereon shall be returned to Purchaser as its sole remedy and all further rights and obligations of the parties hereunder shall cease, other than Purchaser's indemnification and hold harmless obligations set forth at in this Agreement, which shall nonetheless survive; or (b) commence an action for specific performance of Seller's obligations under this Agreement. Under no events or circumstances shall Seller be liable to Purchaser for any indirect or consequential damages under this Agreement.

14. Indemnification.

(a) Seller shall and does hereby indemnify and hold Purchaser, its affiliates, successors and assigns and their officers, directors, employees, agents and shareholders (the "Purchaser Indemnified Parties") harmless from and against all loss, cost, expense, damage, injury, obligation, liability, penalty, fine, suit and settlement including, without limitation, reasonable attorney and consultant fees and expenses, reasonable investigation and laboratory fees and expenses, the costs of remediation as required by any governmental authority, any response costs incurred to any other person or loss of natural resources, including reasonable

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costs of assessing such injury, court costs and other litigation expenses of whatever kind or nature, known or unknown, contingent or otherwise, arising out of or resulting from any "Pre-Closing Environmental Conditions"; provided, however, that any such indemnification shall not apply to the extent of any losses resulting from the negligence or willful misconduct of the Purchaser or its agents and provided further that this indemnification shall terminate one (1) year after the Closing. "Pre-Closing Environmental Conditions" shall mean any Hazardous Substance present in the soil, groundwater, surface water, sediment or air at the Real Estate that were present prior to the Closing or any migration of any Hazardous Substance in soil, groundwater, surface water, sediment, air, or any of them, before or after the Closing, to a location beyond the boundaries of the Real Estate.

(b) The right of any Purchaser Indemnified Party to indemnification pursuant to this Paragraph 14 will not be affected by any investigation conducted by, for, or on behalf of the Purchaser, or any knowledge acquired (or capable of being acquired) at any time by the Purchaser or any of the Purchaser's contractor's, representatives or agents, whether before or after the execution and delivery of this Agreement or the Closing.

(c) Purchaser shall and does hereby indemnify and hold Seller and its agents harmless from and against all loss, cost, expense, damage, injury, obligation, liability, penalty, fine, suit and settlement including, without limitation, reasonable attorney and consultant fees and expenses, reasonable investigation and laboratory fees and expenses, the costs of remediation as required by any governmental authority, any response costs incurred to any other person or loss of natural resources, including reasonable costs of assessing such injury, court costs and other litigation expenses of whatever kind or nature, known or unknown, contingent or otherwise, arising out of a new release of Hazardous Substances at the Real Estate first occurring on or after the Closing and transfer of ownership of the Real Estate to Purchaser and during the ownership of the Real Estate by Purchaser; provided, however, that any such indemnification shall terminate one (1) year after the Closing and shall not apply to the extent of any losses resulting from the negligence or willful misconduct of the Seller or its agents.

15. Notice. All notices required or permitted hereunder shall be in writing and shall be served on the parties at the following addresses:

If to Seller: Garrison Glen LLC
141 Main Street
Nashua, NH 03061

With a copy to:

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If to Purchaser: Unitil Energy Systems, Inc.
6 Liberty Lane West
Hampton, New Hampshire 03842
Attn: Jacquie Agel

With a copy to: Mark E. Beliveau, Esq.
Pierce Atwood, LLP
One New Hampshire Avenue, Suite 350
Portsmouth, NH 03801

Escrow Agent: Bow Street LLC
Attn: Margaret O'Brien
111 Bow Street
Portsmouth, NH 03801

Any such notices shall be: (a) sent by certified mail, return receipt requested, in which case notice shall be deemed delivered three (3) business days after deposit, postage prepaid in the U.S. mail, (b) sent by a nationally recognized overnight courier, in which case notice shall be deemed delivered one (1) business day after deposit with such courier, or (c) sent by hand delivery, in which case notice shall be deemed delivered on the date of receipt. Notwithstanding the foregoing, copies of notices may be delivered by confirmed and acknowledged electronic mail or facsimile transmission. The above addresses may be changed by written notice to the other party; provided, however, that no notice of a change of address shall be effective until actual receipt of such notice.

16. Governing Law. The validity, meaning and effect of this Agreement shall be determined in accordance with the laws of the State of New Hampshire.

17. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

18. Captions. The captions in this Agreement are inserted for convenience of reference and in no way define, describe or limit the scope or intent of this Agreement or any of the provisions hereof.

19. Assignability. Purchaser may not assign its rights under this Agreement without the prior written consent of Seller, which consent may be granted, withheld, or conditioned in Seller's sole discretion. Notwithstanding the foregoing, Purchaser may, by written notice to Seller at any time at least five (5) business days in advance of Closing, designate a nominee to accept title to the Real Estate at Closing. Such nominee shall be jointly and severally liable for all Purchaser's obligations hereunder.

20. Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective legal representatives, successors and permitted assigns.

TFM 6/8/2018

21. Modifications; Waiver. No waiver, modification amendment, discharge or change of this Agreement shall be valid unless the same is in writing and signed by the party against which the enforcement of such modification, waiver, amendment, discharge or change is sought.

22. Entire Agreement. This Agreement contains the entire agreement between the parties relating to the transactions contemplated hereby and all prior or contemporaneous agreements, understandings, representations or statements, oral or written, including, without limitation, the Non-Binding Letter of Intent dated April 3, 2018, are superseded hereby.

23. Partial Invalidity. Any provision of this Agreement which is unenforceable or invalid or the inclusion of which would adversely affect the validity, legality or enforcement of this Agreement shall be of no effect, but all the remaining provisions of this Agreement shall remain in full force and effect.

24. No Third Party Rights. Nothing in this Agreement, express or implied, is intended to confer upon any person, other than the parties hereto and their respective successors and assigns, any rights or remedies under or by reason of this Agreement, nor shall any term or provision in this Agreement impair or diminish any rights or remedies Seller or Purchaser may have against any person not a party hereto, except as expressly stated herein.

25. Broker. Seller and Purchaser represent each to the other that each has had no dealings with any broker, finder or other party concerning Purchaser's purchase of the Real Estate, except Bow Street, LLC (the "Broker"). The Broker represents the Purchaser only in this transaction. The Purchaser shall be responsible for the fee/commission due Bow Street, LLC upon Closing. Seller and Purchaser each hereby agree to indemnify and hold the other harmless from all loss, cost, damage or expense (including reasonable attorney's fees) incurred by the other as a result of their breach of the foregoing representation and warranty. The representations and warranties contained in this Section 25 shall survive the Closing or the termination of this Agreement.

26. Effective Date. For purposes of calculation of all time periods within which Seller or Purchaser must act or respond as herein described, all phrases such as "the date of this Agreement," "the date of execution of this Agreement" or any other like phrase referring to the date of the Agreement, shall mean and refer to the Effective Date of this Agreement as described in the first sentence of page 1 hereof, regardless of whether or not both Seller and Purchaser may or may not have executed this Agreement on such Effective Date.

27. Exclusivity. The Seller agrees that from the Effective Date to the Closing Date or such earlier termination of this Agreement as allowed for herein, the Seller, its agents or representatives may not, directly or indirectly, (i) solicit or encourage any inquiries or proposals for, or enter into any discussions with respect to, the acquisition by any person (other than the Purchaser and its representatives) of any interest in the Real Estate; or (ii) furnish or cause to be furnished any non-public information concerning the Real Estate to any person (other than the Purchaser and its representatives), other than as required by applicable laws and regulations and in each case after prior notice to and consultation with the Purchaser. The Seller and its respective agents and representatives will promptly notify the Purchaser of any inquiry or

TKM 6/8/2018

proposal received by such person with respect to the acquisition by any other person of the Real Estate.

28. No Publicity. The Seller will keep strictly confidential the existence of this Agreement, the contents hereof and will not issue any press release or other public statement without the consent of the Purchaser, except for disclosures required by applicable laws and regulations, in which case, the Seller will consult with the Purchaser and cooperate to the maximum extent possible in advance of such disclosure.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

WITNESS:

SELLER:
GARRISON GLEN LLC

Thomas F. Monahan, Manager

PURCHASER:
UNITIL ENERGY SYSTEMS, INC.

By
Thomas P. Meissner, Jr.
President and CEO

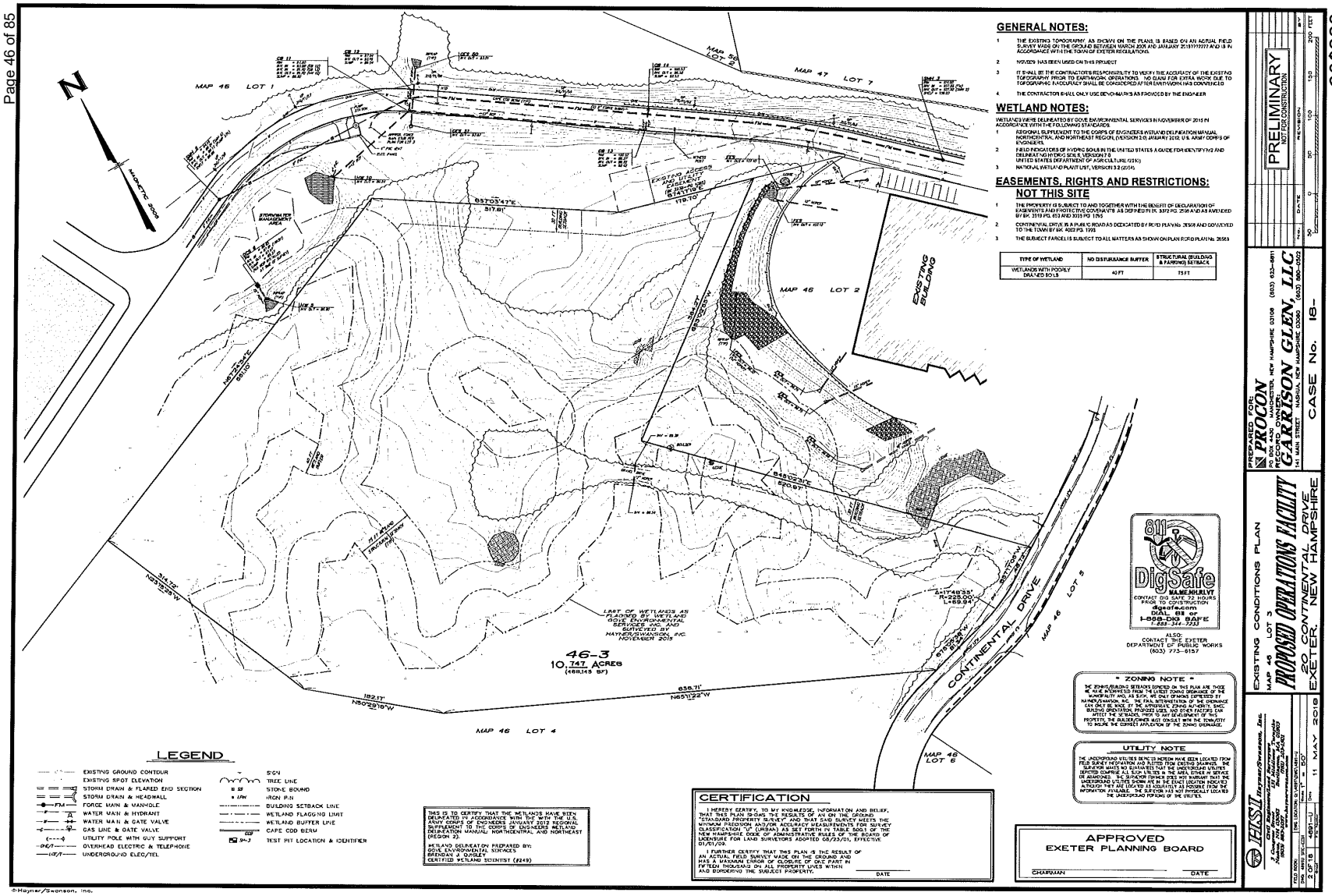
BROKER (for the limited purpose of acknowledging the provisions of Section 25 hereof):

BOW STREET LLC

By: Margaret O'Brien
Margaret O'Brien, Member

H:\tjleonard\Clients\Monahan, Thomas\Garrison Glen Property Development\Purchase Sale Agreement - Garrison Glen LLC redline WWF 5-21-18.docx

EXHIBIT A



GENERAL NOTES:

1. THE EXISTING TOPOGRAPHY, AS SHOWN ON THE PLANS, IS BASED ON AN ACTUAL FIELD SURVEY MADE ON THE GROUND BETWEEN MARCH 2009 AND JANUARY 2015????????? AND IS IN ACCORDANCE WITH THE TOWN OF EXETER REGULATIONS.
2. NGVD29 HAS BEEN USED ON THIS PROJECT
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE ACCURACY OF THE EXISTING TOPOGRAPHY PRIOR TO EARTHWORK OPERATIONS. NO ADDITIONAL FOR EXTRA WORK DUE TO TOPOGRAPHIC INACCURACY SHALL BE CONSIDERED AFTER EARTHWORK HAS COMMENCED
4. THE CONTRACTOR SHALL ONLY USE BENCHMARKS AS PROVIDED BY THE ENGINEER

WETLAND NOTES:

WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES IN NOVEMBER OF 2015 IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

1. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012 U.S. ARMY CORPS OF ENGINEERS
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES: A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 7.0 UNITED STATES DEPARTMENT OF AGRICULTURE (2015)
3. NATIONAL WETLAND PLANT LIST, VERSION 3.3 (2014).

EASEMENTS, RIGHTS AND RESTRICTIONS: NOT THIS SITE

1. THE PROPERTY IS SUBJECT TO AND TOGETHER WITH THE BENEFIT OF DECLARATION OF EASEMENTS AND PROTECTIVE COVENANTS AS DEFINED IN BK. 3372 PG. 2598 AND AS AMENDED BY BK. 3519 PG. 659 AND 3515 PG. 1795
2. CONTINENTAL DRIVE IS A PUBLIC ROAD AS DEDICATED BY PLAN PLAN No. 2658 AND CONVEYED TO THE TOWN BY BK. 4002 PG. 1979
3. THE SUBJECT PARCEL IS SUBJECT TO ALL MATTERS AS SHOWN ON PLAN PLAN No. 2658

TYPE OF WETLAND	NO DISTURBANCE BUFFER	STRUCTURAL (BUILDING & PARKING) SETBACK
WETLANDS WITH POORLY DRAINED SOILS	40 FT	75 FT

LEGEND

- EXISTING GROUND CONTOUR
- EXISTING SPOT ELEVATION
- STORM DRAIN & FLARED END SECTION
- STORM DRAIN & HEADWALL
- FM FORCE MAIN & MANHOLE
- WATER MAIN & HYDRANT
- WATER MAIN & GATE VALVE
- GAS LINE & GATE VALVE
- UTILITY POLE WITH GUY SUPPORT
- OHE/T OVERHEAD ELECTRIC & TELEPHONE
- UGE/T UNDERGROUND ELEC/TEL
- SIGN
- TREE LINE
- STONE BOUND
- IRON PIN
- BUILDING SETBACK LINE
- WETLAND FLAGGING LIMIT
- WETLAND BUFFER LINE
- CAPE COD BERM
- TP-J TEST PIT LOCATION & IDENTIFIER

THIS IS TO CERTIFY THAT THE WETLANDS HAVE BEEN DELINEATED IN ACCORDANCE WITH THE WITH THE U.S. ARMY CORPS OF ENGINEERS JANUARY 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST (REGION 2).

WETLAND DELINEATION PREPARED BY:
GOVE ENVIRONMENTAL SERVICES
BRENDAN J. GUNSLEY
CERTIFIED WETLAND SCIENTIST (#249)

CERTIFICATION

I HEREBY CERTIFY, TO MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THIS PLAN SHOWS THE RESULTS OF AN ON THE GROUND "STANDARD PROPERTY SURVEY" AND THAT SAID SURVEY MEETS THE MINIMUM PRECISION AND/OR ACCURACY MEASUREMENTS FOR SURVEY CLASSIFICATION "U" (URBAN) AS SET FORTH IN TABLE 5061 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS ADOPTED 08/23/01, EFFECTIVE 01/01/09.

I FURTHER CERTIFY THAT THIS PLAN IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS A MAXIMUM ERROR OF CLOSURE OF ONE PART IN FIFTEEN THOUSAND ON ALL PROPERTY LINES WITHIN AND BOUNDING THE SUBJECT PROPERTY.

DATE

APPROVED
EXETER PLANNING BOARD

CHAIRMAN DATE

" ZONING NOTE "

THE ZONING/BUILDING SETBACKS SHOWN ON THIS PLAN ARE THOSE AS ARE INTERPRETED FROM THE LATEST ZONING ORDINANCE OF THE TOWN OF EXETER, AS SUCH THE ONLY ZONING SETBACKS SHOWN ARE THOSE APPLICABLE TO THE ZONING ORDINANCE. SUCH SETBACKS CAN ONLY BE MADE BY THE APPROPRIATE ZONING AUTHORITY. SUBJECT BUILDING PROVISION, PROPOSED USES, AND OTHER FACTORS CAN AFFECT THE SETBACKS, PRIOR TO ANY DEVELOPMENT OF THIS PROPERTY, THE BUILDER/OWNER MUST CONSULT WITH THE TOWN/CITY TO INSURE THE CORRECT APPLICATION OF THE ZONING ORDINANCE.

UTILITY NOTE

THE UNDERGROUND UTILITIES SHOWN HEREON HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND PLOTTED FROM EXISTING SOURCES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND PIPELINES OF THE UTILITIES.

PRELIMINARY
NOT FOR CONSTRUCTION

No.	DATE	REVISION	BY
30	0	DD	

0 50 100 150 200 FEET

PREPARED FOR:
PROCON
ENGINEERING & CONSTRUCTION, NEW HAMPSHIRE 03108 (603) 623-8811
RECORD OWNER:
GARRISON GLEN, LLC
141 MAIN STREET NASHUA, NEW HAMPSHIRE 03060 (603) 880-0552

CASE No. 18-

EXISTING CONDITIONS PLAN
MAP 46 LOT 3

PROPOSED OPERATIONS FACILITY
20 CONTINENTAL DRIVE
EXETER, NEW HAMPSHIRE

TESTA Engineers/Surveyors, Inc.
Civil Engineers/Land Surveyors
Nashua, NH 03060
Bedford, NH 03110
(603) 880-0552 www.testaengineers.com

FIELD BOOK:	DWG LOCATION: S:\MAPPING\18-01	Drn:	T. FOY
2 OF 18	4891-U	Chk:	
SCALE: 1"=20'	DATE: 11 MAY 2018		

©Hoyner/Swanson, Inc.

T.F.M. 6/18/18

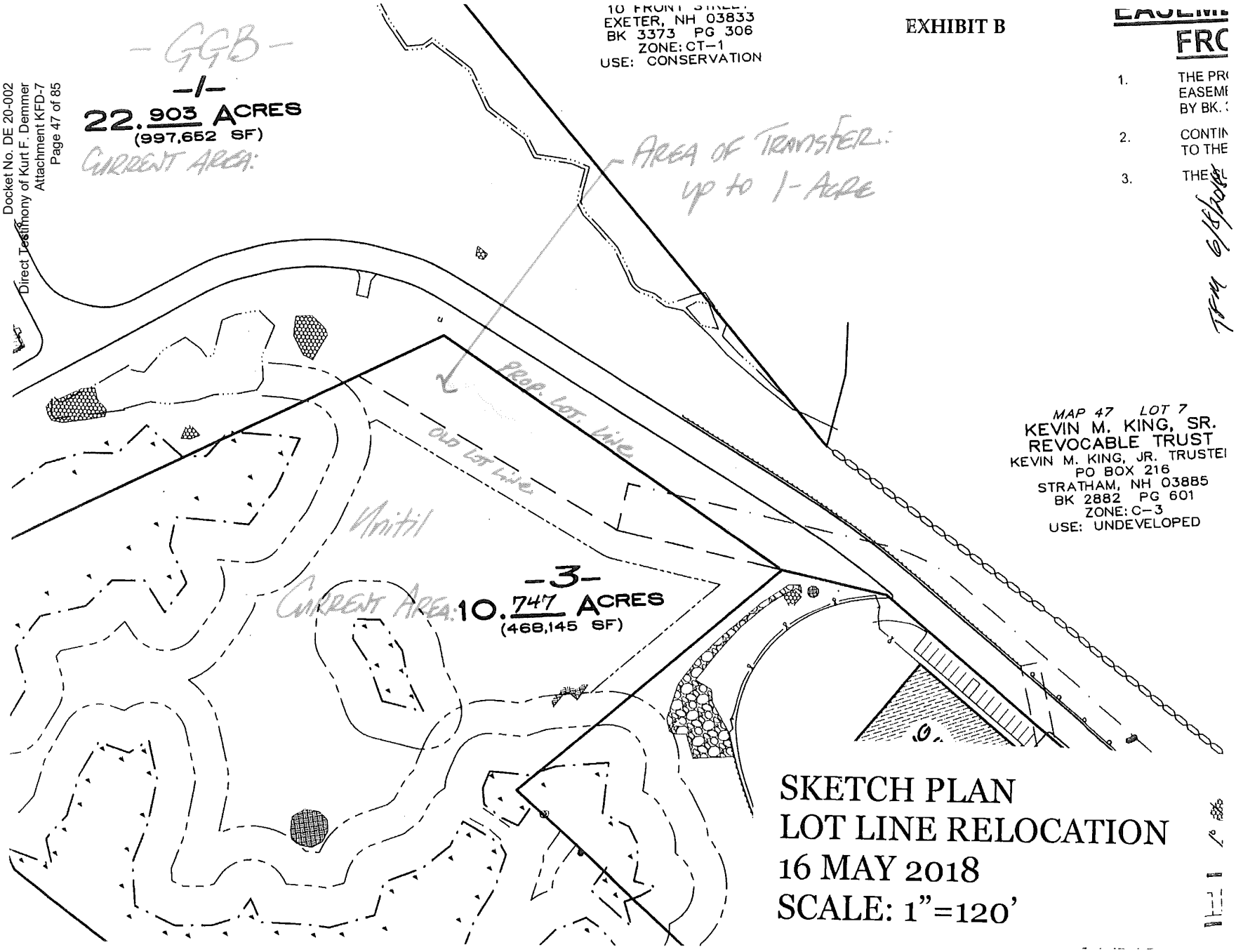


EXHIBIT B
10 FRONT STREET
EXETER, NH 03833
BK 3373 PG 306
ZONE: CT-1
USE: CONSERVATION
-GGB-
-1-
22.903 ACRES
(997,652 SF)
CURRENT AREA:
AREA OF TRANSFER:
up to 1-ACRE
PROP. LOT LINE
OLD LOT LINE
Unitil
CURRENT AREA:
-3-
10.747 ACRES
(468,145 SF)
MAP 47 LOT 7
KEVIN M. KING, SR.
REVOCABLE TRUST
KEVIN M. KING, JR. TRUSTEE
PO BOX 216
STRATHAM, NH 03885
BK 2882 PG 601
ZONE: C-3
USE: UNDEVELOPED
SKETCH PLAN
LOT LINE RELOCATION
16 MAY 2018
SCALE: 1"=120'

EXHIBIT C

ESCROW AGREEMENT

EXHIBIT D

List of Seller's Disclosure Documentation

1. Copy of an Owner's Policy of Title Insurance, Policy No. A75-0892783 dated December 3, 2004 showing the Seller as Owner of Lot 6 as shown on Plan D-26568 which lot is also known as Map 46, Lot 3 of the Assessor's Maps for the Town of Exeter, New Hampshire and which lot is a apportion of the Real Estate,;

2. Copies of financial data related to the Real Estate, including the most recent real property tax bills, any special assessments, and any correspondence relating thereto, received by Seller in connection with the Real Estate;

3. Copies of any and all engineering studies, wetland studies, topographical studies, and soil boring test results;

4. Copies of any and all existing, proposed or proffered conditions and agreements accepted and agreed to by Seller (or any predecessor in title to Seller if such documents are in the possession of Seller) as a condition to development of the Real Estate;

5. Copies of all environmental reports, studies, permits and all other documents pertaining to any use or presence of Hazardous Substances (as defined in the Agreement) in, on, under or about the Real Estate or pertaining to any other environmental matter with respect to conditions in, on, under or about the Real Estate, or operations and businesses conducted thereon, if any;

6. Copies of all subdivision and site plans, and all approvals, permits and licenses related to the Real Estate;

7. Copies of all leases, service agreements, and contracts of agreements affecting the Real Estate; and

8. Copies of all other documents, instruments and agreements relating to the Real Estate which are reasonably requested in writing by Purchaser.

If Purchaser terminates this Agreement pursuant to any of Purchaser's rights to do so under this Agreement, Purchaser will return to Seller all the documents provided by Seller hereunder.

EXHIBIT C

ESCROW AGREEMENT

THIS AGREEMENT is entered into by and among Garrison Glen LLC ("Seller"), Unitil Energy Systems, Inc. ("Purchaser"), and Bow Street LLC, ("Escrow Holder").

WITNESSETH, WHEREAS

A. Seller and Purchaser have entered into a Purchase and Sale Agreement dated as of June 15, 2018 ("Purchase Agreement") pursuant to which Seller has agreed to sell to Purchaser the real estate and improvements therein described located in Exeter, NH, and Purchaser, subject to the terms of the Purchase Agreement, has agreed to deliver into escrow with Escrow Holder, the sum totaling Thirty Thousand Dollars ($30,000.00) ("Earnest Money"), which Earnest Money is to be held and disbursed by Escrow Holder, or paid directly to Seller, as the case may be, in accordance with the terms and conditions of this Agreement and the Purchase Agreement, which Earnest Money and any interest or earnings thereon shall hereinafter be referred to as the "Fund." Capitalized terms used and not otherwise defined herein shall have the meaning ascribed to such terms in the Purchase Agreement.

B. Purchaser has deposited the Earnest Money with Escrow Holder on June 15, 2018 concurrently with the execution of this Agreement.

C. Purchaser has advised Escrow Holder that Purchaser's taxpayer identification number is 02-0121400

D. Escrow Holder agrees to act as escrow holder to hold, administer, invest and disburse the Fund on the terms and conditions herein set forth.

NOW, THEREFORE, in consideration of the foregoing and in consideration of the mutual covenants of the parties herein contained, and in further consideration of the sum of Ten Dollars ($10.00), which each of the parties acknowledges as adequate and sufficient, the parties hereto agree as follows:

1. Definitions.

All terms used herein, unless otherwise herein defined, shall have the meanings set forth in the Purchase Agreement.

2. Acknowledgment of Receipt.

Escrow Holder hereby acknowledges receipt of the Earnest Money from Purchaser pursuant to the Agreement, consisting of $30,000.00.

3. Administration and Investment of Fund.

Escrow Holder hereby agrees to hold, administer and disburse the Fund pursuant to this Agreement, and in accordance with the Purchase Agreement. Escrow Holder shall deposit the funds in a federally insured financial institution without interest Earned thereon.

4. Termination by Seller or Purchaser.

If at any time hereafter either Seller or Purchaser shall deliver to the other ("Recipient") and to Escrow Holder a written notice (given in accordance with Paragraph 8 hereof) asserting that the party giving the notice ("Notice Party") is entitled to receive and retain the Fund pursuant to the terms of the Purchase Agreement, Escrow Holder shall, not less than ten (10) business days after receipt of such notice, deliver the Fund to Notice Party unless within said period of ten (10) business days Recipient shall give written notice to Escrow Holder and Notice Party that it disputes Notice Party's claim to the Fund, in which case Escrow Holder shall either: (a) retain the Fund until it receives written instructions executed by both Seller and Purchaser as to the disposition and disbursement of the Fund, or until ordered by final court order, decree or judgment, which has not been appealed, to deliver the Fund to a particular party, in which event the Fund shall be delivered in accordance with such notice, instruction, order, decree or judgment; or (b) transfer the Fund either to a party mutually agreeable to Purchaser and Seller to serve as a substitute escrow holder to hold the deposit and such interest pending the resolution of dispute between Purchaser and Seller, or into a court of competent jurisdiction if the parties are unable to agree upon a substitute escrow agent.

In the event Seller or Purchaser notifies Escrow Holder that it is entitled to release of the Fund as hereinabove permitted, Purchaser's or Seller's notice to Escrow Holder shall include a copy of the notice to the Recipient and a statement on which Escrow Holder may rely, that Purchase or Seller has notified the other party that the requesting party is entitled to the Fund.

5. Disbursement at Closing or Termination.

Subject to Paragraph 4 hereof, Escrow Holder shall, at Closing, apply the Fund to the Purchase Price to be paid by Purchaser to Seller, in accordance with the Purchase Agreement. At the Closing, the full amount of the Earnest Money shall be applied to the Purchase Price or disbursed as otherwise contemplated by this Agreement.

6. Escrow Holder.

(a) Escrow Holder shall directly or indirectly hold possession of and keep all of the Fund subject to the terms and conditions of this Agreement, and shall deliver and dispose of the same according to the terms and conditions hereof, and shall deal with the parties hereto in relation to the sums so escrowed fairly and impartially according to the intent of the parties as herein expressed, provided however that Escrow Holder is to be considered as a depository only, shall not be deemed to be a party to any document other than this Agreement, and shall not be responsible or liable in any manner whatsoever for the sufficiency, manner of execution, or validity of any written instructions, certificates or any other documents received by it, nor as to

the identity, authority or rights of any persons executing the same. Escrow Holder shall be entitled to rely at all times on instructions given by Seller and/or Purchaser, as the case may be and as required hereunder, without any necessity of verifying the authority therefor. Notices given (i) by counsel to and on behalf of Purchaser, shall be deemed given by Purchaser, and (ii) by counsel to and on behalf of Seller, shall be deemed given by Seller, provided that in each case such notices recite the authority of such counsel to so act.

(b) Escrow Holder shall not at any time be held liable for actions taken or omitted to be taken in good faith and without negligence. Seller and Purchaser agree to save and hold Escrow Holder harmless from any loss and from any claims or demands arising out of its actions hereunder and hereby agree to indemnify Escrow Holder from any claims or demands for losses arising out of its activities hereunder.

(c) It is further understood by Seller and Purchaser that if, as the result of any disagreement between them or adverse demands and claims being made by any of them upon Escrow Holder, or if Escrow Holder otherwise shall become involved in litigation or proceedings with respect to this Agreement or the Purchase Agreement, such parties agree that they, jointly and severally, are and shall be liable to Escrow Holder and shall reimburse Escrow Holder on demand for all costs, expenses and counsel fees it shall incur or be compelled to pay by reason of such litigation.

(d) In taking or omitting to take any action whatsoever hereunder, Escrow Holder shall be protected in relying upon any notice, paper, or other document believed by it to be genuine, or upon evidence deemed by it to be sufficient, and in no event shall Escrow Holder be liable hereunder for any act performed or omitted to be performed by it hereunder in the absence of negligence or bad faith. Escrow Holder may consult with counsel in connection with its duties hereunder and shall be fully protected in any act taken, suffered or permitted by it in good faith and without negligence in accordance with the advice of such counsel.

(e) Purchaser agrees that Escrow Holder shall not, by virtue of its serving as Escrow Agent, be disqualified from representing Purchaser as Broker in connection with this Agreement and/or the Purchase Contract.

7. Term of Agreement.

The term of this Agreement shall be from and after the date of this Agreement as hereinafter set forth to and including the earliest to occur of (i) any of the events set forth in Paragraphs 4, 5 and 6 hereof; (ii) the termination or cancellation of the Purchase Agreement in accordance with its terms; or (iii) the termination hereof by written agreement of the parties hereto.

8. Notices.

Any notices under this Agreement shall be: (a) sent by certified mail, return receipt requested, in which case notice shall be deemed delivered three (3) business days after deposit, postage prepaid in the U.S. mail, (b) sent by a nationally recognized overnight courier, in which case notice shall be deemed delivered one (1) business day after deposit with such courier, or (c)

sent by hand delivery, in which case notice shall be deemed delivered on the date of receipt, in each case to the parties at their respective addresses as follows:

If to Seller:	Garrison Glen, LLC 141 Main Street Nashua NH 03061 Attn: Thomas F. Monahan
With a copy to:	Welts, White & Fontaine, P.C. Attn: Thomas J. Leonard, Esq. 29 Factory Street P.O. Box 507 Nashua, NH 03061
If to Purchaser:	Unitil Energy Systems, Inc. 6 Liberty Lane West Hampton, New Hampshire 03842 Attn: Jacquie Agel
With a copy to:	Mark E. Beliveau, Esq. Pierce Atwood, LLP One New Hampshire Avenue, Suite 350 Portsmouth, NH 03801
Escrow Agent:	Bow Street LLC Attn: Margaret O'Brien 11/Bow Street Portsmouth, NH 03801

The above addresses may be changed by written notice to the other party; provided, however, that no notice of a change of address shall be effective until actual receipt of such notice. Courtesy copies of notices are for informational purposes only, and a failure to give or receive copies of any notice shall not be deemed a failure to give notice.

9. Miscellaneous.

(a) This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, executors, administrators, representatives, successors and assigns.

(b) This Agreement shall be construed under and governed by the laws of the State of New Hampshire, and, in the event that any provision hereof shall be deemed illegal or unenforceable, said provision shall be severed herefrom and the remainder of this Agreement shall be enforced in accordance with the intentions of the parties as herein expressed.

(c) This Agreement may not be amended or altered except by an instrument in writing executed by all the parties hereto.

(d) This Agreement may be executed in counterparts, all of which taken together shall constitute one agreement.

10. Counterparts.

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

WITNESS WHEREOF, the parties hereto have executed this Agreement as of June ___, 2018. In the event of a conflict between the terms hereof and the terms of the Purchase Agreement, the Purchase Agreement shall govern.

SELLER:

GARRISON GLEN LLC

Witness

Thomas F. Monahan, Manager

PURCHASER:
UNITIL ENERGY SYSTEMS, INC.

By:
Thomas P. Meissner, Jr.
President and CEO

ESCROW HOLDER:
BOW STREET LLC

By:
Margaret O'Brien

{W6743357.1}

FIRST AMENDMENT TO PURCHASE AND SALE AGREEMENT

THIS FIRST AMENDMENT TO PURCHASE AND SALE AGREEMENT is dated as of the 5 day of September, 2018, by and between **GARRISON GLEN** LLC, a New Hampshire limited liability company with a usual place of business at 141 Main Street, Nashua NH 03061, ("Seller"), and **UNITIL ENERGY SYSTEMS, INC.**, or its nominee, a New Hampshire corporation having an address of c/o Unitil, 6 Liberty Lane West, Hampton, NH 03842, ("Purchaser").

RECITALS

WHEREAS, by Purchase and Sale Agreement dated June 15, 2018 (the "Agreement") Seller agreed to sell and Purchaser agreed to purchase the "Real Estate" as defined in the Agreement.

WHEREAS, the Seller and Purchaser now wish to amend the Agreement as more particularly described herein.

NOW, THERFORE, in consideration of the mutual covenants, promises and undertakings set forth below, the parties hereto agree as follows:

1. Section 4(a) of the Agreement is hereby amended by increasing the duration of the Due Diligence Period from ninety (90) days to one hundred fifty (150) days. As a result, the Due Diligence Period will now end at 5:00 p.m. on November 12, 2018.

2. Section 9(c) of the Agreement is hereby amended in its entirety and replaced with the following:

> A land use change tax has been assessed against 20 Continental Drive by the Town of Exeter in the amount of Thirty-Seven Thousand Five Hundred ($37,500.00) Dollars (the "Tax"). The Seller and Purchaser shall each pay fifty percent (50%) of the Tax. Purchaser shall deliver its share in the amount of Eighteen Thousand Seven Hundred Fifty ($18,750.00) Dollars to Seller within thirty (30) days of the complete execution of this First Amendment to Purchase and Sale Agreement. The Seller shall be responsible for delivering full payment of the Tax to the Town of Exeter promptly thereafter (if the Tax has not already been paid by Seller) and provide Purchaser with proof of payment. Payment of the Tax to the Town by Seller is a condition precedent to Purchaser's obligation to purchase the Real Estate. If Purchaser timely delivers a Purchaser's Termination Notice to Seller, Seller shall, within ten (10) days of receipt of Purchaser's Termination Notice, reimburse Purchaser for its share of the Tax in the amount of Eighteen Thousand Seven Hundred Fifty ($18,750.00) Dollars.

3. The Agreement, as amended hereby, is ratified and confirmed and is, as of the date hereof, in full force and effect.

{W6863512.1}

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

WITNESS:

SELLER:
GARRISON GLEN LLC

Thomas F. Monahan, Manager

PURCHASER:
UNITIL ENERGY SYSTEMS, INC.

By: _____
Thomas P. Meissner, Jr.
President and CEO

{W6863512.1}

PIERCE ATWOOD LLP

MARK E. BELIVEAU

Pease International Tradeport
1 New Hampshire Ave. #350
Portsmouth, NH 03801

PH 603.373.2002
FX 603.433.6372
mbeliveau@pierceatwood.com

www.pierceatwood.com

Admitted in: NH

SENT BY ELECTRONIC MAIL AND OVERNIGHT MAIL

April 5, 2019

Garrison Glen, LLC
c/o Thomas J. Leonard
Welts, White & Fontaine, PC
29 Factory Street
PO Box 507
Nashua, NH 03061

Re: Garrison Glen, LLC to Unitil Energy Systems, Inc. - Purchase and Sale Agreement dated June 15, 2018

Dear Jay,

Pursuant to the Purchase and Sale Agreement between Garrison Glen, LLC and Unitil Energy Systems, Inc. (Unitil), please accept this letter as written notice of the election of Unitil to extend the initial Permitting Diligence Period by One Hundred Eighty (180) days. The initial Permitting Diligence Period ends on May 11, 2019. With this extension, the Permitting Diligence Period will now end no later than November 7, 2019.

As you know, under the Purchase and Sale Agreement, the Permitting Diligence Period is that period of time that Unitil has to apply for and obtain all of the final and non-appealable permits and approvals for its project. Unitil is making good progress in this regard and is currently before the Exeter planning board for site plan review, lot line adjustment and road dedication. Unitil met with Exeter DPW earlier this week regarding the condition of Gourmet Place in continuation of the effort to have the road approved by the planning board and then approved and accepted by the Exeter Select Board or Town Meeting as a town road.

Please contact me if you have any questions. Thank you.

Very truly yours,

Mark E. Beliveau

MEB/tak

cc: Jacquie Agel, Unitil

Attachment H

New Seacoast Region Facility
Space Allocation Schedule

Level	Area Name	User	Area #	Area
1st	DOC Open Office & Private Offcs	DOC	1a	2,629
1st	Electric Ops Open Office Area	DOC	1a	481
			1a Subtotal:	**3,110**
1st	Warehouse, RRs, Labs, WrkRms	DOC	1b	9,678
1st	Electric Ops RR & Work Rm	DOC	1b	933
			1b Subtotal:	**10,611**
1st	Garage (Includes Storage Areas)	DOC	1c	16,516
1st	Vehicle Wash Bay	DOC	1d	1,196
1st	Locker Rms	DOC	9	1,413
			1c, 1d + 9 Subtotal:	**19,125**
1st	Engineering Lab	USC	6	**194**
1st	Common Areas	DOC	7	5,787
1st	Conf Rm 103	DOC	7	157
			7 Subtotal:	**5,944**
1st	Kitchen & Dng/Mtg Rms & HR (143 sf)	SHARED	9	**2,647**
2nd	CED + CED Mgr	USC	2	**1,111**
2nd	Gas Control & Field Services	USC	3	**271**
2nd	OQ Testing & Training Rms	USC	4	**1,334**
2nd	Eng Offices & File Rm	USC	5	**3,042**
2nd	Common Areas	USC	8	3,256
2nd	Conf Rm 203	USC	8	159
			8 Subtotal:	**3,415**
			Grand Total:	**50,804**

*Common Areas: Rest/Locker Rms, Conf Rms, Production, Corridors, IT Rm, Stairs, Lobbies....

Rentable Area Legend

- 1a DOC office
- 1b Warehouse, labs, Workroom
- 1c Garage
- 1d Wash Bay
- 6 Engineering Lab
- 7 1st Level Common: Rest Rooms, Conf Rms, Production, IT Closet, Corridors, Lobby, Stairs (other?)
- 9 Shared Common: Kitchen & Dng/Mtg Rms (3), Locker Room

Rentable Area Legend

- 2 CED (+Mgr's Office)
- 3 Gas Control and Field Services
- 4 OQ Testing & Training Room
- 5 Engineering Office, include file room
- 8 2nd Level Common: Rest Rooms, Conf Rms, Production area, IT Rm, Corridors, Lobby, Stairs (other?)

	Sq Ft	Split	
DOC:	38,790	80.5%	
USC:	9,367	19.5%	
Subtotal:	**48,157**	**100.0%**	
SHARED:	2,647		
DOC Allocation of Shared:	2,132		
USC Allocation of Shared:	515		
SHARED Subtotal:	**2,647**		
Grand Total:	**50,804**		
DOC + SHARED:	40,922		
USC + SHARED:	9,882		
Grand Total:	**50,804**		
Total Bldg:	53,940		(From PB Application)
DOC&USC Grand Total:	50,804		
Difference:	**3,136**		
DOC Allocation of Diff:	2,526	80.5%	
USC Allocation of Diff:	610	19.5%	
DOC:	43,448		
USC:	10,492		
Grand Total:	**53,940**		

Note: Unitil's new Lunenburg, MA DOC was constructed to a IV occupancy category. The decision was made to do the same for the

Unitil Energy Systems, Inc – Occupancy Category
May 30, 2019

The Occupancy Category designates the nature of the occupancy and how it needs to perform under extreme environmental conditions. The different categories signify different design loads for the structure based on flood, wind, snow, earthquake and ice loads. The appropriate reference for this project is IBC 2009 section 1604.5 (Table 1604.5). The table is broken into four categories, with Category I having the least structural loading requirements and Category IV having the most restrictive structural loading requirements. The table below provides a reference for how the types of structures can be designated into which categories.

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited t • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Occupancy Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including bu limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000[a]. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2 occupancies having surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures. • Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1(2). • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.1.1 to use gross floor area calculations shal permitted to use net floor areas to determine the total occupant load.

In addition to specific loading requirements outlined above, the occupancy category is used for a number of additional purposes, including the determination of importance factor in ASCE 7, the requirements for structural integrity for exit and elevator hoistway enclosures, glazing for wind design, determination of Seismic Design Category and special inspection and structural observation, among other items.

In June of 2013 the Division of Fire Safety issued an informational bulletin to help define Essential Facilities associated with division 1604.5. Below is a portion of that memo. It indicates that a Category 4 facility, an

Essential Facility, is required to have very specific uses that need to remain operational in the event of extreme environmental loading.

		Power Systems (COPS)		
SUPERSEDES	RELEASED BY	APPROVED BY	SOURCE	SUPERSEDED BY
	MTL	JWD	Brc 303.01, Brc 307.01	

DESIGNATION of ESSENTIAL FACILITIES and CRITICAL OPERATIONS POWER SYSTEMS (COPS)

ESSENTIAL FACILITIES

The term "Essential Facility" is limited to a reference in the IBC and found in Section 1604.5 as Occupancy Category IV to include very specific uses such as hospitals, fire and police stations, designated shelters, critical national defense functions, etc. It is not a reference to a use group type. A definition is also provided that states …remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes". The sole purpose for this designation in the IBC is to provide for enhanced structural loading factors for wind, seismic and snow loads.

While the IBC references the Building Official as the person who makes this designation, the code specifically requires that *"This designation would only be made with consideration of broader public policy, as well as emergency preparedness planning within the jurisdiction in question"*. **Prior to making a determination, the Building Official is therefore obligated to take full consideration of input from all applicable federal, state and municipal authorities.**

Costs:

The current structural design for the Seacoast DOC is based on a Category 2 occupancy. PROCON reached out to Canam to determine what the potential impact would be to move from a Category 2 to a Category 4. They indicated that it would be an increase of 10-15% for the steel. This would result in an approximate increase of $150,000. Other trades, building materials, engineering, etc. with related costs for the potential change in a Category 2 to 4 building upgrade have not been determined at this time.

6/17/19 jda: Included $200K to the "Estimated Construction Costs" in Attachment F.

Determining Occupancy Category:

When there are multiple facilities in one geographical region the facilities as a whole should be considered when determining the occupancy category. In the event of one facility going down, could other facilities provide adequate coverage for the region in question? This holistic approach provides a greater understanding of the risk associated with extreme environmental conditions to a regional response and not just a single facility.

In addition, the occupancy category will need to be reviewed by the Building Inspector to confirm whether they interpret the decision in the same manner.

7/19/19
Prepared for: Mike Lawrence – PROCON
Prepared by: Kristen Osterwood – Unitil
Subject: Sustainability Goals for New Seacoast Region Facility Project in Exeter, NH
Goal Setting Team: Sara Sankowich, Kristen Osterwood, Jacquie Agel

Unitil's Goals for Exeter Building

As this is the first building project by Unitil that will complete construction after the company's corporate commitment to sustainability, it is prudent to reflect those goals in this project as much as financially prudent, considering the stage of the project. Some of the items listed below do not require any additional cost because some of the items are already included (i.e. low flow fixtures) and/or much of the educational tasks are aspects that can be handled by Unitil.

The goals for this building project are intended to reflect Sustainability in the context of Unitil. At Unitil we have well developed, effective programs that support **energy efficiency** for our customers – it only follows that Unitil should lead by example. We need to be prudent investors in our assets – which includes our employees, as such we need to provide **workplaces that allow optimized health and productivity**. There is a close tie between the production of energy and use of water – this building would be a good place to initiate this conversation by supporting **water efficiency**, both inside (fixtures) and outside (landscaping) the building. Lastly, we want to ensure that this building can be used as an **educational tool** to share with customers – highlighting effective energy efficiency measures, impacts of healthy indoor spaces, and importance water conservation and native landscaping.

Goals:
- Energy Efficiency
- Indoor Environmental Quality (workplace support health and productivity)
- Water Efficiency
- Education

Ways to achieve each goal:
- Energy Efficiency
    - Increased Insulation
    - Airtight construction (material and construction practice)
    - External shading on southern façade
    - Light colored roof
    - High performance windows
    - Mechanical, high efficiency, VAV – ERV
    - Lighting controls (responsive daylighting and occupancy)
    - Light colored paving material to reduce heat island effect
- Indoor Environmental Quality
    - Low/no VOC materials
    - Increased ventilation rates
    - Improved thermal comfort (HVAC, controls, seating selection, air movement)
    - Daylight and view of outside for all occupants

- Work areas based on both input for needed work functions as well as current best practices for workspaces
- Plants and/or biophilic design
- Lighting (quality and individual control)
- Ergonomic comfort (sit/stand)

- Water Efficiency/Management
  - Low flow fixtures
  - Sensor controlled faucets
  - Rainwater harvesting for onsite use (truck washing, landscaping)
  - Native plantings (watering not required after plants established)
  - Rainwater management onsite (retention pond/water feature)
  - Permeable pavement where possible
  - Water quality improvement/hazardous water management (poles & transformers)
- Education
  - Energy efficiency: effect methods to improve the energy efficiency of home or business (roof insulation, air sealing, etc.)
  - Indoor Environmental Quality: effective of air sealing on indoor air quality and resulting improvement with fresh air ventilation, air movement on thermal comfort (fans = comfortable with warm temperatures),
  - Water efficiency: impact on bill of inexpensive aerators and low flow fixtures

UES Seacoast

Construction Authorization

AUTH: **191035**
Date: **2/8/2019**
Budgeted Amount: **$1,200,000.00**

Budget Item No: **GPBE03**
Budget Year: **2019**
Description: **Acquisition of New DOC & Sale of Existing DOC**
Project Supervisor: **Agel, Jacquie**
Crew Days: **0**
Start Date:
Completion Date:

Type: **Original**
Sequence: **1**
Status: **Completed**
Initiated Date: **2/8/2019 2:59:19 PM**
Initiated By: **Doucette, George**
Finalized Date: **3/28/2019 8:34:19 AM**
Finalized By: **Lydon, Lisa**

APPROVALS

Action Date	Approved	Approver/Title
3/1/2019	YES	**Lydon, Lisa** *Plant Accountant*
3/1/2019	YES	**Bickford, Tressa** *Manager Utility Accounting and Budgeting*
3/21/2019	YES	**Agel, Jacquie** *Manager, Fleet & Facilities*
3/22/2019	YES	**Closson, John** *VP, People, Shared Services & Org. Effectiveness*
3/28/2019	YES	**Bonazoli, John** *Manager Distribution Engineer*
3/12/2019	YES	**Sprague, Kevin** *VP, Engineering*
3/20/2019	YES	**Main, Dan** *Manager of Regulatory Services and Corporate Compliance*
3/22/2019	YES	**Vaughan, Christine** *SVP, CFO and Treasurer*
3/21/2019	YES	**Brock, Laurence** *Senior Vice President & Chief Financial Officer*

ESTIMATED COST SUMMARY

Description	Amount
Total Project Cost:	$1,200,000.00
Less Customer Contribution:	$0.00
Net Authorized Cost:	$1,200,000.00
Retirement:	$900,000.00
Cost Of Removal:	$0.00
Salvage:	$0.00
CWO Total:	$1,200,000.00

DESCRIPTION/SCOPE

Purchase land for a new Seacoast DOC facility.

Sale of existing DOC Seacoast facility @ 114 Drinkwater Road, Kensington, NH

Includes preliminary survey and due diligence costs to vet existing building and land acquisition opportunities, as well as, the sale of 114 Drinkwater Rd.

A P&S agreement for the purchase of a parcel of land in Exeter, NH was entered into in June 2018 with approx. 12 months of due diligence prior to closing on the transaction. $1.2M (includes land purchase $1M, closing costs, broker's fee, current use tax, PSI costs)

JUSTIFICATION

The current facility is nearing 70+ years old, windows are original and need to be replaced and the garage height does not allow adequate clearance for new and taller bucket trucks.

NOTES

AUTHORIZATION COMMENTS

CWO Summary

CWO	Description	Amount
20192713	Acquisition of New DOC & Sale of Existing DOC	$0.00
20192714	Acquisition of New DOC	$1,175,000.00
20192715	Sale of Existing DOC	$25,000.00
	Total	$1,200,000.00

UES Seacoast

Construction Authorization

AUTH: **191060**
Date: **8/22/2019**
Budgeted Amount: **$5,000,000.00**

Budget Item No: **GPBE02**
Budget Year: **2019**
Description: **Construction - New DOC Facility**
Project Supervisor: **Agel, Jacquie**
Crew Days: **0**
Start Date:
Completion Date:

Type: **Original**
Sequence: **1**
Status: **Completed**
Initiated Date: **8/22/2019 11:47:27 AM**
Initiated By: **Doucette, George**
Finalized Date: **9/12/2019 9:46:20 AM**
Finalized By: **Lydon, Lisa**

APPROVALS

Action Date	Approved	Approver/Title
9/10/2019	YES	**Lydon, Lisa** *Plant Accountant*
9/10/2019	YES	**Bickford, Tressa** *Manager Utility Accounting and Budgeting*
9/10/2019	YES	**Agel, Jacquie** *Manager, Fleet & Facilities*
9/11/2019	YES	**Closson, John** *VP, People, Shared Services & Org. Effectiveness*
9/11/2019	YES	**Bonazoli, John** *Manager Distribution Engineer*
9/11/2019	YES	**Sprague, Kevin** *VP, Engineering*
9/11/2019	YES	**Main, Dan** *Manager of Regulatory Services and Corporate Compliance*
9/12/2019	YES	**Brock, Laurence** *Senior Vice President & Chief Financial Officer*
9/12/2019	YES	**Vaughan, Christine** *SVP, CFO and Treasurer*

ESTIMATED COST SUMMARY

Description	Amount
Total Project Cost:	$15,931,474.00
Less Customer Contribution:	$0.00
Net Authorized Cost:	$15,931,474.00
Retirement:	$0.00
Cost Of Removal:	$0.00
Salvage:	$0.00
CWO Total:	$15,931,474.00

DESCRIPTION/SCOPE

Construct a new NH Seacoast Region Facility, in Exeter NH, to include space for the following business needs; NH Seacoast's Electric Distribution Operations Center (DOC), Business Continuity for Gas Control & Field Services, System Emergency Operating Center (S-EOC), Central Electric Dispatch (CED), OQ Testing, Training, Offices and lab for Electric Engineering Department.

Scope to include:

Preliminary Survey cost including:
- Preconstruction, engineering & design, construction management pre-construction services, geo-tech, civil/survey, environmental survey, legal fees, permitting, insurance, etc.

Construction: site work, utilities (electric, gas, comm, sewer/water), construction to include:
- 53,940 sf +/- sf for office areas, warehouse, enclosed vehicle storage area with a wash bay, etc.
- Bermed outside transformer & other storage
- Outside material laydown areas
- Emergency back-up Generator
- Construction Administration: Construction Manager and engineers & designers field observations, RFIs, Submittals review and other miscellaneous construction phase documentation.
- Project Close Out: Commissioning, As-Builts, etc.
- Furniture/Furnishings/Equipment: Office, warehouse, operations areas, building electronic access control and security systems, and Information Technology infrastructure.
- Move

This is a multi-year project:
Q3 2019 Break ground/begin construction
2020 Completion, Commissioning and Occupancy

JUSTIFICATION

The current Distribution Operations Center (DOC) is 60+ years old and no longer adequately supports the present day operational needs of UES/Seacoast. The current DOC was constructed in the 1950s. Since that time the customer base has grown as has the requirement to stock more materials (inside and out) including transformers and poles. The transformers take up a great deal of space in a stockyard that was designed for operations 60+ years ago when utility trucks were much smaller. The current day line trucks barely fit into the 1950s garage. In addition, this building will solve space constraints at other company facilities, in connection with business continuity for the company's Gas Control, Field Services and Central Electric Dispatch (CED) functions , Electric Engineering department including lab space for functional testing of equipment as well as, provide space for a Prometric certified Operator Qualifications (OQ) testing.

NOTES

Preliminary Survey costs need to be transferred into individual CWO's.

AUTHORIZATION COMMENTS

CWO Summary

CWO	Description	Amount
20192718	Construction - New DOC Facility	$13,681,559.00
20192719	Engineering & Architectural Services	$933,415.00
20192720	Legal . Insurance, Permitting & Misc	$36,500.00
20192721	Internal Project Management	$150,000.00
20192722	Office: Furniture/Equip./Appliances & Furnishings	$825,000.00
20192723	Warehouse & Ops: Equipment & Furnishings	$20,000.00
20192724	IT / Data / Tel / Misc Equipment & Travel	$160,000.00
20192725	Move to 20 Continental Drive & Clean Out of 114 DWR Building	$125,000.00
	Total	$15,931,474.00

RECEIVED

DEC 11 2019

Initial: GD

PROCON

PCCOR #001

PROCON LLC
1359 Hooksett Road
Hooksett, New Hampshire 03106
Phone: (603) 623-8811

Project: 70-9201 - Unitil- EO DOC Seacoast
20 Continental Drive
Exeter, New Hampshire

Prime Contract Change Order Request #001: Tree Clearing

TO:	Unitil Energy Systems, Inc. 6 Liberty Lane West Hampton New Hampshire, 03842	**FROM:**	PROCON LLC P.O. Box 4430 Manchester New Hampshire, 03108
CHANGE ORDER REQUEST NUMBER / REVISION:	001 / 0	**PRIME CONTRACT CHANGE ORDER:**	None
STATUS:	Pending - In Review	**CREATED BY:**	Chris Powers (PROCON LLC)
SCHEDULE IMPACT:	0 days	**DATE CREATED:**	12 /4/2019
		TOTAL AMOUNT:	$ 6,521.20

CHANGE ORDER REQUEST TITLE: Tree Clearing

CHANGE ORDER REQUEST DESCRIPTION:
This change order is being processed for the Land and Tree Clearing of the project site back on May 28, 2019. This work was done by Severino outside of the GMP contract by and between Unitil and PROCON. This work needed to take place prior to the month of June and July to not impact the young bats.

ATTACHMENTS:

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER REQUEST:

PCO #	Contract Company	Title	Schedule Impact	Amount
001	Unitil Energy Systems, Inc.	Tree Clearing	0 days	$6,521.20
			Total:	$ 6,521.20

CHANGE ORDER REQUEST LINE ITEMS:

PCO: 001

#	Cost Code	Description	Type	Amount
1	31-0010-110 - Sitework Sub	Land and Clearing Site	Subcontractors	$ 6,242.00
			Subtotal:	$6,242.00
		Payment & Performance Bond: = 0.68% Applies to PCI Equipment, Misc. Other, Labor, Subcontractors, Temp. Facilities, Material, and Rental Equipment.		$ 42.13
		Insurance: 0.75% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.		$ 47.13
		CM Fee: 3.00% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.		$ 189.94
			Grand Total:	$6,521.20

Unitil Energy Systems, Inc.
6 Liberty Lane West
Hampton New Hampshire 03842

SIGNATURE DATE 12/30/19

PROCON LLC

PROCON LLC
P.O. Box 4430
Manchester New Hampshire 03108

SIGNATURE DATE 12-30-19

Severino Trucking Co., Inc.
P. O. Box 202
512 Raymond Road
Candia, NH 03034
603 483-2133

Invoice 12571

RECEIVED
JUL 25 2019
PROCON LLC

Bill to:	Job: 5096
Pro Con Inc. PO Box 4430 Manchester, NH 03108	Unitil Exeter

Invoice #: 12571 Date: 06/30/19	Customer P.O. #:
Payment Terms: Net 30	Salesperson:
Customer Code: PROCON	

Remarks: Construct Landing and Cearing Site 5/28

Quantity	Description	U/M	Unit Price	Extension
1.000	Clearing	LS	4,950.00	4,950.00
36.000	1 1/2 Stone	CY	22.00	792.00
4.000	Excavator	HR	125.00	500.00
			Subtotal:	6,242.00
			Total:	6,242.00 ✓

Print Date: 07/23/19

PROCON
CONNECT · CREATE · CONSTRUCT

PCCOR #002

PROCON LLC
1359 Hooksett Road
Hooksett, New Hampshire 03106
Phone: (603) 623-8811

Project: 70-9201 - Unitil- EO DOC Seacoast
20 Continental Drive
Exeter, New Hampshire

Prime Contract Change Order Request #002: 800 AMP, NEMA 3R 277V/480V 3 Phase Panel Board

TO:	Unitil Energy Systems, Inc. 6 Liberty Lane West Hampton New Hampshire, 03842	**FROM:**	PROCON LLC P.O. Box 4430 Manchester New Hampshire, 03108
CHANGE ORDER REQUEST NUMBER / REVISION:	002 / 0	**PRIME CONTRACT CHANGE ORDER:**	None
STATUS:	Pending - In Review	**CREATED BY:**	Chris Powers (**PROCON LLC**)
SCHEDULE IMPACT:	0 days	**DATE CREATED:**	3 /24/2020
		TOTAL AMOUNT:	$ 15,083.16

CHANGE ORDER REQUEST TITLE: 800 AMP, NEMA 3R 277V/480V 3 Phase Panel Board

CHANGE ORDER REQUEST DESCRIPTION:
This change order is being issued for incorporating a 800 AMP, Nema 3R, 277/480V, 3 phase exterior mounted panel board containing two (2) 800 amp "Kirk-Keyed" circuit breakers.

Circuit breaker number 1 will receive the "Source 2" feeder from the generator, circuit breaker number 2 will be tied into the panel mounted cam-lock connectors (2 per phase with one (1) ground). This gives the ability to import portable power in the event of a failure of the main generator. This imported power will be labeled "Source 3".

This option for the generator was not originally included as the basis of design for the generator.

ATTACHMENTS:
PCO 1.pdf

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER REQUEST:

PCO #	Contract Company	Title	Schedule Impact	Amount
002	Unitil Energy Systems, Inc.	800 AMP, NEMA 3R 277V/480V 3 Phase Panel Board	0 days	$15,083.16
			Total:	**$ 15,083.16**

CHANGE ORDER REQUEST LINE ITEMS:

PCO: 002

#	Cost Code	Description	Type	Amount
1	36-1000-101 - Owner Contingency	800 AMP, NEMA 3R 277V/480V 3 Phase Panel Board	Misc. Other	$ 14,122.00
			Subtotal:	$14,122.00
			P&P Bond: ≈ 0.68% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.	$ 95.32
			Insurance: 3.00% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.	$ 426.52
			CM Fee: 3.00% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.	$ 439.32
			Grand Total:	**$15,083.16**

PROCON
CONNECT · CREATE · CONSTRUCT

PCCOR #002

Unitil Energy Systems, Inc.
6 Liberty Lane West
Hampton New Hampshire 03842

Jacqueline D. Agel Digitally signed by Jacqueline D. Agel
Date: 2020.04.14 09:28:51 -04'00'

SIGNATURE **DATE**

PROCON LLC

PROCON LLC
P.O. Box 4430
Manchester New Hampshire 03108

4-14-20

SIGNATURE **DATE**

GEMINI ELECTRIC, INC.

A Design Build Firm

TO: *Chris Powers, Project Manager*
Pro Con, Inc.
PO Box 4430
Manchester, NH 03108

DATE: *3/4/20*
PROJECT #: *19-0011*
PCO #: ***1***

PROJECT: *Unitil DOC, Exeter, NH*

Gemini Electric Inc. is pleased to provide our pricing to: install an 800 amp, Nema 3R, 277/480v, 3 phase exterior mounted panel board containing 2-800 amp "Kirk-Keyed "circuit breakers.
Circuit breaker #1 will receive the "Source 2" feeder from the generator, circuit breaker #2 will be tied into the panel mounted cam-lock connectors (2 per phase w/1 ground). This gives the ability to import portable power in the event of a failure of the main generator. This imported power will be labeled "Source 3".

Labor	*$*	*5,200.00*
Panel	*$*	*5,400.00*
Cam-lock Connectors	*$*	*880.00*
Misc. Material	*$*	*800.00*
Subtotal	*$*	*12,280.00*
Overhead & Profit @ 15%	*$*	*1,842.00*
Total Change Requested	***$***	***14,122.00***

Thank you for the opportunity to be of service. Please do not hesitate to contact us should you have any questions or concerns.

Submitted and approved by:

Matthew C. Connors

Approved by:

CC:

8 Priscilla Lane • Auburn, NH 03032
p 603-644-7170 • f 603-645-4099
www.geminielectricinc.com

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-14 Witness: John F. Closson

Request:

Reference Response 3-6 stating "the Company is currently reviewing additional project change orders for approval." Please provide those additional project change orders and indicate whether they have yet been approved by the Company.

Response:

Currently nineteen (19) change orders have been prepared. Change order #001 has been approved (please see Staff 4-14 Attachment 1), change order #002 is in draft, and the rest of the change orders are under review and pending approval. Please see Staff 4-14 Attachment 2 for a summary report of all change orders and their status.

RECEIVED

DEC 11 2019

Initial: GD

PROCON

PCCOR #001

PROCON LLC
1359 Hooksett Road
Hooksett, New Hampshire 03106
Phone: (603) 623-8811

Project: 70-9201 - Unitil- EO DOC Seacoast
20 Continental Drive
Exeter, New Hampshire

Prime Contract Change Order Request #001: Tree Clearing

TO:	Unitil Energy Systems, Inc. 6 Liberty Lane West Hampton New Hampshire, 03842	**FROM:**	PROCON LLC P.O. Box 4430 Manchester New Hampshire, 03108
CHANGE ORDER REQUEST NUMBER / REVISION:	001 / 0	**PRIME CONTRACT CHANGE ORDER:**	None
STATUS:	Pending - In Review	**CREATED BY:**	Chris Powers (PROCON LLC)
SCHEDULE IMPACT:	0 days	**DATE CREATED:**	12 /4/2019
		TOTAL AMOUNT:	$ 6,521.20

CHANGE ORDER REQUEST TITLE: Tree Clearing

CHANGE ORDER REQUEST DESCRIPTION:
This change order is being processed for the Land and Tree Clearing of the project site back on May 28, 2019. This work was done by Severino outside of the GMP contract by and between Unitil and PROCON. This work needed to take place prior to the month of June and July to not impact the young bats.

ATTACHMENTS:

POTENTIAL CHANGE ORDERS IN THIS CHANGE ORDER REQUEST:

PCO #	Contract Company	Title	Schedule Impact	Amount
001	Unitil Energy Systems, Inc.	Tree Clearing	0 days	$6,521.20
			Total:	$ 6,521.20

CHANGE ORDER REQUEST LINE ITEMS:

PCO: 001

#	Cost Code	Description	Type	Amount
1	31-0010-110 - Sitework Sub	Land and Clearing Site	Subcontractors	$ 6,242.00
			Subtotal:	$6,242.00
		Payment & Performance Bond: = 0.68% Applies to PCI Equipment, Misc. Other, Labor, Subcontractors, Temp. Facilities, Material, and Rental Equipment.		$ 42.13
		Insurance: 0.75% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.		$ 47.13
		CM Fee: 3.00% Applies to Labor, Subcontractors, Temp. Facilities, Material, PCI Equipment, Rental Equipment, and Misc. Other.		$ 189.94
			Grand Total:	$6,521.20

Unitil Energy Systems, Inc.
6 Liberty Lane West
Hampton New Hampshire 03842

SIGNATURE DATE 12/30/19
PROCON LLC

PROCON LLC
P.O. Box 4430
Manchester New Hampshire 03108

SIGNATURE DATE 12-30-19

Printed On: 12/4/ 2019 12 :20 PM

SEVERINO
TRUCKING CO., INC.

Severino Trucking Co., Inc.
P. O. Box 202
512 Raymond Road
Candia, NH 03034
603 483-2133

Invoice 12571

RECEIVED
JUL 25 2019
PROCON LLC

Bill to:	Job: 5096
Pro Con Inc. PO Box 4430 Manchester, NH 03108	Unitil Exeter

Invoice #: 12571 Date: 06/30/19	Customer P.O. #:
Payment Terms: Net 30	Salesperson:
Customer Code: PROCON	

Remarks: Construct Landing and Cearing Site 5/28

Quantity	Description	U/M	Unit Price	Extension
1.000	Clearing	LS	4,950.00	4,950.00
36.000	1 1/2 Stone	CY	22.00	792.00
4.000	Excavator	HR	125.00	500.00
			Subtotal:	6,242.00
			Total:	6,242.00 ✓

Print Date: 07/23/19

Printed on Mon Aug 24, 2020 at 02:16 pm EDT

Job #: 70-9201 Unitil- EO DOC Seacoast
20 Continental Drive
Exeter New Hampshire.

PROCON LLC
1359 Hooksett Road
Hooksett, New Hampshire 03106
United States
(603) 623-8811

Unitil - EO DOC Seacoast Prime Contract

Change Order Requests

#	Revision	Title	Date Initiated	PCCO	PCOs	Status	Amount
001	0	Tree Clearing	12/04/19	PCCO #001	PCO #001	Approved	$6,521.20
002	0	800 AMP, NEMA 3R 277V/480V 3 Phase Panel Board	03/24/20	PCCO #002	PCO #002	Draft	$14,753.67
003	0	Sustainability Allowance	07/22/20		PCO #003	Pending - In Review	($2,508.00)
004	0	Unitil Contingency	07/22/20		PCO #004	Pending - In Review	($1,001.00)
005	0	OH Door Changes	07/22/20			Pending - In Review	$0.00
006	0	Building Controls	07/22/20			Pending - In Review	$0.00
007	0	ASI No. 7 - Level 2 Bathroom	07/22/20			Pending - In Review	$0.00
008	0	ASI No. 16 Pressure Washer	07/22/20			Pending - In Review	$0.00
009	0	Extended General Conditions	07/22/20		PCO #009	Pending - In Review	$228,225.11
010	0	COVID-19	07/22/20		PCO #010	Pending - In Review	$71,019.38
011	0	Category-IV Upgrades	07/22/20		PCO #011	Pending - In Review	($36,773.43)
012	0	Security	07/22/20		PCO #012	Pending - In Review	$81,136.84
013	0	Owner Requested Equipment	07/22/20		PCO #013	Pending - In Review	$2,089.46
014	0	Weather Conditions	07/22/20		PCO #014	Pending - In Review	$38,152.48
015	0	Wall Covering 1 In Lobby 101	07/22/20		PCO #015	Pending - In Review	$2,820.78
016	0	UPS Battery Capacity	07/22/20		PCO #016	Pending - In Review	$10,008.51
017	0	Door Hardware Submittal Change	07/22/20		PCO #017	Pending - In Review	$1,646.50
018	0	Adding Locks to Lockers	07/22/20		PCO #018	Pending - In Review	$2,408.10
019	0	IT Equipment, Infrastructure, Racks, Trays, Etc.	07/22/20		PCO #019	Pending - In Review	$28,036.22
						Total:	**$446,535.82**

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-15 Witness: John F. Closson

Request:

Reference Response 3-6, Attachment 1, stating "The commercial real estate market in Unitil's Seacoast service territory was vetted. There were very few viable options. A commercial building in the Industrial Drive area of Exeter was located but the owner did not want to sell."

a. Please explain how the commercial real estate market in Unitil's Seacoast service territory was vetted.

b. Please describe the viable options the Company identified, including their approximate annual rental/purchase costs, square footage, acreage, and location.

c. Please explain why the viable options identified were very few.

d. Please explain the rental/purchase cost, square footage, acreage, and location of the "commercial building in the Industrial Drive area of Exeter."

e. Please confirm whether the Company identified and analyzed any property that the Company may own in other locations e.g. Plaistow.

f. Please explain why the owner of the "commercial building in the Industrial Drive area of Exeter," did not want to sell, and why this building was identified in spite of the fact that the owner did not want to sell.

g. Please explain whether the owner of the "commercial building in the Industrial Drive area of Exeter," offered a sale or rental price to the Company, and if so, what that price was and why the Company did not accept that offer.

Response:

a. Unitil engaged a commercial real estate broker (Margaret O'Brien) with 30+ years of commercial real estate experience in the NH seacoast market. Unitil's real estate broker presented options in the greater Seacoast area.

b. Unitil's commercial real estate broker prepared a matrix of possible commercial real estate options within Unitil's NH seacoast region's service territory. Please see Staff 4-15 Attachment 1. Unitil's notes in the Notes column indicate why options were not considered.

c. Although many options were presented, many were not viable due to the location of the real estate within Unitil Energy Systems' NH Seacoast service territory.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-15 Witness: John F. Closson

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d. The rental/purchase cost, square footage, acreage, and location of the commercial building in the Industrial Drive area of Exeter is included in Staff 4-15 Attachment 1 (Item #1).

e. Unitil reviewed its NH Seacoast region real estate portfolio and no options were identified that would satisfy the requirements for Unitil's new NH Seacoast Region Facility.

f. To clarify, the owner was interested in selling but not at price that Unitil was willing to pay based on comparable commercial real estate sales in the NH Seacoast region market over the previous two (2) year period. The comparable commercial real estate sales data was provided by Unitil's commercial real estate broker, Margaret O'Brien. The average price per square foot of the comparable commercial real estate data was $55.71 for the previous (2) year period. The owner wanted to sell at $88.79/sf which would be a 59% premium over the comparable data. Please see Staff 4-15 Attachment 2.

g. The owner of the Industrial Drive facility offered a sales price of $5.75M, or $88.79/sf, an amount considerably higher than the average comparable commercial real estate data ($55.71/sf), as shown in Staff 4-15 Attachment 2. The Company and Seller could not agree on price and therefore did not enter into a purchase and sales agreement.

New NH Seacoast Region Facility
Buildings and Land Search Locations Matrix

Prepared: 4/13/17 Margaret O'Brien (Commercial Real Estate Broker)

Sites w/Buildings					Asking	Cost	Notes
	Address	Town	BLDG SF	Acres	Price	SF	
#1	22 Industrial Drive	Exeter	65,760	10.2	$ 5,700,000.00	$ 86.68	Unitil: This option was pursued for approximately 1 year on and off but an agreement could not be reached with the owner. Broker: Footprint 58,500 2nd floor 5,942 office 4850 mezzanine storage Total approved SF = 65,760 Owner of property has permits for an additional curb cut, increased parking spaces by 61 spaces to 172 spaces and increase the building footprint by 25,000 SF
#2	239 Walton Road	Seabrook	54,600	26	$ 2,650,000.00	$ 48.53	Unitil: Not a central location in service territory. Pass on this one. Track for a comp Broker: Located next to a elementary school in a residential area. Building is under agreement. Will track sale as a comparable for the Kensington DOC.
#3	185 South Main Street	Newton	11,152	11.42	$ 950,000.00	$ 85.19	Unitil: Not a central location in service territory. Pass on this one. Broker: Sale is subject to Wells Fargo short sale requirements. Site is actually two lots, 10.14 and 1.22 acres.
#4	143/145A Route 125	Plaistow	10,124	Two parcels 18.10 and 1.78	$ 3,500,000.00	$ 345.71	Unitil: Not a central location in service territory. Pass on this one. Higher price range. Broker: Three existing buildings are on the 1.78 acre lot which abuts the 18.10 acre site.
Land Only					**Asking**	**Cost**	
	Address	**Town**	**BLDG SF**	**Acres**	**Price**	**Acre**	**Notes**
#5	Garrison Glen Continental Drive	Exeter	n/a	Three parcels all contiguous 20.69 ,21.12 and 10.75 acres	varies	Ask sale price $125,000 per acre.	Unitil: Entered into a P&S for the 20 Continental Drive parcel in 2018. Purchased land in 2019 following approximately 12 months of due diligence including the permitting process with the Town of Exeter. Unitil: Issued a letter of intent for 19 Continental Drive. A P&S agreement was not reached. Broker: Most recent transaction was for the 22.9 acre site for GiftBaskets.com (now named Gourmet Place). Land owner built to suit for GiftBaskets with a 10 year lease with options. Building approx. 120,000 +/_ SF warehouse/distribution facility. Starting lease rate was $9.75 PSF, NNN.
#6	5 Continental Drive	Exeter	n/a	15.89	undetermined	undetermined	Unitil: TBD. Not on market. Broker: Purchased for $500,000 on 9/29/2014. This parcel was intended to be used to build a home fashions showroom. Owners decided not to build. May be interested in a sale.
#7	Off Holland Way	Exeter	n/a	20.15	$600,000.00	$ 29,776.67	Unitil: Passed on this due to wetlands and building footprint limitations. Broker: Developer bought this excess land with the Tyco buildings on Holland Way. Saxe Investments, Bill Steinberg. Just listed by CBRE site appears to have a large amount of wetlands. Conceptual for a 31,800 SF medical building (footprint approx. 10,000 SF)
#8	Off Holland Way	Exeter	n/a	21.69	$600,000.00	$ 27,662.52	Unitil: Passed on this due to wetlands and building footprint limitations. Broker: Developer bought this excess land with the Tyco buildings on Holland Way. Saxe Investments, Bill Steinberg. Just listed by CBRE site appears to have a large amount of wetlands. Conceptual for a 15,000 SF medical building (footprint approx. 5,000 SF)
#9	319 New Zealand Road	Seabrook	n/a	75	$ 6,500,000.00	$ 86,666.67	Unitil: Passed on this due to non-central location in service territory, land tends to be wet, and close to the coast - concerns about storms. Broker: Former Yankee Dog Track. We can explore the potential of a 10 acre subdivision of the property at the right hand side of the entrance.
#10	Joanne Drive	Plaistow	n/a	25.81	$ 450,000.00	$ 17,435.10	Unitil: Passed on this due to non-central location in service territory. Broker: Zoned general commercial industrial 14 + acres are usable. Pending sale
#11	4 East Way	Kingston	n/a	11.21	$ 988,000.00	$ 88,135.59	Unitil: Passed on this due to location within service territory Broker: Vacant Land - pending sale listed with KW Commercial NE Janet Faulkner
#12	Route 125/Rte 107	Kingston	n/a	16.98	$ 995,000.00	$ 58,598.35	Unitil: Passed on this due to location within service territory Broker: Vacant Land - pending sale listed with The Merrill Bartlett Group Lyne Bartlett Merrill
#13	Route 125/Rte 107	Kingston	n/a	42.18	$ 995,000.00	$ 23,589.38	Unitil: Passed on this due to location within service territory Broker: Vacant Land - pending sale listed with The Merrill Bartlett Group Lyne Bartlett Merrill
#14	231 Route 125	Kingston	n/a	38	$ 695,000.00	$ 18,289.47	Unitil: Passed on this due location within service territory. Broker: Undetermined as to usable acreage. Vacant land - listed with Masiello Group Greg Schena
#15	Route 125	Kingston	n/a	38	$ 695,000.00	$ 18,289.47	Unitil: Passed on this due location within service territory. Broker: Undetermined as to usable acreage. Vacant land - listed with Masiello Group Greg Schena

Sites w/Buildings					Asking	Cost	Notes
#16	266 Route 125	Kingston	n/a	112	undetermined	undetermined	Unitil: Not on market. Broker: Owned by John Wolters. This 170,000 SF industrial building is sited on approx. 25 acres leaving 87 excess acres. Building has been leased long term to Sears Logistics occupying approx. 70,000 SF. Leasing the rest of the space has been historically challenging. Owner may consider a sale of a portion of the excess land and/or of the existing building.
#17	14 Olde Road	Danville	n/a	16.5	$ 495,000.00	$ 30,000.00	Unitil: Passed on this due to non-central location in service territory. Broker: Large flat corner lot at lighted intersection of 111 and 111A. Site is currently an active horse farm. Listed with Doug Martin KW Commercial.
#18	12 Lafayette Road	Hampton Falls	n/a	12.9	undisclosed	undisclosed	Unitil: Passed on this due to location within service territory. Broker: Located on Route 1 in Hampton Falls, this is the former Faro Gardens site. Zoned Business district. Property looks like it has a fair amount of wetland area. It is currently being marketed as a retail or residential redevelopment.

22 Industrial Drive Exeter			**$ 5,600,000.00**		**64,757**	**10.2**	**$ 86.48**	
Address	**Buyer**	**Seller**	**Sale Price**	**Sale Date**	**Building Size**	**Land**	**Price PSF**	
12 Forbes Road, Newmarket, NH	Michael J. Parking Rev Trust	Shearwater Investment Corp.	$ 2,000,000.00	2/4/2016	27,000	3.71	$ 74.07	
4 Merrill Industrial Drive, Hampton, NH	Vinther Holdings	Seacoast Business Alliance Corp	$ 1,650,000.00	8/31/2016	35,000	3.6	$ 47.14	
111 Venture Drive Dover, NH	Merchandise Central LLC	Three Fifty Six Trust	$ 2,300,000.00	10/6/2016	41,000	8.03	$ 56.10	
139 Flightline Drive, Portsmouth, NH	Galileo RMF LLC	Air Cargo at Pease LLC	$ 1,950,000.00	1/7/2015	46,220	7.375	$ 42.19	
95A Plaistow Road Plaistow, NH	Storage Locker Plaistow	Scott Building Twenty LLC	$ 2,800,000.00	2/19/2015	48,000	11.15	$ 58.33	
235 Heritage Ave Portsmouth, NH	Cooper Malt LLC	Five N Associates	$ 3,475,000.00	10/24/2016	51,700	4.7	$ 67.21	
27 Production Drive, Dover, NH	JMW Prodiction LLC	Park Nameplate LLC	$ 2,967,350.00	12/31/2015	52,224	13.33	$ 56.82	
22 Industrial Drive Exeter, NH	East Coast Ventures Inc.	55 Heritage LLC	$ 3,773,000.00	4/29/2015	64,757	10.2	$ 58.26	
44 Industrial Drive, Dover, NH	Solvetta Sales, Inc	45 Industrial Drive Associates,LLC	$ 3,300,000.00	2/28/2017	80,000	8.46	$ 41.25	$ 55.71
25 Nimble Hill Road	25 Nimble Road LLC	Thermo Shandon Inc.	$ 4,250,000.00	11/6/2012	140,885	13.96	$ 30.17	
1050 Perimeter Road, Manchester, NH	Airtight IV LLC	217 138 Manchester Air Holdings	$ 4,050,000.00	7/30/2014	146,000	19.46	$ 27.74	
2060 Brown Ave Manchester, NH	Raymond Spillane LLC	Moore Business Forms	$ 2,650,000.00	12/22/2014	146,080	10.66	$ 18.14	
55 Executive Drive Hudson, NH	Farley White Hudson LLC	Presstech LLC	$ 8,650,000.00	5/13/2014	166,626	35.25	$ 51.91	
216 Airport Drive Rochester, NH	Albany Engineering	216 Airport Drive LLC	$ 9,000,000.00	4/29/2015	198,200	27.92	$ 45.41	
56 Milliken Street Portland, ME	Plymouth 56 Milliken LLC	Milliken Portland Properties LLC	$ 10,500,000.00	11/21/2014	200,625	25.75	$ 52.34	
655 South Willow Street, Manchester, NH	655 South Willow LLC	Osram Sylvania, Inc.	$ 4,200,000.00	10/26/2015	236,000	14.96	$ 17.80	
1 Baker's Way Biddeford, ME	Biddeford Holdings LLC	Flowers Banking Company of Biddeford LLC	$ 6,865,000.00	10/31/2014	265,126	40.1	$ 25.89	$ 33.67
					Average PSF All		$ 45.34	

Note: This spreadsheet was prepared for Unitil by commercial real estate broker Margaret O'Brien/Margaret O'Brien Realty. It was sent to Unitil on April

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-16 Witness: John F. Closson

Request:

Reference Response Staff 3-6 Attachment C Page 20 of 58, describing the ballpark estimate of the sale price of the 26 acre property on which the current Unitil Kensington facility is located as $800,000.

a. Has the Company placed the property on the market, pending completion of its new facility? If so, please describe the asking price and any offers the Company may have received. If not, please explain why not.

Response:

The Company has not placed the property on the market. Unitil is currently working with its commercial real estate broker, Margaret O'Brien, on the marketing material with the intention of placing the property on the market in 2020. The Kensington facility will not be sold until it is vacated. The asking price is still under review and the Company has not received any offers because the property has not been listed yet.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-17 Witness: John F. Closson

Request:

Reference Response Staff 3-6 Attachment 1, Page 6 of 58 describing the risks associated with Option 2 (which appears to cost ~$3 million less than the Company's chosen option, Option 4), and Page 25 of 58, describing the itemized cost of the four options. Please state which of the risks described on page 6 of 58 have already been incorporated into the itemized costs described on page 25 of 58, which have not, and why this is the case.

Response:

Eight (8) risks were described for Option 2 in Staff 3-6 Attachment 1 on Page 6 of 28.

Costs for risks 4, 5, 6, 7, and part of 8 were incorporated into the itemized costs described on page 25 of 58. For risk 8, the cost of internal labor (operations, IT, facilities, etc.) and telecom data costs were not included in the costs described for Option 2 on page 25 of 58.

Risk items 1, 2, and 3 were not incorporated into the itemized costs described on page 25 of 58 as follows:

Risk 1 – This risk was noted because Options 2 would involve Planning Board approval. The new use of the property, due to the renovations and addition, would not meet the grandfathered zoning use of the property and the risk was that Option 2 may not have been approved.

Risk 2 - This risk was noted to highlight that if Unitil's NH Seacoast Electric Operations facility remained at the Kensington location, the facility after the addition and renovation were completed, would not meet the current day programming and operational needs.

Risk 3 – No cost information was available. Unitil did not obtain pricing to remove asbestos.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-18 Witness: John F. Closson

Request:

Reference Response Staff 3-6 Attachment 1, Page 26-54 of 58, providing a purchase and sale agreement (and amendments) between Garrison Glen LLC and Unitil Energy Systems, Inc. Please describe how long the property at issue was on the market prior to Unitil's purchase of the property and what the asking price for the property was for each year the property was on the market, if it was on the market for more than one year.

Response:

The 20 Continental Drive property was on and off the market for many years. The asking price was $125,000/acre at the time Unitil Energy Systems' began to pursue 20 Continental Drive as an option for the new NH Seacoast Region Facility.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-19 Witness: John F. Closson

Request:

Reference Response Staff 3-6 Attachment 4, which is the construction authorization form for the new facility.

a. Please explain why the budgeted amount is $5M but the CWO total is $15.9M?

b. Please explain whether and how the Company incorporates burdens into its project budgeting and construction authorization forms. If it does not, please explain why not.

Response:

a. The Construction Authorization (Staff 3-6 Attachment 4) amount of $5M was the forecasted expenditure for the 2019 budget year. The balance of the total amount of $15.9M was forecasted to be spent in the 2020 budget year. Actual construction began in August 2019.

b. The burdens for this building project are charged directly to this project through a Construction Work Order associated with the Construction Authorization. The burdens on utility construction projects are not directly assignable. In those cases we use overhead clearing accounts to charge the burdens to the projects.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 5

Received: September 14, 2020 Date of Response: September 23, 2020
Request No. Staff 5-2 Witness: John F. Closson

Request:

Reference Response 4-6 describing the Kensington facility's likely sale price. Please provide any site assessments related to the Kensington facility and potential environmental remediation requirements, boring samples, etc. Also please indicate if that assessment or remediation has been factored in the market valuation price.

Response:

Unitil's property at 114 Drinkwater Road in Kensington, NH is currently registered in three programs with the New Hampshire Department of Environmental Services (NH DES):

(1) Storage Tank Programs (Site No. 19940422) - Aboveground Storage Tank (AST), Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST)
(2) Public Water System (PWS ID No. 1256010)
(3) Hazardous Waste Generator (US EPA ID No. NHD986471944)

Storage Tank Programs -

The site maintains a 1,000-gallon, No. 2 Fuel Oil, doubled-walled aboveground storage tank for heating purposes. No concerns exist for this aboveground storage tank.

In October 1995, three underground storage tanks were removed from the site – containing:

(1) 3,000-gallon diesel fuel,
(2) 3,000-gallon unleaded gasoline, and
(3) 1,000-gallon No. 2 Fuel Oil.

Two of the three tanks were reported as leaking underground storage tanks. As a result, the site is under a Groundwater Management Permit (Permit No. GWP-199404022-K-005 expires 04/29/2025) to address resulting groundwater contamination for petroleum-related products such as benzene, toluene, ethylbenzene, xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs). Costs associated with the monitoring are recovered through the NH DES Petroleum Recovery Fund. Furthermore, soil contamination from the leaking underground storage tanks has been addressed via several remediation projects – the most recent completed in the summer 2015. Groundwater and soil contamination remain at low concentrations but above NH DES soil remediation standards and are monitored through periodic sampling and NH DES oversight.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 5

Received: September 14, 2020 Date of Response: September 23, 2020
Request No. Staff 5-2 Witness: John F. Closson

Additional detail, including recent soil boring information, can be found in Staff 5-2 Attachments 1-5.

Public Water System –

The site is registered as a public water system (PWS) because it serves more than 25 people/employees. The on-site groundwater supply well is sampled quarterly for established contaminants with the results submitted to the NH DES. The groundwater has consistently tested below established criteria for BTEX and PAH constituents associated with the above-mentioned leaking underground storage tanks. In 2019, the NH DES lowered the groundwater concentrations for perfluoroalkyl and polyfluoroalkyl substances (PFAS), which initially resulted in the site exceeding those limits. In the interim, a court challenge removed the lowered concentrations and subsequent, quarterly sampling has resulted in PFAS concentrations below both the old and lowered concentrations. PFAS sampling will no longer be required once the site displays four quarters below those concentrations (anticipated by January 2021). Additionally, the NH DES recently lowered the arsenic concentration; although the site was at the limit during the water treatment survey, subsequent re-analysis revealed compliance with the new arsenic concentration.

Additional detail can be found in Staff 5-2 Attachments 6-10.

Hazardous Waste Generator –

Although the site is registered as a small quantity generator of hazardous waste (i.e., generates < 220 lbs/month), the majority of hazardous wastes (e.g., mercury, oil, and PCBs) are managed as either universal/recycled wastes or US EPA Toxic Substances Control Act (TSCA) wastes rather than the US EPA's Resource Conservation and Recovery Act (RCRA) wastes. No violations have ever been issued to the site regarding the management of these wastes.

The Kensington facility's involvement in the three NH DES programs described above was considered when the opinion of value for the site was determined.

Attachment - KFD - 8

37 Line Reconductoring

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-1 Witness: Jacob Dusling

Request:

Reference Company Least Cost Integrated Resource Plan at Page 18 of 590 describing the UES-Capital 37 Line Loading Constraint.

a. Please provide the annual peak loading on the UES-Capital 37 Line for each of the past five years.

b. If there was a major customer spot load and cluster of spot loads that contributed to the projected 3.5MW deficiency, please provide a narrative describing those loads and whether they have materialized as the company projected.

c. Please provide the hourly loading of the Capital 37 line on the peak day during 2019.

Response:

a. The UES-Capital 37 line loading constraint is a planned contingency loading concern. This loading constraint exists when the 37 line is utilized to restore all load for the loss of 4X1 at Penacook with all hydroelectric generators and Wheelabrator (SES) out of service. Per Unitil planning criteria, this is how the area would be studied during summer peak loads.

   The table below displays the historical peak loading of UES-Capital's 37 line/4X1 load area for each of the last five years. The loading displayed in this table assumes Wheelabrator (SES) and the three hydroelectric generators are off-line.

	Load (kW) / % or Normal Rating				
	2015	2016	2017	2018	2019
37 Line/4X1 Load	12,231 / 81%	12,913 / 86%	13,207 / 88%	13,644 / 90%	13,510 / 90%

b. The 37 line loading constraint is due to general load growth and approximately 750kVA additional load from a new commercial development that will be supplied via the 37 line.

   The 3.5MW deficiency is based on 2022 forecasted peak loads. In 2021, the 37 line, while supplying 4X1 with the largest generator and all hydroelectric generators out of service (these are typically not operating during summer peak times), is expected to be loaded to 18.1MW or 3MW above normal. It is Unitil's intent that any project that is implemented reduces line loading below its normal rating to provide sufficient

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 2

Received: June 11, 2020 Date of Response: June 22, 2020
Request No. Staff 2-1 Witness: Jacob Dusling

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capacity for future load growth and extend through the end of the 10 year study timeframe.

Since the completion of the latest planning study and the decision to reconductor the 37 line, additional information was received regarding the proposed commercial development mentioned above. Phase 1 of this development is currently under construction and is now anticipated to be between 1.5MW and 2MW of load.

c. 37 Line/4X1 hourly load data for the UES-Capital peak day, 7/30/2019, is attached as Staff 2-1 Attachment 1.

Date/Time	37 Line / 4X1 Load (kW)
7/30/2019 0:00	9613
7/30/2019 1:00	9261
7/30/2019 2:00	8527
7/30/2019 3:00	7471
7/30/2019 4:00	8632
7/30/2019 5:00	7988
7/30/2019 6:00	8536
7/30/2019 7:00	9997
7/30/2019 8:00	10960
7/30/2019 9:00	11575
7/30/2019 10:00	11294
7/30/2019 11:00	11748
7/30/2019 12:00	12273
7/30/2019 13:00	12417
7/30/2019 14:00	12560
7/30/2019 15:00	12072
7/30/2019 16:00	11403
7/30/2019 17:00	11945
7/30/2019 18:00	12861
7/30/2019 19:00	12100
7/30/2019 20:00	12464
7/30/2019 21:00	12441
7/30/2019 22:00	11604
7/30/2019 23:00	10389

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-1 Witness: Jacob Dusling

Request:

Reference Response 2-1, stating that the UES Capital 37 line loading constraint exists "when the 37 line is utilized to restore all load for the loss of 4x1 at Penacook with all hydroelectric generators and Wheelabrator (SES) out of service and noting that the Company's planning criteria outlines this as the framework for evaluating summer peak loads.

a. Are there any strategies available to the Company, such as enhanced pay-for-performance compensation strategies to ensure that Wheelabrator would run during contingency conditions that lead to this constraint? If the company considered such strategies, please explain why they were not chosen in this instance (Wheelabrator sensitivity to voltage variations and related down times, etc.). If the Company did not consider such a strategy, please explain why.

b. Did the Company inquire with Electrisola regarding any further interest in load curtailment beyond the transmission system peaks targeted in Unitil's energy efficiency program offerings, possibly during those instances of system peak?

c. Please provide the SCADA loading data for the 37 line overload duration. Please indicate if the loading data also includes power factor and voltage measurements.

d. Please provide all calculations and internal and external reference documents, including IEEE 738, that Unitil utilizes for conductor ratings including parameters.

e. Please confirm when the construction is planned to begin on the 37 line reconductoring and when that is planned to be placed into service and used and useful.

Response:

a. Unitil's planning criteria requires the largest non-Company owned distributed generation (DG) facility to be modelled off-line and all other DG facilities modelled at their assumed (based on historical data) output during the season and time of study. This portion of Unitil's planning criteria has been in place for over fifteen years. This approach mitigates the risk for any one given generation unit being off-line due to a scheduled or unscheduled reason at the time of system peak.

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Received: July 9, 2020 Date of Response: August 4, 2020
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Additionally, Wheelabrator is very sensitive to voltage disturbances and typically trips off-line for faults anywhere on Unitil's subtransmission system and remains offline until they are ready to reconnect to Unitil's system.

b. The Company did not inquire with Electrisola regarding any further interest in load curtailment.

c. The 37 line has not historically violated planning criteria. The overload constraint is during a planning contingency in a future year. The hourly load data provided in response to Staff 2-1 is the anticipated peak load of the 37 line/4X1 load area in 2019. This load data includes kW information and does not include voltage or power factor information.

d. Attached is the Company's Electrical Equipment Rating Procedures. Unitil utilizes USi's RateKit Thermal Rating Toolkit Software to perform conductor rating calculations. The RateKit output file for 1/0AA, Poppy conductor (phase conductor of the 37 line is attached as Staff 3-1 Attachment 2.

e. Construction of the 37 line reconductoring is scheduled to begin in early 2021 and is scheduled to be placed in service and be used and useful by June 1, 2021.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-2 Witness: Jacob Dusling

Request:

Reference Response 2-1(b) describing a 750kVa load as a major spot load associated with the 37 line loading constraint and a later statement that the development's load is now anticipated to be between 1.5MW and 2MW.

a. Please provide all planning documents the Company has used to determine the load requirements of the development.

b. Please provide the latest load sheet data associated with the development. If those load sheet data do not reflect the 1.5-2MW of load, please explain when those load data sheet will be available.

c. Please explain whether the load sheet data utilizes connected load or applies a coincident factor to determine how much load existing infrastructure will need to accommodate and why.

d. If there is a load related to an electric vehicle charger planned for the development, please provide the planning documents which indicate this will be a part of the development's load.

e. Please provide all final load determinations that were utilized in the Circuit Analysis, Windmil or otherwise, and the incremental contribution (kW, kVA, amperage) this load had on the 37 line.

Response:

a. Staff 3-2 Attachment 1 through Staff 3-2 Attachment 5 contain the load information Unitil has received to date for stage 1 of the "37 line Development". Unitil has not received any load information for stage 2 of this development.

   - Staff 3-2 Attachment 1 is a load data sheet for a 20,000 square foot retail space totaling 260kW of connected load that was provided by the customer.
   - Staff 3-2 Attachments 2, 3 and 4 are load information for the proposed Market Basket
     - Attachment 2 – Electrical Load Analysis provided by customers indicates 1,461kVA of connected load and 1,022kVA of load with a 70% demand factor.
     - Attachment 3 – Load data sheet provided by the customer indicating 1,490kW of connected load.
     - Attachment 4 – Historical peak load information for a similar store indicating a peak demand of 667kVA.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 3

Received: July 9, 2020 Date of Response: August 4, 2020
Request No. Staff 3-2 Witness: Jacob Dusling

- Staff 3-2 Attachment 5 – Email regarding the expected load of Tesla Superchargers and two universal DC chargers. Site planned for 1MW Supercharger (4 stalls at 250kW each) and two 150kW universal DC chargers.

b. See Staff 3-2 item (a) and associated attachments.

c. See Staff 3-2 item (a) and associated attachments.

d. See Staff 3-2 item (a) and associated attachments.

e. At the time of study Unitil did not know the full scope of the development or have load data for any of the retail space. For planning purposes the Company assumed an additional 750kVA on the 37 line. Since the time of study Unitil received the load data sheets attached in response to Staff 3-2 item (a) for stage 1 of this development.

   The anticipated 1.5MW to 2 MW of load was determined by the following:

   - Anticipated loads -1,538kVA :
     - Market Basket – 534kVA (80% of similar store data)
     - 20,000 square foot retail space – 104kVA (40% of connected kW)
     - EV Charging – 900kVA (3 Supercharger ports, one universal charger)

   Stage 2 of this development is expected to consist of approximately 57,000 square feet of retail, office and restaurant space.

Unitil Electric Load Data Sheet

Customer/Project 20,000 sq ft Retail Space
Service Address
City

	Name	Email or Fax	Phone
Customer	DSM Realty, Inc, 881 East St, Tewksbury, MA	nmartin@demoulasmarketbasket.com	978 640 8117
Contractor	Lowell Central Electric		978 794 1650
Electrician	John Maria		978 375 7427
Project Manager			
Engineer	Ronald W. Buia, PE	rbuia@buiaengineering.com	978 475 5184

Date Required _____ **Residential** [ ] **Commercial** [ ]

Service Requested:
- [ ] Line Extension
- [X] New Service Request
- [ ] Relocation
- [ ] Repair, Maintenance, Change

Voltage:
- [ ] 120/240
- [ ] 208/120
- [X] 480/277
- [ ] Other

Phases:
- [ ] 1
- [x] 3

# of Electric Meters Required: 1 of ____ Service Size In Amps: 600

If multiple meters are required, please fill out additional load sheets for each different service type

New or Existing	Equipment (blank rows are for other equipment)	Load per Unit (in kW, kVA, or HP only)	QTY	Total Load (kW, kVA, or HP)	Hrs/ Day	Days/ Week
	Lighting			45	14	7
	Receptacles			30	14	7
	Air Conditioning			100	14	7
	Electric Space Heating			10	14	7
	Electric Water Heating			10	14	7
	Elevator			N/A		
	Office Equipment			20	14	7
	Compactor			25	2	7
	Misc			20	14	7
		600 Amp, 480/277V,3-phase				
			Total Connected Load (kW, kVA, or HP):	260		

Largest Motors Information

Located in Which Equipment Listed Above	Largest Motor (HP)	Nameplate Voltage	Phases 1 or 3	Starting Current*	Running Current	Starts per Day	Hrs per Day	Start Code*	Starting Method** (ATL, VFD, Soft Start)
Air Conditioning	25	480	3	150	25	6	14	B	FVNR

* a locked rotor current or NEMA Starting Code is required for all motors over 5 hp (NEC Article 430, table 430-7B)
** motor starting method is required for all motors 5HP and over

Emergency Generation? N/A KW Capacity _____ Generation Type _____

It is the customer's obligation to consult with Unitil if there are changes or additions to the load data or use of equipment. If insufficient or inaccurate data is provided, the customer may be billed for future upgrade of Unitil's facilities.

Signature: Ronald W. Buia Date 7/16/19

Name (Please Print): Ronald W. Buia. PE

Please return to: Gary Raymond, E-mail: raymondg@unitil.com OR Heather Jardullo, E-mail: jardullo@unitil.com
Unitil, 1 McGuire St, Concord NH, 03301

RONALD W. BUIA, INC.
Electrical Engineers
EST. 1984

July16, 2019

ELECTRICAL LOAD ANALYSIS
MARKET BASKET

Type of Load	Connected Load	KVA
Lighting	80,000 sq ft X 1.5 Watts/sq ft	120
Site Lighting		10
Electric Heat		10
Air Conditioning	15 Roof Top Units	
RTU-1	9.5Amps @ 480 V, 3-Phase	8
RTU-2	12.3 " @ " "	10
RTU-3	30" @ " "	25
RTU-4	30 " @ " "	25
RTU-5	12.3 " @ " "	10
RTU-6	25 " @ " "	21
RTU-7	36 " @ " "	30
RTU-8	36 " @ " "	30
RTU-9	36 " @ " "	30
RTU-10	9.5 " @ " "	8
RTU-11	12.3" @ " "	10
RTU-12	12.3" @ " "	10
RTU-13	20" @ " "	17
RTU-14	46.5" @ " "	39
RTU-15	88.5" @ " "	73
	Air Conditioning Subtotal	346

1600 Osgood Street, Building 20, Suite 2-89 ● North Andover, MA 01845
(978) 682-9229

Refrigeration

Compressors	6 @ 12.5 Hp (17Amps each @ 480 V, 3 Phase) 10 @ 18 Hp (23 Amps each @ 480 V,3 Phase	
	Total compressor amps = 332 amps	276
Freezers	70 @ (4 Amps each @ 480V, 3-Phase)	233
	Refrigeration Subtotal	509

Oven & Steaming Equipment

Oven No.1	60 Amp @ 480 V, 3-Phase	50
Oven No.2	30 Amp @ " "	25
Lobster Steamer No.1	(24 Amp @ " "	20
Lobster Steamer No.2	(24Amp @ " :	20
	Cooking & Bakery Subtotal	115

Supermarket Equipment

Misc. Kitchen Equipment	80 Amps @ 480 V, 3-Phase	66
Misc Bakery Equipment	110 Amps @ " "	91
Misc Meat Dept Equipment	40 Amps @ " "	33
	Supermarket Equipment Subtotal	190

Compactors			
Compactor No.1	15 Hp	(21Amps @ 480 V, 3-Phase)	18
Compactor No.2	15 Hp	(21 " @ " ")	18
		Compactors Subtotal	36
Motors	Many motors	3/4Hp to 5 Hp	25
Office Equipment			80
		Total Connected KVA	1,461
		SUPERMARKET DEMAND FACTOR	7 0 %
		Total Demand KVA	1022

$$\frac{1022 \text{ KVA X } 1000}{1{,}73 \text{ X } 480\text{V}} = 1{,}230 \text{ Amps}$$

Therefore request a 1,600 Amp, 480/277V, 3-Phase, 4-Wire underground service from a pad mount transformer.

There will be a stand-by 500 KW Diesel generator for the market

The last 24 Market Basket Supermarkets have been powered with 750 KVA utility pad mounted transformers.

Sincerely,

Ronald, W. Buia, P.E.

1600 Osgood Street, Building 20, Suite 2-89 ● North Andover, MA 01845
(978) 682-9229

Unitil Electric Load Data Sheet

Customer/Project Market Basket Supermarket
Service Address
City

	Name	Email or Fax	Phone
Customer	DSM Realty Inc - nmartin@demoulasmarketbasket.com		(978)640-8117
Contractor	Lowell Central Electric		(978)794-1650
Electrician	John Maria		(978)375-7427
Project Manager			
Engineer	Ronald W. Buia, PE rbuia@buiaengineering.com		(978)475-5184

Date Required _____ **Residential** [ ] **Commercial** [X]

Service Requested:
- [ ] Line Extension
- [ ] New Service Request
- [ ] Relocation
- [ ] Repair, Maintenance, Change

Voltage:
- [ ] 120/240
- [ ] 208/120
- [X] 480/277
- [ ] Other

Phases:
- [ ] 1
- [X] 3

# of Electric Meters Required: 2 of ___ Service Size In Amps: 1600

If multiple meters are required, please fill out additional load sheets for each different service type

New or Existing	Equipment (blank rows are for other equipment)	Load per Unit (in kW, kVA, or HP only)	QTY	Total Load (kW, kVA, or HP)	Hrs/ Day	Days/ Week
	Lighting			144	14	7
	Receptacles			20	14	7
	Air Conditioning			346	14	7
	Electric Space Heating			10	14	7
	Electric Water Heating			10	14	7
	Elevator			20	14	7
	Kitchen Bakery Equipment			305	2	7
	Compactors			36	14	7
	Office Equipment			80	14	7
	Mic			10	14	7
	Refrigeration			509	24	7
			Total Connected Load (kW, kVA, or HP):	1,490		

Largest Motors Information

Located in Which Equipment Listed Above	Largest Motor (HP)	Nameplate Voltage	Phases 1 or 3	Starting Current*	Running Current	Starts per Day	Hrs per Day	Start Code*	Starting Method** (ATL, VFD, Soft Start)
Multipple Small Motors	25	480	3	150	25	6	14	B	FVNR

* a locked rotor current or NEMA Starting Code is required for all motors over 5 hp (NEC Article 430, table 430-7B)
** motor starting method is required for all motors 5HP and over

Emergency Generation? Yes KW Capacity 500 Generation Type Diesel

It is the customer's obligation to consult with Unitil if there are changes or additions to the load data or use of equipment. If insufficient or inaccurate data is provided, the customer may be billed for future upgrade of Unitil's facilities.

Signature: Ronald W. Buia Date 07/16/2019

Name (Please Print): Ronald W. Buia

Please return to: Gary Raymond, E-mail: raymondg@unitil.com OR Heather Jardullo, E-mail: jardullo@unitil.com
Unitil, 1 McGuire St, Concord NH, 03301

Electrical Engineers
Est. 1984

July 16, 2019 SUMMARY ~~(SEE ACTUAL BILLS)~~

TYPICAL MARKET BASKET STORE (ROCHESTER, NH) PEAK DEMAND

2018	PEAK KW	KVA
MAR – APRIL	455	506
APRIL – MAY	452	493
MAY – JUNE	481	537
JUNE – JULY	533	593
JULY – AUG	602	667
AUG – SEPT	565	
SEPT – OCT	503	560
OCT – NOV	462	506
NOV – DEC	449	493
DEC – JAN	445	493
JAN – FEB	444	485

TYPICAL MARKET BASKET STORE (LYNN, MA) PEAK DEMAND

2018	PEAK KW	KVA
FEB – MAR	456	492
JAN – FEB	450	486
DEC – JAN	450	486
NOV – DEC	450	486
OCT – NOV	“	“
SEPT – OCT	“	“
AUG – SEP	“	“
JUL – AUG	“	“
JUNE – JUL	“	“
MAY – JUNE	“	“
APR - MAY	“	“

Ronald, W. Buia, P.E.

5 Tilton Lane, Andover, Ma 01810
978 475 5184

Dusling, Jacob

From: David Rauseo <drauseo@comcast.net>
Sent: Monday, May 4, 2020 10:19 AM
To: Glueck, Tyler; Miller, Gary; 'Jason Hill'
Subject: RE: Exit 17
Attachments: We sent you safe versions of your files; EXIT 17 LIQUOR STORE AND EV PARKING SPACE PLAN 4-21-20.pdf

Mimecast Attachment Protection has deemed this file to be safe, but always exercise caution when opening files.

Tyler and Gary,

The V3 Tesla Superchargers have a 1 MW charge box that supplies 4 stalls at 250 kW each. We plan two of these, plus two 150kW universal DC chargers at Exit 17. Market Basket may have a few Level 2 chargers along their northern exterior wall, but powered via their building's service. We expect all DC chargers will share one transformer. Please see attached plan with likely transformer and Tesla Charge Box locations.

Feel free to call or write if you have any questions.

David

David Rauseo
Interchange Development / Concord Crossing
Exit 17, Concord, NH
http://www.concordcrossing.com/
(603) 491-1103 (cell)

From: Glueck, Tyler [mailto:glueckt@unitil.com]
Sent: Monday, May 4, 2020 8:37 AM
To: David Rauseo; Miller, Gary; 'Jason Hill'
Subject: RE: Exit 17

David,

Speaking of EV chargers, I was wondering if I could get some additional information for them. I know we had talked about ten spots, but could you please provide the number of charging heads, peak output per head, and the overall desired service size. This would help as we plan how to serve the area.

Thank you,

Tyler

From: David Rauseo [mailto:drauseo@comcast.net]
Sent: Saturday, May 2, 2020 9:42 PM
To: Miller, Gary; 'Jason Hill'; Glueck, Tyler
Subject: RE: Exit 17

Gary, Tyler, and Jason,

As a reminder, per our telephone conversation, I also plan to construct the 10 DC electric vehicle charging stations on the northwest parking spaces of Market Basket (along Route 4) and the telecommunications tower to the east of the 22k attached retail as part of Phase 1.

David

David Rauseo
Interchange Development / Concord Crossing
Exit 17, Concord, NH
http://www.concordcrossing.com/
(603) 491-1103 (cell)

From: David Rauseo [mailto:drauseo@comcast.net]
Sent: Wednesday, April 29, 2020 1:49 PM
To: 'Miller, Gary'; 'Jason Hill'; 'Glueck, Tyler'
Subject: RE: Exit 17

Gary,

It is our goal to energize the supermarket and attached 22k retail and the NH Liquor Store, on Route 4 immediately to the west. These buildings will be ready to open fall of 2021. We will be constructing the north and south road systems per plan to satisfy these two uses, but we are cannot nail down the specific sizes and locations of the remaining uses. For example, we have a signed LOI for an urgent care facility on the southernmost Whitney Road pad site (now shown as 7k sf retail). However, we have not received a site plan from that end user yet. Also, the remaining retail uses may be larger or smaller than what is shown on that concept plan.

Please feel free to call on my cell to discuss.

David

David Rauseo
Interchange Development / Concord Crossing
Exit 17, Concord, NH
http://www.concordcrossing.com/
(603) 491-1103 (cell)

From: Miller, Gary [mailto:millerg@unitil.com]
Sent: Wednesday, April 29, 2020 9:56 AM
To: David Rauseo; 'Jason Hill'; Glueck, Tyler
Subject: RE: Exit 17

Thanks! Correct me if I'm wrong David, but the plan is to get the infrastructure (conduits, manholes, structures etc) in place throughout the property so there is limited interference from construction later on but phase 1 (the buildings identified in phase 1) needs to be energized first and then energize the other portions of the site as it gets built out? Or did I misinterpret the plan from our discussion last week?

Thanks

From: David Rauseo [mailto:drauseo@comcast.net]
Sent: Wednesday, April 29, 2020 9:47 AM
To: 'Jason Hill' <jhill@tfmoran.com>; Glueck, Tyler <glueckt@unitil.com>

Cc: Miller, Gary <millerg@unitil.com>
Subject: RE: Exit 17

Gary and Jason,

The 7,000 SF retail along Whitney Road is the Urgent Care which will come soon thereafter.

David

David Rauseo
Interchange Development / Concord Crossing
Exit 17, Concord, NH
http://www.concordcrossing.com/
(603) 491-1103 (cell)

From: Jason Hill [mailto:jhill@tfmoran.com]
Sent: Wednesday, April 29, 2020 9:17 AM
To: Glueck, Tyler
Cc: Miller, Gary; David Rauseo
Subject: RE: Exit 17

Hi Tyler- please see attached. Everything inside of the red line area is part of phase 1.
Thanks,
Jason Hill

From: Glueck, Tyler <glueckt@unitil.com>
Sent: Wednesday, April 29, 2020 8:51 AM
To: Jason Hill <jhill@tfmoran.com>
Cc: Miller, Gary <millerg@unitil.com>; David Rauseo <drauseo@comcast.net>
Subject: Exit 17

Jason,

I am working on the layout of the electric service right now. Would you be able to mark a pdf with the buildings that will be part of phase 1? I just want to confirm which ones we are getting transformers to first.

Thanks,

Tyler Glueck
Engineer, Distribution
Unitil Service Corp.
W: 603-379-3827
C: 484-866-0027
glueckt@unitil.com

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-4 Witness: Jacob Dusling

Request:

Reference Response 3-2 Attachment 5, stating "The V3 Tesla Superchargers have a 1MW charge box that supplies 4 stalls at 250kW each. We Plan two of these plus two 150kW universal chargers at Exit 17. Market Basket may have a few Level 2 chargers along their northern exterior wall. We expect all DC chargers will share one transformer... Please see attached plan with likely transformer and Tesla Charge Box locations… [and] I also plan to construct the 10 DC electric vehicle charging stations on the northwest parking spaces of Market Basket (along Route 4)."

a. Please provide the email attachment referred to above, and any other attachments to emails provided in response to Set 3.

b. Reference response 3-2(a) stating "Site planned for 1MW Supercharger (4 stalls at 250kW each) and two 150kW universal DC chargers. Please reconcile this with the statements in email exchange referred to above.

c. Please state the overall number of charging stations the Company is planning for and electric demand associated with those stations and how it determined that demand.

d. Please describe what demand factor the Company uses to determine load associated with electric vehicle charging stations and why.

e. Will the planned reconductoring suffice to carry the *two* 1MW charge boxes and two 150kW chargers?

Response:

a. Attached as Staff 4-4 Attachment 1 and Staff 4-4 Attachment 2 are the email attachments associated with the response to Staff 3-2.

b. At the time of review, it was the Company's understanding that the site was being designed to accommodate two V3 Tesla Superchargers with one V3 Tesla Supercharger being installed as part of phase 1 of the development and the second Supercharger being installed at an unknown future data. This has since changed. It is now our understanding that both Superchargers will be installed at the same time as part of phase 1.

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 4

Received: August 14, 2020 Date of Response: August 28, 2020
Request No. Staff 4-4 Witness: Jacob Dusling

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c. The Company is planning on up to two (2) 1MW Tesla V3 Superchargers and two (2) to six (6) universal level 2 (150kW) chargers. Two associated with the "Tesla" site and up to four (4) associated with Market Basket.

   In this case, Unitil assumed 75% of the Supercharger stalls could be utilized at one time and 50% of the universal level 2 chargers could be utilized at the same time as the 75% of Supercharger stalls. In this case, if all EV chargers are constructed, the Company would assume a demand of up to 2MW.

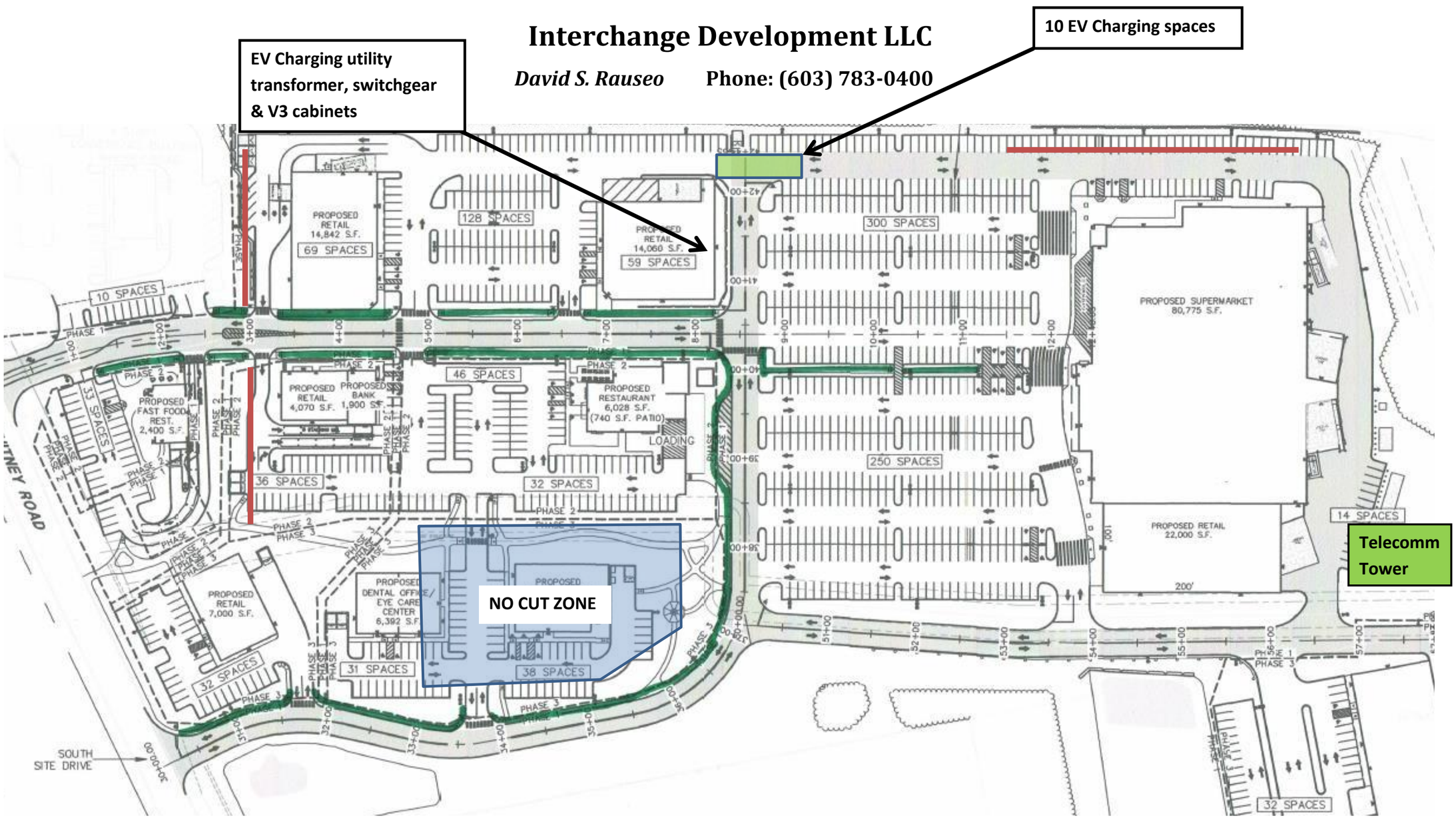
d. For system and distribution planning purposes Unitil will typically assume 75% of the EV charger ports being utilized at one time. In locations with both Level 2 and DC Fast Charge facilities the Company assumes 75% of the DC fast charge ports being utilized at the same time as 50% of the Level 2 ports. The assumption that 75% of the EV charger ports are being utilized at the same time is based on historical usage of a DC Fast Charge facility in Seabrook. However, in the case of sizing transformers for these facilities Unitil assumes all charging ports being utilized at the same time.

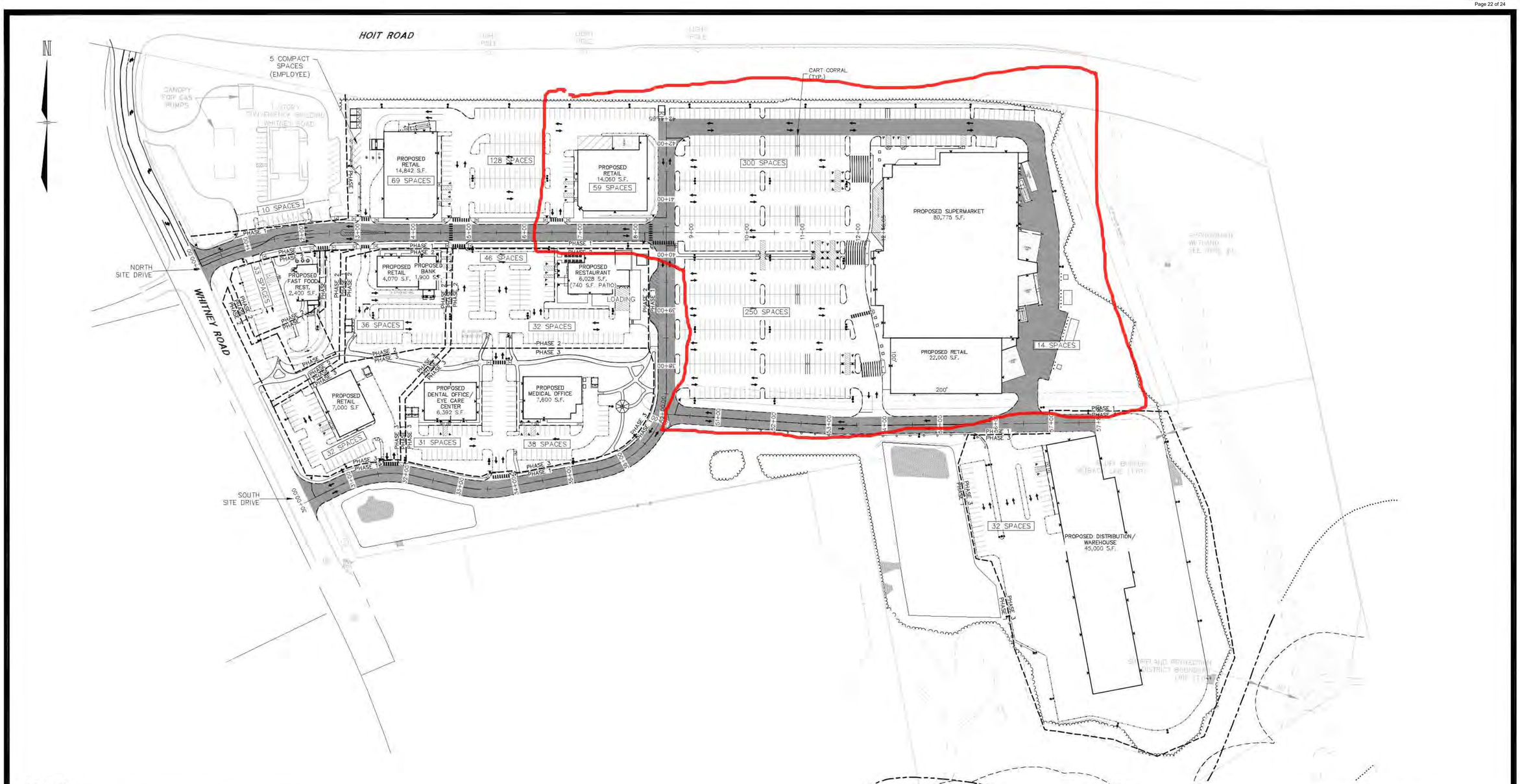
e. The planned reconductoring will provide sufficient subtransmission line capacity to supply up to two (2) 1MW charge boxes and up to six (6) 150kW chargers.

EXIT 17 LIQUOR STORE AND EV PARKING SPACE PLAN 4-21-20

Interchange Development LLC

David S. Rauseo Phone: (603) 783-0400





NOTES

1. CONSERVATION AREA DISTRICT SIGNAGE IS REQUIRED TO BE PLACED ON EXISTING VEGETATATION AT 100 FT ON CENTER ALONG THE INTERIOR EDGE OF THE BLUFF BUFFER AROUND THE PERIMETER OF THE PROPERTY. SIGNAGE SHALL CONFIRM TO CITY OF CONCORD CONSERVATION COMMISSION STANDARDS.

TAX MAP 06P LOTS 5 & 6

OVERALL SITE LAYOUT PLAN

MIXED USE DEVELOPMENT

WHITNEY ROAD, CONCORD, NH

OWNED BY

BRADLEY WHITNEY & JENNIFER HABEL & INTERCHANGE DEVELOPMENT L.L.C.

PREPARED FOR

INTERCHANGE DEVELOPMENT L.L.C.

SCALE: 1"=80' **JUNE 17, 2019**

APPROVED BY THE CONCORD PLANNING BOARD

ON _____

CHAIRMAN: _____ *AND*

SECRETARY: _____

DIG SAFE
MA ME NH RI VT
CALL 811 BEFORE YOU DIG
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

STATE OF NEW HAMPSHIRE
ROBERT E. DUVAL
No. 7705
LICENSED
PROFESSIONAL ENGINEER
11 March 2020

Graphic Scale in Feet: 80 40 20 0 80

REV.	DATE	DESCRIPTION	DR	CK
4	3/10/20	REVISED PER AgT COMMENTS	PWH	JSH
3	11/22/19	ISSUE FOR PERMITTING	JSH	JSH

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE 95830.00 | DR JSH | CK RED | FB | CADFILE 95830-00 Site R18

SHEET C2.0

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 5

Received: September 14, 2020 Date of Response: September 23, 2020
Request No. Staff 5-1 Witness: John Bonazoli

Request:

Reference Response 4-4, describing the Exit 17 development.

a. Please provide a narrative describing the process the Company undertakes to determine the estimated demand/revenues associated with a new customer/facility, and how the Company decided what the necessary contribution-in-aid-of-construction (CIAC) might be.

b. Please provide any CIAC forms relating to the exit 17 development, including, if available, any documentation of the CIAC related to the electric vehicle chargers.

c. Please provide the Seabrook charging data referenced in Response 4-4(d).

    i. If available, also please provide the next circuit level device (Line Recloser or Substation breaker) data including kW, kVA, Amperage in the similar duration or interval as the customer's metering device.

Response:

a. The Company's Line Extension Policy is included as part of UES' tariffs on file with the New Hampshire Public Utilities Commission. The Line Extension Policy describes the cost allowances and customer advance payment policies that are applicable to electric line extension projects in New Hampshire including customer payment obligations associated with the provision of underground service. Upon a request for the installation of a new service to a customer facility, the operations department and engineering department determine all system modifications that are required to provide service to the proposed facility based on the load information provided by the customer. When the scope of work is determined, a cost estimate is generated based on labor, material costs, outside services, and vehicle costs. In some instances, for example, system upgrades due to an existing customer increasing electric loads, a project may be evaluated based on its rate of return. The rate of return model (UES Model) is used to determine if a Contribution In Aid of Construction (CIAC) is required from the customer. The UES Model calculates a rate of return over a benchmark period, based on project cost and customer distribution revenues as determined above. If the project does not yield an acceptable rate of return, the model calculates a

Unitil Energy Systems, Inc.
Docket No. DE 20-002
PUC Staff Information Requests – Set 5

Received: September 14, 2020 Date of Response: September 23, 2020
Request No. Staff 5-1 Witness: John Bonazoli

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non-refundable customer contribution required for the project to pass the rate of return test over the benchmark period. The benchmark period is typically twenty years for residential and municipal service and ten years for general service.

b. Due to the customer schedule, a cost estimate or rate of return has not yet been calculated for the Exit 17 development. This process is not expected to be performed prior to November, 2020. Please note that the need for the 37 Line Reconductoring project was identified in the system planning process before the Company had knowledge of or received the request for service to this development.

c. Please refer to Staff 5-1 Attachment 1 for the 15 minute interval metering information at the TESLA Seabrook charging station from September 20, 2016 at 11AM, when the service was energized, until August 14, 2020 at 12AM.

   Staff 5-1 Attachment 2 includes the 5 minute SCADA metering information that was available during the time frame above for circuit 2X3 which supplies the Tesla charging station.

   Staff 5-1 Attachment 3 includes the 5 minute SCADA metering information that was available during the time frame above for the 3353 line which supplies circuit 2X3. Historical SCADA data is not stored for more than 3 years.

Attachment - KFD - 9

Environmental Compliance

Unitil	Engineering Procedure	Procedure No.	PR-DT-DS-11
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FOREWORD

The purpose of this document is to define the process for evaluating electric construction projects that propose upgrades to substations, the distribution system or the subtransmission system.

Any questions or inquiries regarding information provided in this document should be referred to the Director of Engineering.

_____ _____

Kevin E. Sprague Date
Director, Engineering

_____ _____

John J. Bonazoli Date

Manager, Distribution Engineering

REVISION HISTORY

Date of Review:

Revision #	Date	Description of Changes
0	07/09/2018	Initial Issue

Unitil	Engineering Procedure	Procedure No.	PR-DT-DS-11
	Distribution Engineering	Page No.	TOC
		Revision No.	0
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Table of Contents

List of Appendices

1.0 Introduction

Project evaluation is an integral component of maintaining a cost effective system that ensures safe and reliable electric service to Unitil customers. It is imperative that Unitil has a consistent process and documentation criteria for project evaluation.

1.1 Purpose

The purpose of this document is to provide a consistent approach and procedure for project evaluation. This document establishes thresholds in which Unitil reviews non-wires alternative projects and performs detailed cost/benefit analyses that include reliability, environmental and economic impacts.

1.2 Applicability & Scope

The procedure defined in this document shall be applied whenever the need for a project is identified on the distribution or subtransmission systems and/or within a substation. This procedure also applies to projects identified as part of Unitil's Joint Planning Process with Eversource, NH.

This procedure does not apply to projects being justified based on condition replacement or reliability benefit only. It also does not apply to customer requested projects such as DG interconnections, line relocations to accommodate customer requests, the installation of new developments, etc. However, this procedure does apply to loading and/or voltage driven projects that are required due customer requested projects.

1.3 Updating the Guideline

The Director, Engineering is responsible for maintaining this guideline to ensure the guideline is current with changes in the company's organization, policies or to capture good utility practices. All revisions and/or additions shall detail a revision date and number on the top right corner of each page within the header, as well as a brief description in the *Revision History* section on the cover.

Comments are welcomed and should be documented (using the *Request for Procedure/Change Form* reference in Appendix C) and addressed to the Director, Engineering. All documented comments shall be retained in a separate file and reviewed each time this procedure is revised. These comments will keep the contents of the procedure current and enhance its usefulness.

1.4 Availability

Current copies of this procedure can be found on the Hampton Shared Drive. Hard copies are not version controlled.

NOTE: Only up-to-date versions of the documents are posted on the Hampton Shared Drive. All other revisions (both electronic and hardcopy) should not be referenced.

2.0 General Information

2.1 Cost Estimates

All dollar amounts and cost estimates referenced in this procedure are without general construction overhead costs unless otherwise noted.

2.2 Definitions

Constraint	A project driven by a violation of planning criteria such as low voltage, overloaded equipment, equipment replacement, etc.
Option	A project identified to address a system constraint.
Traditional Option	Conventional electric system upgrades such as reconductoring, voltage conversion, equipment upgrades, etc.
Non-wires / DER Alternatives	Non-conventional load reduction projects such as Distributed Generation (DG), Distributed Energy Resources (DER), energy storage, energy efficiency, Volt/VAR optimization (VVO), etc.

3.0 Project Evaluation Workflow

When a constraint is identified that will require upgrades to the distribution or subtransmission systems and/or within a substation the Project Evaluation Workflow Diagram in Appendix A shall be followed to determine the need to identify and review alternatives and the necessary detail of project evaluation that will be required.

The following sections will provide additional details regarding the Project Evaluation Workflow Diagram and examples of its use.

3.1 Project Evaluation Workflow Diagram – Details

3.1.1 BOX A – Project Need Identified

- Anytime a constraint is identified that involves upgrades to a substation, the distribution or subtransmission systems this project evaluation workflow tool shall be referenced.

3.1.2 BOX B – Traditional Option Estimate Greater than $100,000

- An initial traditional option shall be developed and estimated.
- If the estimate for the traditional option is less than $100,000 the option should be recommended for construction.
- If the initial traditional option is estimated to cost more than $100,000 proceed to BOX C.

$100,000 was chosen as a threshold to allow for small scale upgrades to be implemented with no additional evaluation required. Small scale upgrades include projects such as: regulator installations, step-down transformer upgrades, load transfers, etc.

3.1.3 BOX C – Multiple Traditional Options Required

- If the initial traditional option is estimated to cost more than $100,000 at least two traditional options shall be evaluated.
- A review of the cost, reliability impact and system master plan compliance is performed to determine a recommended traditional option. Preference should be given to the least cost option that meets the required criteria (i.e. loading, capacity, voltage, reliability, etc.)
- Proceed to BOX D once a recommended traditional option is selected.

3.1.4 BOX D – Recommended Traditional Option Greater than $250,000

- If the recommended traditional option estimate is less than $250,000 proceed to BOX H.
- If the recommended traditional option estimate is more than $250,000 proceed to BOX E.

Based on the estimated cost per MW (as of 4/10/18) to implement non-wires alternatives it was determined that non-wires alternatives would not be evaluated if the recommended traditional option has an estimated cost of less than $250,000. This amount may be reviewed in the future as advancements are made in technology that reduces the installed costs of non-wires alternatives.

3.1.5 BOX E – Required Construction Start Date

- The required construction start date of the recommended traditional option must be between three and five years into the future to proceed to BOX F. If it is less than three years or more than five years into the future proceed to BOX H.

It is assumed that it will take a minimum of three years to receive and evaluate proposals, implement the project and confirm the results of non-wires alternative projects.

3.1.6 BOX F – Loading and/or Voltage Criteria Violation(s)

- If the recommended traditional option addresses only loading and/or voltage violations proceed to BOX G.
  - An example of this type of option is a voltage conversion project that is being recommended to address a conductor loading constraint.
- If the recommended traditional option is not needed to address loading and/or voltage violations proceed to BOX I.
  - An example of this type of option is a breaker replacement project that is being recommended to address an aging piece of equipment.

- If the recommended traditional option has components that address loading and/or voltage concerns and non-loading and/or voltage constraints (i.e. condition based replacement) a more detailed cost breakdown will be necessary.
  - The overall estimate for the option must be broken down into an estimate to address the loading and/or voltage violation and an estimate for the non-loading/voltage component.
  - If the estimate to address the loading and/or voltage violation is more than $250,000 proceed to BOX G, otherwise proceed to BOX I.
  - An example of this type of option is a breaker being removed from service due to condition and a portion of a circuit needs to be reconductor to accommodate transferring load to remove the breaker from service. In this case the reconductoring portion of the option would need to be more than $250,000 to proceed to BOX G.

This step in the workflow is required to determine if non-wires alternatives will be considered. Typically, non-wires alternatives are only viable options to address loading and/or voltage constraints. Non-wires alternatives should not be considered for condition based replacement projects that do not have components to address loading and/or voltage concerns.

3.1.7 BOX G – Develop and Issue RFP for Non-Wires Alternative Project

- Develop and issue a request for proposal from non-wires alternative vendors. Once proposals are received proceed to BOX I.

3.1.8 BOX H – Planning Process Engineering Judgment Determines the Need to Review Non-Wires Alternatives

- If the constraint was not identified through the distribution system or system planning efforts (i.e. the project is required due to a condition replacement) proceed to BOX J.
- If the constraint was identified through the distribution or system planning efforts, the constraint and recommended traditional option shall be reviewed and engineering judgment shall be used to determine if a review of non-wires alternatives is required.
- Proceed to BOX J if non-wires alternative review is not required
- Proceed to BOX G if non-wires alternative review is required

3.1.9 BOX I – Complete Detailed Cost Benefit Analysis of Options

- Complete the Detailed Cost/Benefit Analysis spreadsheet in Appendix B.
  - See section 4.0 below for additional details about the spreadsheet.
- The results of the spreadsheet along with engineering and operational judgment shall be used to determine the recommended option.
- Proceed to Box J.

3.1.10 BOX J – Recommend Project

- For constraints identified as part of the distribution and/or system planning process the option shall be recommended for construction in the associated planning study.
- For projects identified outside of the planning process the option shall be submitted for acceptance to the necessary approvers.
- Preference should be given to the least cost option that meets the required criteria (i.e. loading, capacity, voltage, reliability, etc.)

3.2 Project Evaluation Workflow Diagram – Examples

3.2.1 Example 1 – Recommended Traditional Option Estimate less than $100,000

Circuit analysis identifies an overloaded step-down transformer. It is recommended that the step-down transformer should be replaced.

- Estimate Cost: Less than $100,000

<u>Workflow Diagram Walkthrough</u>

- BOX B – Estimated cost is less than $100,000
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.2 Example 2A – Recommended Traditional Option between $100,000 and $250,000

Circuit analysis identifies low voltage at the end of a single-phase lateral. The initial traditional option is to reconductor the line with larger conductor.

- Estimated Cost: $100,000 – $250,000
- Engineering Judgment Determines that non-wires alternatives do not need to be reviewed

<u>Workflow Diagram Walkthrough</u>

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a recommended traditional option.
  - The second traditional option is to convert the lateral to a higher operating voltage and is estimated to cost more than $250,000.
  - Cost/benefit review results in the reconductoring option that is estimated to cost between $100,000 and $250,000 is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is less than $250,000
  - Proceed to BOX H
- BOX H – Engineering judgment determines that a review of non-wires alternatives is not needed

- Proceed to BOX J
- BOX J – Recommend Option

3.2.3 Example 2B – Recommended Traditional Option between $100,000 and $250,000

Circuit analysis identifies low voltage at the end of a single-phase lateral. The initial traditional option is to reconductor the line with larger conductor.

- Estimated Cost: $100,000 – $250,000
- Engineering judgment determines that non-wires alternatives do need to be reviewed

<u>Workflow Diagram Walkthrough</u>

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a recommended traditional option.
  - The second traditional option is to convert the lateral to a higher operating voltage and is estimated to cost more than $250,000.
  - Cost/benefit review results in the reconductoring project that is estimated to cost between $100,000 and $250,000 is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is less than $250,000
  - Proceed to BOX H
- BOX H – Engineering judgment determines that a review of non-wires alternatives is needed
  - Proceed to BOX G
- BOX G – Develop and issue RFP for non-wires alternative projects
  - Receive and review proposals
  - Proceed to BOX I
- BOX I – Complete Detailed Cost/Benefit Analysis spreadsheet in Appendix B
  - Detail/Cost benefit analysis results in a recommended project.
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.4 Example 3A – Recommended Traditional Option Greater than $250,000

Circuit analysis identifies low voltage and overloaded conductor. The initial traditional option is to convert this portion of the system to a higher operating voltage.

- Estimated Cost: More than $250,000
- Required Start Date: Two years in the future
- Engineering judgment determines that non-wires alternatives do not need to be reviewed

Workflow Diagram Walkthrough

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a recommended traditional option.
  - The second traditional option is to reconductor the area and install voltage regulators. Estimated Cost $175,000.
  - Cost/benefit review results in the conversion project that is estimated to cost more than $250,000 is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is more than $250,000
  - Proceed to BOX E
- BOX E – Required start date is less than 3 years in the future
  - Proceed to BOX H
- BOX H – Engineering judgment determines that a review of non-wires alternatives is not needed
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.5 Example 3B – Recommended Traditional Option Greater than $250,000

Circuit analysis identifies low voltage and overloaded conductor. The initial traditional option is to convert this portion of the system to a higher operating voltage.

- Estimated Cost: More than $250,000
- Required Start Date: Two years in the future
- Engineering judgment determines that non-wires alternatives do need to be reviewed

Workflow Diagram Walkthrough

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a recommended traditional option.
  - The second traditional option is to reconductor the area and install voltage regulators. Estimated Cost $175,000.
  - Cost/benefit review results in the conversion project that is estimated to cost more than $250,000 is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is more than $250,000
  - Proceed to BOX E
- BOX E – Required start date is less than 3 years in the future

  - Proceed to BOX H
- BOX H – Engineering judgment determines that a review of non-wires alternatives is needed
  - Proceed to BOX G
- BOX G – Develop and issue RFP for non-wires alternative projects
  - Receive and review proposals
  - Proceed to BOX I
- BOX I – Complete Detailed Cost/Benefit Analysis spreadsheet in Appendix B
  - Detail/Cost benefit analysis results in a recommended project.
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.6 Example 3C – Recommended Traditional Option Greater than $250,000

Distribution load projections identify overloaded substation equipment. The initial traditional option is to upgrade the equipment.

- Estimated Cost: More than $250,000
- Required Start Date: Four years in the future
- Project is loading related

<u>Workflow Diagram Walkthrough</u>

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a recommended traditional option.
  - The second traditional option is to convert circuit to 34.5 kV and remove substation equipment. Estimated Cost more than $250,000.
  - Cost/benefit review results in the conversion project that is estimated to cost more than $250,000 is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is more than $250,000
  - Proceed to BOX E
- BOX E – Required start date is between 3 and 5 years in the future
  - Proceed to BOX F
- BOX F – Project is required to address loading violations
  - Proceed to BOX G
- BOX G – Develop and issue RFP for non-wires alternative projects
  - Receive and review proposals
  - Proceed to BOX I

- BOX I – Complete Detailed Cost/Benefit Analysis spreadsheet in Appendix B
  - Detail/Cost benefit analysis results in a recommended project.
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.7 Example 3F – Recommended Traditional Option Greater than $250,000

The system planning study identifies a conductor loading constraint. The initial traditional option is to reconductor the identified line section.

- Estimated Cost: More than $250,000
- Required Start Date: More than five years in the future
- Engineering judgment determines that non-wires alternatives do not need to be reviewed at this time (review maybe required when the project start date is three to five years in the future).

<u>Workflow Diagram Walkthrough</u>

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a recommended traditional option.
  - The second traditional option is to construct a second line. Estimated Cost more than $250,000.
  - Cost/benefit review results in the reconductoring project is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is more than $250,000
  - Proceed to BOX E
- BOX E – Required start date is more than 5 years in the future
  - Proceed to BOX H
- BOX H – Engineering judgment determines Project does not need non-wires alternatives reviewed
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.8 Example 3G – Recommended Traditional Option Greater than $250,000

The system planning study identifies a conductor loading constraint. The initial traditional option is to reconductor the identified line section.

- Estimated Cost: More than $250,000
- Required Start Date: More than five years in the future
- Engineering judgment determines that non-wires alternatives do need to be reviewed

Workflow Diagram Walkthrough

- BOX B – Estimate more than $100,000
  - Proceed to BOX C
- BOX C – Develop additional traditional options and perform cost/benefit review to determine a proposed traditional option.
  - The second traditional option is to construct a second line. Estimated Cost more than $250,000.
  - Cost/benefit review results in the reconductoring project is the recommended traditional option.
  - Proceed to BOX D
- BOX D –Estimated cost is more than $250,000
  - Proceed to BOX E
- BOX E – Required start date is more than 5 years in the future
  - Proceed to BOX H
- BOX H – Engineering judgment determines Project does need non-wires alternatives reviewed
  - Proceed to BOX G
- BOX G – Develop and issue RFP for non-wires alternative projects
  - Receive and review proposals
  - Proceed to BOX I
- BOX I – Detailed Cost/Benefit Analysis spreadsheet in Appendix B
  - Complete Detail/Cost benefit analysis results in a recommended project.
  - Proceed to BOX J
- BOX J – Recommend Option

3.2.9 Example 4 – Customer Requested Project

A proposed commercial development is expected to cause mainline loading and/or voltage concerns on the circuit. The project evaluation for the necessary upgrades to address the mainline loading and/or voltage concerns shall be evaluated per this procedure with a process similar to what is described in examples 3.2.1 through 3.2.10.

3.2.10 Example 4 – Projects to Address Condition Concerns

Inspections identify the need to address condition concerns associated with a piece of substation equipment. The desired project is to transfer load to adjacent circuits and retire the aging piece of equipment. Circuit upgrades are required to accommodate the load transfer. The project evaluation for the necessary circuit upgrades to accommodate the load transfer shall be evaluated per this procedure with a process similar to what is described in examples 3.2.1 through 3.2.10.

3.2.11 Example 5 – Reliability Project

A reliability project is proposed to create a circuit tie between two circuits. To accommodate the creation of the circuit tie a portion of the circuit(s) must be reconductored. This project would not be evaluated per this guideline, because it is justified based on reliability benefit only. However, engineering judgment shall be used to determine if non-wires alternatives should be evaluated as options to the reconductoring.

4.0 Detailed Cost/Benefit Analysis Spreadsheet

The spreadsheet included in Appendix B shall be used to evaluate options that are estimated to cost over $250,000 and are between three and five years in the future. Additionally all constraints that include the evaluation of non-wires alternatives shall be evaluated using this spreadsheet.

For constraints identified through the distribution or system planning efforts, engineering judgment may result in the Detailed Cost/Benefit Analysis Spreadsheet being used to evaluate options that do not meet the requirements above.

Additionally, this spreadsheet can be used at the request of a project approver for any project that is recommended for construction.

It is expected that this spreadsheet will be modified to include all the options being considered to resolve the identified constraint.

An example of a competed Detailed Cost/Benefit Analysis spreadsheet is included in Appendix C.

4.1 Scoring Methodology

A weighted scoring methodology is used to calculate an overall option ranking. The evaluation criteria and the default weighting factors can be modified per engineering and operational judgment. The default weighting factors will be reviewed and updated on an as needed basis.

A brief summary of each of the criteria is included below. It is acceptable for multiple options to have the same ranking for each criterion. For example, options with the same tree clearing impacts would get scored the same.

4.1.1 Functionality

The overall functionality score is calculated from the functionality subcategories.

- Operating Flexibility – how the option affects the operating flexibility of the system.
  - Example – An option that creates a new circuit tie or provides SCADA functionality would score higher than an option that does not.
- Availability – is the benefit of the option expected to be available at all times.
  - Example – A PV installation may have a lower availability score than a reconductoring option due to the timing of the peak load.
  - Example – A PV installation with storage would rank higher than a PV installation without storage.

- Maintenance – future maintenance requirements
  - Example – An option that requires minimal future maintenance would have a higher maintenance score than an option that requires annual maintenance.
- Load Servicing Capacity – ability of the option to accommodate future load additions.
  - Example – An option that accommodates 3 MW of future load would score higher than an option that accommodates 2 MW of future load.
- DG Interconnect Capacity – ability of the option to accommodate future DG additions.
  - Example – An option that increases the area's ability to accommodate additional DG would score higher than an option that does not.
- System Master Plan
  - Example – An option that works towards the master plan for the area would score higher than an option that does not.

4.1.2 Environmental

The overall environmental score is calculated from the environmental subcategories.

- Wetland Impacts
  - Example – Options with the least impact to wetlands and wetland buffers score the highest.
- Tree Clearing
  - Example – Options with the least amount of tree removals score the highest.
- Residential Area Impact – how the option impacts the residential community
  - Example – Options that require a significant amount of new infrastructure to be constructed in residential neighborhoods would score lower than options that involve upgrades to existing facilities.
- Municipal Considerations – how is the option viewed by the local municipals
  - Example – An option that requires more municipal, state or federal permitting and/or review and approval would rank lower than a project that requires less.
  - Example – A project that requires the construction of a new substation in a highly populated area would ran lower than a project to upgrade and existing substation within the confines of the existing substation footprint.

4.1.3 Reliability

The overall reliability score is calculated from the reliability subcategories.

- Customer Exposure
  - Example – Options that decrease customer exposure would score higher than options that increase customer exposure.
- Miles/Equipment Exposure

- Example – Options that decrease miles of exposure would score higher than options that increase miles exposure.

- Automatic Restoration
  - Example – Options that include the installation of automatic restoration or work towards an automatic restoration scheme would score higher than options that do not.
- Power Quality
  - Example – Options that are expected to improve power quality would score higher than options that do not.

4.1.4 Feasibility

The overall feasibility score is calculated from the feasibility subcategories.

- Likelihood of Completion – confidence in the project being completed on schedule
  - Example – An option being constructed with plenty of slack in the schedule would score higher than an option being constructed with no schedule slack time.
- Long Term Solution
  - Example – An option that is expected to resolve the identified constraint for the next ten years would rank higher than an option that is expected to resolve the constraint for five years.
- Life Span
  - Example – An option that is expected to be in-service for thirty years would score higher than an option that has an expected service life of twenty years.
- Design Standards – how the project complies with company standards, materials and practices.
  - Example – An option that involves new materials and/or technology not previously deployed by Unitil would score lower than options that comply with existing practices.

4.1.5 Unitil Cost

Unitil cost includes all costs to Unitil for the installation of the option. In the event a non-wires alternative has costs that will not be paid by Unitil, the costs not being paid by Unitil will not be included in the evaluation.

- Example – The option with the lowest cost to Unitil would have the highest score and the option with the highest cost to Unitil would have the lowest score.

4.1.6 Value Added Benefit of DG

Value added benefits of DG are quantifiable and unquantifiable benefits of DG and other non-wires alternatives. These benefits would be detailed in the non-wires alternative proposals. The benefits considered here are benefits to the distribution system (and its customers) as opposed to the benefits to owner/operator of the DG system.

Traditional options would all get a score of 1 (lowest score).

- Example – Options with the most value added benefits of DG would score the highest and traditional options would score the lowest.

5.0 Documentation of the Evaluation of Options

This section describes the documentation required for projects that are evaluated utilizing the Project Evaluation Workflow and/or Detail Cost/Benefit Analysis Spreadsheet detailed in this procedure.

5.1 Projects Less than $100,000

5.1.1 Projects Identified through the Planning Process

Project need, scope and cost estimate shall be documented in the body of planning study.

5.1.2 Projects Identified Outside of the Planning Process

Project need, scope and cost estimate shall be documented in the Capital Budget and/or sent to the necessary project approvers for acceptance.

5.2 Projects Over $100,000 that do not Require Detailed Cost/Benefit Analysis

5.2.1 Project Identified through the Planning Process

The project need and scopes and cost estimates of the recommended option and all other options considered shall be documented in the body of planning study. The justification for selecting the recommended option and a statement regarding non-wires alternatives not needing to be reviewed shall also be documented in the body of planning study.

5.2.2 Project Identified Outside of the Planning Process

The project need, project scopes and cost estimates of the recommended option and all other options considered shall be documented in a company memo or email to the necessary project approvers. The justification for selecting the recommended option shall also be included in the email or memo.

5.3 Projects that Require Detailed Cost/Benefit Analysis

5.3.1 Projects Identified through the Planning Process

The body of the planning study shall include the project need, summaries of the options considered with the cost estimates and an explanation for selecting the recommended option.

An appendix shall be added to the planning study for each project that requires Detail Cost/Benefit Analysis. The appendix shall include:

- Detailed description of each option including costs, benefits and negatives
- Description and reasons behind the path taken on the Project Evaluation Workflow Diagram

- Copy of the Detail Cost/Benefit Analysis Spreadsheet

5.3.2 Projects Identified Outside of the Planning Process

A company memo or study document shall be provided to necessary project approvers. The memo or study document shall include:

- Need for the project
- Detailed description of each option including costs, benefits and negatives
- Description and reasons behind the path taken on the Project Evaluation Workflow Diagram
- Copy of the Detail Cost/Benefit Analysis Spreadsheet
- Justification for selecting the recommended option

Appendix A
Project Evaluation Workflow Diagram

Appendix B
Detailed Cost/Benefit Analysis Spreadsheet
Blank

Appendix C
Detailed Cost/Benefit Analysis Spreadsheet
Example

Unitil	Engineering Procedure	Procedure No.	PR-DT-DS-11
	Distribution Engineering	Page No.	D-D
		Revision No.	0
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Appendix D - Request for Procedure/Change Form

Requestor: _____
Title: _____
Department: _____
Location/DOC: _____
Date: _____
Procedure No.: _____

Item(s)/Section to be changed (if applicable):
Section: _____
Page: _____
Figure: _____
Appendix _____
Other: _____

For New Procedures
Description of new procedure to be developed: _____

Reason for new procedure: _____

For Changes to Existing Procedures
Description of requested change(s): _____

Reason for requested change(s): _____

Instructions: The individual requesting a new procedure or change(s) to existing procedures shall complete this form and submit it to the Director of the applicable department. For changes to procedures please attach a copy of the existing procedure with revisions marked on the copy.

Requestors Signature: _____ Date: _____

For Reviewers Use Only
Change(s) Approved? YES NO If No, briefly explain _____
Changes Implemented? YES NO Date Implemented: _____
Reviewers Signature: Date: