



Known for excellence.
Built on trust.

GEOTECHNICAL

ENVIRONMENTAL

ECOLOGICAL

WATER

CONSTRUCTION
MANAGEMENT

5 Commerce Park North
Suite 201
Bedford, NH 03110
T: 603.623.3600
F: 603.624.9463
www.gza.com



VIA EMAIL

December 22, 2020
File No. 04.0190967.00

Mr. Kurt Nelson
Eversource Energy
13 Legends Drive
Hooksett, New Hampshire 03106

RE: Monitoring Summary Report
July 4, 2020 through December 4, 2020
Seacoast Reliability Project

Dear Mr. Nelson:

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide this summary report of monitoring activities completed in Newington and Durham, New Hampshire to continue assessing pH conditions at select locations. This report is intended to supplement previous data submittals and summaries provided prior to July 4, 2020. GZA has focused this report on presenting a summary of data collected, as well as providing conclusions and recommendations.

BACKGROUND

The Seacoast Reliability Project (SRP) consists of 12.9 miles of the newly constructed F107 115-kV transmission line including overhead, underground and underwater segments through the Towns of Madbury, Durham, Newington and the City of Portsmouth and upgrade terminals at Madbury and Portsmouth substations. The underground portions of the line were installed in the shallow subsurface within a concrete duct bank (ranging on average from 2.5 to 10 feet to the top of the duct bank) backfilled with fluidized thermal backfill (FTB), which consists of a flowable fill (for thermal protection), and soils from the original excavation.

Drainage changes in the shallow subsurface were identified in two locations along the F017 alignment of the underground installation and appears related to the construction of the SRP. These locations are:

- 29 Gundalow Landing, Newington; and
- Waterworks Road Area, UNH, Durham.

Details of the observed drainage changes were presented in the email to the New Hampshire Department of Environmental Services (NHDES) on May 22, 2020 and the Monitoring Plan dated June 5, 2020. Eversource Energy (Eversource) and its consultants assessed the underground portions of the SRP in relation to the



identified changes in drainage. At both locations it appeared that the transmission line duct bank FTB flowable fill (aggregate and concrete mix) altered drainage patterns of shallow groundwater primarily influenced by the timing of rain events and infiltration of stormwater, which appeared to have caused this shallow groundwater to seep to the ground surface.

In response to the drainage conditions observed, Eversource authorized its subcontractor, McCourt Construction Inc. (McCourt), to make improvements at UNH's Waterworks Road area and 29 Gundalow Landing in May 2020 and authorized GZA to conduct monitoring of the drainage at UNH's Waterworks Road area and Gundalow Landing in the vicinity of the SRP duct bank. Details of the drainage improvements by McCourt are presented in our July 22, 2020 Monitoring Summary Report along with monitoring observations between the period of June 5, 2020 through July 3, 2020 and recommendations for continued monitoring.

MONITORING SUMMARY

Consistent with the Monitoring Summary Report submitted to Eversource on July 22, 2020, regular communications, and coordination including weekly updates that have occurred throughout the monitoring period, Eversource continued to implement weekly visual observations of drainage, site conditions, and pH measurements.

Specifically, the following schedule for monitoring was implemented:

GUNDALOW LANDING AREA

- Minimum of once per week hand-held meter measurements for pH at 29 Gundalow – 1, 29 Gundalow – 2, 64 Gundalow – 1, 64 Gundalow – 2, and 4 Brickyard – 1 monitoring locations through December 4, 2020.
- Due to pH measurements observed on October 30, 2020, two additional monitoring locations were added to the monitoring plan for all events moving forward (4 Brickyard – 2 and 4 Brickyard – 3). A detailed description of these monitoring locations is included in **Table 1** below. Refer to **Figures 1 through 3 - Monitoring Locations Plan** (attached) for monitoring locations presented on aerial photographs.
- Focus on obtaining a range of precipitation scenarios through December 4, 2020 including active storm event monitoring, periods following storm events and dry periods.
- Weekly reporting to NHDES.

UNH WATERWORKS ROAD AREA

- Minimum of once per week hand-held meter measurements for pH at the UNH Wetland – 1 through UNH Wetland – 6 monitoring locations through December 4, 2020.
- Focus on obtaining a range of precipitation scenarios through September 15, 2020 including active storm event monitoring, periods following storm events and dry periods.
- Weekly reporting to NHDES.

As recommended in our July 22, 2020 Monitoring Summary Report, Newington locations Knights Brook -1, Knights Brook – 2, Knights Brook – 3, Hannah lane – 1, Hannah Lane – 2, and Flynn Pit – 1 as well as UNH locations College



Brook – 1, College Brook – 2, CB – 1, CB – 2, RG – 1, A Lot – 1, and Reservoir Brook – 1 were not monitoring during the period of July 4, 2020 through December 4, 2020.

TABLE 1 – MONITORING LOCATIONS

Location Designation	Monitoring Location Description	Sample Location Rationale
29 Gundalow – 1 (Drainage Area)	Drainage area near F107 duct bank at southwest corner of 29 Gundalow property.	Information from this location will be used to assess the pH influence immediately adjacent to the F107 duct bank in Gundalow Landing.
29 Gundalow – 2 (Culvert)	Culvert immediately downgradient from the F107 duct bank that relays stormwater from the 29 Gundalow property under Gundalow Landing to the drainage course on the 64 Gundalow Landing property.	Information from this location will indicate the pH level in the stormwater leaving the 29 Gundalow property through the culvert and drainage course to Little Bay.
64 Gundalow – 1 (Drainage Course)	Immediately after the outlet for culvert that passes under Gundalow Landing, on the 64 Gundalow property.	Information from this location will be used to monitor the stormwater traveling through the drainage course to Little Bay.
64 Gundalow – 2 (Drainage Course)	Immediately before the inlet to the culvert that passes under Brickyard Circle, on the 64 Gundalow Landing property.	Information from this location will be used to monitor the stormwater traveling through the drainage course to Little Bay.
4 Brickyard – 1 (Drainage Course)	Immediately after the outlet for the culvert that passes under Brickyard Circle, on the 4 Brickyard Circle property; approximately 400 feet from outlet to Little Bay.	Information from this location will be used to monitor the stormwater traveling through the drainage course toward Little Bay.
4 Brickyard – 2 (Drainage Course) *Added on 10/30/2020	Approximately 75 feet downstream from 4 Brickyard – 1 in the drainage course, on the 4 Brickyard Circle Property; approximately 325 feet from outlet to Little Bay.	Information from this location will be used to monitor the stormwater traveling through the drainage course toward Little Bay.
4 Brickyard – 3 (Drainage Course) *Added on 10/30/2020	Approximately 75 feet downstream from 4 Brickyard – 2 in the drainage course, on the 4 Brickyard Circle Property; approximately 250 feet from outlet to Little Bay.	Information from this location will be used to monitor the stormwater traveling through the drainage course toward Little Bay.
Knights Brook – 1 (Upstream in Brook)	Upstream of F107 duct bank in Knights Brook.	<i>Not monitored during this period.</i>
Knights Brook – 2 (Downstream in Brook)	Downstream of F107 duct bank in Knights Brook.	<i>Not monitored during this period.</i>
Knights Brook – 3 (Above Duct Bank in Brook)	Within Knights Brook where F107 where the stream flow above the duct bank.	<i>Not monitored during this period.</i>
Hannah – 1 (Wetland NW-22)	Wetland area located along F107 duct bank near Hannah Lane.	<i>Not monitored during this period.</i>
Hannah – 2 (Wetland NW-24)	Wetland area located east of the F107 duct bank near Hannah Lane.	<i>Not monitored during this period.</i>
Flynn Pit – 1 (Wetland NW-4)	Wetland located on the southeast side of the duct bank on the Flynn Pit property.	<i>Not monitored during this period.</i>
UNH Wetland – 1 (Stormwater Area)	Drainage area immediately adjacent to cattail wetland and F107 duct bank	Area where stormwater observed daylighting from slope and calcium carbonate deposits observed.



TABLE 1 – MONITORING LOCATIONS

Location Designation	Monitoring Location Description	Sample Location Rationale
UNH Wetland – 2 (Stormwater Area)	Center of drainage area pool immediately adjacent to cattail wetland.	Stormwater area that pools prior to flowing into cattail wetland.
UNH Wetland – 3 (Cattail Wetland)	Cattail wetland immediately adjacent to where calcium carbonate deposits were observed.	Area of wetland that is closest to F107 duct bank and area where calcium deposits were observed. Area of cattail wetland closest to the duct bank and stormwater area.
UNH Wetland – 4 (Cattail Wetland)	Northeastern area of cattail wetland.	Background monitoring location for cattail wetland.
UNH Wetland – 5 (Cattail Wetland)	Southeastern area of cattail wetland.	Background monitoring location for cattail wetland.
UNH Wetland – 6 (Cattail Wetland)	Cattail wetland near Structure 23.	Background monitoring location for cattail wetland.
College Brook – 1 (Upstream in Brook)	College Brook upstream of F107 duct bank.	<i>Not monitored during this period.</i>
College Brook – 2 (Downstream in Brook)	College Brook downstream of F107 duct bank.	<i>Not monitored during this period.</i>
CB – 1 (Catch Basin)	Catch basin located at the corner of Water Works and Colovos Road.	<i>Not monitored during this period.</i>
CB – 2 (Catch Basin)	Catch basin located east of the duct bank in landscaped area.	<i>Not monitored during this period.</i>
RG – 1 (Rain Garden)	Rain Garden located on the west side of Colovos Road south of the soccer field.	<i>Not monitored during this period.</i>
A Lot – 1 (Drainage Swale)	Drainage swale running along the north side of the F107 duct bank in the UNH A Lot.	<i>Not monitored during this period.</i>
Reservoir Brook – 1 (Brook)	Reservoir Brook near end of Depot Road where Reservoir Brook exits the culvert from the A Lot.	<i>Not monitored during this period.</i>

MONITORING RESULTS AND OBSERVATIONS

A summary of pH readings and observations are presented below. All pH data collected during the period July 4, 2020 through December 4, 2020 are presented in the attached **Table 4**.

NEWINGTON MONITORING LOCATIONS

The monitoring locations associated with the Gundalow Landing drainage course were monitored a minimum of once per week from July 4, 2020 through December 4, 2020. The following summarizes key observations and findings to date:

- Overall pH concentrations at these locations ranged from a low of 6.0 (29 Gundalow – 1 on November 23, 2020) to a high of 12.8 (29 Gundalow – 2 on November 18 and 20, 2020).



- At the Newington monitoring sites, there was a very dry period from July 6, 2020 to September 30, 2020, which limited the feasibility of pH measurements. On most days during this time period, there were only two monitoring locations with standing water (64 Gundalow – 2 and 4 Brickyard – 1). During two monitoring events there was no standing water at any monitoring location (September 22, 2020 and September 28, 2020).
- Significant rain in the month of October 2020 (approximately 4.5 inches) appears to have contributed to shallow subsurface stormwater flows in the vicinity of the duct bank that daylight at the 29 Gundalow drainage culvert and into the drainage course. Elevated pH values were observed at 29 Gundalow – 2 and 64 Gundalow – 1, and to a lesser extent at 64 Gundalow – 2 and 4 Brickyard – 1. On October 30, 2020, pH measured at 29 Gundalow – 2 was 12.3 and has remained at or above 12.0 for all subsequent monitoring events with one exception (11.0 on December 1, 2020). The measurement of pH at 64 Gundalow – 2 was 9.7 on October 30, 2020. The highest pH value at 64 Gundalow – 2 prior to this date was 7.4 on August 4, 2020. The highest pH measurement at 4 Brickyard – 1 was 9.4 recorded on October 30, 2020. The highest pH value at 4 Brickyard – 1 prior to this date was 7.9 measured on August 4, 2020.
- To further monitor the pH in the drainage path downgradient of the 4 Brickyard – 1 location following the pH of 9.4 observed at 4 Brickyard – 1 on October 30, two monitoring locations, 4 Brickyard – 2 and 4 Brickyard – 3, were added to the monitoring schedule. Refer to **Table 1** for location information and **Figures 1 through 3 – Monitoring Location Plan** for locations. The highest pH values observed at 4 Brickyard – 2 and 4 Brickyard – 3 since their addition to the sampling plan were 7.8 and 7.6, respectively.
- Measurement of pH during or immediately following a precipitation event appear to decrease. On December 1, 2020 following a 1.74-inch rain event, pH values at each monitoring location decreased by an average of 1.15 when compared with the previous monitoring event. Similarly, on November 23, 2020 after a 1.59-inch rain event, pH values at 29 Gundalow – 2 and 64 Gundalow – 1 decreased by 0.8 and 1.4, respectively, when compared with the previous monitoring event.
- The data appears to indicate there is a latency relationship between precipitation events and pH increases as stormwater flows through the shallow subsurface and daylights into the Gundalow Landing surficial drainage path. On October 17, 2020 at 29 Gundalow – 2, 64 Gundalow – 2, and 4 Brickyard – 1 increased from the previous day by 1.1, 3.0, and 2.7 pH points, respectively. These increases corresponded with a 0.94-inch rain event and were among some of the largest increases in pH observed between two consecutive monitoring events. pH values at 29 Gundalow – 2 and 64 Gundalow – 1 generally appear to increase when there are multiple dry days following a precipitation event. The overall high pH measurement for the area of 12.8 (29 Gundalow – 2 on November 18 and 20, 2020) was observed two and four days following a measurable rain event. The two highest pH values measured at 64 Gundalow – 1 of 12.7 and 12.4 were also measured on the same dates, respectively. However, it should be noted that this trend does not appear to apply to any other monitoring locations downstream.
- Minor amounts (visually appeared as a very light film) of precipitate was observed on stone and leaf litter below the water surface at 29 Gundalow – 2 during five monitoring events: November 23, November 25, November 27, December 1, and December 3, 2020. The precipitate observations occurred following a 1.59-inch rain event on November 23, 2020. There were observations of drought-related stress to grass at 29 Gundalow – 1 in the months of August and September; however, there were no indications of duct bank-related stressed vegetation observed at any of the Gundalow Landing monitoring locations over the July 4, 2020 through December 4, 2020 monitoring period.



- pH values were generally observed to decrease to normal ranges as the monitoring locations move down the drainage course away from the duct bank. For all daily monitoring events, pH readings at 29 Gundalow – 1 and 29 Gundalow – 2 were significantly higher than those at 4 Brickyard – 3, the monitoring location furthest downstream (as of October 30, 2020). The average pH value at 29 Gundalow – 2 and 64 Brickyard – 1 were 11.1 and 10.8, respectively, while the average pH values at 4 Brickyard – 2 and 4 Brickyard – 3 were 7.5 and 7.3, respectively. Accordingly, it does not appear that the duct bank is influencing pH values beyond the 4 Brickyard – 1 monitoring location.

Table 2 below shows a statistical summary of the maximum, minimum, average, and median pH values at each of the Gundalow Landing monitoring sites over the July 6, 2020 through December 4, 2020 monitoring period.

TABLE 2 – pH MONITORING STATISTICS SUMMARY

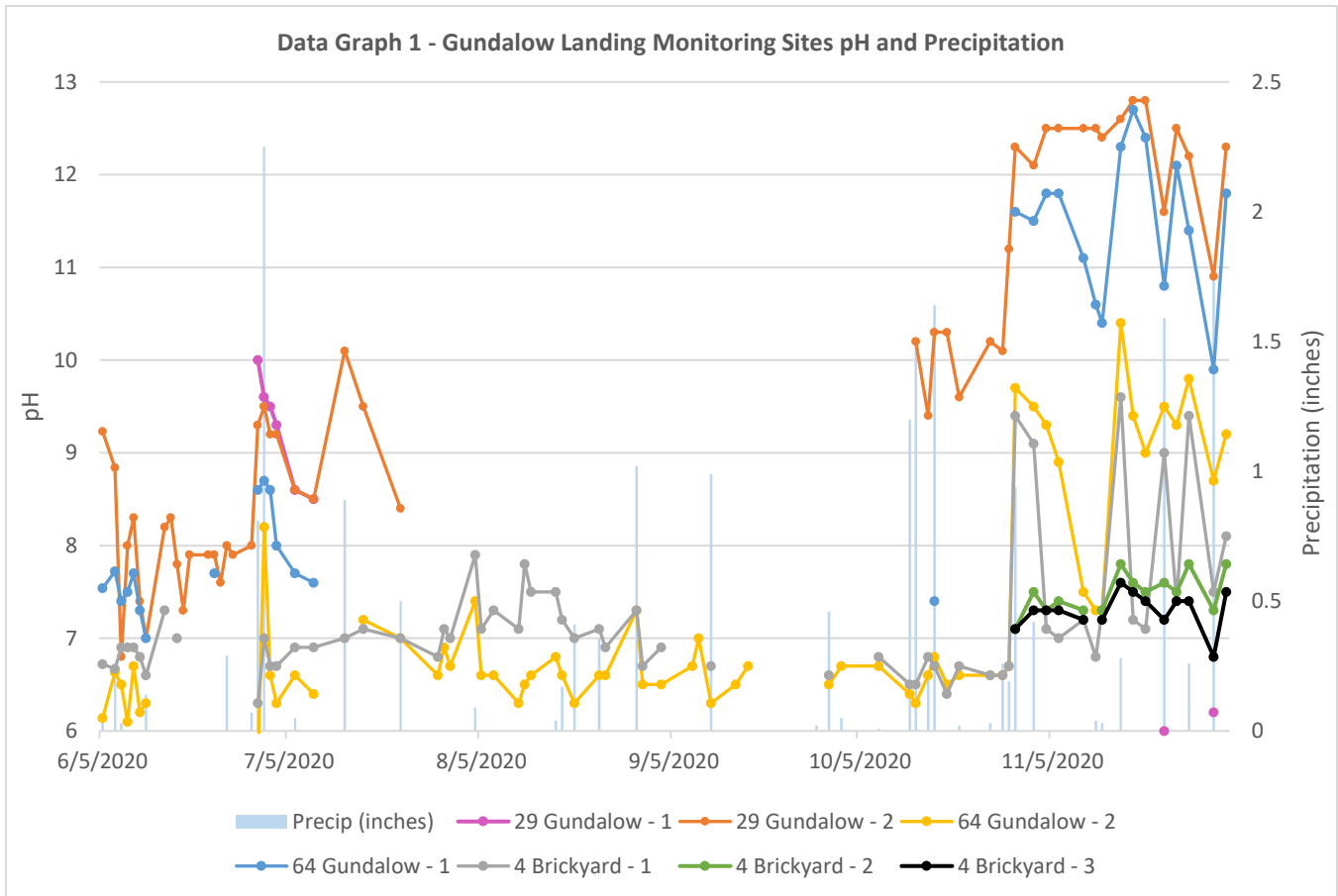
Newington Monitoring Sites

Monitoring Site	Maximum	Minimum	Average	Median
29 Gundalow – 1 (Drainage Area)	8.6	6.0	7.3	7.4
29 Gundalow – 2 (Culvert)	12.8	8.4	11.1	11.4
64 Gundalow – 1 (Drainage Course)	12.7	7.4	10.8	11.5
64 Gundalow – 2 (Drainage Course)	10.4	6.3	7.3	6.7
4 Brickyard – 1 (Drainage Course)	9.6	6.4	7.3	7.1
*4 Brickyard – 2 (Drainage Course)	7.8	7.1	7.5	7.5
*4 Brickyard – 3 (Drainage Course)	7.6	6.8	7.3	7.3

NOTES:

1. *Denotes monitoring site added on October 30, 2020
2. Data covers July 4, 2020 through December 4, 2020 Monitoring Period

Data Graph 1 below shows pH levels at the Gundalow Landing monitoring sites over the July 4, 2020 through December 4, 2020 monitoring period (lines) compared with daily precipitation (bars), with pH on the left Y axis and precipitation in inches on the right Y axis.



Notes: -Gaps in data indicate the monitoring location was dry during that day's monitoring event
-Precipitation data was obtained from weatherunderground.com
-Some precipitation events cover multiple calendar days. Precipitation totals are shown on the day the corresponding monitoring event was performed. Storm event monitoring is conducted within 12 hours of the end of the storm event.

UNH MONITORING LOCATIONS

The monitoring locations associated with the Waterworks Road area were monitored a minimum of once per week from July 4, 2020 through December 4, 2020. The following summarizes key observations and findings to date:

- pH concentrations at the cattail wetland (UNH Wetland – 1 through UNH Wetland – 5) monitoring location ranged from a low of 5.4 (UNH Wetland – 5 on October 28 and 29, 2020) to a high of 10.1 (UNH Wetland – 2 on August 30, 2020). Observed slightly elevated pH readings generally appear to be associated with precipitation events. The three highest measured pH levels (10.1 and 9.6 at UNH Wetland – 2, and 9.6 at UNH Wetland – 1) were all measured on or within two days following precipitation events greater than 1 inch.
- Over the July 4, 2020 through December 4, 2020 monitoring period, there were seven instances of elevated pH measurements (i.e., pH greater than 8.5). These were limited to monitoring locations UNH Wetland – 1 and UNH Wetland – 2. Monitoring locations UNH Wetland – 3, UNH Wetland – 4, and UNH Wetland – 5 averaged pH values of 7.3, 6.4, and 6.3, respectively, over the July 4, 2020 through December 4, 2020 monitoring period.



- No precipitate was observed at any of the UNH area locations throughout the July 4, 2020 through December 4, 2020 monitoring period. Additionally, no signs of stressed vegetation were observed at any of the UNH monitoring locations over the July 4, 2020 through December 4, 2020 monitoring period.
- At the UNH monitoring locations, there was a very dry period from July 29, 2020 to October 16, 2020 which limited pH measurements. On most monitoring events during this time, all monitoring locations were dry. There were seven monitoring events over this time period where UNH Wetland – 2 had enough standing water to be measured, and one monitoring event where UNH Wetland – 3 had enough standing water to be measured.
- Surficial water has not been observed at the UNH Wetland – 6 location to date; therefore, no pH data has been recorded. Vegetation growth in this area appears healthy.

Table 3 below shows a statistical summary of the maximum, minimum, average, and median pH values at each of the UNH monitoring sites over the July 4, 2020 through December 4, 2020 monitoring period.

TABLE 3 – pH MONITORING STATISTICS SUMMARY

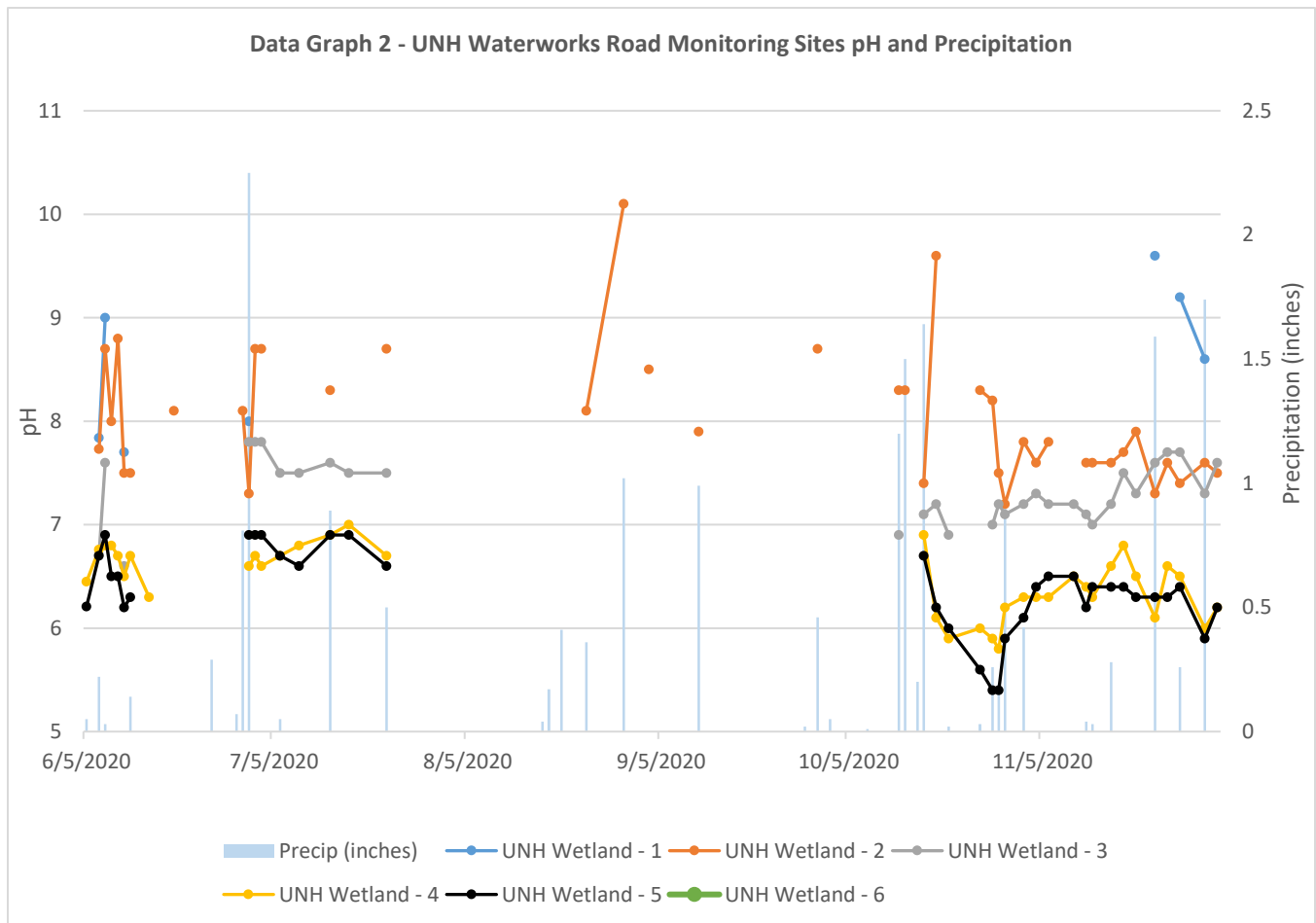
Durham Monitoring Sites

Monitoring Site	Maximum	Minimum	Average	Median
UNH Wetland - 1 (Stormwater Area)	9.6	8.6	9.1	9.2
UNH Wetland - 2 (Stormwater Area)	10.1	7.2	8.0	7.8
UNH Wetland - 3 (Cattail Wetland)	7.7	6.9	7.3	7.3
UNH Wetland - 4 (Cattail Wetland)	7.0	5.8	6.4	6.4
UNH Wetland - 5 (Cattail Wetland)	6.9	5.4	6.3	6.4
UNH Wetland - 6 (Cattail Wetland)	NM	NM	NM	NM

NOTES:

1. Data covers July 4, 2020 through December 4, 2020 Monitoring Period
2. NM indicates no measurements were taken due to dry conditions

Data Graph 2 below shows pH levels at the UNH monitoring sites over the July 4, 2020 through December 4, 2020 monitoring period (lines) compared with daily precipitation (bars), with pH on the left Y axis and precipitation in inches on the right Y axis.



Notes: -Gaps in data indicate the monitoring location was dry during that day's monitoring event
-Precipitation data was obtained from weatherunderground.com
-Some precipitation events cover multiple calendar days. Precipitation totals are shown on the day the corresponding monitoring event was performed. Storm event monitoring is conducted within 12 hours of the end of the storm event.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the July 4, 2020 through December 4, 2020 monitoring period, it appears that the remediation work completed at UNH Waterworks Road area has improved the pH and drainage conditions and pH values continue to normalize. At Gundalow Landing, a pattern of heavy precipitation in October 2020 has likely contributed to periodic increases in pH above levels documented in the previous Monitoring Summary Report covering monitoring events from June 5, 2020 to July 3, 2020 that was submitted to Eversource on July 22, 2020.

At the Gundalow Landing monitoring sites, pH concentrations ranged from a low of 6.0 (29 Gundalow – 1 on November 23, 2020) to a high of 12.8 (29 Gundalow – 2 on November 18 and 20, 2020). Significant rain in the month of October 2020 (approximately 4.5 inches) generally appears to have consistently increased pH values observed at 29 Gundalow – 2 and 64 Gundalow – 1, and occasionally increased pH values at 64 Gundalow – 2 and 4 Brickyard – 1. On October 30, 2020, pH measured at 29 Gundalow – 2 was 12.3 and has remained at or above 12.0 for all subsequent monitoring events with one exception. On October 30, 2020, the pH measured at 4 Brickyard – 1 was 9.4, which was 1.5 higher than the previous highest pH recorded at this location. This observation prompted the addition of two monitoring locations further downstream in the drainage course



(4 Brickyard – 2 and 4 Brickyard – 3). The highest pH values observed at 4 Brickyard – 2 and 4 Brickyard – 3 since their addition to the monitoring plan were 7.8 and 7.6, respectively. This suggests that influence from the duct bank is localized to the upstream portions of the drainage path and has not resulted in an elevated discharge to Great Bay. For this reason, no additional invasive improvements are recommended at this time. However, continued monitoring is recommended as proposed below.

At UNH, the highest pH observed was 10.1 at UNH Wetland – 2 on August 30, 2020, which corresponded with a 1.02-inch storm event. Elevated pH levels were also observed at UNH Wetland – 1 with a high of 9.6. It should be noted that the high of 10.1 was observed during the summer dry period, and the pattern of above average precipitation beginning in October does not appear to have significantly increased pH values at the UNH monitoring locations. From October 1, 2020 through December 4, 2020, there were only four elevated pH readings documented (i.e., pH greater than 8.5): 9.6 on October 19, 2020; 9.6 on November 11, 2020; 9.2 on November 27, 2020; and 8.6 on December 1, 2020. Monitoring locations UNH Wetland – 3, UNH Wetland – 4 and UNH Wetland – 5 highest readings were 7.7, 7.0, and 6.9, respectively. Based on these findings, it does not appear that there are residual impacts outside of the UNH Wetland – 1 and 2 locations. Additionally, it should be noted that the UNH Wetland – 1, UNH Wetland – 2, and UNH Wetland – 3 locations are in a stormwater wetland that receives drainage from a multiple areas, including a pipe that outlets directly adjacent to UNH Wetland – 2 with an unknown origin.

Overall, it appears that installation of the underdrains and removal of the accumulated surficial precipitate conducted in May 2020 resulted in improved conditions along the duct bank at the UNH monitoring locations and does not appear to have resulted in impacts to surrounding resources. Accordingly, discontinuation of monitoring at these locations is recommended.

Accordingly, GZA is proposing to revise the existing monitoring plan as detailed below.

GUNDALOW LANDING AREA

- Minimum of once per week hand-held meter measurements for pH at 29 Gundalow – 1, 29 Gundalow – 2, 64 Gundalow – 1, 64 Gundalow – 2, 4 Brickyard – 1, 4 Brickyard – 2, and 4 Brickyard – 3 monitoring locations through April 30, 2021 with the following exception:
 - GZA understands that during this monitoring period, frozen conditions may affect monitoring feasibility. Weekly monitoring events will not be conducted during prolonged frozen site conditions but will be resumed following rain events or thawing temperatures.
- Focus on obtaining a range of precipitation scenarios through April 30, 2021 including active storm event monitoring, periods following storm events and dry periods. During spring and thaw conditions, monitoring frequency may be increased, dependent on precipitation events.
- Continue to assess pH and potential for associated impacts as more water flows through the system over time.
- Weekly reporting to NHDES.

UNH WATERWORKS ROAD AREA

- No further monitoring proposed.



December 22, 2020

04.0190967.00

Monitoring Summary Report - July 4, 2020 through December 4, 2020

Page | 11

We hope the information contained in this report meets your current needs. If you have any questions, please do not hesitate to contact us.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read "Rebecca B. Cox".

Rebecca B. Cox, P. E.
Senior Project Manager

A handwritten signature in black ink, appearing to read "Matthew J. Deane".

Matthew J. Deane
Technical Specialist

A handwritten signature in black ink, appearing to read "Deborah M. Zarta Gier".

Deborah M. Zarta Gier, CNPR
Principal

MJD/RBC/DMZ:tmd

\\GZA Bedford\Jobs\04\Jobs\0190900s\04.0190967.00 McCourt SRP\Work\Vietas and UNH drainage pH issues\Summary Report Through 120420\final 04.0190967.00 Summary Monitoring Report 122220.docx

Attachments: Table 4 – Summary of pH Monitoring Data
Figures 1 through 3 – Monitoring Locations Plan



Table 4 – Summary of pH Monitoring Data

EVERSOURCE ENERGY
SEACOAST RELIABILITY PROJECT
TABLE 4
pH Monitoring
Newington and Durham, New Hampshire

	WEEK 1							WEEK 2					WEEK 3					WEEK 4					WEEK 5		WEEK 6		WEEK 7	WEEK 8			
	June 5, 2020	June 7, 2020	June 8, 2020	June 9, 2020	June 10, 2020	June 11, 2020	June 12, 2020	June 15, 2020	June 16, 2020	June 17, 2020	June 18, 2020	June 19, 2020	June 22, 2020	June 23, 2020	June 24, 2020	June 25, 2020	June 26, 2020	June 29, 2020	June 30, 2020	July 1, 2020	July 2, 2020	July 3, 2020	July 6, 2020	July 9, 2020	July 14, 2020	July 17, 2020	July 23, 2020	July 29, 2020	July 30, 2020	July 31, 2020	
NEWINGTON																															
29 Gundalow - 1 (Drainage Area)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.0	9.6	9.5	9.3	8.6	8.5	NM	NM	NM	--	--	--	
29 Gundalow - 2 (Culvert)	9.2	8.8	6.8	8.0	8.3	7.4	7.0	8.2	8.3	7.8	7.3	7.9	7.9	7.9	7.6	8.0	7.9	8.0	9.3	9.5	9.2	9.2	8.6	8.5	10.1	9.5	8.4	--	--	--	
64 Gundalow - 1 (Drainage Course)	7.5	7.7	7.4	7.5	7.7	7.3	7.0	--	--	--	--	--	--	7.7	--	--	--	--	8.6	8.7	8.6	8	7.7	7.6	NM	--	--	--	--	--	
64 Gundalow - 2 (Drainage Course)	6.1	6.6	6.5	6.1	6.7	6.2	6.3	--	--	--	--	--	--	--	--	--	--	--	5.6	8.2	6.6	6.3	6.6	6.4	NM	7.2	7.0	6.6	6.9	6.7	
4 Brickyard - 1 (Drainage Course)	6.7	6.7	6.9	6.9	6.9	6.8	6.6	7.3	--	7.0	--	--	--	--	--	--	--	--	6.3	7.0	6.7	6.7	6.9	6.9	7.0	7.1	7.0	6.8	7.1	7.0	
Knight's Brook - 1 (Upstream in Brook)	NM	NM	NM	NM	7.3	7.0	NM	NM	7.0	NM	NM	7.0	NM	NM	7.2	7.1	NM	NM	7.1	6.9	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Knight's Brook - 2 (Downstream in Brook)	NM	NM	NM	NM	7.5	7.2	NM	NM	7.5	NM	NM	7.4	NM	NM	7.3	7.2	NM	NM	7.2	7.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Knight's Brook - 3 (Above Duct Bank in Brook)	NM	NM	NM	NM	7.4	7.2	NM	NM	7.3	NM	NM	7.2	NM	NM	7.2	7.2	NM	NM	7.2	7.1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Hannah - 1 (Wetland NW-22)	--	NM	--	NM	--	--	NM	NM	--	NM	NM	--	NM	NM	--	--	NM	NM	--	6.3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Hannah - 2 (Wetland NW-24)	7.2	NM	6.8	NM	7.3	6.8	NM	NM	7.1	NM	NM	--	NM	NM	--	--	NM	NM	--	6.5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Flynn Pit - 1 (Wetland NW-4)	7.3	NM	6.3	NM	7.1	6.9	NM	NM	7.6	NM	NM	6.5	NM	NM	6.4	5.8	NM	NM	5.8	6.3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
DURHAM/UNH																															
UNH Wetland - 1 (Stormwater Area)	--	7.8	9.0	--	--	7.7	--	--	--	--	--	--	--	--	--	--	--	--	--	8.0	--	--	--	--	--	--	--	--	--	NM	NM
UNH Wetland - 2 (Stormwater Area)	--	7.7	8.7	8.0	8.8	7.5	7.5	--	--	--	--	8.1	--	--	--	--	--	--	8.1	7.3	8.7	8.7	--	--	8.3	--	8.7	--	NM	NM	
UNH Wetland - 3 (Cattail Wetland)	--	6.7	7.6	--	--	6.6	--	--	--	--	--	--	--	--	--	--	--	--	7.8	7.8	7.8	7.5	7.5	7.6	7.5	7.5	--	NM	NM		
UNH Wetland - 4 (Cattail Wetland)	6.5	6.8	6.8	6.8	6.7	6.5	6.7	6.3	--	--	--	--	--	--	--	--	--	--	6.6	6.7	6.6	6.7	6.8	6.9	7.0	6.7	--	NM	NM		
UNH Wetland - 5 (Cattail Wetland)	6.2	6.7	6.9	6.5	6.5	6.2	6.3	--	--	--	--	--	--	--	--	--	--	--	6.9	6.9	6.9	6.7	6.6	6.9	6.9	6.6	--	NM	NM		
UNH Wetland - 6 (Cattail Wetland)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NM	NM	
College Brook - 1 (Upstream in Brook)	7.3	7.1	7.9	7.4	7.4	7.4	7.3	7.7	7.7	7.7	7.5	7.7	7.6	7.7	7.7	7.7	7.7	7.6	7.5	7.3	7.4	7.4	7.5	NM	NM	NM	NM	NM	NM	NM	
College Brook - 2 (Downstream in Brook)	7.2	7.3	7.8	7.2	7.3	7.2	7.2	7.5	7.5	7.5	7.3	7.6	7.5	7.5	7.3	7.4	7.4	7.4	7.2	7.0	7.2	7.3	7.4	NM	NM	NM	NM	NM	NM	NM	
CB-1 (Catch Basin)	6.8	7.1	7.3	7.1	7.3	7.5	7.2	7.4	7.3	7.3	7.5	7.5	7.5	7.5	7.2	7.3	7.4	7.2	6.3	6.5	6.5	6.5	6.7	NM	NM	NM	NM	NM	NM	NM	
CB-2 (Catch Basin)	6.6	6.7	7.2	6.8	6.9	7.3	6.8	6.8	6.7	6.7	6.7	6.7	6.7	6.6	6.8	6.7	6.7	6.6	6.4	6.6	6.7	6.8	6.8	NM	NM	NM	NM	NM	NM	NM	
RG - 1 (Rain Garden)	6.9	7.2	7.1	7.0	7.2	7.2	7.3	7.4	7.3	7.3	7.2	7.3	7.0	7.0	7.2	7.3	7.2	7.2	4.3	4.3	4.2	4.4	5.7	6.3	NM	NM	NM	NM	NM	NM	
A Lot - 1 (Drainage Swale)	--	--	NM	NM	--	--	NM	NM	--	NM	NM	--	NM	NM	--	--	NM	NM	--	--	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Reservoir Brook (Brook)	7.2	7.0	NM	NM	7.5	7.1	NM	NM	7.6	NM	NM	7.7	NM	NM	7.6	7.6	NM	NM	7.2	6.9	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	

- Notes**
- 1) "NM" indicates location not monitored on this date.
 - 2) "--" indicates area monitored but dry.
 - 3) Refer to Daily Drainage Monitoring Report for additional information.

EVERSOURCE ENERGY
SEACOAST RELIABILITY PROJECT
TABLE 4
pH Monitoring
Newington and Durham, New Hampshire

	WEEK 9			WEEK 10			WEEK 11			WEEK 12		WEEK 13			WEEK 14			WEEK 15		WEEK 16	WEEK 17			WEEK 18	WEEK 19			WEEK 20				
	August 4, 2020	August 5, 2020	August 7, 2020	August 11, 2020	August 12, 2020	August 13, 2020	August 17, 2020	August 18, 2020	August 20, 2020	August 24, 2020	August 25, 2020	August 30, 2020	August 31, 2020	September 3, 2020	September 8, 2020	September 9, 2020	September 11, 2020	September 15, 2020	September 17, 2020	September 22, 2020	September 28, 2020	September 30, 2020	October 2, 2020	October 8, 2020	October 13, 2020	October 14, 2020	October 16, 2020	October 17, 2020	October 19, 2020	October 21, 2020		
NEWINGTON																																
29 Gundalow - 1 (Drainage Area)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29 Gundalow - 2 (Culvert)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
64 Gundalow - 1 (Drainage Course)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
64 Gundalow - 2 (Drainage Course)	7.4	6.6	6.6	6.3	6.5	6.6	6.8	6.6	6.3	6.6	6.6	7.3	6.5	6.5	6.7	7.0	6.3	6.5	6.7	-	-	6.5	6.7	6.7	6.4	6.3	6.6	6.8	6.5	6.6		
4 Brickyard - 1 (Drainage Course)	7.9	7.1	7.3	7.1	7.8	7.5	7.5	7.2	7.0	7.1	6.9	7.3	6.7	6.9	-	-	6.7	-	-	-	-	6.6	-	6.8	6.5	6.5	6.8	6.7	6.4	6.7		
Knight's Brook - 1 (Upstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Knight's Brook - 2 (Downstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Knight's Brook - 3 (Above Duct Bank in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Hannah - 1 (Wetland NW-22)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Hannah - 2 (Wetland NW-24)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Flynn Pit - 1 (Wetland NW-4)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
DURHAM/UNH																																
UNH Wetland - 1 (Stormwater Area)	NM	-	NM	NM	-	NM	-	-	-	-	NM	-	-	-	-	NM	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	
UNH Wetland - 2 (Stormwater Area)	NM	-	NM	NM	-	NM	-	-	-	8.1	NM	10.1	-	8.5	-	NM	7.9	-	NM	-	-	8.7	-	-	8.3	8.3	-	7.4	9.6	-	-	
UNH Wetland - 3 (Cattail Wetland)	NM	-	NM	NM	-	NM	-	-	-	-	NM	-	-	-	-	NM	-	-	NM	-	-	-	-	-	6.9	-	-	7.1	7.2	6.9	-	
UNH Wetland - 4 (Cattail Wetland)	NM	-	NM	NM	-	NM	-	-	-	-	NM	-	-	-	-	NM	-	-	NM	-	-	-	-	-	-	-	-	6.9	6.1	5.9	-	
UNH Wetland - 5 (Cattail Wetland)	NM	-	NM	NM	-	NM	-	-	-	-	NM	-	-	-	-	NM	-	-	NM	-	-	-	-	-	-	-	-	-	6.7	6.2	6.0	
UNH Wetland - 6 (Cattail Wetland)	NM	-	NM	NM	-	NM	-	-	-	-	NM	-	-	-	-	NM	-	-	NM	-	-	-	-	-	-	-	-	-	-	-	-	
College Brook - 1 (Upstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
College Brook - 2 (Downstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
CB-1 (Catch Basin)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
CB-2 (Catch Basin)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
RG - 1 (Rain Garden)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
A Lot - 1 (Drainage Swale)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
Reservoir Brook (Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	

Notes

- 1) "NM" indicates location not monitored on this date.
- 2) "-" indicates area monitored but dry.
- 3) Refer to Daily Drainage Monitoring Report for additional information.

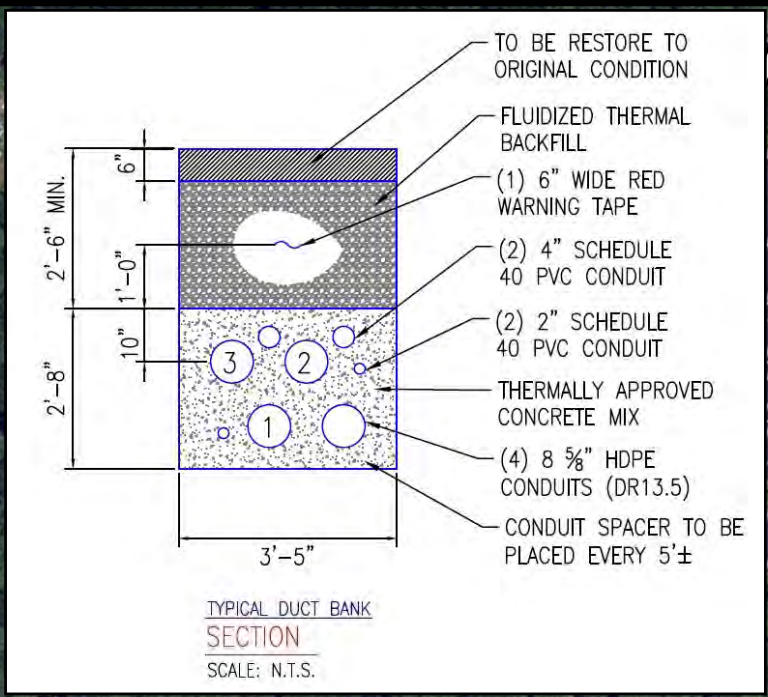
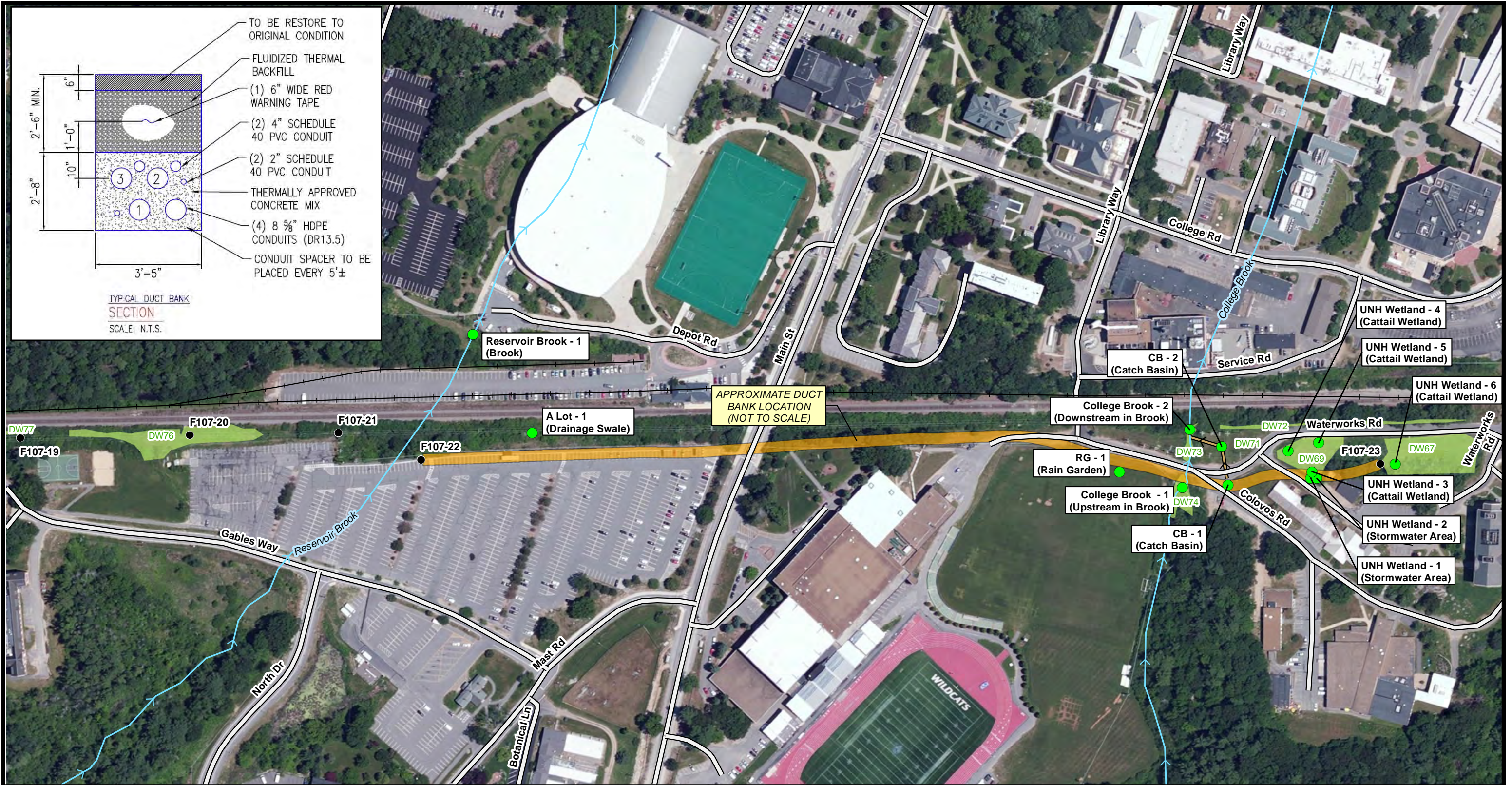
EVERSOURCE ENERGY
SEACOAST RELIABILITY PROJECT
TABLE 4
pH Monitoring
Newington and Durham, New Hampshire

	WEEK 21				WEEK 22			WEEK 23			WEEK 24			WEEK 25			WEEK 26	
	October 26, 2020	October 28, 2020	October 29, 2020	October 30, 2020	November 2, 2020	November 4, 2020	November 6, 2020	November 10, 2020	November 12, 2020	November 13, 2020	November 16, 2020	November 18, 2020	November 20, 2020	November 23, 2020	November 25, 2020	November 27, 2020	December 1, 2020	December 3, 2020
NEWINGTON																		
29 Gundalow - 1 (Drainage Area)	--	--	--	--	--	--	--	--	--	--	--	--	--	6.0	--	--	6.2	--
29 Gundalow - 2 (Culvert)	10.2	10.1	11.2	12.3	12.1	12.5	12.5	12.5	12.5	12.4	12.6	12.8	12.8	11.6	12.5	12.2	10.9	12.3
64 Gundalow - 1 (Drainage Course)	--	--	--	11.6	11.5	11.8	11.8	11.1	10.6	10.4	12.3	12.7	12.4	10.8	12.1	11.4	9.9	11.8
64 Gundalow - 2 (Drainage Course)	6.6	6.6	6.7	9.7	9.5	9.3	8.9	7.5	7.3	7.3	10.4	9.4	9.0	9.5	9.3	9.8	8.7	9.2
4 Brickyard - 1 (Drainage Course)	6.6	6.6	6.7	9.4	9.1	7.1	7.0	7.2	6.8	7.3	9.6	7.2	7.1	9.0	7.4	9.4	7.5	8.1
4 Brickyard - 2 (Drainage Course)	NM	NM	NM	7.1	7.5	7.3	7.4	7.3	NM	7.3	7.8	7.6	7.5	7.6	7.5	7.8	7.3	7.8
4 Brickyard - 3 (Drainage Course)	NM	NM	NM	7.1	7.3	7.3	7.3	7.2	NM	7.2	7.6	7.5	7.4	7.2	7.4	7.4	6.8	7.5
Knight's Brook - 1 (Upstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Knight's Brook - 2 (Downstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Knight's Brook - 3 (Above Duct Bank in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Hannah - 1 (Wetland NW-22)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Hannah - 2 (Wetland NW-24)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Flynn Pit - 1 (Wetland NW-4)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
DURHAM/UNH																		
UNH Wetland - 1 (Stormwater Area)	--	--	--	--	--	--	--	--	--	--	--	--	--	9.6	--	9.2	8.6	--
UNH Wetland - 2 (Stormwater Area)	8.3	8.2	7.5	7.2	7.8	7.6	7.8	--	7.6	7.6	7.6	7.7	7.9	7.3	7.6	7.4	7.6	7.5
UNH Wetland - 3 (Cattail Wetland)	--	7.0	7.2	7.1	7.2	7.3	7.2	7.2	7.1	7.0	7.2	7.5	7.3	7.6	7.7	7.7	7.3	7.6
UNH Wetland - 4 (Cattail Wetland)	6.0	5.9	5.8	6.2	6.3	6.3	6.3	6.5	6.4	6.3	6.6	6.8	6.5	6.1	6.6	6.5	6.0	6.2
UNH Wetland - 5 (Cattail Wetland)	5.6	5.4	5.4	5.9	6.1	6.4	6.5	6.5	6.2	6.4	6.4	6.4	6.3	6.3	6.3	6.4	5.9	6.2
UNH Wetland - 6 (Cattail Wetland)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
College Brook - 1 (Upstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
College Brook - 2 (Downstream in Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
CB-1 (Catch Basin)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
CB-2 (Catch Basin)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
RG - 1 (Rain Garden)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
A Lot - 1 (Drainage Swale)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Reservoir Brook (Brook)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

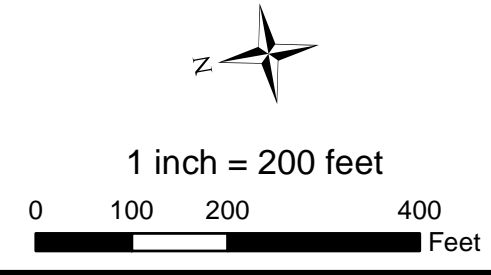
- Notes**
- 1) "NM" indicates location not monitored on this date.
 - 2) "--" indicates area monitored but dry.
 - 3) Refer to Daily Drainage Monitoring Report for additional information.



Figures 1 through 3 – Monitoring Locations Plan



- LEGEND**
- SEACOAST RELIABILITY PROJECT ABOVE-GROUND STRUCTURE
 - MONITORING LOCATION
 - NATIONAL HYDROGRAPHY DATASET STREAM
 - RAILROAD
 - DEPARTMENT OF TRANSPORTATION ROADS
 - APPROXIMATE DRAINAGE COURSE LOCATION
 - APPROXIMATE DRAIN PIPE LOCATION
 - APPROXIMATE LOCATION OF DUCT BANK (NOT TO SCALE - SEE TYPICAL DUCT BANK DETAIL)
 - DELINEATED WETLAND



SEACOAST RELIABILITY PROJECT

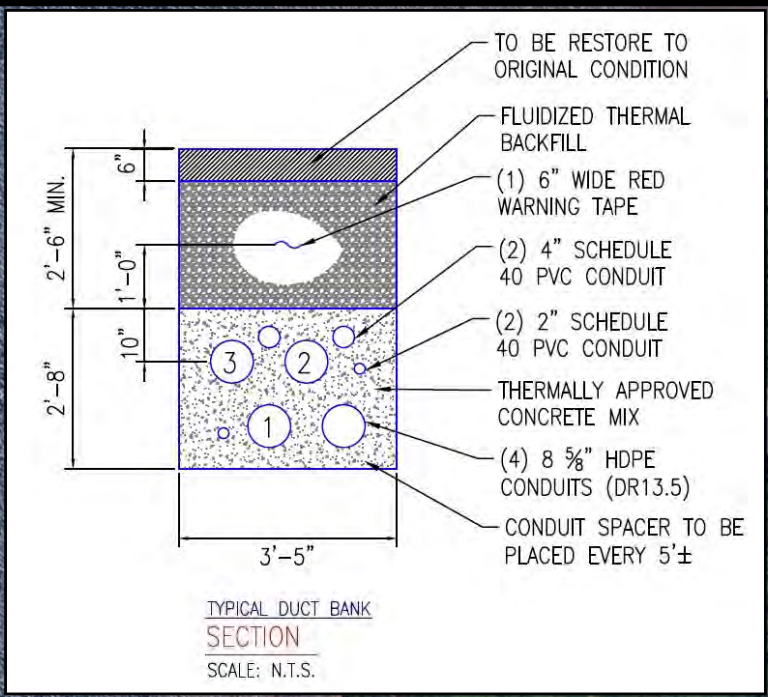
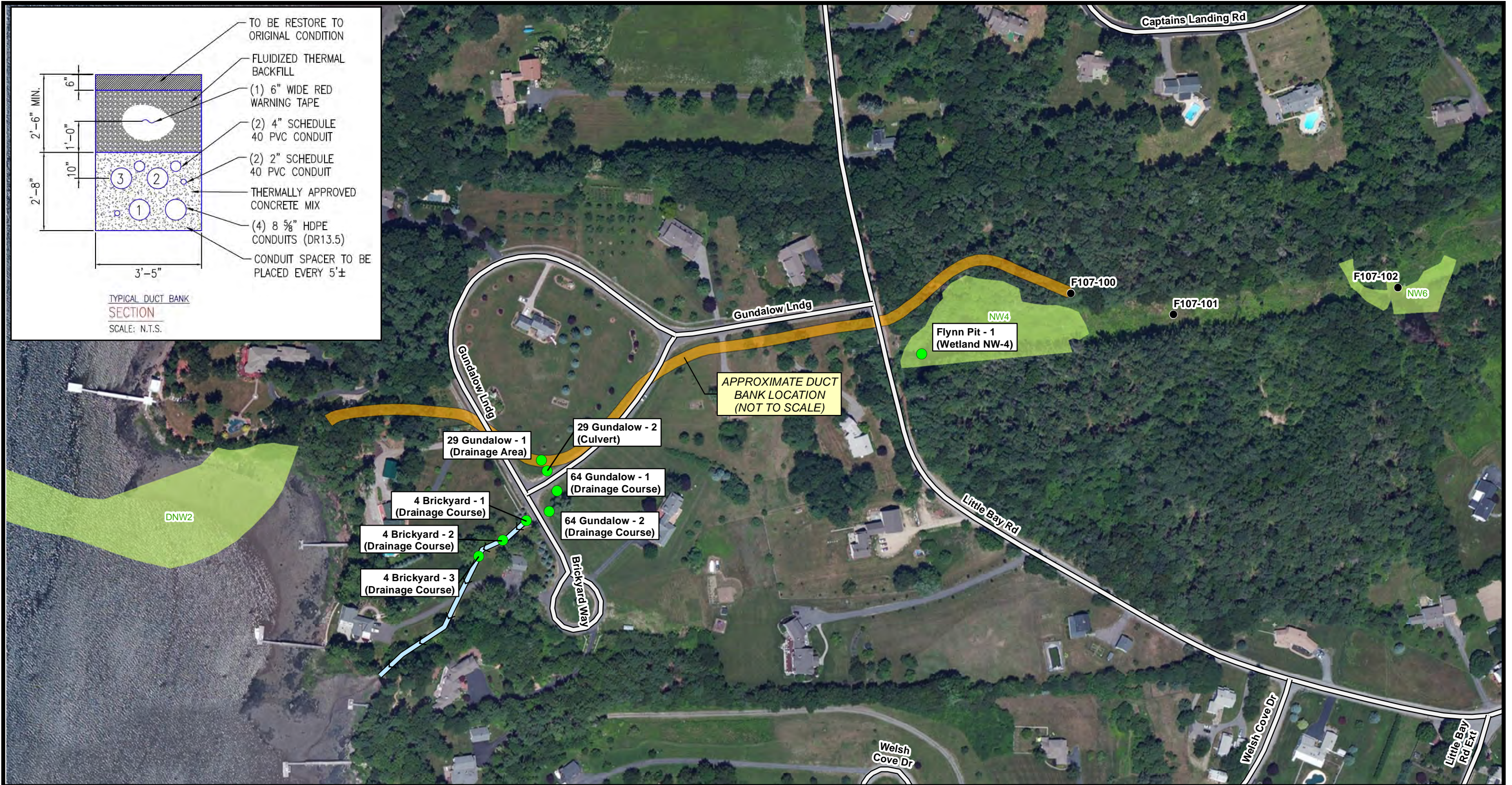
MONITORING LOCATIONS
OCTOBER 30, 2020

DURHAM & NEWINGTON
NEW HAMPSHIRE
FIGURE 1 OF 3

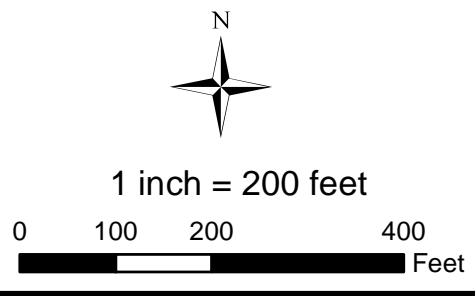
Project No.: 04.0190967.00

EVERSOURCE ENERGY

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com



- LEGEND**
- SEACOAST RELIABILITY PROJECT ABOVE-GROUND STRUCTURE
 - MONITORING LOCATION
 - NATIONAL HYDROGRAPHY DATASET STREAM
 - RAILROAD
 - DEPARTMENT OF TRANSPORTATION ROADS
 - APPROXIMATE DRAINAGE COURSE LOCATION
 - APPROXIMATE DRAIN PIPE LOCATION
 - APPROXIMATE LOCATION OF DUCT BANK (NOT TO SCALE - SEE TYPICAL DUCT BANK DETAIL)
 - DELINEATED WETLAND



SEACOAST RELIABILITY PROJECT

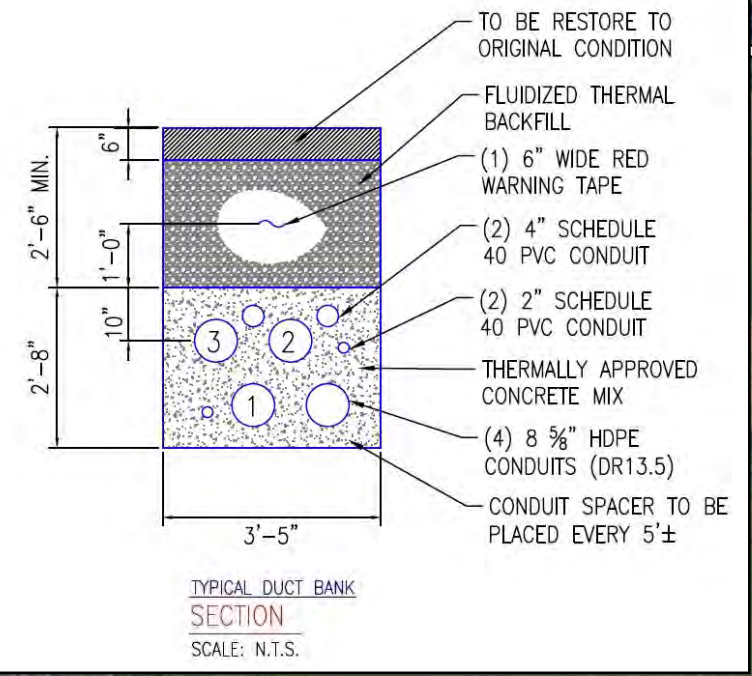
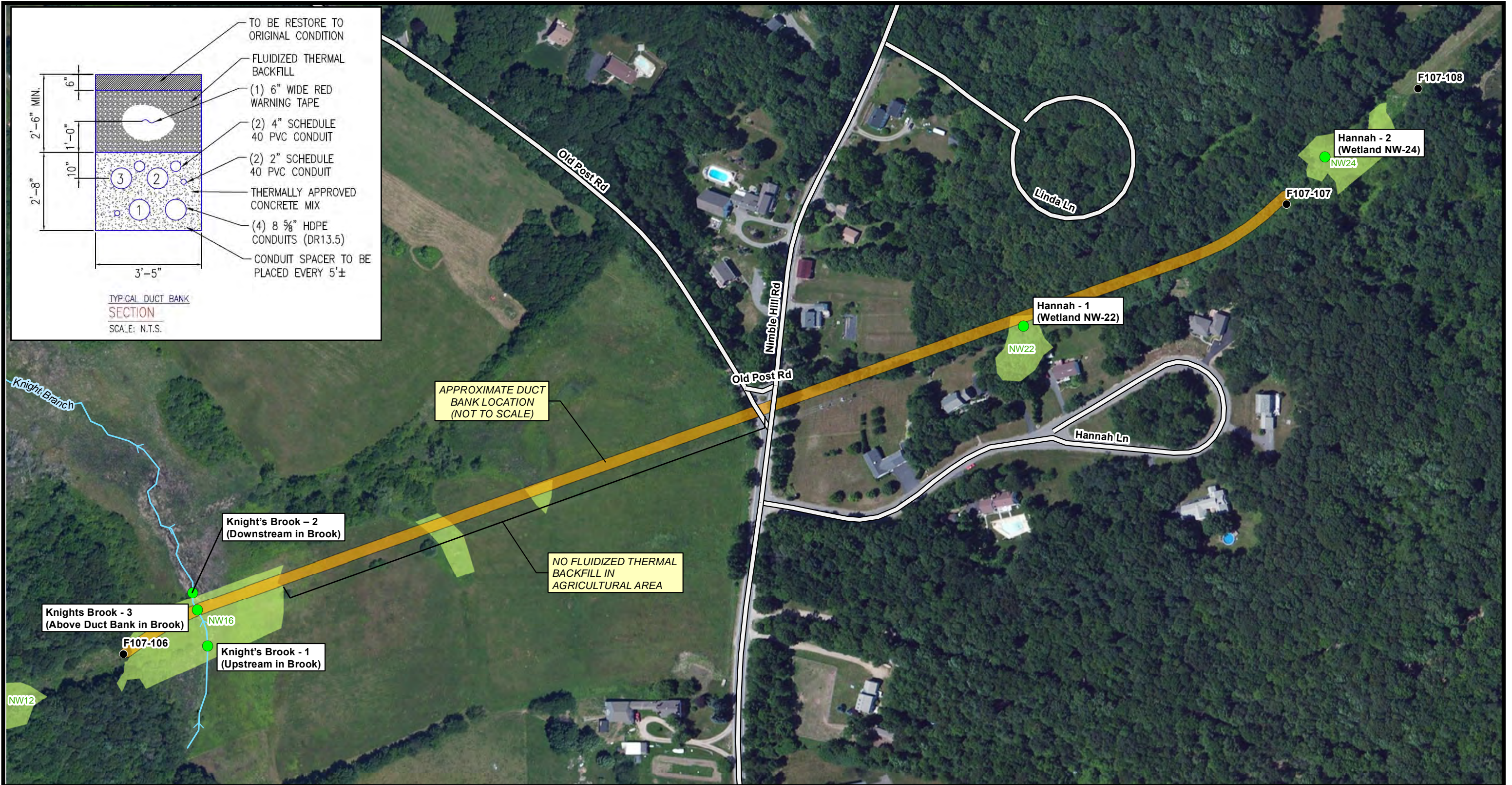
MONITORING LOCATIONS
OCTOBER 30, 2020

DURHAM & NEWINGTON
NEW HAMPSHIRE
FIGURE 2 OF 3

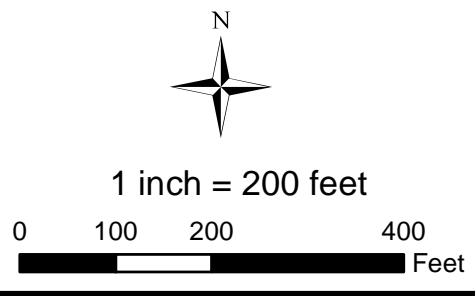
Project No.: 04.0190967.00

EVERSOURCE ENERGY

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com



- LEGEND**
- SEACOAST RELIABILITY PROJECT ABOVE-GROUND STRUCTURE
 - MONITORING LOCATION
 - NATIONAL HYDROGRAPHY DATASET STREAM
 - RAILROAD
 - DEPARTMENT OF TRANSPORTATION ROADS
 - APPROXIMATE DRAINAGE COURSE LOCATION
 - APPROXIMATE DRAIN PIPE LOCATION
 - APPROXIMATE LOCATION OF DUCT BANK (NOT TO SCALE - SEE TYPICAL DUCT BANK DETAIL)
 - DELINEATED WETLAND



SEACOAST RELIABILITY PROJECT

MONITORING LOCATIONS
OCTOBER 30, 2020

DURHAM & NEWINGTON
NEW HAMPSHIRE

FIGURE 3 OF 3

Project No.: 04.0190967.00

EVERSOURCE ENERGY

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com