

Executive Summary

Comprehensive Watershed Planning and Green Infrastructure Demonstration Project Spectacle Pond, Cranston, RI

Project Summary

This project developed and began to implement a holistic approach to improve water quality to Spectacle Pond. This included developing a comprehensive plan to better direct the City's resources to address water quality problems in this urban pond. This project also included the construction of a underground infiltration stormwater treatment unit in the adjacent neighborhood as a demonstration project for both neighborhood residents and City DPW maintenance crews.

Applicant Organization Name and Address

City of Cranston
Cranston City Hall
869 Park Avenue
Cranston, RI 02910

Application Point of Contact and Project Leader

Edward Tally
Environmental Engineer
etally@cranstonri.org
401-780-3173

List of Partner Organizations

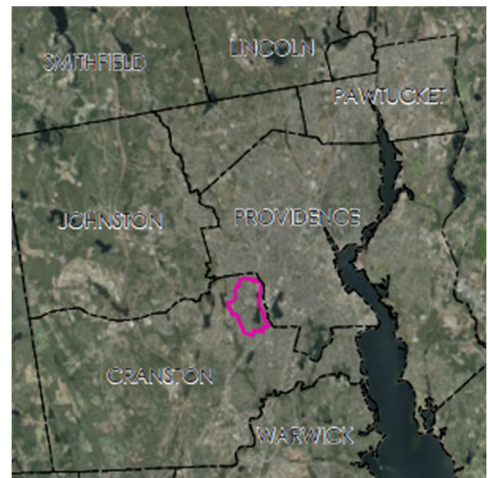
Save The Bay

Location of Project

Spectacle Pond, Cranston, RI
41°47'24.2"N 71°26'34.8"W

Cost

Grant Request \$187,500 **Location**
Non-Federal Match \$62,500; 33% Grant Match
Total \$250,000



Spectacle Pond Watershed



Project Background:

Spectacle Pond is within a highly urbanized watershed located in the City of Cranston, Rhode Island. This pond is part of the Pawtuxet River watershed and is impaired for phosphorus-related impairments. Elevated phosphorus concentrations have resulted in a number of water quality impacts in this urban surface water. These impacts include substantial algal blooms and low dissolved oxygen conditions. A Total Maximum Daily Load (TMDL) has been prepared to restore this pond (September 2007).

Water quality issues in Spectacle Pond also influence water quality and the phosphorous impairment in the Roger Williams Park Pond system. Spectacle Pond serves as the headwaters to the Roger Williams Park Ponds system by overflowing into a culvert that drains to Mashapaug Pond that then discharges to the Roger Williams Park Ponds via culverts.

Spectacle Pond could be a significant surface water resource within this urban watershed. Residential neighborhoods abut the pond with existing road rights-of-ways that could provide access for canoes and kayaks. A public park also abuts the southeastern corner of the pond. Current water quality issues in the pond limit its value to these urban neighborhoods.

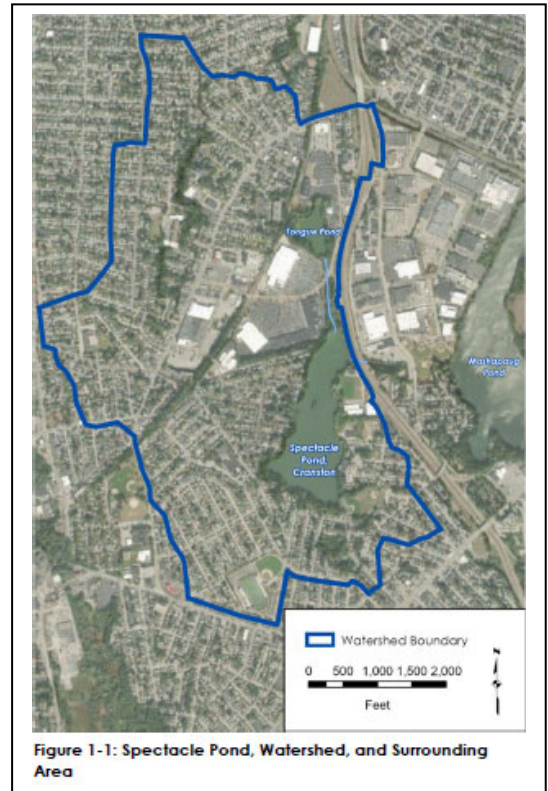


Figure 1-1: Spectacle Pond, Watershed, and Surrounding Area

Project Description:

In April, 2019 the City entered into a competitive grant application process with the Southeast New England Program (SNEP), funded by U.S. Environmental Protection Agency (EPA) through a collaboration with Restore America's Estuaries (RAE). In September, 2019 the City was selected for funding and entered into a grant agreement with RAE.

The major elements of this project were to:

- Complete a holistic assessment of the sources of phosphorus that addresses both internal and external sources and then develop a comprehensive plan that would allow the City of Cranston to direct its limited resources where it will achieve the greatest results for its investments.
- Install an underground stormwater treatment unit demonstration project in a watershed neighborhood to build support with residents to implement additional basins in the future.

The project was managed and coordinated by the City of Cranston's Department of Public Works. The City was supported by several other team members as follows:

- Fuss and O'Neill to develop the water quality improvement plans and planning and designing green infrastructure.
- Universal Excavating, a construction contractor, selected through a competitive public bidding process.
- Save the Bay, who collaborated with the City on the outreach components of the project and provide their expertise in site selection.

Major project tasks are described in further detail below.

1. Prepare QAPP: QAPP will follow USEPA guidance documents.

1. Prepare Phosphorous Reduction Feasibility Study: This study will include several major elements as follows.

- ***Collect Data on Existing Conditions.*** This included targeted field assessment to better characterize actual watershed conditions as well as locate potential sites for a demonstration project.
- ***Water Quality and Sediment Sampling.*** Water quality and sediment sampling was conducted to support the assessment of existing pond trophic status and quantification of nutrient loading from selected input tributaries and bottom sediment. Samples were collected to show any potential release of phosphorus from sediment. This included sampling of representative stormwater outfalls.
- ***Estimate Phosphorus Budget.*** The phosphorus budget was estimated to identify the relative contribution of various sources required to develop a holistic phosphorus reduction plan.
- ***Develop Strategies:*** Potential strategies to restore water quality were identified that incorporate structural and non-structural approaches that are targeted to maximize cost/benefit of future investments to restore water quality in Spectacle Pond and downstream waters.
- ***Develop Final Report:*** In addition to documenting completed work and findings this report defined an overall implementation plan prioritizing the action items identified to restore water quality.

2. Design and Construct Demonstration Project

- ***Identify Bioretention Basin Approach:*** Several types of bioretention basins exist. Conceptual designs were considered and ultimately an underground infiltration stormwater treatment unit was selected.
- ***Identify Potential Demonstration Site:*** Based on potential sites identified in neighborhoods, and feedback from the City, Save the Bay, and neighborhood residents during outreach efforts, a demonstration site was selected.
- ***Develop Design:*** Included collecting in-situ data on soils and groundwater and completing a site-specific design for the demonstration project including hydraulic and phosphorus removal calculations. Construction documents were prepared.
- ***Bid Construction of Demonstration Project:*** The City bid the project and awarded the bid for construction to the lowest qualified bidder.
- ***Complete Construction of Demonstration Project:*** The selected contractor completed the construction of the project under the supervision of the design engineer and the City in October 2022.

3. Public Engagement: Understand stormwater quality issues in general and how they impact Spectacle pond and review design plans.

- ***Watershed / Neighborhood and City residents:*** On-site meeting with neighborhood residents where demonstration project is planned, where design plans will be reviewed and feedback received from neighbors. Witness demonstration project and how well it fits in their neighborhood.

Budget:

For this grant the City of Cranston did not use grant funding or match for staff and other City resources or to claim any indirect costs for the management of this project. This maximized the value of the SNEP investment in this project to preparing deliverables. The City provided its match as cash as funded by the City's existing budget.

Cost Item or Category	Cost Basis	RAE SNEP Request	Total Non-Fed Match	Match Source	Total Project Cost
Contractual					
Environmental Engineering Consultant	QAPP Development Spectacle Pond Feasibility Study and Bioretention Basin Designs	\$146,250	\$48,750	Cash from City Budget	\$195,000
General Contractor for Bioretention Basin Construction and Engineering	Construction of Bioretention Basin	\$41,250	\$13,750	Cash from City Budget	\$55,000
Total Contractual		\$187,500	\$62,500		\$250,000

Spectacle Pond Limnological Investigation:

The Limnological Investigation was finalized in December of 2022. For background, the estimated phosphorus load to Spectacle Pond is 476 lbs/year. The Total Maximum Daily Loads for Phosphorus to Address 9 Eutrophic Ponds in Rhode Island (TMDL) completed by RIDEM (September 2007) required that the phosphorus load be reduced by 326 lbs/yr, a 68% reduction. The Limnological Investigation was conducted to estimate the relative contribution of internal cycling to total phosphorus loading in the pond. This was achieved by collecting bathymetric data, sediment and water quality sampling, and calculating of internal loading. The results of the study indicate that only 1% of the phosphorus loading or approximately 5.6lbs is from internal sources. External sources including those from stormwater runoff, inlet sources, and waterfowl dominate the P loading at 99%. This study also explored recommendations including infiltration systems, tree filters, bioswales, and limiting access of waterfowl to areas that drain to pond. More detailed review of potential external treatment options was explored in the Spectacle Pond Phosphorus Reduction Plan.

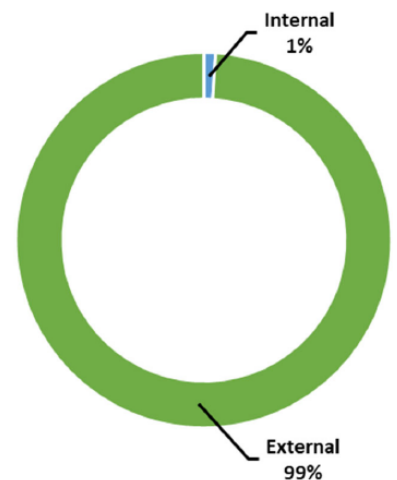


Figure 5-1: Relative Contributions of Internal and External Loading

Construction

- In April of 2022 competitive bids were received from three qualified contractors. Universal Excavating, INC was the lowest bidder at \$94,500.00 and was selected by the City to install the stormwater control. Based on the design the underground stormwater treatment unit removes approximately 0.52 lbs of total phosphorus per year.
- In October, 2022 Universal Excavating Inc. mobilized and has ordered materials for the project. There were delays in the construction of the underground infiltration due mainly to delays in the availability of the proprietary manhole structure, acting as the sediment forebay. The contractor and the DPW communicated with the neighbors on schedule and any coordination.
- Construction occurred over a three-day period with final restoration completed on October 31, 2022.
- \$87,350 was spent on the construction of the underground infiltration stormwater treatment unit which include installation of two manholes with proprietary swirl inserts and three rows of underground infiltration chambers. The bid price of \$94,500 was reduced because it was determined during construction that the replacement of the sewer main and associated sewer street laterals are in sound condition. The City match was originally budgeted at \$13,750 but due to the increase bid pricing (mentioned above) increased to \$46,100.00. This increase resulted in the City providing an additional match of \$32,350.

Outreach Communications and Project Partners:

- Public meetings were held on at the end of Barrett Street on and October 26, 2022 to discuss the Barrett Street water quality improvement project. An initial invite was sent for an October 13, 2022 meeting onsite however, there was a significant rain event requiring it to be rescheduled.
- The City and FandO solicited input from Save the Bay regarding demonstration site selection included input from Save the Bay. Save the Bay also participated in the outreach activity on October 26, 2022. The City is grateful for the partnership we have with Save the Bay. Specifically, Wenley Ferguson productive review and input produces an improved result.

Spectacle Pond Phosphorus Reduction Plan:

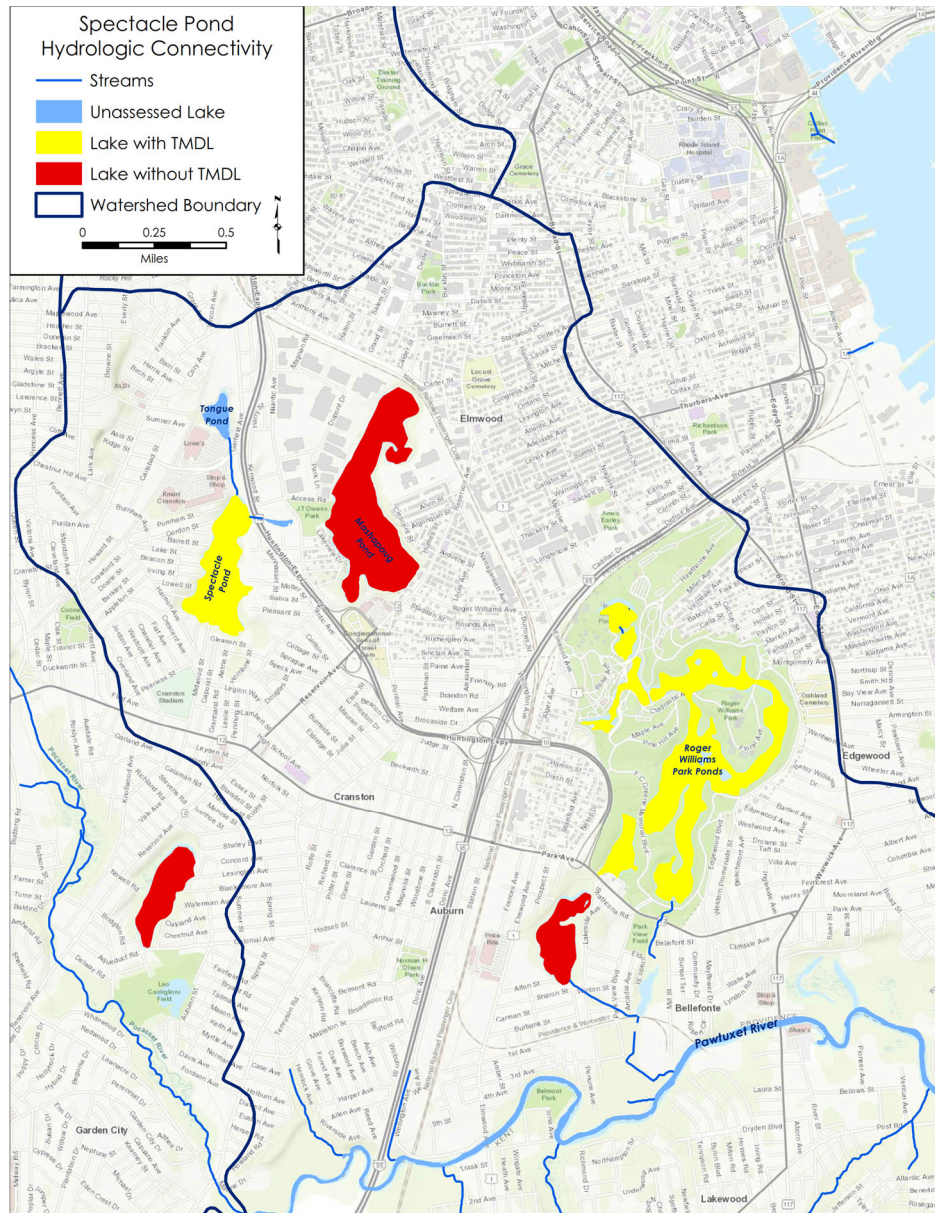
The phosphorus reduction plan was developed through desktop review and site visits. Fourteen (14) locations were selected for consideration. Structural and non-structural BMPs were evaluated for the identified sites. Partnership opportunities were evaluated including Twin Oaks, RIDOT, and Stadium Elementary School. Cost estimates were developed with an estimated \$1.85 million in structural projects. The following expected benefits were calculated if all the structural improvements were implemented:

- Total phosphorus removal of 7.8 lbs
- TSS load reduction of 4,195 lbs

It is important to note these costs do not consider the ongoing costs associated with long term operation and maintenance which increases the operating budget of and utilization of City resources. With extremely tight City budgets and the return on investment on a per lb removal basis it will be challenging to secure City match for continued investment in these structural measures. The City will be working closely with RIDEM, funding organizations, and seeking out collaborative partners to make water quality improvements more manageable.

MAPS, PHOTOS, DRAWINGS, AND ADDITIONAL INFORMATION

Spectacle Pond Location Relative to Mashapaug and Roger Williams Park Ponds



Dead end portion of Barrett Street selected for the underground infiltration stormwater treatment unit.

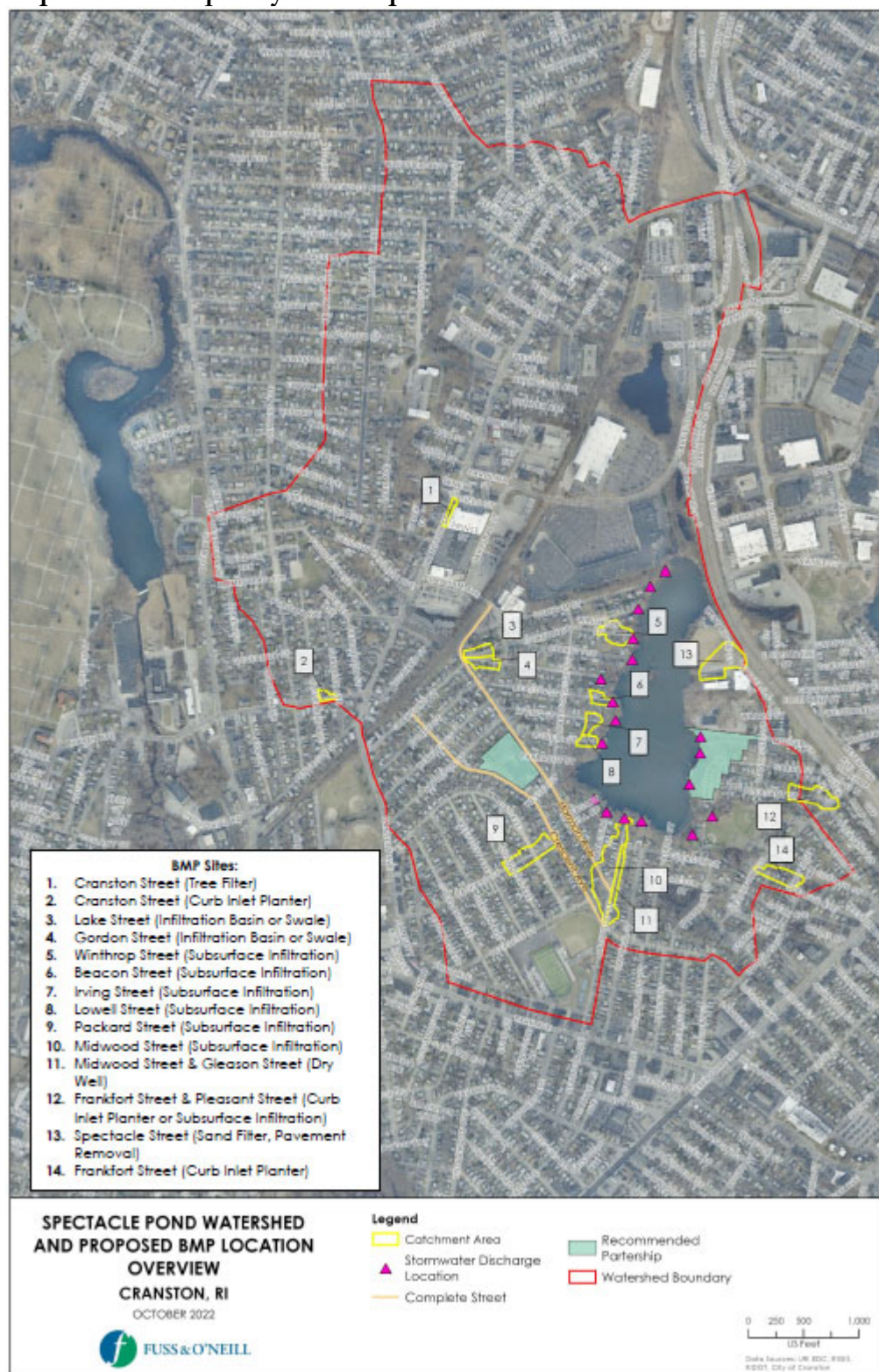


Test pits were dug at the end of Winthrop Street and Barrett Street by Cranston DPW staff.



[illegible]

Fourteen locations identified in the Phosphorus Reduction Plan for future consideration to improve water quality in the Spectacle Pond watershed:



SNEP Watershed Grants City of Cranston Progress Report

1. Cover Information

January 30, 2023

Comprehensive Watershed Planning and Green Infrastructure Demonstration Project at
Spectacle Pond, Cranston, RI
Contract Number: SNEPWG19-2-CRAN
September 1, 2019 – February 28, 2022
(extension granted to December 31, 2022)

City of Cranston, Rhode Island
Edward Tally
401-780-3173
etally@cranstonRI.org

Report type:

Final – (Progress Report # 7 – July 1, 2022 – December 31, 2022)

2. Project Report Narrative

This project provided a prioritized plan to reduce nutrient loadings and improve water quality to the impaired Spectacle Pond as well as improve conditions in Mashapaug and Roger Williams Park Ponds further downstream. The project included the construction of a demonstration green infrastructure project in an urban neighborhood to build support for long-term implementation of the plan. The following sections outline the activities the City has undertaken in this project and within this reporting period.

2.A. Results & Progress to Date

The City finalized the contractual activities during this reporting period. Outreach, construction, and final reports were the focus. A more detailed outline of activities throughout the project are listed below:

- During January and February 2020, Fuss & O'Neill developed a QAPP to support data collection activities for the project. The QAPP detailed the methods to be used, the QA/QC to be applied, and the way in which the data will be used to reach conclusions. Fuss & O'Neill followed the QAPP guidance provided by the United States Environmental Protection Agency (US EPA), including *Guidance for Quality Assurance Project Plan* (USEPA, 2001) in development of the QAPP.

- During February 2020, Fuss & O'Neill submitted a draft of the QAPP to Restore America's Estuaries (RAE) and the US EPA for review.
- On March 11, 2020, the US EPA finished reviewing QAPP and responded to Fuss & O'Neill with a list of comments that required clarification.
- The QAPP was finalized based on the comments received by the US EPA and approved by RAE on March 20, 2020 and the US EPA on March 24, 2020.
- During March and April 2020, Fuss & O'Neill reviewed available information on water quality, stormwater infrastructure, and land use within the Spectacle Pond Watershed. Information was collected and reviewed from available water quality data from RIDEM, Rhode Island Watershed Watch, RIGIS, RIDOT, and the City of Cranston's GIS database.
- Prior to sampling, Fuss & O'Neill staff performed field reconnaissance in the study area to locate outfalls and safe access for staff and equipment for water sampling.
- During March and April 2020, Fuss & O'Neill conducted targeted field assessments to further assess watershed conditions, critical resource areas, and potential sediment and nutrient sources. The field assessments helped to identify restoration, pollution prevention, and retrofit opportunities in the stream corridor and upland portions of the watershed to reduce watershed sediment and nutrient loads to the pond. Field assessments were conducted using standards methods and protocols that were detailed in the QAPP. Fuss & O'Neill used the data review and field assessments to determine watershed conditions, areas of potential pollutant sources, and opportunities for nutrient management conditions.
- Prior to sampling, Fuss & O'Neill staff performed field reconnaissance in the study area to locate outfalls and safe access for staff and equipment for water sampling.
- Starting in May 2020, water quality sampling activities were conducted to support the assessment of existing pond trophic status and quantification of nutrient loading from input tributaries and bottom sediment. Methodologies used generally followed the guidance provided in the US EPA *Lake and Reservoir Restoration Guidance Manual* (USEPA, 1990), the University of Rhode Island Watershed Watch Monitoring Manuals (URIWW, 2012; 2013), and the US EPA's volunteer monitoring guidance (USEPA, 1997) and are detailed in the QAPP.
- Three dry weather water sampling events were conducted from May 1 - June 30, 2020. The sampling events occurred on May 8 and 28 and June 26, 2020. Water sampling was originally proposed to begin in April 2020 but the on-set of the COVID-19 pandemic caused Fuss & O'Neill to reschedule the April sampling event to the beginning of May. During the sampling events, water samples were collected from multiple areas around Spectacle Pond and the inlet from Tongue Pond. Nine stormwater outfalls and surface runoff locations were sampled for nutrients, estimated flow, and in-situ water quality parameters including water temperature, dissolved oxygen (DO), and conductivity.
- In-Lake water sampling did not occur during the first two sampling events due to the inability to socially distance two samplers in a boat. However, in-lake sampling did occur during the third sampling event conducted on June 26, 2020.

- Two dry weather and two wet weather water sampling events were conducted from July 1 – November 1, 2020. The dry weather sampling events occurred on July 30 and August 26, 2020. The wet weather sampling events occurred on October 12 and 29, 2020. During the sampling events, water samples were collected from multiple areas around and within Spectacle Pond and the inlet from Tongue Pond. Nine stormwater outfalls and surface runoff locations, as well as one in-pond location, were sampled for nutrients, estimated flow, and in-situ water quality parameters including water temperature, dissolved oxygen (DO), and conductivity.
- One sediment sampling event was conducted on August 26, 2020. Three locations within the pond were sampled for nutrients, including phosphorus and organic matter content.
- Analytical and in-situ data collected during the water quality and sediment sampling events was used to estimate the phosphorus budget of the pond and develop a phosphorous reduction plan.
- A *Stormwater Best Management Practices Conceptual Plan* was developed in October 2020. The plan includes an approximate cost for design, permitting, and construction for proposed best management practices.
- Stormwater BMP selection was conducted, and a dry-well infiltration system was selected for the end of Barrett Street, on the western shore of the pond. Winthrop Street was selected as a backup location, or a potential second BMP installation location should funding be sufficient.
- Some additional water quality sampling was conducted to collect data related to temperature and dissolved oxygen at depth during the spring. Due to COVID-19 in the spring of 2020 it was not possible to collect these profiles.
- Subsurface investigations (test pits) were conducted at two locations selected for BMP construction. (photos previously attached)
- Design, cost estimates, and permitting documents have been prepared for Barrett Street, the location selected for installation of an underground stormwater treatment structure. (files previously attached)
- Design, cost estimates, and permitting documents have been prepared for Barrett Street, the location selected for installation of an underground stormwater treatment structure. (files previously attached)
- Prepare and submit a preliminary Determination Application and associated materials to Freshwater Wetlands Division of RIDEM (file attached)
- Fuss & O'Neill has submitted the final report related to the water quality and sediment quality investigations.
- Early on in the process Fuss and O'Neill desktop analysis identified six (6) potential streets/locations where stormwater BMP's could be implemented on a neighborhood wide potential locations for Green Infrastructure improvements,
- In May of 2021 two locations were evaluated for suitable soils. The City provided the excavator and operator to dig test pits at the end of the roadway at Winthrop Street and Barrett Street. Fuss and O'Neill conducted the soil evaluations. Ultimately, due to site conditions, treatable watershed area, and spacial considerations Barrett Street was chosen as the location for the underground stormwater treatment unit.

- Design, cost estimates, and permitting documents were prepared for Barrett Street, the location selected for installation of an underground stormwater treatment structure. Based on the design the underground stormwater treatment unit removes approximately 0.52 lbs of total phosphorus per year. (files previously attached)
- A Preliminary Determination Application and associated materials to Freshwater Wetlands Division of RIDEM (file previously attached)
- In April of 2022 competitive bids were received from three qualified contractors. Universal Excavating, INC was the lowest bidder at \$94,500.00 and was selected by the City to install the stormwater control.
- In October, 2022 Universal Excavating Inc. mobilized and ordered materials for the project. There were delays in the construction of the underground infiltration due mainly to delays in the availability of the proprietary manhole structure, acting as the sediment forebay. The contractor and the DPW communicated with the neighbors on schedule and any coordination.
- Construction occurred over a three-day period with final restoration completed on October 31, 2022.
- During the reporting period the City met with the neighbors during outreach and construction. The City and the contractor were able to successfully accommodate the impacted neighbors for access to their homes and address other DPW concerns. An example was the relocation of the guardrail at the end of the roadway approximately five (5) feet to provide additional space to mitigate the snow pack at the end of the road that would occasionally block a driveway. The City views the buy-in from the neighborhood as an important outcome. The DPW strives to be an entity that is trust-worthy, follows through, and assists constituents when possible.
- Spectacle Pond Limnological Investigation: The Limnological Investigation was finalized during this reporting period. For background, the estimated phosphorus load to Spectacle Pond is 476 lbs/year. The Total Maximum Daily Loads for Phosphorus to Address 9 Eutrophic Ponds in Rhode Island (TMDL) completed by RIDEM (September 2007) required that the phosphorus load be reduced by 326 lbs/yr, a 68% reduction. The Limnological Investigation was conducted to estimate the relative contribution of internal cycling to total phosphorus loading in the pond. This was achieved by collecting bathymetric data, sediment, and water quality sampling, and calculating of internal loading. The results of the study indicate that only 1% of the phosphorus loading or approximately 5.6lbs is from internal sources. External sources including those from stormwater runoff, inlet sources, and waterfowl dominate the P loading at 99%. This study also explored recommendations including infiltration systems, tree filters, bioswales, and limiting access of waterfowl to areas that drain to pond. More detailed review of potential external treatment options was explored in the Spectacle Pond Phosphorus Reduction Plan.
- Spectacle Pond Phosphorus Reduction Plan: During the reporting period this plan was reviewed and finalized desktop review and site visits were completed. Fourteen (14) sites were selected for consideration. Structural and non-structural BMPs were evaluated for the identified sites. Partnership

opportunities were evaluated including Twin Oaks, RIDOT, and Stadium Elementary School. The following expected benefits were calculated if all of the structural improvements were implemented:

- Total phosphorus removal of 7.8 lbs
- TSS load reduction of 4,195 lbs

It is important to note these costs do not consider the ongoing costs associated with long term operation and maintenance which increases the operating budget of and utilization of City resources. With an extremely tight City budgets and the return on investment on a per lb removal basis it will be challenging to secure City match for continued investment of structural measures. The City will be working closely with RIDEM, funding organizations, and seeking out collaborative partners to make water quality improvements more manageable.

2.B. Work Remaining Under Current Contract

The major tasks of the project are outlined below. All tasks have been completed.

TASKS	STATUS
Task 1: QAPP	Complete
Task 2: Phosphorus Reduction Study	Complete
Task 2.1: Data Gathering and Review	Complete
Task 2.2: Water Quality and Sediment Sampling	Complete
Task 2.3: Phosphorus Budget	Complete
Task 2.4: Water Quality Restoration Strategies	Complete
Task 2.5: Final Report	Complete
Task 3: Demonstration Project Approach and Location	Complete
Task 3.1: Bioretention Basin Alternatives	Complete
Task 3.2: Demonstration Site Selection	Complete
Task 4: Demonstration Project Design	Complete
Task 4.1: Collect Existing Conditions Information	Complete
Task 4.2: Preliminary Design and Opinion of Cost	Complete
Task 4.3: Final Design	Complete
Task 5: Bidding and Construction	Complete
Task 6: Community Outreach and Support	Complete

2.C. Compliance

The QAPP was submitted to RAE and US EPA during February 2020 by Fuss & O'Neill. The QAPP was approved by RAE on March 20, 2020 and the US EPA on March 24, 2020.

Permit documents were prepared for permitting infiltration at the selected BMP location.

October 2021 an Application for Stormwater Construction Permit and Water Quality Certification was submitted.

On March 8, 2022 an Insignificant Alteration- Permit was received from RIDEM

On December 21, 2021 the City requested and received a contract extension to June 30, 2022 due to the following reasons:

- The COVID-19 pandemic created challenges in completing our outreach activities;
- The City's environmental engineering consulting firm, Fuss and O'Neill, experienced early delays in sampling and field activities due to COVID-19 protocols; and
- A contracted professional limnologist experienced delays in analyzing pond data therefore delaying reporting results.

A second contract extension was requested and granted until October 31, 2022 for the following reasons:

- Construction contractor experienced longer than anticipated lead times for equipment related to the infiltration chamber construction

A third extension contract extension was requested and granted until December 31, 2022 for the following reasons:

- Additional time to process final invoicing and the final review of the Limnological Investigation Report and Spectacle Pond Phosphorus Reduction Plan

A site inspection was conducted by the Director of SNEP Watershed Implementation Grants, Tom Ardito, on November 17, 2022. During the site visit plans were reviewed and the work was inspected.

2.D. Project Partners

The City has been in contact with the project partner (F&O) to advise them on the execution of the QAPP and the phosphorous reduction study. The City and F&O solicited input from Save the Bay regarding demonstration site selection included input from Save the Bay. Save the Bay also participated in the outreach activity on October 26, 2022. The City is grateful for the partnership we have with Save the Bay. Specifically, Wenley Ferguson, who provided valuable input and improved outcome.

2.E. Volunteer and Community Involvement

No volunteer and community involvement activities were undertaken during the reporting period.

2.F. Outreach & Communications

Public meetings were held on at the end of Barrett Street on and October 26, 2022 to discuss the Barrett Street water quality improvement project. A copy of the outreach material is included in the supporting details. An initial invite was sent for an October 13, 2022 meeting onsite however, there was a significant rain event and it needed to be rescheduled.

3. Project Budget Report

The funds that were expended during the reporting period are shown in the budget tables below.

3.A. Summary Budget Tables

Summary Budget Table 1: Expenditures by Federal Cost Category

Budget Category	Total Budgeted Funds	Total Budgeted Match	Grant Funds Expended This Period	Grant Funds Expended Cumulative	Match Funds Expended This Period	Match Funds Expended Cumulative	Match Source (note cash or in-kind)
Personnel							
Fringe							
Travel							
Equipment							
Supplies							
Contractual							
Environmental Engineering Consultant	\$146,250	\$48,750	\$16,867.50	\$143,647.50	\$5,622.50	\$47,882.50	Cash
General Contractor for Bioretention Basin Construction and Engineering	\$41,250	\$13,750	\$41,250.00	\$41,250.00	\$46,100.00	\$46,100.00	Cash
Subtotal Contractual	\$187,500	\$62,500	\$58,117.50	\$184,897.50	\$51,722.50	\$93,982.50	
Other							
Total Direct	\$187,500	\$62,500	\$58,117.50	\$184,897.50	\$51,722.50	\$93,982.50	
Indirect							
Total	\$187,500	\$62,500	\$58,117.50	\$184,897.50	\$51,722.50	\$93,982.50	

Summary Budget Table 2: Expenditures by Project Task (Grant Funds Only)

Budget Category	Budgeted Grant Funds	Expended Progress Period 1	Expended Progress Period 2	Expended Progress Period 3	Expended Progress Period 4	Expended Progress Period 5	Expended Progress Period 6	Actual Expended to Date
Task 1 – Environmental Consultant	\$146,250	\$25,878.75	\$46,807.50	\$30,367.50	\$0	\$23,726.25	\$16,867.50	\$143,647.50
Task 2 – Construction & Engineering	\$41,250	\$0	\$0	\$0	\$0	\$0	\$41,250.00	\$41,250.00
Total	\$62,500	\$25,878.75	\$46,807.50	\$30,367.50	\$0	\$23,726.25	\$58,117.50	\$184,897.50

3.B. Budget Narrative

The City of Cranston has not proposed to use grant funding or match for staff and other City resources for the management of this project. While the exact amount of time of City staff was not tracked implementing this project required a significant commitment of City time. The staff completed reports, attended meetings, completed site visits, coordinated test pit activities, mobilized excavators, created mailing lists and sent outreach materials, attended outreach activities, procured the engineering firm and construction firm, tracked billing and invoices. To maximize the value of the work that can be completed under the grant funding, the City provided its match as funded by the City's existing budget. Work invoiced for this reporting period totals \$109,840.00.

Contractual Environmental Engineering Budget:

During this reporting period \$22,490 was spent on the category. In total, \$191,530.00 was expended. The Limnological Investigation, Phosphorus Reduction Plan, and stormwater control design are valuable tools the City will use in the future to inform its decisions. The City is pleased to report the total billed amount came in slightly under budget.

General Contractor for Underground Infiltration Stormwater Treatment Unit:

During this reporting period \$87,350 was spent on this category. This work included the construction of the Underground Infiltration Stormwater Treatment unit which include installation of two manholes with proprietary swirl inserts and three rows of underground infiltration chambers. The bid price of \$94,500 was reduced because it was determined during construction that the replacement of the sewer main and associated sewer street laterals were in sound condition. A total of \$41,250 is eligible to be reimbursed by grant funds. The City match was originally budgeted at \$13,750 but due to the increase bid pricing (mentioned above) increased to \$46,100.00. This increase resulted in the City providing an additional match of \$32,350.

The City has produced a final invoice (#4) under separate cover to RAE in the amount of \$58,117.50. This amount represents 75% of the eligible funds expended this reporting period.

4. Supporting Materials

The following supporting materials are attached to this report:

- Spectacle Pond Phosphorus Reduction Plan – October, 2022 Final Report
- Spectacle Pond Limnological Investigation, December 2022
- Green Infrastructure Outreach Meeting Poster, October 2022

5. Certification

The undersigned verifies that the descriptions of activities and expenditures in this progress report are accurate to the best of my knowledge; and that the activities were conducted in agreement with the grant contract. I also understand that matching fund levels established in the grant contract must be met.

By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and objectives set forth in the terms and conditions of the Federal award. I am aware that any false, fictitious, or fraudulent information, or the omission of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (U.S. Code Title 18, Section 1001 and Title 31, Sections 3729–3730 and 3801–3812).

Grantee Signature:


Edward Tally

Environmental Program Manager

City of Cranston

Date: 2/17/23



Come learn what the City of Cranston is doing to improve water quality in Spectacle Pond!

Wednesday, October 26, 2022

5:00 to 6:00pm

End of Barrett Street
Cranston, RI



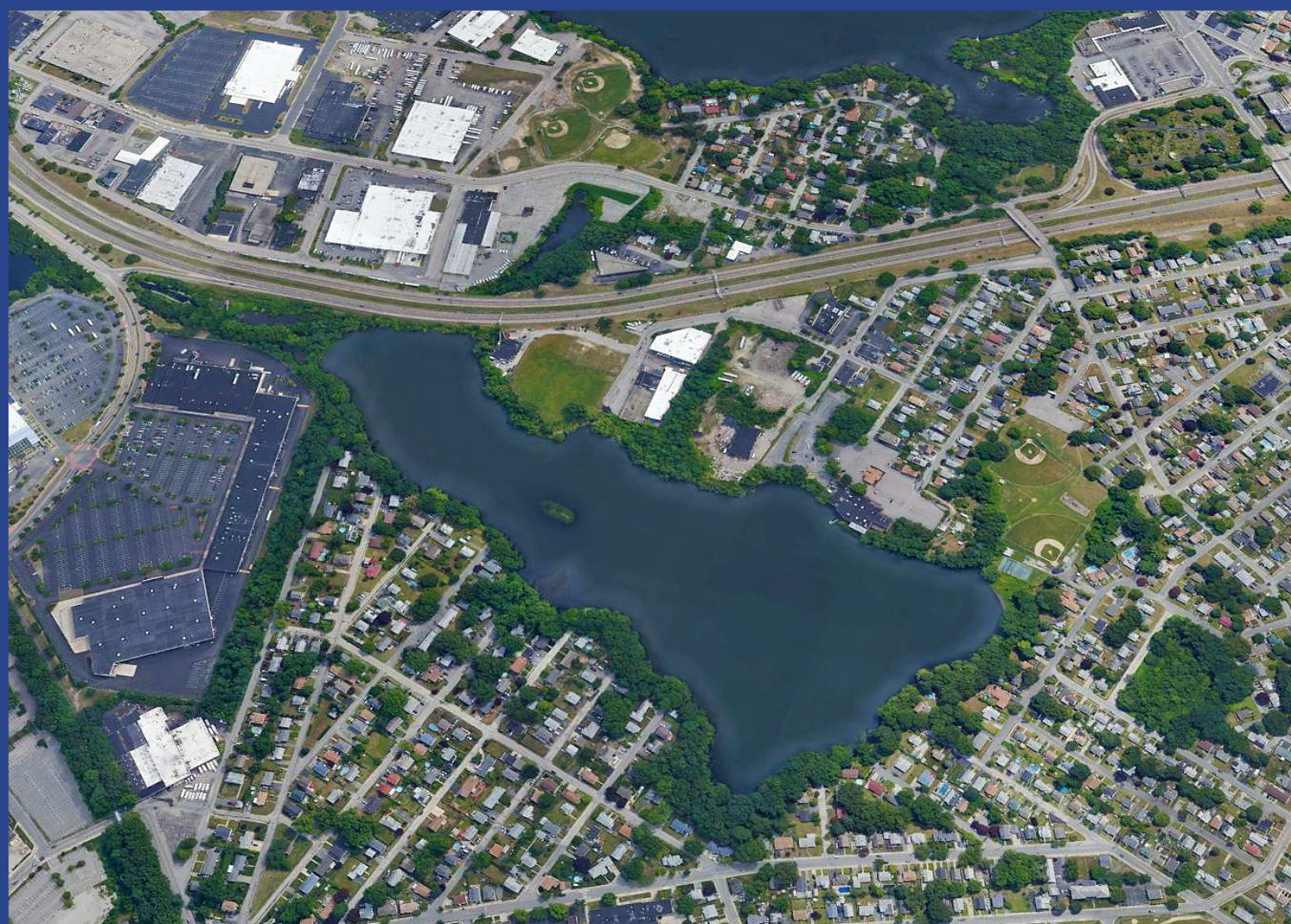
Hear from experts in the field!

Learn more about the Barrett Street water quality improvement project. Including the proposed construction of a subsurface infiltration system.



To Register, please email: etally@cranstonri.gov

Presented by the City of Cranston and Fuss & O'Neill, as part of Southeast New England Program (SNEP).



Spectacle Pond Phosphorus Reduction Plan

City of Cranston, Rhode Island

OCTOBER 2022



FUSS & O'NEILL

317 Iron Horse Way | Suite 204 | Providence, RI 02908

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Spectacle Pond Phosphorus Reduction Plan

City of Cranston

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End of Report

1 Overview

The purpose of this Phosphorus Reduction Plan is to identify structural stormwater best management practices (BMPs) to reduce phosphorus and sediment loading to Spectacle Pond. Spectacle Pond (herein referred to as the Pond) is a freshwater body located in the City of Cranston, Rhode Island.

The Pond's watershed is approximately 638 acres, 65% of which is impervious (412 acres)¹. Residential properties are located to the west and south of the Pond and industrial and commercial properties occupy the northern and eastern shorelines. Throughout the watershed, the City of Cranston (the City) maintains an extensive network of drainage infrastructure that collects and discharges stormwater to seven outfalls. Based on the findings of the Spectacle Pond Limnological Investigation, completed by Fuss & O'Neill in 2020, the primary source of phosphorus, accounting for over 90% of the loading, is stormwater runoff from the Pond's densely developed watershed.

The Rhode Island Department of Environmental Management (RIDEM) established a Total Maximum Daily Load (TMDL) for phosphorus loading in September 2007. According to the TMDL analysis, the annual phosphorus load to maintain healthy water quality is 148 kg/year (326 lbs/yr), while the estimated current annual phosphorus load is 216 kg/year (476 lbs/yr).² To achieve the water quality standards outlined by RIDEM, a 68% annual phosphorus load reduction is required.

The City has already identified and implemented multiple structural and non-structural BMPs to reduce the phosphorus load on the Pond. Structural BMP projects at Speck Park, as well as, within the right-of-way at Pomham and Barrett Street have already been completed or are currently being designed. In addition to the installation of new structural BMPs, non-structural measures, such as ongoing maintenance of the existing drainage infrastructure, reduced wintertime sanding, and increased street sweeping, are all being used to reduce the discharge of sediment to the Pond. However, to meet the TMDL goals, additional opportunities to reduce phosphorus will be necessary and are the subject of this report.

2 Approach

The treatment approach recommended in this plan is focused on structural BMPs that infiltrate stormwater into the native soils. According to soil survey data available through the Natural Resources Conservation Service (NRCS), the soils in the Pond's watershed are typically sandy and well-draining, suitable for infiltration-style BMPs.³ The total phosphorus removal efficiency of infiltration BMPs is

¹ [*Spectacle, Mashapang, Roger Williams Park Ponds SCP, Spectacle Pond \(RI0006017L-07\), Cranston, RI*](#), Rhode Island Department of Transportation (RIDOT), December 30, 2017.

² [*Total Maximum Daily Loads for Phosphorus to Address 9 Eutrophic Ponds in Rhode Island \(TMDL\)*](#), Rhode Island Department of Environmental Management (RIDEM), September 2007.

³ [*US Department of Agriculture \(USDA\), Natural Resources Conservation Service \(NRCS\), Web Soil Survey*](#), July 31, 2019.

higher than that of filtration practices, such as bioretention.⁴ Because phosphorus is often transported with sediment, reducing sediment loading is also a priority. The City will maximize the total phosphorus load reduction per project dollar spent by prioritizing infiltration and sediment removal projects wherever practical. Therefore, a suite of structural infiltration BMPs were selected and sited for potential implementation based on the following criteria:

1. Effectively infiltrate stormwater into existing soils and remove sediment.
2. Minimal footprint within the City's right-of-way or publicly maintained space.
3. Relatively low maintenance requirements.
4. Are replicable (i.e., can seamlessly integrated into repaving, utility, and tree planting projects).

2.1 Desktop Review & Site Visits

To develop this plan, an initial desktop review of geospatial data within the Pond's watershed was completed to identify potential sites for structural BMPs, as well as to identify opportunities to remove existing pavement or other impervious surfaces. Several data sources were reviewed as part of the desktop review, including:

- Aerial Mapping (Spring 2021)
- City Stormwater Infrastructure
- City Utility Data (Currently available water and sewer data provided by the City.)
- Hydrologic Soil Group (HSG), NRCS Web Soil Survey (2022)
- RIGIS 2-ft Topography (2011)
- RIGIS 2020 Impervious Area (2022)
- Freshwater Wetlands (2021)

From the initial desktop review, six streets were identified as potential "Complete Streets," where stormwater BMPs could be implemented on a neighborhood-wide scale, and over 20 individual structural BMP locations were identified. Site visits were conducted by Fuss & O'Neill, on August 19, 2020, to refine the initial selection. The site visits were used to confirm the accuracy of the geospatial data as well as understand the unique site constraints and considerations for each proposed BMP. Elements reviewed and considered during site inspections included:

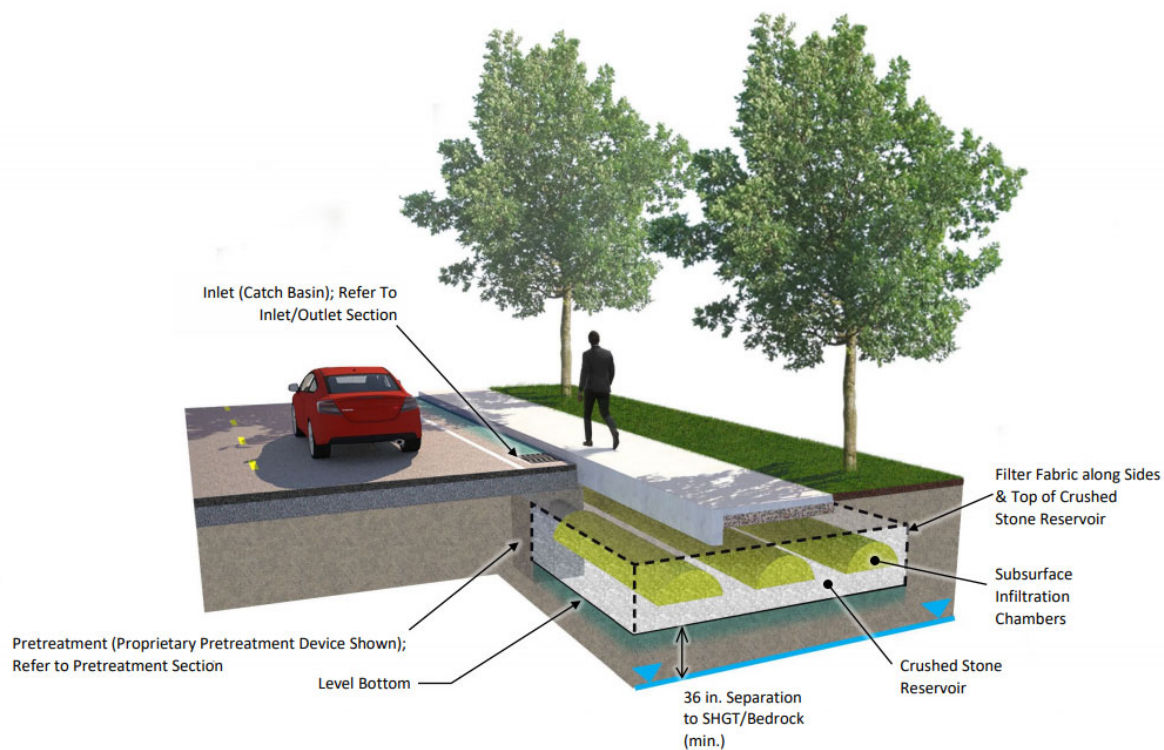
- Topographic slope
- Adjacent land use
- Ease of access for maintenance
- Conflicts with existing utilities
- Location of existing drainage infrastructure
- Indicators of Utilities (e.g., overhead wires, curb stops, and vales)

⁴ [*Table H-3 – Pollutant Removal Efficiency Rating Values for Water Quality BMPs, Rhode Island Stormwater Design and Installation Standards Manual*](#), RIDEM, Amended March 2015.

2.2 Structural BMP Selection

In order to ensure long-term operation and maintenance of any structural BMPs installed in the Spectacle Pond Watershed, types of practices were first reviewed and vetted with the City. Practices were evaluated on several criteria, including ease of maintenance, space requirements, phosphorus removal efficiency, and cost. Based on these conversations, five BMP types were identified and described in more detail below⁵.

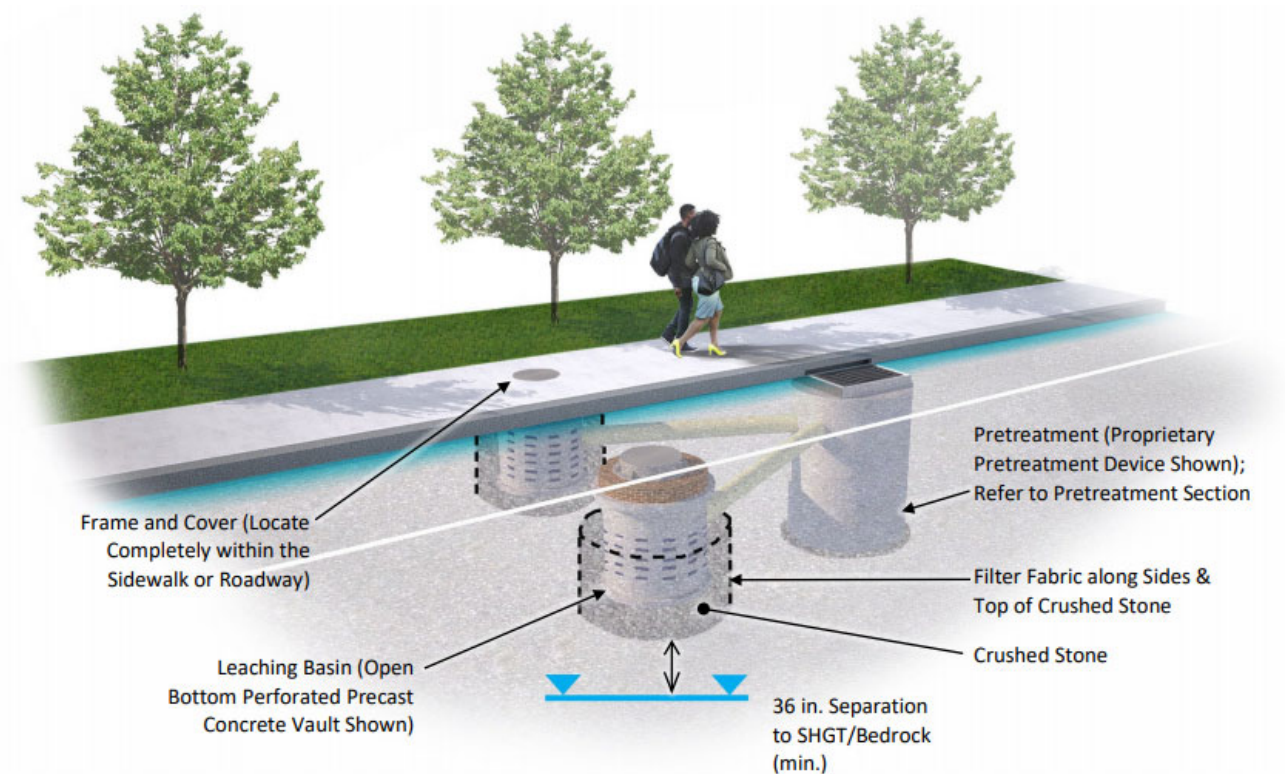
○ Subsurface Infiltration Systems



Subsurface infiltration systems consist of open-bottomed storage chambers in a crushed stone reservoir. The chamber and crushed stone reservoirs provide temporary storage for stormwater before it infiltrates into subsurface soils. These systems require pretreatment systems to remove oil, sediment, and debris before stormwater enters the infiltration system. Subsurface infiltration systems can vary in size, depending on the area of runoff treated. These systems require adequacy draining soils and separation from the existing groundwater table to be effective. Subsurface infiltration systems may be used in areas where surface structural BMPs are not feasible.

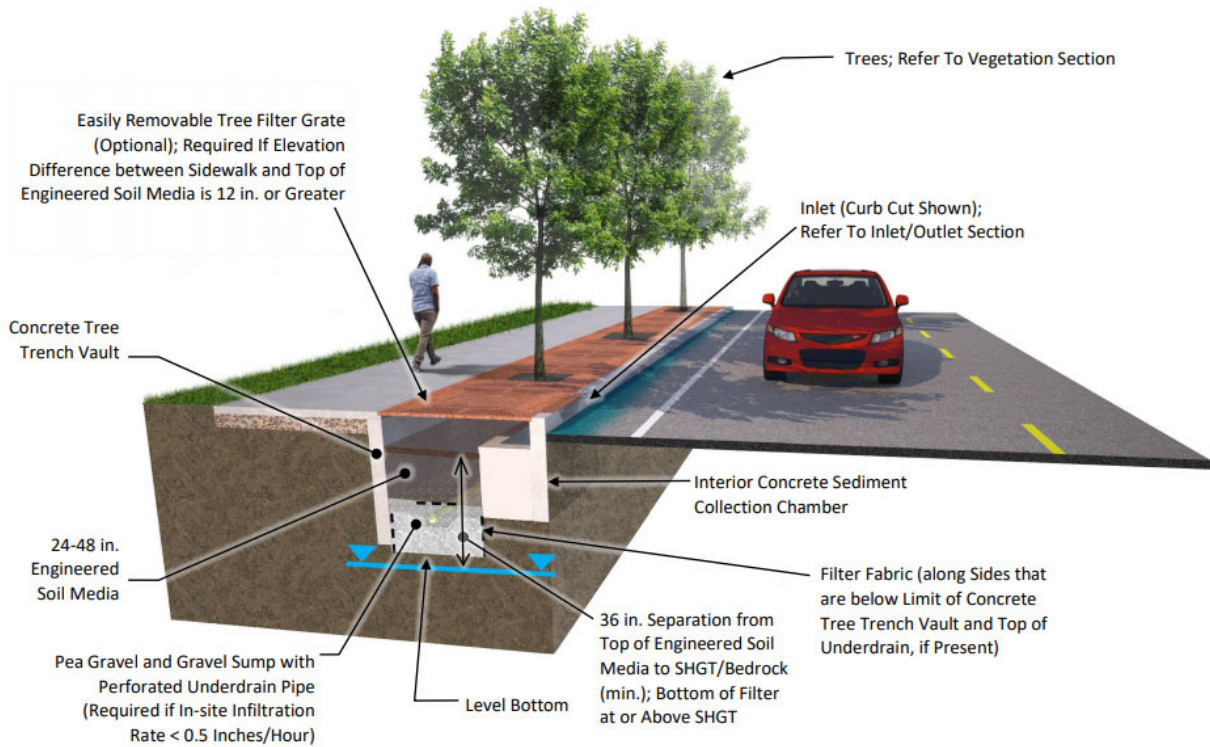
⁵ Structural BMP Illustrations are from the [RIDOT Linear Stormwater Manual](#), February 2019.

○ Drywells



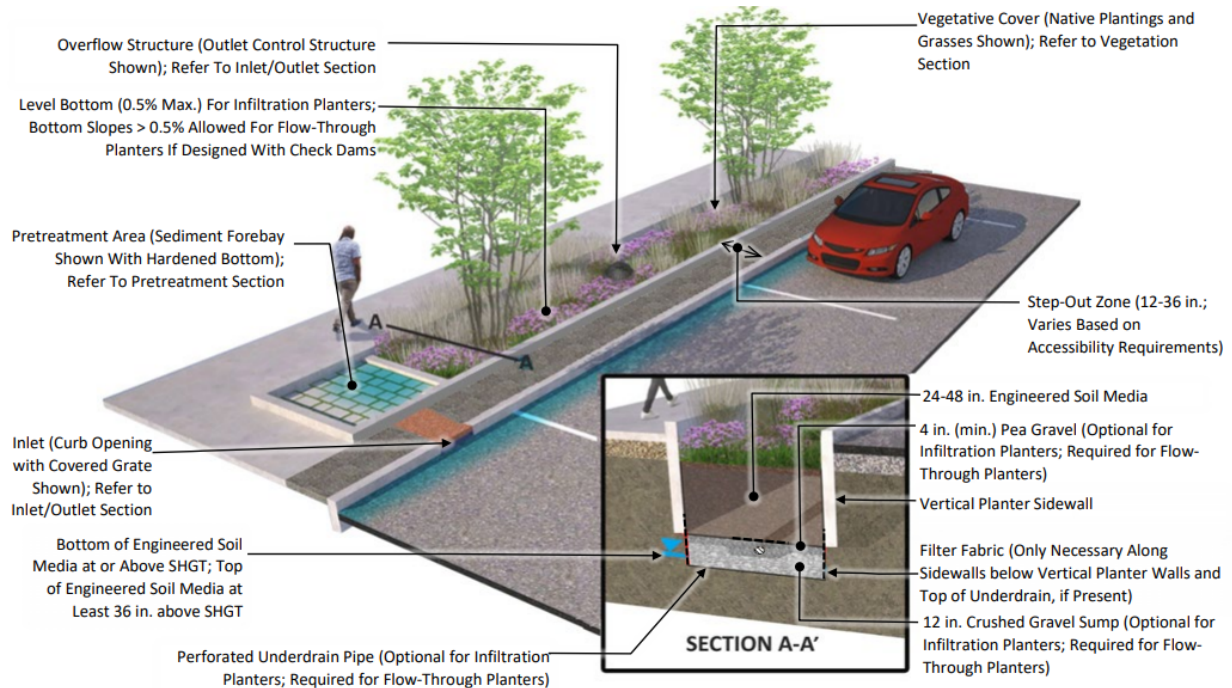
Similar to subsurface infiltration systems, drywells are underground structures that receive, temporarily store, and infiltrate stormwater from impervious surfaces. Drywells typically consist of concrete or plastic perforated chambers surrounded by gravel, which allows runoff to slowly infiltrate to the surrounding area. Drywells require soils and groundwater depths that are suitable for infiltration. Drywells also have a relatively small footprint and can be used in areas where surface structural BMPs are not feasible.

○ **Tree Filter**



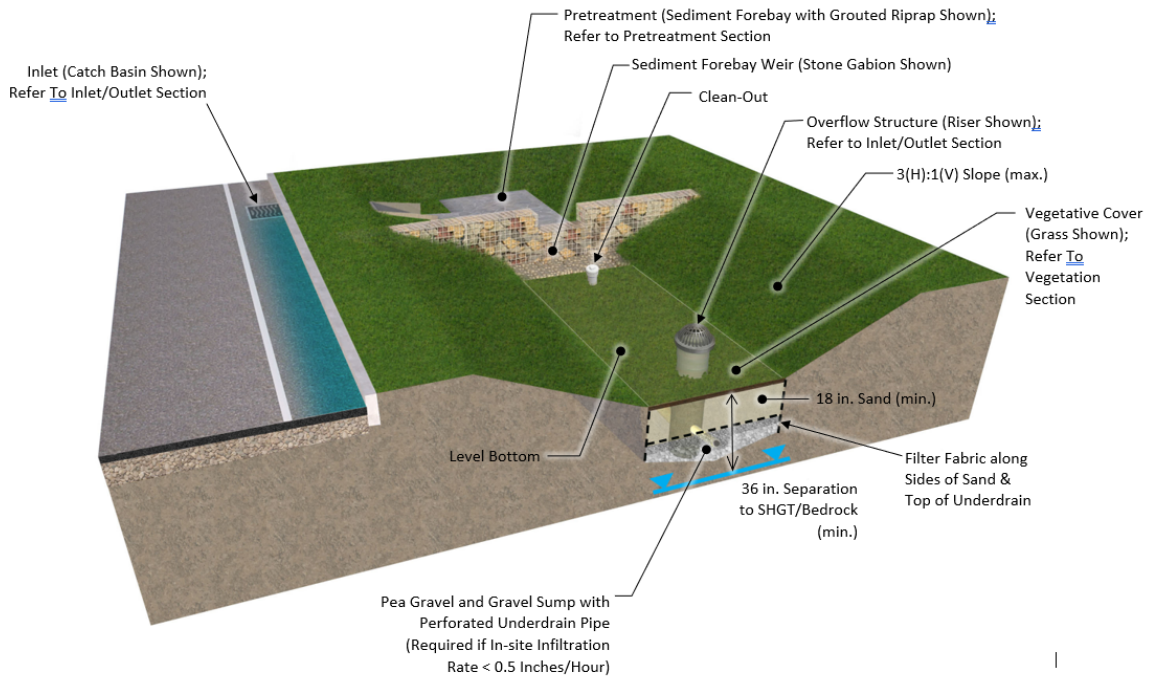
Tree filters are systems that house one or more trees and are filled with engineered soil media atop an optional drainage layer. Tree filters can be designed to infiltrate stormwater or treat stormwater before it discharges to an existing drainage network. These systems are typically installed in sidewalks, along curbs, or in parking lots. In addition to stormwater infiltration, tree filters can provide aesthetic benefits and additional shade coverage.

○ Curb In-let Planters



Curb inlet planters are a type of system that is located within the roadway right-of-way immediately adjoining roadway curbing. These systems have an engineered soil media below the surface of the planter that facilitates stormwater filtration and vegetative growth. These planters are frequently designed to infiltrate, typically referred to as infiltration planters, but can be designed with an underdrain to capture filtered water and assist with drainage from the system, typically referred to as flow-through planters.

○ Sand Filter



Sand filters are sand-filled basins or trenches that capture, temporarily store, and filter stormwater runoff. Sand filters require less space than other filtering practices but must be in designed areas with an adequate elevation difference between the inlet and outlet to efficiently move stormwater through the system. Sand filters have higher longevity than other filtering practices and are frequently designed to infiltrate. A typical sand filter design includes an overflow to allow large storm events to bypass the system without causing damage.

2.3 Non-Structural BMPs

In addition to the installation of new structural BMPs, non-structural BMPs, such as waterfowl management and public education, along with the ongoing maintenance and good housekeeping actions that the City currently undertakes, are important for protecting water quality on a watershed-wide scale.

Waterfowl

The TMDL identifies waterfowl as a major source of phosphorus in the Pond. Waterfowl, specifically resident flocks of geese that do not migrate, can become a nuisance and degrade water quality over time. Perimeter fencing and vegetated barriers are currently used by some property owners to inhibit waterfowl access to their properties. Feeding waterfowl is currently banned by RIDEM in Rhode Island. Informational signage detailing why feeding the waterfowl is banned is important to keep waterfowl from congregating in public areas. Coordination with RIDEM to reduce the waterfowl population is one mechanism that the City could use to manage waterfowl. Such efforts would require communication on a neighborhood-wide scale to ensure public support.

Privately Owned Impervious Area

While this report focuses on identifying potential structural BMPs that the City can execute and maintain within the public right-of-way, improvements on privately owned properties, including public education and outreach or public-private partnerships, have the potential for significant water quality impacts. Approximately 70% of the total impervious surface within the watershed is on private property (e.g., commercial parking lots, residential roofs and driveways, private walkways, etc.), while the other 30% is publicly owned and maintained (roadways, City and State-owned parcels, etc.). Potential partnership opportunities are discussed further below.

Communities within Rhode Island, and to a larger extent across New England, have used websites and social media platforms to educate residents on best management practices relating to stormwater management at their residences, including practices related to pet waste, lawn and grass clippings, fertilizer use, winter driveway maintenance, leaf litter, and waterfowl. One example is the Town of Ashland, MA, which produced an interactive ArcGIS storymap for residents on “dos” and “don’ts” relating to stormwater best management practices at home.⁷ Additionally, educational materials are available through the Massachusetts Think Blue campaign, which focuses on educating residents and businesses on ways to reduce pollution to local waterbodies.⁸ The Central Massachusetts Regional Stormwater Coalition (CMRSWC) also provides resources on effectively conducting social media outreach to spread awareness and educate residents on non-structural best management practices.⁹

⁷ Website: <https://storymaps.arcgis.com/stories/eb1dd8e42b574a509cadd8c80433b50d>

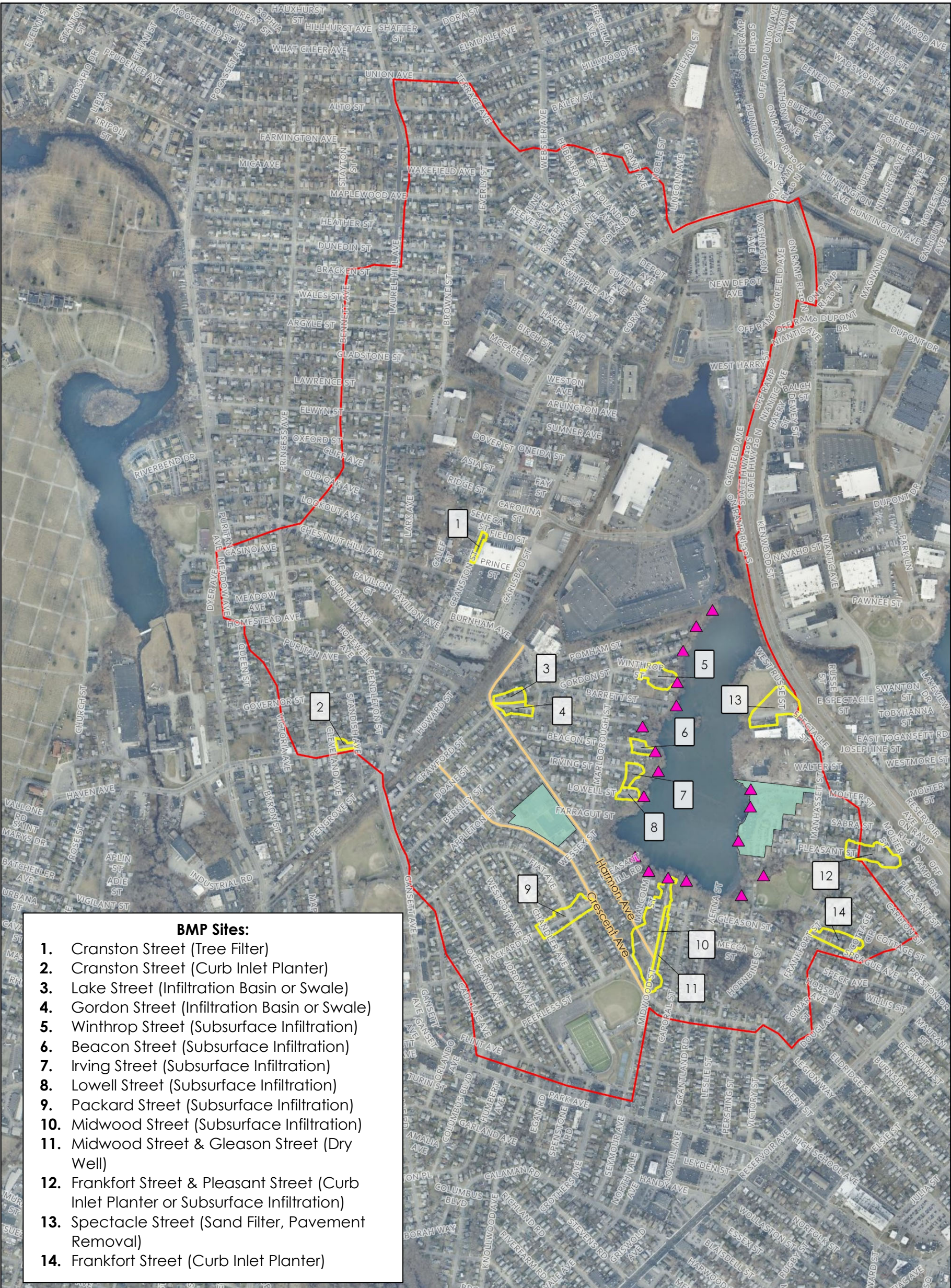
⁸ Website: <https://www.thinkbluemassachusetts.org/>

⁹ Website: <https://www.centralmastormwater.org/toolbox/pages/social-media-outreach>

3 Potential Structural BMP Locations

An overview of the BMP sites that have been identified for implementation is provided in *Figure 1*. The approximate footprint of each BMP within the right-of-way, a description of the system, and the corresponding contributing watersheds are provided in *Figures 2-15*. This study represents a conceptual-level assessment, future design phases are required for any selected BMP to provide a comprehensive understanding of its feasibility.

As shown in *Table 1*, not all locations have the available space to treat the entire water quality volume. However, due to the large impervious area treated, some of these sites still have the potential to significantly reduce pollutant loadings to the Pond. Because the Pond has a TMDL, the full water quality volume was the target volume for conceptual design (in accordance with Appendix C of the RI Stormwater Design and Installation Standards Manual, 2015). *Table 2* shows annual pollutant loadings and reductions for each of the BMPs.

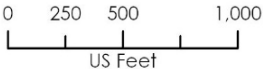


**SPECTACLE POND WATERSHED
AND PROPOSED BMP LOCATION
OVERVIEW
CRANSTON, RI**

OCTOBER 2022

Legend

- | | |
|---|---|
|  Catchment Area |  Recommended Partnership |
|  Stormwater Discharge Location |  Watershed Boundary |
|  Complete Street | |



Data Sources: URI EDC, RIGIS, RIDOT, City of Cranston

Spectacle Pond Phosphorus Reduction Plan Site 1. Cranston Street

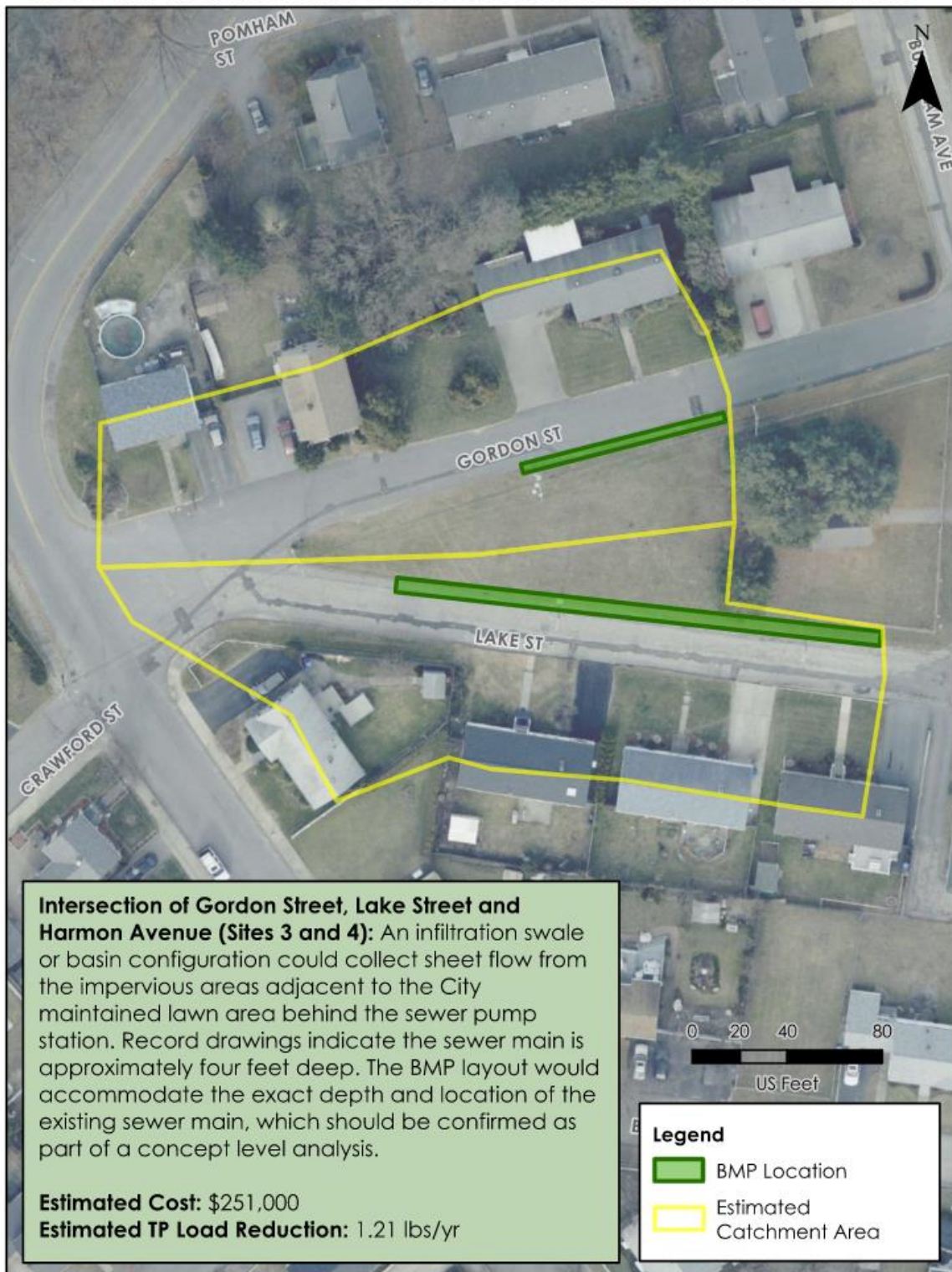


Spectacle Pond Phosphorus Reduction Plan Site 2. Cranston Street



Data Sources: URI EDC, RIGIS, RIDOT, City of Cranston

Spectacle Pond Phosphorus Reduction Plan
Sites 3 and 4. Intersection of Gordon Street, Lake Street and Harmon Avenue



Data Sources: URI EDC, RIGIS, RIDOT, City of Cranston

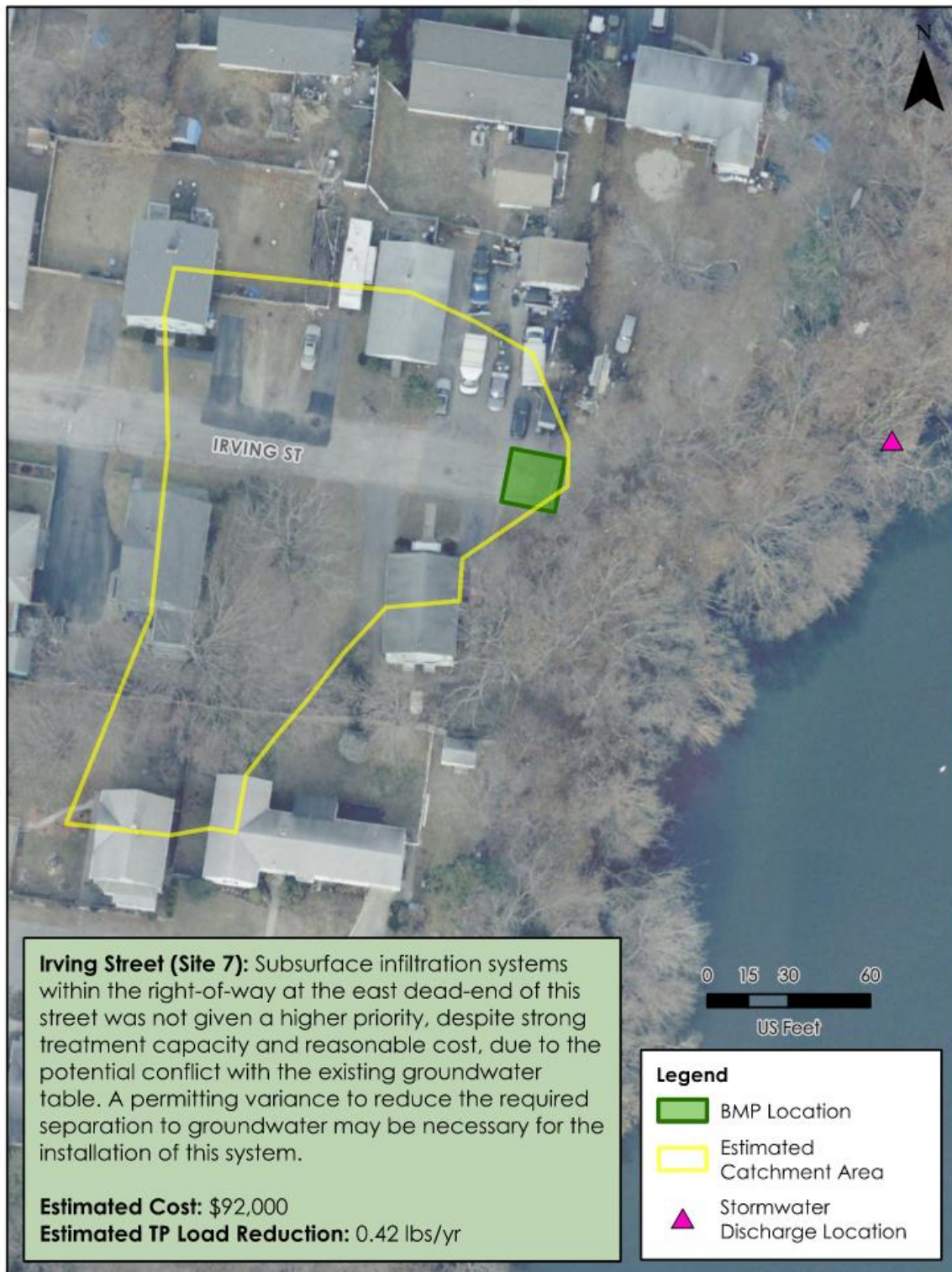
Spectacle Pond Phosphorus Reduction Plan Site 5. Winthrop Street



Spectacle Pond Phosphorus Reduction Plan Site 6. Beacon Street



Spectacle Pond Phosphorus Reduction Plan Site 7. Irving Street



Spectacle Pond Phosphorus Reduction Plan Site 8. Lowell Street



Spectacle Pond Phosphorus Reduction Plan Site 9. Packard Street



Spectacle Pond Phosphorus Reduction Plan Site 10. Midwood Street



Spectacle Pond Phosphorus Reduction Plan
Site 11. Intersection of Midwood Street and Gleason Street



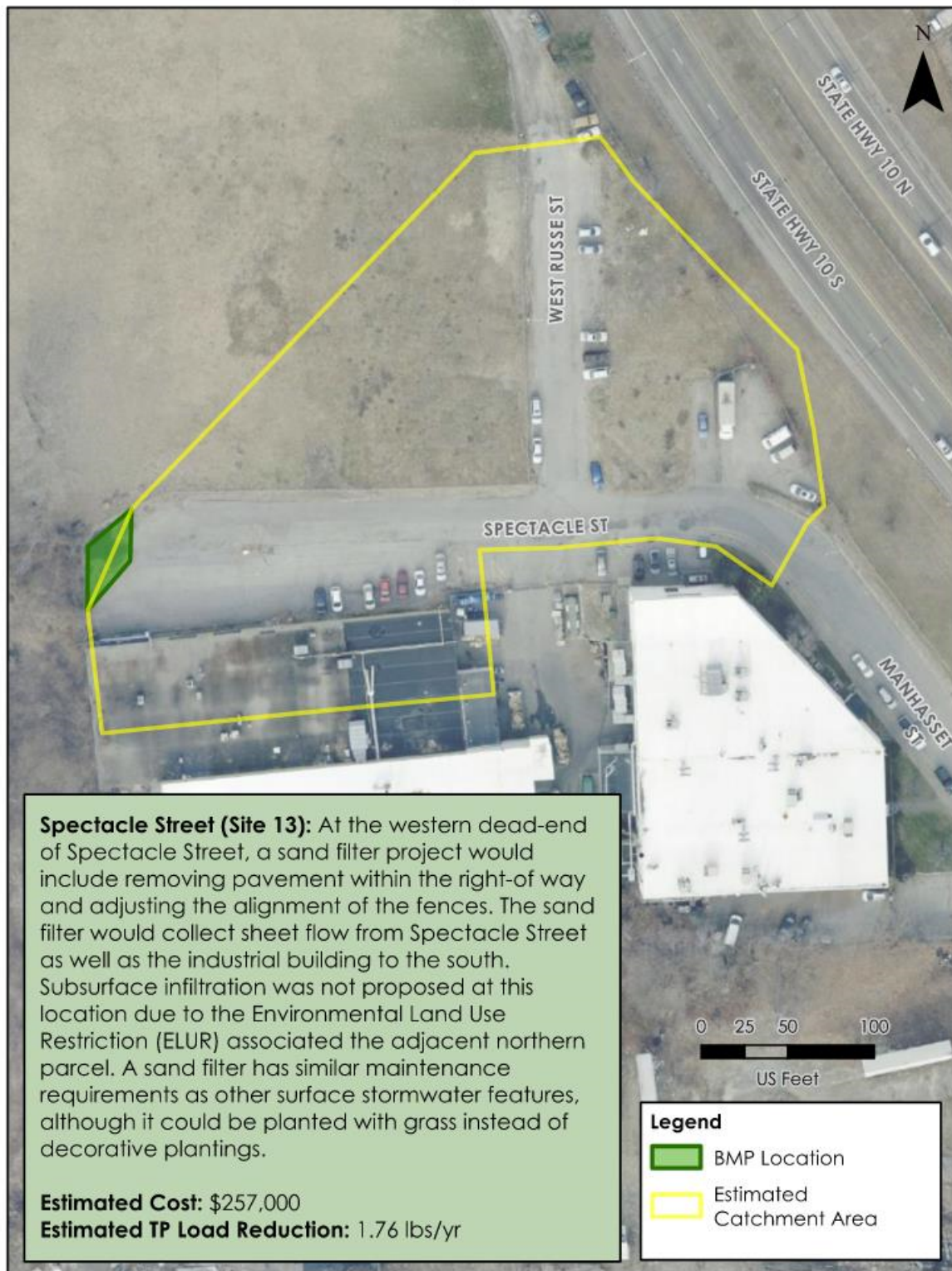
Data Sources: URI EDC, RIGIS, RIDOT, City of Cranston

**Spectacle Pond Phosphorus Reduction Plan
Site 12. Intersection of Frankfort Street and Pleasant Street**



Data Sources: URI EDC, RIGIS, RIDOT, City of Cranston

Spectacle Pond Phosphorus Reduction Plan Site 13. Spectacle Street



**Spectacle Pond Phosphorus Reduction Plan
Site 14. Intersection of Frankfort Street and Sprague Avenue**



Data Sources: URI EDC, RIGIS, RIDOT, City of Cranston

3.1 Opportunities for Further Analysis

- **Lake Street Outfall Watershed Analysis**
 - It is likely that the drainage network at the intersection of Gordon Street and Burnham Avenue ties into the drainage network that outfalls on Lake Street; however, the available drainage data from the City does not clearly depict an interconnection. If an interconnection exists, the Lake Street outfall watershed is roughly 150 acres and includes a large section of Cranston Street. Targeting structural BMPs in this watershed would have additional positive benefits to phosphorus reduction and overall water quality. It would be important to identify and delineate the extent of the catchment prior to siting additional BMPs. A targeted BMP campaign in this watershed would have a significant impact on water quality and should be the focus of future analysis.
- **Gordon Street Outfall Watershed Analysis**
 - The watershed that contributes to the outfalls at Speck Park from the Gordon Street neighborhood is over six (6) acres. The drainage network that contributes to this outfall is incongruous with both the 2007 TMDL RIDEM watershed and the 2017 watershed revised by RIDOT for their Stormwater Control Plan (SCP), which are typically accepted by RIDEM. Further investigations confirming the layout of the drainage network should be performed to confirm the contributing area to this outfall and adequately size potential BMPs.
- **Marlborough Street & Laurel Hill Avenue**
 - Structural BMPs were originally proposed within both of these rights-of-way, however, due to these streets being recently paved, these streets were designated for future analysis.

3.2 Complete Streets

Crescent Avenue and Harmon Avenue: A cost-effective approach to reducing stormwater runoff in large areas of the watershed is to incorporate structural BMPs into proposed traffic calming projects. The Crescent Avenue and Harmon Avenue neighborhoods have wide roadways with long hills, where drivers are prone to increased speeds. Reducing the width of the road with curb in-let planters and tree filters, between areas of formalized parallel parking, can be used as a mechanism to slow down traffic. Such projects can be used to address pedestrian and bicycle safety as well.

Complete Streets not only provide the benefit of increased vehicular and pedestrian safety but are also an opportunity for phosphorus reduction through stormwater structural BMP installation. The Crescent Avenue and Harmon Avenue neighborhoods would be ideal candidates for a Complete Streets approach, where structural BMPs are proposed on a neighborhood-wide scale to improve safety and water quality.

3.3 Partnership Opportunities

Partnership opportunities between the City and other local stakeholders can be leveraged to improve water quality, through both structural and non-structural BMPs. Two partnership opportunities were identified during this study.

- **Twin Oaks Restaurant**
 - The restaurant and parking lots consist of approximately six (6) acres of impervious area on the western shore of the Pond. Stormwater enters the pond at this location via sheetflow from the impervious surface as well as from three City-owned outfalls. Structural BMPs could be incorporated into a design to formalize and maximize the number of parking spaces as well as treat runoff from Molter Street, Sabra Street, and Pleasant Street. The City maintains a strong relationship with the restaurant owners. Non-structural BMPs, such as eliminating the use of sand in the parking lot during the winter, could also be coordinated with the property owners.
- **Rhode Island Department of Transportation (RIDOT)**
 - RIDOT is currently under a Consent Decree with USEPA to implement stormwater quality improvements for their infrastructure in every impaired watershed impacted by RIDOT runoff, including Spectacle Pond. While RIDOT is responsible for implementing controls on nearby state roads, USEPA does allow RIDOT to partner with municipalities to address up to 25% of their stormwater quality requirements, even when the drainage is not on RIDOT-maintained roads. Opportunities for RIDOT to contribute funding to municipalities to implement these types of controls are ongoing. One advantage of RIDOT funding is that it can be used as a match for other grant programs.
- **Stadium Elementary School**
 - The approximately one-acre asphalt play area behind the elementary school offers a unique opportunity to leverage a partnership between the City and public school. Green infrastructure elements, such as permeable play surface tree filters and/or subsurface infiltration systems, could be incorporated into the area. A BMP project at the school would also provide an educational and interactive opportunity to teach students about environmental science.

4 Potential Funding Sources

State Revolving Fund (SRF) Loan Program

The SRF provides a low-cost financing option for communities through multiple programs. The Clean Water Program provides loans to help municipalities comply with federal and state water quality requirements by focusing on watershed management priorities, stormwater management, and green infrastructure, as well as community septic system repair programs and riverbank restoration projects. Open space acquisitions related to water quality protection are also eligible for financing.

One program, the Bay and Watershed Restoration Fund (BWRF), is administered by RIDEM to fund programs allocated by previous bond referenda. The fund is meant to provide assistance for the feasibility analysis, design, construction, or rehabilitation of: nonpoint source water pollution control facilities, stormwater pollution control projects, riparian buffer and aquatic habitat restoration projects, and projects which prevent or mitigate flooding.

Website: <http://www.dem.ri.gov/programs/water/finance/state-revolving-fund.php>

RiIB Stormwater Project Accelerator

The Stormwater Project Accelerator is administered by the Rhode Island Infrastructure Bank and the Department of Transportation. The program provides upfront funding to municipalities for infrastructure funding to support green stormwater infrastructure in Rhode Island that will ultimately be reimbursed through state and local reimbursement grants. Eligible projects must first secure state or local funding.

Website: <https://riib.org/solutions/programs/stormwater-project-accelerator/>

Municipal Resilience Preparedness (MRP) Action Grant Program

The MRP Action Grant Program is administered through the RI Infrastructure Bank, in partnership with the Nature Conservancy. To be eligible for funding, communities must complete the MRP Planning Grant process, which Cranston has not yet participated in. The MRP Action Grant offers financial assistance to municipalities that are interested in implementing climate adaptation actions to address the impacts of climate change in their communities (extreme weather, sea level rise, inland, and coastal flooding, severe heat, etc.). The program funds projects relating to planning, assessments, and regulatory updates; nature-based solutions for ecological and public health; and resilient redesigns and retrofits for critical facilities and infrastructure. In past funding rounds, project amounts ranged from \$150,000 to \$400,000. A 25% match, either through cash or in-kind services, is required.

Website: <https://riib.org/solutions/programs/municipal-resilience-program/>

Clean Water Act, Section 319 Nonpoint Source Implementation Grants

Section 319 Grants are available for projects that promote restoration and protection of water quality through reducing and managing nonpoint source pollution. These grants are made possible by federal funds provided to RIDEM by the USEPA under Section 319 of the Clean Water Act. Eligible applicants include municipal, state, or regional governments, quasi-state agencies, public schools and universities, and non-profit watershed, environmental, or conservation organizations. Pursuant to federal guidelines for Section 319 funding, projects can only be funded in those areas in which a Watershed-Based Plan has been completed.

Clean Water Act Section 319 grants may be used for green stormwater infrastructure projects (if not mandated by a stormwater permit) and certain restoration activities. Projects should be in line with the state's 2019 guidance document "Nonpoint Source Management Program Plan." Annual funding is approximately \$750,000 and requires a 33% match.

RIDEM 319 website: <https://dem.ri.gov/environmental-protection-bureau/water-resources/research-monitoring/water-quality-resources/nonpoint-source-pollution>

Southeast New England Program (SNEP) Network

Southeast New England Watershed Grant Program: Over the last 5 years, the US Environmental Protection Agency (USEPA) has administered this grant program providing \$22 million in funding for water quality and sustainability projects for the Narragansett Bay and Buzzard's Bay watersheds. This watershed includes almost all of Rhode Island and most of Southeastern Massachusetts and Cape Cod. These grant applications typically require a 50% match. Stormwater quality projects are fundable under this grant program, however, these grants are very competitive with less than half of the grant applications typically being funded. As a result, it is important that the projects proposed with these grant applications incorporate a unique element that provides a differentiator compared to other applications.

Tables

Table 1: Conceptual BMP Sizing & Load Reduction Analysis						
Site	Street Name	BMP Type	Drainage Area (Acres)	Impervious Area (%)	Water Quality Volume (Cubic feet)	Percent of Water Quality Volume Treated ¹
13	Spectacle Street	Sand Filter (Pavement Removal)	1.99	56	4,012	100%
12	Frankford Street & Pleasant Street	Curb Inlet Planter or Subsurface Infiltration	1.43	84	4,332	50%
8	Lowell Street	Subsurface Infiltration	0.38	88	1,231	100%
6	Beacon Street	Subsurface Infiltration	0.40	92	1,339	100%
5	Winthrop Street	Subsurface Infiltration	1.00	60	2,184	40%
3	Lake Street (At Gordon St.)	Infiltration Basin or Swale	0.56	65	1,322	100%
4	Gordon St. (At Harmon Ave.)	Infiltration Basin or Swale	0.59	71	1,533	100%
11	Midwood Street & Gleason Street	Dry Well	0.87	75	2,350	20%
7	Irving Street	Subsurface Infiltration	0.48	64	1,126	90%
9	Packard Street	Subsurface Infiltration	1.55	90	5,022	40%
10	Midwood Street	Subsurface Infiltration	2.91	75	7,915	20%
1	Cranston Street	Tree Filter	0.23	100	850	40%
14	Frankford Street	Curb Inlet Planter	1.09	64	2,515	10%
2	Cranston Street	Curb Inlet Planter	0.25	94	857	20%

Footnotes:

¹ Percent of the WQv treated is based on sizing calculations from the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM) .

Table 2: Annual Pollutant Load Reduction ¹							
Site	Street Name	TSS Loading (lbs/yr)	TP Loading (lbs/yr)	TSS Load Reduction (%)	TP Load Reduction (%)	TSS Load Reduction ² (lbs/yr)	TP Load Reduction ² (lbs/yr)
13	Spectacle Street	1,049	3.15	88%	56%	918	1.76
12	Frankford Street & Pleasant Street	1,098	3.29	46%	30%	509	0.98
8	Lowell Street	311	0.93	86%	52%	267	0.49
6	Beacon Street	337	1.01	89%	54%	299	0.55
5	Winthrop Street	567	1.70	36%	22%	206	0.38
3	Lake Street (At Gordon St.)	341	1.02	90%	55%	306	0.56
4	Gordon St. (At Harmon Ave.)	393	1.18	90%	55%	355	0.65
11	Midwood Street & Gleason Street	600	1.80	14%	9%	87	0.16
7	Irving Street	291	0.87	79%	48%	230	0.42
9	Packard Street	1,268	3.80	33%	20%	416	0.76
10	Midwood Street	2,021	6.06	22%	13%	444	0.81
14	Frankford Street	650	1.95	7%	4%	44	0.09
1	Cranston Street	213	0.64	39%	24%	82	0.15
2	Cranston Street	216	0.65	15%	10%	32	0.06

Footnotes

¹ Pollutant Loadings, Reduction Capacity, and Load Reduction were determined based on Appendix H Section H.3 of the RISDISM

² Reduction Capacity was determined by multiplying the treatment efficiency value for bioretention reported in Table H-3 of the RISDISM by the Treatment Capacity (Percent of WQv that can be treated in the area available at each site) in Table 2.

Table 3: Order of Magnitude Cost Estimates

Order of Magnitude Cost Range												
Site Number	Location and BMP Type		Construction					Planning and Design		Cost Range		
			Unit Cost	Unit	Adjustment Factor	Quantity	Base Cost	Allowance	Cost	Total Cost	-30%	+ 50%
1	Cranston Street	SilvaCell	\$16.02	cf storage volume	3.0	365.00	\$17,538	30%	\$5,260	\$23,000	\$16,000	\$35,000
2	Cranston Street	Bioretention	\$81,528.00	acre impervious cover treated	3.0	0.04	\$9,979	30%	\$2,990	\$13,000	\$9,000	\$20,000
3	Gordon Street	Bioretention	\$81,528.00	acre impervious cover treated	3.0	0.36	\$89,100	30%	\$26,730	\$116,000	\$81,000	\$174,000
4	Gordon Street (at Harmon Avenue)	Bioretention	\$81,528.00	acre impervious cover treated	3.0	0.42	\$103,788	30%	\$31,140	\$135,000	\$95,000	\$203,000
5	Winthrop Street	Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	879.00	\$62,180	30%	\$18,650	\$81,000	\$57,000	\$122,000
6	Beacon Street	Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	1,319.00	\$93,306	30%	\$27,990	\$122,000	\$85,000	\$183,000
7	Irving Street	Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	991.00	\$70,103	30%	\$21,030	\$92,000	\$64,000	\$138,000
8	Lowell Street	Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	1,172.00	\$82,907	30%	\$24,870	\$108,000	\$76,000	\$162,000
9	Packard Street	Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	1,831.00	\$129,525	30%	\$38,860	\$169,000	\$118,000	\$254,000
10	Midwood Street	Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	1,934.00	\$136,811	30%	\$41,040	\$178,000	\$125,000	\$267,000
11	Midwood Street & Gleason Street	Dry Well	\$14,737.50	ea	3.0	2.00	\$88,425	30%	\$26,530	\$115,000	\$81,000	\$173,000
12	Frankfort Street & Pleasant Street	Bioretention	\$81,528.00	acre impervious cover treated	3.0	0.64	\$157,170	30%	\$47,150	\$205,000	\$144,000	\$308,000
		Subsurface Infiltration	\$23.58	cf of runoff treated	3.0	2,333.00	\$165,036	30%	\$49,510	\$215,000	\$151,000	\$323,000
13	Spectacle Street	Sand Filter	\$16.40	cf storage volume	3.0	4,012.00	\$197,372	30%	\$59,210	\$257,000	\$180,000	\$386,000
14	Frankfort Street	Bioretention	\$81,528.00	acre impervious cover treated	3.0	0.06	\$13,501	30%	\$4,050	\$18,000	\$13,000	\$27,000
									<i>Total</i>	<i>\$1,847,000</i>	<i>\$1,295,000</i>	<i>\$2,775,000</i>

Notes:
Costs are based on screening-level evaluations of site characteristics and should be used for planning purposes only. Construction costs could vary significantly.
Quantities were determined through sizing calculations according to recommended formulas. BMP size may vary slightly on the concept sheets provided, as these images are provided for illustrative purposes only.

Spectacle Pond Limnological Investigation

City of Cranston
Cranston, Rhode Island

December 2022



317 Iron Horse Way, Suite 204
Providence, RI 02908

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1 Project Purpose and Goals

1.1 Project Purpose and Goals

According to the *Total Maximum Daily Loads for Phosphorus To Address 9 Eutrophic Ponds in Rhode Island* (TMDL) prepared by RIDEM in September 2007, the estimated annual phosphorus load to Spectacle Pond is 216 kg/year (476 lbs/yr). The TMDL required that the load be reduced by 148 kg/year (326 lbs/yr), a 68% reduction. In order to reach the reduction goal, RIDEM recommended the City of Cranston address external loading sources through stormwater management, deposited sediment management, and waterfowl management. The TMDL also recommended that the City work with a consultant to confirm the significance of internal cycling as a source of phosphorus to the pond and, if this is a significant source, identify appropriate measures to address internal phosphorus loading from sediments at the bottom of the pond.

This limnological assessment of Spectacle Pond was conducted to estimate the relative contribution of internal cycling to total phosphorus loading in the pond. Management recommendations to address the phosphorus impairment will differ based on the relative contributions of internal and external sources. Field data collection in the form of a bathymetric survey, sediment and water quality sampling, and calculations of internal phosphorus loading were conducted. This report documents the findings of the limnological assessment by summarizing the methods (**Section 2**) and results of the field work (**Section 3**) and the internal phosphorus loading calculation (**Section 4**). This report also discusses the relative significance of internal cycling on the water quality of Spectacle Pond and recommends next steps to address the phosphorus impairment in the pond (**Section 5**).

1.2 Background

Spectacle Pond is located in Cranston, Rhode Island within the Pawtuxet River watershed. The pond's watershed, which is approximately 637 acres in size, contains 55% high density residential development with residential properties located west and south of the pond. Industrial and commercial properties occupy the northern and eastern shorelines. The northern basin of Spectacle Pond is connected to Tongue Pond by a manmade ditch that weaves between three wetland replication areas. According to the *Total Maximum Daily Loads for Phosphorus To Address 9 Eutrophic Ponds in Rhode Island* (TMDL) prepared by RIDEM in September 2007, the manmade ditch appears to flow only during periods of high water. The three small wetland replication areas are located adjacent to the manmade ditch but are not hydrologically connected to the stream or to Spectacle Pond (**Figure 1-2**). Spectacle Pond receives inflow via groundwater, surface water runoff, stormwater runoff, tributary inflow, and direct precipitation. There are 19 storm drains and 13 areas of concentrated surface flow that discharge to Spectacle Pond, its tributary, and Tongue Pond. The pond discharges to the northeast via a 48-inch culvert under Route 10 connected to Mashapaug Brook and Mashapaug Pond. Mashapaug Pond is connected to the ponds in Roger Williams Park via a buried stream, ultimately discharging to the Pawtuxet River and Narragansett Bay.

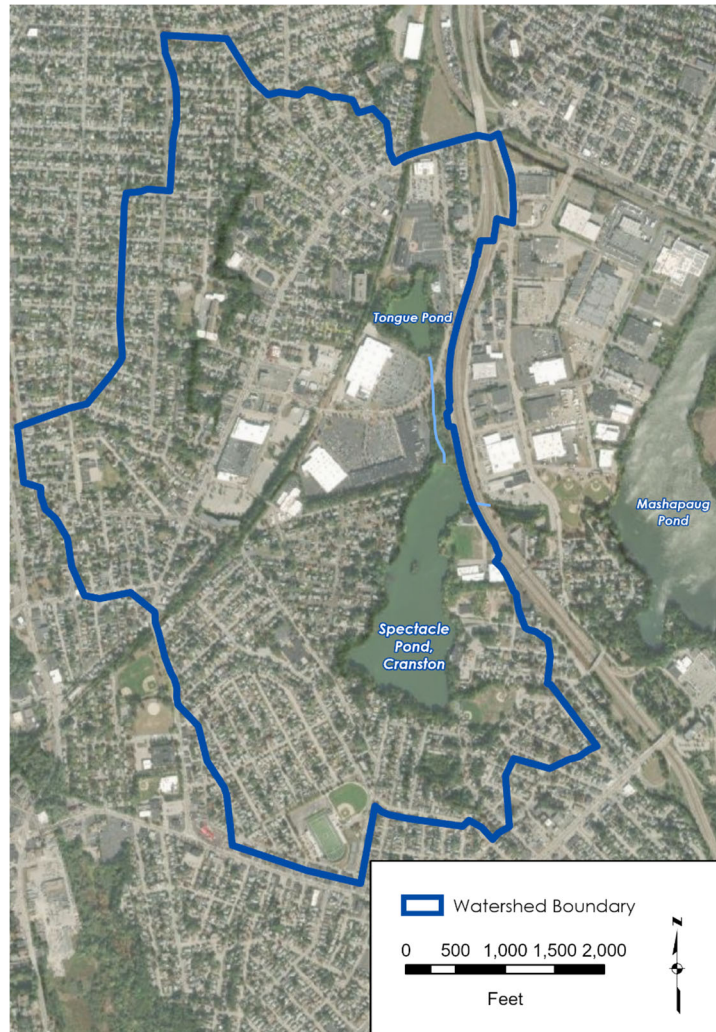


Figure 1-1: Spectacle Pond, Watershed, and Surrounding Area

1.3 Water Quality Data Review

Plant litter, fertilizer, and animal waste contribute the majority of phosphorous to stormwater in residential areas while roads are significant contributors of phosphorous in more commercial and industrial areas (**Figure 1-4**) (Waschbusch et. al, 1999). In the 2007 TMDL, RIDEM attributed phosphorus and phosphorus-related impairments at Spectacle Pond to stormwater, waterfowl, and internal cycling. Stormwater was noted as the major external source of phosphorus with seven outfalls discharging directly to Spectacle Pond. The outfall located on the western side of the pond on Lake Street was noted as the most significant source of phosphorus due to the catchment area draining approximately 41% of the Spectacle Pond watershed (RIDEM, 2007). A large delta of eroded sedimentation was observed located at the end of Lake Street, extending 30 to 50 meters into the pond (RIDEM, 2007).

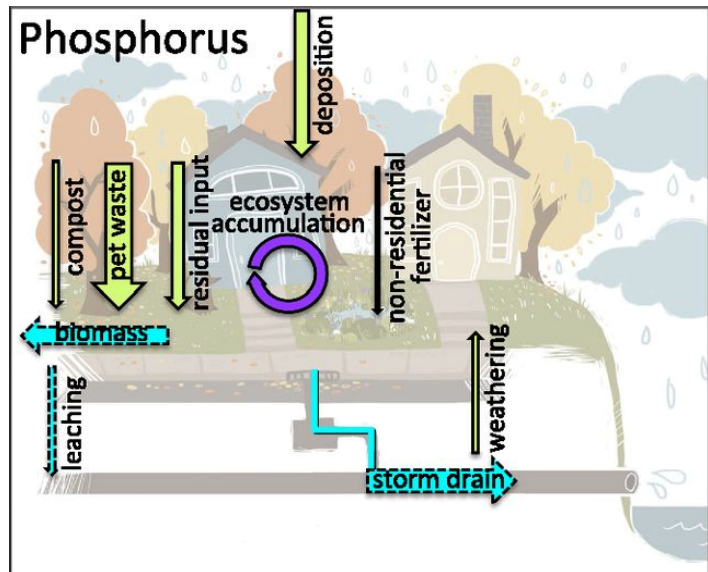


Figure 1-2: Typical external phosphorus sources to a waterbody

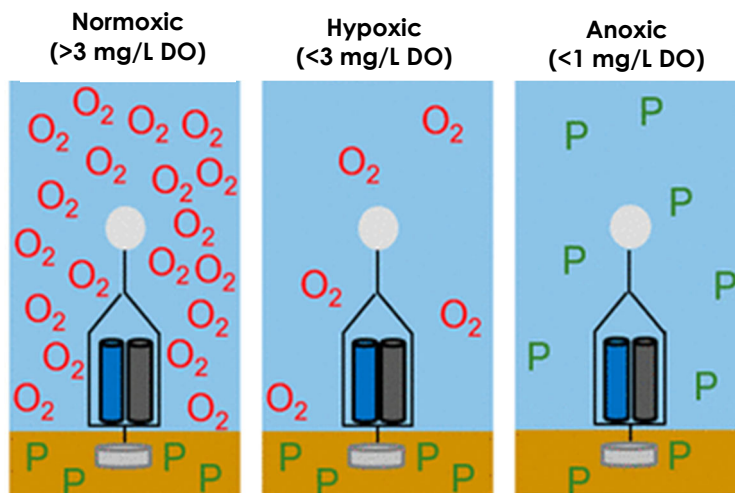


Figure 1-3: Representation of internal phosphorus loading under a range of dissolved oxygen (DO) levels. Image credit: Anderson et al. 2021

Internal loading was also noted as a potential major contributor to phosphorus loading. This internal phosphorus loading can occur when phosphorus is released from lake-bottom sediments, when dissolved oxygen concentrations fall below 1 mg/L, termed anoxia (). Anoxic conditions at the lake bottom trigger biological, chemical, and physical processes that cause phosphorus bound to sediments, and unavailable to aquatic plants and algae, to be released into the water column. This released phosphorus becomes available to algae and aquatic plants, causing rapid algae growth, or blooms. As algae cells die, they settle

back to the bottom of the lake, with the phosphorus they consumed bound up, ready to be released into the water column again when the lake next becomes anoxic.

1.3.1 University of Rhode Island Watershed Watch Data

The University of Rhode Island Watershed Watch (URIWW) has been collecting water quality data, including total phosphorus (TP), Secchi disk depth, dissolved oxygen (DO), and pH in Spectacle Pond since 1999. From 1999 to 2017, TP was above RIDEM's recommended concentration of 25 µg/L and the yearly average Secchi disk depth transparency was consistently within eutrophic range, which is when the environment becomes enriched with nutrients, increasing the amount of plant and algae growth. Between 2015 and 2018, URIWW found that DO concentrations at three meters were generally lower than at one meter below the surface, following the trend of producing anoxic conditions in the summer and recovering in late fall. During those three years, URIWW also found pH values in Spectacle Pond to generally be within the acceptable range of pH 6.5-9.0, as defined by RIDEM's Water Quality Standards (See Section 3 for more detailed information about URIWW data collected).

2 Field Work Methods

2.1 Bathymetry and Soft Sediment Measurement

A pond bathymetry and soft sediment measurement survey of Spectacle Pond was performed to obtain pond depth and sediment thickness data in order to create a pond bottom contour map and calculate the volume of sediment in the pond. Fuss & O'Neill staff collected bathymetric survey information from a boat using a sturdy metal rod, a weighted tape measure, and a Trimble Geo7X handheld submeter Global Positioning System (GPS).

Pond bathymetry and sediment depth in Spectacle Pond were measured on August 26, 2020. Three transects covered the pond. The ends of each transect extended from one shore to the opposite shore. This coverage was sufficient given the limited variation in bathymetry.

A total of 16 survey points were recorded (**Figure 2-1**). At each measurement location, a weighted tape measure was lowered until slack was felt in the tape. That depth was noted as the top of soft sediment. Concurrently, an extendable rod was used to determine the depth of soft sediment at each point in order to map the extent of soft sediment on the pond bottom. The measuring pole was lowered through the water column and slowly pressed into the soft sediment until resistance was met. Resistance was defined as the sediment not yielding to moderate pressure applied by arm strength. The water surface was marked on the measuring pole and the total depth recorded. Sediment thickness was calculated as the difference between these two measurements. The GPS was used to log the location of each measurement point. All depths were recorded relative to the shoreline elevation, 40.3 feet, listed by the University of Rhode Island Watershed Watch (URIWW).

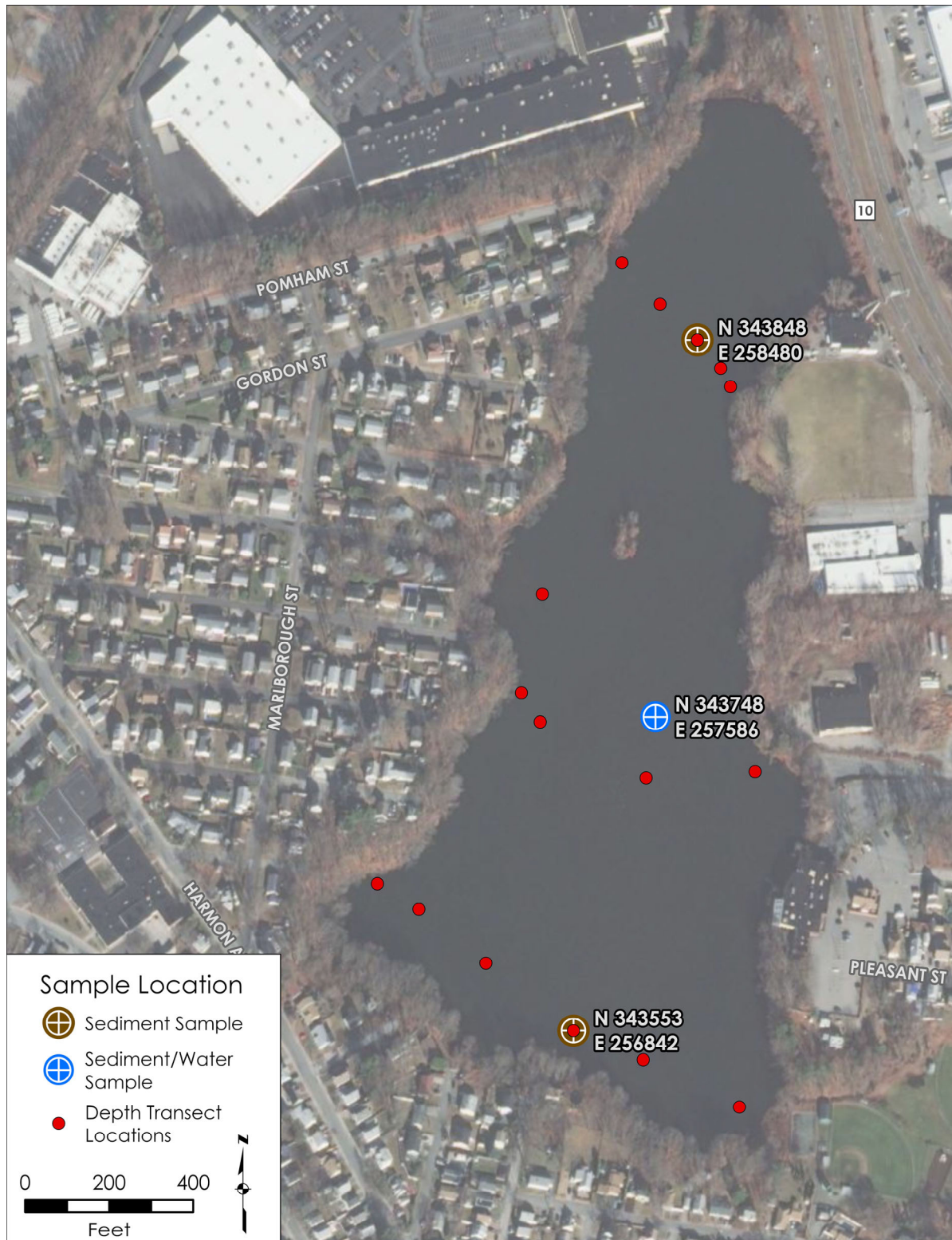


Figure 2-1: Bathymetry of Spectacle Pond. A sediment delta from the outfall at the end of Lake St was identified and measured. Sediment sample locations are noted in RI State Plane Feet (NAD83).

2.2 Sediment Sampling

Sediment sampling and analysis was performed to evaluate sediment characteristics that may impact water quality. On August 26, 2020, three shallow (surficial) sediment samples were collected from pre-determined locations in the pond. Sample locations were chosen prior to the field sampling based upon the soft sediment distribution results from the bathymetric and soft sediment survey.

Samples were collected from a boat using a hand auger. Sediment sample depth was approximately 0 to 6 inches below the water/soft sediment interface. The hand auger was lowered through the water column and advanced through the soft sediment. The auger bucket was filled with sediment and pulled back into the boat, where the sediment was then placed in a stainless-steel bowl to be composited. Three subsamples from each sample location were well homogenized prior to being placed in laboratory-provided glass sample jars with Teflon caps. Following collection, the samples were cooled prior to submittal to Northeast Laboratories, Inc. (Northeast) located in Berlin, Connecticut. Sediment was tested for total phosphorus, loosely bound phosphorus, iron-bound phosphorus, organic matter, and percent solids. Analysis of phosphorus and total solids was outsourced by Northeast to Phoenix Laboratory located in Manchester, Connecticut. Results from these analyses were used to provide estimates of phosphorus released from the sediments and are described in **Sections 3 and 4** and **Appendix A**.

2.3 Water Quality Sampling

Water quality sampling and analysis was performed to record water quality characterization throughout the recreational season (April to September 2020). A total of seven sampling events were conducted throughout the season (**Table 2-1**). Five sampling events occurred during dry weather while the remaining two occurred during wet weather. Water quality sampling consisted of the following sample locations (**Figure 2-2**):

- In-lake sampling at the location used for University of Rhode Island Watershed Watch (URIWW) sampling (41.790244 N, 71.442558 W)
- Inlet from Tongue Pond
- Eight (8) external discharge locations identified as Twin Oaks Outfall, Twin Oaks Surface Water, Speck Field Surface Water, Midwood Street Surface Water, Lake Street Surface Water, Lake Street Manhole, Stop & Shop Outfall and Stop & Shop Surface Water

Water quality sampling at the Stop & Shop Outfall was dependent on observed flow. During the June 26, July 30, and August 26, 2020 sampling events no flow was observed from the outfall. Therefore, no sampling was conducted.

The in-lake water quality samples were collected from a boat using a VanDorn Sampler. Samples were collected at the surface (0.5 feet below water surface), the midpoint of the water column (7-8 feet below water surface), and the pond bottom above sediment (approximately 13 feet below water surface) of the water column. Due to COVID-19 protocols, in-lake sampling did not occur during the first two

sampling events on May 8 and 28, 2020. Two samplers could not socially distance in a boat to collect the samples. The remaining five sampling events included the in-lake sampling.

Water column characteristics, including temperature and dissolved oxygen profiles, were recorded at 1-foot intervals at the in-lake sampling location, at the inlet from Tongue Pond and at the eight stormwater outfalls using an In-Situ SmarTROLL. Water samples were collected into plastic pre-preserved sample containers supplied by the laboratories. Samples were submitted to New England Testing Laboratory, Inc. (NET) in West Warwick, Rhode Island, and Phoenix Environmental Laboratories (Phoenix) in Manchester, Connecticut.

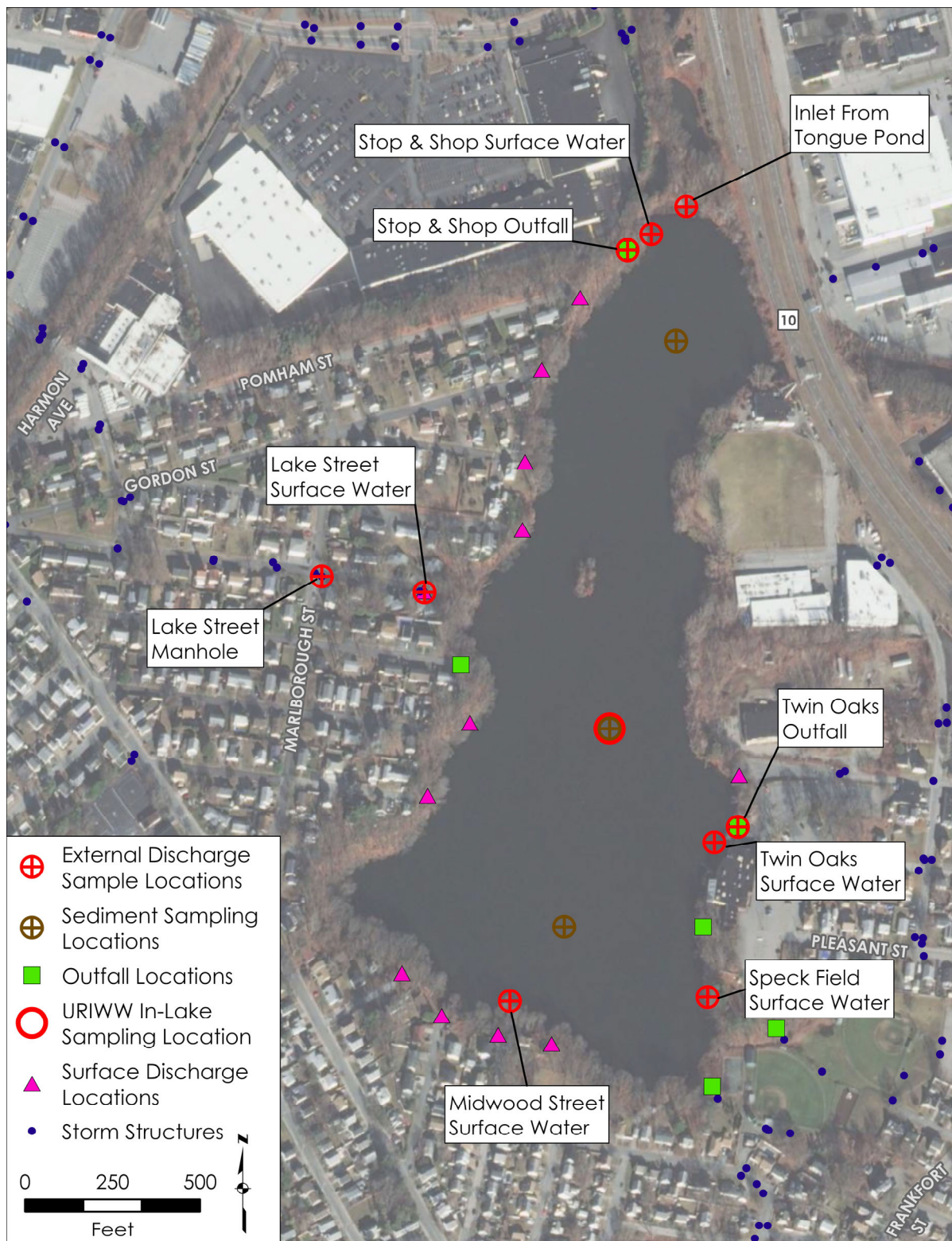


Figure 2-2: Sampling Locations

**Table 2-1
Water Quality Sampling Summary**

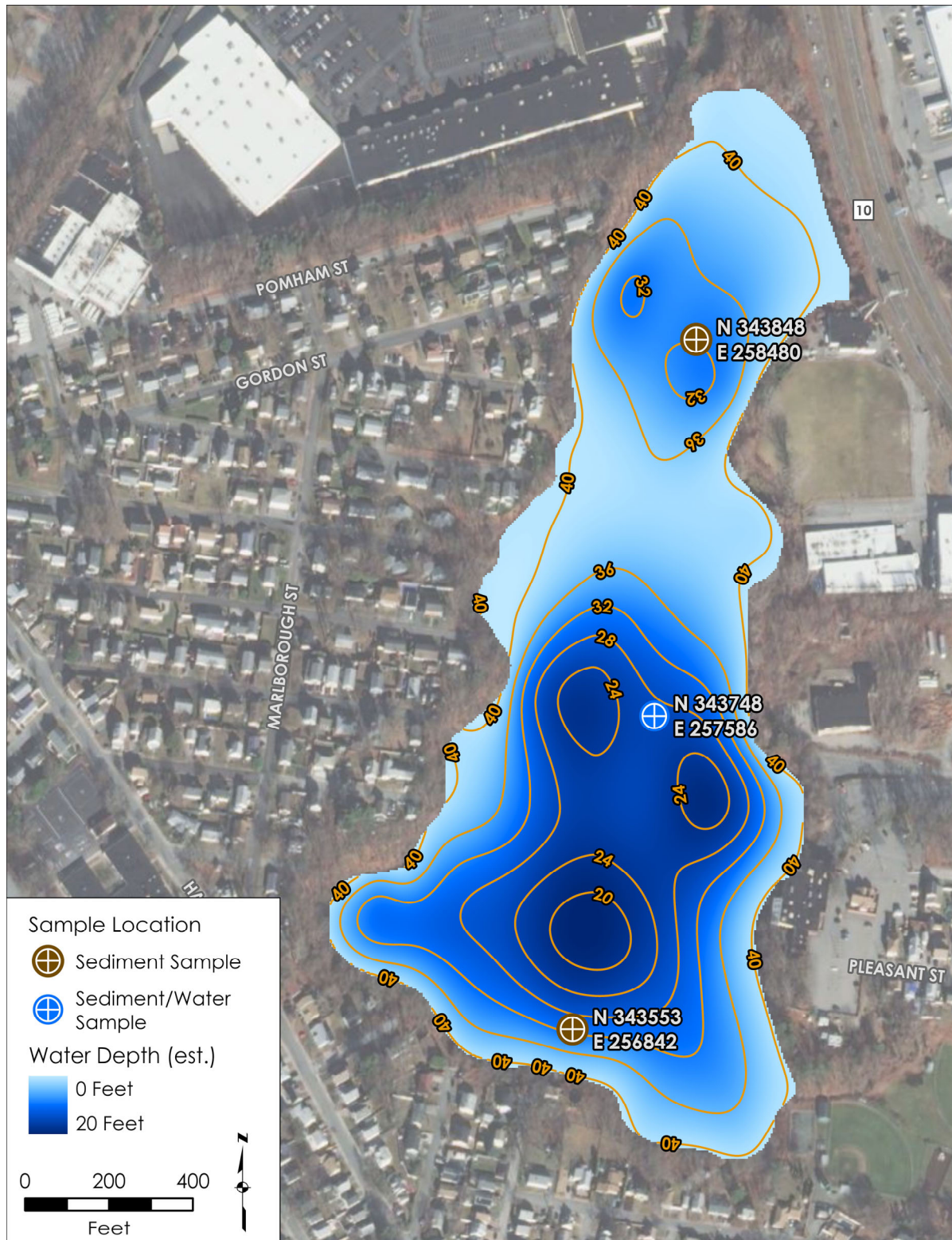
Sample Date	Measured Water Column Characteristics	Laboratory Analytical Parameters
May 8, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Phosphorus Turbidity
May 28, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Phosphorus Turbidity
June 26, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Iron Total Phosphorus Turbidity
July 30, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Iron Total Phosphorus Turbidity
August 26, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Iron Total Phosphorus Turbidity
October 12, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Iron Total Phosphorus Turbidity
October 29, 2020	pH Temperature Specific Conductivity Dissolved Oxygen Oxidation/Reduction Potential	Alkalinity (CaCO ₃) Total Iron Total Phosphorus Turbidity

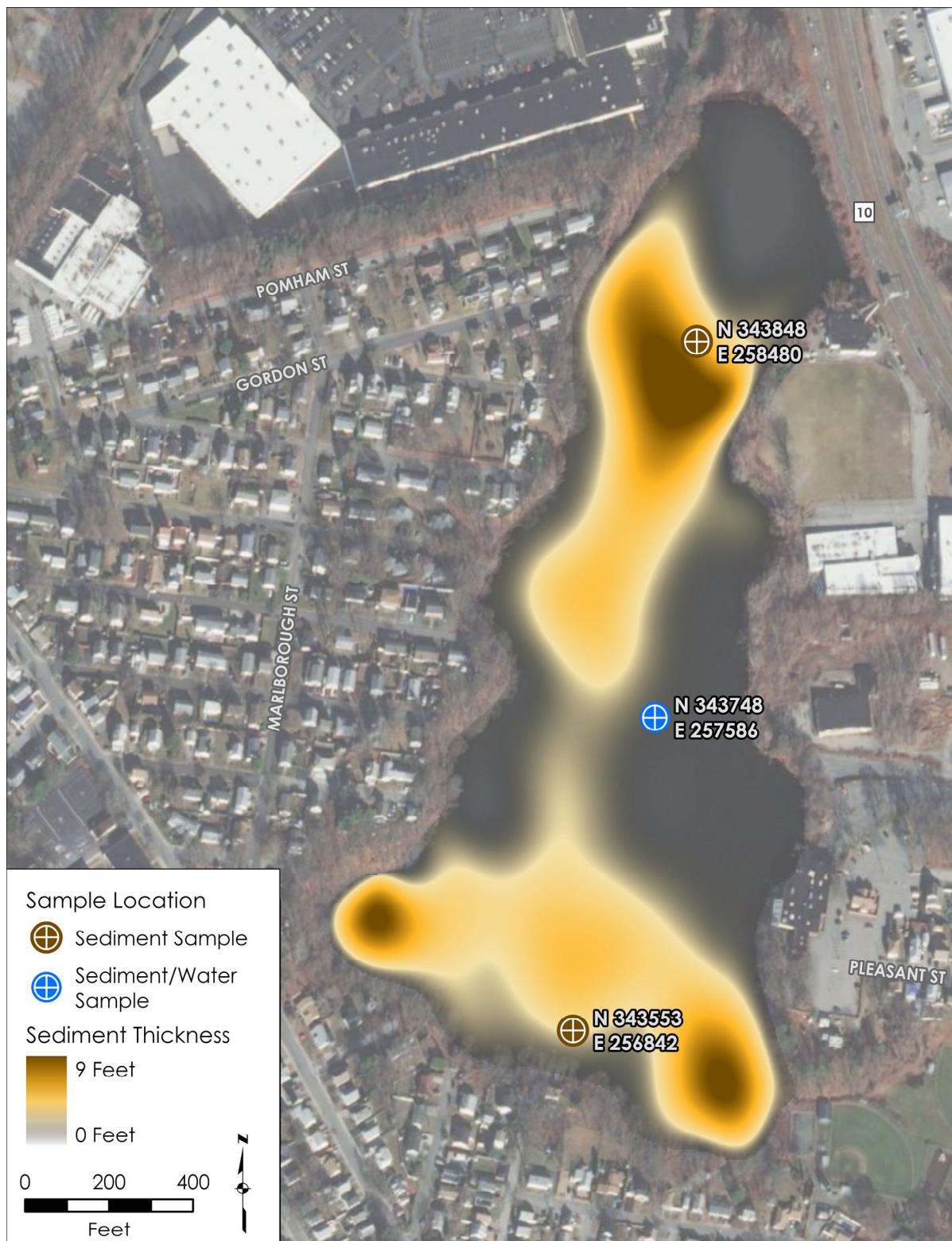
3 Field Work Results

3.1 Bathymetry and Soft Sediment Depth

Using the methods described above, measured soft sediment depths ranged from 0.0 to 3.2 feet, with a mean depth of 1.6 feet. Total sediment volume, calculated in ArcGIS according to methods described by Price (2002), was approximately 113,800 cubic yards (cy). Total pond water volume was calculated by the same methods as approximately 390,000 cy (240 acre-feet). The total volume, including sediment is 312 ac-ft. create A sediment thickness surface was interpolated in ArcGIS via a regularized spline to create a raster of sediment depths (**Figure 3-1**) (

Figure 3-2). Interpolation techniques only cover the extent of input data, which leaves as undefined those areas that were not accessible by boat. To compensate for that, the pond shoreline as digitized by RIGIS at 1:5000 scale was set to zero sediment depth and merged with the measured sediment depths. Interpolation was performed on this merged layer. The interpolated surface was analyzed with the Cut/Fill function in ArcGIS relative to a base surface of zero feet derived from the same lake outline obtained from RIGIS.





3.2 Sediment

Total phosphorus (TP) concentrations in the three sediment samples collected from Spectacle Pond on August 26, 2020 were 5,810 mg/kg, 175 mg/kg, and 3,810 mg/kg. The lowest sediment TP concentration was measured in sediment collected from the southern sampling site in the pond. The southern sampling site had the highest concentration of percent solids and percent organic matter. Available sediment phosphorus (P), which is the sum of loosely-bound and iron-bound P, ranges from 48.4 mg/kg to 386.1 mg/kg (**Table 3-1**).

Table 3-1:
Spectacle Pond In-Lake Sediment Samples

Sample Parameter	Center of Pond	South End of Pond	North End of Pond
Total Phosphorus (mg/kg)	5,810	175	3,810
Total Solids (%)	14.6	66.4	13.7
Organic Matter (%)	10.29	60.83	6.96
Iron-Bound Phosphorus (mg/kg)	376	44.0	78.2
Loosely Bound Phosphorus (mg/kg)	10.1	4.4	3.0
Sum of loosely bound and iron-bound P	386.1	48.4	81.2

3.3 In-lake Water Quality

3.3.1 Temperature and Dissolved Oxygen

Water temperature in Spectacle Pond varied from 12.95°C to 28.54°C (**Figure 3-3**), reaching its peak of in mid-summer. By early fall the pond cooled, mixed, and temperatures became consistent with depth. Dissolved oxygen (DO) profiles created from the seven sampling events at reveal a thermocline that developed around 6 feet depth in the late spring and summer, producing anoxic conditions below in the hypolimnion (**Figure 3-4**). The following spring, conditions became hypoxic to anoxic below 10 feet. Hypoxia, more commonly known as a dead zone, refers to low or depleted oxygen levels in a water body, typically less than less than 2-3 milligrams of oxygen per liter of water. Anoxia is when oxygen levels in a waterbody reach zero milligrams per liter.

The URIWW measured DO during their sampling events from one and three meters below the surface from 2015 to 2018. According to their data, the DO concentrations reported at three meters were generally lower than the one meter. The DO concentrations followed the trend of producing anoxic conditions in the summer and recovering in late fall. At one meter, the DO ranged from 0.95 to 11.9 mg/L with an average of 7.95 mg/L. At three meters, the DO ranged from 0.0 to 11.9 mg/L with an average of 3.27 mg/L.

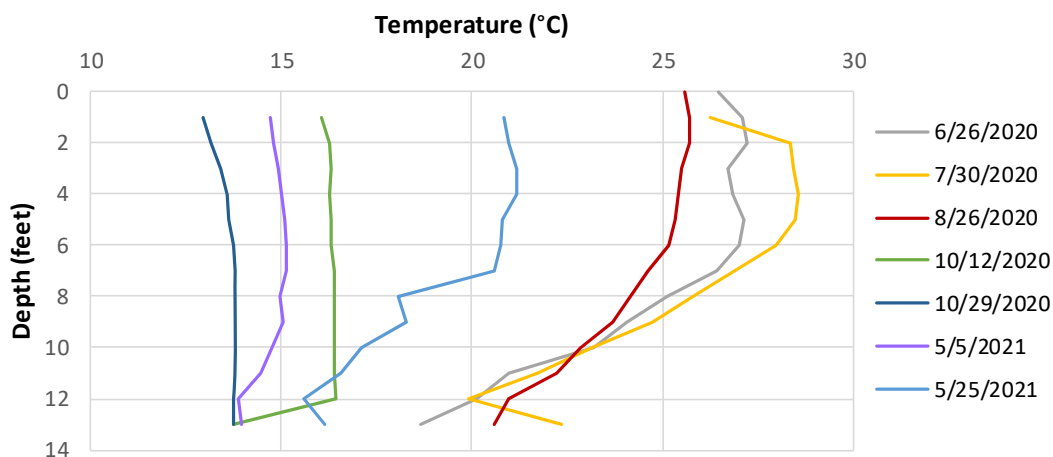


Figure 3-3: Depth Profile of Temperature Measurements in Spectacle Pond

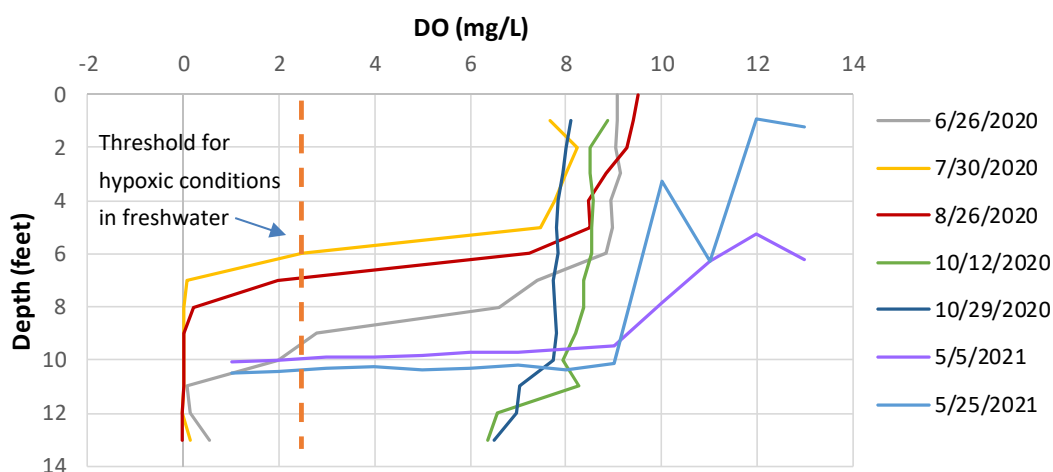


Figure 3-4: Depth Profile of Dissolved Oxygen Measurements in Spectacle Pond

3.3.2 Conductivity

Specific conductivity varied from 0.90 ($\mu\text{S}/\text{cm}$) to 840.9 ($\mu\text{S}/\text{cm}$) (**Figure 3-5**). Conductivity remained consistent with depth during the fall. During the summer, conductivity developed a gradient, reaching a peak of 840.9 $\mu\text{S}/\text{cm}$. An outlier value collected on July 30, 2020 at 1-foot depth was removed from the dataset due to a suspected input error.

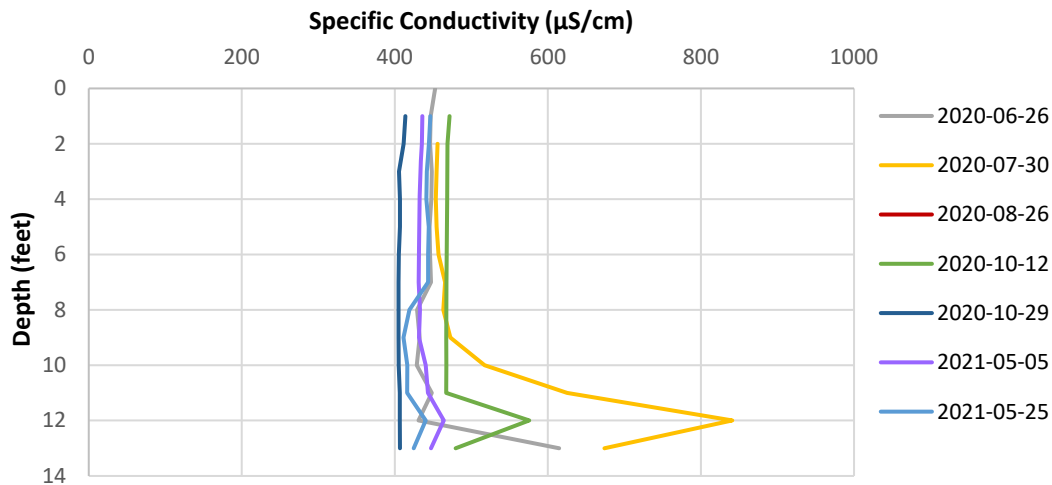


Figure 3-5: Depth Profile of Specific Conductivity Measurements in Spectacle Pond

3.3.3 Redox Potential

Redox potential describes Spectacle Pond's overall reducing/oxidizing capacity. Redox potential decreased greatly with depth for all but one of the four sampling events (October 29, 2020) (**Figure 3-6**). This pattern is in agreement with the dissolved oxygen results described earlier, as the October 29, 2020 samples had consistent concentrations of dissolved oxygen with a slight decrease. Lower redox potential creates conditions conducive to phosphorus release from sediments as discussed in **Section 4**.

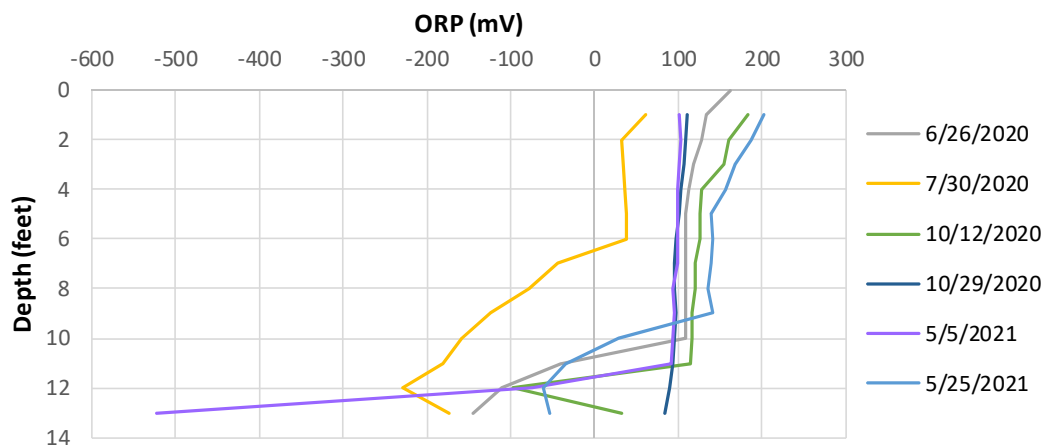


Figure 3-6: Depth Profile of Oxidation Reduction Potential Measurements in Spectacle Pond

3.3.4 pH

pH values in Spectacle Pond were slightly acidic to neutral, which is typical for freshwater ponds in New England. pH values varied from 5.93 to 8.58 with an average value of 7.06, with more neutral measurements in the fall and late spring followed by higher pH values in the late spring, and even higher

values in the summer (**Figure 3-7**). These results fall within the acceptable range of pH 6.5-9.0, as defined by RIDEM's Water Quality Standards. Based on URIWW data from 2015 to 2018 the pond is generally within the RIDEM standard with a recorded high value of 7.9. Wu et al. (2014) demonstrated that more P is released from lake bottom sediments under alkaline conditions than acidic conditions, but the least amount of P is released under neutral pH.

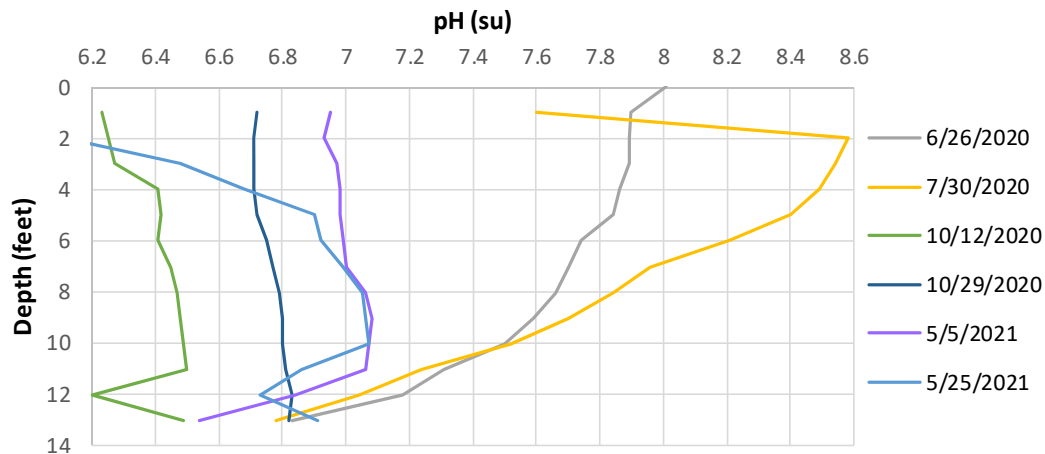


Figure 3-7: Depth Profile of pH Measurements in Spectacle Pond

3.3.5 Turbidity

Turbidity ranged from 4 NTU to 656 NTU with a median of 13.2 NTU (**Figure 3-8**). Few samples met RIDEM's Water Quality Standard for turbidity of 10 NTU. During the late summer and early fall sampling no turbidity readings met the RIDEM standard. Surface and midpoint measurements met water quality standards during the June 26, 2020 and July 30, 2020 sampling events. Turbidity generally increased with depth.

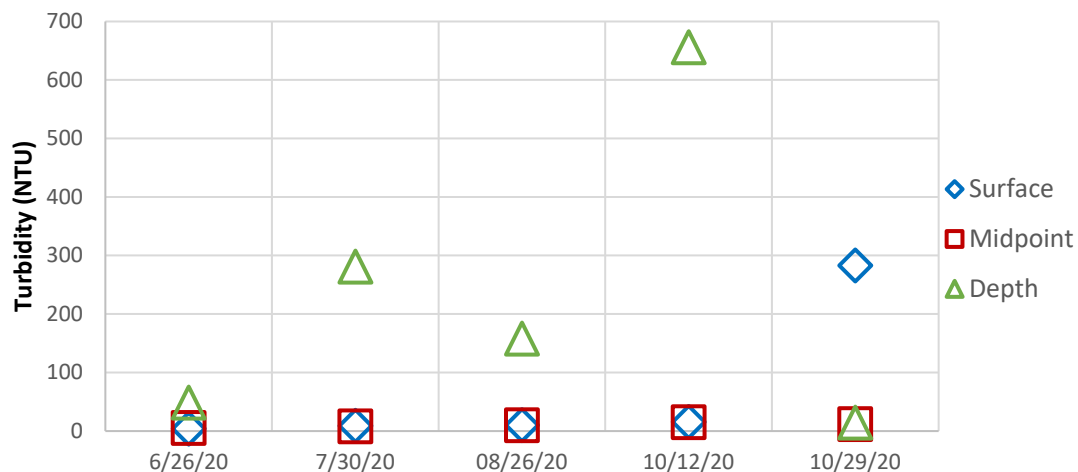


Figure 3-8: Turbidity Measurements in Spectacle Pond

3.3.6 Alkalinity

Alkalinity influences pH by providing a buffering capacity. Higher alkalinity means that there is less likely to be fluctuations in pH. Alkalinity ranged from 31 mg/L to 100 mg/L over the five sampling events at Spectacle Pond (**Figure 3-9**). An alkalinity of 20 mg/L or higher indicates a lake with low sensitivity to pH variations resulting from the input of acidic (low pH) rainfall (Godfrey et al. 1996). Data collected in this study indicates no sensitivity to acidification with alkalinity values of 30 mg/L or higher. Alkalinity values measured during this study were slightly higher than historic alkalinity data obtained from Spectacle Pond by URI Watershed Watch from 2015 to 2018, which had alkalinity values range from 23 to 40 mg/L with an average of 30 mg/L collected from approximately one meter below the surface.

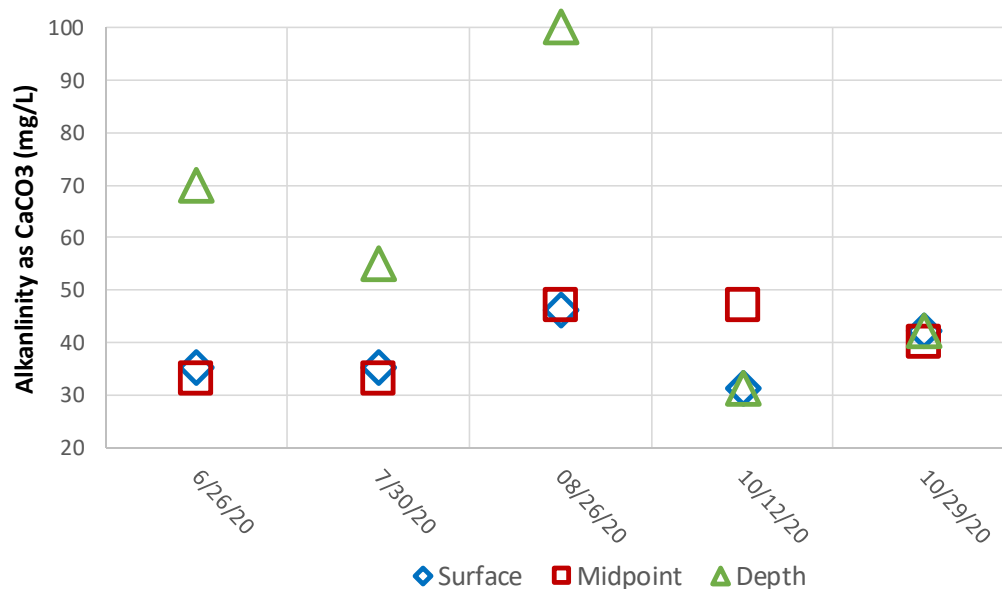


Figure 3-9: Alkalinity Measurements in Spectacle Pond

3.3.7 Phosphorus

Total phosphorus (TP) concentrations in many of the samples from Spectacle Pond exceeded RIDEM's recommended concentration of 25 µg/L (0.025 mg/L) for lakes, ponds, kettle holes, and reservoirs. TP was measured on all dates sampled usually directly at the surface (~0.5 foot), mid-pond depth (~7 to 8 feet) and deep-water depth (~13 feet) (**Figure 3-10**). Duplicate samples, when collected, were averaged for internal loading calculations in **Section 4**. Surface TP ranged from 46 µg/L to 79 µg/L and averaged 60.8 µg/L. Mid-pond depth samples ranged from 44 µg/L to 95 µg/L and averaged 66 µg/L. Deep-water pond samples ranged from 46 µg/L to 11,300 µg/L with a median of 69 µg/L. The outlier in the deep-water sample suggests a median value is a more representative value of the dataset.

These values were compared to the values measured through the University of Rhode Island Watershed Watch (URIWW) that typically measured TP in May, July, September, and October. URIWW has been measuring TP in Spectacle Pond since 1999. From 1999 to 2017 the TP ranged from approximately 30

to 70 µg/l. The program measured an integrated surface sample that collected water from the surface to about the two-meter depth. According to the TMDL, during the sampling periods from 1999 to 2003 the average total phosphorus was 50 µg/L in spring, 62 µg/L in summer, and 61 µg/L in fall with a mean of 57 µg/L.

The surface and mid-point TP measured during the 2020 sampling events were slightly higher than past measurements. There were no historic TP measurements for the depth. Generally, the depth samples had the highest amount of TP, with a high of 11,300 µg/L collected on October 12, 2020.

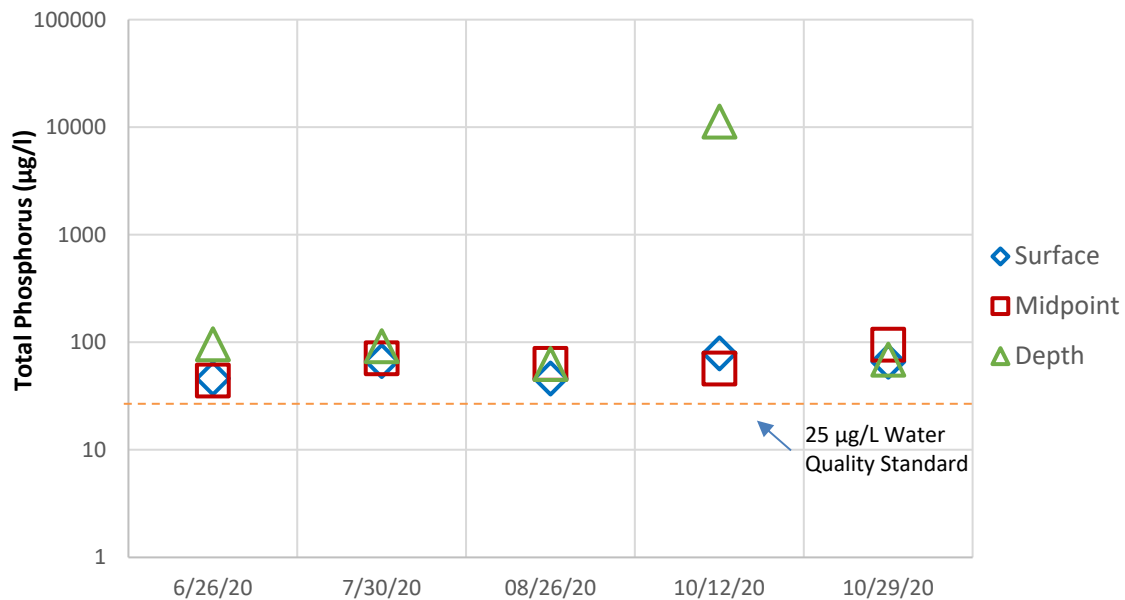


Figure 3-10: Total Phosphorus Concentrations in Spectacle Pond

3.3.8 Total Iron

Total iron in Spectacle Pond varied between 0.161 mg/L and 102 mg/L with an average value of 10.11 mg/L (**Figure 3-11**). The samples from depth returned the largest values of total iron. Iron concentrations are of interest since phosphorus can bind to iron in oxic conditions (i.e., when dissolved oxygen is abundant), and be subsequently released in anoxic conditions such as those observed at depth in Spectacle Pond in the summer months.

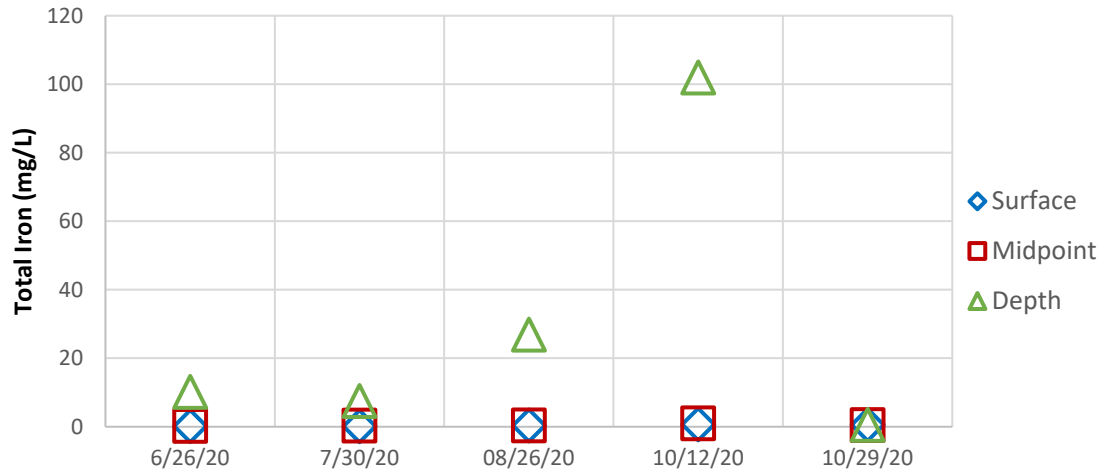


Figure 3-11: Total Iron Concentrations in Spectacle Pond

3.3.9 Secchi Disk Depth

Secchi disk depth was not recorded as part of this assessment. However, the URIWW has measured Secchi disk depth during their sampling events since 1999. From 1999 to 2017 the yearly average Secchi depth transparency was within eutrophic range with depths from approximately 0.5 to 1.5 meters. Based on historically available data, visual observations, and recorded parameters (i.e., dissolved oxygen) during the 2020 sampling events, Spectacle Pond has consistent eutrophic conditions.

3.4 Stormwater Outfalls and Tributary Water Quality

3.4.1 Temperature and Dissolved Oxygen

Water temperatures from the Tongue Pond inlet and eight outfall locations ranged from 13.4°C to 31.87°C (**Figure 3-12**). Water temperatures followed the trend of the in-lake sampling, reaching a peak in mid-summer and cooling down by early fall. Additionally, DO followed the in-lake trend of lowering in the summer, producing anoxic conditions (**Figure 3-13**).

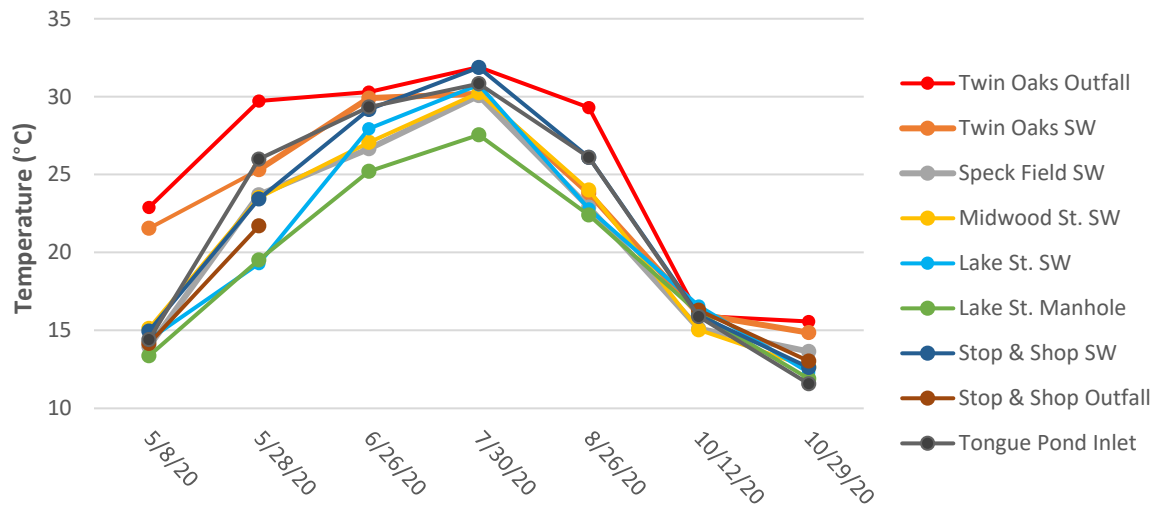


Figure 3-12: Temperature Measurements from Tributary and Outfall Sampling

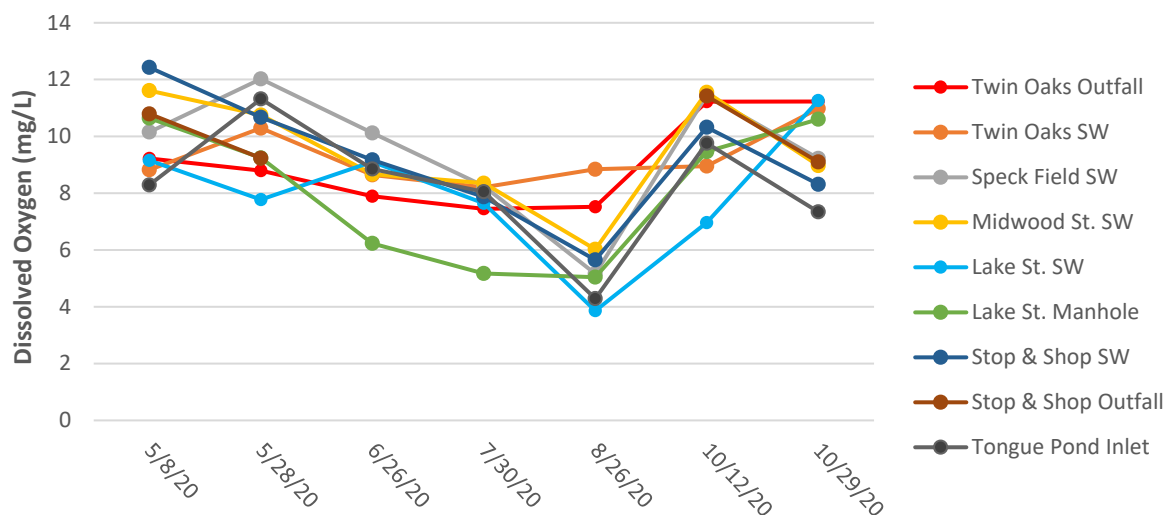


Figure 3-13: Dissolved Oxygen Concentrations from Tributary and Outfall Sampling

3.4.2 Conductivity

Specific conductivity varied from 27.2 ($\mu\text{S}/\text{cm}$) to 534.9 ($\mu\text{S}/\text{cm}$) (**Figure 3-14**). Generally, conductivity peaked during the summer and remained consistent during the fall.

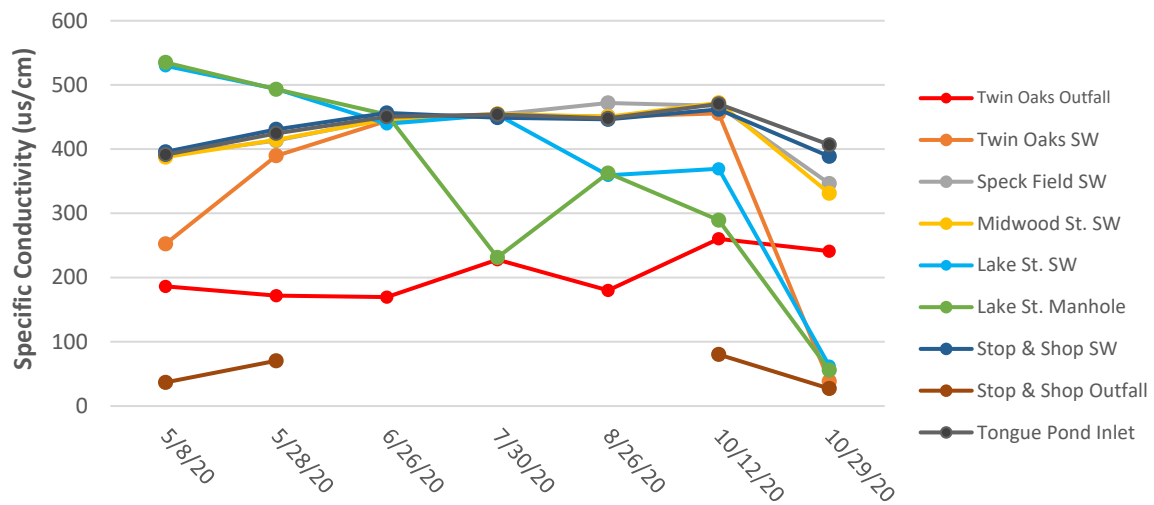


Figure 3-14: Specific Conductivity Measurements from Tributary and Outfall Sampling

3.4.3 Redox Potential

As mentioned above, lower redox potential creates conditions conducive to phosphorus release from sediments. Generally, the redox potential from the tributary and outfall samples were within the same range as the in-lake samples (**Figure 3-15**). This pattern is in agreement with the dissolved oxygen results described earlier.

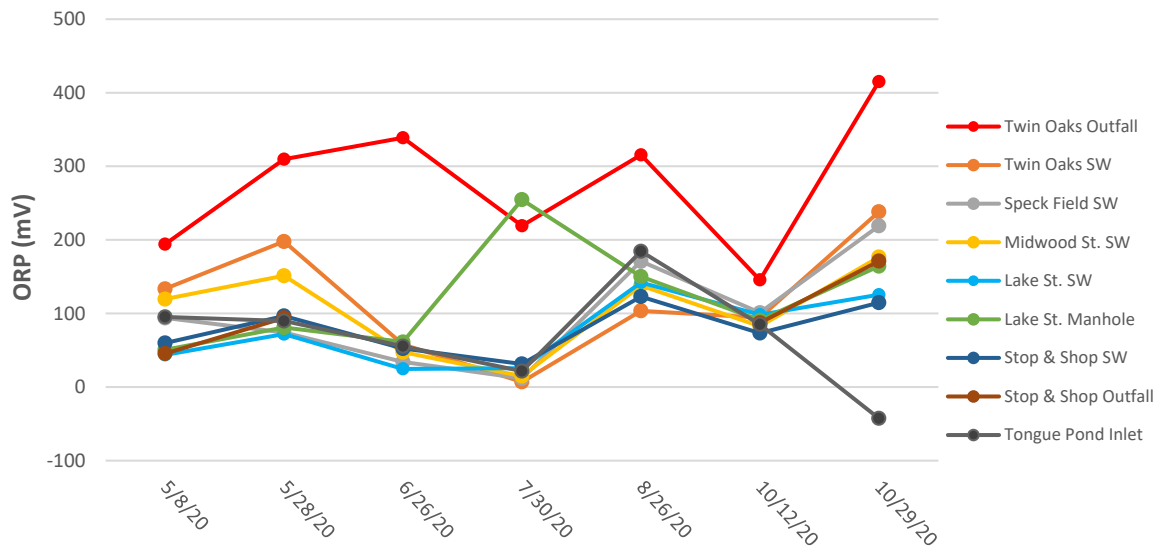


Figure 3-15: Oxidation-Reduction Potential measurements from Tributary and Outfall Sampling

3.4.4 pH

pH values at the tributary and outfalls were slightly acidic to neutral. pH values varied from 5.81 to 9.2 with an average of 7.0 (**Figure 3-16**). The pH values were generally within RIDEM standards for pH and does not appear to have an effect on pH value of Spectacle Pond.

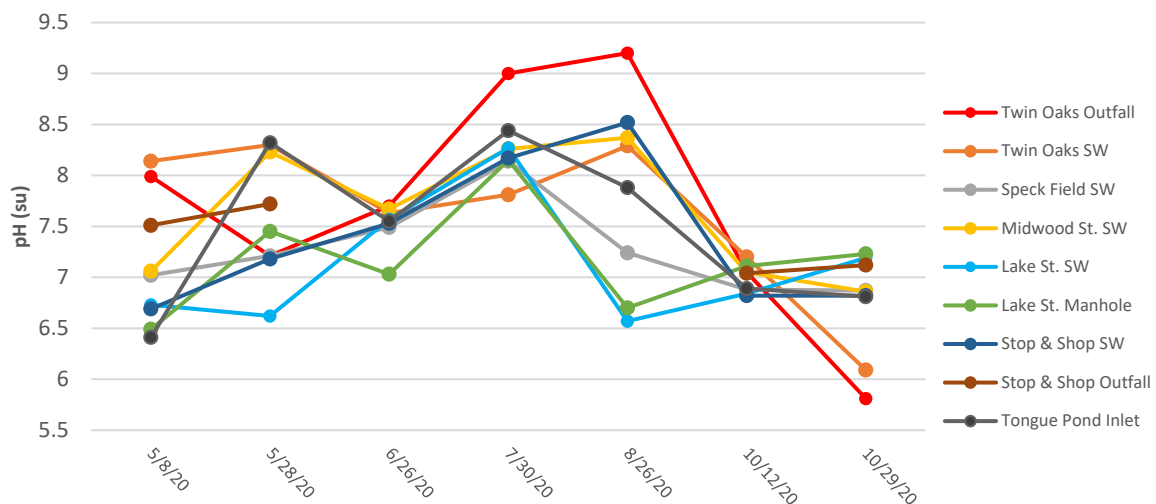


Figure 3-16: pH Measurements from Tributary and Outfall Sampling

3.4.5 Turbidity

Turbidity ranged from 0.1 NTU to 772 NTU (**Figure 3-17**). The highest turbidity reading was collected from the Tongue Pond inlet during the October 29, 2020 wet-weather sampling event. During late spring and early summer, the majority of samples met RIDEM's Water Quality Standard for turbidity in class B fresh waters of 10 NTU. Turbidity followed the in-lake sample trend of increasing into late summer and early fall.

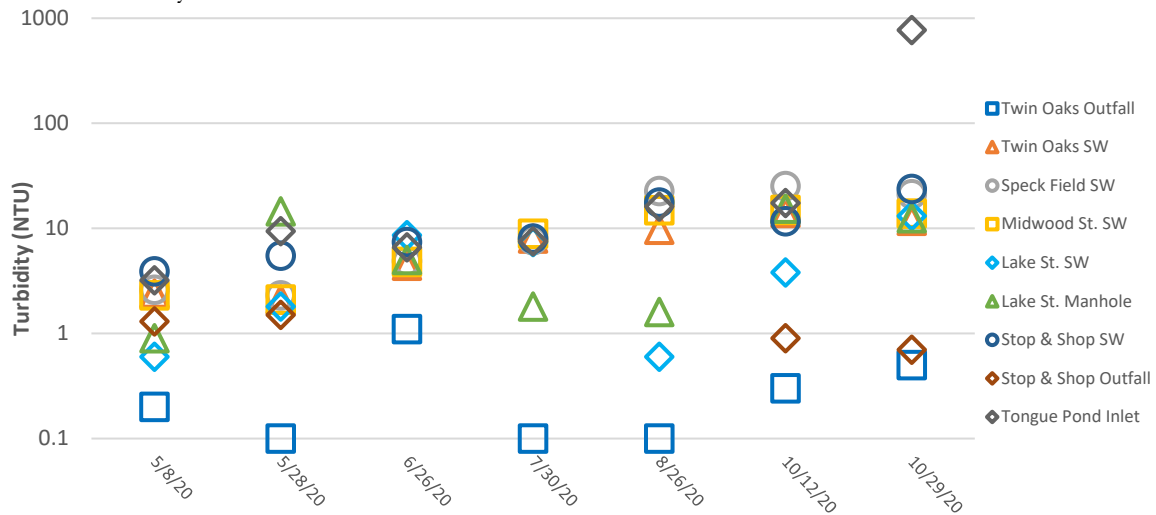


Figure 3-17: Turbidity Measurements from Tributary and Outfall Sampling

3.4.6 Alkalinity

Alkalinity ranged from 6.0 mg/L to 64 mg/L over the seven tributary and outfall sampling events (**Figure 3-18**). The tributary and outfall samples are within the same range as the in-lake samples. Data collected at the outfalls and tributaries under this study indicate that water coming into the pond are unlikely to increase sensitivity to acidification due to the majority of alkalinity values of 20 mg/L or higher.

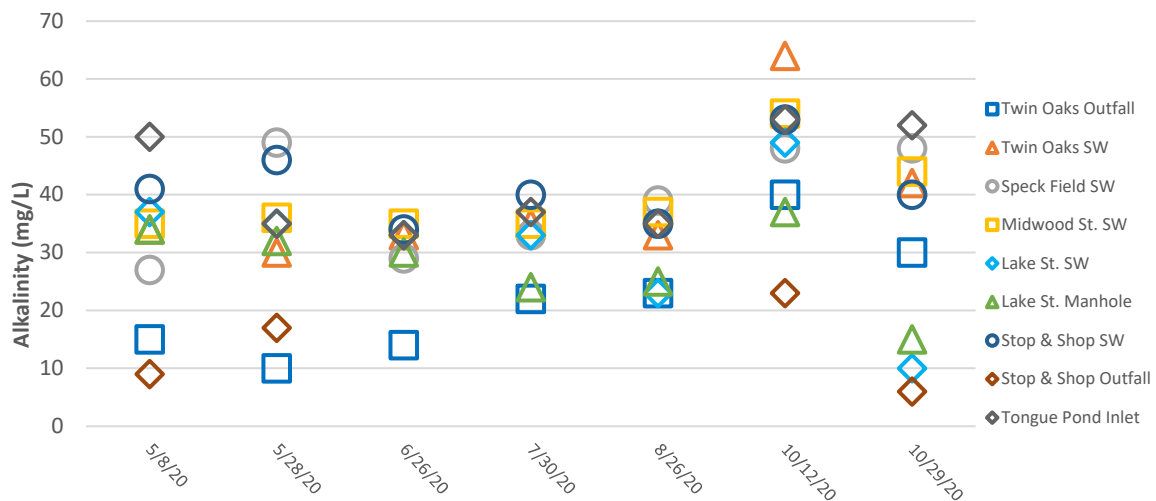


Figure 3-18: Alkalinity of Tributary and Outfall Sampling

3.4.7 Phosphorus

TP ranged from 6.0 to 3,410 µg/L with an average of 109 µg/L (**Figure 3-19**). The September 2007 TMDL indicated stormwater runoff as a significant source of phosphorus. Generally, all samples collected from the tributary and outfalls exceed RIDEM's recommended concentration of 25 µg/L. TP is present at outfall locations flowing into Spectacle Pond.

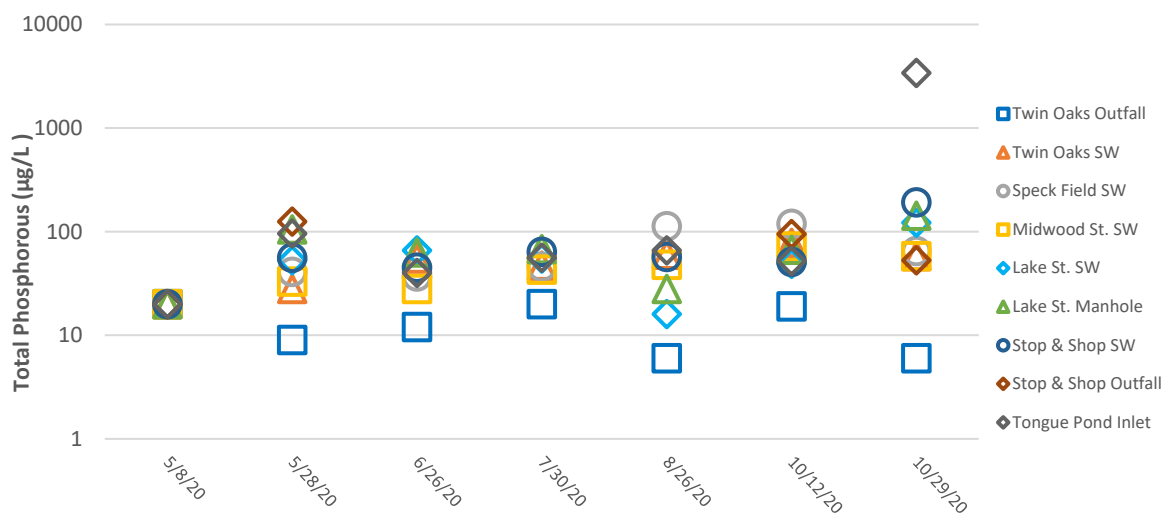


Figure 3-19: Total Phosphorus Concentrations from Tributary and Outfall Sampling

3.4.8 Total Iron

Total iron in Spectacle Pond varied between 0.046 mg/L and 12.7 mg/L with an average value of 0.74 mg/L (**Figure 3-20**). Total iron was present in the tributary and outfall locations. Iron concentrations

were highest during the late summer and early fall sampling events. Iron was not analyzed during the May 8 and 28, 2020 sampling events.

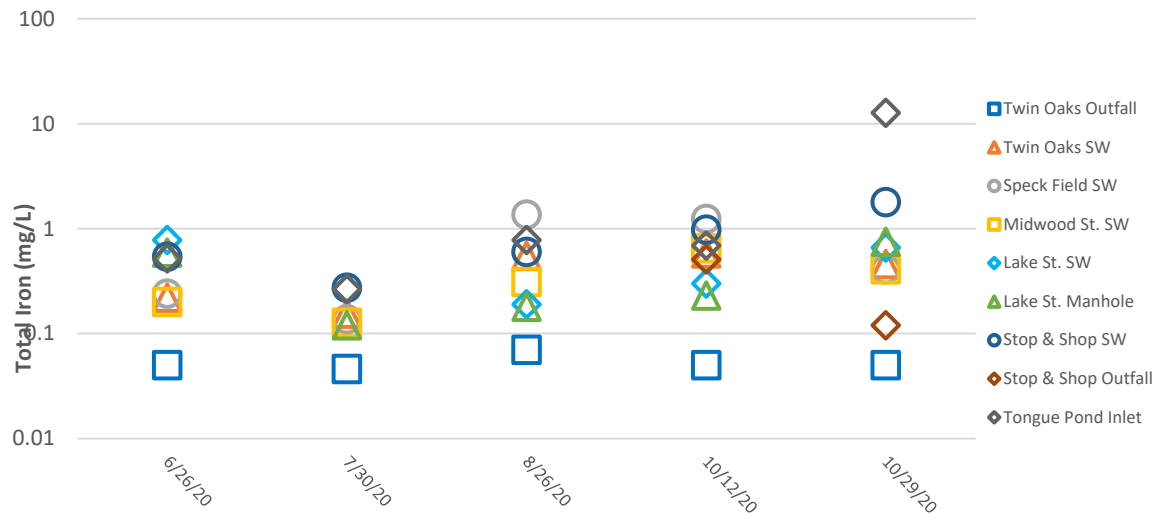


Figure 3-20: Total Iron concentrations from Tributary and Outfall Sampling

3.5 Visual Observations

Fuss & O'Neill field staff visited Spectacle Pond, its outfalls and tributaries seven times over the course of the 2020 recreational season in order to complete this limnological assessment. Dry-weather outfall sampling in May 2020 identified an outfall and manhole on Lake Street with possible visual and olfactory evidence of illicit discharges. Lake edge water samples collected throughout the sampling effort were occasionally noted for having suspended sediment.

4 Estimations of Internal Phosphorus Loading

4.1 Approach

During winter and summer thermal stratification (**Figure 4-1**), when any mixing is limited to surface waters (epilimnion), the lower waters of a lake or pond (hypolimnion) can become anoxic due to chemical and biological activity associated with the breakdown of organic matter by microbes (Wetzel 1983). This can also occur directly at the sediment-water interface of shallow lakes during calm conditions as releases have been documented in waters as shallow as 20 cm (Søndergaard et al 2013). In anoxic conditions, sediments that have acted as a nutrient sink with oxygen present will release P into the hypolimnion. This may eventually influence the productivity of the epilimnion through spring and fall mixis, or turnover, events depending on the extent of P release and the extent of the difference in volumes between the anoxic hypolimnion water and the normoxic epilimnion, with a normal oxygen concentration. Parameters such as organic content, and content of iron, aluminum, manganese, calcium, clay, and other elements with the capacity to bind and release phosphorus may all influence sediment-water interactions and determine the net amount of P released (Søndergaard et al., 2003) from the

sediments. Forms of mobile P, consisting of the loosely sorbed and Fe-P redox sensitive fractions, are most likely to contribute to internal P loading (Pilgrim et al. 2007). Thus, the sediment samples for this study were analyzed for total, loosely sorbed and iron-bound P fractions to explore that potential (See Spectacle Pond P fraction sediment results in).

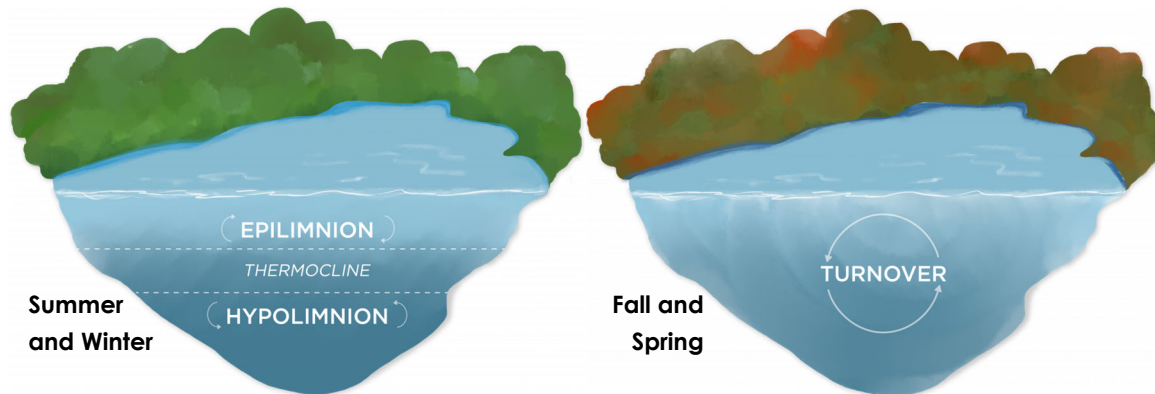


Figure 4-1: Seasonal pond stratification. Image adapted from the Lilly Center for Lakes and Streams at Grace College.

There are four ways to estimate internal P load for a lake (Holdren et al. 2001). These methods range from gross estimates, which approximate the total internal P load, to net estimates, which account for some P loss through the pond outlet and losses to the sediment.

1. Net (and gross) estimates from a complete phosphorus budget through mass balance of inflows, outflows, and internal fluxes on an annual basis. This is the most accurate methods but requires at least monthly measurements of P inputs from all sources, P losses from the outlet, and the P concentration and volume of each lake stratum (epilimnion, metalimnion, and hypolimnion) as they develop over spring and summer.
2. Partially net estimates from in-situ P increases accumulating in the hypolimnion during summer stratification compared to the surface water P concentrations.
3. Gross and net estimates from the in-situ P mass increases throughout the lake over the summer less the P sequestered at fall turnover.
4. Gross estimates from measured or estimated sediment phosphorus release rates and the measured or estimated anoxic area (dissolved O₂ concentrations less than or equal to 2.0 mg/L) and time, the sediment release rates and anoxic factor of Nürnberg (1988; et al. 2012).

With the scope of this study limited to spring through fall sampling, Methods 2 through 4 were employed to estimate the internal P load of Spectacle Pond. While previous work on shallow ponds in Rhode Island suggests that Method 2 yields more accurate P load estimates (J. Schloss, pers. comm.), all three methods were calculated. Comparing results from all three methods can provide additional insight into the difference between gross and net internal P loading. In addition, because Spectacle Pond is

deeper and has more-urban land cover than previously studied RI ponds, and because sample collection was impacted by COVID-19 safety protocols, relying on Method 2 alone may not be the most appropriate comparison. Winter internal loadings for Spectacle Pond were assumed to be negligible given the low spring P concentrations measured. This assumption is supported by previous studies showing that P release is significantly reduced in low temperatures (Nürnberg et al. 2013).

Fuss & O'Neill monitored in-lake conditions between post-spring mixis (May 2020) and fall mixis (October 2020). An additional sample and profile was collected in early May 2021 to provide additional temporal coverage that was not available in 2020 due to COVID-19 safety protocols. Total phosphorus (TP) concentrations were measured on all dates sampled at the surface (0.5-1 foot depth), mid-depth (7 feet), and deep-water depth (13 feet, about a foot from the pond bottom).

4.2 Estimates

Applying DO profiles to the GIS-derived pond bathymetry, collected through the sampling season, provides calculated estimates of areas and volumes of anoxia in Spectacle Pond (**Figure 4-2**). Combining anoxic areas and volumes with measured P concentrations provides estimates of nutrient accumulation in the hypolimnion as it became anoxic and calculation of post-mixis gross internal load settling and sequestration. During the 2020 sampling season, anoxia was first identified in late May below 12 feet depth. In late July, anoxia was present below 6 feet, descending to below 7 feet in August. Fall mixis occurred prior to mid-October.

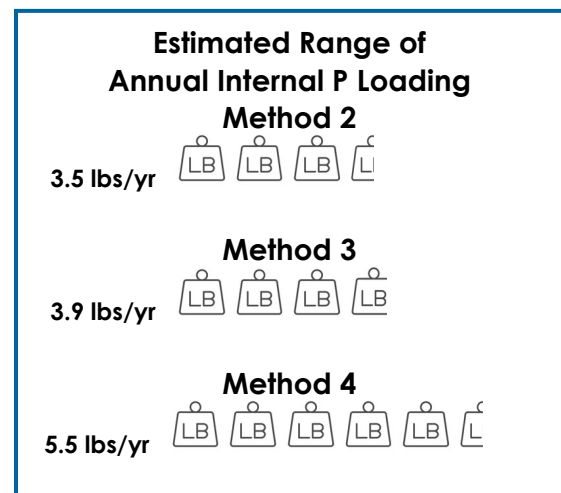


Figure 4-2: Estimated Range of Annual Internal Phosphorous Loading

4.2.1 Method 2

Partially net internal P load using Method 2 was determined by summing the monthly hypolimnetic load as the difference in concentration between the bottom water and upper water TP for the measured anoxic water volume (as concentration multiplied by volume yields the load) divided by the relative volume of the anoxic zone to the oxic lake volume. This resulted in a partial net summer internal P load of 3.5 lbs P/year. It should be noted that epilimnetic TP concentrations varied considerably throughout the sampling period, with significant increases observed over the course of the summer. The less substantial increases observed in the bottom waters suggest that this method produced an underestimate of internal loading due to runoff events that impacted the net difference between the upper and lower waters. Analysis indicated that internal P loading occurred primarily between late May and late August, with the maximum monthly loading occurring in July (1.8 lbs P), when >34% of the pond volume was anoxic. Conditions during the June sampling event had the largest concentration difference between the upper and lower waters of the Pond. Approximately 15% of pond volume was anoxic at that time, and the internal TP yield estimate was 0.7 lbs P.

4.2.2 Method 3

For Method 3, conditions in late May were selected to represent the initial spring pond P mass, late July for the maximum accumulated hypolimnetic P loading, and mid-October for the post-mixis conditions. Epilimnetic TP concentrations were assumed to be equivalent in this mixed layer. Metalimnetic and hypolimnetic TP concentrations were interpolated at each foot interval assuming an increasing TP gradient from below the thermocline to pond bottom. This method yielded a gross internal loading estimate of 5.6 lbs P/year and a net loading estimate of 3.9 lbs P/year. This results in a calculated P resequestration at fall mixis of 31%. Given that mixis most likely occurred in mid to late September in 2020 (a month not sampled during this study), the resequestered P at mixis may have been underestimated here. However, this 31% loss of P to resequentering at mixis does fall into the lower range of expected percent loss as the net P_{int} load is typically 50-72% of the gross loading (Cooke et al. 1993).

4.2.3 Method 4

For Method 4, equations in Nürnberg et al. (2012) yielded an estimate of 42 days of anoxia in Spectacle Pond and an anoxic factor of 13.7 days. Given the significant difference between the deepest site (13 foot) Fe-bound TP concentration and the shallower site samples, a weighted average accounting for the relative surface areas between the sites was employed. Using estimates of sediment release rates based on regressions from Nürnberg (1988) resulted in a P release rate of 1.32 mg/m³ day. Multiplying the anoxic factor by the sediment release rate and the area of the lake resulted in a gross internal loading estimate of 5.5 lbs P/year.

4.2.4 Method Comparison

The estimations from the three methods compare very well. Method 2 resulted in the lowest estimate that can be explained by the variability of summer external loadings due to storm events in this very urban watershed causing this to be an underestimate. This method is the most sensitive to these occurrences as it relies in the net difference between the TP concentration in the upper and lower waters during each month sampled. Method 2 most likely offers a more accurate estimate for gross and net summer internal P loading as it is based on the initial, late summer and post-mixis occurrences which would be less affected by short term storm events. This conclusion is further supported by the results of Method 4, which yielded only slightly lower estimates.

5 Conclusion and Recommendations

Management recommendations to address internal and external sources contributing to P concentrations in Spectacle Pond depend on the relative contribution of P from those sources. Based on the water and sediment quality analyses described in **Sections 2 and 3** and the internal P loading analysis described in **Section 4**, using the highest estimate of internal phosphorus loading of 5.6 lbs P/yr, internal loading represents approximately 1% of the total phosphorus load of 476 lbs P/yr, estimated in the TMDL (**Figure 5-1**). Consequently, while internal loading does contribute to total phosphorus concentrations in Spectacle Pond, external sources (i.e., stormwater runoff, inlet sources, and waterfowl) appear to dominate the loading and it is recommended that these sources be addressed first.

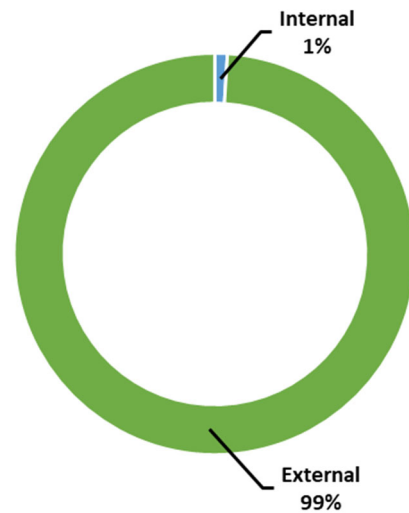


Figure 5-1: Relative Contributions of Internal and External Loading

5.1 Recommendations

Based on information collected in this study, and the prior 2007 TMDL, a plan focused on reducing phosphorus and sediment inputs from stormwater, supported by a secondary focus on discouraging waterfowl use of the pond and minimizing winter-time sanding is recommended. This report provides some general recommendations in more detail than described in the TMDL. The Spectacle Pond Phosphorus Reduction Plan that accompanies this report identifies additional specific locations where opportunities exist to retrofit the storm drain system and provide additional phosphorus load reductions.

Stormwater

In 2007, RIDEM identified 18 outfalls discharging directly to the pond (**Figure 5-2**). Four stormwater outfalls were identified as the most significant potential sources of phosphorus to Spectacle Pond (**Table 5-1**).

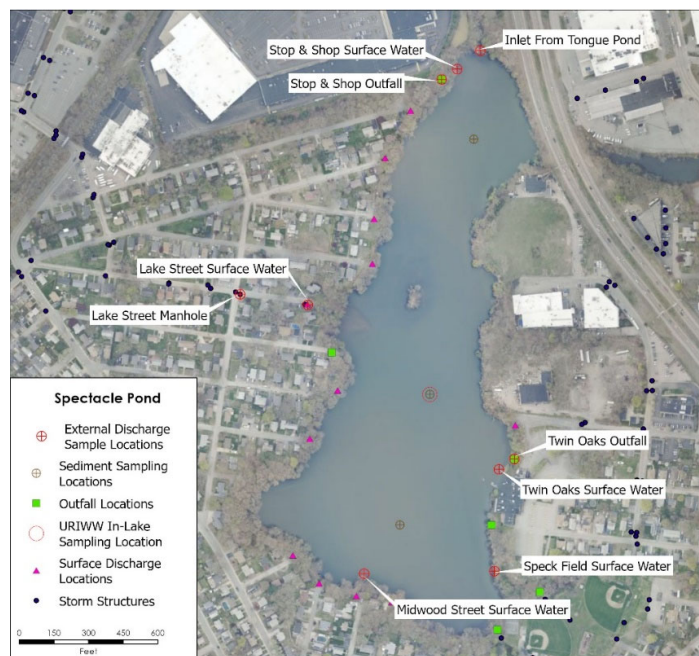


Figure 5-2: External Sources Discharging to Spectacle Pond

The City has already identified several opportunities for stormwater management BMPs, including at Speck Field, and on Pomham and Barrett Streets, and has secured funding for their construction. These future opportunities depend upon the characteristics of underlying soils, the ownership/easement status of the outfalls, and available space (in roadway rights-of-way and public spaces such as parks).

Table 5-1: Priority Outfalls Identified in the TMDL

Outfall ID	Diameter (inches)	Location	Previously Reported Ownership	TMDL Comments
SpP-F	48	Lake Street	City of Cranston	Major sediment delta at end of waste stream
SpP-E	36	Speck Park	City of Cranston	
SpP-D	24	Speck Park	City of Cranston	
SpP-A	15	Molter Street	City of Cranston	Outfall is apparently completely blocked with sediment

Soils in these areas are generally characterized by the US Department of Agriculture Natural Resources Conservation Service (USDA NRCS) based on the soil properties that affect the capacity of the soil to be drained, incorporating factors like depth to a water table, sand content, hydraulic conductivity, and soil density. Rhode Island GIS mapping shows soils are dominated by Hydrologic Soil Group A and B soils with generally good infiltration capacity (**Figure 5-3**) and significant potential for implementing more cost-effective stormwater controls.

However, soils at the north and south shores and a portion of the west shore are mapped as having shallower separation to groundwater. In particular, the area of HSG B soil and shallower groundwater suggests an area that may previously have been an area where stormwater accumulated, such as a tributary stream, which is supported by a sediment delta that appears to stem from the Lake Street outfall. Stormwater solutions in these areas with shallower groundwater separation may require an underdrain and rely primarily on filtration, rather than infiltration, to remove phosphorus from stormwater.

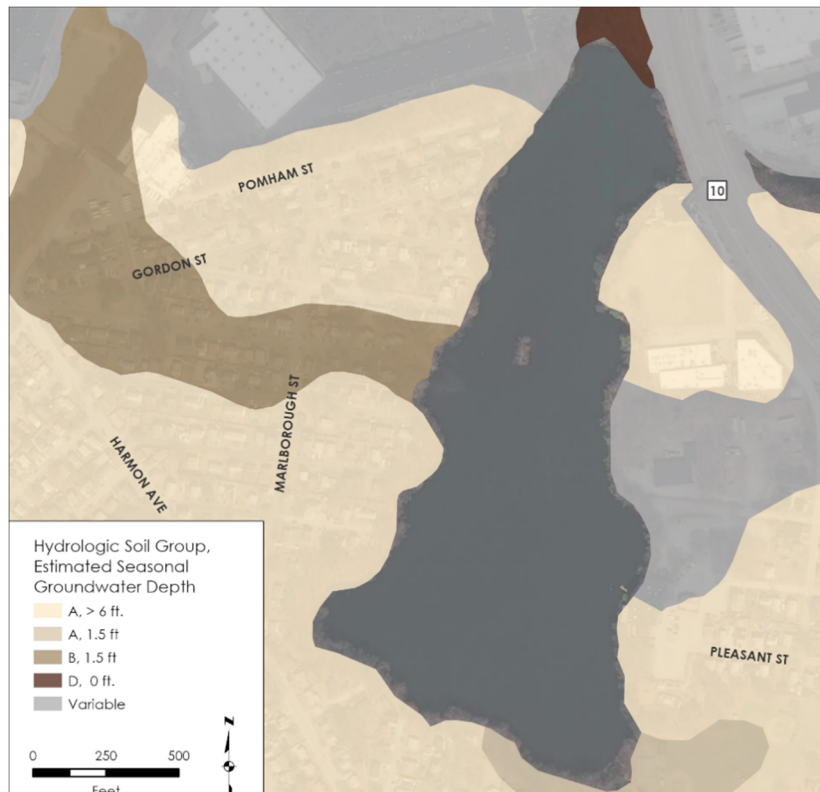


Figure 5-3: Hydrologic Soil Group Characteristics in the Spectacle Pond Watershed

Possible options for stormwater management should be focused on designs that remove sediments and nutrients (i.e., phosphorus). Options that disconnect runoff from roads that now drain directly to the pond and infiltrate that runoff will often be the most effective methods to manage stormwater quality problems. These options have been further analyzed separately to confirm their feasibility. While these options will be effective, they may not be sufficient to reduce the phosphorus loading from the watershed. Such systems may be applicable elsewhere in the watershed but will require additional study to determine their feasibility.

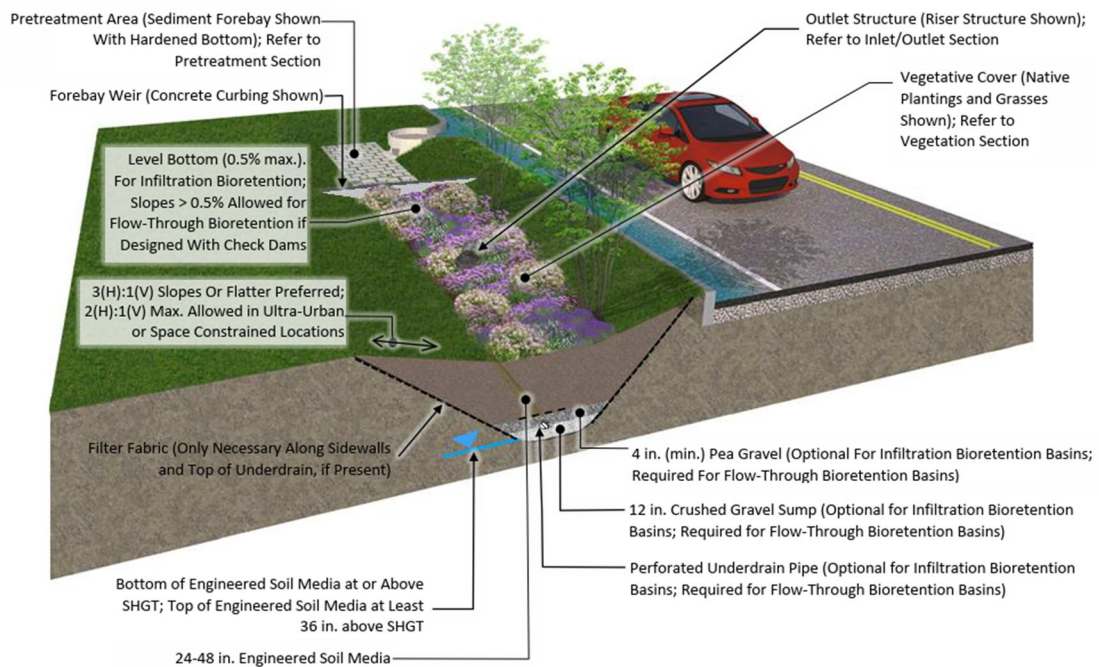
- **Infiltration systems (Figure 5-4)** are systems that capture and temporarily store stormwater runoff, allowing it to soak into the native soil below. These systems prevent a volume of stormwater from discharging to Spectacle Pond and so more closely mimicking pre-development hydrologic conditions. Infiltration systems are typically more efficient at P removal than filtration-based systems, with even small practices providing substantive removal. Infiltration-based practices can be placed at ground level when space exists, or below the surface to accommodate existing surface uses, such as a road, sidewalk, or parking lot. Groundwater separation is a critical design factor for infiltration-based practices. Pretreatment in the form of a forebay or catch basin would be used to remove coarse particulates and allow easier maintenance.

We understand that the widths of the rights-of-way (ROWs) are limited in the neighborhoods around the pond. As a result, the best opportunities for these types of systems would be within easement areas for existing stormwater outfalls. Runoff from the outfalls could be diverted into a bioretention basin (depending on actual elevations and space) where the runoff would be treated.

- **Tree Filters and Bioswales (Figure 5-5)** generally consist of open bottomed systems that include one or more trees or native plants. Street runoff is directed to drain into the surface of the practice where it drains through an engineered soil media that also serves as a growing media for the plants. The engineered soil media removes sediment and particulate-bound phosphorus. The roots also uptake some of the dissolved nutrients. Plants are selected that are resistant to dry and wet conditions and predicted climate change impacts to temperature, rainfall and pests, as well as from chlorides from road salt. Street sand will also accumulate in these filters. The best way to remove this sediment will be with a vacuum truck with a design that prevents the vacuum truck from removing the engineered soils.

Some municipalities have incorporated tree filters and sidewalk bioswales as part of the town's street tree and stormwater management program. Neighbors volunteer to have trees planted in the ROW in front of their homes. A simplified design of a tree filter can then be incorporated to promote stormwater runoff to drain through the filter and disconnect from the conventional drainage system.

In addition to the installation of new BMPs, maintenance and housekeeping actions including reduced wintertime sanding, and increased street sweeping and catch basin cleaning in the watershed could be implemented to reduce sediment loads to the pond. Because phosphorus is often transported with sediment, reduction in sediment can lead to reduced phosphorus loading.

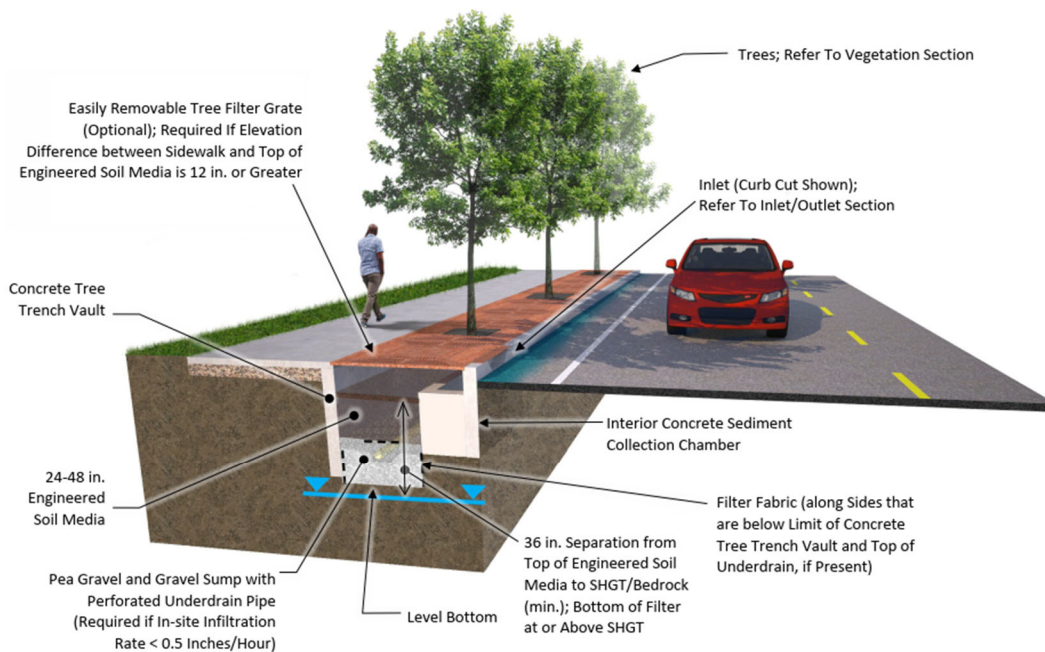


RIDOT Linear Stormwater Manual

2-77



Figure 5-4: Linear Bioretention Basin Example from RIDOT Linear Manual



RIDOT Linear Stormwater Manual

2-115



Figure 5-5: Tree Filter Example from RIDOT Linear Manual

Waterfowl

The 2007 TMDL notes repeated observations of 30-40 waterfowl at a commercial parking area at the northern end of the parking lot. Given steep slopes and dense vegetation, the parking lot and a nearby dirt embankment appear to be the only location where waterfowl congregate. Fencing or vegetated barriers can limit this access. Informational signage to discourage feeding waterfowl installed at public access points may also deter waterfowl from congregating in those locations.

5.2 Potential Funding Sources

In Rhode Island, there are two primary funding sources that are typically available to municipalities to implement stormwater practices to address water quality issues consistent to what is now proposed for Spectacle Pond.

State Revolving Fund (SRF) Loan Program

The SRF provides a low-cost financing option for communities through multiple programs. The Clean Water Program provides loans to help municipalities comply with federal and state water quality requirements by focusing on watershed management priorities, stormwater management, and green infrastructure, as well as community septic system repair programs and riverbank restoration projects. Open space acquisitions related to water quality protection are also eligible for financing.

One program, the Bay, and Watershed Restoration Fund (BWRF) is a program administered by RIDEM to fund programs allocated by previous bond referenda. The fund is meant to provide funding assistance for the feasibility analysis, design, construction, or rehabilitation of nonpoint source water pollution control facilities, stormwater pollution control projects, riparian buffer and aquatic habitat restoration projects, and projects which prevent or mitigate flooding.

Website: <http://www.dem.ri.gov/programs/water/finance/state-revolving-fund.php>

RIIB Stormwater Project Accelerator

The Stormwater Project Accelerator is administered by the Rhode Island Infrastructure Bank and the Department of Transportation. The program provides upfront funding to municipalities for infrastructure funding to support green stormwater infrastructure in Rhode Island that will ultimately be reimbursed through state and local reimbursement grants. Eligible projects must first secure state or local funding.

Website: <https://www.riib.org/spa>

Additionally, while RIDOT does not have a formal grant program for stormwater quality, they are currently under a Consent Decree with USEPA to implement stormwater quality improvements for their infrastructure for every impaired watershed that is being impacted by runoff such as the Spectacle Pond watershed. While they are responsible for implementing controls on nearby state roads, USEPA does allow RIDOT to partner with municipalities to address up to 25% of their stormwater quality requirements, even when the drainage is not on RIDOT-maintained roads. RIDOT does have active

programs where they contribute funding to municipalities to implement these types of controls so that they can record the treatment credits. One advantage of this RIDOT funding is to use it as a match for other grant programs.

Municipal Resilience Preparedness (MRP) Action Grant Program

The MRP Action Grant Program is administered through the RI Infrastructure Bank, in partnership with the Nature Conservancy. To be eligible for funding, communities must complete the MRP Planning Grant process, in which Cranston has not yet participated. The MRP Action Grant offers financial assistance to municipalities that are interested in implementing climate adaptation actions to address the impacts of climate change (extreme weather, sea level rise, inland and coastal flooding, severe heat, etc.). The program funds projects relating to planning, assessments, and regulatory updates; nature-based solutions for ecological and public health; and resilient redesigns and retrofits for critical facilities and infrastructure. In past funding rounds, project amounts ranged from \$150,000 to \$400,000. A 25% match, either through cash or in-kind services, is required.

Website: <https://www.riib.org/mrp>

Clean Water Act, Section 319 Nonpoint Source Implementation Grants

Section 319 Grants are available for projects that promote restoration and protection of water quality through reducing and managing nonpoint source pollution. These grants are made possible by federal funds provided to RIDEM by the USEPA under Section 319 of the Clean Water Act. Eligible applicants include municipal, state, or regional governments, quasi-state agencies, public schools and universities, and non-profit watershed, environmental, or conservation organizations. Pursuant to federal guidelines for Section 319 funding, projects can only be funded in those areas in which a Watershed-Based Plan has been completed.

Clean Water Act Section 319 grants may be used for green stormwater infrastructure projects (if not mandated by a stormwater permit) and certain restoration activities. Projects should be in line with the state's 2019 guidance document "Nonpoint Source Management Program Plan". Annual funding is approximately \$750,000 and requires a 33% match.

RIDEM 319 website: <http://www.dem.ri.gov/programs/water/finance/nonpoint-source-funding.php>

Southeast New England Program Network

Southeast New England Watershed Grant Program: Over the last 5 years, the US Environmental Protection Agency (USEPA) has administered this grant program providing \$22 million in funding for water quality and sustainability projects for the Narragansett Bay and Buzzard's Bay watersheds. This watershed includes almost all of Rhode Island and most of Southeastern Massachusetts and Cape Cod. These grant applications typically require a 50% match. Stormwater quality projects such as those proposed for Upper Dam Pond are fundable under this grant program, however, these grants are very competitive with less than half of the grant applications typically being funded. As a result, it is important that the projects proposed with these grant applications incorporate a unique element that provides a differentiator compared to other applications.

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Appendix A

Internal Loading Calculations

Spectacle Pond Internal Nutrient Loading Calculations

Used anoxic threshold <= 2.0 mg/L

IF anoxic threshold = 2mg/L									
Sampling Date	noxice Sediment Area (ft²)	noxice Sediment Area (m²)	noxice Volume (ft³)	Anoxic Volume (m³)	% Anoxia	Epi- Volume (ft3)	Epi- Volume (m3)	Total Volume (ft³)	Total Volume (m³)
5/5/2021	0	0	0	0	0	9,899,899	280,334	9,899,899	280,334
5/25/2021	97,422	9,052	646,552	18,308	6.5%	9,253,347	262,026	9,899,899	280,334
6/26/2020	217,403	20,200	1,442,827	40,856	14.6%	8,457,072	239,478	9,899,899	280,334
7/30/2020	510,567	47,439	3,388,450	95,950	34.2%	6,511,449	184,384	9,899,899	280,334
8/26/2020	459,004	42,648	3,046,246	86,260	30.8%	6,853,653	194,074	9,899,899	280,334
10/12/2020	0	0	0	0	0	9,899,899	280,334	9,899,899	280,334
10/29/2020	0	0	0	0	0	9,899,899	280,334	9,899,899	280,334

Method 2 Calculations Difference between the hypolimnetic and epilimnetic TP concentration accounting for Anoxic Volume and % that volume is to total lake volume measured during summer stratification

	TP Diff		
Sampling Date	mg/L	Kg P	Lbs P
5/5/2021	0		
5/25/2021	0.012	0.014348357	0.031632387
6/26/2020	0.050	0.297723103	0.656360354
7/30/2020	0.025	0.821024679	1.810031007
8/26/2020	0.017	0.45122472	0.994770018
10/12/2020	0		
10/29/2020	0		
Totals		1.58	3.49

Method 3 Calculations

Sampling Date	Kg TP	Monthly Kg diff	Monthly LBS diff
5/5/2021			
5/25/2021	17.39630082		
6/26/2020			
7/30/2020	19.93686787	2.540567048	5.600934115
8/26/2020			0
10/12/2020	19.15615154	-0.78071633	-1.721167221
10/29/2020			
Net Load		1.76	3.88
Gross Load		2.54	5.60
Percent TP resequstered at fall turnover		30.7%	

Method 4 Calculations

RR

Days Anoxic

Anoxic Factor

Lp Summer

Using sediment release rate estimated from Fe Bound P in sediments and Anoxic Factor (Nürnberg)

1.316 mg/m2-day

42.045 days

13.664 days-m2/m2

2.493 kg

5.496 lbs

Parameters:

Mean Depth

Lake Area

2.0 meters

0.13860 km2

138,600 m2

Days anoxic is most likely an underestimate uisng the Nurenberg equations compared to DO2 measurements made by field staff but compensated by using the average anoxic sediment area as the average of the July and August

Method	Gross Internal P Load kg (lbs)	Net Internal P Load kg (lbs)	Percent P Resequesterd
Method 2	--	1.58 (3.49)	--
Method3	2.54 (5.60)	1.76 (3.88)	30.7%
Method 4	2.49 (5.50)	--	--

Appendix B

Field and Laboratory Data



Table 8
Summary of In Pond SmartTroll Readings

Spectacle Pond
Cranston, Rhode Island

June 26, 2020

Depth (ft)	Temp (C)	RDO (mg/L)	RDO Sat (%)
0.55	26.47	9.07	112.7
1	27.1	9.06	114.2
2	27.2	9.05	114.3
3	26.7	9.15	114.5
4	26.85	8.95	112.2
5	27.15	8.98	113.3
6	27.02	8.83	111.2
7	26.42	7.4	91.6
8	25.13	6.61	80.6
9	24.08	2.77	32.9
10	23.17	1.97	23.3
11	20.97	0.07	0.8
12	20.13	0.13	1.4
13	18.66	0.53	5.8

NOTES:

mg/L: milligrams per liter

ft: feet

C: Celsius

% - Percentage

Created by:

APT



FUSS & O'NEILL

Table 9
Summary of In Pond SmartTroll Readings

Spectacle Pond
Cranston, Rhode Island

July 30, 2020

Depth (ft)	Temp (C)	RDO (mg/L)	RDO Sat (%)
1	26.26	7.67	95.2
2	28.36	8.24	106
3	28.45	8	103.2
4	28.54	7.77	100.5
5	28.46	7.46	96.3
6	27.99	2.5	32
7	26.88	0.09	1.1
8	25.8	0.02	0.3
9	24.74	0.01	0.1
10	23.16	0.01	0.2
11	21.71	0	0
12	19.9	-0.01	-0.2
13	22.33	0.15	1.7

NOTES:

mg/L: milligrams per liter

ft: feet

C: Celsius

% - Percentage

Created by:

APT

Table 10
Summary of In Pond SmartTroll Readings

Spectacle Pond
Cranston, Rhode Island

August 26, 2020

Depth (ft)	Temp (C)	RDO (mg/L)	RDO Sat (%)
0.21	25.6	9.5	116.5
1	25.71	9.42	115.5
2	25.69	9.29	113.9
3	25.51	8.83	108.1
4	25.4	8.48	103.5
5	25.33	8.5	102.4
6	25.15	7.22	87.8
7	24.6	2	24.1
8	24.17	0.21	2.5
9	23.68	0.01	0.1
10	22.85	0.01	0.1
11	22.22	0	0
12	20.97	-0.01	-0.1
13	20.57	-0.01	-0.1

NOTES:

mg/L: milligrams per liter

ft: feet

C: Celsius

% - Percentage

Created by:

APT



FUSS & O'NEILL

Table 11
Summary of In Pond SmartTroll Readings

Spectacle Pond
Cranston, Rhode Island

October 12, 2020

Depth (ft)	Temp (C)	RDO (mg/L)	RDO Sat (%)
1	16.07	8.87	88.7
2	16.25	8.5	85.5
3	16.29	8.49	85.4
4	16.25	8.57	86.1
5	16.29	8.54	85.9
6	16.33	8.54	86
7	16.38	8.36	84.3
8	16.38	8.36	84.3
9	16.4	8.19	82.6
10	16.4	7.95	80.2
11	16.41	8.28	83.5
12	16.43	6.58	66.5
13	13.77	6.36	60.1

NOTES:

mg/L: milligrams per liter

ft: feet

C: Celsius

% - Percentage

Created by:

APT



FUSS & O'NEILL

Table 12
Summary of In Pond SmartTroll Readings

Spectacle Pond
Cranston, Rhode Island

October 29, 2020

Depth (ft)	Temp (C)	RDO (mg/L)	RDO Sat (%)
1	12.95	8.09	77
2	13.17	7.99	76.5
3	13.4	7.93	76.2
4	13.58	7.83	75.6
5	13.64	7.81	75.5
6	13.77	7.84	76
7	13.79	7.75	75.2
8	13.8	7.78	75.5
9	13.81	7.8	75.7
10	13.81	7.75	75.3
11	13.78	7.03	68.2
12	13.77	6.97	67.6
13	13.77	6.49	63

NOTES:

mg/L: milligrams per liter

ft: feet

C: Celsius

% - Percentage

Created by:

APT

Log: Allen
Report Created: 2020-07-12 11:01:53
Site: Spec Pond June
GPS: 41 51 18.92 -71 -26 -25.78

Log Created: 2020-06-26 12:55:22
Number Readings:
Battery Type: SmarTROLLâ„¢ Battery Pack
Battery SN: 372895
Device Type: SmarTROLLâ„¢ MP
Device SN: 483011

Created	Baro (mbar)	Temp (C)	RDO (mg/L)	RDO Sat (%)	pH (pH)	ORP (mV)	Act Cond (ÂµS/cm)	Sp Cond (ÂµS/cm)	Salinity (ps	Resist (Oh	Density (g/cm^3)	TDS (ppt)	Depth (ft)	Pressure (psi)	Air Temp (C)
6/26/2020 12:55	1011.5	26.47	9.07	112.7	8.01	161.6	464.2	452.8	0.2	2154	0.997	0	0.55	0.237	29.2
6/26/2020 12:56	1011.4	27.1	9.06	114.2	7.9	132.7	464.5	446.8	0.2	2153	0.997	0	0.87	0.377	29.1
6/26/2020 12:57	1011.4	27.2	9.05	114.3	7.89	128.3	464.6	446	0.2	2152	0.997	0	2.06	0.891	29.1
6/26/2020 12:59	1011.5	26.7	9.15	114.5	7.89	118	462.9	448.4	0.2	2161	0.997	0	3.02	1.308	28.9
6/26/2020 13:00	1011.4	26.85	8.95	112.2	7.86	113.5	463	447.7	0.2	2160	0.997	0	4.17	1.806	28.9
6/26/2020 13:01	1011.3	27.15	8.98	113.3	7.84	109	463.5	445.3	0.2	2157	0.997	0	5.15	2.231	28.8
6/26/2020 13:02	1011.2	27.02	8.83	111.2	7.74	108.3	463.3	446.1	0.2	2159	0.997	0	6.31	2.735	28.7
6/26/2020 13:02	1011.2	26.42	7.4	91.6	7.7	108.9	456.3	447.3	0.2	2191	0.997	0	7.1	3.076	28.7
6/26/2020 13:02	1011.2	25.13	6.61	80.6	7.66	109.4	430.7	429.1	0.2	2322	0.997	0	8.28	3.588	28.6
6/26/2020 13:03	1011.1	24.08	2.77	32.9	7.59	109.5	423.3	432.5	0.2	2362	0.997	0	9.09	3.94	28.6
6/26/2020 13:03	1011.2	23.17	1.97	23.3	7.5	109.5	417	428.6	0.2	2398	0.998	0	10.05	4.355	28.7
6/26/2020 13:04	1011.1	20.97	0.07	0.8	7.31	-39	413.5	448.3	0.2	2419	0.998	0	11.2	4.856	28.8
6/26/2020 13:04	1011.1	20.13	0.13	1.4	7.18	-111.3	400	431	0.2	2500	0.998	0	12.01	5.205	28.9
6/26/2020 13:10	1011.1	18.66	0.53	5.8	6.83	-144.2	545.4	614.6	0.3	1833	0.999	0	13.09	5.674	29.3

Log: Spec Pond July
Report Created: 2020-08-06 08:48:18
Site: Spec Pond July
GPS:
Log Created: **2020-07-30 09:04:37**
Number Readings:
Battery Type: SmarTROLLâ„¢ Battery Pack
Battery SN: 426755
Device Type: SmarTROLLâ„¢ MP
Device SN: 483011

Created	Baro (mbar)	Temp (C)	RDO (mg/L)	RDO Sat (%)	pH (pH)	ORP (mV)	Act Cond (ÂµS/cm)	Sp Cond (ÂµS/cm)	Salinity (psu)	Resist (Ohm-cm)	Density (g/cm^3)	TDS (ppt)	Depth (ft)	Pressure (l	Air Temp (C)
7/30/2020 9:02	1012.3	26.26	7.67	95.2	7.6	61.3	0.9	0.9	0	1141028	0.997	0	0.94	-0.114	30.4
7/30/2020 9:04	1012.3	28.36	8.24	106	8.58	33.3	484.8	455.9	0.2	2063	0.996	0	2.24	0.972	31.5
7/30/2020 9:05	1012.3	28.45	8	103.2	8.54	35.1	484.4	454.5	0.2	2065	0.996	0	3.01	1.307	31.7
7/30/2020 9:06	1012.3	28.54	7.77	100.5	8.49	36.3	484	453.4	0.2	2066	0.996	0	4.02	1.742	32
7/30/2020 9:06	1012.4	28.46	7.46	96.3	8.4	38.3	484.8	454.5	0.2	2063	0.996	0	5.02	2.176	32.1
7/30/2020 9:06	1012.3	27.99	2.5	32	8.21	39.1	483.6	457.2	0.2	2068	0.996	0	6	2.602	32.2
7/30/2020 9:07	1012.3	26.88	0.09	1.1	7.96	-43.5	482.9	465.7	0.2	2071	0.997	0	6.91	2.996	32.4
7/30/2020 9:08	1012.3	25.8	0.02	0.3	7.84	-78.3	470.5	463.4	0.2	2126	0.997	0	7.93	3.44	32.6
7/30/2020 9:09	1012.4	24.74	0.01	0.1	7.7	-124.7	470.2	472.5	0.2	2127	0.997	0	9.01	3.898	32.7
7/30/2020 9:09	1012.3	23.16	0.01	0.2	7.52	-157.3	499.2	517.4	0.3	2003	0.998	0	10.03	4.341	32.8
7/30/2020 9:10	1012.3	21.71	0	0	7.24	-181	586	625.2	0.3	1706	0.998	0	10.98	4.76	33
7/30/2020 9:12	1012.2	19.9	-0.01	-0.2	7.04	-228.1	759.1	840.9	0.4	1317	0.999	1	11.98	5.06	33.5
7/30/2020 9:18	1012.4	22.33	0.15	1.7	6.78	-172.5	642.2	674	0.3	1557	0.998	0	13.11	5.404	35.2

Log: Kristin Connel
Report Created: 2020-08-26
Site: Spec Pond August

Temp (C)	RDO (mg/L)	RDO Sat (%)	Depth (ft)
25.6	9.5	116.5	0.21
25.71	9.42	115.5	1
25.69	9.29	113.9	2
25.51	8.83	108.1	3
25.4	8.48	103.5	4
25.33	8.5	102.4	5
25.15	7.22	87.8	6
24.6	2	24.1	7
24.17	0.21	2.5	8
23.68	0.01	0.1	9
22.85	0.01	0.1	10
22.22	0	0	11
20.97	-0.01	-0.1	12
20.57	-0.01	-0.1	13

Log: Kristin Connel
Report Created: 2020-10-12
Site: Spec Pond October

Depth (ft)	Temp (C)	RDO (mg/L)	RDO Sat (%)	ORP (mV)	pH (pH)	Sp Cond (ÂµS/cm)
1.02	16.07	8.87	88.7	183.1	6.23	471.5
1.95	16.25	8.5	85.5	160.3	6.25	468.9
3.2	16.29	8.49	85.4	154.1	6.27	468.3
4.24	16.25	8.57	86.1	128.4	6.41	468.5
5.29	16.29	8.54	85.9	126.8	6.42	468.1
6.38	16.33	8.54	86	125.6	6.41	467.9
7.27	16.38	8.36	84.3	120.9	6.45	467.3
8.32	16.38	8.36	84.3	119.3	6.47	467.1
9.33	16.4	8.19	82.6	117.2	6.48	467.3
10.06	16.4	7.95	80.2	115.7	6.49	467.4
10.98	16.41	8.28	83.5	115.3	6.5	467
11.66	16.43	6.58	66.5	-97.7	6.2	575.5
13	13.77	6.36	60.1	32.2	6.49	479.4

Depth	Temp	RDO	RDO Sat	ORP	pH	SP Conductivity
0.73	12.95	8.09	77	110.3	6.72	413.8
1.94	13.17	7.99	76.5	108.1	6.71	411.6
3.07	13.4	7.93	76.2	106.1	6.71	405.5
4.18	13.58	7.83	75.6	103.7	6.71	406.8
5.32	13.64	7.81	75.5	101.8	6.72	406.7
5.96	13.77	7.84	76	98.2	6.75	405.3
6.98	13.79	7.75	75.2	95.7	6.77	404.8
8.07	13.8	7.78	75.5	96.2	6.79	404.9
8.75	13.81	7.8	75.7	97.3	6.8	404.7
10.16	13.81	7.75	75.3	95.8	6.8	405
11.22	13.78	7.03	68.2	92.7	6.81	406.5
11.93	13.77	6.97	67.6	89.7	6.83	406.6
12.62	13.77	6.49	63	83.7	6.82	406.8

Depth	Temp	RDO	RDO Sat	ORP	pH	SP Conductivity
0.98	14.7	10.08	100.2	101.8	6.95	436
1.81	14.81	10.03	99.8	102.2	6.93	435.4
2.8	14.94	9.88	98.8	100.3	6.97	433.4
4.06	15.03	9.88	98.9	100.1	6.98	432.5
4.95	15.09	9.83	98.6	99.7	6.98	431.9
6.01	15.12	9.73	97.6	99.2	6.99	431.5
7.12	15.12	9.69	97.3	98.4	7.00	431.1
8.05	14.98	9.59	95.9	93.3	7.06	432.8
8.99	15.06	9.45	94.7	96.2	7.08	431.5
10.07	14.76	7.86	78.3	93	7.07	440.4
11.05	14.45	6.31	62.4	91.5	7.06	443.4
12.12	13.89	5.27	51.7	-74.7	6.84	463.9
12.84	13.96	6.22	61.2	-522	6.54	447.3

Depth	Temp	RDO	RDO Sat	ORP	pH	SP Conductivity
1.01	20.84	10.52	116.5	202	5.93	446.3
1.89	20.97	10.42	115.9	187.8	6.11	444.5
2.87	21.18	10.34	115.4	168.8	6.48	441.8
3.93	21.16	10.28	114.8	156.2	6.68	441.3
4.78	20.8	10.37	115.1	140.2	6.9	444.4
6.18	20.75	10.31	114.3	140.5	6.92	443.6
6.85	20.57	10.21	113.4	140.2	6.99	443.5
8.05	18.09	10.38	108.8	136.2	7.05	419.1
9.02	18.27	10.14	108.6	140.9	7.06	411.3
9.99	17.12	3.3	33.8	28.6	7.07	416.4
11.07	16.56	6.3	64.5	-34.7	6.86	416.2
11.8	15.61	0.94	9.4	-60.6	6.73	440.4
12.81	16.15	1.21	12.3	-53.3	6.91	424.7

Table 8
Summary of Sediment Results

Spectacle Pond
Cranston, Rhode Island

August 26, 2020

		Sample Location	SED-01 (Center of Pond)	SED-02 (Southern end of pond)	SED-03 (Northern end of pond)
		Sample Number	0508-01	0508-02	0508-03
		Sample Date	8/26/20	8/26/20	8/26/20
		Laboratory	Northeast	Northeast	Northeast
		Sample Type	Grab	Grab	Grab
Analysis Request	Units	Reporting Limit			
Total Phosphorus	mg/kg	NA	5810	175	3810
Iron Bound Phosphorus	mg/kg	NA	376	44	78.2
Loosely Bound Phosphorus	mg/kg	NA	10.1	4.4	3
Total Solids	%	NA	14.6	66.4	13.7
Organic Matter	%	NA	10.29	60.83	6.96

NOTES:

mg/kg: milligrams per kilogram

Only the last six digits of the sample numbers are given.

NA: Not applicable

Northeast: Northeast Laboratories, Inc.

Created by:

APT

Table 1
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

May 08, 2020

		Sample Location	Twin Oaks Outfall	Twin Oaks SW	Speck Field SW	Midwood SW	Lake St SW	Lake St Manhole	Stop & Shop Outfall	Stop & Shop SW	Tongue Pond Inlet
		Sample Number	0508-01	0508-02	0508-03	0508-04	0508-05	0508-06	0508-07	0508-08	0508-10
		Sample Date	5/8/20	5/8/20	5/8/20	5/8/20	5/8/20	5/8/20	5/8/20	5/8/20	5/8/20
		Laboratory	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Analysis Request	Units	Reporting Limit									
Alkalinity (Method SM2320-B)	mg/L	2	15	34	27	35	37	34	9	41	50
Total Phosphorous (Method SM4500-P-E)	mg/L	0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02
Turbidity (SM2130-B)	NTU	0.1	0.2	2.4	2.6	2	0.6	0.9	1.3	3.9	3.2
pH	pH	NA	7.99	8.14	7.02	7	6.73	6.5	7.51	6.69	6.41
Temperature	(C)	NA	22.89	21.55	13.96	15	14.41	13.4	14.15	14.95	14.4
Specific Conductivity	(µS/cm)	NA	186.3	252.5	390.6	388	529.8	534.9	36.6	395.8	391.4
Dissolved Oxygen	mg/L	NA	9.22	8.82	10.15	12	9.15	10.6	10.79	12.43	8.29
Dissolved Oxygen Saturation	%	NA	107.8	100.7	103.5	106.7	90.5	102.7	105.1	124.1	81.5
Oxidation-Reduction Potential	mV	NA	194.1	133.4	93.9	120	43.6	50.7	45.5	59.8	95.3

NOTES:

mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
µS/cm: Conductivity Microsiemens per centimeter

mV: millivolts
Only the last six digits of the sample numbers are given.
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable
SW: Stormwater

REQUIRED DETECTION LIMITS FROM QAPP

TOTAL PHOSPHORUS 0.008 mg/L
ALKALINITY 2.0 mg/L
TURBIDITY 0.1 NTU

Created by: APT
Reviewed by: WG

Table 2
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

May 28, 2020

		Sample Location	Twin Oaks Outfall	Twin Oaks SW	Midwood SW	Lake St Manhole	Lake St SW	Speck Field SW	Stop & Shop Outfall	Stop & Shop SW	Tongue Pond Inlet
		Sample Number	0528-01	0528-02	0528-03	0528-04	0528-05	0528-06	0528-07	0528-08	0528-09
		Sample Date	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20	5/28/20
		Laboratory *	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Laboratory **	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix
		Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Analysis Request	Units	Reporting Limit									
Alkalinity (Method SM2320-B)	mg/L	2	10	30	36	32	35	49	17	46	35
Total Phosphorous (Method SM4500-P-E)	mg/L	0.01	0.009	0.028	0.033	0.105	0.053	0.041	0.125	0.056	0.096
Turbidity (SM2130-B)	NTU	0.1	ND<0.1	2.1	2.1	15	1.8	2.3	1.5	5.5	9.4
pH	pH	NA	7.21	8.30	8.23	7.45	6.62	7.21	7.72	7.18	8.32
Temperature	(C)	NA	29.72	25.31	23.52	19.52	19.28	23.70	21.70	23.43	25.99
Specific Conductivity	(µS/cm)	NA	171.80	389.60	414.40	493.20	493.70	413.20	70.30	430.80	424.6
Dissolved Oxygen	mg/L	NA	8.79	10.29	10.75	9.24	7.77	12.02	9.23	10.67	11.32
Dissolved Oxygen Saturation	%	NA	114.20	124.80	125.70	100.30	83.90	141.60	104.50	125.00	138.9
Oxidation-Reduction Potential	mV	NA	309.60	197.80	151.30	80.80	71.90	74.10	94.00	96.60	89.7

NOTES:
mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
µS/cm: Conductivity Microsiemens per centimeter
mV: millivolts
SW: Stormwater

Only the last six digits of the sample numbers are given.
Laboratory*
Laboratory**
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable

REQUIRED DETECTION LIMITS FROM QAPP
TOTAL PHOSPHORUS 0.008 mg/L
ALKALINITY 2.0 mg/L
TURBIDITY 0.1 NTU

Created by: APT
Reviewed by: WG

Table 3
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

June 26, 2020

		Sample Location	Twin Oaks Outfall	In lake Sample (1 fbs)	In lake Sample (7 fbs)	In lake Sample (13 fbs)	Speck Field SW	Midwood SW	Lake St SW	Stop & Shop SW	Tongue Pond Inlet	Twin Oaks SW	Lake St Manhole	Stop & Shop Outfall
		Sample Number	0626-01	0626-04	0626-02	0626-03	0626-05	0626-06	0626-07	0626-08	0626-10	0626-11	0626-12	0626-13
		Sample Date	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20	6/26/20
		Laboratory *	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Laboratory **	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix
		Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Analysis Request	Units	Reporting Limit												
Alkalinity (Method SM2320-B)	mg/L	2	14	35	33	70	29	35	33	34	33	33	30	Dry
Total Phosphorous (Method SM4500-P-E)	mg/L	0.003	0.012	0.046	0.044	0.096	0.037	0.028	0.066	0.045	0.04	0.055	0.063	Dry
Total Iron (EPA 6010C)	mg/L	0.05	ND<0.05	0.2	0.24	10.2	0.24	0.2	0.78	0.54	0.52	0.22	0.59	Dry
Turbidity (SM2130-B)	NTU	0.1	1.1	4	5.3	48.7	4.9	4.8	8.6	7.4	6.6	4.4	5	Dry
pH	pH	NA	7.7	6.89	7.54	6.98	7.49	7.67	7.57	7.53	7.55	7.63	7.03	Dry
Temperature	(C)	NA	30.29	25.34	26.2	24.17	26.65	27.06	279.40	29.17	29.33	29.9	25.2	Dry
Specific Conductivity	(µS/cm)	NA	169.60	457.90	450.00	505.90	447.80	446.50	439.50	456.30	450.4	443.9	454	Dry
Dissolved Oxygen	mg/L	NA	7.89	8.89	8.66	4.55	10.12	8.67	9.1	9.17	8.85	8.64	6.23	Dry
Dissolved Oxygen Saturation	%	NA	105.20	108.80	107.50	54.30	126.70	109.40	116.70	120.20	116.2	113	76.1	Dry
Oxidation-Reduction Potential	mV	NA	338.90	-53.10	44.20	-101.40	34.10	47.30	24.70	52.30	55.5	57.8	61.2	Dry

NOTES:

mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
µS/cm: Conductivity Microsiemens per centimeter
mV: millivolts
SW: Stormwater

Only the last six digits of the sample numbers are given.
Laboratory*
Laboratory**
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable
fbs: Feet below surface

REQUIRED DETECTION LIMITS FROM QAPP

TOTAL PHOSPHORUS 0.008 mg/L
ALKALINITY 2.0 mg/L
TURBIDITY 0.1 NTU
TOTAL IRON 0.1 mg/L

Created by:
Reviewed by:

APT
WG

Table 4
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

July 30, 2020

		Sample Location	In Lake Sample (13 fbs)	In lake Sample (7.5 fbs)	In lake Sample (1 fbs)	Twin Oaks SW	Speck Field SW	Midwood SW	Lake St SW	Stop & Shop SW	Tongue Pond Inlet	Twin Oaks Outfall	Lake Street Manhole	Stop & Shop Outfall
		Sample Number	0730-01	0730-02	0730-03	0730-04	0730-05	0730-06	0730-07	0730-08	0730-10	0730-11	0730-12	0626-13
		Sample Date	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20	7/30/20
		Laboratory *	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Laboratory **	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix
		Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Analysis Request	Units	Reporting Limit												
Alkalinity (Method SM2320-B)	mg/L	2	55	33	35	35	33	35	33	40	37	22	24	Dry
Total Phosphorous (Method SM4500-P-E)	mg/L	0.003	0.092	0.071	0.067	0.047	0.046	0.043	0.055	0.064	0.056	0.02	0.068	Dry
Total Iron (EPA 6010C)	mg/L	0.05	7.530	0.317	0.161	0.155	0.137	0.127	0.266	0.274	0.266	0.046	0.120	Dry
Turbidity (SM2130-B)	NTU	0.1	281	8.0	9.0	8.0	7.7	8.9	7.4	8.0	7.5	ND<0.1	1.8	Dry
pH	pH	NA	6.85	7.19	7.56	7.81	8.14	8.26	8.27	8.17	8.44	9.00	8.15	Dry
Temperature	(C)	NA	26.33	27.80	28.91	30.19	30.06	30.25	30.76	31.87	30.83	31.90	27.55	Dry
Specific Conductivity	(µS/cm)	NA	534.50	467.70	457.50	452.80	453.90	455.00	453.70	449.00	454	227.80	231.3	Dry
Dissolved Oxygen	mg/L	NA	3.03	4.45	8.41	8.21	8.25	8.35	7.64	7.87	8.05	7.45	5.17	Dry
Dissolved Oxygen Saturation	%	NA	37.70	96.60	109.40	109.30	109.50	111.30	102.90	108.00	108.2	102.00	65.2	Dry
Oxidation-Reduction Potential	mV	NA	-103.80	-15.70	-22.90	7.10	11.80	14.90	25.60	31.40	21.5	219.3	254.7	Dry

NOTES:

mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
µS/cm: Conductivity Microsiemens per centimeter
mV: millivolts
SW: Stormwater

Only the last six digits of the sample numbers are given.
Laboratory*
Laboratory**
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable
fbs: Feet below surface

REQUIRED DETECTION LIMITS FROM QAPP

TOTAL PHOSPHORUS 0.008 mg/L
ALKALINITY 2.0 mg/L
TURBIDITY 0.1 NTU
TOTAL IRON 0.1 mg/L

Created by:
Reviewed by:

APT

Table 5
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

August 26, 2020

		Sample Location	In lake Sample (1 fbg)	In Lake Sample (7-8 fbs)	In Lake Sample (12 fbs)	Twin Oaks Outfall	Twin Oaks SW	Spec Field Surface	Midwood SW	Lake Str Manhole	Lake Str SW	Stop & Shop SW	Tongue Pond Inlet	Stop & Shop Outfall
		Sample Number	0826-01	0826-02	0826-03	0826-07	0826-08	0826-09	0826-10	0826-11	0826-12	0826-14	0826-15	0826-16
		Sample Date	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20	08/26/20
		Laboratory *	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Laboratory **	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix
		Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Analysis Request	Units	Reporting Limit												
Alkalinity (Method SM2320-B)	mg/L	2	46	47	100	23	33	39	37	25	23	35	35	Dry
Total Phosphorous (Method SM4500-P-E)	mg/L	0.003	0.046	0.063	0.063	0.006	0.06	0.113	0.048	0.028	0.016	0.057	0.066	Dry
Total Iron (EPA 6010C)	mg/L	0.05	0.390	0.37	26.9	0.07	0.55	1.36	0.31	0.18	0.19	0.600	0.78	Dry
Turbidity (SM2130-B)	NTU	0.1	10.2	10.0	158.0	ND<0.1	9.7	22.7	14.9	1.6	0.6	17.6	16.1	Dry
pH	pH	NA	NA	NA	NA	9.2	8.29	7.24	8.37	6.7	6.57	8.52	7.88	Dry
Temperature	(C)	NA	25.71	24.60	20.97	29.3	23.8	22.90	24.00	22.4	22.8	26.10	26.1	Dry
Specific Conductivity	(µS/cm)	NA	NA	NA	NA	180.10	450.70	472.00	450.30	362.60	359.3	446.40	447.9	Dry
Dissolved Oxygen	mg/L	NA	9.42	2.00	-0.01	7.52	8.84	5.16	6.02	5.04	3.86	5.65	4.29	Dry
Dissolved Oxygen Saturation	%	NA	115.50	24.10	-0.10	98.40	104.30	60.00	71.80	58.00	44.9	70.00	53.1	Dry
Oxidation-Reduction Potential	mV	NA	NA	NA	NA	315.50	103.50	170.90	137.90	150.10	142.1	122.9	184.4	Dry

NOTES:
mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
µS/cm: Conductivity Microsiemens per centimeter
mV: millivolts

Only the last six digits of the sample numbers are given.
Laboratory*
Laboratory**
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable
fbg: Feet below surface

REQUIRED DETECTION LIMITS FROM QAPP
TOTAL PHOSPHORUS 0.008 mg/L
ALKALINITY 2.0 mg/L
TURBIDITY 0.1 NTU
TOTAL IRON 0.1 mg/L

Created by:
Reviewed by:

APT

F:\P2017\0900\B10\Deliverables\Report\Limnological Investigation\Appendices\Appendix B - Field Data\apt_SW Samples_Data_Table_200521.xlsx

Table 6
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

October 12, 2020

		Sample Location	In lake Sample (13 fbs)	In Lake Sample (7-8 fbs)	In Lake Sample (1 fbs)	Twin Oaks Outfall	Twin Oaks SW	Midwood SW	Lake St Manhole	Lake St SW	Spec Field SW	Stop & Shop Outfall	Stop & Shop SW	Tongue Pond Inlet
		Sample Number	1012-01	1012-02	1012-03	1012-04	1012-05	1012-06	1012-07	1012-08	1012-09	1012-10	1012-11	1012-12
		Sample Date	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20	10/12/20
		Laboratory *	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Laboratory **	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix
Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	
Analysis Request		Units	Reporting Limit											
Alkalinity (Method SM2320-B)	mg/L	2	31	47	56	40	64	54	37	49	48	23	53	53
Total Phosphorous (Method SM4500-P-E)	mg/L	0.003	11.3	0.057	0.079	0.019	0.078	0.072	0.067	0.049	0.119	0.095	0.051	0.052
Total Iron (EPA 6010C)	mg/L	0.05	102.000	0.99	0.71	ND<0.05	0.58	0.65	0.23	0.3	1.24	0.510	0.98	0.69
Turbidity (SM2130-B)	NTU	0.1	656.0	15.2	15.6	0.3	14.0	15.0	15.4	3.8	25.3	0.9	11.7	17.4
pH	pH	NA	6.49	6.55	6.58	7.05	7.2	7.05	7.11	6.84	6.88	7.04	6.82	16.89
Temperature	(C)	NA	13.77	14.04	14.25	15.93	16.03	15.03	16.10	16.56	15.11	16.29	15.97	15.88
Specific Conductivity	(µS/cm)	NA	479.40	478.30	474.50	260.40	455.70	472.10	289.30	369.40	467.3	80.30	462	470.4
Dissolved Oxygen	mg/L	NA	6.36	9.81	10.18	11.22	8.95	11.55	9.46	6.96	11.44	11.42	10.32	9.76
Dissolved Oxygen Saturation	%	NA	60.10	94.20	97.30	111.50	84.50	113.60	95.10	70.50	112.5	115.10	103.5	97.6
Oxidation-Reduction Potential	mV	NA	32.20	40.80	49.60	145.60	94.40	82.60	90.80	98.20	101.00	87.2	73.3	85.1

NOTES:

mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
ÅμS/cm: Conductivity Microsiemens per centimeter
mV: millivolts

Only the last six digits of the sample numbers are given.
Laboratory*
Laboratory**
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable
fbs: Feet below surface

REQUIRED DETECTION LIMITS FROM QAPP

TOTAL PHOSPHORUS	0.008 mg/L
ALKALINITY	2.0 mg/L
TURBIDITY	0.1 NTU
TOTAL IRON	0.1 mg/L

Created by: APT
Reviewed by:

Table 7
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

October 29, 2020

		Sample Location	Twin Oaks Outfall	Twin Oaks SW	Spec Field SW	Midwood SW	Lake St Manhole	Lake St SW	Stop & Shop Outfall	Stop & Shop SW	Tongue Pond Inlet	In Lake Sample (13 fbs)	In Lake Sample (7-8 fbs)	In Lake Sample (1 fbs)
		Sample Number	1029-01	1029-02	1029-03	1029-04	1029-05	1029-06	1029-07	1029-08	1029-10	1029-11	1029-12	1029-13
		Sample Date	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/21
		Laboratory *	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab	Net Lab
		Laboratory **	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix	Phoenix
		Sample Type	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Analysis Request		Units	Reporting Limit											
Alkalinity (Method SM2320-B)	mg/L	2	30	42	48	44	15	10	6	40	52	42	40	38
Total Phosphorous (Method SM4500-P-E)	mg/L	0.003	0.006	0.058	0.065	0.058	0.143	0.122	0.053	0.192	3.41	0.069	0.095	0.066
Total Iron (EPA 6010C)	mg/L	0.05	ND<0.05	0.46	0.41	0.41	0.75	0.66	0.12	1.79	12.700	0.55	0.46	0.57
Turbidity (SM2130-B)	NTU	0.1	0.5	11.8	21.1	13.8	12.5	13.1	0.7	23.7	772	14.5	11.8	283
pH	pH	NA	5.81	6.09	6.87	6.86	7.23	7.19	7.12	6.82	6.81	6.91	6.99	68.4
Temperature	(C)	NA	15.57	14.85	13.64	12.65	11.9	12.30	13.03	12.61	11.57	11.39	12.31	13.42
Specific Conductivity	(µS/cm)	NA	241.10	38.34	346.40	331.10	55.80	62.20	27.20	388.70	406.70	363	398.2	407.2
Dissolved Oxygen	mg/L	NA	11.23	10.98	9.22	8.97	10.6	11.26	9.1	8.31	7.34	9.06	8.87	6.54
Dissolved Oxygen Saturation	%	NA	112.70	108.60	88.80	84.50	98.00	105.30	86.60	78.50	67.60	83.3	83.2	72.7
Oxidation-Reduction Potential	mV	NA	415.20	238.30	219.00	176.70	164.20	125.40	171.30	114.60	-42.5	120.1	91.2	83.9

NOTES:

mg/L: milligrams per liter
NTU: Nephelometric Turbidity Unit
pH: Potential for hydrogen
C: Celsius
ÅpS/cm: Conductivity Microsiemens per centimeter
mV: millivolts

Only the last six digits of the sample numbers are given.
Laboratory*
Laboratory**
ND<X: compound not detected above laboratory reporting limit
NA: Not applicable
fbs: Feet below surface

REQUIRED DETECTION LIMITS FROM QAPP

TOTAL PHOSPHORUS	0.008 mg/L
ALKALINITY	2.0 mg/L
TURBIDITY	0.1 NTU
TOTAL IRON	0.1 mg/L

Created by: APT
Reviewed by:

		Sample Location
		Sample Number
		Sample Date
		Laboratory *
		Laboratory **
		Sample Type
Analysis Request	Units	Reporting Limit
Alkalinity (Method SM2320-B)	mg/L	2
Total Phosphorous (Method SM4500-P-E)	mg/L	0.02
Total Iron (EPA 6010C)	mg/L	NA
Turbidity (SM2130-B)	NTU	0.1
pH	pH	NA
Temperature	(C)	NA
Specific Conductivity	(μ S/cm)	NA
RDO	mg/L	NA
RDO Saturation	%	NA
ORP	mV	NA

NOTES:

mg/L: milligrams per liter

NTU: Nephelometric Turbidity Unit

pH: Potential for hydrogen

C: Celsius

μ S/cm: Conductivity Microsiemens per centimeter

mV: millivolts

Only the last six digits of the sample numbers are given.

Laboratory*

Laboratory**

ND<X: compound not detected above

NA: Not applicable

SW: Stormwater

REQUIRED DETECTION LIMIT

TOTAL PHOSPHORUS

ALKALINITY

TURBIDITY

TOTAL IRON

Table 1
Summary of Surface Water Results

Spectacle Pond
Cranston, Rhode Island

May - October 2020

Stop & Shop (DUP)	Tongue Pond Inlet (DUP)	Stop & Shop SW (DUP)	Stop & Shop SW DUP
0508-09	0528-10	0626-09	0730-09
5/8/20	5/28/20	6/26/20	7/30/20
Net Lab	Net Lab	Net Lab	Net Lab
Net Lab	Phoenix	Phoenix	Phoenix
Grab	Grab	Grab	Grab
35	36	32	35
ND<0.02	0.096	0.043	0.067
NA	NA	0.71	0.284
3.8	5.6	6.3	8.4
6.69	8.32	7.53	8.17
14.95	25.99	29.17	31.87
395.8	424.6	456.30	449.00
12.43	11.32	9.17	7.87
124.1	138.9	120.20	108.00
59.8	89.7	52.30	31.40

ND = laboratory reporting limit

CRS FROM QAPP

0.008 mg/L

2.0 mg/L

0.1 NTU

Lake St SW (DUP)	Tongue Pond Inlet (DUP)	Stop & Shop SW DUP
0826-13	1012-12	1029-09
08/26/20	10/12/20	10/29/20
Net Lab	Net Lab	Net Lab
Phoenix	Phoenix	Phoenix
Grab	Grab	Grab
25	57	32
0.016	0.075	0.216
0.18	0.83	1.49
0.7	15.2	20.7
6.57	16.89	6.82
22.8	15.88	12.67
359.3	470.4	388.7
3.86	9.76	8.31
44.9	97.6	78.5
142.1	85.1	114.60

Created by: APT
Reviewed by:

Appendix C

Laboratory Analytical Reports





New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0E08041

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 18-May-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 05/08/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0E08041. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0E08041-01	1604200508-01	Water	05/08/2020	05/08/2020
0E08041-02	1604200508-02	Water	05/08/2020	05/08/2020
0E08041-03	1604200508-03	Water	05/08/2020	05/08/2020
0E08041-04	1604200508-04	Water	05/08/2020	05/08/2020
0E08041-05	1604200508-05	Water	05/08/2020	05/08/2020
0E08041-06	1604200508-06	Water	05/08/2020	05/08/2020
0E08041-07	1604200508-07	Water	05/08/2020	05/08/2020
0E08041-08	1604200508-08	Water	05/08/2020	05/08/2020
0E08041-09	1604200508-09	Water	05/08/2020	05/08/2020
0E08041-10	1604200508-10	Water	05/08/2020	05/08/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1604200508-01 (Lab Number: 0E08041-01)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-02 (Lab Number: 0E08041-02)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-03 (Lab Number: 0E08041-03)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-04 (Lab Number: 0E08041-04)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-05 (Lab Number: 0E08041-05)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-06 (Lab Number: 0E08041-06)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-07 (Lab Number: 0E08041-07)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-08 (Lab Number: 0E08041-08)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

Request for Analysis (continued)

1604200508-09 (Lab Number: 0E08041-09)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

1604200508-10 (Lab Number: 0E08041-10)

Analysis

Alkalinity (CaCO₃)
Total Phosphorous
Turbidity

Method

SM2320-B (11)
SM4500-P-E (11)
SM2130-B (11)

Method References

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: 1604200508-01
Lab Number: 0E08041-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	15		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	0.2		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-02
Lab Number: 0E08041-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	34		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	2.4		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-03
Lab Number: 0E08041-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	27		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	2.6		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-04
Lab Number: 0E08041-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	2.3		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-05
Lab Number: 0E08041-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	37		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	0.6		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-06
Lab Number: 0E08041-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	34		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	0.9		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-07
Lab Number: 0E08041-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	9		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	1.3		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-08
Lab Number: 0E08041-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	41		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	3.9		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-09
Lab Number: 0E08041-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	3.8		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Results: General Chemistry

Sample: 1604200508-10
Lab Number: 0E08041-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	50		2	mg/L	05/09/20	05/09/20
Total Phosphorous	ND		0.02	mg/L	05/15/20	05/15/20
Turbidity	3.2		0.1	NTU	05/09/20 8:45	05/09/20 8:45

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0E0298 - Turbidity										
Blank (B0E0298-BLK1)					Prepared & Analyzed: 05/09/20					
Turbidity	ND		0.1	NTU						
Blank (B0E0298-BLK2)					Prepared & Analyzed: 05/09/20					
Turbidity	ND		0.1	NTU						
LCS (B0E0298-BS1)					Prepared & Analyzed: 05/09/20					
Turbidity	1.0		0.1	NTU	1.00		95.0	0-200		
LCS (B0E0298-BS2)					Prepared & Analyzed: 05/09/20					
Turbidity	1.0		0.1	NTU	1.00		98.0	0-200		
Duplicate (B0E0298-DUP1)					Prepared & Analyzed: 05/09/20					
Turbidity	0.2		0.1	NTU		0.2			0.00	200
Batch: B0E0319 - Alkalinity										
Blank (B0E0319-BLK1)					Prepared & Analyzed: 05/09/20					
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0E0319-BS1)					Prepared & Analyzed: 05/09/20					
Alkalinity as CaCO3	46		2	mg/L	50.0		91.9	90-110		
Duplicate (B0E0319-DUP1)					Prepared & Analyzed: 05/09/20					
Alkalinity as CaCO3	35		2	mg/L		40			11.8	20
Matrix Spike (B0E0319-MS1)					Prepared & Analyzed: 05/09/20					
Alkalinity as CaCO3	78		2	mg/L	50.0	40	76.0	80-120		

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0E0572 - Total phosphate										
Blank (B0E0572-BLK1)					Prepared & Analyzed: 05/15/20					
Total Phosphorous	ND		0.02	mg/L						
Blank (B0E0572-BLK2)					Prepared & Analyzed: 05/15/20					
Total Phosphorous	ND		0.02	mg/L						
LCS (B0E0572-BS1)					Prepared & Analyzed: 05/15/20					
Total Phosphorous	1.04		0.02	mg/L	1.00		104	90-110		
LCS (B0E0572-BS2)					Prepared & Analyzed: 05/15/20					
Total Phosphorous	1.04		0.02	mg/L	1.00		104	90-110		
Duplicate (B0E0572-DUP1)					Source: 0E08027-02		Prepared & Analyzed: 05/15/20			
Total Phosphorous	ND		0.02	mg/L		ND				20
Matrix Spike (B0E0572-MS1)					Source: 0E08027-02		Prepared & Analyzed: 05/15/20			
Total Phosphorous	0.82		0.02	mg/L	1.00	ND	82.5	80-120		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0E28060

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 02-June-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 05/28/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0E28060. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0E28060-01	1604200528-01	Water	05/28/2020	05/28/2020
0E28060-02	1604200528-02	Water	05/28/2020	05/28/2020
0E28060-03	1604200528-03	Water	05/28/2020	05/28/2020
0E28060-04	1604200528-04	Water	05/28/2020	05/28/2020
0E28060-05	1604200528-05	Water	05/28/2020	05/28/2020
0E28060-06	1604200528-06	Water	05/28/2020	05/28/2020
0E28060-07	1604200528-07	Water	05/28/2020	05/28/2020
0E28060-08	1604200528-08	Water	05/28/2020	05/28/2020
0E28060-09	1604200528-09	Water	05/28/2020	05/28/2020
0E28060-10	1604200528-10	Water	05/28/2020	05/28/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1604200528-01 (Lab Number: 0E28060-01)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-02 (Lab Number: 0E28060-02)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-03 (Lab Number: 0E28060-03)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-04 (Lab Number: 0E28060-04)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-05 (Lab Number: 0E28060-05)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-06 (Lab Number: 0E28060-06)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-07 (Lab Number: 0E28060-07)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-08 (Lab Number: 0E28060-08)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-09 (Lab Number: 0E28060-09)

Analysis

Alkalinity (CaCO₃)

Turbidity

Method

SM2320-B (11)

SM2130-B (11)

1604200528-10 (Lab Number: 0E28060-10)

Analysis

Alkalinity (CaCO₃)

Method

SM2320-B (11)

Request for Analysis (continued)

1604200528-10 (Lab Number: 0E28060-10) (continued)

Analysis

Turbidity

Method

SM2130-B (11)

Method References

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions:

Alkalinity: The Matrix Duplicate for the '1604200528-01' sample recovered outside of the recommended QC parameters.

Results: General Chemistry

Sample: 1604200528-01
Lab Number: 0E28060-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	10		2	mg/L	05/29/20	05/29/20
Turbidity	ND		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-02
Lab Number: 0E28060-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	30		2	mg/L	05/29/20	05/29/20
Turbidity	2.1		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-03
Lab Number: 0E28060-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	36		2	mg/L	05/29/20	05/29/20
Turbidity	2.1		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-04
Lab Number: 0E28060-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	32		2	mg/L	05/29/20	05/29/20
Turbidity	14.5		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-05
Lab Number: 0E28060-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	05/29/20	05/29/20
Turbidity	1.8		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-06
Lab Number: 0E28060-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	49		2	mg/L	05/29/20	05/29/20
Turbidity	2.3		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-07
Lab Number: 0E28060-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	17		2	mg/L	05/29/20	05/29/20
Turbidity	1.5		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-08
Lab Number: 0E28060-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	46		2	mg/L	05/29/20	05/29/20
Turbidity	5.5		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-09
Lab Number: 0E28060-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	05/29/20	05/29/20
Turbidity	9.4		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Results: General Chemistry

Sample: 1604200528-10
Lab Number: 0E28060-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	36		2	mg/L	05/29/20	05/29/20
Turbidity	5.6		0.1	NTU	05/28/20 16:15	05/28/20 16:15

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0E1077 - Turbidity										
Blank (B0E1077-BLK1)					Prepared & Analyzed: 05/28/20					
Turbidity	ND		0.1	NTU						
Blank (B0E1077-BLK2)					Prepared & Analyzed: 05/28/20					
Turbidity	ND		0.1	NTU						
LCS (B0E1077-BS1)					Prepared & Analyzed: 05/28/20					
Turbidity	1.0		0.1	NTU	1.00		95.0	0-200		
LCS (B0E1077-BS2)					Prepared & Analyzed: 05/28/20					
Turbidity	0.9		0.1	NTU	1.00		92.0	0-200		
Duplicate (B0E1077-DUP1)					Prepared & Analyzed: 05/28/20					
Turbidity	ND		0.1	NTU		ND				200
Batch: B0E1135 - Alkalinity										
Blank (B0E1135-BLK1)					Prepared & Analyzed: 05/29/20					
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0E1135-BS1)					Prepared & Analyzed: 05/29/20					
Alkalinity as CaCO3	50		2	mg/L	50.0		101	90-110		
Duplicate (B0E1135-DUP1)					Prepared & Analyzed: 05/29/20					
Alkalinity as CaCO3	13		2	mg/L		10			26.1	20
Matrix Spike (B0E1135-MS1)					Prepared & Analyzed: 05/29/20					
Alkalinity as CaCO3	66		2	mg/L	50.0	10	113	80-120		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.



0 E 2 8060 a

EE, LLC

- ☐ 146 Hartford Road, Manchester, CT 06040
- ☐ 56 Quarry Road, Trumbull, CT 06611
- ☐ 1419 Richland Street, Columbia, SC 29201
- ☐ 78 Interstate Drive, West Springfield, MA 01089

- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
- ☒ 275 Promenade Street, Suite 350, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD

0577

Turnaround:

- ☐ 1 Day* ☐ 3 Days* ☐ Other (days)
- ☐ 2 Days* ☒ Standard (days) *Surcharge Applies

PROJECT NAME

Spectacle Pond

PROJECT LOCATION

Cranston, RI

PROJECT NUMBER

20170900.B10

LABORATORY

Net Lab

REPORT TO: Allen Tetylow (atexty@extendo.com)

INVOICE TO: Allen Tetylow (atexty@extendo.com)

P.O. NO.: 160420170900.B10

Analysis Request

Containers

Date: 5/26/2020

Sampler's Signature: *Muller*

Source Codes:

MW = Monitoring Well

PW = Potable Water

S = Soil

W = Waste

SW = Surface Water

T = Treatment Facility

B = Sediment

A = Air

X = Other

Item No.	Transfer Check				Sample Number	Source Code	Date Sampled	Time Sampled
	1	2	3	4				
1	✓				1601200528-01	SW	5/26/20	1015
2	✓				-02			1023
3	✓				-03			1052
4	✓				-04			1116
5	✓				-05			1140
6	✓				-06			1215
7	✓				-07			1255
8	✓				-08			1312
9	✓				-09			1352
10	✓				-10			1355

Alkalinity (SM 2310) (5/26/20)

Soil VOA Val. [] methanol	Glass Soil Container () oz	Water VOA Val. [] As is [] HCl	Glass Amber () ml [] As is [] H ₂ SO ₄	Plastic - As is [] 250 ml [] 500 ml	Plastic - HNO ₃ 250 ml [] 500 ml	Plastic - NaOH, 250 ml [] 500 ml	Unfiltered [] 1000 ml [] 602
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Comments

Transfer Number	Relinquished By	Accepted By	Date	Time
1	<i>Muller</i>	<i>[Signature]</i>	5/26/20	1500
2			5/26/20	
3				
4				

Reporting and Detection Limit Requirements
Alkalinity: 0.1 NTU
Totality: 0.1 NTU

Additional Comments

See attached [illegible]

[Signature]



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0F26039

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 02-July-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 06/26/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0F26039. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0F26039-01	1604200626-01	Water	06/26/2020	06/26/2020
0F26039-02	1604200626-02	Water	06/26/2020	06/26/2020
0F26039-03	1604200626-03	Water	06/26/2020	06/26/2020
0F26039-04	1604200626-04	Water	06/26/2020	06/26/2020
0F26039-05	1604200626-05	Water	06/26/2020	06/26/2020
0F26039-06	1604200626-06	Water	06/26/2020	06/26/2020
0F26039-07	1604200626-07	Water	06/26/2020	06/26/2020
0F26039-08	1604200626-08	Water	06/26/2020	06/26/2020
0F26039-09	1604200626-09	Water	06/26/2020	06/26/2020
0F26039-10	1604200626-10	Water	06/26/2020	06/26/2020
0F26039-11	1604200626-11	Water	06/26/2020	06/26/2020
0F26039-12	1604200626-12	Water	06/26/2020	06/26/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1604200626-01 (Lab Number: 0F26039-01)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-02 (Lab Number: 0F26039-02)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-03 (Lab Number: 0F26039-03)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-04 (Lab Number: 0F26039-04)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-05 (Lab Number: 0F26039-05)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-06 (Lab Number: 0F26039-06)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-07 (Lab Number: 0F26039-07)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-08 (Lab Number: 0F26039-08)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Request for Analysis (continued)

1604200626-09 (Lab Number: 0F26039-09)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-10 (Lab Number: 0F26039-10)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-11 (Lab Number: 0F26039-11)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200626-12 (Lab Number: 0F26039-12)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Method References

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: 1604200626-01
Lab Number: 0F26039-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	14		2	mg/L	06/29/20	06/29/20
Turbidity	1.1		0.1	NTU	06/27/20 10:15	06/27/20 10:15

Results: General Chemistry

Sample: 1604200626-02
Lab Number: 0F26039-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	06/29/20	06/29/20
Turbidity	5.3		0.1	NTU	06/27/20 10:15	06/27/20 10:15

Results: General Chemistry

Sample: 1604200626-03
Lab Number: 0F26039-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	70		2	mg/L	06/29/20	06/29/20
Turbidity	48.7		0.5	NTU	06/27/20 10:15	06/27/20 10:15

Results: General Chemistry

Sample: 1604200626-04
Lab Number: 0F26039-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	06/29/20	06/29/20
Turbidity	4.1		0.1	NTU	06/27/20 10:15	06/27/20 10:15

Results: General Chemistry

Sample: 1604200626-05
Lab Number: 0F26039-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	29		2	mg/L	06/29/20	06/29/20
Turbidity	4.9		0.1	NTU	06/27/20 10:30	06/27/20 10:30

Results: General Chemistry

Sample: 1604200626-06
Lab Number: 0F26039-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	06/29/20	06/29/20
Turbidity	4.8		0.1	NTU	06/27/20 10:30	06/27/20 10:30

Results: General Chemistry

Sample: 1604200626-07
Lab Number: 0F26039-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	06/29/20	06/29/20
Turbidity	8.6		0.1	NTU	06/27/20 10:30	06/27/20 10:30

Results: General Chemistry

Sample: 1604200626-08
Lab Number: 0F26039-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	34		2	mg/L	06/29/20	06/29/20
Turbidity	7.4		0.1	NTU	06/27/20 10:30	06/27/20 10:30

Results: General Chemistry

Sample: 1604200626-09
Lab Number: 0F26039-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	32		2	mg/L	06/29/20	06/29/20
Turbidity	6.3		0.1	NTU	06/27/20 10:30	06/27/20 10:30

Results: General Chemistry

Sample: 1604200626-10
Lab Number: 0F26039-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	06/29/20	06/29/20
Turbidity	6.6		0.1	NTU	06/27/20 10:45	06/27/20 10:45

Results: General Chemistry

Sample: 1604200626-11
Lab Number: 0F26039-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	06/29/20	06/29/20
Turbidity	4.4		0.1	NTU	06/27/20 11:00	06/27/20 11:00

Results: General Chemistry

Sample: 1604200626-12
Lab Number: 0F26039-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	30		2	mg/L	06/29/20	06/29/20
Turbidity	5.0		0.1	NTU	06/27/20 11:00	06/27/20 11:00

Results: Total Metals

Sample: 1604200626-01
Lab Number: 0F26039-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	ND		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-02
Lab Number: 0F26039-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.24		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-03
Lab Number: 0F26039-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	10.2		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-04
Lab Number: 0F26039-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.20		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-05
Lab Number: 0F26039-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.24		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-06
Lab Number: 0F26039-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.20		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-07
Lab Number: 0F26039-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.78		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-08
Lab Number: 0F26039-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.54		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-09
Lab Number: 0F26039-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.71		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-10
Lab Number: 0F26039-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.52		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-11
Lab Number: 0F26039-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.22		0.05	mg/L	06/29/20	06/30/20

Results: Total Metals

Sample: 1604200626-12
Lab Number: 0F26039-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.59		0.05	mg/L	06/29/20	06/30/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0F1195 - Turbidity										
Blank (B0F1195-BLK1)	Prepared & Analyzed: 06/27/20									
Turbidity	ND		0.1	NTU						
Blank (B0F1195-BLK2)	Prepared & Analyzed: 06/27/20									
Turbidity	ND		0.1	NTU						
LCS (B0F1195-BS1)	Prepared & Analyzed: 06/27/20									
Turbidity	1.0		0.1	NTU	1.00		102	0-200		
LCS (B0F1195-BS2)	Prepared & Analyzed: 06/27/20									
Turbidity	1.0		0.1	NTU	1.00		104	0-200		
Duplicate (B0F1195-DUP1)	Prepared & Analyzed: 06/27/20									
Turbidity	1.3		0.1	NTU		1.1			13.9	200
Batch: B0F1198 - Turbidity										
Blank (B0F1198-BLK1)	Prepared & Analyzed: 06/27/20									
Turbidity	ND		0.1	NTU						
Blank (B0F1198-BLK2)	Prepared & Analyzed: 06/27/20									
Turbidity	0.1		0.1	NTU						
LCS (B0F1198-BS1)	Prepared & Analyzed: 06/27/20									
Turbidity	1.0		0.1	NTU	1.00		104	0-200		
LCS (B0F1198-BS2)	Prepared & Analyzed: 06/27/20									
Turbidity	1.1		0.1	NTU	1.00		110	0-200		

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0F1198 - Turbidity (Continued)										
Duplicate (B0F1198-DUP1)			Source: 0F26039-11			Prepared & Analyzed: 06/27/20				
Turbidity	4.2		0.1	NTU		4.4			5.08	200
Batch: B0F1241 - Alkalinity										
Blank (B0F1241-BLK1)						Prepared & Analyzed: 06/29/20				
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0F1241-BS1)						Prepared & Analyzed: 06/29/20				
Alkalinity as CaCO3	50		2	mg/L		50.0	101	90-110		
Duplicate (B0F1241-DUP1)			Source: 0F26034-04			Prepared & Analyzed: 06/29/20				
Alkalinity as CaCO3	ND		2	mg/L		ND				20
Matrix Spike (B0F1241-MS1)			Source: 0F26034-04			Prepared & Analyzed: 06/29/20				
Alkalinity as CaCO3	37		2	mg/L		50.0	ND	73.6	80-120	

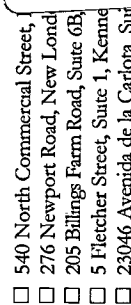
Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0F1229 - Metals Digestion Waters										
Blank (B0F1229-BLK1)					Prepared: 06/29/20 Analyzed: 06/30/20					
Iron	ND		0.05	mg/L						
LCS (B0F1229-BS1)					Prepared: 06/29/20 Analyzed: 06/30/20					
Iron	11.4		0.05	mg/L	10.0		114	85-115		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.





FUSS & O'NEILL

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- ☐ 146 Hartford Road, Manchester, CT 06040
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☐ 1550 Main Street, Suite 400, Springfield, MA 01103
☐ 108 Myrtle Street, Suite 502, Quincy, MA 02171

- ☐ 540 North Commercial Street, Manchester, NH 03101
☐ 276 Newport Road, New London, NH 03257
☐ 205 Billings Farm Road, Suite 6B, White River Junction, VT 05001
☐ 5 Fletcher Street, Suite 1, Kennebunk, ME 04043
☐ 23046 Avenida de la Carota, Suite 600, Laguna Hills, CA 92653

☐ Other

CHAIN-OF-CUSTODY RECORD

43441

Turnaround

- ☐ 24-Hour* ☐ 72-Hour* ☐ Other (days)
☐ 48-Hour* ☒ Standard (days) *Surcharge Applies

PROJECT NAME

Spectacle Pond

PROJECT LOCATION

Croston, CT

PROJECT NUMBER

261709001310

LABORATORY

NET LAB

REPORT TO: Allen Tenyow atenyow@fandO.com

INVOICE TO: Allen Tenyow atenyow@fandO.com

P.O. No.: 1604201709001310

Sampler's Signature: *Madly Gray* Date: 6/26/2020

Source Codes:

MW=Monitoring Well PW=Potable Water T=Treatment Facility S=Soil B=Sediment

SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete

X=Other

Analysis Request

Alkalinity (5.2525)
Total Iron (0.01305)
Total Nitrogen (0.01305)

Containers

- Plastic - NaOH, 250 ml ☐ 0.45L ☐ 10L
Plastic - HNO₃, 250 ml ☐ 500 ml ☐ 1000 ml
Plastic - H₂SO₄, 250 ml ☐ 500 ml ☐ 1000 ml
Plastic - As₂S₃, 250 ml ☐ 500 ml ☐ 1000 ml
Glass Amber () ml ☐ As₂S₃ ☐ HCl
Water VOA Vial, 125 ml ☐ HCl
Other
Glass Soil Container () oz ☐ Na₂SO₄
Soil VOA Vial, 125 ml ☐ water ☐ Na₂SO₄
Soil VOA Vial, 125 ml ☐ methanol

Comments

Transfer Check
1 2 3 4

Sample Number

Source Code

Date Sampled

Time Sampled

11 1604201709001310-11 SW 6/26/2020 1436
12 1604201709001310-12 6/26/2020 1515

Transfer Number

Relinquished By

Accepted By

Date

Time

Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other
____ Duplicates ____ Blanks (Item Nos. ____)

Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.

Additional Comments:

27



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0G30045

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 05-August-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 07/30/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0G30045. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0G30045-01	1604200730-01	Water	07/30/2020	07/30/2020
0G30045-02	1604200730-02	Water	07/30/2020	07/30/2020
0G30045-03	1604200730-03	Water	07/30/2020	07/30/2020
0G30045-04	1604200730-04	Water	07/30/2020	07/30/2020
0G30045-05	1604200730-05	Water	07/30/2020	07/30/2020
0G30045-06	1604200730-06	Water	07/30/2020	07/30/2020
0G30045-07	1604200730-07	Water	07/30/2020	07/30/2020
0G30045-08	1604200730-08	Water	07/30/2020	07/30/2020
0G30045-09	1604200730-09	Water	07/30/2020	07/30/2020
0G30045-10	1604200730-10	Water	07/30/2020	07/30/2020
0G30045-11	1604200730-11	Water	07/30/2020	07/30/2020
0G30045-12	1604200730-12	Water	07/30/2020	07/30/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1604200730-01 (Lab Number: 0G30045-01)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-02 (Lab Number: 0G30045-02)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-03 (Lab Number: 0G30045-03)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-04 (Lab Number: 0G30045-04)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-05 (Lab Number: 0G30045-05)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-06 (Lab Number: 0G30045-06)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-07 (Lab Number: 0G30045-07)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-08 (Lab Number: 0G30045-08)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

Request for Analysis (continued)

1604200730-09 (Lab Number: 0G30045-09)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-10 (Lab Number: 0G30045-10)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-11 (Lab Number: 0G30045-11)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

1604200730-12 (Lab Number: 0G30045-12)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 200.8
SM2130-B (11)

Method References

Methods for the Determination of Metals in Environmental Samples EPA-600/R-94/111, USEPA, 1994

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: 1604200730-01
Lab Number: 0G30045-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	55		10	mg/L	08/03/20	08/03/20
Turbidity	281		1.0	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-02
Lab Number: 0G30045-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	08/03/20	08/03/20
Turbidity	8.0		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-03
Lab Number: 0G30045-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	08/03/20	08/03/20
Turbidity	9.0		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-04
Lab Number: 0G30045-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	08/03/20	08/03/20
Turbidity	8.0		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-05
Lab Number: 0G30045-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	08/03/20	08/03/20
Turbidity	7.7		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-06
Lab Number: 0G30045-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	08/03/20	08/03/20
Turbidity	8.9		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-07
Lab Number: 0G30045-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	08/03/20	08/03/20
Turbidity	7.4		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-08
Lab Number: 0G30045-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	40		2	mg/L	08/03/20	08/03/20
Turbidity	8.0		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-09
Lab Number: 0G30045-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	08/03/20	08/03/20
Turbidity	8.4		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-10
Lab Number: 0G30045-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	37		2	mg/L	08/03/20	08/03/20
Turbidity	7.5		0.1	NTU	07/30/20 16:15	07/30/20 16:15

Results: General Chemistry

Sample: 1604200730-11
Lab Number: 0G30045-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	22		2	mg/L	08/03/20	08/03/20
Turbidity	ND		0.1	NTU	07/30/20 17:10	07/30/20 17:10

Results: General Chemistry

Sample: 1604200730-12
Lab Number: 0G30045-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	24		2	mg/L	08/03/20	08/03/20
Turbidity	1.8		0.1	NTU	07/30/20 17:10	07/30/20 17:10

Results: Total Metals

Sample: 1604200730-01
Lab Number: 0G30045-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	7.53		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-02
Lab Number: 0G30045-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.317		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-03
Lab Number: 0G30045-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.161		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-04
Lab Number: 0G30045-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.155		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-05
Lab Number: 0G30045-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.137		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-06
Lab Number: 0G30045-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.127		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-07
Lab Number: 0G30045-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.266		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-08
Lab Number: 0G30045-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.274		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-09
Lab Number: 0G30045-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.284		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-10
Lab Number: 0G30045-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.266		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-11
Lab Number: 0G30045-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.046		0.001	mg/l	07/31/20	07/31/20

Results: Total Metals

Sample: 1604200730-12
Lab Number: 0G30045-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.120		0.001	mg/l	07/31/20	07/31/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0G1291 - Turbidity										
Blank (B0G1291-BLK1)	Prepared & Analyzed: 07/30/20									
Turbidity	ND		0.1	NTU						
Blank (B0G1291-BLK2)	Prepared & Analyzed: 07/30/20									
Turbidity	ND		0.1	NTU						
LCS (B0G1291-BS1)	Prepared & Analyzed: 07/30/20									
Turbidity	1.0		0.1	NTU	1.00		105	0-200		
LCS (B0G1291-BS2)	Prepared & Analyzed: 07/30/20									
Turbidity	1.0		0.1	NTU	1.00		102	0-200		
Duplicate (B0G1291-DUP1)	Prepared & Analyzed: 07/30/20									
Turbidity	302		1.0	NTU		281			7.20	200
Batch: B0G1297 - Turbidity										
Blank (B0G1297-BLK1)	Prepared & Analyzed: 07/30/20									
Turbidity	ND		0.1	NTU						
Blank (B0G1297-BLK2)	Prepared & Analyzed: 07/30/20									
Turbidity	0.1		0.1	NTU						
LCS (B0G1297-BS1)	Prepared & Analyzed: 07/30/20									
Turbidity	1.1		0.1	NTU	1.00		108	0-200		
LCS (B0G1297-BS2)	Prepared & Analyzed: 07/30/20									
Turbidity	1.0		0.1	NTU	1.00		96.0	0-200		

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0G1297 - Turbidity (Continued)										
Duplicate (B0G1297-DUP1)		Source: 0G30045-11		Prepared & Analyzed: 07/30/20						
Turbidity	0.1		0.1	NTU		ND				200
Batch: B0H0074 - Alkalinity										
Blank (B0H0074-BLK1)		Prepared & Analyzed: 08/03/20								
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0H0074-BS1)		Prepared & Analyzed: 08/03/20								
Alkalinity as CaCO3	54		2	mg/L		50.0	108	90-110		
Duplicate (B0H0074-DUP1)		Source: 0G30039-01		Prepared & Analyzed: 08/03/20						
Alkalinity as CaCO3	5		2	mg/L		4			22.2	20
Matrix Spike (B0H0074-MS1)		Source: 0G30039-01		Prepared & Analyzed: 08/03/20						
Alkalinity as CaCO3	55		2	mg/L		50.0	4	103	80-120	

Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0G1303 - Metals Digestion Waters										
Blank (B0G1303-BLK1)										
Iron	ND		0.001	mg/l						Prepared & Analyzed: 07/31/20
LCS (B0G1303-BS1)										
Iron	0.181		0.001	mg/l	0.200		90.6	85-115		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.



FUSS & O'NEILL

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☐ 276 Newport Road, New London, NH
☐ 205 Billings Farm Road, Suite 6B, White R
☐ 5 Fletcher Street, Suite 1-Kennecbunk, N
☐ 23046 Avenida de la Carlota, Suite 600,

CHAIN-OF-CUSTODY RECORD 43451

PROJECT NAME

Spectacle Pond

PROJECT LOCATION

Cranton, NJ

PROJECT NUMBER

201709001810

LABORATORY

Net LAB

REPORT TO: Allen Tenyaw (atey@pse.fond.com)

INVOICE TO: Allen Tenyaw (atey@pse.fond.com)

P.O. No.: 1604201709001810

Sampler's Signature: *Mark J. Gann* Date: 8/30/2020

Source Codes: MW=Monitoring Well PW=Potable Water T=Treatment Facility S=Soil B=Sediment
SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete

X=Other

Analysis Request

ALKALINITY (AS 2308)
TOURBIDITY (NTU 2308)
TOTAL SOLIDS (TS 2308)

Item No.	Transfer Check				Sample Number	Source Code	Date Sampled	Time Sampled
	1	2	3	4				
1					1604201709001810	SW	8/30/20	9:28
2					-02			9:35
3					-03			9:45
4					-04			9:53
5					-05			9:58
6					-06			10:09
7					-07			10:15
8					-08			10:24
9					-09			10:26
10					-10			10:33

Item No.	Transfer Check				Sample Number	Source Code	Date Sampled	Time Sampled
	1	2	3	4				
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other ()
Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.
Additional Comments: ALKALINITY: 2mg/L TOURBIDITY: 0.1 NTU

Accepted By: *Mark J. Gann* Relinquished By: *Mark J. Gann*
Date: 8/30/2020 Time: 1302

Turnaround: ☐ 24-Hour* ☐ 72-Hour* ☐ Other () (days)
☒ 48-Hour* ☒ Standard () (days) *Surcharge Applies

Containers: Plastic - NaOH, 250 ml ☐ 0.45L ☐ 10L
Plastic - HNO₃, 250 ml ☐ 500 ml ☐ 1000 ml
Plastic - As₂S₃, 250 ml ☐ 500 ml ☐ 1000 ml
Glass Amber () ml ☐ As₂S₃ ☐ HCl
Water VOA Val. ☐ As₂S₃ ☐ HCl
Other: ☐ Na₂SO₄
Glass Soil Container () oz
Soil VOA Val. ☐ water ☐ Na₂SO₄
Soil VOA Val. ☐ methanol

Comments: *ALKALINITY (AS 2308)
TOURBIDITY (NTU 2308)
TOTAL SOLIDS (TS 2308)*

Turnaround: 23



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0H26049

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 01-September-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 08/26/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0H26049. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0H26049-01	1604200826-01	Water	08/26/2020	08/26/2020
0H26049-02	1604200826-02	Water	08/26/2020	08/26/2020
0H26049-03	1604200826-03	Water	08/26/2020	08/26/2020
0H26049-04	1604200826-07	Water	08/26/2020	08/26/2020
0H26049-05	1604200826-08	Water	08/26/2020	08/26/2020
0H26049-06	1604200826-09	Water	08/26/2020	08/26/2020
0H26049-07	1604200826-10	Water	08/26/2020	08/26/2020
0H26049-08	1604200826-11	Water	08/26/2020	08/26/2020
0H26049-09	1604200826-12	Water	08/26/2020	08/26/2020
0H26049-10	1604200826-13	Water	08/26/2020	08/26/2020
0H26049-11	1604200826-14	Water	08/26/2020	08/26/2020
0H26049-12	1604200826-15	Water	08/26/2020	08/26/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1604200826-01 (Lab Number: 0H26049-01)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-02 (Lab Number: 0H26049-02)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-03 (Lab Number: 0H26049-03)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-07 (Lab Number: 0H26049-04)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-08 (Lab Number: 0H26049-05)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-09 (Lab Number: 0H26049-06)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-10 (Lab Number: 0H26049-07)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-11 (Lab Number: 0H26049-08)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Request for Analysis (continued)

1604200826-12 (Lab Number: 0H26049-09)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-13 (Lab Number: 0H26049-10)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-14 (Lab Number: 0H26049-11)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604200826-15 (Lab Number: 0H26049-12)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Method References

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: 1604200826-01
Lab Number: 0H26049-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	46		2	mg/L	08/27/20	08/27/20
Turbidity	10.2		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-02
Lab Number: 0H26049-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	47		2	mg/L	08/27/20	08/27/20
Turbidity	10.0		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-03
Lab Number: 0H26049-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	100		2	mg/L	08/27/20	08/27/20
Turbidity	158		1.0	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-07
Lab Number: 0H26049-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	23		2	mg/L	08/27/20	08/27/20
Turbidity	<		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-08
Lab Number: 0H26049-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	33		2	mg/L	08/27/20	08/27/20
Turbidity	9.7		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-09
Lab Number: 0H26049-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	39		2	mg/L	08/27/20	08/27/20
Turbidity	22.7		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-10
Lab Number: 0H26049-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	37		2	mg/L	08/27/20	08/27/20
Turbidity	14.9		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-11
Lab Number: 0H26049-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	25		2	mg/L	08/27/20	08/27/20
Turbidity	1.6		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-12
Lab Number: 0H26049-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	23		2	mg/L	08/27/20	08/27/20
Turbidity	0.6		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-13
Lab Number: 0H26049-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	25		2	mg/L	08/27/20	08/27/20
Turbidity	0.7		0.1	NTU	08/27/20 14:10	08/27/20 14:10

Results: General Chemistry

Sample: 1604200826-14
Lab Number: 0H26049-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	08/27/20	08/27/20
Turbidity	17.6		0.1	NTU	08/27/20 14:30	08/27/20 14:30

Results: General Chemistry

Sample: 1604200826-15
Lab Number: 0H26049-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	35		2	mg/L	08/27/20	08/27/20
Turbidity	16.1		0.1	NTU	08/27/20 14:30	08/27/20 14:30

Results: Total Metals

Sample: 1604200826-01
Lab Number: 0H26049-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.39		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-02
Lab Number: 0H26049-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.37		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-03
Lab Number: 0H26049-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	26.9		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-07
Lab Number: 0H26049-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.07		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-08
Lab Number: 0H26049-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.55		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-09
Lab Number: 0H26049-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	1.36		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-10
Lab Number: 0H26049-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.31		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-11
Lab Number: 0H26049-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.18		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-12
Lab Number: 0H26049-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.19		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-13
Lab Number: 0H26049-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.18		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-14
Lab Number: 0H26049-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.60		0.05	mg/L	08/27/20	08/28/20

Results: Total Metals

Sample: 1604200826-15
Lab Number: 0H26049-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.78		0.05	mg/L	08/27/20	08/28/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0H1144 - Turbidity										
Blank (B0H1144-BLK1)	Prepared & Analyzed: 08/27/20									
Turbidity	ND		0.1	NTU						
Blank (B0H1144-BLK2)	Prepared & Analyzed: 08/27/20									
Turbidity	ND		0.1	NTU						
LCS (B0H1144-BS1)	Prepared & Analyzed: 08/27/20									
Turbidity	1.0		0.1	NTU	1.00		102	0-200		
LCS (B0H1144-BS2)	Prepared & Analyzed: 08/27/20									
Turbidity	1.0		0.1	NTU	1.00		104	0-200		
Duplicate (B0H1144-DUP1)	Source: 0H26049-01 Prepared & Analyzed: 08/27/20									
Turbidity	11.0		0.1	NTU		10.2			7.55	200
Batch: B0H1145 - Turbidity										
Blank (B0H1145-BLK1)	Prepared & Analyzed: 08/27/20									
Turbidity	ND		0.1	NTU						
Blank (B0H1145-BLK2)	Prepared & Analyzed: 08/27/20									
Turbidity	ND		0.1	NTU						
LCS (B0H1145-BS1)	Prepared & Analyzed: 08/27/20									
Turbidity	1.0		0.1	NTU	1.00		104	0-200		
LCS (B0H1145-BS2)	Prepared & Analyzed: 08/27/20									
Turbidity	1.1		0.1	NTU	1.00		107	0-200		

Quality Control (Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0H1145 - Turbidity (Continued)										
Duplicate (B0H1145-DUP1)		Source: 0H26049-11				Prepared & Analyzed: 08/27/20				
Turbidity	17.1		0.1	NTU		17.6			2.88	200
Batch: B0H1147 - Alkalinity										
Blank (B0H1147-BLK1)						Prepared & Analyzed: 08/27/20				
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0H1147-BS1)						Prepared & Analyzed: 08/27/20				
Alkalinity as CaCO3	49		2	mg/L		50.0	98.1	90-110		
Duplicate (B0H1147-DUP1)		Source: 0H25061-01				Prepared & Analyzed: 08/27/20				
Alkalinity as CaCO3	44		2	mg/L		46			3.92	20
Matrix Spike (B0H1147-MS1)		Source: 0H25061-01				Prepared & Analyzed: 08/27/20				
Alkalinity as CaCO3	89		2	mg/L		50.0	46	87.6	80-120	

Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0H1111 - Metals Digestion Waters										
Blank (B0H1111-BLK1)					Prepared: 08/27/20 Analyzed: 08/28/20					
Iron	ND		0.05	mg/L						
LCS (B0H1111-BS1)					Prepared: 08/27/20 Analyzed: 08/28/20					
Iron	10.5		0.05	mg/L	10.0		105	85-115		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.



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- ☐ 78 Interstate Drive, West Springfield

CHAIN-OF-CUSTODY RECORD

0592

PROJECT NAME

SPECTACLE POND

PROJECT LOCATION

CRANSTON, RI

REPORT TO: ALLEN TEVAV

atevav@fandO.com

INVOICE TO: ALLEN TEVAV

atevav@fandO.com

P.O. No.: 160420170900.B10

Sampler's Signature: *[Signature]*

Date: 8/26/20

Source Codes:

MW=Monitoring Well PW=Potable Water S=Soil W=Waste
SW=Surface Water T=Treatment Facility B=Sediment A=Air

X=Other

Item No.	Transfer Check	Sample Number	Source Code	Date Sampled	Time Sampled
1	1	1604200826-01	SW	8/26/20	1200
2	1	-02	SW		1200
3	1	-03	SW		1200
4	1	-07	SW		1100
5	1	-08	SW		1120
6	1	-09	SW		1200
7	1	-10	SW		1240
8	1	-11	SW		1240
9	1	-12	SW		1310
10	1	-13	SW		1330

Total Iron
Alkalinity

PROJECT NUMBER

2070900.B10

LABORATORY

NET LAB

Analysis Request

Containers

Soil VOA Val. [] methanol	Glass Soil Container () oz	Water VOA Val. [] As is [] HCl	Glass Amber () oz	Plastic - As is [] 250 ml [] 500 ml [] 1000 ml	Plastic - HNO ₃ 250 ml [] 500 ml [] 1000 ml	Plastic - NaOH, 250 ml [] 500 ml [] 1000 ml	Unlabeled
----------------------------	-----------------------------	----------------------------------	--------------------	---	--	---	-----------

Comments

Reporting and Detection Limit Requirements.

Time

Date

Accepted By

Relinquished By

Transfer Number

Additional Comments:

Time

Date

Accepted By

Relinquished By

Transfer Number



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0J12013

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 19-October-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 10/12/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0J12013. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0J12013-01	1604201012-01	Water	10/12/2020	10/12/2020
0J12013-02	1604201012-02	Water	10/12/2020	10/12/2020
0J12013-03	1604201012-03	Water	10/12/2020	10/12/2020
0J12013-04	1604201012-04	Water	10/12/2020	10/12/2020
0J12013-05	1604201012-05	Water	10/12/2020	10/12/2020
0J12013-06	1604201012-06	Water	10/12/2020	10/12/2020
0J12013-07	1604201012-07	Water	10/12/2020	10/12/2020
0J12013-08	1604201012-08	Water	10/12/2020	10/12/2020
0J12013-09	1604201012-09	Water	10/12/2020	10/12/2020
0J12013-10	1604201012-10	Water	10/12/2020	10/12/2020
0J12013-11	1604201012-11	Water	10/12/2020	10/12/2020
0J12013-12	1604201012-12	Water	10/12/2020	10/12/2020
0J12013-13	1604201012-13	Water	10/12/2020	10/12/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1604201012-01 (Lab Number: 0J12013-01)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-02 (Lab Number: 0J12013-02)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-03 (Lab Number: 0J12013-03)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-04 (Lab Number: 0J12013-04)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-05 (Lab Number: 0J12013-05)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-06 (Lab Number: 0J12013-06)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-07 (Lab Number: 0J12013-07)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-08 (Lab Number: 0J12013-08)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Request for Analysis (continued)

1604201012-09 (Lab Number: 0J12013-09)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-10 (Lab Number: 0J12013-10)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-11 (Lab Number: 0J12013-11)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-12 (Lab Number: 0J12013-12)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1604201012-13 (Lab Number: 0J12013-13)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Method References

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: 1604201012-01
Lab Number: 0J12013-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	31		10	mg/L	10/16/20	10/16/20
Turbidity	656		2.0	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-02
Lab Number: 0J12013-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	47		2	mg/L	10/16/20	10/16/20
Turbidity	15.2		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-03
Lab Number: 0J12013-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	56		2	mg/L	10/16/20	10/16/20
Turbidity	15.6		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-04
Lab Number: 0J12013-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	40		2	mg/L	10/16/20	10/16/20
Turbidity	0.3		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-05
Lab Number: 0J12013-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	64		2	mg/L	10/16/20	10/16/20
Turbidity	14.0		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-06
Lab Number: 0J12013-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	54		2	mg/L	10/16/20	10/16/20
Turbidity	15.0		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-07
Lab Number: 0J12013-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	37		2	mg/L	10/16/20	10/16/20
Turbidity	15.4		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-08
Lab Number: 0J12013-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	49		2	mg/L	10/16/20	10/16/20
Turbidity	3.8		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-09
Lab Number: 0J12013-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	48		2	mg/L	10/16/20	10/16/20
Turbidity	25.3		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-10
Lab Number: 0J12013-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	23		2	mg/L	10/16/20	10/16/20
Turbidity	0.9		0.1	NTU	10/13/20 17:05	10/13/20 17:05

Results: General Chemistry

Sample: 1604201012-11
Lab Number: 0J12013-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	53		2	mg/L	10/16/20	10/16/20
Turbidity	11.7		0.1	NTU	10/13/20 16:55	10/13/20 16:55

Results: General Chemistry

Sample: 1604201012-12
Lab Number: 0J12013-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	53		2	mg/L	10/16/20	10/16/20
Turbidity	17.4		0.1	NTU	10/13/20 16:55	10/13/20 16:55

Results: General Chemistry

Sample: 1604201012-13
Lab Number: 0J12013-13 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	57		2	mg/L	10/16/20	10/16/20
Turbidity	15.2		0.1	NTU	10/13/20 16:55	10/13/20 16:55

Results: Total Metals

Sample: 1604201012-01
Lab Number: 0J12013-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	102		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-02
Lab Number: 0J12013-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.99		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-03
Lab Number: 0J12013-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.71		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-04
Lab Number: 0J12013-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	ND		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-05
Lab Number: 0J12013-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.58		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-06
Lab Number: 0J12013-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.65		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-07
Lab Number: 0J12013-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.23		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-08
Lab Number: 0J12013-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.30		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-09
Lab Number: 0J12013-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	1.24		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-10
Lab Number: 0J12013-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.51		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-11
Lab Number: 0J12013-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.98		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-12
Lab Number: 0J12013-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.69		0.05	mg/L	10/13/20	10/16/20

Results: Total Metals

Sample: 1604201012-13
Lab Number: 0J12013-13 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.83		0.05	mg/L	10/13/20	10/16/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0J0544 - Turbidity										
Blank (B0J0544-BLK1)					Prepared & Analyzed: 10/13/20					
Turbidity	ND		0.1	NTU						
Blank (B0J0544-BLK2)					Prepared & Analyzed: 10/13/20					
Turbidity	ND		0.1	NTU						
LCS (B0J0544-BS1)					Prepared & Analyzed: 10/13/20					
Turbidity	0.9		0.1	NTU	1.00		92.0	0-200		
LCS (B0J0544-BS2)					Prepared & Analyzed: 10/13/20					
Turbidity	1.0		0.1	NTU	1.00		95.0	0-200		
Duplicate (B0J0544-DUP1)					Prepared & Analyzed: 10/13/20					
Turbidity	626		2.0	NTU		656			4.68	200
Batch: B0J0545 - Turbidity										
Blank (B0J0545-BLK2)					Prepared & Analyzed: 10/13/20					
Turbidity	ND		0.1	NTU						
LCS (B0J0545-BS1)					Prepared & Analyzed: 10/13/20					
Turbidity	1.1		0.1	NTU	1.00		110	0-200		
LCS (B0J0545-BS2)					Prepared & Analyzed: 10/13/20					
Turbidity	0.9		0.1	NTU	1.00		93.0	0-200		
Duplicate (B0J0545-DUP1)					Prepared & Analyzed: 10/13/20					
Turbidity	12.6		0.1	NTU		11.7			7.41	200

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0J0725 - Alkalinity										
Blank (B0J0725-BLK1)					Prepared & Analyzed: 10/16/20					
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0J0725-BS1)					Prepared & Analyzed: 10/16/20					
Alkalinity as CaCO3	50		2	mg/L	50.0		101	90-110		
Duplicate (B0J0725-DUP1)					Prepared & Analyzed: 10/16/20					
Alkalinity as CaCO3	ND		2	mg/L		ND				20
Matrix Spike (B0J0725-MS1)					Prepared & Analyzed: 10/16/20					
Alkalinity as CaCO3	93		2	mg/L	50.0	ND	185	80-120		

Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0J0512 - Metals Digestion Waters										
Blank (B0J0512-BLK1)					Prepared: 10/13/20 Analyzed: 10/16/20					
Iron	ND		0.05	mg/L						
LCS (B0J0512-BS1)					Prepared: 10/13/20 Analyzed: 10/16/20					
Iron	9.89		0.05	mg/L	10.0		98.9	85-115		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.



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☐ 108 Myrtle Street, Suite 502, Quincy, MA 02171

- ☐ 540 North Commercial Street, M
☐ 276 Newport Road, New London
☐ 205 Billings Farm Road, Suite 6B
☐ 5 Fletcher Street, Suite 1, Kennet
☐ 23046 Avenida de la Carlota, Sut



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CHAIN-OF-CUSTODY RECORD

43471

☐ 24-Hour* ☐ 72-Hour* ☐ Other _____ (days)
☐ 48-Hour* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME				PROJECT LOCATION				PROJECT NUMBER				LABORATORY			
Spectacle Pond				CANASTON, CT				20170900.810				NET LAB			
REPORT TO: ALLEN TEVYAKW (atevya@fandO.com)															
INVOICE TO: ALLEN TEV YAKW (atevya@fandO.com)															
P.O. No.: 160420170900.810															
Sampler's Signature: <i>Wall Sygn</i>				Date: 10/12/2010											
Source Codes:															
MW=Monitoring Well				PW=Potable Water				T=Treatment Facility				S=Soil			
SW=Surface Water				ST=Stormwater				W=Waste				A=Air			
C=Concrete															
X=Other _____															
Item No.	Transfer Check	1	2	3	4	Sample Number	Source Code	Date Sampled	Time Sampled	Analysis Request	Containers	Comments			
1						1604201012 - 01	SW	10/12/20	1137	X	X	X	X	Plastic - NaOH, 250 ml	
2						- 02		1141	1141	X	X	X	X	Plastic - HNO ₃ , 250 ml	
3						- 03		1145	1145	X	X	X	X	Plastic - H ₂ SO ₄ , 250 ml	
4						- 04		1216	1216	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	
5						- 05		1221	1221	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	
6						- 06		1250	1250	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	
7						- 07		1315	1315	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	
8						- 08		1320	1320	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	
9						- 09		1332	1332	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	
10						- 10		1312	1312	X	X	X	X	Plastic - As ₂ S ₃ , 250 ml	

Transfer Number	Relinquished By	Accepted By	Date	Time	Charge Exceptions:
1	<i>Wall Sygn</i>	<i>[Signature]</i>	10/12/20	15:45	☐ CT Tax Exempt ☐ QA/QC ☐ Other _____ ____ Duplicates _____ Blanks (Item Nos: _____)
2					Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.
3					
4					Additional Comments:



New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0J29056

Client Project: 20170900.B10 - Spectacle Pond, Cranston

Report Date: 05-November-2020

Prepared for:

Alan Tevyaw
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 10/29/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0J29056. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0J29056-01	1603201029-01	Water	10/29/2020	10/29/2020
0J29056-02	1603201029-02	Water	10/29/2020	10/29/2020
0J29056-03	1603201029-03	Water	10/29/2020	10/29/2020
0J29056-04	1603201029-04	Water	10/29/2020	10/29/2020
0J29056-05	1603201029-05	Water	10/29/2020	10/29/2020
0J29056-06	1603201029-06	Water	10/29/2020	10/29/2020
0J29056-07	1603201029-07	Water	10/29/2020	10/29/2020
0J29056-08	1603201029-08	Water	10/29/2020	10/29/2020
0J29056-09	1603201029-09	Water	10/29/2020	10/29/2020
0J29056-10	1603201029-10	Water	10/29/2020	10/29/2020
0J29056-11	1603201029-11	Water	10/29/2020	10/29/2020
0J29056-12	1603201029-12	Water	10/29/2020	10/29/2020
0J29056-13	1603201029-13	Water	10/29/2020	10/29/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1603201029-01 (Lab Number: 0J29056-01)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-02 (Lab Number: 0J29056-02)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-03 (Lab Number: 0J29056-03)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-04 (Lab Number: 0J29056-04)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-05 (Lab Number: 0J29056-05)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-06 (Lab Number: 0J29056-06)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-07 (Lab Number: 0J29056-07)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-08 (Lab Number: 0J29056-08)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Request for Analysis (continued)

1603201029-09 (Lab Number: 0J29056-09)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-10 (Lab Number: 0J29056-10)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-11 (Lab Number: 0J29056-11)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-12 (Lab Number: 0J29056-12)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

1603201029-13 (Lab Number: 0J29056-13)

Analysis

Alkalinity (CaCO₃)
Iron
Turbidity

Method

SM2320-B (11)
EPA 6010C
SM2130-B (11)

Method References

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: 1603201029-01
Lab Number: 0J29056-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	30		2	mg/L	11/05/20	11/05/20
Turbidity	0.5		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-02
Lab Number: 0J29056-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	42		2	mg/L	11/05/20	11/05/20
Turbidity	11.8		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-03
Lab Number: 0J29056-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	48		2	mg/L	11/05/20	11/05/20
Turbidity	21.1		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-04
Lab Number: 0J29056-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	44		2	mg/L	11/05/20	11/05/20
Turbidity	13.8		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-05
Lab Number: 0J29056-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	15		2	mg/L	11/05/20	11/05/20
Turbidity	12.5		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-06
Lab Number: 0J29056-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	10		2	mg/L	11/05/20	11/05/20
Turbidity	13.1		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-07
Lab Number: 0J29056-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	6		2	mg/L	11/05/20	11/05/20
Turbidity	0.7		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-08
Lab Number: 0J29056-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	40		2	mg/L	11/05/20	11/05/20
Turbidity	23.7		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-09
Lab Number: 0J29056-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	32		2	mg/L	11/05/20	11/05/20
Turbidity	20.7		0.1	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-10
Lab Number: 0J29056-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	52		2	mg/L	11/05/20	11/05/20
Turbidity	772		2.0	NTU	10/30/20 15:55	10/30/20 15:55

Results: General Chemistry

Sample: 1603201029-11
Lab Number: 0J29056-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	42		2	mg/L	11/05/20	11/05/20
Turbidity	14.5		0.1	NTU	10/30/20 16:10	10/30/20 16:10

Results: General Chemistry

Sample: 1603201029-12
Lab Number: 0J29056-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	40		2	mg/L	11/05/20	11/05/20
Turbidity	11.8		0.1	NTU	10/30/20 16:10	10/30/20 16:10

Results: General Chemistry

Sample: 1603201029-13
Lab Number: 0J29056-13 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Alkalinity as CaCO3	38		2	mg/L	11/05/20	11/05/20
Turbidity	283		1.0	NTU	10/30/20 16:10	10/30/20 16:10

Results: Total Metals

Sample: 1603201029-01
Lab Number: 0J29056-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	ND		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-02
Lab Number: 0J29056-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.46		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-03
Lab Number: 0J29056-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.41		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-04
Lab Number: 0J29056-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.41		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-05
Lab Number: 0J29056-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.75		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-06
Lab Number: 0J29056-06 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.66		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-07
Lab Number: 0J29056-07 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.12		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-08
Lab Number: 0J29056-08 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	1.79		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-09
Lab Number: 0J29056-09 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	1.49		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-10
Lab Number: 0J29056-10 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	12.7		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-11
Lab Number: 0J29056-11 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.55		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-12
Lab Number: 0J29056-12 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.46		0.05	mg/L	10/30/20	11/03/20

Results: Total Metals

Sample: 1603201029-13
Lab Number: 0J29056-13 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Iron	0.57		0.05	mg/L	10/30/20	11/03/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0K0066 - Turbidity										
Blank (B0K0066-BLK1)	Prepared & Analyzed: 10/30/20									
Turbidity	ND		0.1	NTU						
Blank (B0K0066-BLK2)	Prepared & Analyzed: 10/30/20									
Turbidity	ND		0.1	NTU						
LCS (B0K0066-BS1)	Prepared & Analyzed: 10/30/20									
Turbidity	1.0		0.1	NTU	1.00		99.0	0-200		
LCS (B0K0066-BS2)	Prepared & Analyzed: 10/30/20									
Turbidity	1.0		0.1	NTU	1.00		100	0-200		
Duplicate (B0K0066-DUP1)	Source: 0J29056-01 Prepared & Analyzed: 10/30/20									
Turbidity	0.5		0.1	NTU		0.5			1.90	200
Batch: B0K0070 - Turbidity										
Blank (B0K0070-BLK1)	Prepared & Analyzed: 10/30/20									
Turbidity	ND		0.1	NTU						
Blank (B0K0070-BLK2)	Prepared & Analyzed: 10/30/20									
Turbidity	ND		0.1	NTU						
LCS (B0K0070-BS1)	Prepared & Analyzed: 10/30/20									
Turbidity	1.0		0.1	NTU	1.00		100	0-200		
LCS (B0K0070-BS2)	Prepared & Analyzed: 10/30/20									
Turbidity	1.0		0.1	NTU	1.00		99.0	0-200		

Quality Control (Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0K0070 - Turbidity (Continued)										
Duplicate (B0K0070-DUP1)		Source: 0J29056-11		Prepared & Analyzed: 10/30/20						
Turbidity	14.1		0.1	NTU		14.5			2.80	200
Batch: B0K0225 - Alkalinity										
Blank (B0K0225-BLK1)		Prepared & Analyzed: 11/05/20								
Alkalinity as CaCO3	ND		2	mg/L						
LCS (B0K0225-BS1)		Prepared & Analyzed: 11/05/20								
Alkalinity as CaCO3	51		2	mg/L	50.0		102	90-110		
Duplicate (B0K0225-DUP1)		Source: 0J29056-01		Prepared & Analyzed: 11/05/20						
Alkalinity as CaCO3	35		2	mg/L		30			15.4	20
Matrix Spike (B0K0225-MS1)		Source: 0J29056-01		Prepared & Analyzed: 11/05/20						
Alkalinity as CaCO3	76		2	mg/L	50.0	30	91.6	80-120		

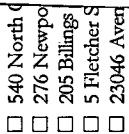
Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0J1339 - Metals Digestion Waters										
Blank (B0J1339-BLK1)					Prepared: 10/30/20 Analyzed: 11/03/20					
Iron	ND		0.05	mg/L						
LCS (B0J1339-BS1)					Prepared: 10/30/20 Analyzed: 11/03/20					
Iron	10.4		0.05	mg/L	10.0		104	85-115		
Batch: B0J1340 - Metals Digestion Waters										
Blank (B0J1340-BLK1)					Prepared: 10/30/20 Analyzed: 11/03/20					
Iron	ND		0.05	mg/L						
LCS (B0J1340-BS1)					Prepared: 10/30/20 Analyzed: 11/03/20					
Iron	10.4		0.05	mg/L	10.0		104	85-115		

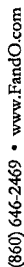
Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.



43499

Transfer Number	Relinquished By	Accepted By	Date	Time	Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other _____ _____ Duplicates _____ Blanks (Item Nos: _____)
1	<i>[Signature]</i>		10/29/20		Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.
2					
3		<i>[Signature]</i>	10-29-20	4:04	Additional Comments:
4					



☐ 540 North Commercial Street, Manchester, NH 03101
☐ 276 Newport Road, New London, NH 03257
☐ 205 Billings Farm Road, Suite 6B, White River Junction, VT 05001
☐ 5 Fletcher Street, Suite 1, Kennebunk, ME 04043
☐ 23046 Avenida de la Carlota, Suite 600, Laguna Hills, CA 92653

43498

Turnaround

☐ 24-Hour* ☐ 72-Hour* ☐ Other _____ (days)
☐ 48-Hour* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME

PROJECT LOCATION

PROJECT NUMBER

LABORATORY

5166 TALE DONO

CALANSTON, ALI

20170900.3310

NET-LAS

REPORT TO: ALLEN TEYAKW (atey@awe.fandao.com)

INVOICE TO:

P.O. No.: 160320170900.810

Sampler's Signature:

Wendy Zapp

Date: 10/29/20

Source Codes:

MW=Monitoring Well
SW=Surface Water
PW=Potable Water
ST=Stormwater

T=Treatment Facility
W=Waste A=Air

B=Sediment

X=Other

Item No.	Transfer Check
1	2
3	4

Sample Number

Source

Date: _____

Time

X=Other

TO THE INNOVATION
TOURISM
ACTIVITY

[illegible]

Σ2

Transfer	Relinquished By
----------	-----------------

Relinquished By Mark J. J.

Accepted By

Date _____

Time

Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other _____
 _____ Duplicates _____ Blanks (Item Nos: _____)

Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.

Additional Comments:



Fuss & O'Neill
Attn: Allen Tevyaw
317 Iron Horse Way, Suite 204
Providence, RI 02908

Email: atevyaw@fando.com

<u>Report Date:</u> 10/15/2020	<u>Date Sampled:</u> 8/26/2020
<u>Laboratory ID#:</u> N2081902 (01-03)	<u>Date Received:</u> 9/08/2020
<u>Sample Description:</u> SEDIMENT	<u>Date(s) Tested:</u> See Below
Sample Site: Spectacle Pond – Cranston, RI	

<u>Client ID#:</u>	<u>Date Collected</u>	<u>Time Collected</u>	<u>Total Phosphorous (mg/kg) ♦</u>	<u>Iron Bound Phosphorus (mg/kg)</u>	<u>Loosely Bound Phosphorous (mg/kg)</u>	<u>Total Solids ♦ (%)</u>	<u>Organic Matter (%)</u>
1604200826-04	8/26/2020	--	5,810	376	10.1	14.6	10.29
1604200826-05	8/26/2020	--	175	44.0	4.4	66.4	60.83
1604200826-06	8/26/2020	--	3,810	78.2	3.0	13.7	6.96
			9/21/2020 ♦	10/14/2020	10/13/2020	9/18/2020 ♦	10/15/2020
Method:			SM4500PE-11	SM4500 P	SM4500 P	SM2540B-11	

♦ = Analysis for Phosphorous and Total Solids

was outsourced to & tested by Phoenix Lab#PH0618 / Rpt#: GCG80758

Comments:

Results are based on sample, as submitted to Northeast Laboratories, Inc. on: 9/08/2020

Approved by:

Laboratory Director

Northeast Laboratories, Inc. 129 Mill Street Berlin, CT 06037 www.nelabsct.com

Telephone: 860-828-9787 Toll Free (In State) 800-826-0105 (Out of State) 800-654-1230 Fax: 860-829-1050
CT Cert. #PH-0404 / PH-2040 EPA Cert. #CT-024 USDA Cert. #0976 FDA Reg. #086650488 CT CSL #0000624



Tuesday, June 02, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND
SDG ID: GCG03521
Sample ID#s: CG03521 - CG03530

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

June 02, 2020

SDG I.D.: GCG03521

Project ID: SPECTACLE POND

Client Id	Lab Id	Matrix
16042000528-01	CG03521	SURFACE WATER
16042000528-02	CG03522	SURFACE WATER
16042000528-03	CG03523	SURFACE WATER
16042000528-04	CG03524	SURFACE WATER
16042000528-05	CG03525	SURFACE WATER
16042000528-06	CG03526	SURFACE WATER
16042000528-07	CG03527	SURFACE WATER
16042000528-08	CG03528	SURFACE WATER
16042000528-09	CG03529	SURFACE WATER
16042000528-10	CG03530	SURFACE WATER



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

10:15
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03521

Project ID: SPECTACLE POND
Client ID: 16042000528-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.009	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

10:23
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03522

Project ID: SPECTACLE POND
Client ID: 16042000528-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.028	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

10:52
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03523

Project ID: SPECTACLE POND
Client ID: 16042000528-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.033	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

11:16
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03524

Project ID: SPECTACLE POND
Client ID: 16042000528-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.105	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

11:40
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03525

Project ID: SPECTACLE POND
Client ID: 16042000528-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.053	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

12:15
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03526

Project ID: SPECTACLE POND
Client ID: 16042000528-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.041	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

12:55
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03527

Project ID: SPECTACLE POND
Client ID: 16042000528-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.125	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

13:12
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03528

Project ID: SPECTACLE POND
Client ID: 16042000528-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.056	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

13:52
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03529

Project ID: SPECTACLE POND
Client ID: 16042000528-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.096	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 02, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

05/28/20
05/29/20

Time

13:55
14:36

Laboratory Data

SDG ID: GCG03521
Phoenix ID: CG03530

Project ID: SPECTACLE POND
Client ID: 16042000528-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.096	0.003	mg/L	0.5	06/01/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

June 02, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

June 02, 2020

QA/QC Data

SDG I.D.: GCG03521

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 531723 (mg/L), QC Sample No: CG02877 (CG03521, CG03522, CG03523, CG03524, CG03525, CG03526, CG03527, CG03528)													
Phosphorus, as P	BRL	0.01	2.76	2.77	0.40	98.8			94.1			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 531724 (mg/L), QC Sample No: CG03533 (CG03529, CG03530)													
Phosphorus, as P	BRL	0.01	0.039	0.037	NC	97.7			93.5			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
June 02, 2020

Tuesday, June 02, 2020

Sample Criteria Exceedances Report

GCG03521 - FO-RI

Criteria: None
State: RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----	----------------

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Analysis Comments

June 02, 2020

SDG I.D.: GCG03521

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



FUSS & O'NEILL ENVIROSCIENCE, LLC

Disciplines to Deliver

(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
☐ 56 Quarry Road, Trumbull, CT 06611
☐ 1419 Richland Street, Columbia, SC 29201
☐ 78 Interstate Drive, West Springfield, MA 01089

- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
☐ 275 Promenade Street, Suite 350, Providence, RI 02908
☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

1.4 *anlepk*

CHAIN-OF-CUSTODY RECORD

0579

PROJECT NAME

Spectacle Pond

PROJECT LOCATION

Cranston, RI

PROJECT NUMBER

20170900.B1D

REPORT TO:

ALLEN TEVIAW

atevia@fandO.com

Analysis Request

Total Phosphorus (SM 432)

INVOICE TO:

ALLEN TEVIAW

atevia@fandO.com

P.O. NO.:

160420170900.B1D

Sampler's Signature:

[Signature]

Date:

5/23/20

Source Codes:

MW=Monitoring Well

SW=Surface Water

PW=Potable Water

T=Treatment Facility

S=Soil

B=Sediment

W=Waste

A=Air

X=Other

Item No.

Transfer Check

1 2 3 4

Sample Number

Source Code

Date Sampled

Time Sampled

1 ☒ - ☒ - ☒ - ☒ 1604200528-01 SW 5/23/20 1015

2 ☒ - ☒ - ☒ - ☒ 1604200528-02 1023

3 ☒ - ☒ - ☒ - ☒ 1604200528-03 1052

4 ☒ - ☒ - ☒ - ☒ 1604200528-04 1116

5 ☒ - ☒ - ☒ - ☒ 1604200528-05 1140

6 ☒ - ☒ - ☒ - ☒ 1604200528-06 1215

7 ☒ - ☒ - ☒ - ☒ 1604200528-07 1255

8 ☒ - ☒ - ☒ - ☒ 1604200528-08 1312

9 ☒ - ☒ - ☒ - ☒ 1604200528-09 1352

10 ☒ - ☒ - ☒ - ☒ 1604200528-10 1355

Transfer Number

Relinquished By

Accepted By

Date

Time

Reporting and Detection Limit Requirements:

Total P: 0.008 mg/L

1 ALLEN TEVIAW

FIELD FRIDGE

5/23/20 1601

2 FIELD FRIDGE

ALLEN TEVIAW

5/24/20 0700

3 ALLEN TEVIAW

5/29/20 7:30

4

5/29/20 1430

Additional Comments:

If you can not meet the reporting limit, just shoot me an email & let me know



Thursday, July 09, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND
SDG ID: GCG26773
Sample ID#s: CG26773 - CG26784

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

July 09, 2020

SDG I.D.: GCG26773

Project ID: SPECTACLE POND

Client Id	Lab Id	Matrix
1604200626-01	CG26773	SURFACE WATER
1604200626-02	CG26774	SURFACE WATER
1604200626-03	CG26775	SURFACE WATER
1604200626-04	CG26776	SURFACE WATER
1604200626-05	CG26777	SURFACE WATER
1604200626-06	CG26778	SURFACE WATER
1604200626-07	CG26779	SURFACE WATER
1604200626-08	CG26780	SURFACE WATER
1604200626-09	CG26781	SURFACE WATER
1604200626-10	CG26782	SURFACE WATER
1604200626-11	CG26783	SURFACE WATER
1604200626-12	CG26784	SURFACE WATER



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

10:54
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26773

Project ID: SPECTACLE POND
Client ID: 1604200626-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.012	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

13:23
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26774

Project ID: SPECTACLE POND
Client ID: 1604200626-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.044	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

13:28
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26775

Project ID: SPECTACLE POND
Client ID: 1604200626-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.096	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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July 09, 2020

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Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

13:37
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26776

Project ID: SPECTACLE POND
Client ID: 1604200626-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.046	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

13:48
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26777

Project ID: SPECTACLE POND
Client ID: 1604200626-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.037	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

13:55
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26778

Project ID: SPECTACLE POND
Client ID: 1604200626-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.028	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

14:05
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26779

Project ID: SPECTACLE POND
Client ID: 1604200626-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.066	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

14:10
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26780

Project ID: SPECTACLE POND
Client ID: 1604200626-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.045	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

14:15
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26781

Project ID: SPECTACLE POND
Client ID: 1604200626-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.043	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

14:20
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26782

Project ID: SPECTACLE POND
Client ID: 1604200626-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.040	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

14:36
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26783

Project ID: SPECTACLE POND
Client ID: 1604200626-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.055	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 09, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.A10

Custody Information

Collected by: AT
Received by: CP
Analyzed by: see "By" below

Date

06/26/20
07/02/20

Time

15:15
15:53

Laboratory Data

SDG ID: GCG26773
Phoenix ID: CG26784

Project ID: SPECTACLE POND
Client ID: 1604200626-12

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.063	0.003	mg/L	0.5	07/07/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 09, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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QA/QC Report

July 09, 2020

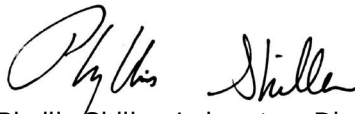
QA/QC Data

SDG I.D.: GCG26773

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 536340 (mg/L), QC Sample No: CG25970 (CG26773, CG26774, CG26775, CG26776, CG26777)													
Phosphorus, as P	BRL	0.01	0.183	0.180	1.70	97.5			95.7			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 536341 (mg/L), QC Sample No: CG26872 (CG26778, CG26779, CG26780, CG26781, CG26782, CG26783, CG26784)													
Phosphorus, as P	BRL	0.01	<0.010	<0.010	NC	98.6			104			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
July 09, 2020

Thursday, July 09, 2020

Sample Criteria Exceedances Report

Criteria: None

GCG26773 - FO-RI

State: RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----	----------------

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

July 09, 2020

SDG I.D.: GCG26773

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



FUSS & O'NEILL ENVIRONMENTAL SCIENCE, LLC

Disciplines to Deliver

(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
☐ 56 Quarry Road, Trumbull, CT 06611
☐ 1419 Richland Street, Columbia, SC 29201
☐ 78 Interstate Drive, West Springfield, MA 01089

- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
☐ 275 Promenade Street, Suite 350, Providence, RI 02908
☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

WCIPK 2.7 Page 1 of 2

CHAIN-OF-CUSTODY RECORD 0582

PROJECT NAME SPECTACLE POND

PROJECT LOCATION CRANSTON, RI

PROJECT NUMBER 207070900.A10

LABORATORY PHOENIX

REPORT TO: ALLEN TEVYAN atevyan@fandO.com Analysis Request

INVOICE TO: ALLEN TEVYAN atevyan@fandO.com

P.O. NO.: 1604200626-01

Sampler's Signature: *[Signature]* Date: 6/26/20

Source Codes:
MW=Monitoring Well PW=Portable Water S=Soil W=Waste
SW=Surface Water T=Treatment Facility B=Sediment A=Air

X=Other

Item No.	Transfer Check				Sample Number	Source Code	Date Sampled	Time Sampled
	1	2	3	4				
1	-	-	-	-	1604200626-01	SW	6/26/20	1354
2	-	-	-	-	1604200626-02	SW		1323
3	-	-	-	-	1604200626-03	SW		1328
4	-	-	-	-	1604200626-04	SW		1337
5	-	-	-	-	1604200626-05	SW		1348
6	-	-	-	-	1604200626-06	SW		1355
7	-	-	-	-	1604200626-07	SW		1405
8	-	-	-	-	1604200626-08	SW		1410
9	-	-	-	-	1604200626-09	SW		1415
10	-	-	-	-	1604200626-10	SW		1410

Containers	Total Phosphorus (SM 4500)										Comments
	Soil VOA Val. [] methanol	Glass Soil Container () oz	Glass VOA Val. [] water	Other	Water VOA Val. [] oz	Glass Amber () ml	Plastic - As is, [] HCl	Plastic - As is, [] H ₂ SO ₄	Plastic - H ₂ SO ₄ , [] 250 ml	Plastic - HNO ₃ , 250 ml	
											26773
											26774
											26775
											26776
											26777
											26778
											26779
											26780
											26781
											26782

Transfer Number	Relinquished By	Accepted By	Date	Time
1	ALLEN TEVYAN	FIELD FRIDGE	6/26/20	1700
2	FIELD FRIDGE	ALLEN TEVYAN	7/2/20	0800
3	ALLEN TEVYAN	<i>[Signature]</i>	2-2-22	9:50
4	<i>[Signature]</i>	Hospital House	7/2/20	15:53

Reporting and Detection Limit Requirements:

Total P: 0.008 mg/L

Additional Comments:



Wednesday, August 12, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND
SDG ID: GCG48429
Sample ID#s: CG48429 - CG48440

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

August 12, 2020

SDG I.D.: GCG48429

Project ID: SPECTACLE POND

Client Id	Lab Id	Matrix
1604200730-01	CG48429	SURFACE WATER
1604200730-02	CG48430	SURFACE WATER
1604200730-03	CG48431	SURFACE WATER
1604200730-04	CG48432	SURFACE WATER
1604200730-05	CG48433	SURFACE WATER
1604200730-06	CG48434	SURFACE WATER
1604200730-07	CG48435	SURFACE WATER
1604200730-08	CG48436	SURFACE WATER
1604200730-09	CG48437	SURFACE WATER
1604200730-10	CG48438	SURFACE WATER
1604200730-11	CG48439	SURFACE WATER
1604200730-12	CG48440	SURFACE WATER



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

9:25
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48429

Project ID: SPECTACLE POND
Client ID: 1604200730-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.092	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

9:35
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48430

Project ID: SPECTACLE POND
Client ID: 1604200730-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.071	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

9:45
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48431

Project ID: SPECTACLE POND
Client ID: 1604200730-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.067	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

9:53
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48432

Project ID: SPECTACLE POND
Client ID: 1604200730-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.047	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

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Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

9:58
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48433

Project ID: SPECTACLE POND
Client ID: 1604200730-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.046	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

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Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

10:05
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48434

Project ID: SPECTACLE POND
Client ID: 1604200730-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.043	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

10:15
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48435

Project ID: SPECTACLE POND
Client ID: 1604200730-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.055	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

10:24
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48436

Project ID: SPECTACLE POND
Client ID: 1604200730-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.064	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

10:26
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48437

Project ID: SPECTACLE POND
Client ID: 1604200730-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.067	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

10:33
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48438

Project ID: SPECTACLE POND
Client ID: 1604200730-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.056	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

11:05
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48439

Project ID: SPECTACLE POND
Client ID: 1604200730-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.020	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

August 12, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

07/30/20
08/05/20

Time

11:37
18:20

Laboratory Data

SDG ID: GCG48429
Phoenix ID: CG48440

Project ID: SPECTACLE POND
Client ID: 1604200730-12

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.068	0.003	mg/L	0.5	08/11/20	EG	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

August 12, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

August 12, 2020

QA/QC Data

SDG I.D.: GCG48429

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 540853 (mg/L), QC Sample No: CG48546 (CG48432, CG48433, CG48434, CG48435, CG48436, CG48437, CG48438, CG48439, CG48440)													
Phosphorus, as P	BRL	0.01	0.022	0.025	NC	90.2			98.5			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 540852 (mg/L), QC Sample No: CG50607 (CG48429, CG48430, CG48431)													
Phosphorus, as P	BRL	0.01	<0.010	<0.010	NC	94.2			113			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
August 12, 2020

Sample Criteria Exceedances Report

GCG48429 - FO-RI

Criteria: None
State: RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
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*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Analysis Comments

August 12, 2020

SDG I.D.: GCG48429

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



FUSS & O'NEILL

(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
☐ 56 Quarry Road, Trumbull, CT 06611
☒ 317 Iron Horse Way, Suite 204, Providence, RI 02908
☐ 1550 Main Street, Suite 400, Springfield, MA 01103
☐ 108 Myrtle Street, Suite 502, Quincy, MA 02171

- ☐ 540 North Commercial Street, Manchester, NH 03101
☐ 276 Newport Road, New London, NH 03257
☐ 205 Billings Farm Road, Suite 6B, White River Junction, VT 05001
☐ 5 Fletcher Street, Suite 1, Kennebunk, ME 04043
☐ 23046 Avenida de la Carlota, Suite 600, Laguna Hills, CA 92653

WCAP Page 1 of 2

2.3

Other

CHAIN-OF-CUSTODY RECORD 43456

PROJECT NAME

SPECTACLE POND

PROJECT LOCATION

CRANSTON, RI

PROJECT NUMBER

20170900.B10

LABORATORY

PHOENIX

REPORT TO: ALLEN TEVYAN *atevyan@fandO.com* Analysis Request

INVOICE TO: ALLEN TEVYAN *atevyan@fandO.com*

P.O. No.: 160420070900.B10

Sampler's Signature: *[Signature]* Date: 7/30/20

Source Codes:

MW=Monitoring Well PW=Potable Water
SW=Surface Water ST=Stormwater

T=Treatment Facility
W=Waste A=Air C=Concrete

X=Other

Item No.	Transfer Check				Sample Number	Source Code	Date Sampled	Time Sampled
	1	2	3	4				
1	-	-	-	-	1604200730-01	SW	7/30/20	0925
2	-	-	-	-	-02			0935
3	-	-	-	-	-03			0945
4	-	-	-	-	-04			0953
5	-	-	-	-	-05			0958
6	-	-	-	-	-06			1005
7	-	-	-	-	-07			1015
8	-	-	-	-	-08			1024
9	-	-	-	-	-09			1026
10	-	-	-	-	-10			1033

Total Phosphorus (ppm) 484129									
Total Phosphorus (ppm) 484130									
Total Phosphorus (ppm) 484131									
Total Phosphorus (ppm) 484132									
Total Phosphorus (ppm) 484133									
Total Phosphorus (ppm) 484134									
Total Phosphorus (ppm) 484135									
Total Phosphorus (ppm) 484136									
Total Phosphorus (ppm) 484137									
Total Phosphorus (ppm) 484138									

Transfer Number	Relinquished By	Accepted By	Date	Time	Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other
1	ALLEN TEVYAN	FIELD FRIDGE	7/30/20	1437	☐ Duplicates ☐ Blanks (Item Nos.)
2	FIELD FRIDGE	ALLEN TEVYAN	7/30/20	1800	Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.
3	ALLEN TEVYAN	<i>[Signature]</i>	8-5-20	16:20	Total P: 0.008 mg/L
4	<i>[Signature]</i>	<i>[Signature]</i>	8/5	1820	Additional Comments:



Thursday, September 03, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND
SDG ID: GCG64309
Sample ID#s: CG64309 - CG64320

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

September 03, 2020

SDG I.D.: GCG64309

Project ID: SPECTACLE POND

Client Id	Lab Id	Matrix
1604200826-01	CG64309	SURFACE WATER
1604200826-02	CG64310	SURFACE WATER
1604200826-03	CG64311	SURFACE WATER
1604200826-07	CG64312	SURFACE WATER
1604200826-08	CG64313	SURFACE WATER
1604200826-09	CG64314	SURFACE WATER
1604200826-10	CG64315	SURFACE WATER
1604200826-11	CG64316	SURFACE WATER
1604200826-12	CG64317	SURFACE WATER
1604200826-13	CG64318	SURFACE WATER
1604200826-14	CG64319	SURFACE WATER
1604200826-15	CG64320	SURFACE WATER



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Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20

Time

15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64309

Project ID: SPECTACLE POND
Client ID: 1604200826-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.046	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20

Time

15:38

08/28/20

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64310

Project ID: SPECTACLE POND
Client ID: 1604200826-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.063	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20

Time

15:38

SDG ID: GCG64309
Phoenix ID: CG64311

Laboratory Data

Project ID: SPECTACLE POND
Client ID: 1604200826-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.063	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

September 03, 2020

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Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

11:00
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64312

Project ID: SPECTACLE POND
Client ID: 1604200826-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.006	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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September 03, 2020

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Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

11:20
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64313

Project ID: SPECTACLE POND
Client ID: 1604200826-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.060	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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September 03, 2020

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Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

12:00
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64314

Project ID: SPECTACLE POND
Client ID: 1604200826-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.113	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

12:20
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64315

Project ID: SPECTACLE POND
Client ID: 1604200826-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.048	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

12:40
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64316

Project ID: SPECTACLE POND
Client ID: 1604200826-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.028	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

13:10
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64317

Project ID: SPECTACLE POND
Client ID: 1604200826-12

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.016	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

13:30
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64318

Project ID: SPECTACLE POND
Client ID: 1604200826-13

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.016	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

14:00
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64319

Project ID: SPECTACLE POND
Client ID: 1604200826-14

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.057	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

September 03, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: CP
Analyzed by: see "By" below

Date

08/21/20
08/28/20

Time

14:30
15:38

Laboratory Data

SDG ID: GCG64309
Phoenix ID: CG64320

Project ID: SPECTACLE POND
Client ID: 1604200826-15

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.066	0.003	mg/L	0.5	09/02/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

September 03, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

September 03, 2020

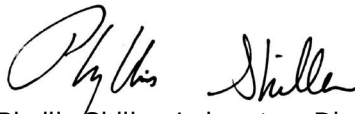
QA/QC Data

SDG I.D.: GCG64309

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 543885 (mg/L), QC Sample No: CG64300 (CG64309, CG64310, CG64311, CG64312, CG64313, CG64314, CG64315)													
Phosphorus, as P	BRL	0.01	1.05	1.08	2.80	100			100			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 543886 (mg/L), QC Sample No: CG64326 (CG64316, CG64317, CG64318, CG64319, CG64320)													
Phosphorus, as P	BRL	0.01	0.079	0.079	0	99.0			98.5			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
September 03, 2020

Sample Criteria Exceedances Report
GCG64309 - FO-RI

Criteria: None
State: RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
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*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Analysis Comments

September 03, 2020

SDG I.D.: GCG64309

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

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- ☐ 146 Hartford Road, Manchester, CT 06040
- ☐ 56 Quarry Road, Trumbull, CT 06611
- ☐ 1419 Richland Street, Columbia, SC 29201
- ☐ 78 Interstate Drive, West Springfield, MA 01089
- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
- ☐ 275 Promenade Street, Suite 350, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD 0590

Turnaround

☐ 1 Day* ☐ 3 Days* ☒ Standard (____ days) ☐ Other ____ (days)
 *Surcharge Applies

PROJECT NAME		PROJECT LOCATION		PROJECT NUMBER	LABORATORY
SPECTACLE Pond		CRANSTON, RI		2070900-B10	PHOENIX
REPORT TO: ALLEN TEVYAN		atevyan@fandO.com			
INVOICE TO: ALLEN TEVYAN		atevyan@fandO.com			
P.O. No.: 16042017000-B10					
Sampler's Signature: <i>[Signature]</i>		Date: 8/2/00			
Source Codes:		PW=Potable Water S=Soil W=Waste			
MW=Monitoring Well T=Treatment Facility B=Sediment A=Air					
SW=Surface Water					
X=Other _____					

Item No.	Transfer Check	Sample Number	Source Code	Date Sampled	Time Sampled	Analysis Request	Containers	Comments
1	-	1604200826-01	SW	8/2/00				64309
2	-	-02						64310
3	-	-03						64311
4	-	-07			1100			64312
5	-	-08			1100			64313
6	-	-09			1200			64314
7	-	-10			1200			64315
8	-	-11			1200			64316
9	-	-12			1310			64317
10	-	-13			1330			64318

Handwritten in margin: TOTAL PHOSPHORUS

Transfer Number	Relinquished By	Accepted By	Date	Time	Reporting and Detection Limit Requirements:
1	ALLEN TEVYAN	FIELD FRIDGE	8/2/00	1700	Reporting Limit 0.008 mg/L
2	FIELD FRIDGE	ALLEN TEVYAN	8/2/00		
3	ALLEN TEVYAN	GT	8/2/00	1037	
4	GT	8/2/00	1538		



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☐ 1419 Richland Street, Columbia, SC 29201
☐ 78 Interstate Drive, West Springfield, MA 01089

- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
☐ 275 Promenade Street, Suite 350, Providence, RI 02908
☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

WCIP 2.5 PAGE 2 of 2

CHAIN-OF-CUSTODY RECORD

0591

Turnaround

- ☐ 1 Day* ☐ 3 Days* ☐ Other _____ (days)
☐ 2 Days* ☒ Standard _____ (days) *Surcharge Applies

PROJECT NAME		PROJECT LOCATION		PROJECT NUMBER		LABORATORY	
SPECTACLE (DOM)		CRAWSTON, RI		2070900.B10		PHENIX	
REPORT TO: ALLEN TAVAN		atryan@fando.com		Analysis Request		Containers	
INVOICE TO: ALLEN TAVAN		atryan@fando.com					
P.O. NO.: 160420070900.B10							
Sampler's Signature: <i>[Signature]</i>		Date: 8/28/20					
Source Codes:		PW=Potable Water S=Soil W=Waste					
MW=Monitoring Well T=Treatment Facility B=Sediment A=Air							
SW=Surface Water							
X=Other _____							
Item No.	Transfer Check	Sample Number	Source Code	Date Sampled	Time Sampled	Comments	
11	✓	1604200826-14	SW	8/28/20	1400	X 64309-64319	
12	✓	↓ -15	↓	✓	1430	X 64310-64320	
						64311	
						64312	
						64313	
						64314	
						64315	
						64316	
						64317	
						64318	

Transfer Number	Relinquished By	Accepted By	Date	Time
1	ALLEN TAVAN	FIELD FRIDGE	8/28/20	1700
2	FIELD FRIDGE	ALLEN TAVAN	8/28/20	
3	A	ST	8/28/20	1037
4	ST	ST	8/28	1534

Reporting and Detection Limit Requirements:

Additional Comments: Reporty Limit - 0.008 $\mu\text{g/L}$



Wednesday, October 21, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND
SDG ID: GCG98796
Sample ID#s: CG98796 - CG98808

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

October 21, 2020

SDG I.D.: GCG98796

Project ID: SPECTACLE POND

Client Id	Lab Id	Matrix
1604201012-01	CG98796	SURFACE WATER
1604201012-02	CG98797	SURFACE WATER
1604201012-03	CG98798	SURFACE WATER
1604201012-04	CG98799	SURFACE WATER
1604201012-05	CG98800	SURFACE WATER
1604201012-06	CG98801	SURFACE WATER
1604201012-07	CG98802	SURFACE WATER
1604201012-08	CG98803	SURFACE WATER
1604201012-09	CG98804	SURFACE WATER
1604201012-10	CG98805	SURFACE WATER
1604201012-11	CG98806	SURFACE WATER
1604201012-12	CG98807	SURFACE WATER
1604201012-13	CG98808	SURFACE WATER



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

11:37
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98796

Project ID: SPECTACLE POND
Client ID: 1604201012-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	11.3	0.25	mg/L	50	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

Total Phosphorus: Due to sample matrix, and low reporting level could not be achieved.

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

11:41
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98797

Project ID: SPECTACLE POND
Client ID: 1604201012-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.057	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

11:43
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98798

Project ID: SPECTACLE POND
Client ID: 1604201012-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.079	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:18
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98799

Project ID: SPECTACLE POND
Client ID: 1604201012-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.019	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:21
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98800

Project ID: SPECTACLE POND
Client ID: 1604201012-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.078	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:50
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98801

Project ID: SPECTACLE POND
Client ID: 1604201012-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.072	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:15
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98802

Project ID: SPECTACLE POND
Client ID: 1604201012-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.067	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:20
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98803

Project ID: SPECTACLE POND
Client ID: 1604201012-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.049	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:32
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98804

Project ID: SPECTACLE POND
Client ID: 1604201012-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.119	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:12
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98805

Project ID: SPECTACLE POND
Client ID: 1604201012-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.095	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:23
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98806

Project ID: SPECTACLE POND
Client ID: 1604201012-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.051	0.003	mg/L	0.5	10/20/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:45
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98807

Project ID: SPECTACLE POND
Client ID: 1604201012-12

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.052	0.003	mg/L	0.5	10/20/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:50
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98808

Project ID: SPECTACLE POND
Client ID: 1604201012-13

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.075	0.003	mg/L	0.5	10/20/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 21, 2020

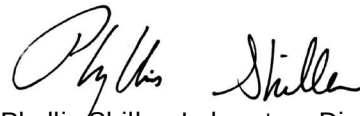
QA/QC Data

SDG I.D.: GCG98796

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 550036 (mg/L), QC Sample No: CG98212 (CG98796)													
Phosphorus, as P	BRL	0.01	0.103	0.100	3.00	98.4			94.4			85 - 115	20
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 550044 (mg/L), QC Sample No: CG98823 (CG98797, CG98798, CG98799, CG98800, CG98801, CG98802, CG98803, CG98804, CG98805)													
Phosphorus, as P	BRL	0.01	0.039	0.034	NC	98.6			112			85 - 115	20
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 550107 (mg/L), QC Sample No: CG99513 (CG98806, CG98807, CG98808)													
Phosphorus, as P	BRL	0.01	9.63	8.71	10.0	96.9			93.7			85 - 115	20
Comment: Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
October 21, 2020

Sample Criteria Exceedances Report

GCG98796 - FO-RI

Criteria: None
State: RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----	----------------

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

October 21, 2020

SDG I.D.: GCG98796

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



FUSS & O'NEILL ENVIROSCIENCE, LLC

Disciplines to Deliver

(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
- ☐ 56 Quarry Road, Trumbull, CT 06611
- ☐ 1419 Richland Street, Columbia, SC 29201
- ☐ 78 Interstate Drive, West Springfield, MA 01089

- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
- ☐ 275 Promenade Street, Suite 350, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD

0595

Turnaround

- ☐ 1 Day* ☐ 3 Days* ☐ Other _____ (days)
- ☐ 2 Days* ☒ Standard _____ (days) *Surcharge Applies

PROJECT NAME
Spectacle Pond

PROJECT LOCATION
Conston, RI

PROJECT NUMBER
20170902 B10

LABORATORY
PHOENIX

REPORT TO: ALLEN TEVYAN atevyan@fandO.com

INVOICE TO: ALLEN TEVYAN atevyan@fandO.com

P.O. No.: 16040070902 B10

Sampler's Signature: Date: 10/12/20

Source Codes: PW=Potable Water S=Soil W=Waste
MW=Monitoring Well T=Treatment Facility B=Sediment A=Air
SW=Surface Water

X=Other _____

Analysis Request

Containers

Soil VOA Val.	mechanol	Glass Soil Container () oz	Glass VOA Val.	As is HCl	Plastic - As is () ml	Plastic - H ₂ SO ₄ () ml	Plastic - HNO ₃ () ml	Plastic - NaOH, 250 ml	Comments
Soil VOA Val.	water	Glass Soil Container () oz	Glass VOA Val.	As is H ₂ SO ₄	Plastic - As is () ml	Plastic - H ₂ SO ₄ () ml	Plastic - HNO ₃ () ml	Plastic - NaOH, 250 ml	98796
Soil VOA Val.									98797
Soil VOA Val.									98798
Soil VOA Val.									98799
Soil VOA Val.									98800
Soil VOA Val.									98801
Soil VOA Val.									98802
Soil VOA Val.									98803
Soil VOA Val.									98804
Soil VOA Val.									98805

Total Phosphorus

Item No.	Transfer Check	Sample Number	Source Code	Date Sampled	Time Sampled
1	-	1604001012-01	SW	10/12/20	1137
2	-	-02		1141	
3	-	-03		1143	
4	-	-04		1218	
5	-	-05		1221	
6	-	-06		1250	
7	-	-07		1315	
8	-	-08		1320	
9	-	-09		1232	
10	-	-10		1312	

Transfer Number	Relinquished By	Accepted By	Date	Time	Reporting and Detection Limit Requirements:
1	ALLEN TEVYAN	FIELD FRIDEE	10/12/20	1600	
2	FIELD FRIDEE	ALLEN TEVYAN	10/13/20	0800	
3	ALLEN TEVYAN	10-16-20 161600	10/16	1633	Report limit - 0.008 mg/L
4					



Wednesday, October 21, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND
SDG ID: GCG98796
Sample ID#s: CG98796 - CG98808

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

October 21, 2020

SDG I.D.: GCG98796

Project ID: SPECTACLE POND

Client Id	Lab Id	Matrix
1604201012-01	CG98796	SURFACE WATER
1604201012-02	CG98797	SURFACE WATER
1604201012-03	CG98798	SURFACE WATER
1604201012-04	CG98799	SURFACE WATER
1604201012-05	CG98800	SURFACE WATER
1604201012-06	CG98801	SURFACE WATER
1604201012-07	CG98802	SURFACE WATER
1604201012-08	CG98803	SURFACE WATER
1604201012-09	CG98804	SURFACE WATER
1604201012-10	CG98805	SURFACE WATER
1604201012-11	CG98806	SURFACE WATER
1604201012-12	CG98807	SURFACE WATER
1604201012-13	CG98808	SURFACE WATER



Environmental Laboratories, Inc.
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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

11:37
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98796

Project ID: SPECTACLE POND
Client ID: 1604201012-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	11.3	0.25	mg/L	50	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

Total Phosphorus: Due to sample matrix, and low reporting level could not be achieved.

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

11:41
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98797

Project ID: SPECTACLE POND
Client ID: 1604201012-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.057	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

11:43
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98798

Project ID: SPECTACLE POND
Client ID: 1604201012-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.079	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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October 21, 2020

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Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:18
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98799

Project ID: SPECTACLE POND
Client ID: 1604201012-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.019	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:21
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98800

Project ID: SPECTACLE POND
Client ID: 1604201012-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.078	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

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Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:50
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98801

Project ID: SPECTACLE POND
Client ID: 1604201012-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.072	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

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Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:15
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98802

Project ID: SPECTACLE POND
Client ID: 1604201012-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.067	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:20
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98803

Project ID: SPECTACLE POND
Client ID: 1604201012-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.049	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

12:32
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98804

Project ID: SPECTACLE POND
Client ID: 1604201012-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.119	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:12
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98805

Project ID: SPECTACLE POND
Client ID: 1604201012-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.095	0.003	mg/L	0.5	10/20/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:23
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98806

Project ID: SPECTACLE POND
Client ID: 1604201012-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.051	0.003	mg/L	0.5	10/20/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:45
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98807

Project ID: SPECTACLE POND
Client ID: 1604201012-12

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.052	0.003	mg/L	0.5	10/20/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 21, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by:
Received by: B
Analyzed by: see "By" below

Date

10/12/20
10/16/20

Time

13:50
16:33

Laboratory Data

SDG ID: GCG98796
Phoenix ID: CG98808

Project ID: SPECTACLE POND
Client ID: 1604201012-13

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.075	0.003	mg/L	0.5	10/20/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

October 21, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 21, 2020

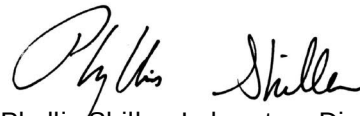
QA/QC Data

SDG I.D.: GCG98796

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 550036 (mg/L), QC Sample No: CG98212 (CG98796)													
Phosphorus, as P	BRL	0.01	0.103	0.100	3.00	98.4			94.4			85 - 115	20
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 550044 (mg/L), QC Sample No: CG98823 (CG98797, CG98798, CG98799, CG98800, CG98801, CG98802, CG98803, CG98804, CG98805)													
Phosphorus, as P	BRL	0.01	0.039	0.034	NC	98.6			112			85 - 115	20
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 550107 (mg/L), QC Sample No: CG99513 (CG98806, CG98807, CG98808)													
Phosphorus, as P	BRL	0.01	9.63	8.71	10.0	96.9			93.7			85 - 115	20
Comment: Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
October 21, 2020

Sample Criteria Exceedances Report

Criteria: None
State: RI

GCG98796 - FO-RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
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*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

October 21, 2020

SDG I.D.: GCG98796

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



FUSS & O'NEILL ENVIRONMENTAL SCIENCE, LLC

Disciplines to Deliver

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- ☐ 146 Hartford Road, Manchester, CT 06040
- ☐ 56 Quarry Road, Trumbull, CT 06611
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- ☐ 78 Interstate Drive, West Springfield, MA 01089

- ☐ 50 Redfield Street, Suite 100, Boston, MA 02122
- ☐ 275 Promenade Street, Suite 350, Providence, RI 02908
- ☐ 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD 0595

Turnaround

- ☐ 1 Day* ☐ 3 Days* ☐ Other _____ (days)
- ☐ 2 Days* ☒ Standard _____ (days) *Surcharge Applies

PROJECT NAME Spectacle Pond		PROJECT LOCATION Conston, RI		PROJECT NUMBER 20170902 B10		LABORATORY PHOENIX	
REPORT TO: ALLEN TEVHAN		INVOICE TO: ALLEN TEVHAN		P.O. No.: 16040070902 B10		Analysis Request Total Phosphorus	
Sampler's Signature: 		Date: 10/12/20		Source Codes: PW=Potable Water S=Soil MW=Monitoring Well T=Treatment Facility B=Sediment SW=Surface Water A=Air		Containers	
X=Other _____							
Item No.	Transfer Check 1 2 3 4	Sample Number	Source Code	Date Sampled	Time Sampled	Comments	
1	- - - -	1604001012-01	SW	10/12/20	1137	X	Plastic - NaOH, 250 ml Unfiltered
2	- - - -	-02			1141	X	Plastic - HNO ₃ , 250 ml Filtered 500 ml
3	- - - -	-03			1143	X	Plastic - H ₂ SO ₄ , 250 ml 500 ml
4	- - - -	-04			1218	X	Plastic - As is, 250 ml 500 ml
5	- - - -	-05			1221	X	Plastic - As is, 250 ml 500 ml
6	- - - -	-06			1250	X	Plastic - As is, 250 ml 500 ml
7	- - - -	-07			1315	X	Plastic - As is, 250 ml 500 ml
8	- - - -	-08			1320	X	Plastic - As is, 250 ml 500 ml
9	- - - -	-09			1232	X	Plastic - As is, 250 ml 500 ml
10	- - - -	-10			1312	X	Plastic - As is, 250 ml 500 ml

Transfer Number	Relinquished By	Accepted By	Date	Time	Reporting and Detection Limit Requirements:
1	ALLEN TEVHAN	FIELD FRIDGE	10/12/20	1600	Additional Comments: Report limit - 0.008 mg/L
2	FIELD FRIDGE	ALLEN TEVHAN	10/13/20	0800	
3	ALLEN TEVHAN	10-16-20	10/16/20	9:50	
4			10/16	1633	



Thursday, November 05, 2020

Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Project ID: SPECTACLE POND CRANSTON, RI
SDG ID: GCH07876
Sample ID#s: CH07876 - CH07888

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

November 05, 2020

SDG I.D.: GCH07876

Project ID: SPECTACLE POND CRANSTON, RI

Client Id	Lab Id	Matrix
1603201029-01	CH07876	SURFACE WATER
1603201029-02	CH07877	SURFACE WATER
1603201029-03	CH07878	SURFACE WATER
1603201029-04	CH07879	SURFACE WATER
1603201029-05	CH07880	SURFACE WATER
1603201029-06	CH07881	SURFACE WATER
1603201029-07	CH07882	SURFACE WATER
1603201029-08	CH07883	SURFACE WATER
1603201029-09	CH07884	SURFACE WATER
1603201029-10	CH07885	SURFACE WATER
1603201029-11	CH07886	SURFACE WATER
1603201029-12	CH07887	SURFACE WATER
1603201029-13	CH07888	SURFACE WATER



Environmental Laboratories, Inc.
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Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

9:42
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07876

Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-01

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.006	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

9:50
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07877

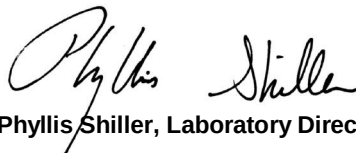
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-02

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.058	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

10:18
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07878

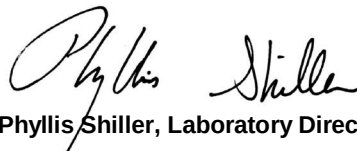
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-03

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.065	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

10:52
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07879

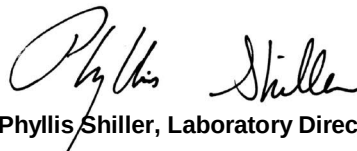
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-04

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.058	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

11:21
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07880

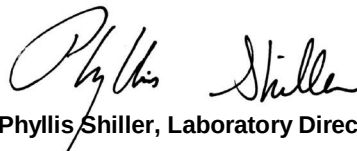
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-05

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.143	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

11:32
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07881

Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-06

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.122	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

12:02
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07882

Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-07

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.053	0.003	mg/L	0.5	11/03/20	MI	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

12:11
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07883

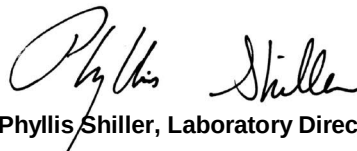
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-08

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.192	0.003	mg/L	0.5	11/04/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

12:15
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07884

Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-09

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.216	0.003	mg/L	0.5	11/04/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

12:33
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07885

Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	3.41	0.063	mg/L	13	11/04/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

14:35
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07886

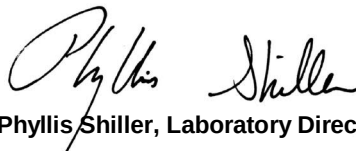
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.069	0.003	mg/L	0.5	11/04/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



Environmental Laboratories, Inc.
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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

14:47
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07887

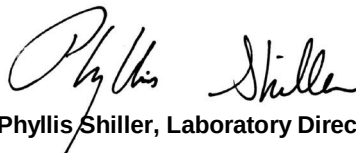
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-12

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.095	0.003	mg/L	0.5	11/04/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Analysis Report

November 05, 2020

FOR: Attn: Allen Tevyaw
Fuss & O'Neill, Inc.
Foundry Corporate Office Center
317 Iron Horse Way, Suite 204
Providence, RI 02908

Sample Information

Matrix: SURFACE WATER
Location Code: F&O-RI
Rush Request: Standard
P.O.#: 20170900.B10

Custody Information

Collected by: MS
Received by: LB
Analyzed by: see "By" below

Date

10/29/20
11/03/20

Time

14:52
13:22

Laboratory Data

SDG ID: GCH07876
Phoenix ID: CH07888

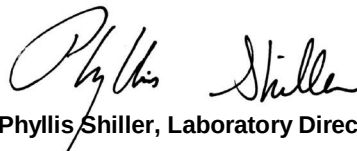
Project ID: SPECTACLE POND CRANSTON, RI
Client ID: 1603201029-13

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Phosphorus, as P	0.066	0.003	mg/L	0.5	11/04/20	JR	SM4500PE-11

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

November 05, 2020

Reviewed and Released by: Rashmi Makol, Project Manager



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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

November 05, 2020

QA/QC Data

SDG I.D.: GCH07876

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 551964 (mg/L), QC Sample No: CH07851 (CH07876, CH07877, CH07878, CH07879, CH07880, CH07881, CH07882)													
Phosphorus, as P	BRL	0.01	5.82	5.78	0.70	99.2			97.3			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 552065 (mg/L), QC Sample No: CH07994 (CH07888)													
Phosphorus, as P	BRL	0.01	4.65	4.67	0.40	101			103			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 552063 (mg/L), QC Sample No: CH08313 (CH07883, CH07884, CH07885, CH07886, CH07887)													
Phosphorus, as P	BRL	0.01	7.63	7.51	1.60	99.8			94.9			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference


Phyllis Shiller, Laboratory Director
November 05, 2020

Sample Criteria Exceedances Report

GCH07876 - FO-RI

Criteria: None
State: RI

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
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*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



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Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

November 05, 2020

SDG I.D.: GCH07876

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



FUSS & O'NEILL

(860) 646-2469 • www.FandO.com

- ☐ 146 Hartford Road, Manchester, CT 06040
☐ 56 Quarry Road, Trumbull, CT 06611
☒ 317 Iron Horse Way, Suite 204, Providence, RI 02908
☐ 1550 Main Street, Suite 400, Springfield, MA 01103
☐ 108 Myrtle Street, Suite 502, Quincy, MA 02171

- ☐ 540 North Commercial Street, Manchester, NH 03101
☐ 276 Newport Road, New London, NH 03257
☐ 205 Billings Farm Road, Suite 6B, White River Junction, VT 05001
☐ 5 Fletcher Street, Suite 1, Kennebunk, ME 04043
☐ 23046 Avenida de la Carlota, Suite 600, Laguna Hills, CA 92653

CHAIN-OF-CUSTODY RECORD

43500

PROJECT NAME

PROJECT LOCATION

PROJECT NUMBER

LABORATORY

SPECTACLE ROAD

MANSTON, CT

20170900.B10

PHOENIX

REPORT TO: ALLEN TENYAW (atenyaw@fandoc.com)

INVOICE TO: 71

P.O. NO.: 160320170900.B10

Sampler's Signature: *Muelly Seay* Date: 10/29/20

Source Codes:

MW=Monitoring Well PW=Potable Water T=Treatment Facility S=Soil B=Sediment
SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete

X=Other

Analysis Request

Containers

TOTAL PHOSPHORUS (54 H3PO4)

Item No.	Transfer Check 1 2 3 4	Sample Number	Source Code	Date Sampled	Time Sampled
1		1603201029 - 01	SW	10/29/20	0942
2		- 02		10/29/20	0950
3		- 03		10/29/20	1018
4		- 04		10/29/20	1052
5		- 05		10/29/20	1121
6		- 06		10/29/20	1132
7		- 07		10/29/20	1202
8		- 08		10/29/20	1211
9		- 09		10/29/20	1215
10		- 10		10/29/20	1233

Comments	Plastic - NaOH, 250 ml	Plastic - HNO ₃ , 250 ml	Plastic - H ₂ SO ₄ , 250 ml	Plastic - As ₂ S ₃ , 250 ml	Plastic - As ₂ S ₃ , 500 ml	Plastic - As ₂ S ₃ , 1000 ml	Glass Amber () ml, As ₂ S ₃	Glass Amber () ml, HCl	Glass Amber () ml, H ₂ SO ₄	Water VOA Vial, As ₂ S ₃	Water VOA Vial, HCl	Other	Other	Glass Soil Container () oz	Glass Soil Container () oz	Soil VOA Vial, As ₂ S ₃	Soil VOA Vial, HCl	Soil VOA Vial, H ₂ SO ₄
07876																		
07877																		
07878																		
07879																		
07880																		
07881																		
07882																		
07883																		
07884																		
07885																		

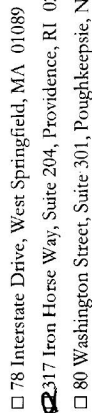
Transfer Number	Relinquished By	Accepted By	Date	Time
1	<i>Muelly Seay</i>	<i>FOO FUSSE</i>	10/29/20	1630
2	<i>Allen Tenyaw</i>	<i>[Signature]</i>	11/3	1125
3	<i>[Signature]</i>	<i>[Signature]</i>	11/3	1322
4				

Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other ()
____ Duplicates ____ Blanks (Item Nos:)

Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☐ MCP CAM Cert.

TOTAL PHOSPHORUS: 0.008 mg/L

Additional Comments:



37101

Turnaround

☐ 24-Hour* ☐ 72-Hour* ☐ Other _____ (days)
☐ 48-Hour* ☒ Standard (_____ days) *Surcharge Applies

PROJECT NUMBER

LABORATORY

20170960.316

Analysis Request

analysis
Request

[illegible]



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