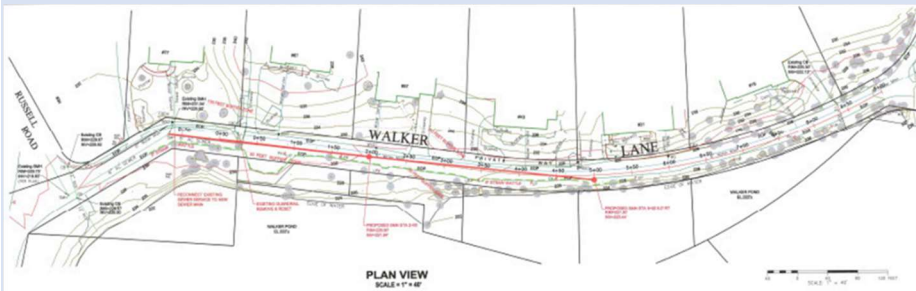


January
2023

Walker Pond Improvements

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Overall Project Status Review



The Walker Pond Improvement Project is a multi-phased project broken into three (3) categories of activities to address the water quality of Walker Pond.

Category I: Contributory Area Runoff Control and Treatment

Category II: Water Quality Treatments

Category III: Sewer Main Extension

Due to known septic system issues in the area and resident requests to facilitate connections, Category III was prioritized. Providing interconnection with Town Sewer reduces nutrients that may leach to surrounding waterbodies from less efficient septic systems. The Walker Lane Sewer Extension reached final completion in June 2022.

This past fall, Category I structural and nature-based measures and a headwall at the inlet pipe were installed to promote nutrient uptake and soil activity through the installation of drainage structures, a vegetated filter strip, and public education. Runoff entering the pond has a greater opportunity for infiltration thus protecting and promoting sustainable management of the pond ecosystems increasing resiliency and promoting biodiversity.

Educational signage is anticipated for installation during the upcoming spring season.

Category II Approach

The Conservation Commission engaged ESS in 2017 to analyze pond conditions. The observations and recommendations resulting from that analysis served as the basis for project definition, development and funding requests.

The proposed approach to Category II included activities such as:

- Chemical Treatment
- Hydro Raking
- Overflow Structure Improvements

Funding for this category also included permitting and project management costs associated with these activities.



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Category II Plan

As part of project due diligence and responsible project management, general observed assessments of pond conditions lead to a necessary review of the proposed approach and consideration of adjustments to better serve the overall project goals, community and pond maintenance strategy. This review has resulted in a final plan that remains aligned with the proposed approach while simultaneously addressing current conditions efficiently and focusing on long-term water quality management.

Since the initial report was developed, conditions in Walker Pond have changed and an increase of extreme weather events, control structure issues and environmental impacts have contributed to the exacerbation of some of the identified issues.

Each category of the overall project will benefit residents, visitors and promote environmental stewardship providing opportunities to include beneficial BMPs and further our NPDES efforts. On February 16, 2022, Needham was approved for \$356,000 of funding through the American Rescue Plan Act (ARPA) to execute the activities proposed in Category II of Walker Pond Improvements.

Overflow Structure



Replacement of assets occurs at the end of the useful service life. The life expectancy of an asset is impacted by the natural properties of its materials and the degree of deterioration and performance can vary depending on environmental factors.

During 2022 the Walker Pond experienced rapidly dropping water levels. A DPW crew was dispatched to assess the possible cause. In addition to severe environmental conditions, the overflow structure was inspected and revealed significant deterioration beyond typical maintenance. The full assessment of the structure verified the need for full structure replacement.

The outlet structure at the intersection of Walker Lane and Central Ave was designed and constructed as a poured-in-place concrete device and has been in operation since the mid-1990's. The stop logs utilized for controlling the pond elevation and structural integrity has weakened and is no longer functioning as designed. The DPW fortified the structure temporarily with a fabricated steel plating however water is still able to release necessitating the sandbags currently in place until a permanent solution could be developed and implemented.

Replacement presents an opportunity to increase functionality of the asset through installation of a more modern structure that is easy, safe, and cost-effective to maintain and is fabricated in a way to allow discharge sampling from the pond. The sampling capability will support monitoring of pond health while still functioning as a control asset for water levels. The project team is finalizing a design or procurement of a pre-fabricated structure that takes into consideration longevity, operations and maintenance ease and safety.

A portion of the total funding request was earmarked for minor improvements to the outlet structure, including the overflow grate and wooden stop-log replacements. The increased scope of the necessary structure replacement will result in reallocation of budget resources for procurement, installation and construction activities, permitting and project management.

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To control algal populations, limiting nutrient supply through runoff reduces the potential growth of algae. The runoff control measures along with the sewer extension nutrient control efforts and were integral to addressing the overall water quality issues at Walker Pond. Controlling the quality of runoff into the pond is an important component of effective, long-term water quality management.

Another element to water quality is treatment. Pond treatment represents the process of biological oxidation of organic matter whether affected by natural or artificially accelerated transfer of oxygen. The report developed by ESS advised chemical treatments may improve the water quality and address observed algae and vegetated overgrowth.



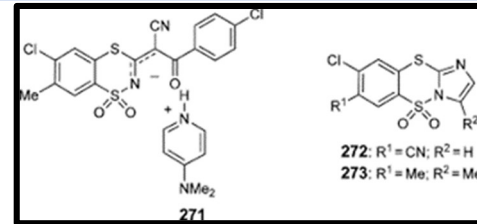
Photo provided by Mark Ettinger on July 28, 2022.

Walker Pond was treated previously with positive results and has provided the community with years of pond usage and enjoyment. Given the current conditions and quality today, resuming a chemical treatment course remains a part of the Category II phase.

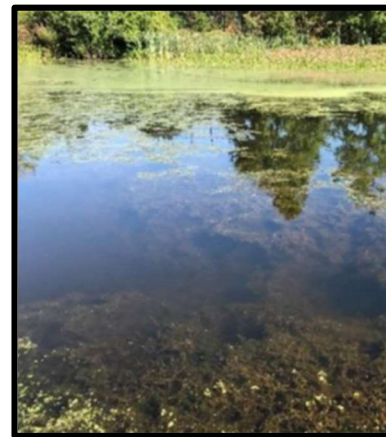
Chemical treatment can have a negative environmental impact to the ecosystem if not closely monitored and applied prudently only as needed. Remaining sensitive to the concerns of the Conservation Commission and the health and safety of the surrounding residents, the project team sought direction when developing the final strategy from pond treatment professionals. It is suggested to monitor, conduct water quality sampling and establish a plan for the existing waters with the least invasive approach over the course of this spring, summer and fall to establish a baseline. This plan and any treatment actions will need to be permitted through the Conservation Commission. Following the baseline determination, development of a chemical application maintenance plan (if necessary) can be established with confidence and an understanding of level of effort, funding needs and consistent parameters for effective monitoring of pond health. Any maintenance plan, whether including a chemical treatment component or not, could require ongoing staff resources.

Once a full round of applications has been completed, reassessment of the treated waters for any continued algal growth or excessive vegetation will comprehensively inform decisions to continue chemical application or adjust treatments up to and including performing more extensive control measures such as hydro-raking or dredging.

Chemical Treatment



Taking care of our ponds helps to keep the environment, local recreation and overall natural aesthetics in balance.



Walker Pond dominated by watermeal and duckweed (water surface), and native coontail and filamentous algae (submerged). Photo taken by ESS Group, Inc. during the Walker Pond Lake Management Study 2017.