

Town of Lexington, Massachusetts

Volunteer Water Quality and Outfall Screening Program

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Summary

Over the past year, the Town of Lexington Engineering and Conservation Divisions piloted a volunteer water quality and outfall screening program to assist the Town with improving the stream health of the area addressed in the EPA Administrative Order. The goal of the program is to train citizen science volunteers to investigate conditions and monitor water quality at outfalls and report their findings back to the Engineering Division. Engineering staff then reviews the data to determine which outfalls require further investigation, such as illicit connections, high ammonia counts, sewage odors, and impaired infrastructure. Resources are then allocated to address problem areas. The program has proven so successful that it is now being expanded to areas outside of the EPA Administrative Order.

Pilot Program – EPA Administrative Order Area

In the pilot phase of the program, the volunteers focused on the area covered by the EPA Administrative Order, which included upstream outfalls in the watershed of outfall 15-30 (the outfall at Hayes Lane and Grant Street). Engineering and Conservation staff worked together to develop protocols and a training program for volunteers. Initially, 2 2-member teams of volunteers were recruited and trained to partake in the program. The teams' tasks included locating and inventorying outfalls, returning for 5 follow-up water quality samples, and maintaining communication with Engineering and Conservation staff. In the inventory component, volunteers photographed the outfall and evaluated its physical features (see sample data sheet). In the water quality screening component, volunteers sampled for ammonia and chlorine and collected data on parameters such as temperature, odor, and turbidity. Volunteers collected both wet and dry weather samples. When volunteers found chlorine present or high ammonia concentrations, they returned a sample to Engineering staff for further investigation. When volunteers were unable to locate an outfall, located an unmapped outfall, or identified compromised infrastructure, they immediately notified Engineering staff for further investigation. Follow-up work was then undertaken by Engineering staff. Photographs and inventory data were compiled into a binder for the purpose of assisting with future outfall screening.

One example of how the pilot phase succeeded can be found in the case of outfall 15-4. Outfall 15-4 is a neighborhood outfall with a small catchment area and no underdrain, which meant that it was considered a lower priority for staff screening. However, the volunteers were able to include it in their screening efforts. On investigation, volunteers initially found no flow at the outfall, but on subsequent visits, they noticed a trickle coming from the outfall during dry weather. They sampled and identified high ammonia concentrations and returned a sample to Engineering staff, who confirmed the high ammonia concentrations. Five samples were then sent to the laboratory and elevated bacteria concentrations were identified. Engineering staff then researched the area and determined that the close proximity to an aging sanitary line was the most likely cause of bacteria contribution. Now, plans are in place to reline this sanitary line, with the expectation that the exfiltration will be eliminated and the bacteria source removed.

Expanding the Program to Other Areas

Due to the success of the pilot program, Engineering and Conservation staff decided to expand the program to other areas of town. In June, staff and volunteers met to evaluate the program and kick-off the next phase, which includes 10 volunteers and focuses on additional subwatersheds within Lexington's Shawsheen River Watershed. Staff and volunteers will meet again in the fall to review progress.