



City of New York

OFFICE OF THE COMPTROLLER

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COMPTROLLER



MANAGEMENT AUDIT

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Deputy Comptroller for Audit

Audit Report on the New York City
Department of Education's Controls over
Testing for Lead in School Water

MD19-117A

June 25, 2021



THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
SCOTT M. STRINGER

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To the Residents of the City of New York:

My office has audited the New York City Department of Education (DOE) to determine whether the agency has adequate controls over lead testing of school water and needed remediation efforts. We perform audits such as this as a means to increase accountability and to help promote public safety.

The audit concluded that DOE generally met applicable water testing standards. The audit found that water samples were generally collected in accordance with State guidelines; fixtures were generally tested; and required stagnation periods for testing were generally met. However, the audit noted several exceptions. Although all schools that required testing were tested, *none* of them received their primary testing by the October 31, 2016 deadline. In addition, the test results indicated that 84 percent of schools had at least one fixture test with elevated lead levels since 2016. Further, we found that three zip codes in Brooklyn (East New York, Bushwick, and Brownsville) had 95 percent or more of their schools with at least one fixture with an elevated lead level when tested. With regard to post-remediation testing, only 65 percent of the fixtures requiring post-remediation testing were tested timely and DOE has no evidence that it tracked the timeliness of fixture remediation and repair. In addition, there were instances of missing or unsubstantiated information in the DOE's database.

To address these and other issues, the audit made 19 recommendations, including that DOE should: ensure timely compliance with State rules and regulations pertaining to lead testing; track and monitor testing time frames; track and monitor the timeliness of fixture remediation and repair; test water when school is in full session; retest fixtures tested during summer months; fixtures without any subsequent tests; and ensure that appropriate stagnation periods are met.

The results of the audit have been discussed with DOE officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please e-mail my Audit Bureau at audit@comptroller.nyc.gov.

Sincerely,

Scott M. Stringer

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CITY OF NEW YORK OFFICE OF THE COMPTROLLER MANAGEMENT AUDIT

Audit on the New York City Department of Education's Controls over Testing for Lead in School Water

MD19-117A

EXECUTIVE SUMMARY

The Department of Education (DOE) provides primary and secondary education to over one million students in grades Pre-K through 12 in New York City (City) and employs approximately 79,000 teachers. DOE is required to follow the United States Environmental Protection Agency's (EPA's) Safe Drinking Water Act (SDWA), which was passed by Congress in 1974 to ensure the drinking water in schools is safe for drinking.

In September 2016, the Governor of New York State (NYS or the State) signed emergency legislation requiring all school districts in the State to test potable water systems (used for drinking or food preparation) for lead contamination and to take appropriate responsive actions if necessary. To implement this new law, the NYS Department of Health (NYSDOH) issued an emergency regulation, titled *Lead Testing in School Drinking Water* under the New York Codes, Rules and Regulations (NYCRR) Title 10, Subpart 67-4. This emergency regulation required that all NYS schools receive lead testing by October 31, 2016.¹ DOE has categorized this testing period as the "primary testing year." In May 2018, an amendment to the *Lead Testing in School Drinking Water* regulation was signed that requires all State schools be tested for lead in 2020. However, DOE obtained permission from NYSDOH to test one-third of the schools each year for Calendar Years 2018, 2019, and 2020. DOE has categorized these three testing periods as "Cohorts."

In 2016, DOE created the Water Quality and Lead Compliance (Water Quality) unit, operating under DOE's Division of School Facilities (DSF), to address water quality issues in schools. DOE contracts with two lead testing vendors, Precision Environmental Inc. and ATC Group Services, LLC, known as environmental consultants (ECs), to collect water samples from in scope fixtures in schools.² The ECs share lead testing results with DOE electronically. DOE has a quality control

¹ For grades Pre-K through 5, the deadline for collecting water samples was September 30, 2016, while for grades 6 through 12, the deadline was October 31, 2016.

² In scope fixtures are used for drinking or cooking purposes and include water fountain bubblers, bottle filling stations, and food preparation sinks. Out of scope fixtures include eye wash stations, covered slop sinks, faucets in laboratory classrooms, and hot water faucets.

process to verify the accuracy of lab results before they are uploaded into DOE's Lead in Water database.

If the lab testing indicates that the lead level in drinking water for a fixture has exceeded the NYCRR's mandated action level of 15 parts per billion (ppb), DOE is required to immediately tag the fixture and remove it from service.³ However, classroom and restroom cold water faucets can remain in use provided that the school posts a sign indicating that the fixture is for "hand washing only."

Audit Findings and Conclusion

The audit found that while DOE's records reflect that it generally met applicable water testing standards, we identified several notable exceptions that indicate the need for the agency to improve its controls over lead testing of school water and remediation efforts.

Preliminarily, although the audit found that all schools that required testing were ultimately tested, *none* of them received their primary testing by the October 31, 2016 deadline.

In addition, according to DOE's Lead in Water database, the test results for the primary testing year and the subsequent Cohorts reflect that

- 84 percent of schools (1,323 out of 1,574) had at least one fixture test with elevated lead levels since 2016, with 10,814 such fixtures identified during the primary testing year.
- In total, in excess of 1 out of every 10 fixtures tested (11 percent) had elevated lead levels at the time they were tested.
- Further, we found that three zip codes in Brooklyn (East New York, Bushwick, and Brownsville) had 95 percent or more of their schools with at least one fixture with an elevated lead level when tested.

Delayed testing placed school students and personnel drinking water from these fixtures at risk for a longer period of time than would have been the case if the testing had been done within the initially mandated time frames.

In addition, the audit found that DOE does not ensure that ECs meet certain timeliness deadlines. In response to the State's mandate that every school be tested by the end of October 2016, DOE modified and extended the ECs' contractual target time frames for submitting water test results and performing post-remediation testing to accommodate the increased volume of testing needed. With regard to submitting water test results, however, the time frame adopted by DOE did not reflect the entire process. Specifically, it omitted the period starting with the collection of samples to their submission to the lab, a portion of the process where we observed delays. Furthermore, DOE did not assemble the data necessary to monitor whether the ECs conducted the process in a timely manner. With regard to post-remediation testing, our analysis found that only 65 percent of the fixtures requiring remediation from the 2018 and 2019 Cohorts were tested timely in accordance with DOE's modified time frame. The audit also found that DOE has no evidence that it tracked the timeliness of fixture remediation and repair. In fact, we found fixtures

³ Tagging a fixture is the process of placing an orange "out of service" tag at the fixture's on and off valve.

pending repairs at Brooklyn schools for over three years, including 27 at one school located in Bushwick and 23 at another located in City Line.

At the same time, we found that: (1) water samples were generally collected in accordance with State guidelines; (2) fixtures were generally tested; and (3) required stagnation periods for testing were generally met. However, even with DOE's efforts, we found some exceptions. Specifically, we identified:

- 5,188 (2 percent) out of 270,822 water samples (from 583 schools) were not collected on days when schools were in full session as recommended, which could result in higher lead results;
- 325 (<1 percent) out of 152,914 fixtures did not receive all of the required tests (while the number of exceptions are small, each one reflects an increased risk to the health of students and staff in the City's schools); and
- 15 (1 percent) of the 1,574 schools that were (open as of September 2019) did not meet the required stagnation period when they received their initial water testing.

Finally, we found that data in the Lead in Water database generally reconciled with the information contained in the lab reports, although we identified instances of missing or unsubstantiated information. While we tested to ensure that all fixtures that received tests had a ppb result listed, we did not validate the actual test results.

Audit Recommendations

Based on the audit, we make 19 recommendations, including:

- DOE should ensure timely compliance with State rules and regulations pertaining to lead testing in water.
- DOE should track and monitor testing time frames, to ensure ECs are conducting the tests and submitting the results timely, and incorporate time frames for the entire process into its written internal policies and procedures.
- DOE should track and monitor the timeliness of fixture remediation and repair of out of order fixtures and follow-up with Facilities and the plumbing contractors in instances where remediation or repair is not done timely.
- DOE should follow lead testing guidelines recommended by NYSDOH and test water when school is in full session.
- DOE should ensure that fixtures which were re-tested during the summer months with elevated lead levels are retested.
- DOE should ensure that fixtures without any subsequent tests are retested.
- DOE should ensure that appropriate stagnation periods are met when accommodating schools' requests for testing on specific dates.

Agency Response

In its response, DOE agreed with 12 recommendations, partially agreed with three (#8, #10, and #12), and disagreed with four recommendations (#3, #4, #14, and #19). DOE also disagreed with the summary of findings in the report and responded, contrary to the audit findings, that the majority of the recommendations are consistent with already existing and longstanding DOE policies. After carefully reviewing DOE's arguments, we find no basis to alter any of the report's findings or conclusions.

AUDIT REPORT

Background

DOE provides primary and secondary education to over one million students in grades Pre-K through 12 in the City and employs approximately 79,000 teachers. DOE prepares students to meet grade level standards for reading, writing, and mathematics and prepares high school students to graduate ready for college or careers.

In its over 1,800 schools, DOE is required to follow the United States EPA's SDWA, which was passed by Congress in 1974 to ensure the drinking water in schools is safe for drinking. In 2011, Congress passed the Reduction of Lead in Drinking Water Act (RLDA), which revised the maximum allowable percentage of lead surfaces in contact with potable water, such as fixtures (water fountain bubblers, bottle filling stations, and food preparation sinks) or components, from 8 percent to the lower limit of 0.25 percent. The City's water is virtually lead free when delivered from the upstate reservoir system. However, water can absorb lead from fixtures, faucets, and fittings, especially if it has not been run for several hours.

In September 2016, the Governor of New York signed emergency legislation requiring all school districts in the State to test potable water systems (used for drinking or food preparation) for lead contamination and to take appropriate responsive actions if necessary. To implement this new law, the NYSDOH issued an emergency regulation, titled *Lead Testing in School Drinking Water* under the New York Codes, Rules and Regulations (NYCRR) Title 10, Subpart 67-4. This emergency regulation required that all NYS schools receive lead testing by October 31, 2016. DOE has categorized this testing period (November 29, 2016 through April 26, 2017) as the "primary testing year." The School Construction Authority assisted DOE with testing all New York City schools for lead levels in potable water in School Year 2016–2017 while DOE remediated all fixtures that tested above the action level of 15 ppb.

In May 2018, an amendment to the *Lead Testing in School Drinking Water* regulation was signed that required all NYS schools be tested for lead in 2020. However, DOE obtained permission from NYSDOH to test one-third of the schools each year for Calendar Years 2018, 2019, and 2020. DOE has categorized these three testing periods as "Cohorts."

DOE's Water Quality unit operates under DOE's DSF. DOE created the Water Quality unit in 2016 to address water quality issues in schools and to ensure that all applicable local, state, and federal laws are followed. School buildings constructed after January 1, 2014 or buildings certified lead free by a NYS licensed engineer or architect are exempt from lead testing of water. In such buildings, nonetheless, DOE still tests the applicable fixtures.

DOE contracts with two lead testing vendors, Precision Environmental Inc. and ATC Group Services, LLC, known as Environmental Consultants, or ECs. The ECs employ staff that travel to the schools and collect water samples from in scope fixtures. During initial testing, the staff use handheld devices to scan metal barcodes (called an asset tag) located on the in scope fixture and the testing water bottle barcodes, which allows the ECs to keep track of where each sample was

taken from.⁴ If a fixture is found to be out of order, it is not tested due to stagnation guidelines, and is retested at a later time.⁵

The ECs deliver the samples to the testing laboratories with a printed chain of custody form that is signed by the EC's staff.⁶ The testing time, building ID, and type of fixture is registered by each scan and documented on the chain of custody form. The ECs share lead testing results with DOE electronically. The testing laboratory sends the Water Quality unit an e-mail containing an Excel spreadsheet documenting the test results along with a PDF laboratory report. DOE has a quality control process to verify the accuracy of lab results before they are uploaded into DOE's Lead in Water database.

If the lab testing indicates that the lead level in drinking water for a fixture has exceeded the action level of 15 ppb, DOE is required to immediately tag the fixture and remove it from service. However, classroom and restroom cold water faucets can remain in use provided that the school posts a sign indicating that the fixture is not safe for drinking water and that it is for "hand washing only." The Water Quality unit coordinates with DSF's Director of Facilities unit's (Facilities) trade coordinators to address fixtures that fail initial lead testing. Facilities is comprised of seven regional teams throughout the five boroughs. Fixtures that fail initial lead testing are designated for remediation and fixtures that are out of order are designated for repair. Handheld devices are not used for post-remediation testing. Therefore chain of custody forms listing the fixtures to be retested are pre-printed prior to the hygienist's visit to the school.

Facilities documents the plumbing remediation and repair work on work orders in Passport Portal J, DOE's computerized maintenance management system used by Facilities' to assist in its daily operations. A work order contains a variety of information including the job description, fixture information, catalog ID, and asset tag.⁷ According to Facilities officials, the work orders are targeted for completion within 12 months.

Once a work order is prepared, it is electronically sent to a DOE contract manager through Passport Portal J. The contract manager sends the plumbing contractor assigned to the region an email with a work proceed order explaining the remediation work needed for the fixture. Remediation may include various steps including replacing the water aerator, installing in-line strainers, and valve cleaning. Sometimes the entire fixture may need to be replaced. Priority for remediation is given to kitchen sinks, water drinking fountains and bottle filling stations.

Once the remediation is completed by the plumbing contractor, DOE's contract manager will notify the Water Quality unit that the fixture can receive post-remediation testing. To receive payment, the plumbing contractor submits a Contractor's Application for Payment (CAP) to DOE, along with the workers' timesheets and a list of the materials used to perform the remediation. When the CAP is processed, the work order in Passport Portal J is updated as complete.

⁴ Handheld devices were not used during the primary testing year.

⁵ Per New York City Codes, Rules, and Regulations 67-4.3 (b) water should remain stagnant, or still, for a minimum of 8 hours and a maximum of 18 hours. For example, a leaky faucet will not be tested.

⁶ All testing laboratories must be certified under the Environmental Laboratory Approval Program per NYSDOH. The Environmental Laboratory Approval Program (ELAP) of the Wadsworth Center was established in 1984, under Section 502 of the Public Health Law and is responsible for the certification of laboratories performing environmental analyses on samples originating from New York State, thus ensuring the accuracy and reliability of these analyses.

⁷ Catalog IDs are used to identify each fixture by specifying the borough, building, floor number, closest room located to the fixture, type of fixture (e.g. CW for cold water, B for bubbler), and sequence number.

For post-remediation testing, ECs obtain two water samples: the first is a draw sample (whereby water is drawn from the fixture when the fixture is first turned on) and the second is a 30-second flush sample (obtained after the water is run for 30 seconds). The purpose of the 30-second flush sample is to help identify the source of any lead exceedances identified in the draw sample.

If the first sample is found to be below the action level of 15 ppb, the second sample will not be analyzed. However, if the first sample has an exceedance above 15 ppb, the fixture will be treated as an elevation and the second sample will be analyzed by the testing laboratory. If the 30-second flush tests above action level, the source of the lead generally originates from the pipes within the wall. If the 30-second flush sample tests below action level, the source of the lead is generally from the fixture or the components located outside the wall.

Once a fixture has tested below elevated lead levels, Facilities is notified to place the fixture back into service. However, if the fixture continues to test with elevated lead levels, additional plumbing remediation and post-remediation testing will occur. Fixtures with three consecutive elevated tests will be considered and evaluated for decommissioning (i.e. permanently removing the fixture from the wall).

Objective

To determine whether DOE has adequate controls over lead testing of school water and needed remediation efforts.

Scope and Methodology Statement

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The scope of this audit was Fiscal Year 2017 through Fiscal Year 2020.

Discussion of Audit Results with DOE

The matters covered in this report were discussed with DOE officials during and at the conclusion of this audit. A preliminary draft report was sent to DOE and discussed at an exit conference held on April 7, 2021. On May 13, 2021 we submitted a draft report to DOE with a request for comments. We received a written response from DOE on May 27, 2021. In its response, DOE agreed with 12 recommendations, partially agreed with three (#8, #10, and #12), and disagreed with four recommendations (#3, #4, #14, and #19).

In its response, DOE stated,

The DOE disagrees with the summary findings of this report and the majority of the recommendations are consistent with already existing and longstanding policies of the DOE. During the course of this audit, and after the auditors shared

their findings, the DOE has provided evidence showing why the auditors' findings of non-compliance were not factually supported. The publishing of this report, in its current state, creates an increased risk that the general public will mistakenly believe their health and safety and the health and safety of our children are at risk within school buildings.

DOE's response is unfortunately based on numerous inaccurate and misleading statements. Preliminarily, we note that although DOE states that the recommendations are consistent with existing DOE practices and policies, we did not find this to be the case during the audit scope period. In addition, DOE's assertion that it provided evidence showing that our findings of non-compliance were not supported is inaccurate. To the extent that DOE provided credible evidence to refute a preliminary audit finding, we made appropriate modifications to the report. In fact, DOE fails to mention that we made significant modifications from the preliminary draft report to the draft report based on documentation the agency submitted after the exit conference. Finally, we find no merit in DOE's claim that the publishing of this report "creates an increased risk" that the general public will mistakenly believe there is a health and safety risk within school buildings. The report clearly states that fixtures were generally tested with minimal exceptions; nonetheless, the report also correctly states that DOE needs to improve its tracking of fixture statuses and its controls over testing and remediation efforts to ensure that they are done timely. We urge DOE to seriously consider and act on those findings.

Throughout its response, DOE challenged specific audit findings based on additional inaccurate and unsupported statements and misrepresentations. For example, DOE inaccurately stated in its response that "[a]ll testing of fixtures met the requirements for stagnation periods under New York State rules and regulations as well as in subsequent guidance from the New York State Department of Health (NYSDOH)." However, as noted in the report, DOE conducted some lead testing on Sundays and Mondays and during the summer months, in conflict with NYSDOH guidelines directing that water samples should only be collected when school is in full session, to the extent possible, and should not be collected after weekends or holidays.

Regarding our finding that we did not find evidence that certain fixtures had received required testing, DOE stated, "All fixtures which required testing received their required testing." However, despite having ample opportunity to do so, DOE failed to provide evidence that the fixtures we cite as not being tested either were tested or not required to be tested. Consequently, in the absence of such evidence, we have no basis to alter our finding.

Pertaining to our finding that some fixtures did not receive timely post-remediation testing, DOE stated that water fixtures requiring post-remediation testing are not in service "and therefore do not result in an increased risk of exposure to building occupants." However, we make no such argument in the report. Rather, the report states that such fixtures remain unavailable for long periods of time.

Regarding our finding that some fixtures were tested after weekends and holidays, DOE stated, "There are no rules or regulations prohibiting testing from occurring on a Sunday or Monday. Guidance recommends that it should generally be avoided; however, if there is a need to test on these days, then the testing should occur on these days as it is critical that DOE test as quickly as possible." However, according to State regulations, sampled water shall be motionless in the pipes for a minimum of 8 hours, but not more than 18 hours, before collecting samples. Accordingly, NYSDOH guidelines state that sampled water should not be tested after weekends or holidays to ensure that water usage conditions are normal prior to testing. In effect, DOE's

stated practice risks accuracy in favor of speed. Failure to ensure that the proper stagnation requirements have been met increases the risk that water tests may yield higher elevated lead testing results, leading to unnecessary expenses for remediation work and follow-up tests that are not needed.

Regarding our finding that none of the schools received their primary testing by the October 31, 2016 deadline set by the State, DOE stated,

The New York State's Emergency Regulation Section 67 was promulgated on September 6th, 2016, and guidance was issued by NYSDOH on September 23rd, 2016, leaving 20 business days to complete testing of over 150,000 fixtures by the regulatory deadline of October 31, 2016. After ample communication among the NYSDOH, the NYC Department of Health and Mental Hygiene, the School Construction Authority (SCA) and the DOE it was decided that all applicable fixtures would be subsequently retested. The SCA performed these rounds of testing, commencing in November 2016. This testing of over 1500 schools was completed by April 2017. Given the vast scope of the DOE's portfolio, constrictions on possible testing timeframes imposed by the required eight-hour stagnation period, and limitations of testing capacity, five months was a reasonable timeframe for meeting the testing requirements in over 1500 buildings. The DOE created the Water Quality Unit and its database after these rounds of testing.

However, in support of this assertion, DOE failed to provide evidence that it received an extension from NYSDOH for meeting the testing mandate. In the absence of such evidence, we have no basis to alter our finding. Additionally, we note that DOE's statement that fixtures were "retested" appears to be an attempt to imply that DOE had already tested its fixtures in accordance with the State's regulation. However, as stated in the report, this testing was unrelated to that regulation and was conducted prior to its promulgation.

With regard to fixtures we cite as having elevated lead levels, DOE questioned certain aspects of that finding. Regarding the percentage of fixtures we cite in the report, DOE stated,

The percentage of fixtures found to have elevated lead levels at the time of testing has been inflated by a percentage point, *i.e.*, on page 2, in the second point; and on page 7, in the second paragraph.

However, DOE's argument that the report inflates the percentage of fixtures found to have elevated lead levels is incorrect. The difference between DOE's figure and ours is a result of our having appropriately excluding from the calculations fixtures that were out of scope, not yet tested and fixtures DOE confirmed should not be tested.

DOE further stated,

Handheld devices are currently being used to eliminate user error and electronically sign the chain of custody forms for all testing, including post-remediation testing.

The DOE tracks all testing dates in the Lead in Water database, including at the conclusion of the remediation process.

While DOE is currently using handhelds for testing, this was not the case for our scope period. DOE did not use handhelds for initial testing during the primary testing year and only started using handhelds for post-remediation testing in March 2021. Additionally, DOE misstates the report finding and wrongly claims we found that DOE does not track *testing* dates. Rather, the report states that DOE does not track the date *the remediation work was completed*. As stated in the report, DOE was unable to provide evidence that it records the fixture remediation or repair completion dates in either Passport Portal J or in the Lead in Water Database. In the absence of evidence to the contrary, we have no basis to alter our finding.

Finally, regarding our finding that DOE has no evidence that it tracks the timeliness of fixture remediations and repairs, DOE stated,

The DOE schedules all testing. Environmental contractors do not have access to school buildings unless the DOE provides them access. Contract terms allows for the DOE to schedule post remediation testing on a specific date. The DOE does so via advance scheduling with the environmental contractor. Because of this, testing is not “late” or “untimely.” A fixture which is placed out of service because of an exceedance remains out of service until post-remediation testing clears the fixture for use.

The DOE effectively tracks the repairs of plumbing fixtures in a different database than that which it tracks testing. This distinction provides a source for members of the field offices within the Division of School Facilities to identify repaired plumbing fixtures and/or fixtures that need repair, furthering optimal efficiency across all forms of maintenance and repair. This process also ensures that senior management has metrics by which they can effectively manage DOE staff and resources.

However, DOE’s assertions do not undercut the audit findings. The fact that DOE schedules lead testing does not preclude it from ensuring that it is done timely. As stated in the report, we found that 65 percent of the fixtures requiring post-remediation testing were tested after DOE’s required 14-day time frame, with some fixtures tested more than 60 days after the 14-day limit. Notably, DOE itself established this time frame and, as we cited earlier, states in its response, “it is critical that DOE test as quickly as possible.” In addition, despite having ample opportunity to do so, DOE provided no evidence that it established a mechanism to track the timeliness of fixture remediations and repairs.

After carefully reviewing DOE’s arguments, we find no basis to alter any of the report’s findings or conclusions. The full text of DOE’s response is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

The audit found that while DOE's records reflect that it generally met applicable water testing standards, the several exceptions found in this audit indicate that it nonetheless needs to improve its controls over lead testing of school water and remediation efforts.

Preliminarily, although the audit found that all schools that required testing were tested, *none* of them received their primary testing by the October 31, 2016 deadline. Rather, all schools were tested *after* the primary testing year deadline. In addition, according to DOE's Lead in Water database, the test results for the primary testing year and the subsequent Cohorts indicated that 84 percent of schools (1,323 out of 1,574) had at least one fixture test with elevated lead levels since 2016, with 10,814 fixtures identified during the primary testing year. In total, in excess of 1 out of every 10 fixtures tested (11 percent) had elevated lead levels at the time they were tested. Further, we found that three Brooklyn zip code (East New York, Bushwick, and Brownsville) had 95 percent or more of their schools with at least one fixture with an elevated lead level when tested. Delayed testing placed school students and personnel drinking water from these fixtures at risk for a longer period of time than would have been the case if the testing had been done within the initially mandated time frames.

In addition, DOE does not ensure that ECs meet certain timeliness deadlines. The audit found DOE modified target time frames because its contracts with the ECs were implemented prior to the 2016 mandate for lead testing which increased the volume of testing needed. With regard to submitting water test results, however, DOE did not adopt a time frame that reflects the entire process, from the collection of water samples to the submission of test results to DOE. Rather, it omits the period starting with the collection of the samples to their submission to the lab for testing, a period where we observed delays. Further, DOE did not assemble the data necessary to assess whether the ECs conducted the process in a timely manner.

With regard to post-remediation testing, our analysis found that only 65 percent of the 5,701 fixtures requiring post-remediation testing for the 2018 and 2019 Cohorts were tested timely. The audit also found that DOE has no evidence that it tracked the timeliness of fixture remediation and repair, which increases the risk that remediation and repairs will not be completed in a timely manner. Rather, we found fixtures pending repairs at Brooklyn schools for over three years, including 27 at one school located in Bushwick and 23 at another located in City Line.

At the same time, we found that: (1) water samples were generally collected in accordance with State guidelines; (2) fixtures were generally tested; and (3) required stagnation periods for testing were generally met. However, even with DOE's efforts, we found some exceptions. Specifically, we identified:

- 5,188 (2 percent) out of 270,822 water samples (from 583 schools) were not collected on days when schools were in full session, which could result in higher lead results;
- 325 (<1 percent) out of 152,914 fixtures did not receive required tests, involving 41 in scope fixtures (from 25 schools) that did not receive a lead test from the primary testing year or their associated 2018 or 2019 Cohort and 284 in scope fixtures that received

only one of the two required lead tests.⁸ While the number of exceptions are small, each one reflects an increased risk to the health of students and staff in the City's schools and

- 15 (1 percent) of the 1,574 schools that were (open as of September 2019) did not meet the required stagnation period when they received their initial water testing.

In addition, we found that data in the Lead in Water database generally reconciled with the information contained in the lab reports, although we identified instances of missing or unsubstantiated information. While we tested to ensure that all fixtures that received tests had a ppb result listed, we did not validate the actual test results.

The details of our findings are discussed in the following sections of this report.

DOE Did Not Test Schools by the October 2016 Deadline Set by New York State's Emergency Regulation Section 67

According to the NYCRR Section 67-4.3, all City schools were required to be tested for lead in their water by October 31, 2016, identified by DOE as the primary testing year. However, as of the October 31, 2016 deadline, none of the 1,518 DOE schools open that year had received such tests. All schools have been tested but *after* the primary testing year deadline; with initial testing commencing on November 29, 2016 through April 26, 2017, nearly six months after the State imposed deadline.

DOE claims that NYSDOH agreed to a testing extension in compliance with Section 67-4.3. However, no evidence was provided that directly supported this claim. Initially, DOE provided our office with a NYSDOH press release dated January 27, 2017 stating that DOE was in the process of testing their schools. This release does not, however, contain any indication that a testing extension was granted. When we further requested evidence that an extension was granted, DOE provided our office with an email from NYSDOH. This email acknowledged numerous communications that took place between DOE and NYSDOH after the promulgation of the NYCRR in September 2016. Ultimately, NYSDOH made the determination that the unrelated testing performed by DOE between March and June 2016 (prior to the NYCRR effective September 2016 date) was not conducted in compliance with the NYCRR. Those communications did not include any discussions of or approval from NYSDOH for an extension after October 31, 2016.

Delays in lead water testing prolonged the risk to students and school personnel of their drinking water with elevated levels of lead.

84 Percent of Schools Had at Least One Fixture with Elevated Lead Levels

Based on Report #20 Water Safety Test Results, generated from the Lead in Water database, 1,323 (84 percent) of the 1,574 schools in the DOE system had at least one fixture test with elevated lead levels between November 2016 and September 2019 (i.e., the primary testing year

⁸ As part of the 2020 cohort, one-third of the schools were not scheduled to begin testing until January 2020, and therefore not included in this test.

and subsequent Cohorts). In total, from 148,120 unique fixtures tested, 15,860 (11 percent) had elevated lead levels at the time⁹ they were tested, with 10,814 of those fixtures being identified in the primary testing year. Please see Table I for a breakdown of the 1,323 schools and Table II for a breakdown of the 15,860 fixtures with elevated lead levels.

Table I

Number of Schools with Elevated
Lead Levels in Fixtures
November 2016 - September 2019

| Borough | Total Schools in Borough | Citywide % | Schools with Elevated Lead Levels in Fixtures | Citywide % | Schools with ≥20% Fixtures with Elevated Lead Levels | Citywide % |
|----------------|---------------------------------|-------------------|--|-------------------|---|-------------------|
| Brooklyn | 477 | 30% | 418 | 32% | 57 | 32.02% |
| Queens | 418 | 27% | 341 | 26% | 59 | 33.15% |
| Bronx | 338 | 21% | 271 | 20% | 34 | 19.10% |
| Manhattan | 238 | 15% | 208 | 16% | 15 | 8.43% |
| Staten Island | 103 | 7% | 85 | 6% | 13 | 7.3% |
| Totals | 1,574 | 100% | 1,323 | 100% | 178 | 100% |

Table II

In Scope Fixtures with Elevated
Lead Levels
November 2016 - September 2019

| Borough | Total In-Scope Fixtures in Borough | Citywide % | Number of Fixtures with Elevated Lead Levels | Citywide % |
|----------------|---|-------------------|---|-------------------|
| Brooklyn | 45,989 | 32% | 5,457 | 34% |
| Queens | 39,075 | 26% | 4,263 | 27% |
| Bronx | 28,524 | 19% | 2,852 | 18% |
| Manhattan | 25,520 | 17% | 2,321 | 15% |
| Staten Island | 9,012 | 6% | 967 | 6% |
| Totals | 148,120 | 100% | 15,860 | 100% |

⁹ From DOE's fixture inventory, we removed fixtures with a "Y" in the Final Out of Scope category and fixtures, such as ice makers and sprayers that DOE confirmed should not be tested, but that were listed as in scope. Finally, we removed all fixtures that were not yet tested and contained "Nulls" in the Result PPB and Sample Date columns.

In addition, the five zip codes with the highest percentage of schools with elevated lead levels were in the Bronx and Brooklyn. These zip codes are listed in Table III, along with the number of schools in each zip code with 20 percent or more fixtures with elevated levels.

Table III
Top Five Zip Codes with Fixtures
with Elevated Lead Levels

| Borough | Zip Code | Neighborhood* | Number of Schools Located Within Zip Code | Number of Schools within Zip Code with Fixtures with elevated Lead Levels | Percentage | Schools with ≥20% Fixtures with Elevated Levels | Percentage |
|----------|----------|---------------|---|---|------------|---|------------|
| Bronx | 10457 | Bathgate | 32 | 27 | 84% | 2 | 6% |
| Bronx | 10456 | Melrose | 29 | 24 | 83% | 6 | 21% |
| Brooklyn | 11207 | East New York | 23 | 22 | 96% | 2 | 9% |
| Brooklyn | 11221 | Bushwick | 22 | 22 | 100% | 1 | 5% |
| Brooklyn | 11212 | Brownsville | 21 | 20 | 95% | 2 | 10% |

*Source: www.Unitedstateszipcodes.org

When DOE does not ensure that testing and remediation work is performed timely, it could impact schools that have a significant percentage of fixtures with elevated levels. Where there are fixtures with elevated lead levels and testing is not conducted timely, students and school personnel will continue to be exposed to high levels of lead in their water for longer than should have been the case.

Recommendation

- DOE should ensure timely compliance with State rules and regulations pertaining to lead testing in water.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.”

Auditor Comment: While we are encouraged that DOE agrees it should comply with State rules and regulations for lead testing, this was not reflected by DOE’s practices during our scope period. None of the DOE schools received testing as of the October 31, 2016 deadline and DOE was unable to provide evidence that it received a testing extension from NYSDOH.

DOE Did Not Ensure That ECs Met Certain Timeliness Benchmarks

No Evidence That DOE Monitors the Timeliness of Water Sample Test Result Submissions

According to the contracts between DOE and the ECs, a Type A Proceed Order is utilized to initiate routine drinking water sampling and analysis. The contracts initially stated that the ECs

shall submit written laboratory reports with the test results which must be received by DOE within 7 days from the date of inspections. An August 2014 amendment to the contracts increased that time frame to 10 days.

Based on this target, our initial analysis of the time frames between the water sample collections and the submissions of water test results to DOE for 69 randomly selected water samples revealed that for 58 sampled testing dates (84 percent) the submission of results occurred after the 10 days required by the contract amendment, with an average time of 21 days from collection to submission of test results, ranging up to 70 days.

At the exit conference, DOE officials stated that its contracts with the ECs were entered into prior to the mandate for lead testing and that at DOE's discretion it modified the contract requirements, due to the increased volume of testing. DOE officials stated that the time requirement for the submission of laboratory reports was superseded by its *Lead in Water Testing Protocol*, which states, "ECs shall request a 7-10 day turnaround time for analysis." However, it appears that the modification applied only to the 2019 Cohort based on the date, January 11, 2019, when DOE first sent to the ECs a copy of its *Lead in Water Testing Protocol* that contained this new time frame.

Additionally, this modification does not account for the entire process. The process relating to the 10-day time frame specified in the contract amendments encompasses three stages: (1) collecting the water samples; (2) submitting the samples to the lab for testing; and (3) submitting the lab test results to DOE. The time frame contained in the protocol accounts only for the submission of lab results to DOE—it does not account for the period between collecting the samples and submitting them to the lab.

Further, DOE did not even record the date that samples were sent to the lab and only started recording the date that it received the results in the Lead Water database in March 2020, so neither we nor DOE are able to determine the degree to which ECs were in compliance with the modified time targets set by DOE for the portion of the process regarding the submission of test result to the agency. Additionally, we have no basis upon which to determine whether the ECs are submitting samples to labs for analysis and forwarding the results to DOE in a timely manner.

Evidence Indicates That Only 65 Percent of Post-Remediation Testing Was Timely

After steps have been taken to address the potential cause of a high lead test, the ECs must test the relevant fixture to ensure that remediation efforts were successful. Pursuant to the contract with the ECs, such post-remediation testing is initiated through a Type A Proceed Order and must commence no later than three working days from receipt of a verbal notification, except where a specific start date is given.¹⁰ The ECs are required to commence and complete water sampling collection on the same day. Using the 2018 and 2019 Team Remediation Reports, our initial analysis of the dates on which post-remediation testing occurred found that—based on the contractual time frames—the overwhelming majority of the 5,701 fixtures requiring post-remediation tests were not tested within the 3-day time frame, with 3,292 (58 percent) being tested more than 5 days late.

¹⁰ The DOE contracts define three types of Proceed Orders: Type A—used for routine installation and replacement projects; Type B—used when it's necessary for the contractor to provide an analysis of the problem and a proposal for the solution with an estimate of cost for the work; and Type C—used when DOE accepts the detailed proposal of the contractor in response to a Type B proceed order.

However, as stated earlier, the contracts with the ECs were entered into prior to the State mandate for lead testing and the need for an increased volume of testing. During the course of the audit, DOE officials stated that the ECs have 14 calendar days to perform post-remediation testing on fixtures with elevated lead levels once the request to do so is made by DOE. We subsequently requested evidence of when DOE notified the ECs of this modification to the time frame provided for in the contract. DOE responded that it shared its Lead in Water Testing Protocol with the ECs. However, the protocol does not mention the 14-day time frame.

Based on the modified 14-day time frame, our analysis of the post-remediation testing found that of the 5,701 fixtures requiring post-remediation tests, 3,688 (65 percent) were tested timely. Table IV shows the fixture post-remediation testing delays breakdown by cohort.

Table IV
Timeliness in Conducting Post-Remediation Testing

| Cohort | | 2018 | | 2019 | | Total | % of all fixtures |
|-----------------------|------------------------|-----------------|-----------------|-----------------|-----------------|-------|-------------------|
| Post-remediation Test | | 1 st | 2 nd | 1 st | 2 nd | | |
| Number of fixtures | | 2,040 | 205 | 3,097 | 359* | 5,701 | 100% |
| Tested Timely | | 1,039 | 168 | 2,262 | 219 | 3,688 | 64.7% |
| Not Tested Timely | 1 – 5 days late | 274 | 8 | 401 | 19 | 702 | 12.3% |
| | 6 – 30 days late | 395 | 12 | 193 | 14 | 614 | 10.8% |
| | 31 – 60 days late | 155 | 2 | 28 | 0 | 185 | 3.2% |
| | >60 days late | 54 | 6 | 56 | 2 | 118 | 2.1% |
| | Not tested as of 10/20 | 0 | 0 | 0 | 10 | 10 | .2% |
| | Total Late | 878 | 28 | 678 | 45 | 1,629 | 28.6% |
| Unable to Determine | | 123 | 9 | 157 | 95 | 384 | 6.7% |

*The actual number of fixtures requiring post-remediation was 369. However, we removed from this figure 10 fixtures that were later decommissioned.

Of the remaining 2,013 fixtures, 1,629 were tested late, and of those, 927 were tested more than 5 days late. We could not determine the timeliness of the testing for 384 fixtures (6.7 percent) because the test date field was either left blank or contained a date that was *prior to* the test request date. Finally, we found that DOE did not perform tests on the 10 remaining fixtures as of October 2020.

As stated above, DOE provided no evidence that it formally notified ECs of the changed time frames. Absent such evidence, we have limited assurance that DOE formally notified ECs of this change. Further, we question the degree to which DOE was actually monitoring the ECs' timeliness in conducting this testing at all.

When water samples are not collected, delivered, analyzed and reported to DOE in a timely manner, any fixtures with elevated lead levels will remain in service longer than they should. This increases the risk to students and school personnel of exposure to high levels of lead. In addition,

when time frames for testing and reporting are not met, there is an increased risk that DOE will not receive critical information in a timely manner which would hinder DOE's ability to take necessary actions promptly. Finally, when ECs are not timely in conducting post-remediation testing, fixtures remain out of service and unavailable to students and school personnel for unnecessarily long periods of time.

No Evidence That DOE Tracked Timeliness of Fixture Remediation and Repair

According to Comptroller's Directive #1, *Principles of Internal Control*, "Management, throughout the organization, should be comparing actual functional or activity level performance data to planned or expected results, analyzing significant variances and introducing corrective action as appropriate." Accordingly, DOE should be tracking the timeliness of when conditions in fixtures are remediated and when repairs of out of order fixtures are made.¹¹

In addition, the requirements contracts between DOE and some plumbing contractors call for the remediation and repair of fixtures initiated through a Type A Proceed Order to be completed within 30 working days, unless otherwise set forth in the proceed order. However, there is no contractually defined completion time frame for Type C Proceed Orders, which are used when DOE accepts the detailed proposal of the contractor in response to a Type B proceed order (used for the contractor to provide a proposal for work and a cost estimate). Although, in some cases, a completion time frame may be specified in the Proceed Order itself, that is not always the case and so there is no consistently imposed standard for the time within which the work must be completed.

We found that DOE has no evidence that it tracked the timeliness of any of the fixture remediation and repair work. During the course of the audit, we requested but received no evidence that DOE had a mechanism to track the timeliness of remediations and repairs. After we issued the preliminary draft report to DOE, however, the agency provided us with a document that outlined a process for tracking the timeliness of fixture remediation and repair. According to DOE, it was created to memorialize the tracking process. However, there is no finalization date or other evidence of when it was prepared. Further, DOE provided no actual evidence that the process described in it, or any process, was used to track the timeliness of remediation and repairs.

Additionally, DOE was unable to provide evidence that it records the fixture remediation or repair completion dates either in the Passport Portal J Database (where the fixture remediation work order is created by DSF personnel) or in the Lead in Water Database (which is utilized by the Water Quality unit to track fixtures with elevated lead levels requiring remediation.) In addition, DOE does not identify the type of Proceed Order (A or C) in the Passport Portal J database, so it cannot readily identify those repairs that are subject to the 30 working day completion target applicable to Type A Proceed Orders, and those that do not have target completion dates, as is the case for Type C Proceed Orders. Further, DOE was unable to provide evidence that it aggregately tracked the timeliness of fixture remediation or repair.

Our review of DOE's 2018 and 2019 Team Remediation Report for all DOE schools found that a total of 5,711 fixtures required plumbing remediation. However, the report does not include: the

¹¹ Due to stagnation guidelines, out of order fixtures are not tested for lead. Fixtures will be repaired and tested at a later time.

fixture remediation completion date, the date the Proceed Order was issued, or the type of Proceed Order that was issued. Failure to track that information in the Team Remediation Report hinders DOE's ability to track the timeliness of fixture remediation.

In addition to finding no evidence that DOE monitored the timeliness of fixture remediation work, we also learned that DOE officials did not even know the contractual time frames for plumbing contractors to remediate fixtures. DOE officials repeatedly stated that Facilities has an internal 12-month goal for the remediation of fixtures and were seemingly unaware of the 30 days maximum allotted time allowed by the contract for plumbing contractors to complete Type A proceed orders.

Since the time frame for actual remediation is not tracked by DOE, we calculated the number of work days between the failed test date and the date the request for retesting was made after the remediation was completed. Table V below provides a breakdown of the 5,711 fixtures requiring plumbing remediation.

Table V**Time Frames for Fixtures Requiring Remediation between Failed Test and Request for Testing after Remediation**

| Cohort | 2018 | | 2019 | | Total | % of all fixtures |
|--|--------------|------------|--------------|------------|--------------|-------------------|
| | 1st | 2nd | 1st | 2nd | | |
| Post-remediation Work | | | | | | |
| Number of fixtures | 2,040 | 205 | 3,097 | 369 | 5,711 | 100% |
| Time frame between failed test and request for retesting after remediation (post-remediation test): | | | | | | |
| Within 30 days | 51 | 160 | 90 | 236 | 537 | 9.4% |
| 31 to 90 days | 760 | 26 | 1,034 | 14 | 1,834 | 32.11% |
| 91 – 140 days | 925 | 0 | 1,321 | 3 | 2,249 | 39.38% |
| 141 – 190 days | 176 | 0 | 481 | 0 | 657 | 11.5% |
| 191 – 240 days | 1 | 0 | 26 | 0 | 27 | .47% |
| 241 – 290 days | 7 | 0 | 0 | 0 | 7 | .12% |
| >290 days | 0 | 0 | 1 | 0 | 1 | .02% |
| Not tested as of 10/20 | 0 | 0 | 0 | 10 | 10 | .18% |
| Total # of fixtures where time frame between failed test and request for post-remediation test exceeded 30 days | 1,869 | 26 | 2,863 | 17 | 4,775 | 83.6% |
| Unable to determine time frame | 120 | 19 | 144 | 116 | 399 | 7% |
| Average # of days between failed test and request for retesting after remediation | 96 | 19 | 103 | 13 | | |

As shown in Table V, the time frame between the failed test and the request for retesting after remediation for over 80 percent of the fixtures needing remediation exceeded 30 days. However, neither we nor DOE can identify how many, if any, of these fixtures were actually remediated by contractors within 30 days, but where DOE was delayed in: (1) submitting the work order to the contractor after the failed test; and/or (2) requesting the post-remediation test after the contractor remediated the fixture.

Fixtures Remain Out of Order for Extended Periods

With regard to the out of service fixtures, DOE's Water Safety Test Results report indicated that a total of 167 fixtures have remained out of service for extended periods of time. Notably, 103 have not received a lead test since the primary testing year concluded in June 2017, more than three years ago. Of the 167 fixtures, 135 (81 percent) were under the supervision of DSF's Team 4 which covers Brooklyn North. In fact, one Brooklyn school located in Bushwick had 27 out of

service fixtures (21 cold water fixtures and 6 bubblers) while another school in City Line had 23 out of service fixtures (16 cold water faucets, 5 bubblers and 2 bottle fillers). DOE indicated that the majority of the 167 fixtures were re-categorized as “out of scope, decommissioned, does not exist” or are “still out of order.” However, DOE provided evidence for only 13 of these fixtures. For the remaining 154 fixtures, we were provided no evidence to indicate that these fixtures were out of scope, decommissioned, or do not exist. Further, Water Quality did not update these fixture statuses in the Lead and Water Database as required. (This issue is discussed in more detail later in this report.) In addition, we note that a significant number of fixtures are unavailable at some schools which is not only inconvenient for the students and staff, but could potentially raise health concerns, particularly if there is a lack of handwashing sinks available during the COVID-19 pandemic.

When plumbing remediation and repair completion dates are not tracked, DOE is hindered in assessing plumbing contractors’ performance and determining whether plumbing work is completed timely. When plumbing remediation and repairs are not completed in a timely manner, fixtures remain out of service and may be unavailable to school students and personnel for long periods of time. While the total number of fixtures that are out of service for prolonged periods of time is not great, the impact on the students and staff who rely on them for drinking water may be meaningful. DOE should examine and address the causes in delays in repairing out of order fixtures and note if there are particular causes of these delays where they disproportionately affect particular geographic area.

Recommendations

2. DOE should track and monitor testing time frames, to ensure ECs are conducting the tests and submitting the results timely, and incorporate time frames for the entire process into its written internal policies and procedures.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.”

Auditor Comment: While we are encouraged that DOE agrees it should track and monitor testing time frames, this was not reflected by DOE’s practices during our scope period. As stated in the report, we found no evidence that DOE monitored the timeliness of water test result submissions and post-remediation tests were not done timely. In the absence of evidence to the contrary, we reaffirm our finding and urge DOE to implement this recommendation.

3. DOE should enforce the 3-working-day post-remediation time frame with its ECs and incorporate these time frames into its written internal policies and procedures.

DOE Response: “The DOE disagrees with this recommendation. The language from the contract between the DOE and environmental contractors states that, ‘The Contractor shall commence the work required by a Type A Proceed Order no later than (3) working days of receipt of a verbal notification except where a specific date is given.’ The Department of School Facilities issues a Type A Proceed Order to the environmental contractor that contains a specific date that the environmental contractor is to conduct post remediation testing in a particular school. Scheduling is done in advance by the Water Quality Unit in conjunction

with the school administration and environmental contractor. Environmental contractors cannot enter school buildings without this advance scheduling. As such, all post remediation testing is conducted in compliance with the contractual time frame.”

Auditor Comment: DOE was unable to provide evidence of the specific start dates given to the contractors for post-remediation testing or any evidence that it is tracking the timeliness of post-remediation testing. Notably, the 14-calendar-day time frame to perform post-remediation testing was established by DOE itself, so it is incumbent upon the agency to ensure that its own policy is followed. Moreover, regardless of what DOE determines the time frame for post-remediation testing should be, it should incorporate that time frame into its written policies and procedures and establish a mechanism to monitor and track the timeliness of post-remediation testing.

4. DOE should track and follow-up with the ECs in instances where they do not perform post-remediation tests timely.

DOE Response: “The DOE disagrees with this recommendation. The language from the contract between the DOE and environmental contractors states that, ‘The Contractor shall commence the work required by a Type A Proceed Order no later than (3) working days of receipt of a verbal notification except where a specific date is given.’ The Department of School Facilities issues a Type A Proceed Order to the environmental contractor that contains a specific date that the environmental contractor is to conduct post remediation testing in a particular school. Scheduling is done in advance by the Water Quality Unit in conjunction with the school administration and environmental contractor. Environmental contractors cannot enter school buildings without this advance scheduling. As such, all post remediation testing is conducted in compliance with the contractual time frame and is timely.”

Auditor Comment: DOE was unable to provide evidence of the specific start dates given to the contractors for post-remediation testing or any evidence that it is tracking the timeliness of post-remediation testing. Without such evidence, we do not know of any basis upon which DOE could claim that post-remediation testing is conducted timely. We therefore urge DOE to implement this recommendation.

5. DOE should track and monitor the timeliness of fixture remediation and repair of out of order fixtures and follow-up with Facilities and the plumbing contractors in instances where remediation or repair is not done timely.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.”

Auditor Comment: While we are encouraged that DOE agrees that it should track and monitor the timeliness of fixture remediation and the repair of out of order fixtures, this was not reflected by DOE’s practices during our scope period. DOE was unable to provide evidence that it records the fixture remediation or

repair completion dates, without which DOE would be unable to track timeliness. In the absence of evidence to the contrary, we reaffirm our finding and urge DOE to implement this recommendation.

6. DOE should assess the operating status of the out of order fixtures and create plumbing work orders to ensure that out of order fixtures are repaired, and tested for lead so that the fixtures can be placed back into service.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.”

Auditor Comment: While we are encouraged that DOE agrees that it should assess the status of out of order fixtures, this was not reflected by DOE’s practices during our scope period. As stated in the report, we identified fixtures that have remained out of service since the primary testing year that ended in June 2017.

7. DOE should review the delays in repairs of out of order fixtures and address the cause of the delays.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.”

Auditor Comment: While we are encouraged that DOE agrees that it should review the delays in repairs of out of order fixtures, this was not reflected by DOE’s practices during our scope period. As stated in the report, we identified a number of fixtures that have remained out of service since June 2017 and DOE has provided no evidence that it has identified the reasons why nor taken appropriate action to facilitate repairs.

8. DOE should modify its Passport Portal J and the Lead in Water Database to ensure that it captures the plumbing remediation or repair completion date.

DOE Response: “The DOE partially agrees with this recommendation. The DOE agrees that Passport Portal J should capture the plumbing remediation or repair completion date. However, the DOE disagrees that it needs to modify the Lead in Water Database as it already contains the date the remediation of a fixture was completed. Remediation is noted as complete in the Lead in Water Database as the date the fixture has been tested and approved for consumption or the date the fixture was decommissioned.”

Auditor Comment: While the Lead in Water Database contains the date that remediated fixtures have been tested, it does not contain the date that the contractor actually completed the post-remediation work or repair. Without this information, DOE is hindered in tracking whether remediation and repair work is conducted timely. As such, we reaffirm our finding and urge DOE to implement this recommendation.

DOE Does Not Perform Adequate Reviews of Data Entered in the Lead in Water Database

According to DOE officials, the Water Quality unit is responsible for verifying the accuracy of lead testing data after they are uploaded into Lead in Water Database, as well as updating fixture statuses and entering requests for testing dates into Lead in Water Database.

However, the Water Quality unit does not perform adequate reviews of the downloaded data after importing it into the Lead in Water Database and did not review data entered for completeness or accuracy. While we found that data in the Lead in Water database generally reconciled with the information contained in the lab reports, we nonetheless found instances in which information in the database was missing or unsubstantiated. Based on our review of Report #20 Water Safety Test Results, which is a comprehensive report of all fixtures tested from Fiscal Year 2017 through Fiscal Year 2020, we found that 213 (4 percent) sample testing dates (from 171 unique schools) had an incorrect “From Lab Results” date of July 20, 2017 from 5,263 sample testing dates. According to DOE officials, a bulk import of lead testing data was added to the Lead in Water Database on July 20, 2017 and the “From Lab Results” were incorrectly recorded as July 20, 2017.¹² In addition, 1,569 sample testing dates contained a “null” in the “From Lab Results” rather than a date. DOE officials stated that these labs were imported in one batch from one combined spreadsheet instead of individual lab results before the database was brought online. As a result of the inaccurate dates, DOE does not have reliable information that would enable it to effectively track ECs’ timeliness in submitting water testing results to DOE. Subsequent to the issuance of the preliminary draft report, DOE provided a document detailing steps it established for reviewing testing laboratory results. However, DOE indicated that this document was created in October 2019 shortly after the audit commenced in May 2019. DOE had not previously shared this document, and based on the issues we identified, there is limited assurance that the process outlined in the document was consistently followed.

In addition, we found that data was missing or inaccurate, including: 783 (7 percent) of 11,412 fixtures that were either missing request for testing dates or contained inaccurate dates based on the 2018 and 2019 Team Remediation Report; and 98 (2 percent) of 5,950 fixtures that were incorrectly categorized in the database as active fixtures in the 2018 and 2019 Team Remediation Report when they had in fact been decommissioned.¹³ Without a request for testing dates, DOE has limited assurance that ECs are being informed that fixtures are ready for testing in a timely manner, or that the ECs tested the fixtures in a timely manner. In addition, when fixtures are incorrectly categorized, the risk that DOE will not have an accurate number of the fixtures available and in use is increased.

Recommendations

9. DOE should ensure that its recently developed written policy for data verification is adhered to for all testing results entered in the Lead in Water database.

¹² According to DOE officials, bulk importing of water testing results into the Lead in Water Database commenced in June 2017 and was completed on July 20, 2017.

¹³ Example of inaccurate dates included “1900” entered as a year when request for testing was data entered into the Lead in Water Database.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies. The DOE developed the data verification practices concurrently with the creation of its Lead in Water database in 2017. Although the practices created in 2017 were not memorialized in writing until 2019, the practices followed in 2017 were the same as those in 2019.”

Auditor Comment: While we are encouraged that DOE agrees that its policy for data verification should be adhered to, this was not reflected by DOE’s practices during our scope period. As stated in the report, we found that DOE did not perform adequate reviews of the data entered into the Lead in Water Database, leading to missing and inaccurate dates and incorrectly categorized fixtures. Consequently, we urge DOE to implement this recommendation.

10. DOE should modify their Lead in Water Database to ensure that required fields are not left blank and that inappropriate past or future dates are not accepted.

DOE Response: “The DOE partially agrees with this recommendation, which is consistent with programming changes already made to the Lead in Water database. The programming team for the Lead in Water Database wrote code into the database to prevent required fields from being left blank and to prevent input of inaccurate dates.”

Auditor Comment: Based on DOE’s response, it is unclear what part of the recommendation DOE is disagreeing with. In addition, DOE does not indicate in its response when the programming team wrote such code into the database. However, based on our findings that the database contained inaccurate dates and had missing dates, it is evident that this code was not written into the database during the period covered by our scope.

Incomplete Chain of Custody Forms

According to DOE officials, a chain of custody form is a legal document which tracks the movement and possession of the water samples. According to DOE’s contract with the ECs, the chain of custody form should include the signature of the ECs that relinquish the water sample to the testing laboratory. In addition, DOE officials indicated that the EC’s testing laboratory personnel should document the ppb results for each sample tested on the chain of custody form.

However, we found that the ECs did not sign the chain of custody forms for 14 (20 percent) of the 69 sampled schools (20 percent) and laboratory personnel did not record the ppb lab results on the chain of custody forms for 17 schools (25 percent).

This occurred in part because DOE has not assigned anyone the responsibility for reviewing the chain of custody forms that accompany the analytical laboratory reports to ensure that the forms are complete. In addition, DOE’s contract with the vendor does not clearly identify the laboratory personnel’s specific responsibilities pertaining to documenting the ppb results on the forms. Without a complete chain of custody form, DOE may be unable to track and record the changes in obtaining the water sample, custody, control, transfer, and analysis of the water sample, potentially compromising the integrity of the test results.

Recommendation

11. DOE should ensure chain of custody forms are adequately reviewed for completeness, signed, and that all ppb results are recorded.

DOE Response: “The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies. Since the inception of water testing, the DOE required chain of custody forms which were reviewed by DOE vendors and the laboratories analyzing water samples. Since inception, a laboratory analyzing collected water samples submits a certificate of analysis with ppb results to the DOE upon completion of analysis. In 2021, DOE updated its policy on chain of custody so that all chain of custody forms are generated and signed electronically on the handheld scanner in order to eliminate user error.”

Auditor Comment: While we are encouraged that DOE agrees that chain of custody forms should be adequately reviewed, this was not reflected by DOE’s practices during our scope period. Nonetheless, we are hopeful that, going forward, DOE’s newly updated policy on chain of custody forms will eliminate the issues identified in this audit.

Water Samples Used for Lead Testing Generally Collected in Accordance with State Guidelines

According to NYSDOH guidelines, *Lead Testing School Drinking Water*, water samples should only be collected when school is in full session, to the extent possible, since summer sampling requires additional actions including flushing to simulate normal water use patterns during normal school operations.¹⁴ However, as previously stated, there should be a minimum of eight hours water stagnation.

While DOE generally conducted lead testing in accordance with state guidelines, we did find some exceptions. From Report #20 NYC DOE Water Safety Test Results –With All Results (Report #20 Water Safety Test Results), which is a comprehensive report showing all historical data in chronological order for all fixtures from Fiscal Year 2017 through Fiscal Year 2020, from 270,822 tested in scope fixture samples, we identified 5,188 test samples (2 percent) from 4,221 unique fixtures that were collected on days when the schools were not in full session in July and August of 2017, 2018, and 2019. Although the percentage of fixtures tested when schools were not in full session was small, these tests were conducted at 583 (37 percent) of the 1,574 schools.

DOE officials claim that DOE is in compliance with the guidelines since the testing at these schools was post-remediation testing or testing of new or repaired fixtures. However, the criteria mentioned above does not differentiate between initial and post-remediation testing and DOE provided no other guidelines where this exception is noted. In addition, according to Facilities personnel, no additional actions are taken when testing during the summer months. Consequently, we have no basis upon which to corroborate DOE’s explanation, nor can we, or

¹⁴ Flushing is a process which eliminates stagnant water sitting in school pipes by opening pipes, faucets and tabs in school buildings and allowing the water to flow. School water mains are run for 10 minutes while fixtures are run for one minute. Facilities personnel currently flush schools on Monday mornings and after holiday weekends.

DOE be assured of the accuracy of these tests since, according to Facilities personnel, the additional actions needed to simulate normal water use patterns were not performed.

When water samples are collected when schools are not in full session (e.g., during the summer recess) to simulate normal water use patterns, stagnant water used for water sampling may result in higher elevated lead results. Such elevated results would require unnecessary follow-up and deployment of resources, which could slow down the responses to fixtures that legitimately actually have elevated lead levels. Of the 4,221 fixtures that were tested during July and August, 1,068 (25 percent) fixtures tested with elevated lead levels. Thereafter, 214 of these 1,068 fixtures were decommissioned or deemed out of scope. From the remaining 854 fixtures, 831 (97 percent) were subsequently remediated and retested. However, 242 fixtures were retested again during the months of July and August—of these, 99 fixtures tested with elevated lead. The remaining 23 (3 percent) fixtures have not received any subsequent lead water tests. Subsequent to the issuance of the preliminary draft report, DOE provided documentation for 19 of the 23 fixtures indicating that 8 were decommissioned, 3 were out of order, 2 were out of scope, 1 was mislabeled and 5 were tested. However, Water Quality did not update the statuses of 10 of these fixtures in the Lead in Water database. (This issue is discussed in more detail later in this report.) Water Quality received information on the remaining nine fixtures subsequent to our receiving the data in September 2019. DOE did not provide any evidence for the four remaining fixtures.

Fixtures Generally Tested with Minimal Exceptions

According to DOE's *NYC Department of Education (DOE) 2018-2020 Lead in Water Testing Protocol*, "in scope fixtures" require a lead water test. In addition, per DOE officials, based on the Cohort testing cycle, in scope fixtures that remain in commission should have a minimum of two lead tests, one for the primary testing year 2016-2017 and the second within their associated Cohort (2018 or 2019).¹⁵

Our review of the Report #20 Water Safety Test Results revealed that the vast majority of fixtures—151,885 out of 152,914 (99.3 percent)—received the required tests.¹⁶ Of the outstanding 1,029 fixtures, we identified 163 in scope fixtures, from 64 schools, that remained in commission during the entire three year period but did not receive a lead test during the primary testing year or their associated 2018 or 2019 Cohort. Of the remaining 866 in scope fixtures, 774 (89 percent) were tested only during the primary testing year (2016-2017) and 92 (11 percent) were tested only during the 2018 or 2019 Cohort.

According to DOE officials, there may be several reasons why the 163 in scope fixtures may not have received a lead test. For example, a fixture was tagged but is out of order and was never tested, a fixture was tagged but is out of scope and was never tested, or a fixture is decommissioned (and its status will be updated in the Lead in Water Database). In addition, DOE officials stated that some fixtures were tested, some no longer exist, and for others there was an issue when the ECs relabeled the fixtures. Subsequent to the issuance of the preliminary draft report, and nine months after we shared the list of these fixtures with DOE, DOE provided documentation on 122 fixtures. The documentation indicated that 49 fixtures do not exist, 34 are

¹⁵ Cohort 2020 is the third cohort in DOE's three-year testing cycle; which commenced in February 2020. These schools and their fixtures were not included in this audit test.

¹⁶ Some fixtures were decommissioned, deemed out of scope (which were tested during the primary year), or were out of service and therefore not required to receive the second test.

out of scope, 12 are out of order, 10 were decommissioned, 13 had other operating statuses and four were tested in March or April 2021.¹⁷

Our review of the materials revealed that the statuses for 110 (90 percent) of the 122 fixtures were provided to Water Quality by EC or DSF personnel prior to September 2019 but DOE did not update their status in the Lead in Water Database in a timely manner. (This issue is discussed in more detail in the following section of the report.) Water Quality received information on the remaining 12 fixtures subsequent to our receiving the data in September 2019. Six fixture updates occurred recently in 2021 showing that 2 fixtures were out of order and 4 fixtures were tested. DOE provided either no evidence or insufficient information regarding the statuses of the remaining 41 fixtures.

DOE officials provided multiple explanations for why the 866 in scope fixtures received one lead test including that some of these fixtures were new fixtures brought online in 2018 or after, were out of scope, out of order, or decommissioned. DOE officials indicated that the fixture's current status will be updated in DOE's Lead in Water Database. Subsequent to the issuance of the preliminary draft report, and nine months after we shared the list of these fixtures with DOE, DOE provided sufficient evidence that 586 fixtures were either tested or not required to be tested. These include: 71 fixtures at a school that merged with another school located in the same building; 73 fixtures located at former school sites or locations that are no longer in use; and 438 fixtures that do not exist, are out of scope, out of order, were decommissioned, had other operating statuses, including mislabeled or inaccessible or were recently tested.

Water Quality received the fixture statuses for 299 of the above-mentioned 438 fixtures from EC or DSF personnel prior to our receipt of the data from the Lead in Water Database in September 2019. However, DOE did not update the status of these fixtures in the Lead in Water database. (This issue is discussed in detail in the following section of the report.) Furthermore, Water Quality did not update the status of 35 of these fixtures as out of order; therefore, these fixtures have remained out of service for students and personnel, although Water Quality was notified between October 2018 and May 2019 that these fixtures were out of order.

For 143 fixtures, DOE was unable to determine the status of the fixtures based on its records and therefore requested that EC or DSF staff visit the schools to provide the current operating status of the fixtures and in 46 instances actually test the fixtures.¹⁸ These visits took place in March and April 2021.

DOE did not provide sufficient information regarding the statuses of the remaining 284 fixtures in that either no documentation was provided or the documents were not dated and there was no indication that the information was shared with DOE by the EC or DSF staff.

When in scope fixtures remain untested, DOE has no assurance of the fixture's current lead levels, which could increase the risk to the health of school students and personnel if the fixtures have elevated lead levels. Since DOE provided insufficient evidence to show that 325 fixtures were either tested or were not required to be tested, it has no assurance of the fixture's current lead level status or operational status, which places students at increased risk for exposure to lead in their drinking water.

¹⁷ The 13 fixtures include mislabeled fixtures, inaccessible fixtures, or fixtures which were subsequently tested.

¹⁸ DOE received status information on four fixtures prior to September 2019. However DOE also had the ECs visit the schools to check the current status of these fixtures only recently in March and April 2021.

Fixture Statuses Were Not Adequately Tracked and Updated in the Lead in Water Database

According to Comptroller's Directive #1, transactions should be promptly recorded to maintain their relevance and value to management in controlling operations and decision making. According to DOE officials, when ECs conduct lead testing they are required to email DOE any issues identified during testing (e.g., fixtures out of order, out of scope or do not exist) and thereby provide DOE with timely relevant information.

However, the audit found that DOE did not adequately track the status of fixtures and did not update the fixture statuses in the Lead in Water database.¹⁹ As mentioned above in previous sections of the report, we found the data provided by DOE in connection with the audit did not always reflect the correct status of fixtures. In 432 instances, DOE provided emails it received from the EC or DSF personnel documenting that the fixtures were either out of scope, out of service, decommissioned or that the fixtures do not exist. In all instances, the e-mails were dated prior to our receipt of inconsistent and outdated data contained in the Lead in Water database in September 2019.²⁰ Accordingly, for example, DOE received an email dated October 10, 2018 stating that a fixture had been decommissioned; however, the data DOE contained in the Lead in Water database provided in September 2019—almost one year later—incorrectly identified this fixture as being active.

This occurred because the individuals in the Water Quality unit did not adequately track, review, and update the fixture statuses in the Lead in Water database. In addition, in some instances the ECs did not note the fixtures with issues in the email body as required so Water Quality may not have received notification that certain fixture statuses needed to be updated.

When the status of fixtures are not adequately tracked and are incorrectly noted, DOE does not have an accurate depiction of the in scope fixtures and is hindered in determining whether fixtures need to be tested or repaired.

Recommendations

12. DOE should follow lead testing guidelines recommended by NYSDOH and test water when school is in full session.

DOE Response: "The DOE agrees with this recommendation. The DOE agrees that it should follow all requirements and lead testing guidelines recommended by the NYSDOH, which is consistent with our practices and longstanding policies. However, the DOE disagrees with the recommendation of performing non-initial testing when school is in full session, which is not a NYSDOH recommendation. Adoption of this policy would needlessly extend the average period of time a fixture remains out of service in some instances."

Auditor Comment: While we are encouraged that DOE agrees that it should follow all requirements and lead testing guidelines recommended by the

¹⁹ Since the discrepancies did not relate to the lab testing ppb results, we felt that we could rely on the data for testing.

²⁰ The 432 fixtures include 13 from the out of order fixtures, 10 fixtures from summer testing period, 110 fixtures from fixtures not identified as being tested and 299 fixtures identified as having only one test.

NYSDOH, this was not reflected by DOE's practices during our scope period. As stated in this report, we identified 5,188 test samples (2 percent) that were collected on days when the schools were not in full session in July and August of 2017, 2018, and 2019. DOE officials claim that DOE is in compliance with the guidelines since the testing at these schools was post-remediation testing or testing of new or repaired fixtures. However, the NYSDOH guidelines do not differentiate between initial and post-remediation testing and Facilities personnel confirmed that no additional actions, such as flushing, were taken when testing during the summer months. We therefore reaffirm our finding and urge DOE to implement this recommendation.

13. DOE should ensure that fixtures which were re-tested during the summer months with elevated lead levels are retested.

DOE Response: "The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies. The DOE retests all fixtures with exceedances after the fixtures have been remediated and/or repaired."

Auditor Comment: It appears that DOE misunderstood our recommendation. We are recommending that DOE retest the fixtures it tested in the summer months that resulted in elevated lead levels, since NYSDOH guidelines recommend that water samples should only be collected when school is in full session. Summer sampling requires additional actions including flushing to simulate normal water use during normal school operations. As stated above, Facilities personnel confirmed that these actions were not taken when testing was performed during the summer months.

14. DOE should ensure that the four fixtures without any subsequent tests are retested.

DOE Response: "The DOE disagrees with the premise of the recommendation. Three of the four fixtures were retested and data was submitted to the Comptroller's Office. The remaining fixture was decommissioned, and as such, retesting is not required."

Auditor Comment: DOE's statement is incorrect; it did not provide evidence that three of the four fixtures were retested and that the remaining fixture was decommissioned. Nevertheless, we are pleased that DOE has indicated that it has taken action regarding the fixtures in question.

15. DOE should assess whether the fixtures that have not been tested are operating and are in or out of scope.

DOE Response: "The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies."

Auditor Comment: While we are encouraged that DOE agrees that it should assess whether the fixtures that have not been tested are operating or out of scope, this was not reflected by DOE's practices during our scope period. This is

evidenced by the fact that: (1) it took DOE nine months to provide documentation on the statuses of some fixtures; (2) updated fixture statuses were provided to Water Quality by EC or DSF staff but were not updated in the database; and (3) DOE was unable to provide evidence that cited fixtures were tested or not required to be tested. We therefore urge DOE to implement this recommendation.

16. Based on the assessment, DOE should take the appropriate actions and appropriately document them in a timely manner, including fixture repairs or updating the fixture's fixture type and status, in their Lead in Water Database.

DOE Response: "The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies."

Auditor Comment: While we are encouraged that DOE agrees that it should take appropriate actions regarding fixtures that have not been tested, DOE provided insufficient evidence (and in some cases, no evidence) that it did so. As indicated in the report, for a number of fixtures DOE provided insufficient evidence that the fixtures were either tested or not required to be tested. We therefore urge DOE to implement this recommendation.

17. DOE should adequately track fixtures and ensure that fixture statuses are timely updated in the Lead in Water database.

DOE Response: "The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies."

Auditor Comment: While we are encouraged that DOE agrees that it should adequately track fixtures and ensure fixture statuses are timely updated in the Lead in Water database, this was not reflected by DOE's practices during our scope period. As stated in the report, we identified 432 fixtures for which DOE provided emails from the EC or DSF personnel to indicate that their status was not accurately reflected in the database. Accordingly, we urge DOE to implement this recommendation.

Stagnation Periods for Testing Were Generally Met with Some Exceptions

According to the NYCRR Section 67-4.3(b), sampled water shall be motionless in the pipes for a minimum of 8 hours, but not more than 18 hours, before sample collection. In addition, according to NYSDOH's *Lead Testing in School Drinking Water*, sampled water should not be tested after weekends or holidays. Further, according to DOE officials, initial testing should not be conducted on Sundays.

We found that the required stagnation periods for testing were generally met with some exceptions. Based on Report #20 Water Safety Test Results, we identified only 15 (1 percent) of 1,574 schools that received initial water testing on Sundays and Mondays. These 15 schools accounted for 1,495 (1 percent) of in scope fixtures tested out of DOE's unique population of 152,914 fixtures.

According to DOE officials, some Sunday and Monday testing was done to accommodate requests by schools; in other cases, the sampled testing actually occurred on dates other than a Sunday or Monday. However, DOE provided insufficient evidence to support its claims. (For example, DOE provided testing documentation with conflicting dates.)

Sunday and Monday testing occurred in part due to inadequate written policies and procedures. While *DOE's Lead in Water Testing Protocol* is utilized, key procedures and guidelines are vague or missing as they pertain to testing on Sundays and Mondays.

Without the proper stagnation period, lead water testing may result in higher elevated lead testing results, which could result in unnecessary expenses for remediation work and follow-up tests that were not needed. As previously noted, the unnecessary deployment of resources could slow down the overall time for necessary remediation measures to be implemented. Of the 1,495 fixtures, 121 (8 percent) tested with elevated lead levels. All 121 fixtures were subsequently remediated and retested. In addition, without detailed written policies and procedures, there is a risk that DOE personnel may be unsure of the water testing guidelines and not be in compliance with State regulations and their own internal policies and procedures.

Recommendations

18. DOE should ensure that appropriate stagnation periods are met when accommodating schools' requests for testing on specific dates.

DOE Response: "The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies."

Auditor Comment: While we are encouraged that DOE agrees that appropriate stagnation periods be met when accommodating schools' requests for testing, this was not consistently reflected by DOE's practices during our scope period. As indicated in the report, we identified a number of exceptions where schools' water samples were tested on Sundays and Mondays.

19. DOE should update its written policy on Lead Testing to document that lead samples should not be collected on Sundays and Mondays.

DOE Response: "The DOE disagrees with this recommendation. The DOE follows all requirements set forth by the NYSDOH. If there is a need for water samples to be collected on a Sunday or Monday, the DOE collects samples on these days, as per the NYSDOH's guidance. As the auditor's found, only one percent of schools and one percent of fixtures were tested on a Sunday or Monday. Given this, no updates to written policy is necessary."

Auditor Comment: According to the NYCRR Section 67-4.3(b), sampled water shall be motionless in the pipes for a minimum of 8 hours, but not more than 18 hours, before sample collection. Failure to ensure that sampled water undergoes the proper stagnation period increases the risk that testing will result in higher elevated lead levels, which could result in unnecessary expenses for remediation work and follow-up tests that were not needed. We acknowledge in the report that only one percent of schools were tested on a Sunday or Monday; however, DOE

should discontinue this practice and update its written policy. Accordingly, we reaffirm our finding and urge DOE to implement this recommendation.

DETAILED SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The audit scope was Fiscal Year 2017 through Fiscal Year 2020.

To obtain an understanding of the procedures and regulations regarding the testing and remediation of water fixtures in NYC schools by DOE, we reviewed and where applicable, used as criteria the following documents:

- EPA Safe Drinking Water Act Section 1417
- New York Codes, Rules and Regulations Title 10, Subpart 67-4
- *NYSDOH Guidelines, Lead Testing School Drinking Water*
- *NYC DOE 2018-2020 Lead in Water Testing Protocol Report #20 NYC DOE Water Safety Test Results –With All Results*
- 2018 and 2019 Team Remediation Report
- *Passport Portal J Custodian/Building Management Information and Instruction Guide*
- Division of School Facilities Organization Chart
- Water Quality unit Organization Chart
- DOE's SQL Database Overview document
- NYSDOH Lead Testing School Drinking Water letter
- Comptroller's Directive #1: *Principles of Internal Control*
- DOE 2020 Cohort List of School Buildings
- DOE's Water Flushing Protocol Memorandum to Custodian Engineer
- Contractor Application for Payment document
- Plumbing vendor contracts
- Chain of Custody form

- Information related to water safety from DOE's website such as Water Testing, Standard Response Protocol and Water Testing Results

To obtain an understanding of the lead testing and remediation process involved with DOE's controls over testing for lead in school water, we conducted interviews with DOE's Executive Director of the Division of School Facilities, the Director of the Water Quality unit, and the DOE Special Assistant.

To obtain an understanding of the Lead in Water database used by DOE for recording the lead testing in school water and reports used by DOE, we interviewed DOE's Executive Director of the Division of School Facilities, the Director of the Water Quality unit, the Special Assistant, and the Director of Operations Data and Special Programs.

To obtain an understanding of how the lead testing fixture results are received by DOE from the testing laboratories and how the data is entered into the SQL Lead in Water database we conducted an observation of the Quality Control process. We met, in person, with the Water Testing Coordinator, the Database Maintenance consultant, and the Director of Operations Data and Special Programs.

To obtain an understanding on how DOE monitors and remediates fixtures with elevated lead levels and out of order fixtures, we met with the Director of Facilities for Brooklyn North. To obtain a further understanding of the remediation and repair process, we met with the Trade Coordinator who enters work orders for repairs in the DOE Passport Portal J system and the Contract Manager and DOE Plumbing Supervisor who send work orders to contractors that make repairs and who may inspect the repairs.

In October 2019, we received Report #20 Water Safety Test Results which included 331,193 fixture entries for 1,574 school buildings for Fiscal Year 2017 through Fiscal Year 2020. We also received a Report #1 Inventory by School listing which contains an aggregate number of fixtures and fixture types per school. We documented our review for data reliability.

From Report #20 Water Safety Test Results, utilizing Audit Command Language (ACL), we identified 6,186 fixtures that appeared only once in the data when two tests were required. From the 6,186 fixtures, we further identified whether fixtures did not have the required two tests, which fixtures no longer required testing (e.g. decommissioned, out of scope), or if the fixture has remained out of order. In addition, utilizing ACL, we identified the day of the week schools received their lead test to determine whether lead testing was conducted on Sundays and Mondays.

From Report #20 Water Safety Test Results, utilizing ACL, we identified 6,833 unique sample school testing dates for Fiscal Year 2017 through Fiscal Year 2020. We randomly selected 69 schools to determine whether the ECs performed lead testing in a timely manner and whether COC forms were complete and accurate. In addition, we compared the information in the Lead in Water database with the lab reports to determine whether the catalog numbers for the fixtures and the test results reconciled.

Utilizing Excel's pivot function table, from 5,263 sample testing dates that contain a date in the "From Lab Results" column, we identified 213 (4 percent) schools with an identical "From Lab Results" date of July 20, 2017. In addition, we identified 1,569 sample testing dates containing a "null" in the "From Lab Results."

From Report #20 Water Safety Test Results, we utilized Excel's sort and filter function, to identify fixtures where samples were collected on days when schools were not in full session in July and August of 2017, 2018, and 2019.

From Report #20 Water Safety Test Results, we identified all schools which received lead water testing. Based on the borough and address, we identified the school's zip code using Google. We further filtered the zip codes to identify the top five zip codes with fixtures with elevated lead levels.

From Report #20, utilizing Excel's formula function, we identified 42 fixtures whose initial testing results contained N/A in the Result ppb column. We determined whether these fixtures received a subsequent valid lead test result.

In October 2020, we received Report #9 2018 and 2019 Team Remediation reports for Calendar Years 2018 and 2019 which included 5,701 fixtures that tested with elevated lead levels and required plumbing remediation and post-remediation testing. We determined the time frame for plumbing remediation and whether ECs performed post-remediation testing in a timely manner.

To determine the accuracy of the lead testing data in City schools reported on the DOE website for parents and students, we compared the information on DOE's website to Report #20 Water Safety Test Results.

To obtain an understanding of the water sampling and collection process, we observed one of the ECs perform post-remediation testing at a school.

The results of the above tests, while not projectable to their respective populations, provided a reasonable basis for us to evaluate the DOE's controls over the testing for lead and remediation in New York City schools.



May 27, 2021

Marjorie Landa
Deputy Comptroller for Audit
The City of New York
Office of the Comptroller
One Centre Street
New York, NY 10007-2341

RE: Audit Report on the New York City Department of Education's Controls over Testing for Lead in School Water MD19-117A

Dear Ms. Landa:

This letter will serve as the New York City Department of Education's (DOE) formal response to the New York City Office of the Comptroller's (Comptroller) draft audit report on the DOE's Controls over Testing for Lead in School Water (Report).

The DOE disagrees with the summary findings of this report and the majority of the recommendations are consistent with already existing and longstanding policies of the DOE. During the course of this audit, and after the auditors shared their findings, the DOE has provided evidence showing why the auditors' findings of non-compliance were not factually supported. The publishing of this report, in its current state, creates an increased risk that the general public will mistakenly believe their health and safety and the health and safety of our children are at risk within school buildings.

The following list of statements are corrections to findings contained in the report which, as written, are factually incorrect:

- All testing of fixtures met the requirements for stagnation periods under New York State rules and regulations as well as in subsequent guidance from the New York State Department of Health (NYSDOH).
- All fixtures which required testing received their required testing.
- Potable water fixtures requiring post-remediation testing are not in service and therefore do not result in an increased risk of exposure to building occupants.

- There are no rules or regulations prohibiting testing from occurring on a Sunday or Monday. Guidance recommends that it should generally be avoided; however, if there is a need to test on these days, then the testing should occur on these days as it is critical that DOE test as quickly as possible.
- The New York State's Emergency Regulation Section 67 was promulgated on September 6th, 2016, and guidance was issued by NYSDOH on September 23rd, 2016, leaving 20 business days to complete testing of over 150,000 fixtures by the regulatory deadline of October 31, 2016. After ample communication among the NYSDOH, the NYC Department of Health and Mental Hygiene, the School Construction Authority (SCA) and the DOE it was decided that all applicable fixtures would be subsequently retested. The SCA performed these rounds of testing, commencing in November 2016. This testing of over 1500 schools was completed by April 2017. Given the vast scope of the DOE's portfolio, constrictions on possible testing timeframes imposed by the required eight-hour stagnation period, and limitations of testing capacity, five months was a reasonable timeframe for meeting the testing requirements in over 1500 buildings. The DOE created the Water Quality Unit and its database after these rounds of testing.
- The percentage of fixtures found to have elevated lead levels at the time of testing has been inflated by a percentage point, *i.e.*, on page 2, in the second point; and on page 7, in the second paragraph.
- Handheld devices are currently being used to eliminate user error and electronically sign the chain of custody forms for all testing, including post remediation testing.
- The DOE tracks all testing dates in the Lead in Water database, including at the conclusion of the remediation process.
- The DOE schedules all testing. Environmental contractors do not have access to school buildings unless the DOE provides them access. Contract terms allows for the DOE to schedule post remediation testing on a specific date. The DOE does so via advance scheduling with the environmental contractor. Because of this, testing is not "late" or "untimely." A fixture which is placed out of service because of an exceedance remains out of service until post-remediation testing clears the fixture for use.
- The DOE effectively tracks the repairs of plumbing fixtures in a different database than that which it tracks testing. This distinction provides a source for members of the field offices within the Division of School Facilities to identify repaired plumbing fixtures and/or fixtures that need repair, furthering optimal efficiency across all forms of maintenance and repair. This process also ensures that senior management has metrics by which they can effectively manage DOE staff and resources.

Response to Recommendations:

Recommendation 1. *DOE should ensure timely compliance with State rules and regulations pertaining to lead testing in water.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 2. *DOE should track and monitor testing time frames, to ensure ECs are conducting the tests and submitting the results timely, and incorporate time frames for the entire process into its written internal policies and procedures.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 3. *DOE should enforce the 3 working day post remediation time frame with its ECs and incorporate these time frames into its written internal policies and procedures.*

Response. The DOE disagrees with this recommendation. The language from the contract between the DOE and environmental contractors states that, “The Contractor shall commence the work required by a Type A Proceed Order no later than (3) working days of receipt of a verbal notification except where a specific date is given.” The Department of School Facilities issues a Type A Proceed Order to the environmental contractor that contains a specific date that the environmental contractor is to conduct post remediation testing in a particular school. Scheduling is done in advance by the Water Quality Unit in conjunction with the school administration and environmental contractor. Environmental contractors cannot enter school buildings without this advance scheduling. As such, all post remediation testing is conducted in compliance with the contractual time frame.

Recommendation 4. *DOE should track and follow-up with the ECs in instances where they do not perform post remediation tests timely.*

Response. The DOE disagrees with this recommendation. The language from the contract between the DOE and environmental contractors states that, “The Contractor shall commence the work required by a Type A Proceed Order no later than (3) working days of receipt of a verbal notification except where a specific date is given.” The Department of School Facilities issues a Type A Proceed Order to the environmental contractor that contains a specific date that the environmental contractor is to conduct post remediation testing in a particular school. Scheduling is done in advance by the Water Quality Unit in conjunction with the school administration and environmental contractor. Environmental contractors cannot enter school buildings without this

advance scheduling. As such, all post remediation testing is conducted in compliance with the contractual time frame and is timely.

Recommendation 5. *DOE should track and monitor the timeliness of fixture remediation and repair of out of order fixtures and follow-up with Facilities and the plumbing contractors in instances where remediation or repair is not done timely.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 6. *DOE should assess the operating status of the out of order fixtures and create plumbing work orders to ensure that out of order fixtures are repaired, and tested for lead so that the fixtures can be placed back into service.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 7. *DOE should review the delays in repairs of out of order fixtures and address the cause of the delays.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 8. *DOE should modify its Passport Portal J and the Lead in Water Database to ensure that it captures the plumbing remediation or repair completion date.*

Response. The DOE partially agrees with this recommendation. The DOE agrees that Passport Portal J should capture the plumbing remediation or repair completion date. However, the DOE disagrees that it needs to modify the Lead in Water Database as it already contains the date the remediation of a fixture was completed. Remediation is noted as complete in the Lead in Water Database as the date the fixture has been tested and approved for consumption or the date the fixture was decommissioned.

Recommendation 9. *DOE should ensure that its recently developed written policy for data verification is adhered to for all testing results entered in the Lead in Water database.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies. The DOE developed the data verification practices concurrently with the

creation of its Lead in Water database in 2017. Although the practices created in 2017 were not memorialized in writing until 2019, the practices followed in 2017 were the same as those in 2019.

Recommendation 10. *DOE should modify their Lead in Water Database to ensure that required fields are not left blank and that inappropriate past or future dates are not accepted.*

Response. The DOE partially agrees with this recommendation, which is consistent with programming changes already made to the Lead in Water database. The programming team for the Lead in Water Database wrote code into the database to prevent required fields from being left blank and to prevent input of inaccurate dates.

Recommendation 11. *DOE should ensure chain of custody forms are adequately reviewed for completeness, signed, and that all ppb results are recorded.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies. Since the inception of water testing, the DOE required chain of custody forms which were reviewed by DOE vendors and the laboratories analyzing water samples. Since inception, a laboratory analyzing collected water samples submits a certificate of analysis with ppb results to the DOE upon completion of analysis. In 2021, DOE updated its policy on chain of custody so that all chain of custody forms are generated and signed electronically on the handheld scanner in order to eliminate user error.

Recommendation 12. *DOE should follow lead testing guidelines recommended by NYSDOH and test water when school is in full session.*

Response. The DOE agrees with this recommendation. The DOE agrees that it should follow all requirements and lead testing guidelines recommended by the NYSDOH, which is consistent with our practices and longstanding policies. However, the DOE disagrees with the recommendation of performing non-initial testing when school is in full session, which is not a NYSDOH recommendation. Adoption of this policy would needlessly extend the average period of time a fixture remains out of service in some instances.

Recommendation 13. *DOE should ensure that fixtures which were re-tested during the summer months with elevated lead levels are retested.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies. The DOE retests all fixtures with exceedances after the fixtures have been remediated and/or repaired.

Recommendation 14. *DOE should ensure that the four fixtures without any subsequent tests are retested.*

Response. The DOE disagrees with the premise of the recommendation. Three of the four fixtures were retested and data was submitted to the Comptroller's Office. The remaining fixture was decommissioned, and as such, retesting is not required.

Recommendation 15. *DOE should assess whether the fixtures that have not been tested are operating and are in or out of scope.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 16. *Based on the assessment, DOE should take the appropriate actions and appropriately document them in a timely manner, including fixture repairs or updating the fixture's fixture type and status, in their Lead in Water Database.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 17. *DOE should adequately track fixtures and ensure that fixture statuses are timely updated in the Lead in Water database.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 18. *DOE should ensure that appropriate stagnation periods are met when accommodating schools' requests for testing on specific dates.*

Response. The DOE agrees with this recommendation, which is consistent with its practices and longstanding policies.

Recommendation 19. *DOE should update its written policy on Lead Testing to document that lead samples should not be collected on Sundays and Mondays.*

Response. The DOE disagrees with this recommendation. The DOE follows all requirements set forth by the NYSDOH. If there is a need for water samples to be collected on a Sunday or Monday, the DOE collects samples on these days, as per the NYSDOH's guidance. As the auditor's found,

only one percent of schools and one percent of fixtures were tested on a Sunday or Monday. Given this, no updates to written policy is necessary.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin Moran', with a stylized flourish at the end.

Kevin Moran
Chief Schools Operations Officer