



Date: August 13, 2025

To: Sheryl M.M. Long, City Manager

From: Lauren Sundararajan, CFE, Internal Audit Manager *L.S*

Copies to: Internal Audit Committee
William Weber, Assistant City Manager
Andrea E. Yang, Interim Executive Director, Greater Cincinnati Water Works

Subject: **Lead Service Line Replacement Program Audit**

Attached is the Lead Service Line Replacement Program audit report. The primary objectives of this audit were to evaluate the efficiency and effectiveness of Greater Cincinnati Water Works' (GCWW) Lead Service Line Replacement Program, and to ensure compliance with all applicable legal and regulatory requirements. This audit was conducted in accordance with the current audit agenda.

We would like to thank the management and staff of GCWW for their assistance and cooperation during this audit.

If you need any further information, please contact me.

Attachment

Lead Service Line Replacement Program Audit

August 2025



Lauren Sundararajan, CFE
Internal Audit Manager

Pamela King
Senior Internal Auditor

Zeenat Tabaku
Internal Auditor

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Executive Summary

Internal Audit (IA) conducted a performance audit of Greater Cincinnati Water Works' (GCWW) Lead Service Line Replacement Program (LSLRP). The primary objectives of this audit were to evaluate the efficiency and effectiveness of GCWW's LSLRP, and to ensure compliance with all applicable legal and regulatory requirements.

The Environmental Protection Agency (EPA) established the Lead and Copper Rule (LCR) in 1991 to protect public health by reducing lead exposure in drinking water, primarily from lead pipes and brass or bronze fixtures. GCWW launched its Enhanced Lead Program in 2016, focusing on public outreach and developing an LSLRP.

The audit revealed several opportunities for strengthening internal controls over LSLRP operations. For instance, IA found that scrap metal lead pipes were not collected for recycling according to GCWW protocols. Following an internal investigation by GCWW, it was determined the pipes were misappropriated by a member of the City's in-house lead crew and sold for scrap metal value for their personal gain. As management was unaware that the pipes were not being recycled according to protocol, the crew member was able to continue misappropriating the pipes until GCWW conducted its investigation. While no violation of environmental laws was identified and the in-house lead crew was dismantled and disciplined for these actions, it is critical to ensure that the disposal of lead pipes is properly monitored if the crew is reinstated, and that management oversight and review of lead pipe removal and disposal is robust.

IA found that metrics do not exist to determine the amount and monetary value of recycled lead. The City's contract with Cohen Brothers, Inc. (Cohen) states that the City receives a portion of the money from all recycled metals, including lead. As the amount and monetary value of recycled lead was not shown on recycling invoices, those who viewed the invoices were unaware that lead should have been collected. Currently, no mechanism or metrics exist to compare the estimated weight of lead piping removed with receipts from Cohen or quantify the value of recycled lead.

IA also found that the in-house lead crew did not receive recurring training. While the in-house lead crew was trained in 2019 on all facets of working with lead pipes, this training was not repeated; additionally, according to GCWW management, there has been significant turnover of lead crew supervisors and leaders in the past five years. Regular, recurring training of the in-house lead crew is essential to ensure that all employees are compliant with all current departmental procedures.

To reduce the risks in LSLRP operations and ensure adherence to environmental regulations, IA recommends that LSLRP ensure that all lead pipes are disposed of in accordance with NIOSH hazardous material storage requirements; strengthen management oversight and communication regarding lead service line removal and disposal; create tracking and periodic reporting methods on the quantity of lead pipes removed, including the amount and monetary value of recycled lead; and institute regular, recurring training for in-house lead crew members on scrap metal pipe management procedures and ensure that documentation of completed training with employee signatures exists. Implementing these recommendations will improve the internal control system within LSLRP operations and help management achieve desired results through effective stewardship of public resources.

I. Introduction

Background

GCWW supplies an average of forty-three billion gallons of water annually through over 3,180 miles of mains to 240,000 customers, serving approximately 1.2 million individuals.¹ Lead was commonly used for service lines in the early 1900s; however, in 1928, the City mandated the installation of copper pipes. Today, some service lines still contain lead.

The EPA established the LCR in 1991 to protect public health by reducing lead exposure in drinking water, primarily from lead pipes and brass or bronze fixtures. GCWW launched its Enhanced Lead Program in 2016, focusing on public outreach and developing a LSLRP. In this early iteration of the program, citizens were responsible for paying the cost of private line replacements.

In 2019, GCWW worked with the National Institute for Occupational Safety and Health (NIOSH) to assess lead exposure risks for crews replacing lead lines and made enhancements to improve employee safety. The LSLRP had a dedicated team of eight to nine staff members. In 2021, the City assumed responsibility for restoring private and public lines at no cost, increasing participation to 50%; at this time, participation in the program has reached approximately 90%.

Lead service lines have been historically replaced either by GCWW's in-house lead crew or by contractors such as Neumann Plumbing, Adleta Construction, The Gertz Company, and Moerlein Construction Group. The in-house lead crew, which was recently dismantled and disciplined, was responsible for completing public line replacements. Following the dismantling of the crew, GCWW placed an Emergency Purchase Request for Adleta Excavating, LLC, to complete the public line replacements. Contractors are responsible for completing private line replacements and water main replacement projects, and are overseen by GCWW inspectors, who travel to worksites and ensure that contract terms are enforced. Further, the City maintains a contract with Cohen, which is responsible for recycling scrap metal including lead and returning a portion of those proceeds to the City.

Working with the University of Cincinnati School of Planning Urban Planning Program, GCWW aims to replace lead service lines equitably. Approximately 1,333 lines have been replaced from July 2024 to April 2025.² By 2037, the EPA requires all lead lines to be eliminated, necessitating a significant increase in GCWW's replacement efforts citywide.

IA was informed that funding for the LSLRP comes predominantly from Fund 312 for private side replacement work and Fund 756 for public side replacement. Multiple loans and grants have been utilized to reimburse these accounts after the work is completed. Loans and grants are typically through the Ohio EPA Drinking Water State Revolving Fund (DWSRF)³, but also through the State H2Ohio program⁴ and the United States EPA.

¹ LSLRP PowerPoint Presentation

² Branch Details Excel Document from Kevin Kappers, Dated 4/25/2025

³ Drinking Water State Revolving Fund (DWSRF) | US EPA

⁴ H2Ohio.ohio.gov

Audit Selection

IA conducted this audit in accordance with the Audit Work Plan.

Audit Objectives

The primary objectives of this performance audit were to evaluate the efficiency and effectiveness of GCWW's LSLRP, and to ensure compliance with all applicable legal and regulatory requirements.

Audit Scope and Methodology

To accomplish the audit objectives, IA compared current practices to industry standards, reviewed pertinent policies and procedures, examined department contracts and records, interviewed appropriate staff, and analyzed statistics of relevant data. Records reviewed included data from Fiscal Year (FY) 2023 to present.

During the audit, environmental compliance was evaluated in relation to the management of scrap lead pipes removed from service. Under Ohio law, the IA audit qualifies as an environmental audit, which is defined as a voluntary, thorough, and discrete self-evaluation of one or more activities at one or more facilities or properties that is documented; is designed to improve compliance, or identify, correct, or prevent non-compliance, with environmental laws; and is conducted by the owner or operator. While no violation of environmental laws was identified, the audit determined the need for additional controls on the management of lead pipes removed from service.

Scope Limitation

IA was unable to interview members of the in-house lead crew, as the crew had been dismantled and disciplined due to an internal GCWW investigation of improper lead pipe disposal. Remaining crew members, represented by their City union representatives, refused to speak to IA.

Statement of Auditing Standards

As required by the Cincinnati Administrative Code Article II §15, this audit was conducted in accordance with the Generally Accepted Government Auditing Standards (GAGAS), except for standard 5.60 pertaining to external peer review requirements. This exception did not have a material effect on the audit.

IA continues to conduct internal quality reviews to assure conformance with applicable GAGAS. IA performed the fieldwork between April and July 2025.

Recommendations

IA commends the staff of GCWW for their cooperation throughout the audit.

II. Audit Findings and Recommendations

Lead pipes were found to be misappropriated.

The NIOSH Job Hazard Analysis created in 2019 states that removed lead piping must be placed in a backhoe bucket, transported to the GCWW Main Station location, and disposed of in a designated container, which Cohen is responsible for servicing. During the course of the audit, a discrepancy was identified in how lead pipes removed during LSLRP projects were being handled. As a result of IA's inquiry, an internal investigation was conducted by GCWW management and revealed that members of the in-house lead crew were removing lead pipes from job sites, stockpiling them at GCWW's Tennyson location, then loading them into a crew member's truck, at which point they were removed to an undisclosed location for that crew member's own profit.

Through GCWW's investigation, it appeared that the lead pipes were recycled; therefore, no violations related to hazardous waste or environmental laws occurred. However, although the in-house lead crew was dismantled and disciplined for these actions, it is critical to ensure that if the crew is reinstated, the disposal of lead piping is properly monitored by GCWW management.

Recommendation 1: Ensure that all lead pipes are disposed of in accordance with NIOSH hazardous material storage requirements.

Department Response: Agree. Internal Audit's efforts alongside a thorough investigation by GCWW Staff uncovered an internal employee misappropriating lead pipes after service line replacement for personal gain. GCWW immediately suspended work by internal crews during the investigation and has since rolled out a series of additional controls to ensure this does not happen again. Those controls include updated crew requirements to report on the location and quantity of lead pipe removed, updated supervisor procedures requiring weekly recycling dumpster inspections, and increased staff training. The new controls have already been implemented by GCWW- Distribution Division supervisors.

Management oversight and communication regarding lead service line removal and disposal should be strengthened.

Proper management oversight and communication is necessary to ensure processes are functioning as intended, errors are detected, and department objectives are carried out appropriately. IA found that management oversight and communication regarding lead service line removal and disposal should be strengthened: as mentioned above, proper protocol for disposing of lead pipes was not followed by members of the in-house lead crew. According to GCWW staff, the Cohen metal recycling container had not been serviced in approximately five years, and management was unaware that the pipes were not being recycled according to protocol. Due to this lack of oversight of lead crew operations and the Cohen container, the crew member was able to continue misappropriating the pipes until IA inquired about disposal procedures and GCWW conducted its internal investigation.

Recommendation 2: Strengthen management oversight and communication regarding lead service line removal and disposal.

Department Response: Agree. Standard operating procedures for internal GCWW crews

require use of a dumpster designated for lead service line recycling. Finding #1 of this report acknowledges that an employee was found not to be following this procedure. As mentioned in the response above, new controls have already been added to require staff to capture the location from which lead pipes were removed and the quantity removed. This data informs supervisors and enables them to provide effective oversight. Updated SOPs include tasks by supervision to verify anticipated quantities of lead are disposed of in the recycling dumpster on a weekly basis.

Additionally, recurring annual training and new employee training includes lead recycling procedures.

Metrics do not exist to determine the amount and monetary value of recycled lead.

The City's contract with Cohen states that the City receives a portion of the money from all recycled metals, including lead. However, the amount and monetary value of recycled lead was not shown on recycling invoices separate from other recycled metals because no lead was collected from the Main Station container. Those who viewed the recycling invoices were unaware that lead should have been collected, which allowed lead pipes to continue being misappropriated. Currently, no mechanism exists to compare the estimated weight of lead piping removed with receipts from Cohen, and metrics that include the amount and monetary value of recycled lead are not collected. A metric related to recycling profits could help to quantify the financial return from salvaging and recycling old lead pipes and associated materials. These procedures are critical in ensuring that the City can quantify the amount and monetary value of the lead removed from circulation and recycled.

Recommendation 3: Create tracking and periodic reporting methods on the quantity of lead pipes removed, including the amount and monetary value of recycled lead.

Department Response: Agree. This has already been incorporated by GCWW- Distribution Division supervisors into the SOP and work order requirements. (See responses 1 and 2)

The in-house lead crew did not receive recurring training.

According to GCWW management, the in-house lead crew was trained on all facets of working with lead pipes, including disposal, after the NIOSH report was released. However, this training has not been repeated, and newer members of the in-house lead crew were trained on the job by other crew members. Additionally, according to GCWW management, there has been significant turnover of lead crew supervisors and leaders in the past five years. Regular, recurring employee training is essential to ensure that all employees are aware of and compliant with all current departmental procedures.

Recommendation 4: Institute regular, recurring training for in-house lead crew members on scrap metal pipe management procedures and ensure that documentation of completed training with employee signatures exists.

Department Response: Agree. This change has already been incorporated by GCWW- Distribution Division supervisors and GCWW- Safety and Training into new employee and annual training programs. (See response 2)

Lead pipelines that are left abandoned in the ground after replacement are not being tracked.

When the in-house crew or contractors replace lead pipelines, the lead pipes are often left underground unless they disrupt the replacement process; no tracking mechanism exists to document where these pipes are located. While leaving the pipes underground is not a violation of the LCR, maintaining a record of abandoned lead lines may help with future infrastructure planning and maintenance and ensure that all lead piping is accounted for.

Recommendation 5: Maintain detailed records of all lead lines that have been left abandoned.

Department Response: Agree. This change has already been incorporated GCWW-Distribution Division supervisors into the SOP and work order requirements. (See responses 1 and 2)

Contractor expectations should be redefined.

The departmental purchase order for Moerlein Construction Group states that the contractor must schedule inspections 24 hours before replacing lead service lines.⁵ However, IA was informed by LSLRP that the contractor has been disregarding this clause and not informing inspectors of their whereabouts. When terms of an agreement are not enforced and inspectors are not able to oversee contractors' work, regulatory compliance, health and safety, and public trust may be negatively impacted. Overall, proper oversight of contractors is crucial to ensure safety and compliance with lead service line replacements.

Recommendation 6: Clarify expectations with contractors.

Department Response: Disagree. GCWW disagrees with the implication that there has been any lapse in water service line replacement inspection or enforcement of standards that would impact health, safety, or regulatory compliance. Every lead service line replacement completed through GCWW's program has received a passing inspection, which is required before contractor payment is authorized. We believe the concern cited in this recommendation reflects a minor disagreement between inspection staff and just one of several replacement contractors.

GCWW is constantly adapting and improving its program and is in the process of increasing the number of inspection staff and has already updated the scope of work included in its agreement with contractors.

Master agreements governing LSLRP have not been completed.

Master agreements, or contracts that outline the terms and conditions between clients and vendors when vendors are providing multiple services, are essential to ensure that contract negotiations with the same vendor are not repetitive. Contractors such as Nieman Plumbing and Adleta Construction often undertake multiple projects on behalf of LSLRP; however, master agreements have not been developed between LSLRP and the contractors. Currently, LSLRP is working with the Procurement Department (Procurement) to develop a new Request for Quote, which will allow Procurement to handle master agreements; however, these agreements have

⁵ "Plumber must call GCWW at 513-591-7825 at least 24-hours prior to replacing the lead service line to schedule inspection of the new copper service line." Departmental Purchase Order, Moerlein East End PKG

not been completed.

Recommendation 7: Work with Procurement to complete master agreements.

Department Response: Disagree. The GCWW Lead Service Line Replacement Program is unique, not only to the city, but was one of the first proactive replacement programs in the Country. GCWW worked closely with the Office of Procurement, Law Department, Department of Economic Inclusion, and City leadership to establish the program and its contracting mechanisms. The established program has been working since 2018 and has resulted in over 7,500 successful lead service line replacements.

Recent regulatory changes require GCWW to accelerate the rate of lead service line replacements. To meet the requirement of replacing all lead service lines by 2037, GCWW has reached out to our colleagues in the City's Procurement and Inclusion agencies to help determine the best procurement alternatives to accelerate the rate of removal of lead service lines, increase the contracting pool, and maximize utilization of small, local, minority owned businesses. Master agreements are just one possible option under consideration. Advertising for a new one-off contracting opportunity, which may or may not involve master agreements, is expected to be released by the end of the calendar year.

III. Conclusion

The audit revealed several opportunities for improvement over LSLRP operations. For example, IA found that lead pipes were misappropriated, management oversight and communication regarding lead service line removal and disposal should be strengthened, metrics do not exist to determine the amount and monetary value of recycled lead, and the in-house lead crew did not receive reoccurring training.

To improve LSLRP operations, IA recommends that LSLRP ensure all lead pipes are disposed of in accordance with NIOSH hazardous material storage requirements; strengthen management oversight and communication regarding lead service line removal and disposal; create tracking and periodic reporting methods on the quantity of lead pipes removed, including the amount and monetary value of recycled lead; and institute regular, recurring training for in-house lead crew members on scrap metal pipe management procedures and ensure that documentation of completed training with employee signatures exists. Implementing these recommendations will improve the internal control system within LSLRP operations and help management achieve desired results through effective stewardship of public resources.

IV. Greater Cincinnati Water Works Response

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Recommendation 2: Strengthen management oversight and communication regarding lead service line removal and disposal.

Department Response: Agree. Standard operating procedures for internal GCWW crews require use of a dumpster designated for lead service line recycling. Finding #1 of this report acknowledges that an employee was found not to be following this procedure. As mentioned in the response above, new controls have already been added to require staff to capture the location from which lead pipes were removed and the quantity removed. This data informs supervisors and enables them to provide effective oversight. Updated SOPs include tasks by supervision to verify anticipated quantities of lead are disposed of in the recycling dumpster on a weekly basis.

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