BAXTER & WOODMAN
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Draft Lead Service Line Replacement Plan

2500586.00

Village of Northbrook (IL0312070)

Northbrook, IL

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List of Definitions and Abbreviations

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a CWS must follow. The current Action Level for lead is 15 parts per billion, in accordance with the Lead and Copper Rule.[2]

Community Water System/Supply (CWS): A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.[2]

Corrosion Control Treatment (CCT): A treatment that utilizes a corrosion inhibitor which is a substance that can reduce the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.[3]

Emergency Repair: Any unscheduled water main, water service, or water valve repair or replacement that results from failure or accident.[1]

Full Lead Service Line Replacement (LSLR): Replacement of a lead service line (or galvanized service lines requiring replacement) that results in the entire length of the water service line, regardless of ownership, being free of lead.[2] A full lead service line replacement could leave a lead service line in place in the ground but out of service if using a new non-lead service line.[3]

Galvanized Requiring Replacement (GRR): A galvanized service line that is or ever was downstream of a lead service line or is currently downstream of a lead status unknown service line.[3]

Note: Galvanized water service lines have a rough interior surface. If the galvanized service line is or has been in contact with lead, then it likely has lead particulate that has settled on the interior surface.

Galvanized Service Line: A water service line that is made out of iron or steel piping zinc-dipped to prevent corrosion and rusting.[3]

Illinois Lead Service Line Replacement and Notification Act (ILSLRNA): Illinois law requiring CWS to create a water service line material inventory, create a LSLR Plan, provide notice to potentially affected building occupants, prohibit partial LSLR, and disconnect LSLs from the drinking water supply.[1]

Lead: A naturally occurring element found in small amounts in the earth's crust; while it has some beneficial uses, it can be toxic to humans and animals, causing health effects.[2]

Lead and Copper Rule (LCR): Federal law established by USEPA to protect public health and reduce exposure to lead and copper in drinking water.[2]

Lead Service Line (LSL): A water service line made of lead or water service line connected to a lead pigtail, lead gooseneck, or other lead fitting.[1]

Lead Status Unknown Service Line: A water service line that a CWS has yet to identify as lead, galvanized requiring replacement, or non-lead material. The service line material may also be designated as Unknown.[3]

Non-Lead Service Line: A water service line that a CWS has determined through an evidence-based record, method, or technique is non-lead or galvanized requiring replacement. The service line material may also be designated using its actual material of construction (e.g., plastic, copper, ductile iron, etc.).[3]

Safe Drinking Water Act (SDWA): A federal law that regulates the nation's public drinking water supply to protect public health. The Act has been revised multiple times since its enactment in 1974, the last revision occurring in 2018. In 1986, Congress amended the SDWA to ban the use of lead pipe, flux, and solder. There was a two-year implementation period after Congress banned the use of lead pipe. For the purpose of the LSLR Plan, 1988 will be used as the year lead pipe was banned.

Solder: A type of metal that is used to join metal parts such as sections of pipe, without melting the existing metal in the parts to be joined.[2]

Suspected Lead Service Line: A water service line that a CWS finds more likely than not to be made of lead than non-lead.[1]

Trigger Level (TL): The concentration of lead which, if exceeded, triggers notification, water quality sampling and goal-based replacement requirements which a CWS must follow. Effective October 16, 2024, the Trigger Level for lead is 10 parts per billion, in accordance with the Lead and Copper Rule Revisions.[2]

Unknown Not Lead Service Line: A water service line that CWS has been unable to determine the material of, however has safely assumed the service is not mead of lead based upon historical knowledge, such as the building/property was developed after Congress banned the use of lead pipe in 1988 and/or the service line diameter is greater than 2-inches.

Water Main: A pipe that conveys water to a connector or customer's water service line. In residential areas, it is usually located underground.[2]

Water Service Line: Piping, tubing, and necessary appurtenances acting as a conduit from the water main or source of potable water supply to the building plumbing at the first shut-off valve or 18 inches inside the building, whichever is shorter.[1]

Water Service Line Material Inventory: A water service line inventory developed by a community water supply under this Act that identifies the material of each water service line.[1]

Water Service Line Ownership: Lead water service line ownership is shared between the CWS and the property owner. The CWS maintains the water service line from the watermain up to the b-box (exterior shut-off valve); from the b-box into the home is the homeowner's responsibility. Note, for water service lines not requiring replacement, refer to the Village's Code (Sec. 27-48. - Repairs and maintenance) regarding water service line ownership.[1]

References:

1. Defined in accordance with the Illinois Lead Service Line Replacement and Notification Act
2. Defined in accordance with the U.S. Environmental Protection Agency (USEPA)
3. Defined in accordance with the General Assembly's Illinois Administrative Code

1. Executive Summary

Under the Illinois Lead Service Line Replacement and Notification Act (ILSLRNA) and US Environmental Protection Agency's (USEPA) Lead and Copper Rule Revisions (LCRR), the Village of Northbrook (Village) is tasked with facilitating the replacement of all lead and galvanized requiring replacement (GRR) water service lines connected to its drinking water supply. The purpose of a Lead Service Line Replacement (LSLR) Plan is to identify and locate lead and GRR water service lines, develop strategies to facilitate the replacement of such water service lines, identify funding mechanisms for replacements, and develop design and construction criteria for executing replacements. This LSLR Plan is the Village's draft and will be revised annually.

The Village has 12,548 water service lines within its corporate limits and is actively working to identify the material of each water service line. At this time, the Village has identified 292 lead and GRR water service lines. The table below highlights the inventory efforts of the Village since 2020, including remaining unknowns, identified, and replaced lead and GRR water service lines.

Table 1 - Water Service Lines Requiring Replacement and Replaced to Date

Year	Total Water Service Lines	Unknown Material	Lead & GRR	Replaced Lead
2020	12,642	0	2,262	6
2021	12,642	0	2,262	26
2022	12,551	92	835	7
2023	12,510	0	316	13
2024	12,548	0	292	19

At this time, the Village has 292 lead and galvanized requiring replacement service lines with no remaining unknowns. Under ILSLRNA, the Village intends to replace all lead water service lines by 2042, with replacements scheduled to begin in 2027. At a required replacement rate of 7% per year, the Village is required to facilitate the replacement of 20 lead service lines annually, over 15 years. The replacement schedule as shown in the table below includes a one-year, five-year, 10-year and 15-year goals, which accumulates the total replacements to be completed by that designated year.

Table 2 - Water Service Line Replacement Schedule

IEPA Goal Years	Year End	Known Lead	Cumulative Required Replacements	Non-Lead[2]	Total Service Lines[3]
	2026	280[1]	0	12,268	12,548
Year One	2027	260	20	12,288	12,548
5-Year	2031	180	100	12,368	12,548
10-Year	2036	80	200	12,468	12,548
15-Year	2041	0	280	12,548	12,548

Notes:

1. At this time, the Village is estimating to have 292 lead service lines, with 12 being replaced between 2025 and 2026, resulting in 280 lead service lines at the end of 2026.
2. Non-lead water service lines have been identified as copper, plastic, galvanized, cast iron, ductile iron or transite.
3. Total Service Lines is the summation of the remaining known lead and the non-lead services for each IEPA Goal Year. The Cumulative Required Replacements are already summed within the Non-Lead quantity for each IEPA Goal Year.

At this time, the Village is estimating that the total cost to replace all 292 lead and GRR service lines will be $7.9 million, with an annual estimated cost starting to be roughly $530,000 over 15 years or $790,000 over 10 years. At this time, the Village of Northbrook is assessing what funding programs and local revenue sources will minimize the debt service and overall financial impact on the Village and its consumers.

The Village of Northbrook will post this Draft Lead Service Line Replacement Plan online at https://northbrook.il.us/1119/Lead-Service-Line-Inventory at the time of their second draft LSLR Plan submittal to Illinois Environmental Protection Agency (IEPA) by April 15, 2025. The Village will provide opportunity for public comment before the final LSLR Plan is due on April 15, 2027.

This draft LSLR Plan is pursuant to the ILSLRNA, as well as the LCRR, which was adopted into Illinois Administrative Code effective November 2, 2023. On October 8, 2024, USEPA released the Lead & Copper Rule Improvements (LCRI) with compliance required by November 1, 2027. The LCRI presents changes to the current LCRR, including replacement of all lead and GRR service lines by 2037 and lowering the lead Action Level to 10 parts per billion. At this time, the LCRI is not considered as a part of this draft LSLR Plan. Once community water systems receive guidance on how the state and federal law will interact, the Village will update future LSLR Plans as required by the ILSLRNA, LCRR, and LCRI.

2. Introduction

In accordance with the Illinois Lead Service Line Replacement and Notification Act (ILSLRNA), Public Act 102-0613 (415 ILCS 5/17.12), every Community Water System (CWS) with known lead, suspected lead, galvanized requiring replacement (GRR), or lead status unknown water service lines must create a Lead Service Line Replacement (LSLR) Plan. The purpose of the LSLR Plan is to identify and locate lead and galvanized requiring replacement service lines, develop strategies to facilitate the replacement of such water service lines, identify funding mechanisms for replacements, and develop design and construction criteria for executing replacements.

The Village of Northbrook has 12,548 water service lines connected to the Village's water distribution system. Of those, the Village has identified 292 lead and GRR service lines. To date, the Village has not identified any galvanized requiring replacement service lines. The Village must submit their second draft LSLR Plan to the Illinois Environmental Protection Agency (IEPA) by April 15, 2025. After which, IEPA will review and provide comments back to the Village. After subsequent draft submissions to IEPA, the Village will submit their final LSLR Plan by April 15, 2027.

Since 2020, the Village has been working to identify the material of water service lines and has been reporting materials to IEPA annually. Table 3 below provides a breakdown of total water service lines, including unknown, known lead, and replaced lead service lines within the Village since 2020.

Table 3 - Water Service Lines Requiring Replacement and Replaced to Date

Year	Total Water Service Lines	Unknown Material	Lead & GRR	Replaced Lead
2020	12,642	0	2,262	6
2021	12,642	0	2,262	26
2022	12,551	92	835	7
2023	12,510	0	316	13
2024	12,548	0	292	19

This draft LSLR Plan is pursuant to the ILSLRNA, as well as the LCRR, which was adopted into Illinois Administrative Code effective November 2, 2023. On October 8, 2024, USEPA released the Lead & Copper Rule Improvements (LCRI) with compliance required by November 1, 2027. The LCRI presents changes to the current LCRR, including replacement of all lead and GRR service lines by 2037 and lowering the lead Action Level to 10 parts per billion. At this time, the LCRI is not considered as a part of this draft LSLR Plan. Once community water systems receive guidance on how the state and federal law will interact, the Village will update future LSLR Plans as required by the ILSLRNA, LCRR, and LCRI.

3. System Overview

3.1. Location and Customer Base

The Village of Northbrook is located in Northfield Township, Cook County and is approximately 25 miles north of Chicago, Illinois. According to the 2020 Census, the Village covers 13.24 square miles and serves 35,222 customers. Figure 1 below shows the Village's municipal boundary.

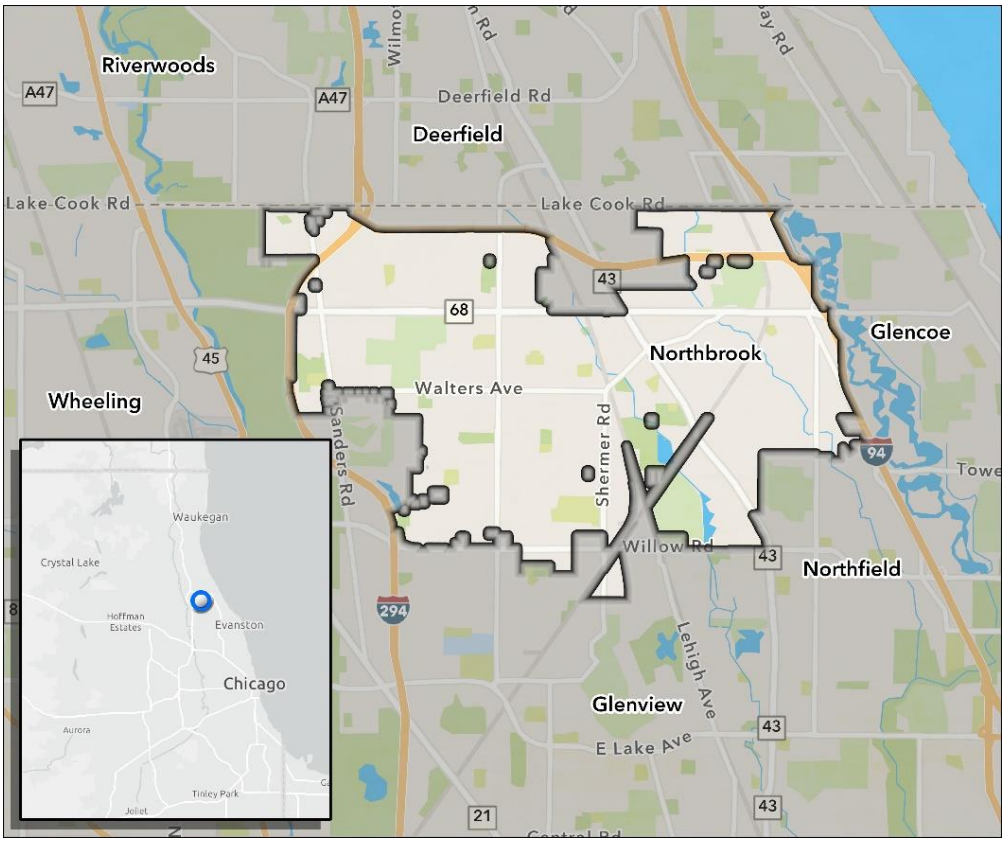


Figure 1 - Village of Northbrook Municipal Boundary

The Village of Northbrook provides water service to customers within the municipal boundary of the Village. This draft LSLR Plan will pertain only to water service lines within the municipal limits of the Village.

Understanding the demographics and characteristics of Village of Northbrook's customer base assists the Village with the planning of future replacements and public engagement needs. Approximately 23% of the Village is non-English speaking, with the most common languages spoken other than English being Russian, Polish or other Slavic, other Indo-European languages, and Korean.

Additionally, IEPA has identified eight criteria to compare and score lead service line replacement projects submitted to the Illinois State Revolving Fund's Public Water Supply Loan Program for funding assistance. Within the Village of Northbrook, there are eight Census designated geographic areas, known as census

tracts. See Appendix A for a map of Northbrook's census tracts and how many points IEPA would award projects in each tract. Projects are awarded points based on which census tract the project is located within.

3.2. Water System Overview

The Village of Northbrook owns and operates their own water treatment plant and distribution system that includes two zones, one elevated tank per zone, two reservoirs, and a booster station in Glencoe where raw water is supplied. The Village's water purification process primarily uses gravity filtration and chlorine disinfection. Additionally, for over 30 years, the Village has had a Corrosion Control Treatment (CCT) program. To prevent lead and copper from leaching into drinking water, the Village adds orthophosphate to the water at the treatment plant. Orthophosphate prevents corrosion by forming a protective coating inside the pipes throughout the distribution system.

Treated water is then distributed to customers through 205 miles of public water main, mostly comprised of cast and ductile iron. The Village is unaware of water main with lead joints in their system. The Village's water distribution system can be seen in Figure 2 below.

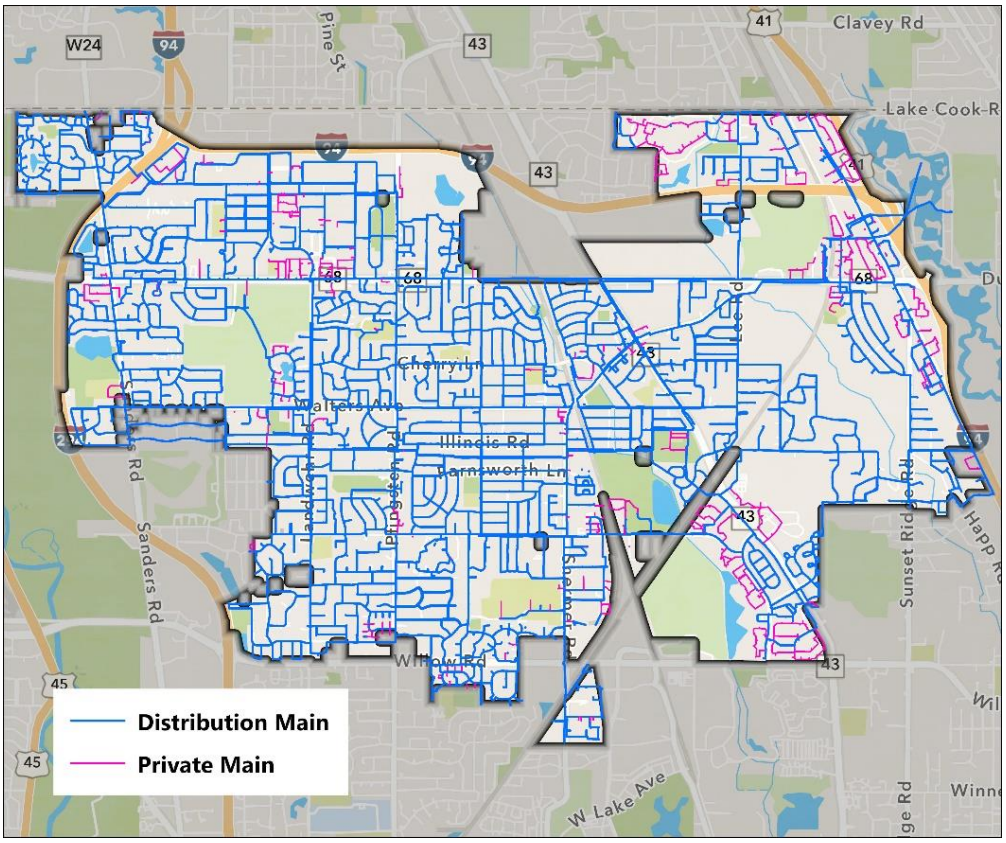


Figure 2 - Village of Northbrook Water Distribution System Map

Additionally, the Village performs regular testing for lead throughout the distribution system. In accordance with the LCRR, the Village has resumed standard monitoring at 60 sites, semi-annually. Results

from the last three rounds of testing are shown below in Table 4. The Village of Northbrook is in full compliance with IEPA and USEPA, which requires a community to be below an Action Level of 15 parts per billion at the 90th percentile. For reference, if a community were to sample at 10 locations and order the sample results from these locations from least to greatest, the 90th percentile would be the ninth highest sample result.

Under the LCRR, an additional sampling limit of 10 parts per billion called the Trigger Level was introduced, effective January 2025. If the Trigger Level is exceeded, a community must take certain actions. The LCRR also introduced changes to lead sampling procedures.

Table 4 - Lead Sampling Results

Year	No. of Sites	Action Level (AL) (parts per billion)	90th Percentile (parts per billion)	No. of Sites over AL
2023	30	15	4.5	0
2020	30	15	4.2	1
2017	30	15	5.73	1

The Village also publishes their annual water quality report (also known as a Consumer Confidence Report) on the Village's website by July of each year. This report provides additional information on the Village's source water, any contaminants found in the water and ways residents may get involved to protect drinking water.

3.3. Future Service Area

At this time, the Village of Northbrook does not anticipate any annexations or planned future expansion. As such, the Village is not anticipating any significant changes to the number of water service lines in town.

4. Lead Service Line Replacements

Under the ILSLRNA and the federal LCRR, the Village is required to facilitate the full replacement of lead and GRR water service lines. The ILSLRNA requires lead and GRR water service lines be replaced if they are disturbed (repaired) or starting in 2027 at a designated rate of replacement each year until all lead and GRR water service lines are completely removed. The LCRR requires lead and GRR water service lines be replaced at a designated rate based upon the sample results of a CWS's lead sampling.

4.1. Water Service Line Material Inventory

A comprehensive water service line material inventory includes compiling a list and location of each active water service line within the Village and identifying the material type for both the public side (from the watermain to the b-box/exterior shut-off valve), and the private side (from the b-box into the building/interior shut-off valve). The water piping inside of the building after the interior shut-off valve is deemed internal plumbing. Internal plumbing is the full responsibility of the property owner. Figure 3 below shows the shared responsibility of a water service line in the Village of Northbrook.

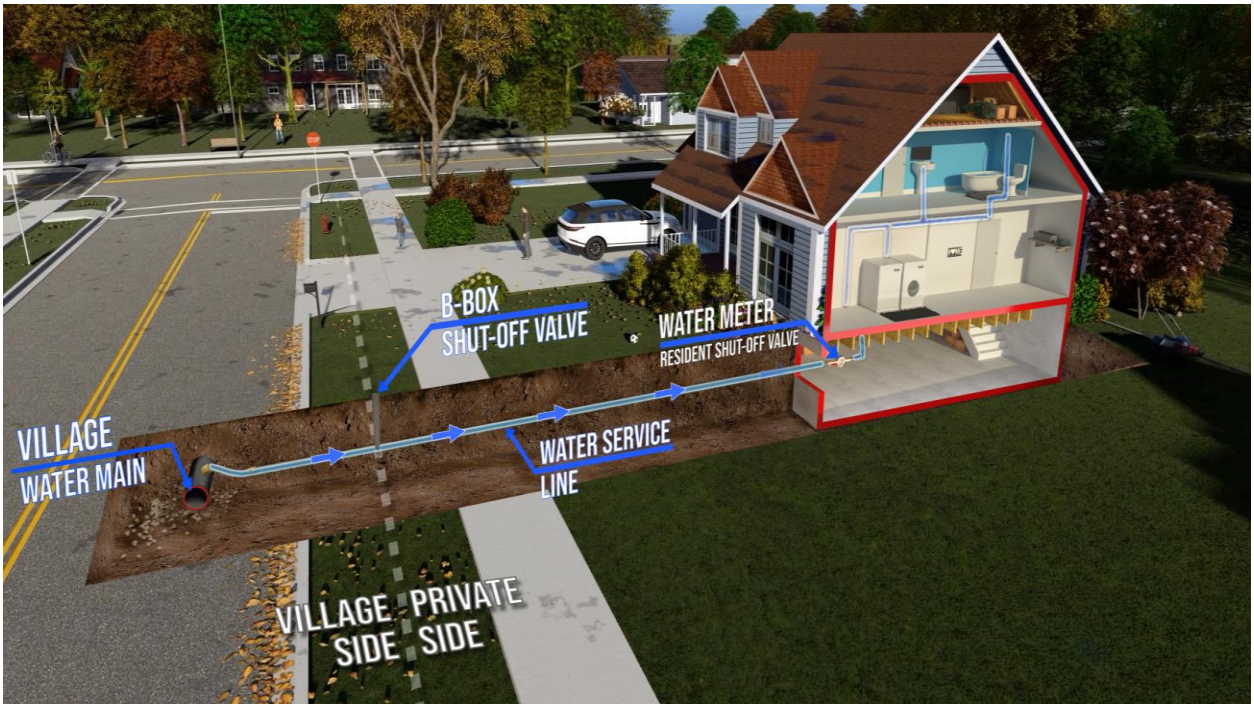


Figure 3 - Water Service Line Ownership

At this time, the Village of Northbrook has identified the material of 12,548 water service lines within their distribution system. Table 5 provides a breakdown of identified materials for both the Village side (Village owned and maintained) and the private side (property owner owned and maintained). The Village expects the total number of lead and GRR service lines will be 292.

Table 5 - Service Line Material Inventory (Updated April 2025)

Service Line Material	Village Side	Private Side
Lead	141	284
Unknown Material	0	0
Galvanized Steel	0	1
Copper	12,144	12,105
Cast/Ductile Iron or Transite	263	158
Unknown Not Lead	0	0

4.1.1. Material Inventory Methodology and Continuing Efforts

When completing the water service line material inventory, a CWS is to utilize, at minimum, the following methods to complete the identification of pipe material types:

- Review of historical documentation, such as as-builts, permits information, construction records, or subdivision plans
- Visual inspection during distribution system maintenance
- Utilize known installation time periods for when lead was or was not installed
- Discuss with staff, contractors, or local plumbers who have worked on service lines connected to the distribution system

Note that under the ILSLRNA and LCRR, the Village is not required to excavate water service lines to determine their material. However, certain circumstances may warrant the Village to complete more invasive methods, such as excavation, on a case-by-case basis.

Village records were reviewed for service line material. In addition, in-home inspections were performed by Village staff and residents by survey request. In-home inspections utilized visual inspection of the water service line as it enters the building to confirm the material type.

4.2. Replacement Schedule

The Village has identified 292 lead and GRR service lines to date and has no remaining unknowns. Although required replacements will not begin until 2027, the Village intends to replace lead service lines (and GRR service lines if encountered) that are within the limits of upcoming Capital Improvement Projects.

Between 2025 and 2026, there are 12 lead service lines within the limits of Upcoming Capital Improvement Projects. The Village anticipates these service lines being replaced before 2027, resulting in 280 lead service lines in 2027.

Water service lines that have been identified as lead to date are shown below in Figure 4. Note that the galvanized service lines identified below do not automatically require replacement. Additional

investigation may be required by the Village to determine if a galvanized service line requires replacement. Appendix B shows all service line material types throughout the Village.

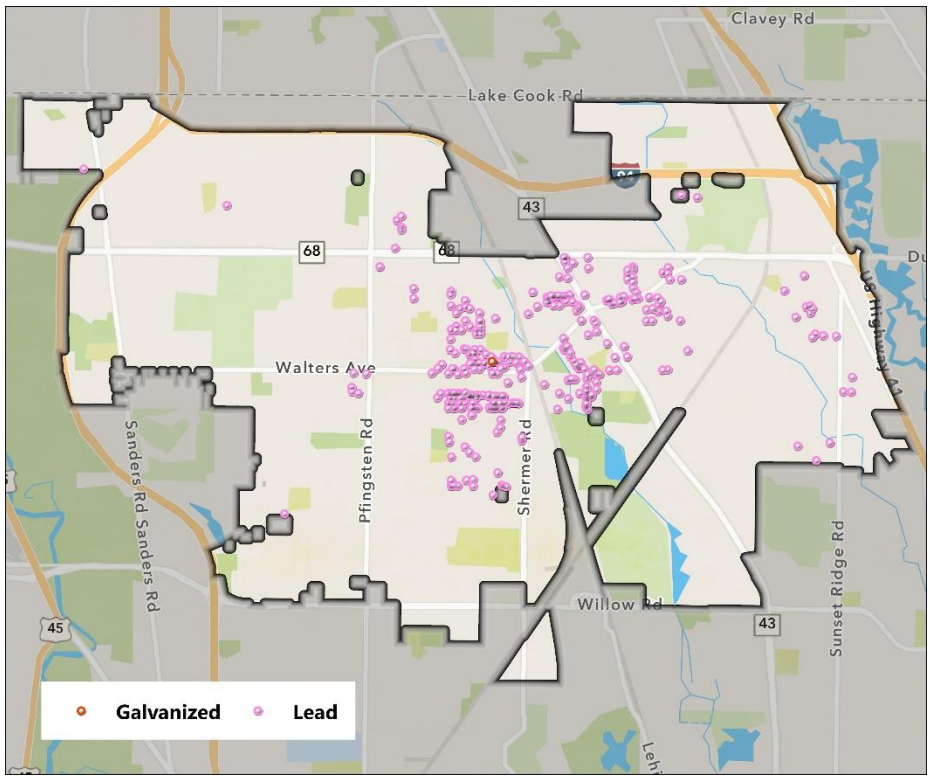


Figure 4 - Village of Northbrook Identified Lead Service Line Locations (Updated April 2025)

The Village does not expect to identify additional lead water service lines beyond those seen above in Figure 4.

4.2.1. Federal Replacement Schedule

Per the LCRR, the Village must initiate lead and GRR water service line replacements based upon the results of the water sampling conducted throughout the distribution system at specified locations/properties approved by the state's primacy agency (agency responsible to ensure that a CWS meets all national drinking water regulations). The Village is required to respond under the LCRR if the following occurs:

- **Exceedance of Trigger Level:** In the event that the Village has an exceedance of 10 parts per billion at the 90th percentile, the Village must recommend a goal replacement rate. The Village will aim to replace 3% of lead water service lines annually, until the Village no longer exceeds the Trigger Level.
  Note that a replacement goal rate is only for CWS's that serve more than 10,000 people.

- **Exceedance of Action Level:** In the event that the Village has an exceedance of 15 parts per billion at the 90th percentile, the Village must begin annual lead and GRR water service line replacements at a rate of 3% per year.

The above requirements became effective October 2024; however, they are superseded by Illinois required rate of lead and GRR water service line replacements starting in 2027, as described in Section 3.2.2 Illinois Replacement Schedule. In October 2024, USEPA finalized the LCRI, which requires communities to replace all LSLs and GRRs by 2037, regardless of sampling results. For the purposes of this draft LSLR Plan, only the LCRR has been considered.

4.2.2. Illinois Replacement Schedule

Per the ILSLRNA, the State of Illinois has set Annual Replacement Rates based on the number of lead and GRR water service lines a community has identified. Table 6 below shows the tiered rate of replacement per the LSLRNA.

Table 6 - Lead Service Line Replacement Rate Requirements (Per Public Act 102-0613)

Total Lead and GRR Service Lines	Annual Replacement Rate	Timeline (years)	Completion Year
0-1,200	**7%**	**15**	**2042**
1,201-4,999	6%	17	2044
5,000-9,999	5%	20	2047
10,000-99,999	3%	34	2061
100,000+	2%	50	2077

Based on the number of lead and GRR water service lines identified, the Village of Northbrook will be required to meet a 7% annual rate of replacement starting in 2027. Under the ILSLRNA, the Village of Northbrook will work to maintain this replacement rate and verify at set goal years that completed replacements are on schedule. Table 7 below indicates the anticipated replacements schedule based on the estimated 292 lead and GRR service lines.

Table 7 - Mandatory Lead Service Line Replacements

Year End	Known LSL	Annual Required Replacements	Planned Replacements[1]		Non-Lead	Total Service Lines
			CIP	LSLR Program		
2027	280[2]	20	35	0	12,271	12,548
2028	245	20	6	14	12,326	12,548
2029	225	20	3	17	12,346	12,548
2030	205	20	28	0	12,366	12,548
2031	177	20	5	15	12,394	12,548
2032	157	20	2	18	12,414	12,548
2033	137	20	0	20	12,434	12,548
2034	117	20	0	20	12,454	12,548
2035	97	20	0	20	12,474	12,548
2036	77	20	0	20	12,494	12,548

Year End	Known LSL	Annual Required Replacements	Planned Replacements[1]		Non-Lead	Total Service Lines
			CIP	LSLR Program		
2037	57	20	0	20	12,514	12,548
2038	37	20	0	20	12,534	12,548
2039	17	17	0	17	12,548	12,548
2040	0	0	0	0	12,548	12,548
2041	0	0	0	0	12,548	12,548

Notes:

1. The Village will continue to update replacements accruing as a part of upcoming Capital Improvement Plan (CIP) programs versus a separate Lead Service Line Replacement (LSLR) Program.
2. At this time, the Village is estimating to have 292 lead service lines, with 12 being replaced between 2025 and 2026, resulting in 280 lead service lines at the end of 2026.

At this time, the Village will need to replace a minimum of 20 water service lines each year to meet the required rate of replacement. To achieve this, the Village will replace lead and GRR water service lines within the limits projects identified in the Village's Capital Improvement Plan (CIP), where appropriate, in addition to a separate program specifically for lead and GRR water service line replacements.

4.3. Prioritization of Lead Service Line Replacements

The Village first intends to prioritize the replacement of lead service lines at facilities that serve populations most sensitive to the effects of lead. Facilities that have a higher likelihood to serve children and/or pregnant women have been identified in Section 4.3.1 High-Risk Facility Replacements below, in accordance with the ILSLRNA and LCRR. Additionally, the Village has reviewed other CIP programs to assist with the prioritization of the remainder of replacements, as identified in Section 4.3.2 Future Replacement Planning.

4.3.1. High-Risk Facility Replacement

High-Risk facilities, as described by the ILSLRNA, are facilities such as preschools, day care centers, day care homes, parks, and playgrounds, hospitals, and clinics. The Village has identified 128 high-risk facilities, with one of the high-risk facilities having a known lead service line. Table 8 below shows the number and type of high-risk facilities identified in the Village.

Table 8 - Lead Service Lines by High-Risk Facility Type (Updated April 2025)

High-Risk Facility	No. of Facilities	Reported Lead
Preschool/Day Care Facility	18	0
Elementary School (K – 5th Grade)	18	0
Secondary School (6th – 12th Grade)	4	0
Women, Infants and Children (WIC) and Head Start programs	0	0
Medical Facility[1]	46	1

Local welfare agencies (shelters)	1	0
Community Centers	8	0
Places of worship	15	0
Parks and playgrounds	18	0

Note:

1. For the purpose of this Plan, hospitals, emergency care, clinics, pediatricians, obstetricians-gynecologists, and midwives were considered medical facilities.

At the high-risk facility with a lead service line, the Village will work with the facility to execute the replacement of the water service line by 2029. Figure 5 below shows the relative location of the high-risk facility with a lead service line.

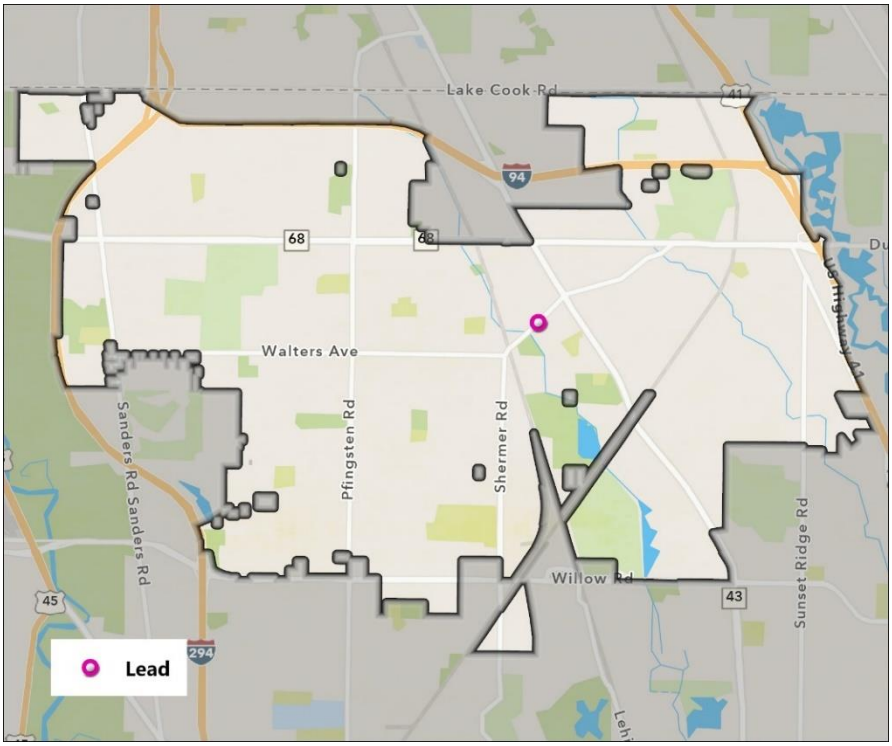


Figure 5 - High-Risk Facilities with a Lead Service Line

4.3.2. Future Replacement Planning

In an effort to minimize inconvenience to residents and reduce overall construction costs, the Village's Capital Improvement Plan (CIP) projects were reviewed and considered to assist with the prioritization of future LSLs replacements. The intent is to schedule replacements either during planned underground infrastructure improvements, such as water main replacement projects, or to schedule replacements in advance of planned roadway resurfacing or sidewalk improvements.

At this time, the Village's Capital Improvement Projects have been reviewed as a part of this draft LSLR Plan. As a part of any Village water main project, the Village will be required to replace any lead service lines that are disturbed. It is recommended that the Village plan to replace any lead or GRR water service lines in advance of their scheduled road improvement programs to reduce the need to patch a newly

resurfaced road in the following years. Figure 6 shows the limits of the CIP projects by program year. The CIP projects are expected to include watermain and road improvements.

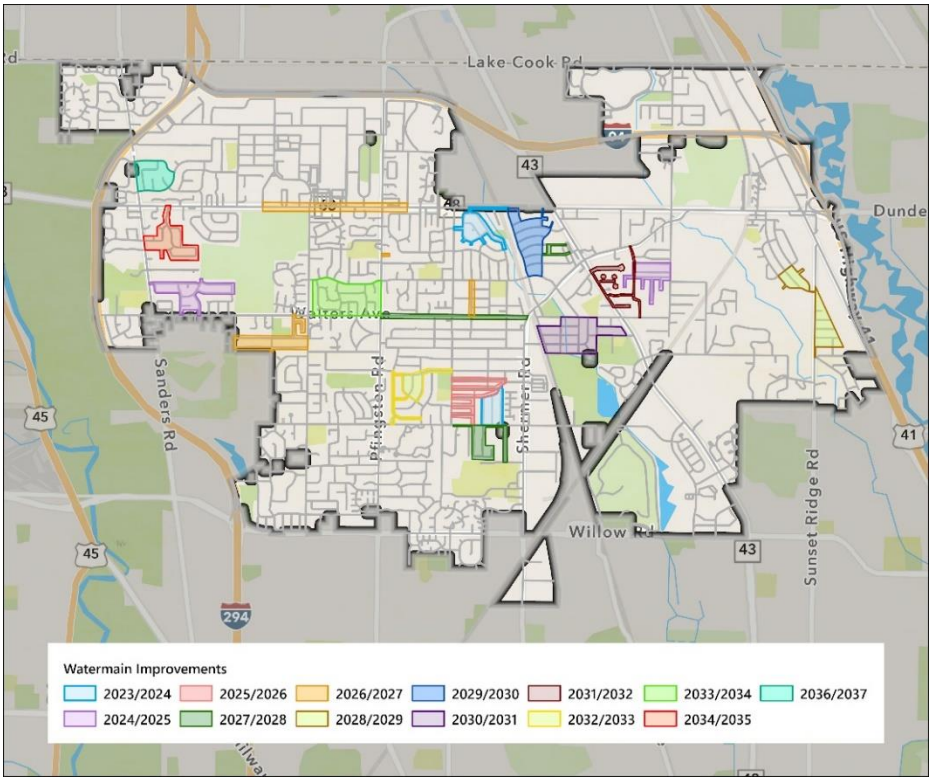


Figure 6 - Village Capital Improvement Project Areas

At this time, there are a total of 95 known lead service lines identified within the limits of the Capital Improvement Projects. Table 9 below shows the total number of known and unknown service line materials within each of the CIP project's limits.

Table 9 - Lead Water Services within CIP Limits

Project Year	Known Lead Service Lines
2025	8
2026	4
2027	35
2028	6
2029	3
2030	28
2031	5
2032	0
2033	2
Total within Project Limits:	**95**

Starting in 2027, the Village will be required to replace an estimated 20 water service lines each year. The Village will need to include additional replacements beyond those identified within the limits of the CIP projects to meet the required 20 water service lines each year. The Village is considering the following ways to prioritize lead and GRR water service lines replacements outside of planned Capital Improvement Projects:

- **50/50 Program –** If a property owner has been informed that their property has a lead water service line and has decided to replace it, or if a water main break or service line disruption occurs, they may participate in the Lead Service Line Replacement Cost Share Program. This program entitles property owners to receive a reimbursement of up to 50% of the cost of the lead service line replacement, with a maximum reimbursement of $5,000, for the replacement of the lead service line between the shut-off valve and the water meter. Property owners must comply with all the terms and conditions set out in the SOP. For more information, visit https://northbrook.il.us/1118/Lead-Service-Line-Replacement.
- **Census Tracts** – In an effort to prioritize disadvantaged customers, the Village is considering prioritizing areas of town based upon census tract information.
- **Presence of Children** – Children under the age of six and pregnant women are the most susceptible to the health effects from lead exposure. The Village is considering prioritizing areas of town where the Village anticipates higher concentrations of children, such as near elementary schools or parks/playgrounds.
- **Lead and GRR Water Service Line Locations** – In an effort to reduce the mobilization costs related to moving construction efforts throughout a community, the Village will work to minimize the limits of each year's replacement project by focusing on areas of town with higher concentrations of lead and GRR water service lines.
- **Future CIP Projects** – The Village will continue to plan other CIP projects based on community needs. As CIP projects are developed, the Village will coordinate lead and GRR water service line replacements within the limits of these projects.

5. Financing Lead Service Line Replacements

The ILSLRNA and the LCRR do not require a CWS to finance the full replacement of a lead or GRR water service line. As described under Section 4.1 Water Service Line Material Inventory, maintaining a water service line is a shared responsibility between the Village and the property owner. The Village is currently assessing what funding options are available for both the Village and property owners. Different funding sources have different requirements associated with utilizing those funds and impact the Village and their consumers in different ways.

5.1. Water Service Line Replacement Cost Analysis

In recent years, the water industry has seen an increase in replacement costs for lead and GRR water service lines, mostly due to an increase in material costs and contractor availability. Additionally, each water service line requiring replacement is unique and dependent on the constraints of an individual property. Interior and exterior restoration efforts may vary from property to property, even within the same area of the Village. Due to this, an average construction cost ranging from $8,000 to $20,000 for a full water service line replacement (from water main to inside the property to the first interior shut-off valve or 18-inches, whichever is shorter) was used for the purpose of this draft LSLR Plan. This cost range is based on replacements completed within the Village recently.

Table 10 provides a cost estimate range to replace all lead water service lines in their entirety within the Village. Note that at this time, the Village is estimating 292 lead and GRR water service lines, but this number is subject to change as the Village continues their effort to identify the material of remaining unknown water service lines.

Table 10 - Estimated Cost Range to Replace ALL LSLs (Undated April 2025)

Full Service Line Replacements	Replacement Cost Estimate (2025 Dollars)	
	Low Range	High Range
292 Lead and GRR Service Lines	$ 2,340,000	$ 5,840,000
Design Engineering (5%)	$ 120,000	$ 290,000
Construction Engineering (8%)	$ 190,000	$ 470,000
Engineering & Construction Sub Total:	$ 2,650,000	$ 6,660,000
Contingency (20%)	$ 530,000	$ 1,320,000
Replacement Total:	**$ 3,180,000**	**$ 7,920,000**
Annual Replacement Cost over 10 years	**$ 320,000**	**$ 790,000**
Annual Replacement Cost over 15 years	**$ 210,000**	**$ 530,000**

For budgetary purposes, design engineering, construction engineering, and a contingency were included in the cost estimate. Design and construction engineering efforts will vary significantly, depending on if

the Village is using Village staff or a consultant and whether a water service line is being replaced as a part of an existing CIP project or a stand-alone lead water service line replacement program. At this time, the Village is estimating that the total cost to replace all 292 lead and GRR services lines will be $7.9 million, with an annual estimated cost starting in 2027 to be roughly $530,000 over 15 years or $790,000 over 10 years.

5.1.1. Upcoming Replacement Costs within CIP Project Limits

The Village has identified lead service lines within the limits of upcoming CIP projects through 2033. As required by the ILSLRNA, the Village will be required to facilitate the replacement of any lead water service line disturbed as a part of the watermain project. Additionally, the Village will be proactive and replace any lead water service lines in advance of planned road programs.

Table 10 provides a breakdown of the additional water service line replacement construction cost anticipated for each of the Village's CIP projects. For budgetary purposes, a cost of $20,000 per water service line replacement was used. However, the Village currently has a 50/50 cost share program with property owners on Village CIP programs. Property owners are notified in advance of a Village CIP project and if they elect to participate, the Village will finance the replacement of the public side and 50% of the private side up to $5,000. Table 11 is for budgetary purposes only and the total financial impact on the Village will vary based on a property owner's participation in the Village's 50/50 cost-share program.

Table 11 - Estimated Replacement Costs for Upcoming CIP Projects

Project Year	Known Lead Service Lines	Entire Replacement Cost
2025	8	$ 160,000
2026	4	$ 80,000
2027	35	$ 700,000
2028	6	$ 120,000
2029	3	$ 60,000
2030	28	$ 560,000
2031	5	$ 100,000
2032	0	$ -
2033	2	$ 40,000
Total within Project Limits:	**95**	**$ 1,900,000**

5.2. Funding Considerations

Understanding the various funding mechanisms available is crucial for the Village to begin planning future replacements and sequencing replacement work with other infrastructure projects. Funding sources may include, but are not limited to:

- Federal loan and grant programs
- State loan and grant programs
- County grant programs
- Local revenue sources, such as water and sewer rates

The Village's eligibility to obtain funds from any of the above sources will be dependent on the requirements of that funding source.

5.2.1. State and Federal Funding Sources

State and federal funding sources for lead and GRR replacements are still relatively inconsistent in availability and most require a community to be considered disadvantaged (which is usually based on the median household income) to be eligible to apply. However, two funding sources the Village may consider to supplement the cost of lead service line replacements include the following:

- U.S. Congressional Directed Spending: Senators can advocate for programs critical to the nation, constituents, and their states that promote economic growth, education, and health care initiatives. Funds are allocated each fiscal year by the U.S. Senate Committee on Appropriations.
- Public Water Supply Loan Program (PWSLP): A low interest loan program funded through Illinois State Revolving Fund to provide financial assistance to eligible public water systems on projects that maintain compliance with the requirements of the Safe Drinking Water Act and Illinois statues/regulations. IEPA has announced for lead service line replacement projects a 0% interest loan for up to 30 years, with additional financial assistance including principal forgiveness and a 40-year loan for disadvantaged communities.

In addition, Cook County is offering free lead service line replacements to licensed home-based childcare providers within suburban Cook County through their LeadCare program. Although this program does not directly assist the Village in funding replacements, it would allow the Village to direct any eligible childcare facility with a lead or GRR water service line to the program. At this time, the Village has no known lead or GRR water service lines at home-based childcare providers.

5.2.2. Local Revenue Funding Sources

If a property owner has been informed that their property has a lead service line and has decided to replace it, or if a water main break or service line disruption occurs, they may participate in the Lead Service Line Replacement Cost Share Program. This program entitles property owners to receive a reimbursement of up to 50% of the cost of the lead service line replacement between the exterior shut-off valve and water meter, with a maximum reimbursement of $5,000. The Village covers the cost of the replacement from water main to the exterior shut-off valve in its entirety. Property owners must comply with all the terms and conditions set out in the SOP.

5.3. Current Funding Considerations

At this time, the Village of Northbrook has a cost-share program for lead and GRR water service line replacement. For more information, visit www.northbrook.il.us/1118/Lead-Service-Line-Replacement.

6. Replacement Procedures

Under the ILSLRNA, partial lead and GRR water service line replacement is prohibited, except in the event a property owner has denied access. As described under Section 4.1 Water Service Line Material Inventory, maintaining a water service line is a shared responsibility between the Village and the property owner. To facilitate and complete the replacement of the entire water service line, from the water main to the first interior shut-off valve or 18-inches within the property, work is completed both within the Village right-of-way as well as on private property.

A lead or GRR water service line replacement shall be completed in accordance with the ILSLRNA, LCRR, Illinois Plumbing Code and Village ordinances. Replacement requirements vary depending on whether the Village or the property owner initiates a replacement and are outlined in the below sections.

6.1. Community Initiated Replacement Procedure

When the Village initiates the replacement of a lead service line, whether planned or during emergency maintenance efforts, the Village must follow specific procedures during the bidding process, resident notification process and at time of construction. Below identifies the various replacement scenarios. These procedures are based on current state and federal regulations.

6.1.1. Minorities, Women, and Persons with Disabilities Act

Per the ILSLRNA, the Village is to make a good faith effort to use contractors and vendors owned by minority persons, women, and persons with a disability for not less than 20% of the total contracts, as defined in Section 2 of the Business Enterprise for Minorities, Women, and Persons with Disabilities Act.

1. Contracts representing at least 11% of the total projects shall be awarded to minority-owned businesses.
2. Contracts representing at least 7% of the total projects shall be awarded to women-owned businesses.
3. Contracts representing at least 2% of the total projects shall be awarded to businesses owned by persons with a disability.

In order to meet the above standards, the Village will require bidders to post in the local newspaper in order to reach contractors and vendors owned by minority persons, women, and persons with a disability. As a prerequisite to demonstrate compliance with the Village of Northbrook's disadvantaged business policy, bidders will need to provide the following at the time of bidding:

1. Completed and signed certification attesting that the bidder will not have any sub-contractors or sub-agreements to complete the water service line replacement work, or
2. Provide adequate proof of publication, including an actual copy of the newspaper advertisement from a daily or regional newspaper. The advertisement must run one day at least 16 days prior to bid opening.

a. A list of all disadvantaged business enterprises (DBE) and non-DBEs that submitted proposals to the Village and/or Bidder shall be provided within five business days after receipt of Bids.

6.1.2. Scheduled Water Service Line Replacements

A scheduled replacement is when the Village has an upcoming project, such as a watermain replacement project, sewer replacement project, or a lead and GRR water service line replacement project, where lead or GRR water service lines are known or suspected and will be physically disturbed, requiring full replacement of the service line. Under these circumstances, the Village will complete the following:

1. At least 45 days prior to replacement, the Village or the Village's representative shall contact the property owner by written notice of the potentially affected service line to request access and permission to replace the lead or GRR water service line.
   a. If the property owner does not respond within 15 days, the Village shall post the request at the building entrance.
      i. If private side replacement is denied due to the property owner not granting access to the property, the Village will request that the property owner should sign the Illinois Department of Public Health's (IDPH) Waiver of Complete Lead Service Line Replacement. The Village may continue with the replacement of the public side and continue with steps 2 through 5.
         1) If a property owner of a nonresidential building or residence operating as a rental property denies a complete water service line replacement, the property owner is responsible for installing and maintain point-of-use filters at all fixtures intended to supply water for the purpose of drinking, food preparation or making baby formula. The filters must meet NSF/ANSI 53 and NSF/ANSI 42 for the reduction of lead.
      ii. If the owner fails to respond, the Village shall notify IDPH within 30 days by filling out the Partial Lead Service Line Replacement – IDPH Notification Form. The Village may continue with the replacement of the public side and continue with steps 2 through 5.
2. At least 14 days prior to replacement, by mail/posted at entrance/electronically, the Village or the Village's representative shall notify the owner and occupants of the upcoming replacement. The notice will include the following information:
   a. The replacement of the lead or GRR water service line may result in a temporary increase in lead levels.
   b. Information on best practices to reduce lead in drinking water.
   c. Information regarding health dangers to young children and pregnant women.
3. The standard method of conducting full lead service line replacement shall be directional drilling, which will minimize the area disturbed by construction and reduce restoration costs. However, site conditions will vary and may require other construction methods, such as pulling a new water service line or performing open-cut replacement. A licensed plumbing contractor is required to perform this work.

When using directional drilling or the pulling construction method, a water service line may be replaced at or in close proximity to the same location of the existing lead or GRR water service line, even if water-sewer service separation requirements are not met, so long as the water service line is either encased or Type K Copper is used, and there is no observed leak on the sewer service per IDPH's Sewer/Water Service Separation Variance. In the event of open-cut replacement, if the water-sewer service separation requirements are not met, the water service will require encasement.

4. At the time of replacement, the Village shall provide the property owner with a Point-Of-Use Filter or Pitcher Filter meeting NSF/ANSI 53 and NSF/ANSI 42 requirements and provides up to six months of filtration.

5. Within 24 hours of replacement, the Village shall notify the owner and occupants of the executed replacement, including:
   a. The replacement of the lead or GRR water service line may result in a temporary increase in lead levels for the next six months.
   b. Information on best practices to reduce lead in drinking water, including the flushing procedures described in Section 6.3 Flushing Procedure After Lead Service Line Replacement.
   c. Information regarding health dangers to young children and pregnant women.
   d. Offer to have the property's water sampled for lead in the next three to six months by the Village or Village's representative. The Village must facilitate the sample being completed, record property participation and sample results (if completed), but the Village is not required to pay for the sample.

6.1.3. Emergency Water Service Line Repair and Replacements

An emergency replacement is when the Village disturbs a lead or GRR water service line during unplanned maintenance, such as a water main break or water service line leak. The Village may temporarily repair the lead service line and maintain water service, however by disturbing a lead service line, full replacement will then be required.

1. At the time work is initiated, by mail/posted at entrance/electronically, the Village shall notify the owner and occupants of the lead service line and provide a Point-Of-Use Filter or Pitcher Filter meeting NSF/ANSI 53 and NSF/ANSI 42 requirements until such time that the remaining portions service line have been replaced or replacement is waived. The notification shall include:
   a. The replacement of the lead or GRR water service line may result in a temporary increase in lead levels.
   b. Information on best practices to reduce lead in drinking water.
   c. Information regarding health dangers to young children and pregnant women.
   d. Information on how to use the provided water filter (pitcher or point-of-use).
   e. Information on the upcoming full water service line replacement and required coordination efforts.

2. From the time of the repair, the Village has 30 days, or 120 days in the event of weather or other circumstances beyond reasonable control that prohibits construction, to facilitate the full replacement of the lead or GRR water service line.
    a. If replacement is denied due to the property owner not granting access to the property, the Village will request that the property owner should sign the Illinois Department of Public Health's (IDPH) Waiver of Complete Lead Service Line Replacement.
        1) If a property owner of a nonresidential building or residence operating as a rental property denies a complete water service line replacement, the property owner is responsible for installing and maintaining point-of-use filters at all fixtures intended to supply water for the purpose of drinking, food preparation or making baby formula. The filters must meet NSF/ANSI 53 and NSF/ANSI 42 for the reduction of lead.
    b. If the owner fails to respond, the Village shall notify IDPH within 30 days by filling out the Partial Lead Service Line Replacement – IDPH Notification Form.
3. The remaining replacement procedures will follow steps 2 through 5 in Section 6.1.2. Scheduled Water Service Line Replacement.

6.2. Property Owner Initiated Replacement Procedure

When the property owner initiates the replacement of a lead service line, whether planned or during emergency maintenance efforts, the property owner and Village must follow specific procedures during prior to and at time of replacement. These procedures are based on current state and federal regulations.

6.2.1. Scheduled Water Service Line Replacement

A scheduled replacement is when the property owner is planning to replace their lead or GRR water service line. This may be due to wanting to remove the lead or GRR water service line or may be due to other property improvements requiring an increase in size of their water service line. Under these circumstances, the property owner will complete the following:

1. The property owner must notify the Village at least 45 days before commencing work to replace the lead or GRR water service line.
2. The Village of Northbrook requires property owners to obtain a permit for water service line replacements, which can be initiated by contacting the Village's Development and Planning Services.
    a. The Village will provide the following information to a property owner intending to replace their lead or GRR water service line.
        i. The replacement of the lead or GRR water service line may result in a temporary increase in lead levels for the next six months.
        ii. Information on best practices to reduce lead in drinking water, including the flushing procedures described in Section 6.3 Flushing Procedure After Lead Service Line Replacement.
        iii. Information regarding health dangers to young children and pregnant women.

iv. Offer to have the property's water sampled for lead in the next three to six months by the Village or Village's representative. The Village must facilitate the sample being completed, record property participation and sample results (if completed), but the Village is not required to pay for the sample.

6.2.2. Emergency Water Service Line Repair and Replacement

An emergency replacement is when property owner disturbs their lead or GRR water service line during unplanned maintenance, such as water service line leak. The property owner may temporarily repair the lead or GRR water service line and maintain water service, however by disturbing the service line, full replacement will then be required. Under these circumstances, the property owner will complete the following:

1. The property owner must provide filters in each kitchen area. The filters must meet NSF/ANSI 53 and NSF/ANSI 42 requirements for the reduction of lead and particulate.
2. If the property owner notifies the Village of the completion of the emergency repair, the Village has 30 days, or 120 days in the event of weather or other circumstances beyond reasonable control that prohibits construction, to complete the replacement of the public portion of the lead or GRR water service line.
    a. At the time of the public side replacement, the Village will provide a Point-Of-Use Filter or Pitcher Filter meeting NSF/ANSI 53 and NSF/ANSI 42 requirements and provides up to six months of filtration. Additionally, the Village will provide notice to the property owner and occupants of the completed lead or GRR water service line replacement. The notice will include:
        i. The replacement of the lead or GRR water service line may result in a temporary increase in lead levels for the next six months.
        ii. Information on best practices to reduce lead in drinking water, including the flushing procedures described in Section 6.3 Flushing Procedure After Lead Service Line Replacement.
        iii. Information regarding health dangers to young children and pregnant women.
        iv. Offer to have the property's water sampled for lead in the next three to six months by the Village or Village's representative. The Village must facilitate the sample being completed, record property participation and sample results (if completed), but the Village is not required to pay for the sample.

6.3. Flushing Procedure After Lead Service Line Replacement

The following flushing instructions are in accordance with ANSI/AWWA C810-17 (First Edition) Replacement and Flushing of Lead Service Lines Section 4.4.2 "Flushing by the customer after lead service replacement." Property owners should follow the below flushing instructions for the day of replacement or before water is used following a lead or GRR water service line replacement to reduce particulate lead.

The steps below should be followed every two weeks for three months following replacement. Hot water should not be used until initial flushing is complete.

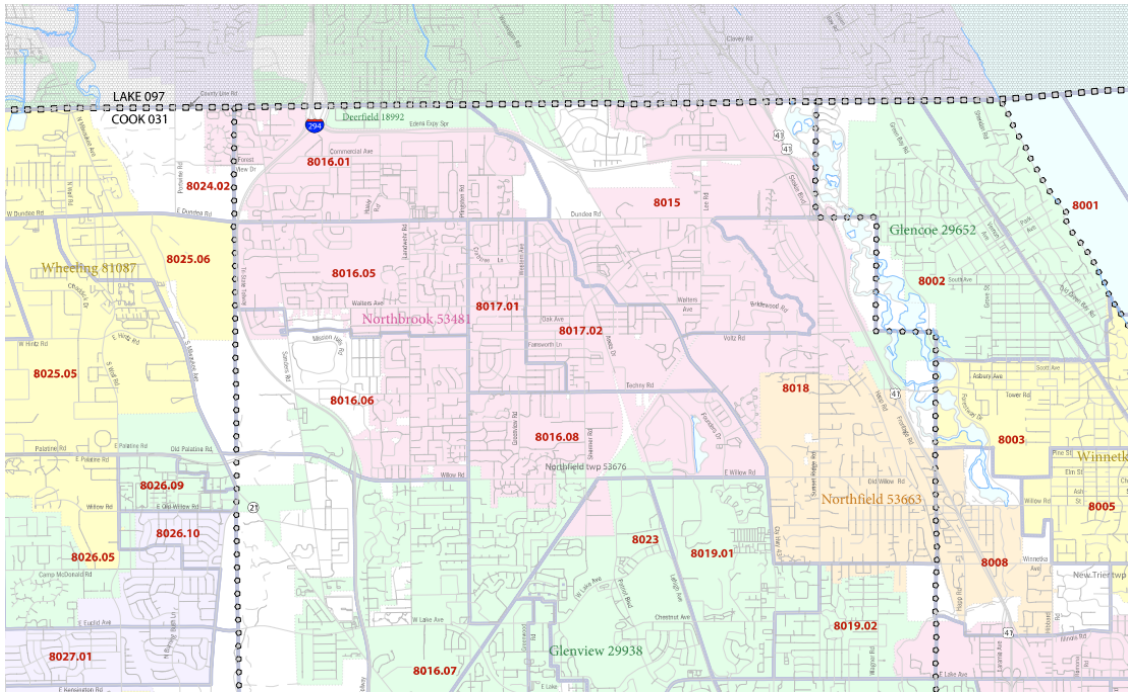
1. Locate all faucets in the building, including laundry tubs, hose-bibs, bathtubs, and showers.
2. Remove aerators and screens from faucets where possible, including showerheads.
3. Open faucets in the basement or lowest floor in the building. Using cold water, leave faucets running at the highest rate possible.
4. Open faucets on the next highest floor in the building, going from lowest level to the highest level in the building, until all faucets are open on all floors in the building.
5. Once all faucets are open, leave the water running for at least 30 minutes.
6. After 30 minutes, turn off faucets in the order they were opened.
7. Clean aerators or screens at each faucet.

Appendix A: Northbrook Census Tracks

Lead Service Line Replacement Funding
Census Metric Data and Percentile Ranks
Data from 2021 5-year American Community Survey

		Median Household Income			Social Security Income			Poverty			Supplemental Security Income		
		Table B19013			Table B19055			Table S1701			Table B19056		
Census Tract	Total	Dollars	Percentile Rank	Points	% of Population	Percentile Rank	Points	% of Population	Percentile Rank	Points	% of Population	Percentile Rank	Points
Census Tract 8015, Cook County, Illinois	100	$ 124,488	89.369	0	43.89	92.75	45	3.8	14.772	5	2.95	39.68	15
Census Tract 8016.01, Cook County, Illinois	115	$ 86,250	69.746	10	39.33	81.909	40	8.6	42.782	20	1.85	24.047	10
Census Tract 8016.05, Cook County, Illinois	100	$ 167,045	97.342	0	33.95	61.785	30	1.8	4.852	0	0.00	0	0
Census Tract 8016.06, Cook County, Illinois	80	$ 148,133	94.932	0	38.03	78.171	35	4.7	20.761	10	2.66	35.503	15
Census Tract 8016.08, Cook County, Illinois	110	$ 124,855	89.462	0	43.83	92.69	45	4.9	22.02	10	2.22	29.084	10
Census Tract 8017.01, Cook County, Illinois	100	$ 205,324	99.134	0	24.12	24.78	10	1.8	4.852	0	2.43	32.094	15
Census Tract 8017.02, Cook County, Illinois	75	$ 171,694	97.62	0	22.27	19.105	5	2.3	6.664	0	0.45	6.234	0
Census Tract 8018, Cook County, Illinois	110	$ 162,468	97.002	0	36.29	72.187	35	7.8	38.636	15	2.72	36.363	15

	Houses Built pre-1990			Children Under 6			Unemployment			Lead Service Line Burden		
	Table B25034			Tables B09001 & B01003			Table S2301					
Census Tract	% of Houses	Percentile Rank	Points	% of Population	Percentile Rank	Points	% of Population	Percentile Rank	Points	% of Service Lines	Points	Total
Census Tract 8015, Cook County, Illinois	78.13	42.076	20	3.96	13.478	5	3.3	24.961	10	2.53%	0	100
Census Tract 8016.01, Cook County, Illinois	62.24	20.423	10	4.55	19.22	5	5.2	48.91	20	2.53%	0	115
Census Tract 8016.05, Cook County, Illinois	88.60	64.742	30	6.16	41.51	30	3.5	27.448	10	2.53%	0	100
Census Tract 8016.06, Cook County, Illinois	71.54	31.265	15	4.42	18.145	5	1.4	4.789	0	2.53%	0	80
Census Tract 8016.08, Cook County, Illinois	71.09	30.497	15	6.40	45.471	30	1.9	8.75	0	2.53%	0	110
Census Tract 8017.01, Cook County, Illinois	79.64	45.546	20	7.65	64.292	50	2.4	14.614	5	2.53%	0	100
Census Tract 8017.02, Cook County, Illinois	63.36	21.713	10	7.38	60.485	50	3.3	24.961	10	2.53%	0	75
Census Tract 8018, Cook County, Illinois	72.65	33.138	15	6.17	41.571	30	1.1	3.346	0	2.53%	0	110



Appendix B - Water Service Line Material Inventory