



OFFICIAL NOTICE AND AGENDA  
of a meeting of a City Board, Commission, Department  
Committee, Agency, Corporation, Quasi-Municipal  
Corporation, or Sub-unit thereof.

A Meeting of Wausau Water Works Commission will be held in the  
Council Chambers, 1st Floor City Hall, Wausau, WI 54403 at 1:30 p.m. on  
Monday, April 3<sup>rd</sup>, 2023.

**Members: Katie Rosenberg (President), Dawn Herbst, Jim Force, Joe Gehin, John Robinson**

### AGENDA

1. Approve Minutes of March 7<sup>th</sup> 2023 Meeting.
2. Director's Report on Utility Operations
  - Update on Projects for 2023
  - Wastewater Facility Construction Update
  - Wastewater Discharging Quality Effluent
  - Wastewater Collection System Technician (Sewer Maintainer)-1 Applicant Awaiting Start Date from Human Resources
  - Wastewater Plant Operation Technician- 9 Applicants Received, Interviews Commenced
  - Wastewater- Hiring/Training of New Staff Continues to be Challenging
  - Wastewater 2023 Project Updates
  - Wastewater- Slip Lined High Density Polyethylene Pipe (HDPE) Shifting Issue on Sturgeon Eddy Road
3. Discussion and Possible Action Approving a Communication Plan for Private Side Lead Service Line Replacement.
4. Discussion on Future Educational Presentations and Policies the Commission Would Like to Consider.

Adjourn.

*\*Next meeting scheduled for May 1<sup>st</sup> 2023 at 1:30 P.M.*

Signed by: /s/ Katie Rosenberg, Mayor  
Presiding Officer or Designee

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THIS NOTICE POSTED AT CITY HALL AND EMAILED TO CITY PAGES AND DAILY HERALD: March 30<sup>th</sup>, 2023 at 10:15 a.m.

*This meeting is being held in person.* Members of the public who do not wish to appear in person may view the meeting live over the internet, cable TV, Channel 981, and a video is available in its entirety and can be accessed at <https://tinyurl.com/wausaucitycouncil>. Any person wishing to offer public comment not appearing in person may e-mail [gina.vang@ci.wausau.wi.us](mailto:gina.vang@ci.wausau.wi.us) with "Water Commission Public Comment" in the subject line prior to the meeting start. All public comment, either by email or in person, will be limited to items on the agenda at this time. The messages related to agenda items received prior to the start of the meeting will be provided to the Chair.

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990 (ADA), the City of Wausau will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs or activities. If you need assistance or reasonable accommodations in participating in this meeting or event due to a disability as defined under the ADA, please call the ADA Coordinator at (715) 261-6622 or [ADAServices@ci.wausau.wi.us](mailto:ADAServices@ci.wausau.wi.us) to discuss your accessibility needs. We ask your request be provided a minimum of 72 hours before the scheduled event or meeting. If a request is made less than 72 hours before the event the City of Wausau will make a good faith effort to accommodate your request.



## **Minutes of March 7, 2023**

A meeting of the Wausau Water Works Commission was called to order at 1:30 p.m. in City Hall on Tuesday, March 7<sup>th</sup>, 2023. In compliance with Wisconsin Statutes, this meeting was posted and receipted for by the Wausau Daily Herald on March 3, 2023.

Members Present: President Rosenberg, Commissioners Herbst, Gehin, Robinson, Force  
Others Present: Eric Lindman, Scott Boers, Ben Brooks, Anne Jacobson, Valerie Swanborg, Jeff Van Ess & Bob Rickabee/Johnson Controls Inc., Sean Wall/MEUW, Susan Wojtkiewicz/Donohue, Tonia Westphal/ Clark-Dietz, Joe Kafczynski/ BecherHoppe.

Via WebEx: Andrew Dow/Donohue, Matthew Bednarski/CDM Smith, Amrou Atassi/CDM Smith.

### **1) Approve Minutes of February 7<sup>th</sup> 2023 Meeting.**

Robinson motioned to approve minutes. Seconded by Gehin.

Robinson requested we amend the minutes to reflect the expression of concerns related to third-party lawsuits that drove behavior that should be factored into consideration on sampling at the wastewater treatment plant.

Robinson motioned to amend the minutes to include those comments. Seconded by Herbst.

Gehin requested that the minutes not be lengthy.

Robinson agreed and stated it used to be the only way for the public to get information relative to the minutes but with youtube, we are presenting the minutes in a recorded fashion, they are long, there are other things omitted and it's hard to determine what should be in it and what shouldn't. The county adopted a policy to just capture the motions but doesn't give the public a reflection on what's discussed. Maybe we could not include everything but capture enough for the intent of the conversation and somehow be in the middle.

Rosenberg questioned if the county's expectations on minutes were included in the rules review committee or something staff came up with?

Robinson replied staff came up with it based on the Wisconsin County's Association and presentation to the board based on recommendations of the WCA.

Force stated he didn't object to the minutes.

Rosenberg stated that from this discussion we would be discussing the minutes internally as there are other committees having similar discussions.

Motion carried 4-1.

### **2) Director's Report on Utility Operations.**

Lindman began that the wastewater increase was summarized with an understanding that we would be reevaluating that later this year and bringing something forward for consideration.

Force questioned the odor at the wastewater plant and if there were any updates.

Brooks replied Gehin stopped by as well to verify if there was an odor present. There may have been a time there was difficulty with the boilers and the digesters pressurizing with roof

release going off that caused that odor.

Gehin stated he was impressed with the outside view of the sludge storage shed covers as they are fully enclosed as before it wasn't. He recommended we have a tour for the Commissioners so they could see what was built in to minimize the odors.

Director's Report Placed on File.

### **3) Presentation by Johnson Controls Inc. (JCI) on Developing Energy Saving Projects with Guaranteed Cost Savings Using WI Performance Contracting and Cooperative Purchasing.**

Lindman began as we move forward with the 5 Year Capital plan, some projects have been moved up, some have been pushed and some are large items we'd like to focus on. We are trying to figure out if there's another approach we could take to get some of these larger capital projects completed that may benefit the Utility and City financially.

Van Ess presented slides in Commission Packet pages 23-31.

Robinson questioned if we were undercounting the flow of water not being billed?

Van Ess replied the 5% inaccuracy was less than the acceptable limit. Mechanical meters slow down over time so with water flowing through them it would measure slower but it's an advantage to the customers. Another inaccuracy was in large meters- maybe it was a commercial building with a larger meter and now they've converted its use but kept the same meter size. Leaks also cause inaccuracies.

Gehin questioned how we are getting meters.

Boers replied meters have been hard to obtain the last two years but there is a standing order for about 11,000 meters. We could continue our plan of 2,500/year but if we wanted we could ramp that up. We are probably low on our reading accuracy; the new plant will reduce our loss water considerably- we don't have chlorination being consumed by Total Organic Carbon (TOC). Van Ess pointed out that we could do this on a lease factor for \$11-\$12 million changeover. I've ran numbers and could probably contract it out for \$4 million. There's a big gap between what was proposed before and what we could do it for- if we borrowed the money, we'd be further ahead then going on a lease program.

Gehin stated spreading meter exchanges over the years was not a bad thing but concurred that meters should be exchanged to get less loss and more revenue.

Force questioned the payment of the third party sign up with savings accrued and pay back.

Van Ess replied there were many ways in which the utility could fund the program, utilize capital dollars and third-party financing. You pay the project upon implementation, then you pay the debt service/ lease with the savings over time. Some of our clients use tax exempt leases which is separate from capital budget. We would work with finance for the best way to move forward. We are installing as a contractor; we would do RFP and work with your partners if you got meters separately that would be deducted from the cost. Pricing is transparent and we bid on your behalf competitively.

Robinson questioned if the \$4 million was obtained from the \$420k set aside in the Capital budget for meter replacements at 8-10 years. He questioned if the cost presented of \$10-\$11 million and our cost of \$3.3- \$4.2 million to replace the meters included installation costs?

Boers replied we're about 4 years into it but we would have to start recycling again and could look back into it. In 8-10 years, we would have failures that come through but may be 4-6 years for rotation again, we could pick out the inaccuracies and start on those right away instead of running into it in 20 years and confirmed it included installation. Our meters are \$115, radios are \$125, that's \$240. We've talked with different vendors willing to do installation and cross connection surveys that provided \$110-\$120 mark at \$350/ meter changeout, this puts us at \$3,956,400.

Van Ess stated there was no projected cost yet but could be paid for with capital budget then funding the other half with the savings.

Boers questioned the budgetary number for the changeout?

Van Ess replied no budgetary numbers but the large meters which are unknown. Costs would be comparable but we would work with you. We could look at this like a procurement versus a straight contracting piece.

Gehin requested staff bring back recommendation.

Rosenberg stated after the lead summit from Washington, DC- more concepts and performance contracting should be coming up for discussion later in the future.

No Action Taken.

#### **4) Discussion and Possible Action Approving the Final Pilot Study Results and the Interim Anion Exchange Media Replacement Schedule.**

Lindman began this was information in the pilot study compiled with Donohue. He questioned the Commission on their comfort level in changeout of the resin in the anion exchange based on the data as it's not something that happens with a call out and it needs to be scheduled. There's significant planning that would have to happen.

Dow presented slides in Commission Packet pages 32-34.

Force questioned the red dotted line and confirmed effluent at startup was low and build/exceed more frequently in the middle range. He also questioned the time frame and if nanograms /parts per trillion (PPT) were the same thing?

Wojtkiewicz replied that was the hazard index- as time goes on, they do start hovering around the hazard index of 1 where DNR is looking at. The total concentration of PFAS compound of 20 ppt. Nanograms and PPT were the same thing.

Dow replied the chart depends on the flow treated through the anion exchange treated vary monthly. An average of 4.8 million gallons/day (mgd) a little over 400 days. An average production from the facility is around 4 mgd that would be 120 million gallons per month on this graph.

Robinson commented that the proposed health advisory was being reviewed from Environmental Protection Agency (EPA) and should be out in the next two weeks that may be in the single digit of ppt and not the 20 ppt. Department of Health Services (DHS) recommendation of 20 ppt combined in addition to the hazard index and not the same as the hazard index. The hazard index was triggering notification to the public. This commission at a previous meeting established the 20 ppt as a goal. He questioned when the Granular Activated Carbon (GAC) would be operational as it seemed longer to develop and with the public health concern in the community, could we accelerate that and reduce the reliance on the anion exchange resin. He questioned if the cost of the resin changeout was \$800k? If we ran 4 million gallons a day, would more flow result in more concentration of PFAS in influent? He was concerned about making a decision with EPA's revised health advisory may be significantly below this. He questioned if we could we take this up with finance in April for \$1 or \$2 million for replacement?

Lindman replied the timeline on the GAC has not changed. GAC should be up and operational by 2024. In those discussions where interim financing would be moving forward, the project is ready to bid. Vessels would take months to order but once ordered and contracted with materials availability we should be good to go. Unless a year ago emergency funding was in place, that would have been the only way to accelerate that timeline. There is no further data. When you look at the chart, we are reducing PFAS as it comes in and goes through the interim and reducing the hazard index down to around 1. What is your comfort level, should we start planning now for a Fall replacement of the resin and then plan another. We are looking at \$2million in today's dollar. It's \$1 million for the changeout that includes the resin, labor, trucking from Donohue's estimate.

Force stated we would have about 4 changeouts before GAC is up and running that would cost \$3- \$4 million dollars. He questioned if the 70% Grant is what you qualify for but not what you get? If we did only 3 changeouts the annual impact of each ratepayer would be the  $\$9.22 \times 3$  and the  $.77 \times 3$ ?

Wojtkiewicz replied that's what you have been deemed to qualify for. There is a cap of \$5 million in principal forgiveness. If your project cost goes up, you would get the \$5 million maximum for the safe drinking water loan state fiscal year 2023 program.

Gehin reiterated the staff recommendation that we start planning the changeout in Fall. He motioned to move in that direction. Seconded by Herbst.

Robinson questioned if that was irrespective of what the concentrations were in the discharge system. He questioned if this were driven by target date and numeric threshold as we are doing quarterly testing. Would we get breakthrough above 20 parts this Fall based on the bench scale testing?

Boers replied there are a lot of moving parts. We don't get the tests back for 3 weeks. If we test in beginning to mid-April, we are looking at middle of May for results. What happens if it's a combined total of 24 and we are at 1.2 on the index. The planning involved with the changeout resin is extensive. It's \$1million worth of work, it's not happening in one month. Is the commission comfortable with 23 for a number or 19? Is \$2-\$3 million resin change out a good number? We are looking for direction in doing what you want us to do. Would it be better to put the \$2 or \$3million towards the GAC? What number are you comfortable with as an effluent number? As a health recommendation, is 18 good, 20 isn't, right now is the question. We are looking for direction at where we want to be.

Robinson replied putting dollars aside, which we can't do, when do you anticipate breakthrough be above 20?

Boers replied maybe another 2 or 3 months.

Dow reiterated that would be correct based on the projected number that we have, it would be in the next couple of months where we would see concentration of 20 parts or above.

Gehin stated that there are a lot of unknowns and would like to proceed with moving forward for this Fall.

Lindman suggested thoughts on starting more frequent sampling along with this motion?

Rosenberg replied that would be good to do more frequent testing so we could get more numbers out to the public.

Robinson replied people are relying on us, whether it's 20 or 23 it doesn't matter but we do have to balance it. If we are doing quarterly, we are looking at breakthrough in June or July, we should begin to prepare, adopt schedule based on breakthrough with costs involved and be prepared to adjust our flow based on what we are seeing. The directive would be to authorize staff to begin process of engaging appropriate parties in resin replacement at the time we are triggering that 20 ppt.

Force questioned if the changeout process takes days, weeks? If we hit the number, would we be over the limit in x amount of time while we change it out?

Boers replied there would be time lapse from when we find out we are over 20 parts recommendation until we get it changed out. It depends on availability of contractor and when we get our test results back, how often we are monitoring, numbers fluctuate on regeneration cycles. If we get 21 today, we could regenerate 2 tanks and be at 17 tomorrow. Depends on water quality, how much PFAS is in the resin and the backwash and regenerating the system. If we are going to shoot for under 20- will have to do major monitoring with a plan in place and have maintenance contracting ready to change out the resin. \$2-\$3million that could be used towards the permanent

solution.

Robinson questioned the GAC replacement cost from the bench scale study for the life of the GAC.

Dow replied that was shared at the September meeting, we prepped the anion exchange interim solution and breakthrough data that showed in the GAC pilot column but there are a lot of other factors and variables.

Lindman stated if we did more frequent sampling, would the commission be ok with continuing the sampling till we get the resin changed out knowing it would be a month or two months before we get that resin changeout coordinated. We want to be ready and make sure we are being proactive in the approach in the interim. We want direction on how we set this up knowing it won't be immediate and likely would do a public notification once we bump up to that 20 or 21. It's something we will be required to do.

Wojtkiewicz replied that it's an imperfect system for monitoring and lag time in getting results. We don't have control over the influent values that fluctuate over time coming in through the wells. Based on ground water flowing, there are so many variables.

Force stated he is in favor of increasing sampling and advocated for preparedness to changeout resin when the time comes.

Rosenberg reiterated that the motion is to move forward with the plan and changeout the resin in the Fall and do more frequent testing so we are ready for that. Let's vote on moving ahead to swap out the resin when we reach that 20 ppt.

Motion carried 5-0.

Rosenberg requested how often the commissioners wanted the sampling, whether it be monthly or every two weeks.

Boers reiterated sampling was required quarterly and was thinking monthly but it would put us in a 7-week window by time we get results. If we do 2 weeks, that would bring us to the 5-6 week window. Sampling costs roughly \$500-\$600 in analysis.

Robinson motioned to trigger more frequent monitoring at June 1<sup>st</sup>.

Force moved that we do sampling monthly starting June 1<sup>st</sup>. Seconded by Gehin.

Motion carried 5-0.

## **5) Discussion on the 5-year Capital Plan and Identifying Other Potential Funding Sources.**

Lindman began comments were brought previously about the GAC and potential additional employees costs over time. There's a breakdown of those items included in the rate case and items not included in the rate case. One request was to add potential funding we've applied for which are now included and as we get that information, we will include those and update you moving forward. I wanted to keep this at the forefront on the capital plan as we move forward with rate cases in place based on borrowing all capital project money and anticipation of receiving grant principal forgiveness funding for some projects. The more received over the course of year would eliminate the need for additional rate impacts moving forward. We wanted to put this together for staff as we move forward to use our cash resources because we are not borrowing this year to do capital projects needed to maintain the utility.

Robinson questioned if the resin changeout was reflected in the 5-year capital plan along with GAC and PFAS removal. He questioned the meter replacement for \$420k year. Would we be done in that 5 year versus 8-10 years. If we got \$350 per changeout and 1,100 we'd be covering costs within that 5-year period for all of them? Are we fully funding the meter replacement within 5-year period or extending beyond? Would this be a placeholder versus a budget? We've got some operational costs for tracking purposes. Staff increases and training are operating costs. I don't see corrossions control. We have CCT study, do we have what the capital cost would be for that?

Lindman replied that would be just a 5-year plan but it would go beyond that. We are projecting what we need for the budget. These are projects we need to do to maintain the utility and costs needed in future years. Every year we update this and it changes a little bit. The CCT study is there and anion exchange media. I've got estimates in there, CCT studies, engineering, loops. I'm not looking for action, just wanted to make sure if you need more information or understanding we could talk about it.

Boers replied it could be done in 5 year period if capital budgets are fully executed annually. Sewer pays half of the water meter expense. With meters and radios, we could do that with the \$4million in 5 years.

Force requested if Johnsons controls was included in this 5-Year capital plan.

Lindman replied it has not been included but it would have impact in this capital plan.

Rosenberg reiterated that she wanted to make sure everyone understood this and had no more additional questions and had information they needed.

No Action Taken

#### **6) Discussion and Possible Action to Contract with Municipal Electric Utilities of Wisconsin for Utility Staff Safety Training Requirements and Safety Training Tracking.**

Lindman began that Baker-Tilly staff assessment concluded with the need of a safety training that is department wide, not just utility. MEUW tracks and prepares things needed and would ensure we meet all our requirements. We have a representative here if you had additional questions. The total annual cost is about \$15,000 and that would be divided by Water, Sewer, Streets.

Force was happy to see the response to the needs. He questioned how MEUW worked and if the training would be effective as it didn't seem like employees were responding well to the trainings.

Wall replied that in the assessments with some employees from water, wastewater and DPW. A lot of the trainings are currently done through video, we've taught a lot of the same stuff but you have to figure different ways to connect with each employee. Learning to make it enjoyable so that when employees leave the trainings, we know they've learned something by watching their coworkers, carrying themselves differently because of the understanding of day-to-day basis.

Herbst motioned to approve contracting with MEUW for utility safety training requirements and tracking. Seconded by Robinson.

Motion carried 5-0.

#### **7) Discussion on Drinking Water Treatment Facility Construction Completion.**

Lindman began this was an update of the drinking water facility construction that is ongoing. The final completion established was February 9<sup>th</sup> and we passed that date and have been assessing liquidated damages. There will be a meeting tomorrow. We don't have a formal request for time extension from the contractor. We are hoping to work through some of the issues verbally tomorrow and have a plan moving forward.

Robinson questioned if we had leverage?

Lindman replied we have \$1.4 million we are holding from the contractor for completion. We are in communication with legal and engineers to make sure we are following contract requirements as we respond as well.

No Action Taken.

#### **8) Discussion and Possible Action on Approving Amendment #1 with CDM Smith for the Next Phase of the Corrosion Control Treatment Study.**

Lindman began this was for the purchasing of lead line loops, implementing, coordination and start up. This is \$177,501 increase to the project. Our estimate for lab and sampling is about \$180,000 in addition, that would be 2023 and 2024 cost. Assuming we use 1/3 in 2023 and remainder in 2024. We need to purchase the lead line loops that would be a chunk of this \$177,000 this would be \$134,000 then the coordination and start up would be that \$19,000. So about \$160,000 is just getting the lead line loops in place, ordered, fabricated, and starting the seasoning of them. We will do some testing as they are getting conditioned. Once loops are conditioned will start doing optimization.

Robinson questioned if that was for the project cost or increase to CDM Smith and if there were additional costs as the city/utility was bearing lab and other costs. He questioned if this was the total costs? We are looking at about \$350,000- so \$125,000 this year. What's the net increase going with CDM?

Boers replied these are not necessarily additional costs, we had planned for the Utility to do a lot of this work ourselves but we are going to be down one tech and we have another tech leaving. Initially the CCT study was supposed to be done March 2023 that's why we are going through with the additional help. We don't know what the DNR is requiring with the loops, we are proposing 3 loops but if they come back with 5 there will be additional costs.

Gehin moved to gratify the amendment for the next phase of the corrosion control study. Seconded by Herbst.

Motion carried 5-0.

#### **9) Discussion on the Private Side Lead Service Line Replacement Plan (LSLRP) in 2023 and 2024 and Future Action Items.**

Lindman began at the last commission meeting, we wanted to pursue some sort of action and made a request to go to city council next week for ARPA funds to replace private side lead service line. Staff agreed we want to do everything we could not to have partial replacements. If the City Council approved ARPA funding of ½ million dollars for the private side, we are working with engineers to prepare a communication plan and bring back in April for presentation. There may be some public outreach in general but we will be coordinating direct action with the community as we move forward next month.

Force requested if we were going to involve the community or neighborhood groups to prepare a plan that would be effective with the homeowners. It would be helpful to address questions from neighbors and provide the right answers.

Lindman replied we have been in contact with the department of public health that have been involved in it. We are going to have engaged communication not just sending letters but what helps get the homeowners engaged and their perspective and doing work like identifying lead by taking pictures and social media but some neighborhood groups are more involved and some aren't.

No Action Taken.

#### **10) Discussion and Possible Action on Purchasing a Generator and Automatic Transfer Switch for 2024 Installation.**

Boers began the generator would help serve our booster station and radio communications for both water and wastewater. We had money budgeted this year but has been moved to next year due to difficulties getting equipment. We'd like to make the procurement now so that it would be ready to go next year for installation. The recommendation is to go with the lowest bidder which is Generac system that we concur with.

Gehin moved to proceed with this project. Since it's in the budget would we need to act on it?

Lindman replied one of the odd things is that we have had to get projects obligated out that will be in 2024. We had some money in 2023 but with our budget constraints, this was a project we thought we had to put on hold. We could order and secure with a PO now but it won't be delivered until 2024 for when the expenditure would happen.

Rosenberg requested if we could have a second. Seconded by Herbst.

Robinson questioned if we could encumber funds that weren't there. We are making a promise to budget next year. We can't buy into future bodies. If we had it budgeted, are we authorizing the execution of the purchase order to be funded in 2024?

Lindman replied we are authorizing the purchase of this in 2024 with operating funds available. We ran into this with our pipe too, we've had to order it a year early, its unfortunate right now but that's where we are at with materials.

Rosenberg reiterated the action of purchasing a generator and automatic transfer switch for installation in 2024.

Motion carried 5-0.

#### **11) Discussion and Possible Action Filling the Senior Facility Tech Position with a Facility Tech Position and Promoting Within Once All Positions are Filled.**

Rosenberg began that this would be discussed at the City's HR committee so we would all roll in the same direction.

Lindman briefed on advertising for an operations' technician and then at some point in the future based on our operation techs promote someone to senior from within based on qualification and competencies. This would be easier and requirements to bring on tech position than a senior tech position.

Rosenberg stated as chair, no action would be required and would like to pull this item to have this discussion at the HR Committee instead.

No Action Taken.

#### **12) Discussion and Possible Action on Approving Sole Source Request for Magnesium Hydroxide Chemical at the Wastewater Treatment Facility.**

Brooks began we've used this water-based magnesium hydroxide for a year, you can add water for an easy clean up and it doesn't cause clogs. He stated he solicited pricing from 2-3 other vendors and no one responded back except Midwest Chemical so he filled out the sole source to retain their chemical.

Force moved to accept this bid. Seconded by Gehin.

Motion carried 5-0.

#### **13) Discussion and Possible Action to Standardize Equipment and Approve Sole Source Equipment Purchase for Sewage Lift Stations.**

Lindman began we are proposing to upgrade several our lift stations, this commission has approved standardizing equipment such as pumps, we'd like to do it with our control stations and panels with a vendor that is in the area for emergencies and remote log ins.

Gehin moved to approve standardizing equipment and approve sole source equipment purchases for sewage lift stations. Seconded by Herbst.

Gehin questioned if we purchased the equipment or if the vendor supplied it?

Brooks replied the vendor supplied the equipment.

Motion carried 5-0.

#### **14) Adjourn.**

Rosenberg stated the next meeting would be joint with Finance and we are still looking at the dates.

Robinson requested that our May 2<sup>nd</sup> meeting be moved as there would be a PFAS workshop in Wausau on the same date and time.

Gehin motioned to adjourn. Seconded by Herbst

Motion carried 5-0.

Link to view meeting in its entirety: <https://tinyurl.com/wausaucitycouncil>

Gina Vang, Recording Secretary

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## **MEMORANDUM**

**TO:** President Rosenberg  
Commissioner Herbst  
Commissioner Force  
Commissioner Gehin  
Commissioner Robinson

**FROM:** Eric Lindman, P.E.  
Director of Public Works & Utilities

**SUBJECT:** Director's Report – April 2023

### **Update on Projects for 2023:**

#### A. Water Treatment Facility

I. Work continues to progress slowly at the water treatment facility. We have not yet received a formal request for time extension from the contractor and liquidated damages continue to be assessed. The facility is operating well but some of the automation is not fully functional as specified. We have also had some mechanical issues which are being worked through as well. There are many items related to landscaping and outdoor finishing work that will be completed once the frost is out of the ground and temperatures are acceptable for the work to be completed.

B. Sanitary Sewer upgrade at 48<sup>th</sup> Ave Sanitary Sewer Interceptor – Bids opened on March 28. Bids came in over engineer estimate and we received only one bid. We will be scheduling a meeting with the contractor to discuss the project bid. This project is being completed to prepare for and accommodate the new 72<sup>nd</sup> Ave lift station force main being installed with the reconstruction of Stewart Ave, which is a DOT project being completed in 2024.

C. CCT Study – Additional ARPA funding for this project was approved at the March 28 Finance Meeting, the final approval will be considered by the city Council on April 11.

#### D. Staffing Updates and Organizational Change Updates:

I. Staff has begun drafting and updating job descriptions that will better fit within the organization and match the proposed organizational chart changes. These changes will better set the utility up for success and will assist with retention of employees.

II. Some the major changes are having different grades of operators and technicians. We would have position descriptions that would outline increased competencies within the same position. For example, we would have an operator technician I, II, III. We could hire at our current skill level as an operator tech I and as the technician increased in certifications and competencies, they could advance to operator tech III. Each of these would be expected to be a pay grade increase and the majority of the responsibility for advancing would be on the employee. The utility would provide the path for advancement and the employee would need to be responsible for planning out their career advancement.

III. The advantage of this type of structure is that it establishes a career for people with advancement rather than just a job. For continuity of service and stability in the utility it is important to market these positions as careers versus just jobs. These are significantly important roles and we need to establish our organization for success and longevity.

IV. Next Steps – As we prepare job descriptions they will be forwarded to HR Director for review and consideration of classification. Once these are determined they will be brought forward to the HR Committee, then Commission then onto council for approval during the budget process. We are proposing to begin making these changes in the 2024 calendar year and future years.

V. This is a change in how the past process had been handled. The Utility Commission has been delegated the authority to make staffing decisions and following past practice these proposed changes would come to the commission for decision. Based on recent discussions staff has been directed to bring these items to the HR committee for their consideration first and then it is proposed to bring them to the Commission for their review and determination. The City Council will have final approval as these will likely require increases in the operating budget, so it would seem most efficient to bring these to council during the budget approval process.

VI. It is anticipated the implementation of the proposed organizational chart will take place over the course of 4-5 years to minimize the budget impacts and allow for these changes to move forward at a pace the utility can handle the changes and increased staffing.

#### **WASTEWATER DIVISION**

1. Wastewater Facility Construction Update: See attached.

2. The Wastewater Treatment Plant continues to operate well and is discharging a quality effluent. Optimization continues throughout the plant.
3. Collection System Technician (Sewer Maintainer): Advertising for the vacant position closed on March 1, 2023. Interviews commenced on March 9, 2023 and a job offer was made on March, 15, 2023. A candidate has accepted the position and waiting for an official start date from HR.
4. Wastewater Plant Operations Technician: Advertising for the two vacant positions closed on March 13, 2023 and 9 applications were received. Interviews commenced on March 27, 2023 and ended on March 31, 2023. Two candidates will be selected upon interview completion followed by job offerings.
5. Hiring and training of new staff continues to be a challenge for the utility. These positions require in depth knowledge of complex treatment processes and equipment being used and it takes a great amount of time to train to a level that new staff can operate equipment confidently and take the on-call status.
6. 2023 Project updates:
  - a) **48<sup>th</sup> Avenue Interceptor Sewer** – A mandatory pre-bid site visit was held on Monday, March 20<sup>th</sup>. One contractor (Haas Sons) attended and therefore is the only contractor prequalified to bid on the project. Bidding will take place on Tuesday, March 28<sup>th</sup>.
  - b) **Sanitary Lift Stations Rehabilitation**:
    - Northwestern and Greenwood Hills lift stations are at the 90% completion point. The project bid date is set for the end of April.
    - Cherry St. lift station is being pushed to 90% completion and will be submitted to City staff for review in April.
    - Crocker St. lift station is on temporary hold until the location of the new station is set.
    - Airport and 32<sup>nd</sup> Avenue lift stations are reaching the 50% completion point.
7. Slip lined High density polyethylene pipe (HDPE) shifting issue on Sturgeon Eddy Road.

On March 7, 2023, Ryan Dwelly (Collection System Supervisor) was contacted by Rick Frahm from Ric's Sewer Service regarding an issue with a lateral entering the sewer main on Sturgeon Eddy Rd. Rick stated that it appeared that there was only a 1-1/2" opening in the lateral for the resident's sewage to pass through to the main because of the sewer main's shifting. Ric's

Sewer was called to the residence experiencing issues one week prior to perform an initial lateral clean and then was called back to that residence to look further into the lateral by televising it from the house to the main in order to verify what was the issue was. This type of sewer main (slip-lined HDPE) has shifted in this location in the past, as well as in other locations containing the same type of slip lining throughout the city. Ryan Dwelly assigned the Collection System staff to televise this location of sewer main and it was confirmed that the slip-lined pipe had shifted and there was blockage at the resident's lateral. Ryan Dwelly immediately made efforts to secure a local contractor in order to reinstate the lateral opening in the locations affected by the main pipe shifting.

On March 14, 2023, the laterals were trimmed back reinstating the lateral opening. A robotic cutter was used by the Contractor to perform this work.

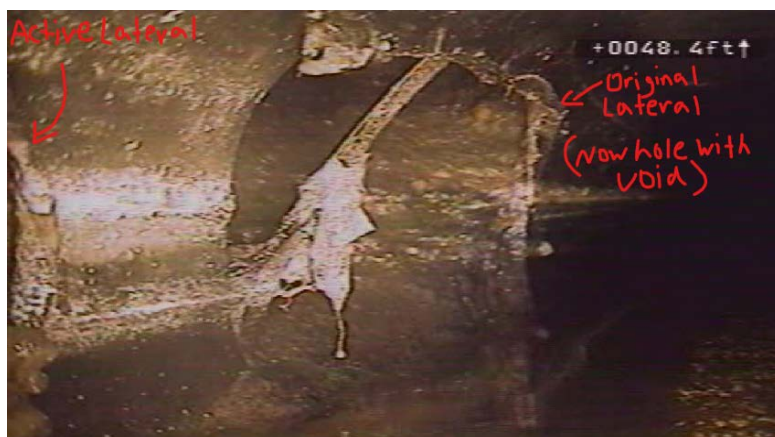


Lateral Opening BEFORE



Lateral Opening AFTER

Below is an example of a different lateral on the same section of slip-lined pipe. Years ago this same main pipe section had shifted so greatly that the contractor at that time used a robotic cutter to reinstate the lateral opening. On March 14, 2023 this same lateral needed to be trimmed back an additional one to two inches because of the pipe shifting again. The picture below indicates the hole in the pipe where the original lateral connection was located prior to the main pipe shifting. There is now a hole/void where gravel, sand, and debris can infiltrate into the sewer main.



Slip-Lined HDPE Pipe  
Background and Process:

The picture below indicates where a contractor pulled in a smaller fused pipe into the existing host pipe.



For example, on Sturgeon Eddy Road. Prior to the contractor pulling fused HDPE pipe through the host sewer main piping, the main was 10" and 12". Once the fused HDPE pipe liner had been installed and converted to slip-lined poly pipe, the sewer main is now 8" and 10". This means the contractor at the time had pulled the fused HDPE pipe liner through the existing host pipe that was 10" and 12".

The problem was is that when the contractor performed this work, they never secured the new HDPE pipe liner to the host pipe or manhole and now the liner inside the host pipe is shifting causing blockage at the residents' laterals. Laterals and rubber saddles stay in place, but the black HDPE pipe liner is shifting. We don't know exactly what is causing the liner to shift other than the fact that it's not secured, but we have a couple theories:

a) At the time of installation, the fused HDPE pipe had been stretched from pulling it through the host pipe. If the contractor did not allow the fused HDPE pipe to contract prior to connecting it to the laterals, the contractor would have had issues from the beginning.

b) There is some theory that temperatures could be a factor causing the poly-pipe to retract and contract throughout the different seasons.

## Project Status Report



### Wastewater Treatment Facility Improvements Project – Engineer During Construction

City of Wausau, Wisconsin

Donohue Project Number 13229

**Period** | February 5, 2023 – March 3, 2023

**Invoice 69**

#### Engineer Activities This Period

- Construction administration services related to technical review of contractor shop drawings, responding to contract interpretation questions (RFIs), initiating requests for proposals (RFPs), attending weekly and monthly construction progress meetings, processing work changes to the contract, and contractor monthly payment requests.
- Prepared and submitted Clean Water Fund disbursement request and provided CWF administration.
- Prepared Work Change Directives and RFPs to address unforeseen work that needed to be expedited to allow the Contractor to maintain their construction scheduled progress.
- The Engineer's application engineering staff working on fine tuning the various systems as unit process systems are being operated.
- In process of developing Change Orders 26 to Contractor for review.
- Preparing final Certificates of Substantial Completion for issue for those process systems that the Owner has begun to operate.
- Continued to address punch list items including the following areas of focus: boilers, disc filters, and Dryer.
- Continued to assist Owner with WDNR Class A biosolids approval.

#### Engineer Near-Term Activities

- As the project proceeds, the engineer will continue to provide construction administration services including responding to RFIs, preparing RFPs, attending weekly and monthly construction progress meetings, processing change orders, reviewing contractor payment requests, and providing part-time on-site resident engineering services.
- Application Engineering programming to fine tune operations.
- Review completed punch list items.

# Project Status Report



## Wastewater Treatment Facility Improvements Project – Engineer During Construction

City of Wausau, Wisconsin

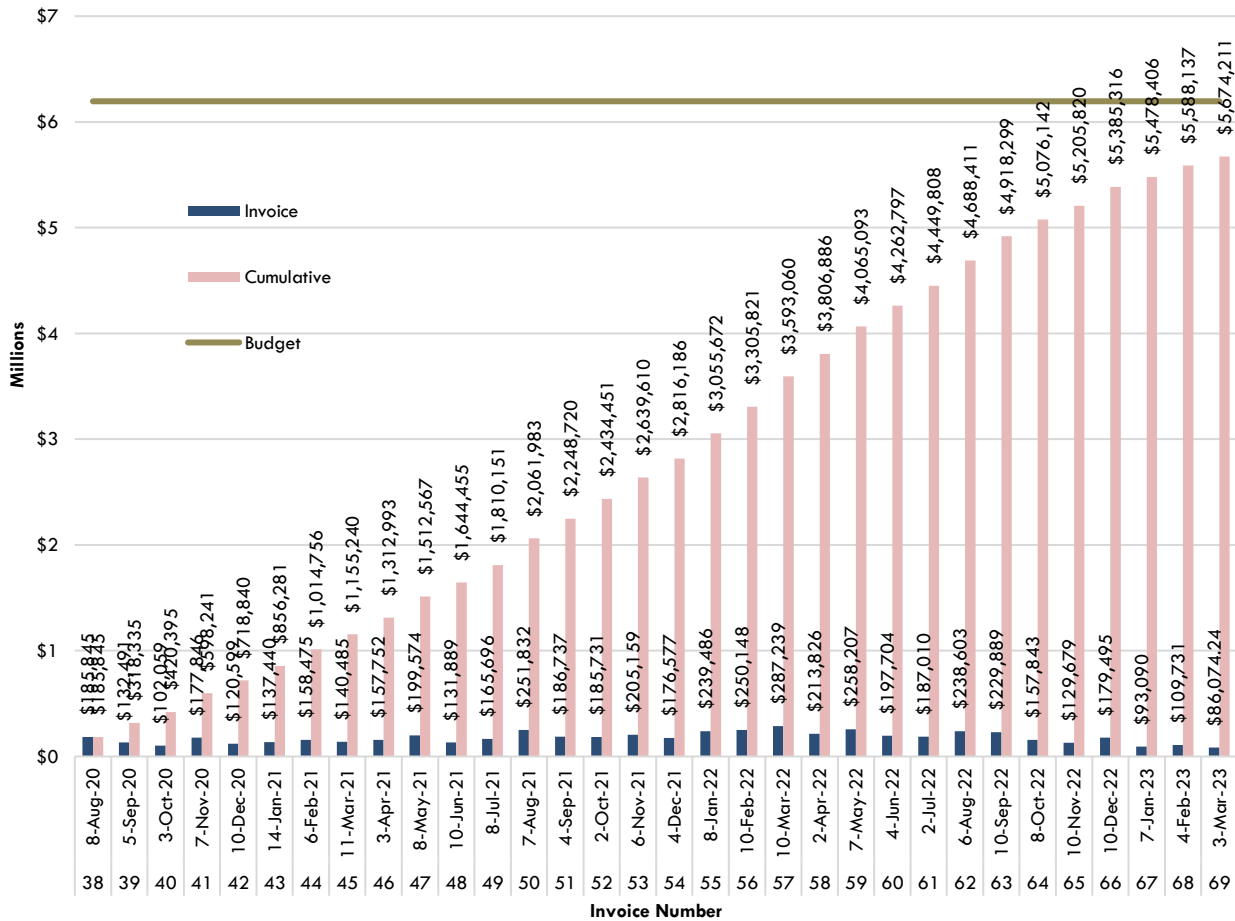
Donohue Project Number 13229

Period | February 5, 2023 – March 3, 2023

Invoice 69

### Project Related Budget Snapshot

#### Construction Engineering Budget



## Project Status Report



### Wastewater Treatment Facility Improvements Project – Engineer During Construction

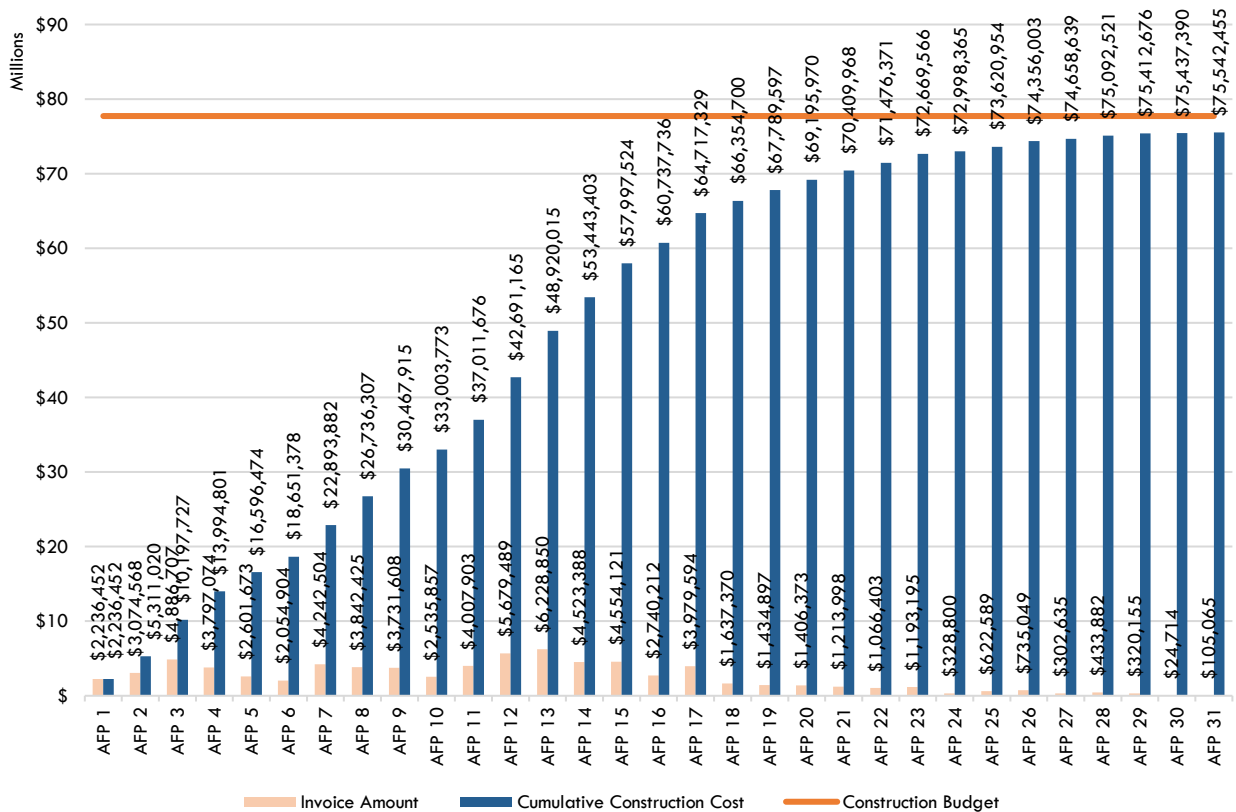
City of Wausau, Wisconsin

Donohue Project Number 13229

Period | February 5, 2023 – March 3, 2023

Invoice 69

#### Construction Budget: Pay Applications Approved by Engineer



## Project Status Report



### Wastewater Treatment Facility Improvements Project – Engineer During Construction

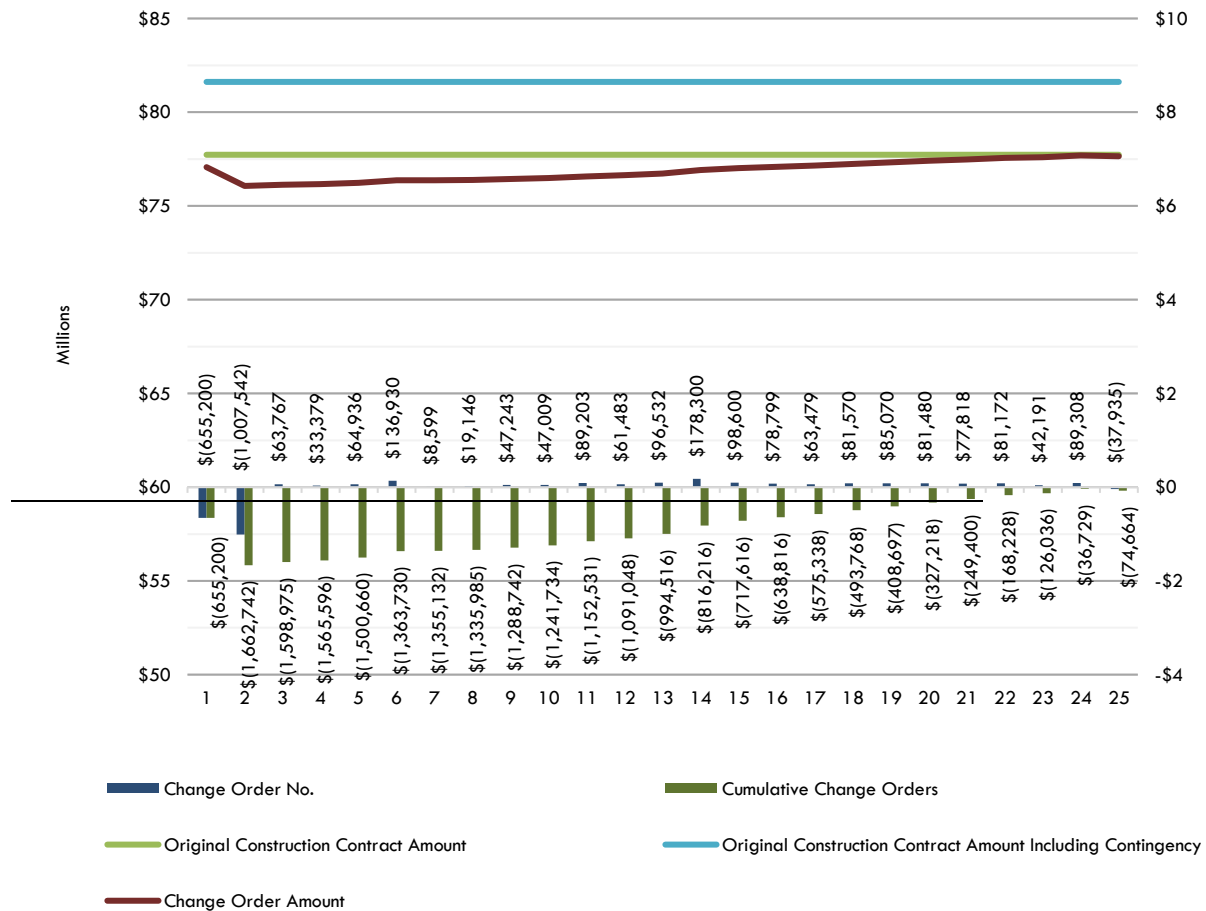
City of Wausau, Wisconsin

Donohue Project Number 13229

Period | February 5, 2023 – March 3, 2023

Invoice 69

#### Overall Project Budget



#### Budget Notes:

1. No budget issues at this time.

#### Remarks

1. Construction is very nearly complete; therefore, construction photographs are no longer beneficial to document project progress.

# INVOICE



3311 Weeden Creek Road  
Sheboygan, WI 53081  
Phone: 920-208-0296  
www.donohue-associates.com

**Invoice To:**

City of Wausau  
Attn: Ben Brooks  
407 Grant Street  
Wausau, WI 54403

**Invoice Date:**

March 9, 2023

**Donohue Project No.:**

13229

**Invoice No:**

13229-69

**Project Manager:**

Mike Gerbitz

**Terms:**

Net 30 Days

**Billing Period:**

02/05/23 - 03/04/23

**Project Description:**

Wastewater Facilities Plan & Design

**Your Authorization:**

Engineering Services Agreement, Signed 03/29/17  
Amendment No. 1, Signed 06/28/18  
Amendment No. 2, Signed 03/05/19  
Amendment No. 3, Signed 01/27/20  
Amendment No. 4, Signed 05/07/20  
Permit Review Fees Payment Request, 02/27/20

**Compensation:**

|                    |    |               |
|--------------------|----|---------------|
| Time and Expense   | \$ | 129,220.00    |
| Time and Expense   | \$ | 984,565.00    |
| Time and Expense   | \$ | 3,323,900.00  |
| Time and Expense   | \$ | 4,351,831.00  |
| Time and Expense   | \$ | 1,843,325.00  |
| Permit Review Fees | \$ | 12,534.50     |
| Total              | \$ | 10,645,375.50 |

**Billing Summary:**

|                           |    |               |
|---------------------------|----|---------------|
| Total Charges to Date     | \$ | 10,124,446.54 |
| Charges Previously Billed | \$ | 10,038,372.30 |
| Current Charges           | \$ | 86,074.24     |

**Summary of Current Charges**

|                       |    |           |
|-----------------------|----|-----------|
| Labor (436.0 hours)   | \$ | 82,577.50 |
| Reimbursable Expenses | \$ | 2,812.74  |
| Permit Review Fees    | \$ | -         |
| Subconsultants        | \$ | 684.00    |
| Total                 | \$ | 86,074.24 |

|                            |           |                  |
|----------------------------|-----------|------------------|
| <b>Current Charges Due</b> | <b>\$</b> | <b>86,074.24</b> |
|----------------------------|-----------|------------------|

**Please Remit to:**

Donohue & Associates, Inc.  
3311 Weeden Creek Road  
Sheboygan, WI 53081  
Phone: 920-208-0296  
Fax: 920-208-0402

**Aged Receivables**

| <u>Current</u> | <u>31 - 60 Days</u> | <u>61 - 90 Days</u> | <u>91 - 120 days</u> | <u>&gt;120 days</u> |
|----------------|---------------------|---------------------|----------------------|---------------------|
| \$86,074.24    | \$109,730.81        | \$4,516.47          | \$0.00               | \$0.00              |

# Wausau Water Utility Communication Plan for Private Side LSL Replacement

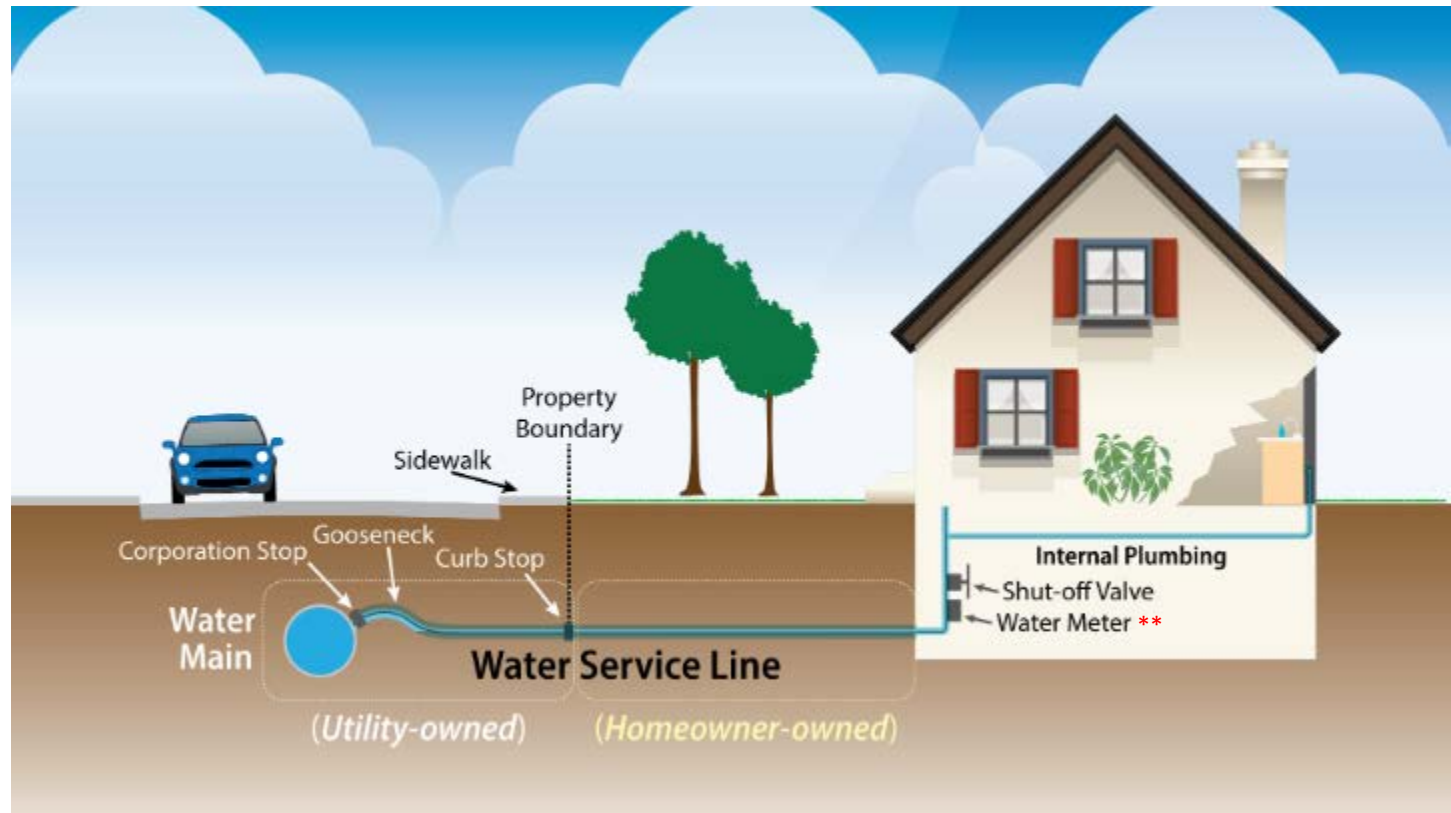
Clark>Dietz

*April 03, 2023*



**CDM  
Smith**

# Typical Service Line Configuration – Interior Meters

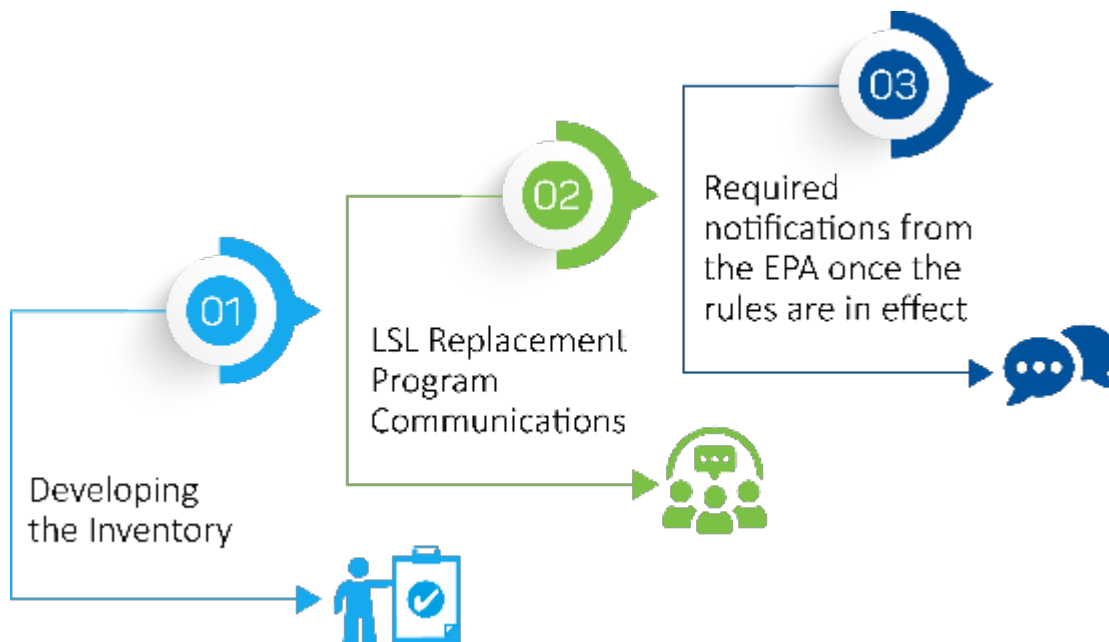


**\*\*** Water meters sometimes located near property line/curb box

# Public Outreach

| PRE-LSLR<br>RAISE AWARENESS AND<br>ENCOURAGE PARTICIPATION                                                                                                                                                                                                                                                                                                                                                                                      | DURING LSLR<br>COORDINATION AND<br>SCHEDULING                                                                                                                                                                                                                                                                                                                         | POST LSLR<br>MAINTAINING<br>WATER QUALITY                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTREACH GOALS</b>                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>OUTREACH GOALS</b>                                                                                                                                                                                                                                                                                                                                                 | <b>OUTREACH GOALS</b>                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>• <i>Why lead is dangerous</i></li> <li>• <i>What homes are at risk</i></li> <li>• <i>What can be done to reduce lead exposure</i></li> <li>• <i>Who is responsible for what segments of lead service lines</i></li> <li>• <i>Options for program participation and risks of opting out</i></li> <li>• <i>Where questions can be directed and where further information will be published</i></li> </ul> | <ul style="list-style-type: none"> <li>• <i>What permitting is required</i></li> <li>• <i>How financial assistance and funding will be distributed</i></li> <li>• <i>When LSLR work will be conducted and what disturbances this work may involve (water shut-off, road closure, etc.)</i></li> <li>• <i>Why homes are selected for prioritized LSLR</i></li> </ul>   | <ul style="list-style-type: none"> <li>• <i>Why and when flushing is necessary</i></li> <li>• <i>How to flush your water daily</i></li> <li>• <i>How to flush your water after a disturbance / LSLR</i></li> <li>• <i>How to obtain a filter (certified to remove lead)</i></li> <li>• <i>How to clean faucet aerators</i></li> <li>• <i>How to provide feedback about the LSLR Program</i></li> </ul> |
| <b>OUTREACH METHODS</b>                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>OUTREACH METHODS</b>                                                                                                                                                                                                                                                                                                                                               | <b>OUTREACH METHODS</b>                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>• Newspaper ads</li> <li>• Robocalls</li> <li>• Handouts with water bills and at libraries, community centers</li> <li>• Social media</li> <li>• Public meetings and open houses coordinated with community liaisons</li> <li>• Online map of LSL inventory</li> </ul>                                                                                                                                   | <ul style="list-style-type: none"> <li>• Letters</li> <li>• Flyers distributed door-to-door</li> <li>• Website with replacement steps, frequently asked questions, an application form, and more</li> <li>• Hotline (added to 311 Program) and email account with responders trained to give accurate and consistent answers to frequently asked questions</li> </ul> | <ul style="list-style-type: none"> <li>• Videos</li> <li>• Demonstrations at public meetings</li> <li>• Door hangers</li> <li>• Closeout documents</li> </ul>                                                                                                                                                                                                                                          |

# Three Areas of Public Communications



# A Strategy for Success



What notifications are required when



Customized key message



Outreach strategies and venues



Important milestones to communicate

# Public Outreach Steps for Private Side LSLR Project

- Pre-LSL Replacement
  - Add project to City Website or dedicated lead website
  - FAQ for project (in person delivery by badged staff)
  - Public meetings
  - Additional outreach with phone, door hangers, and local community meetings
  - GOAL: Sign-up residents and sign right of entry or ROE
- During LSL Replacement (with Contractor)
  - Additional outreach by contractor and ROEs
  - Pre-construction site visit
  - Homeowner agreement form
  - Flushing instructions/filters and other requirements
  - *Hotline to answer questions/concerns*
- Post Replacement
  - Record keeping/documentation
  - Post-replacement sampling
  - Waiver

## Lead in Drinking Water FAQs (Continued)

### What are the symptoms of lead poisoning?

- Signs of repeated lead exposure may include abdominal pain or cramps, aggressive behavior, constipation, sleep problems, headaches, irritability, loss of appetite, fatigue, high blood pressure, numbness or tingling in the extremities, memory loss, anemia and kidney dysfunction.
- In children, long-term lead exposure can lead to intellectual disability and loss of developmental skills.
- A high dose of lead poisoning may result in severe abdominal pain and cramping, vomiting, muscle weakness, stumbling when walking, seizures, coma and brain disease.
- More information is available at <https://www.cdc.gov/nceh/lead/prevention/about-lead.html>

### Can I get tested for exposure to lead?

- Contact your doctor or local health care provider about a blood test for lead exposure or contact the health department in your municipality.

### How can I reduce my exposure to lead?

- Replace your lead service line.
- Always buy plumbing fixtures (faucets, valves, sinks, shower heads, hose bibs, etc.) that have zero-lead content.
- Run your cold water tap to flush out lead. Run the tap until water feels cold. Then fill

- a pitcher with fresh water and place in the refrigerator for future use.
- Always use fresh, cold, running water for drinking, cooking and preparing baby formula.
- Do not boil water for the purpose of removing lead. Boiling water does not remove lead and can increase lead concentration in water.
- Periodically remove and clean faucet screens and aerators.
- Obtain a home water treatment device such as a filter that is NSF certified to remove lead.
- Identify and replace plumbing fixtures containing lead and any copper piping with lead solder.
- Water service lines are sometimes used to ground electrical lines. The wiring in your home or building may be attached to your water service line or elsewhere in your plumbing. If you have a lead service line, this can accelerate its corrosion. Have a licensed electrician check your wiring.
- Be careful of dust from lead based paint. Even though lead based paint was outlawed in 1978, many older homes have not removed it and may currently be a hazard.
- Be careful of other sources of lead in your home. Some household items such as pottery, makeup, toys, and jewelry may contain lead. Wash your children's hands and toys often.



City of Racine, Wisconsin

730 Washington Ave  
Racine, WI 53403

## Water Service Lines FAQs

### What is a water service line and who owns it?

- Water service lines are the pipes that carry water from the City water main in the street into homes/buildings.
- The City owns the water service lines from the water main in the street to the pathway valve. Individual property owners own the service line from the pathway valve to the meter inside your home.

### How do I know if I have a lead service line at my location?

- If you suspect you have lead in your service line or home plumbing, you can visually inspect the water service line piping entering your home or contact the Racine Water Utility. Even if your service line is not lead, you may still have a lead gooseneck in the street if your pipes are galvanized steel. The Utility will verify if your service line is lead or not.
- You can purchase an EPA-approved lead test kit: <https://www.epa.gov/lead/lead-test-kits>

### Where can I get more information?

Andrew McArthur, Field Inspector:  
262-822-8956 or [andrew.mcarthur@cityofracine.org](mailto:andrew.mcarthur@cityofracine.org)

Technician's Office  
262-636-9533

para español:  
Karen Albanil: 262-636-9185

## FREQUENTLY ASKED QUESTIONS



City of Racine, Wisconsin

## Lead Service Line Replacement



Cory Mason, Mayor  
Paul Vornholt, City Administrator

Jeff Cox  
District 1  
Mollie Jones  
District 2  
John Tate II  
District 3  
Amanda Patzarth  
District 4  
Melissa Kagnellian  
District 5

Melissa Kagnellian  
District 6  
Maurice Horton  
District 7  
Marcus T. West  
District 8  
Terry McCarthy  
District 9  
Sam Paebe  
District 10

CJ Reuse  
District 11  
Henry Perez  
District 12  
Natalia Taft  
District 13  
Alicia Jarrett  
District 14  
Melissa Lamba  
District 15

**Trenton Water Works**  
**LEAD SERVICE LINE**  
Replacement Program (LSLRP)

**How the LSLRP Works**  
Before, During, and After Replacement

**BEFORE LEAD SERVICE LINES (LSL) CAN BE REPLACED**

1. The City of Trenton will notify you by mail and by door-to-door visit that your LSL is eligible for replacement.
2. You will be notified by mail and by door-to-door visit that your LSL is eligible for replacement.

**DURING LSL REPLACEMENT**

3. To get a free phone consultation, the technician will call you to discuss the project and the date of the LSL replacement.
4. The LSL replacement will be done by a certified technician. The technician will dig a trench, lay the new LSL, and connect it to the water main. The technician will also install a new water meter and a new water shut-off valve.
5. The technician will also install a new water meter and a new water shut-off valve.
6. The technician will also install a new water meter and a new water shut-off valve.

**AFTER LSL REPLACEMENT**

7. The technician will also install a new water meter and a new water shut-off valve.
8. The technician will also install a new water meter and a new water shut-off valve.
9. The technician will also install a new water meter and a new water shut-off valve.
10. The technician will also install a new water meter and a new water shut-off valve.

**TEMPORARY**

**PERMANENT**

**FOR MORE INFORMATION**

Call 609-426-3000 or visit [www.trentonwaterworks.com](http://www.trentonwaterworks.com)

**AFTER LSL REPLACEMENT**

1. The technician will also install a new water meter and a new water shut-off valve.
2. The technician will also install a new water meter and a new water shut-off valve.
3. The technician will also install a new water meter and a new water shut-off valve.
4. The technician will also install a new water meter and a new water shut-off valve.

**TEMPORARY**

**PERMANENT**

**FOR MORE INFORMATION**

Call 609-426-3000 or visit [www.trentonwaterworks.com](http://www.trentonwaterworks.com)



**LIMPEM O CHUMBO**

**Aviso Importante do Departamento de Água e Esgoto**

Os registros da Cidade de Newark indicam que sua casa tem uma linha de serviço de água de chumbo. A exposição ao chumbo na água potável pode causar sérios problemas de saúde, incluindo danos nos rins e no cérebro. Bebês, crianças e mulheres grávidas estão especialmente em risco.

A cidade tem dois programas para ajudar a proteger sua família da exposição do chumbo na água potável.

**Programa de distribuição de filtro de água**

Novos e antigos donos de casas em Newark podem obter um filtro de água para reduzir a exposição ao chumbo na água potável.

**Programa de substituição da linha de serviço de chumbo**

A cidade está oferecendo um programa de substituição da linha de serviço de chumbo para reduzir a exposição ao chumbo na água potável.

Educate the Public on What to Expect Before, During, and After LSL Replacement

# What Does the Public *Really* Care About

**Passaic Valley Water Commission**

Passaic Valley Water Commission (PVWC) is a public utility providing water and wastewater services to the residents of Passaic County, New Jersey. PVWC is committed to providing high-quality service to its customers and to maintaining the highest standards of safety and reliability.

**BEFORE YOUR SERVICE LINE IS REPLACED**

1. PVWC will be in your yard for a few days. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.
2. PVWC will be in your yard for a few days. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.
3. PVWC will be in your yard for a few days. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.

**DURING YOUR SERVICE LINE REPLACEMENT**

4. The hole in your yard will be about 4 feet deep and 2 feet wide. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.
5. The hole in your yard will be about 4 feet deep and 2 feet wide. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.
6. The hole in your yard will be about 4 feet deep and 2 feet wide. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.
7. The hole in your yard will be about 4 feet deep and 2 feet wide. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line. We will be digging up the ground to replace the water service line.

**QUESTIONS?** [info@pvwc.com](mailto:info@pvwc.com) [973-261-1234](tel:973-261-1234) [www.pvwc.com](http://www.pvwc.com)

**7** The contractor will temporarily patch holes in the yard and street to allow for settling. A contractor will return to install a new water meter inside the new meter pit and remove the water meter inside your home. The holes in the yard will then be restored to pre-work conditions with seeding, concrete, or paving.




Temporary asphalt repair patch in street and/or sidewalk after service line replacement.



Permanent sidewalk repair in the curb stop.



Temporary backfilled holes in your yard are filled with soil and left to settle.



Final yard seeding occurs 3-4 months after the initial patch. Water seeds for best results!

# Example Door Hanger



**LEAD-SAFE CHICAGO**

Lead Service Line Replacement Program (LSLR)  
[www.LeadSafeChicago.org](http://www.LeadSafeChicago.org)

The Chicago Department of Water Management's

**LEAKS AND BREAKS  
FREE LEAD SERVICE  
LINE REPLACEMENT**

A leak has been found on your water service line, the pipe that brings water from the water main to your house. Under Illinois State law effective January 1, 2023, if your water service line is made of lead, galvanized iron, or steel, then the service line must be completely replaced following a leak or a break.

To help homeowners, DWM is providing FREE lead service line replacements (LSLR) for homes with leaking or broken services.

**What this means for you:**

At the time a leak is identified, City crews will repair the leak. Following the repair, the City or assigned contractor will work with you to schedule installing a new water service line.

You will also get a free water meter. If you do not currently have one, this will save you money on your water bill.

**What you need to do now:**

Contact the City now to begin efforts on your FREE LSLR for your home. You can call 312-747-7530, email [LSLR@cityofchicago.org](mailto:LSLR@cityofchicago.org), or scan the QR code to start the coordination.

This replacement must be completed within 30 days of the leak or break.

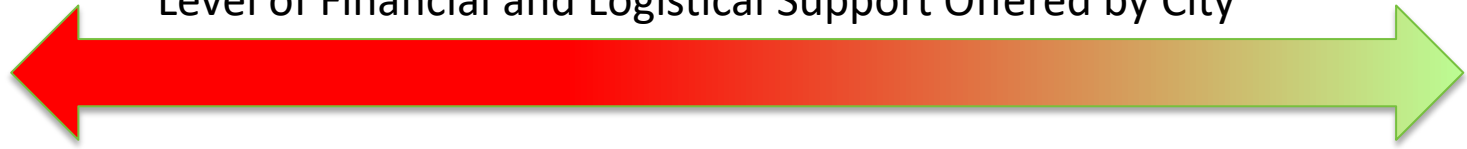
DWM Representative: \_\_\_\_\_

**THIS REPLACEMENT IS FREE**

  If you have any questions, please call 312-747-7530, email [LSLR@cityofchicago.org](mailto:LSLR@cityofchicago.org), or visit [www.LeadSafeChicago.org](http://www.LeadSafeChicago.org)

# Encouraging Homeowner Participation

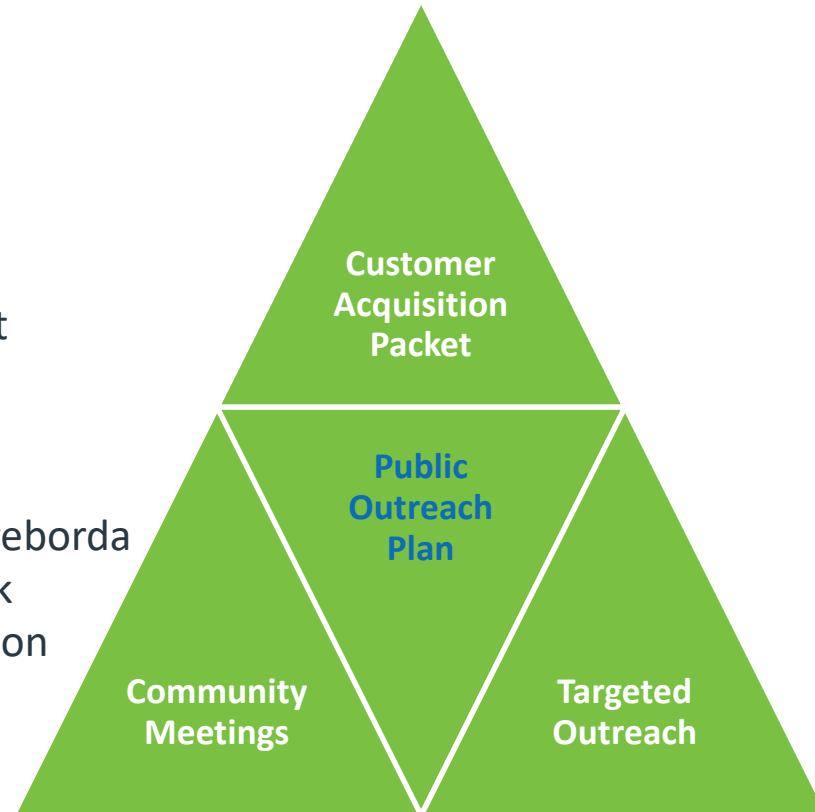
Level of Financial and Logistical Support Offered by City



| Program Options/<br>Decisions | Full City<br>Involvement<br>and Funding              | Moderate City<br>Involvement (1)                                                                                            | Moderate City<br>Involvement (2)                                                           | Limited City<br>Involvement                                          |
|-------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Contractor<br>Selection       | By City<br>(same as public side)                     | By City<br>(same as public side)                                                                                            | Homeowners selects:<br>City provides list of<br>contractors with<br>qualifications / rates | Homeowner selects:<br>City provides list of<br>licensed contractors  |
| Financing                     | Fully funded by City                                 | City offers low-<br>interest loans to<br>finance private side<br>(subsidies can be<br>offered to low-<br>income households) | Homeowner pays but<br>City negotiates unit-<br>rates for replacement                       | Homeowner pays the<br>price they negotiate                           |
| Logistical<br>Support         | City coordinates with<br>homeowner and<br>contractor | City coordinates with<br>homeowner and<br>contractor                                                                        | Some coordination<br>between homeowner<br>and contractor                                   | None; homeowner<br>must complete<br>private side before<br>City work |

# List of CBOs

- Childcaring (Mosinee) for list of Childcare facilities - Micki Krueger
  
- Neighborhood Associations:
  - Athletic Park Neighborhood Group – Jaci Kell
  - East Towne Neighborhood Group – easttowneneighborhood@gmail.com
  - Forest Park Neighborhood Group – Marie Schmidt
  - Grant Neighborhood Group – Jennifer Gabriel
  - Longfellow District – Brooke Mueller
  - Northwest Neighborhood Group – Mary LeBrun
  - Riverview Neighborhood Group – Carlos Etchepareborda
  - Southeast Side Neighborhood Group - Sue Nowak
  - SW Jones District Neighborhood Group – Lou Larson
  - Werle Park Neighborhood Group – Deb Ryan
  - Westies Neighborhood Group – Deb Ryan
  
- Faith in Action – Ruth Hebbe (elderly population)



**UPDATED  
DRAFT**

**City of Wausau  
Wisconsin Water Works  
Lead Service Line Replacement Plan**

City of Wausau

March 2023



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# Executive Summary

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Revisions to the federal Lead and Copper Rule (LCR) will require utilities to collect lead compliance samples from the fifth liter of water from the tap, and will implement a 90<sup>th</sup> percentile 10 ppb lead trigger level. Exceeding this trigger level (while staying below the current 90<sup>th</sup> percentile 15 ppb action level) will require the development of a lead service line replacement (LSLR) plan. Individual properties that exceed 15 ppb of lead in the 5<sup>th</sup> liter sampled will also be required to be investigated and may need to have the lead service line (LSL) replaced by the utility. CDM Smith was retained by the City of Wausau, Wisconsin Water Works (WWW) to assist with updates to the service line material inventory and the development of a lead service line replacement program to prepare for compliance with the LCR revisions.

As the first step in developing an LSLR program, CDM Smith reviewed WWW's existing inventory and identified areas for improvement. The inventory includes material data for most services, identifying 8,000 LSLs in the system, but the source of this data or validation is not typically recorded. CDM Smith recommends validating this data and recording details about how material assumptions were made to better refine subsequent assumptions.

As part of developing the LSLR plan, CDM Smith has outlined factors to be used when determining the prioritization of properties for lead service line replacements. This prioritization is based on environmental justice analysis and protecting high-risk populations. Additional replacements will be conducted with other planned infrastructure work and as emergency leaks and breaks arise in the system.

Based on conversations with WWW, the average cost for replacing a lead service line from the water main to the meter is \$10,000. For 8,000 LSLs, WWW's program is anticipated to cost approximately \$80 million over 15 years. Funding and financing options are available at the state and federal level that could help WWW reduce the cost of the overall program through grants (such as CDBG or WDNR grants) or spread the financial burden of the program over a more manageable period of times with loans (such as the State Drinking Water Loan Program).

In addition to financing, encouraging participation can be one of the greatest challenges of an LSLR program. Strategies for meaningful outreach require clear and thorough messaging available at appropriate times throughout the program. CDM Smith has outlined messaging to deliver specifically before the program begins to inform the public, during the program to encourage participation, and after the program to educate residents about flushing and minimizing exposure to lead through drinking water.

CDM Smith also presents strategies for construction and program implementation logistics. Overall, the schedule over the course of the program will include fewer-than-average replacements as the program ramps up for the first few years, followed by peak program years replacing about 700 lines per year, and finishing with a few years of fewer annual replacements as homes that faced challenges to replacement in previous program phases are addressed.

# Section 1

## Introduction

This section reviews current industry practices for the development of lead service line replacement (LSLR) programs. This section also discusses current Federal and State regulations and legislation related to lead service lines.

### 1.1 Overview

The purpose of this report is to provide strategies for Wausau Water Works (WWW) to remove the lead service lines (LSL) from the distribution system. WWW has retained CDM Smith to develop a plan for a lead service line replacement (LSLR) program. A LSLR program is highly dependent on details that are unique to each water system. Using experience from developing LSLR programs for a variety of other systems and information about Wausau's water system, CDM Smith designed an LSLR program to meet the needs of the community and to support WWW in proactively responding to new legislation surrounding public health and lead. The developed plan is outlined in this report along with the options and background information considered for each aspect of this plan.

### 1.2 Federal Lead and Copper Rule Revisions (LCRR) Related to LSLR

While the current Federal LCRR does not require all utilities to begin replacing LSLs, the law has several requirements to put utilities on the path towards LSLR. Additionally, the federal government has announced that additional revisions to the LCR are expected by October 2024, and these changes are widely anticipated to be stricter than the current LCRR.

The primary requirements of the LCRR related to LSLR for community water systems are:

- 1) Create a material inventory
- 2) Develop a LSLR Plan
- 3) Limit partial LSLR
- 4) New lead limits for mandatory LSLR

Compliance with the new LCRR is set for October 16, 2024.

#### 1.2.1. Create a Material Inventory

All community water systems must develop a service line material inventory and develop a plan for LSLR. The service material inventory must be made publicly available. The inventory must be updated and shared annually or triennially, based on the system's tap monitoring schedule. Residents must be notified annually if they are served by an LSL and provided information regarding the health effects of lead and what they can do to mitigate their risk.

### 1.2.2. Develop a LSLR Plan

The LSLR plan has to include strategies for identifying unknown service line materials, procedures for completing full LSLR, a strategy for communicating with residents for LSLR, a goal replacement rate in the event of an exceedance, flushing procedures, a prioritization strategy, and a strategy for funding and financing LSLR. Any galvanized steel service lines that were downstream of lead (or may have been downstream of lead, but status is unknown) must also be included.

### 1.2.3. Limit Partial LSLR

When a utility is replacing a portion of a LSLs as part of planned work, utilities must offer to replace the private side of the LSLs at the same time as the public side work. However, utilities are not required to pay for the private-side work. Similarly

When a customer initiates an LSLR, the system has 45 days to replace the public-side of the LSL (or 180 days with an approved extension).

Lead goosenecks must be replaced whenever the utility encounters them in the course of planned or unplanned work.

### 1.2.4. New Lead Limits for Mandatory LSLR

Under the existing LCR, utilities that exceeded the action level of 15 ppb had to replace 7% of their LSLs annually. The new LCRR establishes a trigger level of 10 ppb where if the system's 90th percentile lead exceeds the trigger level, the utility proposes a replacement goal and it is approved by the state. If the 90th percentile lead is above the 15 ppb action level, the system will be required to replace 3% of LSLs annually, based on a 2-year rolling average. While this replacement rate is less than the previous LCR target of 7% replacements, the definition of what counts as a LSLR is stricter. Unlike the original LCR, however, partial LSLR, identifying a service as not being lead, and testing a service line as being below 15 ppb for lead all will not count towards required LSL replacement rate goals. Therefore the new LCRR is anticipated to result in more full LSLR than the previous LCR even with a lower replacement goal.

When evaluating if a utility is likely to exceed the 10 ppb trigger level or 15 ppb action level, utilities must consider that the LCRR also shifts the compliance sampling from lead service lines from the first liter to the fifth liter. This change is intended to capture the worst-case scenario for the lead concentration in drinking water by collecting water that has stagnated in the service line, and utilities with lead service lines typically find that their 90th percentile for lead will be higher in the fifth than it is in the first liter. Utilities with LSLs should not assume that past 90<sup>th</sup> percentile results below 10 ppb will mean that they will still be below the trigger limit under the new fifth liter sampling regime. Instead, utilities are advised to take sequential samples, where consecutive one liter bottles are filled until twelve to fifteen samples have been collected, in a selection of homes with lead services to determine how high lead readings can be in the samples in direct contact with the LSL during stagnation.

## 1.3 State LSLR Requirements

Currently, the State of Wisconsin does not have legislation requiring or regulating LSLR programs but does encourage all Wisconsin water systems to consider LSL removal or to develop a service

line material inventory. Additional guidance and funding are offered by the WI DNR to support water systems in protecting the public from lead. More details about the funding offered by the WI DNR are included in Section 5.

## 1.4 Other Lead Service Line Replacement Programs in Wisconsin

Many other cities across the nation and in Wisconsin have already embarked on LSLR programs. **Table 1-1** shows a summary of some of the major program details for other utilities in Wisconsin.

**Table 1-1. LSLR Programs in Wisconsin**

| City<br>(Number of<br>LSL)                                    | Private Side<br>Funding/Financing Offered                                                  | Program Funding Sources                                                                                                                                                    | Notes                                                                       |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Eau Claire</b><br>(~800 each<br>Public and<br>Private LSL) | Offers \$2,000 rebate                                                                      | Funding from Wisconsin<br>Department of Natural Resources<br>(WI DNR)                                                                                                      | Mandated replacement,<br>must fully replace after<br>partial within 90 days |
| <b>Elkhart Lake</b>                                           | Offers up to \$6,000 for<br>replacements                                                   | Grant, source not available                                                                                                                                                | None                                                                        |
| <b>Green Bay</b>                                              | None                                                                                       | \$300,000 from WI DNR in 2018<br>\$500,000 from WI DNR in 2016, plus<br>\$300,000 from Lambeau Field sales<br>tax                                                          | Program completed from<br>1990's through 2020                               |
| <b>Janesville</b>                                             | Offers up to \$5,000 for<br>replacements                                                   | Safe Drinking Water Loan Program<br>(SDWLP)                                                                                                                                | Plans to cover about 100<br>homes with these funds                          |
| <b>Kenosha</b>                                                | 50% of cost subsidized,<br>remaining is low interest loan<br>on property tax over 10 years | Given the authority to establish a<br>financial assistance program<br>through Leading-on-Lead Act,<br>funding to come from utility rates                                   | None                                                                        |
| <b>Madison</b><br>(Had 8,000 LSL)                             | 50% of cost (up to \$1,500)<br>subsidized, offered city<br>financing for remainder         | Cost \$15.5 million, paid for by<br>revenue generated by renting space<br>on top of water towers to cell<br>phone companies for antennas and<br>from annual capital budget | Mandated replacement,<br>Program completed from<br>2000 through 2012.       |
| <b>Manitowoc</b>                                              | Low interest loan, up to<br>\$6,000 at 2.5% over 10 years                                  | Safe Drinking Water Loan Program<br>(SDWLP)                                                                                                                                | Full line owned privately.                                                  |
| <b>Marshfield</b><br>(225 lines)                              | Offers up to \$3,000 for<br>replacements                                                   | \$500,000 in grant money from the<br>DNR                                                                                                                                   | None                                                                        |

| City<br>(Number of<br>LSL)                                  | Private Side<br>Funding/Financing Offered                                                                           | Program Funding Sources                                                                                                                                                    | Notes                                                                                                                          |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Menomonee Falls</b><br>(200 private, 20 public lines)    | Uses principal forgiveness on Safe Drinking Water Loan Program to cover private side replacement                    | Safe Drinking Water Loan Program (SDWLP)                                                                                                                                   | None                                                                                                                           |
| <b>Milwaukee</b><br>(74,000 LSL)                            | Owners of buildings with 1-4 dwelling units pay only \$1,600. Otherwise, special assessment financing over 10 years | Water rate revenue, WI Department of Natural Resources, Public Services Commission, State funding, Wholesale of water to other municipalities, City Budget                 | Ordinance prohibits partial replacements or repairs                                                                            |
| <b>Oconomowoc</b>                                           | Grant of \$2,500 and a low interest loan with a local bank payable in equal installments over a five-year period.   | Safe Drinking Water Loan Program (SDWLP)                                                                                                                                   | Completing private side replacements left in the past as partials                                                              |
| <b>Oshkosh</b>                                              | Reimbursement of 50% of the cost of replacement up to a maximum of \$1500                                           | \$500,000 principal forgiveness loan from the Wisconsin Department of Natural Resources through the Safe Drinking Water Loan Program                                       | Revised municipal code to mandate full LSLR                                                                                    |
| <b>Platteville</b><br>(366 properties with full or partial) | Reimburse replacement cost up to a maximum of \$1,140                                                               | \$310,000 principal forgiveness loan from the Wisconsin Department of Natural Resources through the Safe Drinking Water Loan Program                                       | Homeowner selects contractor                                                                                                   |
| <b>Racine</b>                                               | Offers rebate up to \$3,000, remainder can be low-interest loan                                                     | Rebate program is fully funded by the state, so lottery is closed to homes with public and private lead because utility cannot fund the public side for those extra homes. | No partials, working to repair old partials through lottery system                                                             |
| <b>Ripon</b><br>(80 lines)                                  | Reimburse replacement cost up to a maximum of \$5,000                                                               | Safe Drinking Water Loan Program (SDWLP)                                                                                                                                   | Ordinance allows residents to apply for financial assistance                                                                   |
| <b>Sheboygan</b>                                            | Grant of 50% of total costs up to \$6,000. Remaining cost can use no-interest loan over 36- or 72-months.           | Data not available                                                                                                                                                         | Full line owned privately. Ordinance requires replacement of lead and galvanized and prohibits partial replacements or repairs |
| <b>St. Francis</b>                                          | Offers up to \$5,000 for replacements                                                                               | Safe Drinking Water Loan Program (SDWLP)                                                                                                                                   | Milwaukee completed most public replacements, funding now targets completing partial private side                              |

## Section 2

### Utility Background

Each utility with lead service lines faces unique challenges to removing these lines and protecting the public from the dangers of lead. The history and current practices of treatment used by Wausau Water Works (WWW) are critical to consider in the development of an effective and efficient LSLR program.

#### 2.1 System Background

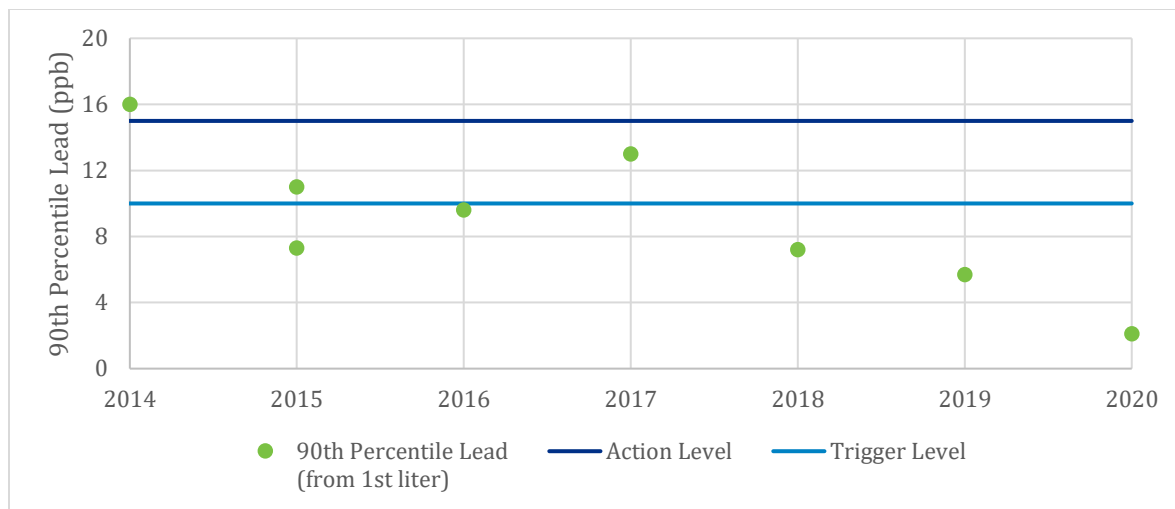
WWW provides municipal water and wastewater service to approximately 16,000 customers through over 250 miles of water mains. WWW has over 16,000 service connections, more than 1,700 fire hydrants, 10 booster stations, and 7 water storage tanks totaling 5,750,000 gallons of water storage.

WWW operates the North Plant, the original facility from 1963, and the South Plant, the addition from 1999. The facilities treat ground water coming from six wells along the Wisconsin River to remove iron and manganese. Two of the wells (Well 3 and 6) are treated for VOC removal with air stripping and the remaining well water is treated with gravity aeration to partially oxidize dissolved iron. Hydrated lime is dosed to adjust the pH to 9.5 to 10.0. Polymers are added for coagulation, flocculation, and sedimentation. Carbon dioxide is added to lower the pH back to 8.5. Solids are removed with gravity filtration before clarification and distribution. The water treatment facility treats and distributes 1.5 billion gallons of water each year; about 4.2 million gallons per day.

A previous assessment of WWW's assets advised the construction of a new treatment plant due to deteriorating conditions in some treatment processes, and this new plant began startup with water flowing in July 2022. The new facility is expected to be in operation in 2023.

#### 2.2 Lead and Copper Rule Compliance

In Wausau, lead service lines stopped being installed around 1965, with some records indicating installation of lead service lines as late as the early 1970's. To prevent the release of lead into the water from LSLs remaining in the system, WWW adds sodium silicate as a corrosion inhibitor. This strategy has been largely effective in keeping the 90<sup>th</sup> percentile lead below the action level in the first liter, with the exception of one exceedance since 2014, as shown in **Figure 2-1**. The figure shows both the current action level (15 ppb) and the trigger level (10 ppb) from the new LCR revisions (LCRR). However, under the new LCRR, these limits will be enforced on the fifth liter, instead of the first liter sample, in properties with LSLs, and lead is typically higher in the fifth liter relative to the first liter. Without sequential sampling results, WWW cannot be sure that they will remain below the trigger limit under the new sampling procedure. If WWW exceeds the trigger level while staying under the action level, the system would be required under the LCR revisions to begin replacing LSLs at an annual replacement rate agreed upon with the WI DNR.



**Figure 2-1. Wausau lead compliance data since 2014, with lines denoting the action level and trigger level based on the LCR revisions. Note, the trigger level will be measured on the 5<sup>th</sup> liter moving forward, and the data shown uses the 1<sup>st</sup> liter sample.**

## Section 3

### Service Line Material Inventory

Wausau Water Works (WWW) has already developed a service line material inventory. Studying this inventory is the first step in developing a LSLR program and a prioritization plan. Identifying unknown service line materials and confirming LSL locations is necessary to develop accurate replacement rate goals, prioritization plans, and funding estimates.

#### 3.1 Existing Inventory

Wausau Water Works provided CDM Smith with their existing service line material inventory as GIS shapefiles. This included shapefiles for water mains, service laterals, valves, and hydrants, among others. CDM Smith reviewed the data in GIS software and database management systems.

The existing service lateral shapefile contained 15,439 laterals. The service line material type overview is shown **Table 3-1** below. For services with different material on the public and private side, the worst-case material is assigned to the full service line.

**Table 3-1 Current (as of October 2022) WWW Service Line Material Inventory**

| Material     | Number of Services |
|--------------|--------------------|
| Lead         | 5,436              |
| Not Lead     | 2,511              |
| Galvanized   | 59                 |
| Unknown      | 7,433              |
| <b>Total</b> | <b>15,439</b>      |

Planning should also consider the expected number of full and partial LSLR since full LSLR will be more expensive than partial LSLR. **Table 3-2** shows the breakdown in public and private side materials to show the anticipated number of full, partial, and potential full/partial replacements.

**Table 3-2 Public and Private Service Line Material Inventory**

| Public / Private Side Material | Number of Services | Summary Replacement            | Number of Service Lines |
|--------------------------------|--------------------|--------------------------------|-------------------------|
| Lead/Lead                      | 480                | Full LSLR                      | 543                     |
| Lead/Galvanized                | 63                 |                                |                         |
| Lead/Unknown                   | 3,717              | Full or Partial LSLR           | 3,737                   |
| Unknown/Lead                   | 20                 |                                |                         |
| Lead/Not Lead                  | 608                | Partial LSLR                   | 1,156                   |
| Not Lead/Lead                  | 548                |                                |                         |
| Unknown/Galvanized             | 9                  | Potential Full or Partial LSLR | 329                     |
| Galvanized/Galvanized          | 1                  |                                |                         |
| Galvanized/Unknown             | 3                  |                                |                         |

| Public / Private Side Material | Number of Services | Summary Replacement    | Number of Service Lines |
|--------------------------------|--------------------|------------------------|-------------------------|
| Unknown/Unknown                | 316                |                        |                         |
| Not Lead/Galvanized            | 46                 | Potential Partial LSLR | 7,163                   |
| Unknown/Not Lead               | 48                 |                        |                         |
| Not Lead/Unknown               | 7,069              |                        |                         |
| Not Lead/Not Lead              | 2,511              | No LSLR                | 2,511                   |

The existing inventory contained nearly complete data for a handful of important variables for service laterals. Both facility ID and diameter fields are populated for 99% of all service line records, while installation date is populated for 96% of records. The water mains shapefile is less populated. The water mains dataset does not have installation dates for 34% of records, however, all records have the decade of installation field populated.

Approximately 700 of the 15,439 service lateral records in WWW's existing inventory do not have installation dates. Of the 14,745 records that do have installation dates, about 9,000 are listed as post-1970. None of these service laterals installed post-1970 are listed as "unknown" on the public side, but on the private side, nearly 6,000 properties are blank for the material.

For overall program planning, the report is using an expected number of LSLR of 8,000. This represents the approximate number of water services that have diameters less than 1.5 inches (or unknown diameters), installation dates before 1988 (or unknown), and not recorded non-lead on both the public and private side. Of this group, if services with one side listed as non-lead are assumed to result in partial replacements and services with both sides listed as lead, galvanized, or unknown as full replacements, approximately 40% of the 8,000 replacements would be expected to be partial replacements. This estimate will be refined as the inventory is advanced.

### 3.1.1 Public-Side Inventory

Table 3-3 below shows the breakdown of materials specifically for the public side of the water service lines.

**Table 3-3 Public Service Line Material Inventory**

| Material     | Public-Side Services |
|--------------|----------------------|
| Lead         | 4,868                |
| Not Lead     | 10,174               |
| Galvanized   | 4                    |
| Unknown      | 393                  |
| <b>Total</b> | <b>15,439</b>        |

#### 3.1.1.1 Review of Public-Side Inventory

As noted in Table 3-1 above, material assignments are available for nearly all of the public side services. Based on discussions with WWW staff, WWW populated the material field (for public

side material) in the service laterals GIS shapefile by digitizing information from over 15,000 tap cards. Since then, materials have been updated from permits and other field verifications. Some materials may have been assumed based on factors such as age.

One challenge with the current inventory is that the source for determining each service line material was not recorded, and so it is not currently known whether each service material in the database was entered from known data, field observation or an assumption was not recorded. If multiple sources (such as a tap card confirmed by a field inspection) were used, the best practice is to maintain both records in the inventory to track that multiple confirmations have been done. Similarly when a record is updated due to a service line replacement, the field confirmation of the original material during construction should be recorded in addition to its current material post-replacement.

Maintaining the data sources for each lateral is important for a few reasons. First, different data will have different degrees of reliability. Knowing that a service line was inspected during a field repair is more reliable than having a historical tap card record. Locations with assumed material based on age and connection size should similarly be tracked to know what percent of the system has field confirmation.

Secondly, maintaining the source provides for the opportunity to validate assumptions. When field inspections are performed, staff should periodically check the field confirmed data against the initial inventory to track data sources turned out to be correct and which ones were incorrect. This practice will both provide increased confidence in the data sources and potentially identify assumptions or data sources that should be considered less reliable.

### 3.1.2 Private-Side Inventory

The material inventory shown in Table 3-4 is less complete for the private side material.

**Table 3-4 Private Service Line Material Inventory**

| Material     | Private-Side Services |
|--------------|-----------------------|
| Lead         | 1,048                 |
| Not Lead     | 3,167                 |
| Galvanized   | 119                   |
| Unknown      | 11,105                |
| <b>Total</b> | <b>15,439</b>         |

However, based on conversations with WWW staff, all materials in the private-side list have been field verified by WWW staff. None of the materials in the column are assumptions.

### 3.1.3 Next Steps for Inventory Development

The following steps are recommended to improve the public side inventory.

#### 3.1.3.1 Document What Is Known About the Inventory

A memo should be written documenting the current inventory. First, this would include what information was available to develop the inventory, such as the information on tap cards, when field observations were collected, and what permitting records were available.

Next, the document should include what utility staff know about initial lead installation and when lead lines would have been replaced. This would include years that staff believe lead was no longer installed on both the private and public side and what connection sizes would be too large to have been lead pipe. This would also include past construction practices, such as replacing the public side during water main replacements and road rebuilds. It would also include observations, such as the report that meter vaults always being lead service lines. Lastly, if applicable, it should include if certain areas of the system were known to have been constructed differently, such as suburbs that were developed at once and incorporated into the city later or portions that were purchased from another earlier utility.

The last section of this memo should describe what assumptions would have been made in assigning materials to services that did not have tap cards.

### **3.1.3.2 Add Source Tracking and Multiple Source Records to the Inventory**

The current inventory columns should be expanded to include more information about the materials for each service. First, new columns should be added for each potential data source. For example, separate columns for meter inspection material, water main replacement material, work order permit, etc. Typically, for each source, columns will track the material observed, the date of the observation, and the person who observed it. Two columns would continue to be maintained to summarize the estimated public and private materials. Where sources conflict on what a material is, WWW should have a documented procedure for deciding which source to use. For example, a field observation would be considered more valid than a tap card. Attention should be paid when field observations conflict. For example, many utilities have found that if a meter vault has copper pipe showing, the copper pipe may only extend a few inches and be connecting pipe into an otherwise lead service line.

WWW should also consider documenting the existing public side inventory better. This can take a few approaches. First, if there is an earlier version of the inventory saved on a hard drive or as an emailed file from after the tap cards were entered but before all of the field investigation updates, this could be compared to the current inventory to identify which materials were changed. This could help identify both which service lines have had field observations and check how often the tap cards were inaccurate. Second, if WWW staff know that certain programs updated the materials, such as past water main replacements or road repairs, if there are digital records of these past projects, the associated service lines can be marked as having been part of those programs. Services not identified in either process can be marked as assumptions based on existing GIS records and updated going forward when field verifications occur in the course of utility work. If neither of these two options is feasible, the full inventory can be marked now as being based on utility assumptions and going forward, sources would be tracked and updated.

### **3.1.3.3 Set Up a Material Assignment Assumption Algorithm for Unknown Private-Side Materials**

The private-side inventory is currently all field verifications. These records should be used to create a material assignment algorithm. At its most basic, materials can be assigned based on:

- 1) Service line installation year (to identify newer buildings as non-lead with 1986 set as a break point if the end of lead installation is not known)

- 2) Connection size (to identify large connections as non-lead)
- 3) Water main installation year (this helps screen for old water service lines attached to newer properties and, for water mains with very recent installation years, locations where the public side is unlikely to match the private side due to the public side being replaced with the water main)
- 4) Public side material (to also help screen for old water services attached to newer properties and, for old water mains, potential locations where copper was initially installed)

The initial assumptions can be assigned to all of the water services. Locations with field observations can be checked against the assumed material to verify how accurate the assumptions are and see if they should be updated in any locations.

## 3.2 General Strategies to Identify Unknowns

If WWW is interested in taking additional steps to proactively improve the accuracy and accelerate the completion of the service material inventory, additional lead verification methods, as presented in this section, fall into the following four categories:

- Machine learning model
- Interior verification methods
- Exterior verification methods, and
- Emerging/other verification methods.

A machine learning model can develop a more complex material assignment model than the manually created one described in Section 3.1.3.3. Interior verification methods necessitate that the homeowner provide access to conduct the inspection. Exterior investigation methods can often be performed from outside the property line. Emerging/other verification methods are methods that are not guaranteed to be accurate in all systems or that are not widely available.

The LSL verification methods have varying degrees of accuracy and complexity. Often, the most complex and high-effort verification methods will yield higher accuracy results. This section presents verification methods with advantages and disadvantages for each method and a rating for accuracy (good, better, best) and cost/effort (low, medium, high). With all methods, it is recommended that a public education campaign accompany the inspection program to keep customers informed of what the utility is doing and why. For each verification method described in the following subsections, a table is presented to summarize the advantages and disadvantages of the verification method.

### 3.2.1 Machine Learning Model

A machine learning model, or predictive model, can help make assumptions about pipe materials at locations with unknown materials. However, it does require some additional verification methods to test and improve the model results.

The following is typical information analyzed by a machine learning model to make predictions about service line materials:

#### *Utility Data Sources*

- Number and location (both address and gps coordinates) of connections
- Description of when:
  - LSLs were installed
  - LSLs were banned
  - LSLs were typically replaced by the utility (i.e. water main replacements / leaks / etc) and extents (full vs partial)
  - LSLs are typically required to be replaced by homeowner (i.e. leaks, renovations, additions) and extents (full vs partial)
- Known service line materials from past work (digital or tap cards)
- Building age
  - Alternate proxies: Water main age, water hydrant age
- History of water main replacements
- History of leaks / breaks
- Historical permits for renovations / service line replacements
- Connection size
  - Alternate proxies: metered water usage, account type (i.e. single family / commercial / school / etc.)

#### *Tax Assessor*

- Building age
- Proxies for likelihood of high-end initial build materials / LSLR from renovations:
  - Square footage
  - Home value
  - Lot size
  - Number of bathrooms
  - Home materials
  - Owner-occupied / senior-occupied

- Home type

#### *Census Data*

- Proxies for likelihood of high-end initial build materials / LSLR from renovations:
  - Census tract income
  - Census tract demographics
  - Census tract homeownership

| Advantages                                                                                                                                                      | Disadvantages                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ Does not require going door-to-door</li> <li>▪ Can help utilities prioritize where to perform verifications</li> </ul> | <ul style="list-style-type: none"> <li>▪ Based on assumptions and will have some margin of error</li> <li>▪ Requires visual validation through other methods described herein</li> <li>▪ Data may be skewed if system consists of various towns with different installation practices</li> <li>▪ Data may be skewed if data is not randomly distributed</li> </ul> |
| Accuracy: Medium (Highly depends on quality of the data input)<br>Cost: Low                                                                                     |                                                                                                                                                                                                                                                                                                                                                                    |

### 3.2.2 Interior Verification

#### **Door-to-Door Inspections**

Field staff and/or hired supplementary consultant staff can be used to conduct door-to-door inspections to verify the service line material inside the house. This method can yield more accurate data than a desktop study alone and can also be done while inspecting or replacing meters inside the house.

For door-to-door inspections, employees can be sent to knock on doors, request homeowners to schedule an inspection using an appointment system, or a combination of both. Once the service line is accessed, several visual checks can be conducted. One indication of lead is the presence of shiny gray metal revealed upon scratching the service line. If a visual test is unsuccessful, a lead swab test can also be conducted.

According to Liggett et al. (publication date unknown), engaging the customer could lead to better cooperation when such LSLs would need to be replaced. Door-to-door inspections can provide a human element and allow WWW to connect with customers on a personal level. However, this method is time- and resource-intensive. As previously mentioned, outside contractors may be hired so that fewer WWW staff are not taken away from their current essential work, though it is best practice to have at least one representative of the utility onsite during door-to-door outreach. In addition, this method only provides information on the interior of the private-side service line, which is not always the same as the private-side exterior service line. Occasionally plumbers or homeowners will replace the interior pipe while leaving the existing exterior pipe in place.

| Advantages | Disadvantages |
|------------|---------------|
|------------|---------------|

|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ In-person relationship building with a customer</li> <li>▪ More accurate than homeowner-provided photos</li> <li>▪ Can load information from a mobile app directly into GIS</li> <li>▪ Opportunity to communicate with customers and empower them to assist in this effort</li> <li>▪ High response rate when people are home</li> </ul> | <ul style="list-style-type: none"> <li>▪ Only provides information on the interior private side of the line and the interior material may differ from the private side buried material.</li> <li>▪ Some interior service line pipes are inaccessible (i.e. crawl spaces)</li> <li>▪ Method is very time and resource intensive</li> </ul> |
| <p>Accuracy: Better (buried pipe is not confirmed with this method)</p> <p>Cost: Medium</p>                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                           |

### Homeowner Surveys and Photos

Instead of sending staff to conduct door-to-door inspections, an information gathering campaign can be implemented through monthly bills, postcards, or other customer communications. Such a campaign could be conducted by mail, e-mail, mobile phone application, or phone call/verbal surveys, and would involve a request to the homeowner to provide survey data and corresponding photos related to service line material identification of the interior private-side service line. A survey can be done with a QR code linked directly to a web form that can be filled out on a smartphone with the ability to attach photos. This survey can then be tied to GIS to track and review responses. One disadvantage to this method is that the information provided may not be comprehensive as it was not collected by individuals specifically trained to conduct such inspections. This method, however, is lower cost, lower effort and is often used for initial data gathering.

| Advantages                                                                                                                                                                                                                                                                                                                                                                          | Disadvantages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ Provides higher accuracy data than desktop review alone</li> <li>▪ Does not require in-person meetings, can be done over mail and electronically</li> <li>▪ Online survey can be linked directly to a database that links to GIS</li> <li>▪ Opportunity to communicate with customers and empower them to assist in this effort</li> </ul> | <ul style="list-style-type: none"> <li>▪ Survey and photos may have data inconsistencies</li> <li>▪ Data must be reviewed by the utility</li> <li>▪ Only provides information on the interior private side of the line and the interior material may differ from the private side buried material.</li> <li>▪ Homeowners that do not have readily available internet access may not be able to complete the online survey</li> <li>▪ Lower response rate than door-to-door inspections but can reach more people</li> </ul> |
| <p>Accuracy: Good (buried pipe is not confirmed with this method)</p> <p>Cost: Low</p>                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Inspection Combined with Water Quality Testing

Free water sampling kits to test for lead in exchange for an interior pipe inspection is an option. When the sample kits are dropped off, utility personnel would perform the inspection. Testing water from a homeowner's tap can provide valuable information to predict service line material. However, this requires due diligence on WWW's part to determine service line material in addition to water sampling. Water sampling may provide more confidence about whether a home is fed by an LSL but is a secondary metric and will not provide a comprehensive confirmation of service line material since false negative (i.e. non-detects even with a LSL) are inevitable. Additionally, to conduct water testing, WWW would be required to enter residences, rely on customer water testing, or hire external contractors to conduct the testing. Water sample kits may include several bottles in an effort to capture the water in the buried service line. A local

university may be a good source of labor to help sample, so as to collect valuable and hard-to-obtain water quality data from stagnated lines.

| Advantages                                                                                                                                                                                                                                                                                                                                                                                | Disadvantages                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Provides higher accuracy data than inspection alone</li> <li>Expands data available to the utility and to the homeowner with a water sample</li> <li>Opportunity to communicate with customers and empower them to assist in this effort</li> <li>May incentivize homeowner to allow for the replacement over just the inspection alone</li> </ul> | <ul style="list-style-type: none"> <li>Providing water sampling kits and analyzing for free to customers is costly</li> <li>Water quality data may be dependent on the quality of testing, if testing is done by the homeowner</li> </ul> |
| Accuracy: Best<br>Cost: High                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                           |

### Contractor Inspections

Other contractors that conduct interior housework could provide survey data for the lead service line inventory. Working with local plumbing contractors, WWW may form relationships that could yield important information as contractors conduct their work in residences. WWW can request that the town or city plumbing inspector include material observed on the service line when performing work in order to obtain a permit. Forming a relationship with contractors who are already working in residences could be an efficient method of service line material verification.

| Advantages                                                                                                                     | Disadvantages                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Potential new data source</li> <li>No additional effort by utility personnel</li> </ul> | <ul style="list-style-type: none"> <li>Interior pipe material may differ from buried materials</li> <li>If partnering with plumbing contractors not directly hired, likely data would not be input directly into GIS</li> <li>Will not provide a significant number of results quickly but can provide verification over time</li> </ul> |
| Accuracy: Best<br>Cost: Low                                                                                                    |                                                                                                                                                                                                                                                                                                                                          |

### Exterior Verification

#### Meter Inspections

Water meters for homes are either located in a meter box in the curb outside the house or within the house's basement. For interior water meter inspections, see "door-to-door inspections" above. For meters installed externally, the water meter can provide a convenient area to directly access the service lines. From this location, WWW staff can conduct physical testing to verify the presence of lead piping.

| Advantages                                                                                                                                                                                       | Disadvantages                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Avoids having to go into the house</li> <li>Depending on the type of meter box, can provide the buried private-side and utility-side materials</li> </ul> | <ul style="list-style-type: none"> <li>Method is very time and resource intensive</li> <li>Pipe attached to meter box may not represent the material of the service line</li> </ul> |

|                                  |                                                                                                                                                                                                                                                                                    |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | <ul style="list-style-type: none"> <li>▪ Not all meter boxes are the same and the service line pipe material may not be able to be identified without digging a test pit</li> <li>▪ Meter boxes can be filled with dirt over time and pipe may not be easily accessible</li> </ul> |
| Accuracy: Better<br>Cost: Medium |                                                                                                                                                                                                                                                                                    |

## Test Pit

Test pitting, or potholing, is one of the most accurate methods of service line verification. Test pitting can be performed by open cut or by hydro-jetting, usually both on the utility-side and the private-side. Since homeowners are more likely to replace the interior service line than the buried service line, the exterior inspections are considered to be more accurate than interior inspections. However, the process is time-intensive, requires restoration on private property and risks damaging either the service line or private property. Test pitting can also disturb LSLs and it is recommended to provide flushing instructions to the residents, and possibly a filter, when disturbing an LSL.

| Advantages                                                                                                                                                                                                                                                                                    | Disadvantages                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ Considered to be the most accurate verification method</li> <li>▪ Can capture both the buried private-side and utility-side materials</li> <li>▪ Can be done simultaneously with a replacement program to minimize disturbance</li> <li>▪</li> </ul> | <ul style="list-style-type: none"> <li>▪ Method is very time and resource intensive</li> <li>▪ Only captures a small section of the buried service line and pipe materials can vary along the line</li> <li>▪ Conducting test pitting in customer's yards is disruptive and risks damage to the line or yard</li> <li>▪ Requires heavy equipment (vacuum truck)</li> <li>▪ May disturb a lead service line and release lead into the drinking water</li> </ul> |
| Accuracy: Best<br>Cost: High                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Emerging and Other Methods

### Cameras/CCTV

CCTV and pipe cameras can be used to provide a visual observation of the interior of the service line. Camera can be inserted at the curb stop or by disconnecting the meter. Video footage can be recorded and analyzed by a field engineer to see if pipe material can be identified. If there is build-up or if a thick scale has formed, the pipe may not be able to be identified. Additionally, if the video shows a pipe is HDPE/PVC, the pipeline can be entered into the lead service line inventory as definitely not a lead service line.

| Advantages                                                                                                                                                                                                | Disadvantages                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ Non-destructive testing method that does not require excavation</li> <li>▪ Potential to see entire private-side service line including buried section</li> </ul> | <ul style="list-style-type: none"> <li>▪ CCTV/camera typically used for general pipe condition/leak assessment, and less for pipe material identification</li> <li>▪ Corrosion or scaling on the pipe may not allow for the pipe material to be identified</li> <li>▪ Access inside the home would be required if inserting at meter and meters are located inside</li> </ul> |

|                                                                       |                                                                                                                                                                                                    |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | <ul style="list-style-type: none"> <li>▪ Dismantling the interior meter or some pipe joints would be required to insert the camera if curb stop does not allow for access into the pipe</li> </ul> |
| Accuracy: Better (higher if the pipe wall is visible)<br>Cost: Medium |                                                                                                                                                                                                    |

### LiDAR Scanning

Hitachi carries a hand-held laser analyzer that can identify metal types in exposed piping (Gingras, 2021). The technology is useful where the pipe is already exposed and of an indeterminable material. That said, it would not be useful where the service line is buried, or the surface of the pipe cannot be exposed. The technology would provide further data in the case that a service line in a basement can be accessed and tested. In the case of verifying the material of a buried service line, excavation would be required to provide a surface on which the hand-held laser scanner can scan.

| Advantages                                                                                                                                                                         | Disadvantages                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ More accurate the visual inspection alone</li> <li>▪ Non-destructive testing method that does not require extensive excavation</li> </ul> | <ul style="list-style-type: none"> <li>▪ Pipe must be exposed so that the hand-held laser analyzer can be used on it requiring interior access or a test pit</li> <li>▪ Process is time and resource intensive</li> </ul> |
| Accuracy: Better<br>Cost: Medium                                                                                                                                                   |                                                                                                                                                                                                                           |

### Sound or Magnetic Waves

In December 2018, a team of researchers affiliated with Drexel University affiliated researchers were granted a patent entitled “Identification of Water Pipe Material Based on Stress Wave Propagation”. The technology seeks to provide a non-destructive testing solution for identifying buried pipe materials without digging. The technology holds great promise to provide an efficient, non-invasive LSL identification method but is not yet ready for commercial use. Further studies are required so that the technology provides accurate information that can be utilized in utility service line verification efforts.

| Advantages                                                                                                                                                                                                                                                            | Disadvantages                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>▪ Non-destructive testing method that does not require extensive excavation</li> <li>▪ Does not require going inside the house</li> <li>▪ May be able to determine if pipe material changes within the service line</li> </ul> | <ul style="list-style-type: none"> <li>▪ Technology is in development and not yet commercially available</li> <li>▪ Equipment required to be purchased</li> <li>▪ Time and resource intensive</li> <li>▪ May be impacted by traffic or presence of other utilities</li> </ul> |
| Accuracy: Unknown<br>Cost: Medium                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                               |



## Section 4

# Lead Service Line Replacement Prioritization

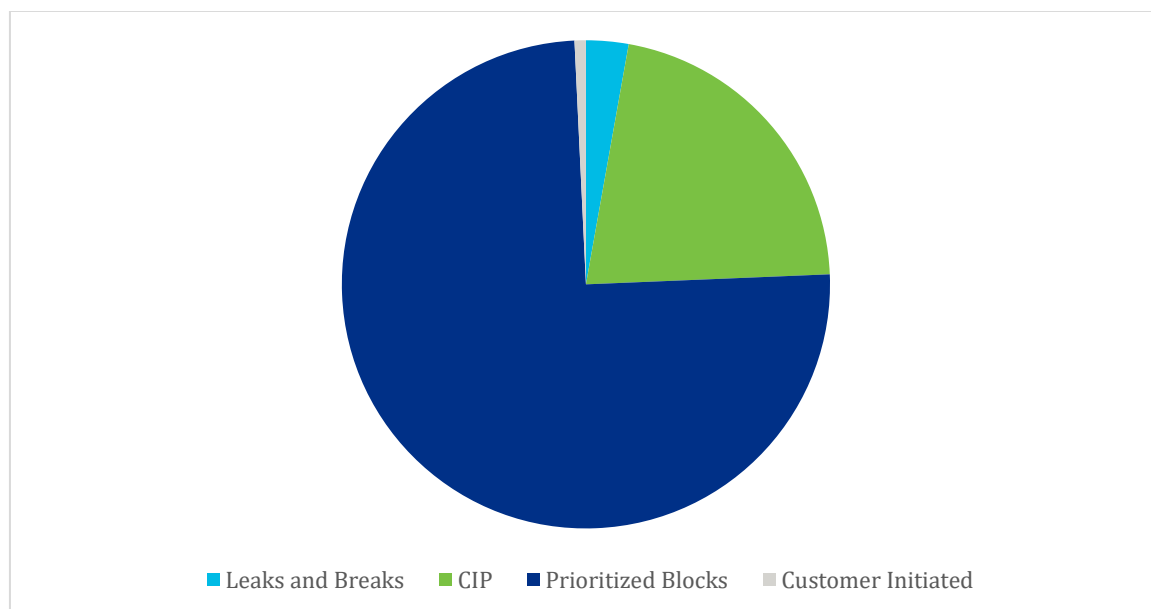
With approximately 8,000 LSLs to replace and a goal of completing the program in 15 years, WWW will need to be strategic about what LSLs are replaced when in the program. By replacing 533 LSLs annually, WWW can complete their program in the targeted 15 years with an approximate annual cost of \$5.33 million. In the event of a trigger level exceedance, WWW would recommend that the replacement goal rate would remain at this proposed 6.5%, since this already exceeds the Federal LCRR replacement rate requirement of 3% for an action level exceedance.

## 4.1 Replacement Goals

Following a proposed pilot program in 2023, LSLR will take place across four main programs:

- Replacement following a leak or a breaks
- Replacement alongside Capital Improvement Plan (CIP) projects
- Prioritized block replacements
- Customer Initiated

**Figure 4-1** shows a breakdown of how many replacements will be done on the basis of each priority criteria. The majority of replacements are anticipated to be through the CIP projects and prioritized block replacements.



**Figure 4-1. Summary of Annual LSLRs in Each Program.**

## 4.2 Leaks and Breaks

Based on discussions with WWW staff, the WWW typically has approximately 10 to 20 leaks and breaks annually on LSLs. This number would be anticipated to go down over time as the number of LSLs in the system is reduced. Leaks and breaks will be replaced as they occur, without limiting the number. Individual years of low or high replacements under this program can be adjusted for by reducing or increasing the number of replacements in other programs the following year.

Prioritization of LSLR would have no impact on the leaks and breaks program.

## 4.3 Integration with CIP Projects

Under the LCRR, WWW will soon be required to offer full LSLR alongside all water main replacement programs. Replacing the full LSL alongside water main projects is a cost effective way to replace LSLs, since crews are already mobilized to these locations. WWW plans water main replacements approximately four years in advance, and Table 4-2 below shows the number of anticipated LSLs related to the planned water main replacements.

**Table 4-1 Number of LSLR Opportunities as Part of Planned Water Main Replacements and Street Reconstruction Projects**

| CIP Project Year | Estimated Potential Lead Service Replacements |
|------------------|-----------------------------------------------|
| 2022             | 161                                           |
| 2023             | 71                                            |
| 2024             | 99                                            |
| 2025             | 127                                           |

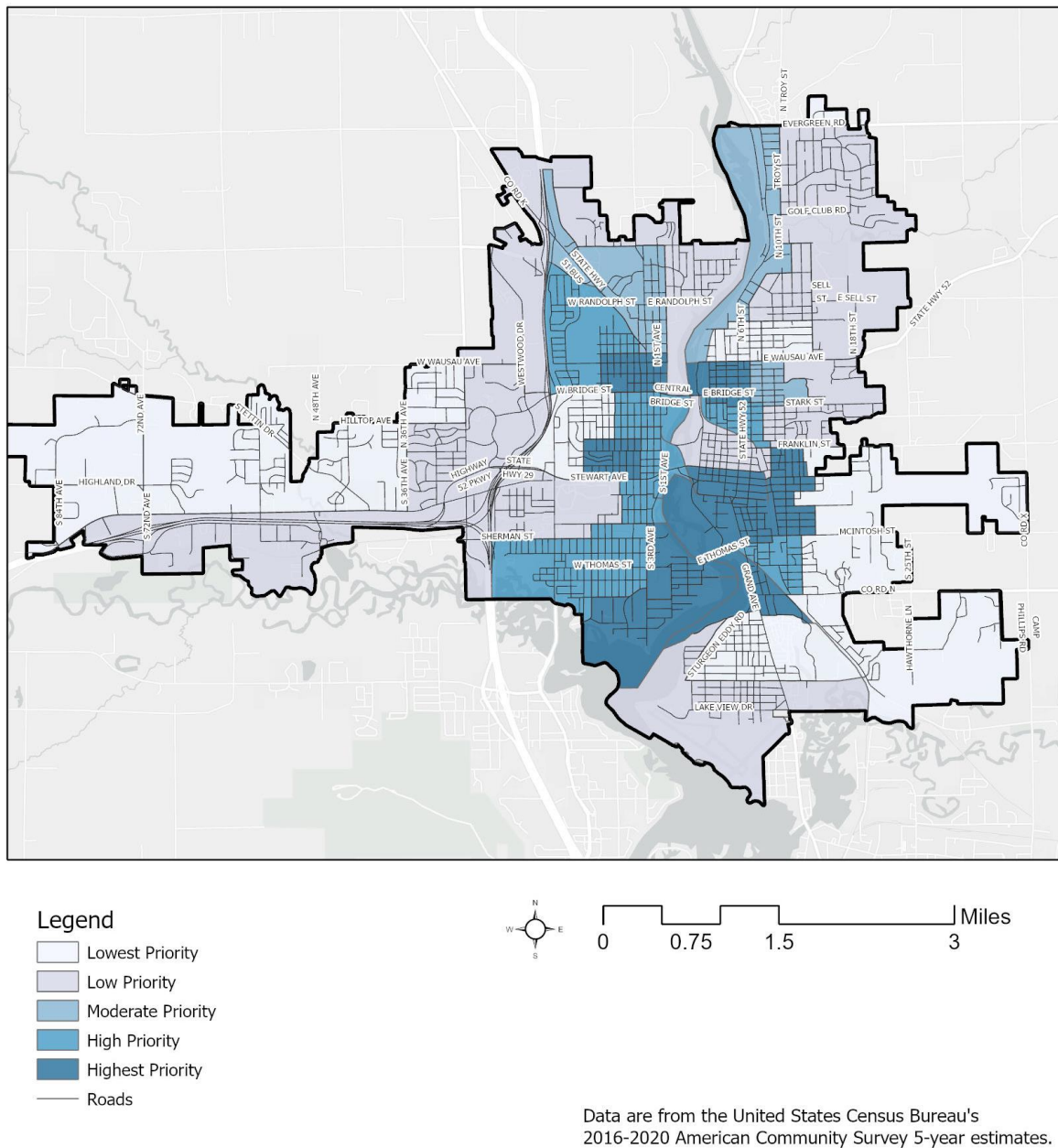
Other projects that disrupt the streets, such as street resurfacing, should also consider including LSLR alongside or in advance of the projects in order to improve construction efficiency.

## 4.4 Prioritized Block LSLR

Each year, after WWW has determined the number of planned LSLR as part of the CIP program and the estimated number of breaks, prioritized blocks will be selected for LSLR to meet the annual target number of LSLR. With between 80 and 170 LSLR anticipated through leaks and breaks and CIP programs, this leaves approximately 360 to 450 annual LSLR under the prioritized block replacement program.

A workshop was conducted with WWW to discuss potential prioritization factors and determine what factors were most critical to meet Wausau's needs. The factors selected below were chosen following discussion with WWW staff and key stakeholders. Figure 4-1 below shows the current prioritization map.

## Wausau Lead Service Line Replacement Prioritization Plan



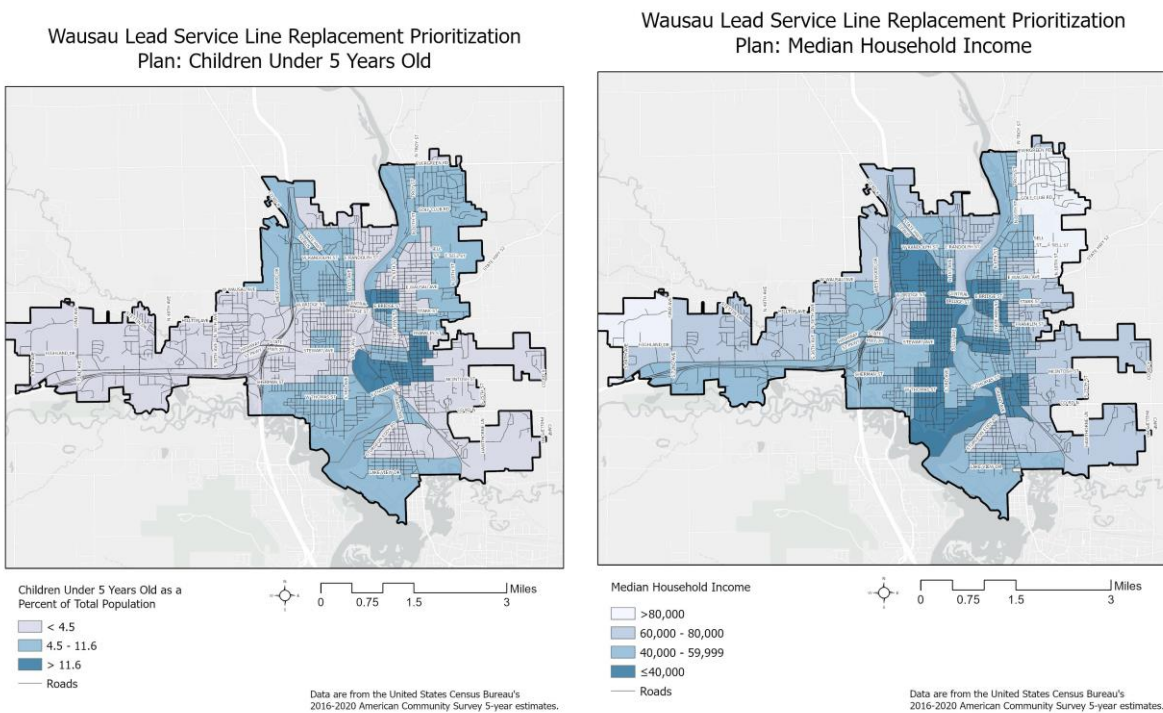
**Figure 4-2 Overall LSLR Prioritization Map**

### 4.4.1 Sensitive Populations

Sensitive populations may be deemed to have greater risk of experience the negative health effects of lead either because they are more susceptible to lead's effects or because they may have

greater exposure to lead in their drinking water. Young children are among those that are considered to be more susceptible to the effects of lead.

In identifying areas to be prioritized for early phases of the program, data from the American Community Survey (ACS) 2016-2020 5-year estimates were used. Median Household Income data was used in prioritization to encourage equity in the program, also supported by the Environmental Justice analysis in the next section. Data indicating the percent of the population under 5 years old for census block areas was also used to identify locations that should be prioritized to protect children as a high-risk population.

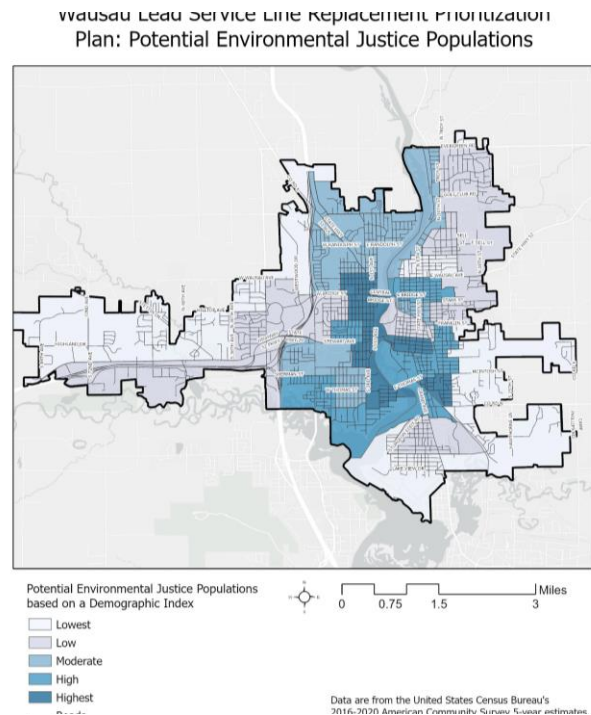


**Figure 4-3 Census Tracts with a High Percentage of Children and Low Income**

#### 4.4.2 Environmental Justice Analysis

Environmental Justice (EJ) analysis is used to assess the impacts that a project may have on minority and low-income populations and ensure that replacements are targeted towards disadvantaged consumers. EJ is a relative measure, calculated by comparing minority and low-income populations in each individual area unit to those populations of a larger area unit (e.g., each census block group to the study area, county, or state).

The U.S. Census Bureau's American Community Survey (ACS) 2016-2020 5-Year Estimates were used as source data to determine minority and low-income populations for the city of Wausau. To identify low-income populations, the percentage of households below the poverty level was calculated for each census block group. To identify minority populations, the percentage of individuals belonging to one or more minority groups was calculated for each block group. Then, these two values were used to calculate an environmental justice demographic index. This is the same demographic index used by the Environmental Protection Agency (EPA) as a component of environmental justice analysis. This analysis was then used with other data to develop prioritization for LSLR.



$$\text{Demographic Index} = \frac{\% \text{ low income population} + \% \text{ minority population}}{2}$$

#### 4.4.3 Prioritization Components

To calculate the prioritization, each of the above parameters is assigned a score 1 to 5 to normalize the rankings. Without this normalization, factors that naturally involve larger numbers (i.e. home value) would automatically dominate the scoring over parameters with smaller numbers (i.e. percent of population under five). The break points for assigning these scores is shown in Table 2-2 below (with 1 being low priority and 5 being high priority). Each parameter also receives a weighting to represent the importance of that parameter relative to the other parameters.

**Table 4-5 Breakpoints for Assigning Priority Scores**

| Parameter                      | Resolution   | Description                                                 | Weight | 1      | 2         | 3         | 4         | 5     |
|--------------------------------|--------------|-------------------------------------------------------------|--------|--------|-----------|-----------|-----------|-------|
| Environmental Justice Analysis | Census Block | EPA defined index that includes income and demographic data | 1      | <=0.17 | 0.18-0.22 | 0.19-0.32 | 0.35-0.59 | >=0.6 |
| Percent Children under 5       | Census Block | American Community Surveys population data                  | 1      | < 4%   | n/a       | 4%-10%    | n/a       | >10%  |

| Parameter               | Resolution   | Description                                | Weight | 1      | 2           | 3           | 4      | 5   |
|-------------------------|--------------|--------------------------------------------|--------|--------|-------------|-------------|--------|-----|
| Median Household Income | Census Block | American Community Surveys population data | 1      | >\$80k | \$60k-\$80k | \$40k-\$60k | <\$40k | n/a |

Once all components were normalized, they were combined to produce a prioritization score for each census block group in the study area:

*Prioritization Score*

$$\begin{aligned}
 &= \text{Population Under 5 Years Old (normalized 1 – 5)} \\
 &+ \text{Median Household Income (normalized 1 – 4)} \\
 &+ \text{Demographic Index (normalized 1 – 5)}
 \end{aligned}$$

#### 4.4.3 Individual Prioritized Locations

In order to increase the speed of replacements in highly sensitive locations, such as schools or daycares, these locations are often prioritized for individual replacements as a separate program. Based on discussion with WWW staff, this approach has already been pursued. WWW staff report that all of the schools do not have LSLs and that daycares were offered free LSLR in prior years. Because daycare locations change over time, it is recommended that an on-going program be developed to continually offer new daycares free LSLR.

### 4.5 Customer Initiated

Under the LCRR, WWW will be required to replace the public side of a LSL whenever a homeowner chooses to replace their private side LSL. WWW does not have control over where and when these LSLRs occur but will still need to reserve resources and be prepared to conduct public side LSLRs on this basis. Where the replacement is part of upsizing the water service, generally done as part of a remodel, the homeowner may continue to be responsible for paying for the full replacement from the house to the water main.

The number of customer-initiated LSLR occurring outside of a home renovation are expected to be minimal.

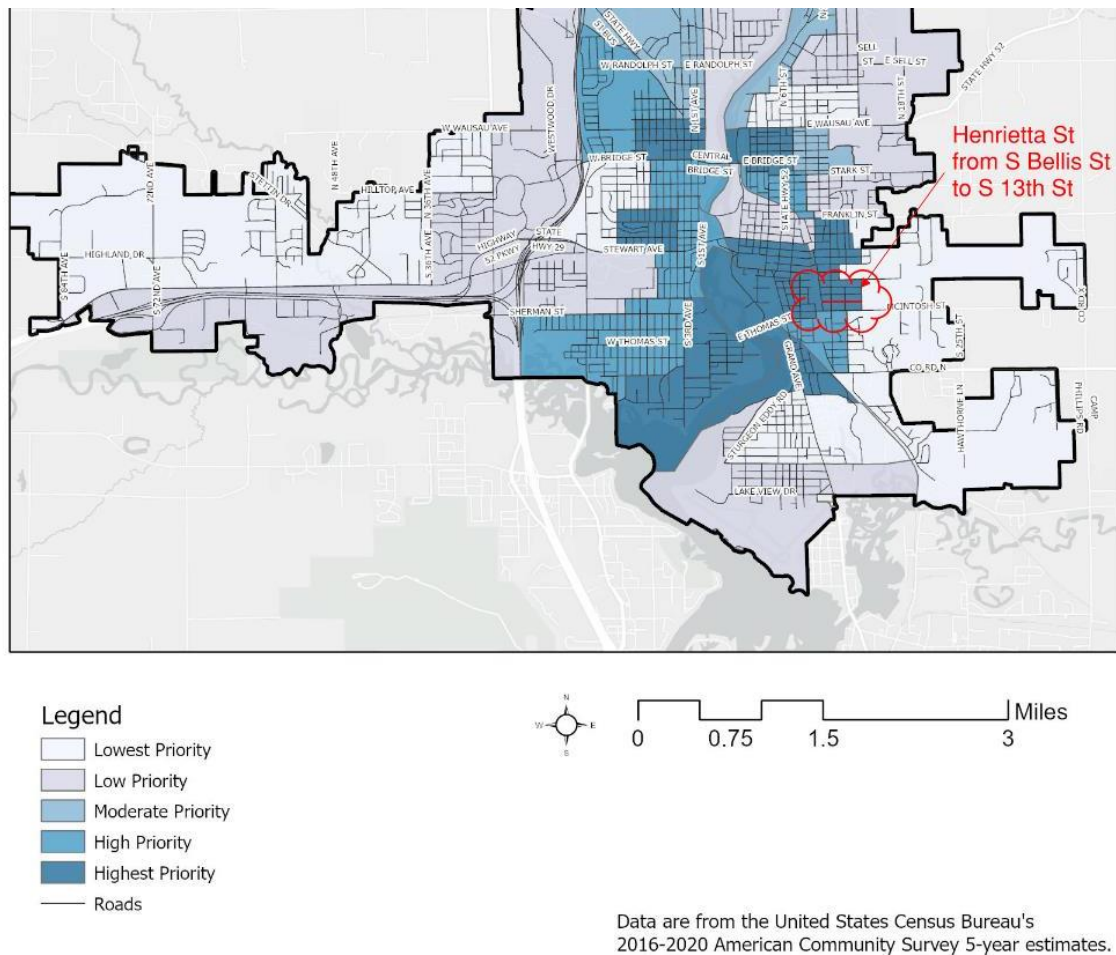
### 4.6 Pilot Program

In order to finalize LSLR standard operating procedures and gain local experience in LSLR, a pilot program is proposed for 2023. During the pilot, different construction methods, including pipe pulling, directional drilling, boring, and open cut, can be tested. Outreach strategies, including different outreach materials, would also be developed and piloted to determine which outreach methods is most effective at increasing participation. The data tracking plan would also be tried and refined. Additionally, this pilot effort would be used to better estimate the full LSLR program costs, including both direct construction costs, and program management costs such as engineering, construction supervision, outreach, and water quality testing.

This pilot program is proposed to include two projects, one with individual LSLR and one with LSLR on a block alongside a water main replacement.

For the individual replacements CDM Smith recommends beginning with a program to replace LSLs in daycares. Because daycare facilities continuously host young children, replacements here have a high potential for a health benefit. In Wausau, the Department for Children and Family Services lists 39 licensed daycares in the city. However, not all of these will have lead services. 23 locations are confirmed to not be lead on the public side in the WWW's inventory. Therefore a program focusing on confirming non-lead in daycares and replacing those with LSLs would be within the scope of a one year pilot.

For a pilot to replace LSLR alongside water mains, the block on Henrietta Street between Bellis Street and 13<sup>th</sup> street is proposed. This area is part of a CIP block project already and is in the highest priority area.



**Figure 4-5 Proposed Pilot LSLR Project**

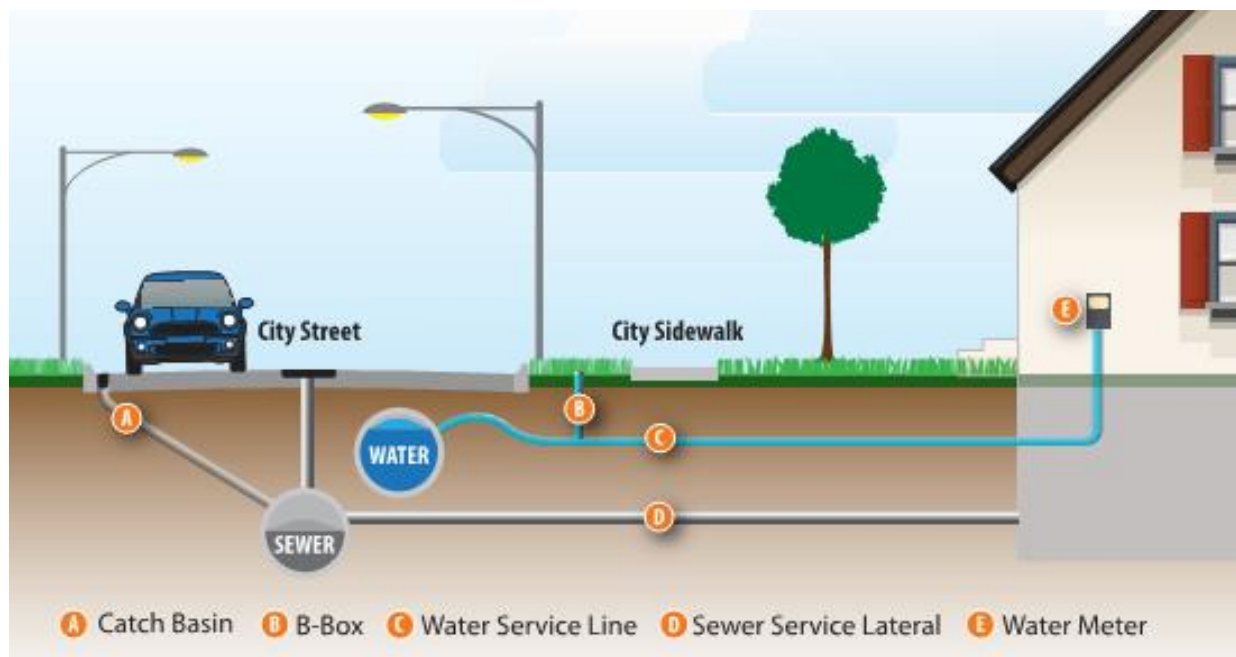


## Section 5

# Funding Opportunities and Strategies

Based on conversations with WWW, the average cost for replacing a lead service line from the water main to the meter is \$10,000. For 8,000 LSLs, WWW's program is anticipated to cost approximately \$80 million<sup>1</sup> over 15 years. This section outlines some options and strategies for funding or financing LSLRs.

In most cities, the ownership of the LSL is split between the utility and the property owner. The property owner typically owns and is responsible for the LSL from the curb stop or property line to the connection into the home as shown in Figure 5-1.



**Figure 5-1. Distribution of Service Line Ownership: Property Owner is Responsible from Meter (E) to B-Box (B), City is responsible for B-Box (B) to Water Main**

## 5.1 Federal Grant Opportunities

Funding may be available to WWW to minimize or finance LSLR program costs for WWW. The Federal government offers grants and loans that may be used for replacing LSLs.

### 5.1.1 WIIN

The federal Water Infrastructure Improvements for the Nation (WIIN) includes grant funding for reducing lead in drinking water, specifically in disadvantaged communities. Two rounds of funding have been allocated nationally through the WIIN program so far. The first round was in

<sup>1</sup> The ultimate program cost may be lower due to approximately 40% of the replacements being partial replacements instead of full replacements (due to a portion of the service line having been previously replaced). However, inflation will increase the program costs over time and additional funding will be needed for program management.

2020 and awarded at a total of \$17.1 million dollars for LSLR. The second round was available in 2022 and totaled \$10 million dollars for LSLR. The first round required a 20% cost share, but this requirement was waived in the second round.

WWW should continue to monitor this program for additional funding rounds. However, both rounds have had limited funding and focused particularly on communities with a history of lead exceedances and disadvantaged communities. Since WWW has not had a lead exceedance since 2014, Wausau is unlikely to be competitive for this grant unless later rounds include more funding and/or change the priorities for the grant.

### **5.1.2 CDBG**

Community Development Block Grants (CDBG) are administered through the U.S. Department of Housing and Urban Development (HUD). These grants are federally funded and distributed on a national level to municipalities and organizations for a wide range of services. There is no required cost-sharing component to this award. The CDBG money is allocated every year, and funds allocated for that year must be spent in that year. If the allocation is not spent in that year, it must be re-applied for in the following year.

In general, at least 70% of the funds must be used to benefit residents of low to moderate income. The target beneficiaries of a project determine how the low to moderate income determination is made. For projects that benefit the public, the area income is the relevant threshold. For these projects, 51% of the area must be low or moderate income. Projects that would benefit the public include water main replacement, road repair, or LSLR for a building that benefits a low-income community. Alternatively, the CDBG funds can be used to benefit individual low or moderate incomes properties. In this case, the individual homeowner must submit an application documenting that they are low or moderate income. Homes that have more than two units are more challenging to document the household income. For a new LSLR program funded with CDBG, it would be recommended to restrict the program to single family or two-flats initially. In order to replace all of the LSLs in a neighborhood block, each individual home would need to document that they meet the income threshold.

The application and income documentation process for using CDBG funds on individual home improvements is extensive. CDBG funds are easier to use on public infrastructure projects, such as water mains, where eligibility can be established at the census block level.

Wausau currently receives \$300,000 annually in CDBG funding. This money can only be used for replacements for low-income residents, and each home must qualify individually for the funding. While the review process for each home to qualify for this funding is time-intensive, this may be a good option to consider for low-income residents to have their LSL fully replaced at no cost to them.

### **5.1.3 The American Rescue Plan Act (ARPA)**

Through the American Rescue Plan Act (ARPA), Wausau received approximately \$15,500,000. However, based on discussions with staff, this funding has been allocated to other needs and will not be available for LSLR.

ARPA funds are a one-time award that was passed as a form of financial relief during the COVID-19 pandemic and are not expected to provide additional rounds of funding.

### 5.1.4 The Bipartisan Infrastructure Law (BIL)

The Bipartisan Infrastructure Law (BIL) allocated \$15 billion over five years to lead service line replacements. This funding will be administered through the Drinking Water State Revolving Funds (DWSRF). States are required to use 49% of these funds as principal forgiveness grants. Currently, these program limit the principal forgiveness to “disadvantaged communities” as defined by each State, and so specific eligibility for principal forgiveness is still being developed. One limitation of these funds, however, is that all funds from BIL (both loans and principal forgiveness) are only available for full LSLR<sup>2</sup>. If a homeowner refuses to participate in the program, replacing the public side of the LSL must be done with other funds.

## 5.2 State Grants

Starting in state fiscal year (SFY) 2024, and for the following five years, the State of Wisconsin will make more than \$48 million available annually to communities across the State for LSL replacements. This funding was made available to the State through the Bipartisan Infrastructure Law (BIL). Forty-nine percent of the BIL funding must be awarded as principal forgiveness (PF) for disadvantaged municipalities or projects in disadvantaged census tracts – while 51% of the dollars will be distributed through the traditional SRF loan program. An LSL specific evaluation will be used for SRF applications that fund replacements. The specific forms and weighting scales are available on the DNR/SRF website. Included in the weighting is an evaluation of disadvantaged communities/census tracts. The DNR published and Intended Use Plan (IUP) that details how dollars from the BIL and SRF can be used. The IUP establishes the process as described above. The IUP needs to be approved for each of the years covered by BIL funding. Although unlikely, the process could change from one year to the next. WWW should review the IUP, Intent to Apply (ITA), and SRF application process each year to ensure it is following the proper procedure.

The State of Wisconsin will distribute these funds through the State Revolving Fund (SRF) Program. The program can be used to fund:

- Public side LSLs (only when the private side is either also replaced or already non-lead)
- Private side LSLs (only when the public side is either also replaced or already non-lead)
- Engineering and construction management/administration
- LSL inventory

Note that only construction related costs are eligible for PF. Non-construction related costs can be funded through a regular SRF loan. Of the total dollar amount allocated to the State of Wisconsin, \$4 million has been set aside specifically to assist water utilities with completing their LSL inventory.

To qualify for funding each year, WWW will need to submit an Intent to Apply (ITA) for funding by October 30 of the previous year (WWW submitted an ITA in October of 2022 for the 2023

<sup>2</sup> If the home currently has a partial LSL, replacing the remainder of the LSL is an allowable expense.

SFY). Loan applications, along with plans and specifications, are due by June 30 each year. Funds are awarded in late summer or early fall each year and can be used for work already completed in the same calendar year.

In addition to meeting SRF program deadlines, WWW will need to apply to the Wisconsin Public Services Commission (PSC) to use funds collected by rates to pay for private side LSL replacements. The application process is detailed on the PSC's website.

Funding that is provided from the SRF program that is backed by the BIL for LSL replacements must comply with federal requirements for construction, namely:

- The project must pass an environmental screening
- The Utility must show a good faith effort to solicit bids from Disadvantaged Business Enterprises (DBEs)
- Compliance with the Davis-Bacon and other related Acts (wage rates)
- Compliance with the Build America Buy America Act (BABA); individual replacements from a pre-qualified list will comply with BABA

## 5.3 Infrastructure Loans

Debt financing would allow the City to undertake an accelerated LSLR program with a more gradual increase in water rates than funding LSLR out of annual rate revenues. Total federal assistance may not exceed 80% of total project costs, but SRF and WIFIA funds can be used together to provide 100% of the project costs. Table 4-2 shows a broad overview of the difference between two major financing options.

**Table 5-1: Comparison of Financing Options**

|                               | SRF                                                              | WIFIA                                                                                          |
|-------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Interest</b>               | Lowest (< 2%)                                                    | Low, based on US Treasury rate                                                                 |
| <b>Loan Size</b>              | Smaller loans                                                    | Focused on larger loans (\$20M minimum)                                                        |
| <b>Matching Requirement</b>   | None                                                             | 51% (can be SRF funds)                                                                         |
| <b>Application Costs</b>      | Free                                                             | Fee for a full application                                                                     |
| <b>Loan Amount</b>            | Loan issued for a specific contract and specific contract amount | Loan can be issued for a program with multiple disbursements for individual projects           |
| <b>In-House Crews Allowed</b> | No                                                               | Yes                                                                                            |
| <b>Repayment period</b>       | 20 years                                                         | 35 years (deferred up to 5 years after substantial completion and flexible repayment schedule) |

### 5.3.1 WIFIA

WIFIA is administered by EPA and provides loans to large water infrastructure projects (projects with eligible costs over \$20 million) that meet its objectives. LSLR projects are eligible for WIFIA funding and in certain circumstances it is possible to combine WIFIA and state funding. The interest rate on WIFIA loans is tied to the Treasury Bond Rate that most closely matches the loan

terms. Borrowers must be able to demonstrate creditworthiness, and there is no principal forgiveness.

The total amount of WIFIA funding is announced annually in a Notice of Funding Availability. WIFIA will fund up to 49% of the total eligible project costs. Eligible costs include costs of construction, rehabilitation, reconstruction, replacement, and preconstruction activities. Application fees and capitalized interest on the WIFIA credit instrument are examples of ineligible project costs. Some costs incurred before the WIFIA application process may be included towards the total eligible project cost. Repayment begins five years after substantial project completion and the final maturity date of the loan for this project would be 35 years after the date of substantial project completion. WIFIA requires that the project scope for the funding application anticipates reaching substantial completion in five years or less.

EPA only issues an invitation to apply to projects that it anticipates can get WIFIA credit assistance (following submission of a letter of interest to the EPA), though it does not guarantee approval. The application process includes an application fee (\$100,000), a credit processing fee (variable), an oral presentation, an assessment of the technical soundness of the project, and development of the term sheet. Creditworthiness will also be further assessed during the application process. The application costs can reach \$2 million, and the majority of these costs are not refundable if an application is unsuccessful.

For the WWW, the WIFIA program likely only makes sense if the program is using WWW crews to perform LSLR. Otherwise, the more complicated and expensive application process is likely not worth it based on the expected project cost over five years.

### 5.3.2 Safe Drinking Water Loan Program

The Wisconsin Department of Natural Resources (WI DNR) offers a Safe Drinking Water Loan Program (SDWLP) with funding applicable to LSLR. This program offers subsidized loans and further subsidies to reduce the cost of those loans for the design, planning, and construction costs for projects including updating drinking water distribution. As of May 2022, the rates for this loan are 2.035% for loans under 20 years and 2.145% for loans 21-30 years. Applications are accepted year-round for projects not seeking principal forgiveness, but applications must be submitted online by September 30 if the utility is seeking any principal forgiveness.

## 5.4 City Revenue

Many of the grants and loans listed are competitive and cannot be guaranteed to be available to WWW. Even with these outside funding sources, WWW will likely still need to find a way to pay for most of this program. These options include water rate increases, special assessments, fees associated with special service areas, and other revenue sources.

### 5.4.1 Water Rates

Some utilities have used water rate increases to fund LSLR programs. Further water rate analysis could be performed to better determine what level of increase would be needed to fund the project. Low-interest loans or bonds could be used to provide short-term funding to allow for a slower increase in water rates to pay for the overall program.

### 5.4.2 Special Assessments

With the imposition of a special assessment, the total project cost of a specific location would be allocated among benefiting properties. The funds raised from the group of homes would pay for that specific project. A tax lien would be placed on each property and repayment would be equivalent as through property taxes.

There are two main benefits to a special assessment. First, homeowners would not be paying the assessment until their property receives a LSLR. With a water rate or property tax increase, every household begins paying as soon as the project starts even though their property may not benefit for years. Second, grant funding can be directly used for low-income projects so that those homeowners either never pay a special assessment or pay a reduced special assessment. A water rate or property tax increase would be universal, and so while grants could be used to offset the overall program cost, the cost reduction wouldn't be directly targeted at the low-income neighborhoods.

### 5.4.3 Special Utility District

This would need to be approved by the majority of the area's property owners. The total project cost of a specific location would be divided evenly among participating properties. A tax lien would be placed on each property and repayment would be equivalent as through property taxes. The funds raised from the group of homes would pay for that specific project.

### 5.4.4 TIF

WWW may be able to use (Tax Incremental Financing) TIF funds for LSLR in the TIF with available funding. As defined by the Wisconsin Department of Revenue<sup>3</sup>, TIF is a financing option that allows a municipality (town, village or city) to fund infrastructure and other improvements, through property tax revenue on newly developed property. A municipality identifies an area, the Tax Incremental District (TID), as appropriate for a certain type of development. The municipality identifies projects to encourage and facilitate the desired development. Then as property values rise, the municipality uses the property tax paid on that development to pay for the projects. After the project costs are paid, the municipality closes the TID.

Overall, LSLR that fall within TIF zones should review the TIF finances when evaluating funding sources for these replacements.

## 5.5 Bonds

Sale of municipal bonds may help to finance the LSLR program for WWW. However, the rules regarding whether this money can be used toward private side replacement must be considered.

Municipal bonds may also be used to finance LSLR. Municipal tax-exempt debt can be used for public infrastructure, but not the private side. Taxable debt may be used to finance the private side. In the current market, taxable debt will likely carry an interest rate 2 percentage points higher than tax-exempt debt, but this premium can be very volatile.

<sup>3</sup> <https://www.revenue.wi.gov/Pages/SLF/tif.aspx>

Bonds would need to be repaid with either increased taxes or water rates. Bond issuances would only be used to provide capital for the project upfront to delay the tax or water rate increases needed to repay the debt.

## 5.6 Private Side Replacement

Many funding or financing tools have requirements regarding whether the money can be used on private property or whether it is applicable toward partial lead service line replacements. Since many sources have come to agreement that full lead service line replacement is better than partial lead service line replacement, most funding and financing sources that are focused on LSLR do allow the funds to be used towards replacement of the private side of the lead line. Additionally, providing funding or financing to homeowners for the private side of the LSL is important to maximizing participation and efficacy of the program.

Most utilities with dedicated LSLR programs offer at least some financial support to residents. This may be in the form of a low interest loans, grants for low-income families, or complete coverage of the cost of replacement. The higher the upfront cost is to the property owner, the more likely it is for the property owner to decline to participate in the program. WWW should apply to use the WI DNR private side LSLR funding to maximize program participation. With low program participation, it would be extremely difficult to meet annual replacement goals and remove all LSLs in the targeted 15 years. If the utility is not planning to fully cover the cost of replacement, a loan program or cost-share program may be advisable. WWW currently has a program in place where a property owner can get up to \$4,000 for some construction projects and up to \$6,000 for other replacements. This could potentially bring the average cost of private side replacement from \$10,000 to \$2,000 for the homeowner. Financing through the City may be a viable option for low-income property owners for the remaining LSLR cost.

## Section 6

# Communication and Outreach Strategy

One of the greatest challenges of a LSLR program is encouraging participation and getting buy-in from residents. Building public trust, conveying critical information, and sharing program details with transparency and accuracy are necessary for the program to be successful. This section proposes an outreach plan to tackle these needs. **Figure 6-1** shows the stages needed for LSLR outreach.

| PRE-LSLR<br>RAISE AWARENESS AND<br>ENCOURAGE PARTICIPATION                                                                                                                                                                                                                                                                                                                                                                               | DURING LSLR<br>COORDINATION AND<br>SCHEDULING                                                                                                                                                                                                                                                                                                                    | POST LSLR<br>MAINTAINING<br>WATER QUALITY                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OUTREACH GOALS</b>                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>OUTREACH GOALS</b>                                                                                                                                                                                                                                                                                                                                            | <b>OUTREACH GOALS</b>                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"><li>• <i>Why lead is dangerous</i></li><li>• <i>What homes are at risk</i></li><li>• <i>What can be done to reduce lead exposure</i></li><li>• <i>Who is responsible for what segments of lead service lines</i></li><li>• <i>Options for program participation and risks of opting out</i></li><li>• <i>Where questions can be directed and where further information will be published</i></li></ul> | <ul style="list-style-type: none"><li>• <i>What permitting is required</i></li><li>• <i>How financial assistance and funding will be distributed</i></li><li>• <i>When LSLR work will be conducted and what disturbances this work may involve (water shut-off, road closure, etc.)</i></li><li>• <i>Why homes are selected for prioritized LSLR</i></li></ul>   | <ul style="list-style-type: none"><li>• <i>Why and when flushing is necessary</i></li><li>• <i>How to flush your water daily</i></li><li>• <i>How to flush your water after a disturbance / LSLR</i></li><li>• <i>How to obtain a filter (certified to remove lead)</i></li><li>• <i>How to clean faucet aerators</i></li><li>• <i>How to provide feedback about the LSLR Program</i></li></ul> |
| <b>OUTREACH METHODS</b>                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>OUTREACH METHODS</b>                                                                                                                                                                                                                                                                                                                                          | <b>OUTREACH METHODS</b>                                                                                                                                                                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"><li>• Newspaper ads</li><li>• Robocalls</li><li>• Handouts with water bills and at libraries, community centers</li><li>• Social media</li><li>• Public meetings and open houses coordinated with community liaisons</li><li>• Online map of LSL inventory</li></ul>                                                                                                                                   | <ul style="list-style-type: none"><li>• Letters</li><li>• Flyers distributed door-to-door</li><li>• Website with replacement steps, frequently asked questions, an application form, and more</li><li>• Hotline (added to 311 Program) and email account with responders trained to give accurate and consistent answers to frequently asked questions</li></ul> | <ul style="list-style-type: none"><li>• Videos</li><li>• Demonstrations at public meetings</li><li>• Door hangers</li><li>• Closeout documents</li></ul>                                                                                                                                                                                                                                        |

**Figure 6-1. Communication Strategies Through the Phases of the LSLR Program**

## 6.1 Outreach Before Participation

Public outreach should begin at one year prior to the beginning of LSLR in order to have time to engage and educate the public. If the project start-up date is targeted for 2024, the working sessions to develop the campaign should be occurring in 2023 with a goal of finalizing outreach material and launching the website with downloadable content.

From 12 months out until the date of replacement, outreach should aim to encourage participation and to schedule LSLRs. In this time frame, persons affected by any upcoming water

main work or LSLRs should be given specific information about the project affecting them and when the work will occur. Multiple phases of reminders should be sent out leading up to any work.

### 6.1.1 Communication Methods

Because the billing system for water is not controlled by WWW, there is not a strong database of contact information existing for all water customers. Bridging this disconnect between the finance department and the utility to create a central database for customer contact information will be an important step in establishing communications with customers about the LSLR program. Such a database should include emails, phone numbers, and names tied to addresses/accounts so that contact information is available for the resident associated with each service line. Methods of reaching individuals include call, text, email, and registered mail.

However, mass communication is also an important part of outreach, especially in initial stages of the program. Methods of reaching large groups within the community include flyers, door hangers, mass mail or email, signage at frequently visited community centers and businesses, connection with community groups and religious centers, presence at community events (like farmer's markets), social media, local news outlets and more. Broad methods of communication should be used to inform people about the program, eligibility for participation, and the benefits available to them for participating. From there questions for more details can be directed to a website, hotline, general email address, and town hall or open house-style events.

Some utilities have found that door hangers typically work best. **Appendix A** gives an example of a door hanger that may be used to notify residents about their options in participating in an LSLR program. However, it's essential to use ALL methods of communication to promote the LSL program in an equitable, inclusive manner and to keep a system updated with contact information.

### 6.1.2 Critical Messages

For residents to feel engaged and willing to participate in the program, they need to understand:

- Why lead is dangerous and why program participation is important and beneficial to them: The LSLR program should make communication of the possibility, source, and associated risk of lead in drinking water a priority. Residents need to know and understand the effects of lead exposure and those who are at higher risk.
- How LSLs could expose them to lead: Occupants of buildings constructed before the early 1970's may have an LSL. Inform residents that lead is not in the water leaving the treatment plant but can enter their water through lead service lines and/or internal plumbing. Residents need to know that disturbances to their LSL, such as transmission main work or partial LSLRs, can release lead into their water.
- What WWW is doing about lead exposure: Educate residents about how WWW adds corrosion control chemicals at the treatment plant to minimize lead corrosion and is continually monitoring water quality in the distribution system

- What residents can do to minimize lead exposure: This includes participating in the LSLR program, flushing water for five minutes once it has stagnated more than 6 hours, using cold water from the tap for drinking / cooking, replacing leaded-brass faucets, using a filter certified for lead removal, and addressing lead paint, soil and other sources of lead

## 6.2 Communication with Residents Eligible to Participate

Once through public outreach and education about the program has gotten underway, residents in areas eligible for the first phase of the LSLR program should be notified and encouraged to participate. Documentation for agreeing or refusing to participate needs to be provided and clearly explained to property owners.

To encourage participation in the program and increase the likelihood of meeting annual replacement goals, an ordinance requiring LSLR or prohibiting the repair of LSLs may be considered. Ordinances have been used successfully by other utilities to complete their lead service line replacement programs. The impact of any code or ordinance on residents should be taken into account when mandating replacement to not create inequity or undue disruption to residents. For this reason, most utilities or cities passing such an ordinance either offer a fully funded LSLR or have restricted enforcement or looser requirements built into the ordinance.

An ordinance can be used to require replacement only in the event of a leak, break, or property sale. On the other hand, full LSL replacement may be required of all property owners by a certain deadline. An ordinance could also be used to require participation in any phases of the LSLR program that are scheduled on the block-level, such as paving.

Again, to balance the equity of the program, not putting undue burden on disadvantaged populations, and the efficiency of the program with minimal disruption to residents, broader requirements for LSLR should come with greater financial resources offered for private side replacement. An ordinance requiring LSLR should be written in such a way that it does not take effect until residents have had a reasonable opportunity to participate in the LSLR program.

### 6.2.1 Participating Residents

WWW or the selected outreach specialists need to first identify a responsible point of contact for each address. Then, communication with the point of contact for each participating home needs to address and document the following:

- Construction scheduling
- The process for replacement participation (what forms are needed and who needs to be present at the home)
- The value of participating in the replacement program
- Who needs access to private property (where and why)
- What restoration will be covered by WWW
- What the resident needs to do to flush water after replacement

On the day of LSLR work, any techniques, findings, communications, complications, etc. should be documented. Contact must be made with the property owners and residents when the work begins and when it is completed.

### 6.2.2 Non-Participating Residents

Even with financial support or a free LSLR program, there will be residents who decline to participate. If possible, outreach specialists should ask the resident to share why they would like to decline to see if they can provide further information to ease concerns. Residents concerned about being cited for code violations or illegal activity can be informed of what type of inspection will be conducted for the work and what would and would not be included in that inspection. Concerns about needing to miss work to be present for the private side of the LSLR may be addressed with strategic construction scheduling or by permitting a neighbor or family member to be present instead. Even with a full understanding of the scope and purpose of the program, there will be residents who do not participate.

For property owners and residents that decline to participate in the program, this decision needs to be documented via a signed waiver between all parties. This waiver should include language that explains the following:

- “LSLR funding assistance by the City may not be available in the future. By declining to participate in the program, it is not guaranteed that funding or financing will be offered by the City for lead service lines replaced outside of the program offered currently.”
- A warning that the work may result in sediment, possibly containing lead from the service line, in the building's water
- Information concerning the best practices for preventing exposure to or risk of consumption of lead in drinking water, including a recommendation to flush water lines during and after the completion of the repair or replacement work and to clean faucet aerator screens
- Information regarding the dangers of lead exposure to young children and pregnant women

## 6.3 Communication After Construction

After LSLR work, instructions for maintaining safe water quality must be shared. Following up with property owners and residents after the work is complete could also provide valuable information about what could be improved about the program or even testimonials that could be shared to encourage others to participate.

### 6.3.1 Sampling Requirements

The proposed Lead and Copper Rule Revisions (LCRR) stipulate the following post-construction sampling for lead service line replacements:

- Partial Lead Service Line Replacement: Any water system that partially replaces a lead service line must offer to collect a follow up tap sample between three and six months

after completion of any partial replacement of the lead service line (40 CFR Part 141 Subpart I 141.84.d.1.iv). Sampling must be in accordance with 141.86.b.

- **Full Lead Service Line Replacement** (According to 40 CFR Part 141 Subpart I 141.84.e.4): Any water system that conducts a full lead service line replacement must offer to the consumer to take a follow up tap sample between three months and six months after completion. The water system must provide the results of the sample to the consumer in accordance with paragraph (d) of that section.

The LCRR is not finalized yet and may change. The revisions are considering a change in the requirements for sampling, as well. Instead of submitting a first draw liter for lead compliance sampling, utilities may be required to collect the fifth liter after stagnation instead.

Based on the proposed revisions to the Lead and Copper Rule at the federal level, sampling may be required following full and partial LSLRs. This should be communicated to the resident so that they know to expect follow-up contact and who to expect contact from (to avoid scams). Explaining the purpose of this sampling may also increase residents' comfort with the sampling.

### 6.3.2 Flushing

While an initial flush will be performed by the contractor once construction is complete, the resident should still be instructed in flushing procedures to reduce lead exposure following construction. The flushing procedure should instruct residents to remove all aerators and, beginning in their lowest floor and moving upwards, open all water faucets and taps. The water should be flushed for a minimum of 30 minutes, and then the taps and faucets closed beginning with the first one that was opened and closing in the same order that they were opened. Resident should be instructed to repeat this 30 minute flush every other week for three months. Residents should also be instructed to conduct daily five minute flushes for six months.

At a minimum, residents should be provided a flyer with detailed instructions, as shown in **Appendix B** and allowed an opportunity to ask any questions about this procedure. **Appendix C** shows other examples of flushing and other flyers and outreach materials developed by CDM Smith for Middlesex Water Company's LSLR program.

### 6.3.3 Program Feedback

Getting feedback from residents about participating in the program can provide useful insights that can be used to improve later phases of the program and perhaps increase participation. A survey or follow up interview may be conducted with residents after replacement is complete to gather helpful information. This survey should be made easily accessible and brief to encourage participation. Such a survey may ask residents for complaints or compliments about the program, about what they wish was done differently, what they were pleasantly or unpleasantly surprised by during the process, or why they chose to participate. Documenting why residents chose not to participate could also provide helpful data.

## Section 7

# Construction and Implementation

This section outlines the details of implementing the LSLR program.

## 7.1 Program Timeline

WWW anticipates starting the LSLR program in 2023. Assuming that two LSLs can be replaced per day by a crew and that two crews can be working each day, four LSLs could be replaced daily. With 250 construction working days in the year, WWW could expect to meet its goal of replacing 533 LSLs annually with only one contract per season.

### 2023 - 2024

- Beginning of program
- Replace homes with highest risk based on prioritization factors
- Implement best practices and make improvements based on lessons learned and participant feedback
- Approximately 200 - 300 LSLRs per year

### 2025 - 2036

- Peak program years
- Maximize efficiency by focusing on block level, but continue using high risk prioritization data
- Approximately 500 - 700 replacements per year at peak

### 2037 - 2038

- Program winding down, fewer LSLs remain
- Focus on outreach and cooperation with homeowners who could not be reached or declined to participate in earlier program phases
- Anticipate more effort and less efficiency for these replacements, approximately 100-200 per year

## 7.2 Construction

Currently, WWW mostly uses trenchless construction methods for service line work. However, the conditions at some properties may require a different type of trenchless construction or even an open cut trench.

### 7.2.1 Open Cut

Of the methods presented herein, open cut installation results in the greatest disturbance to the property owner and the traveling public. **Figure 7-1** shows a typical open cut trench with steel plating to allow vehicle traffic to continue to travel over the open trench. It can also have the longest duration in project timeline as it requires significant restoration of grassy areas, sidewalk, curb and gutter, and pavement is required. In addition to restoration, trees become a concern for open cut as overhead branches can interfere with equipment and working in close proximity to trees may impact the health of the tree's root system. Therefore, tree trimming and root pruning will be required with the work, and with much of the work being performed in the spring through fall periods, coordinating with forestry departments for tree trimming can add additional delays onto the contractor schedule. When working on private property, homeowners may have extensive landscaping, porches, fences, walkway lights, irrigation systems, and other features that may be disturbed during the work. Repairing these features not only adds additional time into the schedule but also additional cost. When considering open cut, factoring in these other elements typically results in a longer duration of work on a property, thereby potentially agitating the property owner and reducing funds available for actual lead service line replacement. This can lead to property owners becoming upset with the entire process, and the contractor potentially never fully restoring an element to its exact original condition. Both the schedule and the discontent homeowners can lead to potentially negative feedback on lead service line replacement programs.

Even though there can be many negative issues associated with open cut, there are some recommended applications. For example, if distances are relatively short between a watermain



**Figure 7-1: Standard Open Cut in Street with Steel Plating**

and a property, it may be much quicker to replace the LSL using open cut methods. Another example is when other utilities are being crossed such as gas or electric lines. If they are crossed, WWW personnel can verify that the utility was never compromised if open cut methods were used, but if trenchless is used, the only way that personnel would know if the utility was disturbed is if there was a side effect such as loss of power.

Open cut may also be the only solution if a property owner's sewer drain is found to be broken or otherwise requiring replacement. It may also be the only option in the case the trenchless technology being utilized has failed, and the back-up plan of installing the water service is the use of open cut methods.

If open cut is being considered on a block-by-block basis, this could result in extremely high impacts to residents and the traveling public. Open cut trenches typically cross perpendicular to the flow of traffic, impacting residents walking, traveling by vehicle or biking.

## 7.2.2 Trenchless Technologies

Trenchless technologies are construction techniques developed to perform subsurface utility work while minimizing surface disruptions, such as to the traveling public, and lowering restoration costs. They are also

generally used to avoid obstacles by maneuvering the trenchless tool while concurrently monitoring its location relative to the obstacle. This method also does not involve continuous trenches. Trenchless technologies are a useful tool for installing water services as well, and they have also been used to install many other types of utilities such as electrical conduit, gas, and fiber optic lines. By reducing the area disturbed at the ground surface, these technologies, when performed by experienced operators, will generally shorten installation timeframes and reduce installation costs. Some general installation differences when compared to open cut include:

- Smaller excavation pits
- Less surface disruption to traveled way & private property
- Control of installation using tools with transmitters and location devices
- More planning and setup
- Shorter installation timeframes

- Reduced overall costs

### Pipe Pulling

Pipe pulling, shown in **Figure 7-2**, is where a new water service is pulled behind the old water service being removed. This method of installation has been successful for some communities but unsuccessful for others. Those communities where it has been unsuccessful has been largely due to the water service being coiled or deformed to a non-circular form that does not allow the cable to be inserted. Some of the advantages to this method is that the contractor is using an existing borehole for the new water service to follow the exact alignment of the existing pipe, so the threat of hitting adjacent utilities and other potential issues is greatly minimized. This makes this method efficient, easy to use and train staff on, and minimally disruptive if successful.



**Figure 7-2: Pipe Pulling General Set-Up**

*Photo Courtesy of Denver Water*

However, this method also has potential disadvantages such as the following:

- Existing pipe or cable may rip apart during the removal.
- Cable can not be inserted into the water service line due to the water service line being kinked, profile being elliptical instead of circular, or other reasons.

- Expander at the connection to the new pipe may catch below grade utilities, rock, tree roots, or other items.
- Monitoring of the installation typically only performed by the operator of the equipment that is using feel of touch to determine if they feel any potential issues resulting in resistance. No additional QC is typically incorporated.
- As using the existing service to perform the work, any issues that occur during construction would have to be addressed using another technology (typically open cut) to resolve to restore the home owners service. This can result in un-met expectations by the home owner if they intended trenchless to be utilized to minimize disturbance to their property.
- Pipe pulling installs a new pipe in the exact location of the existing pipe, and does not result in a betterment to the home owners current plumbing.
- Pipe pulling using typical construction equipment such as shown in Figure 7-2 adds unnecessary stresses on the pulling operation. Pipe pulling equipment such as the Kobus Pipe Puller which attaches to the arm of an excavator, is preferred for this type of technology to minimize those additional stresses.

### Horizontal Boring

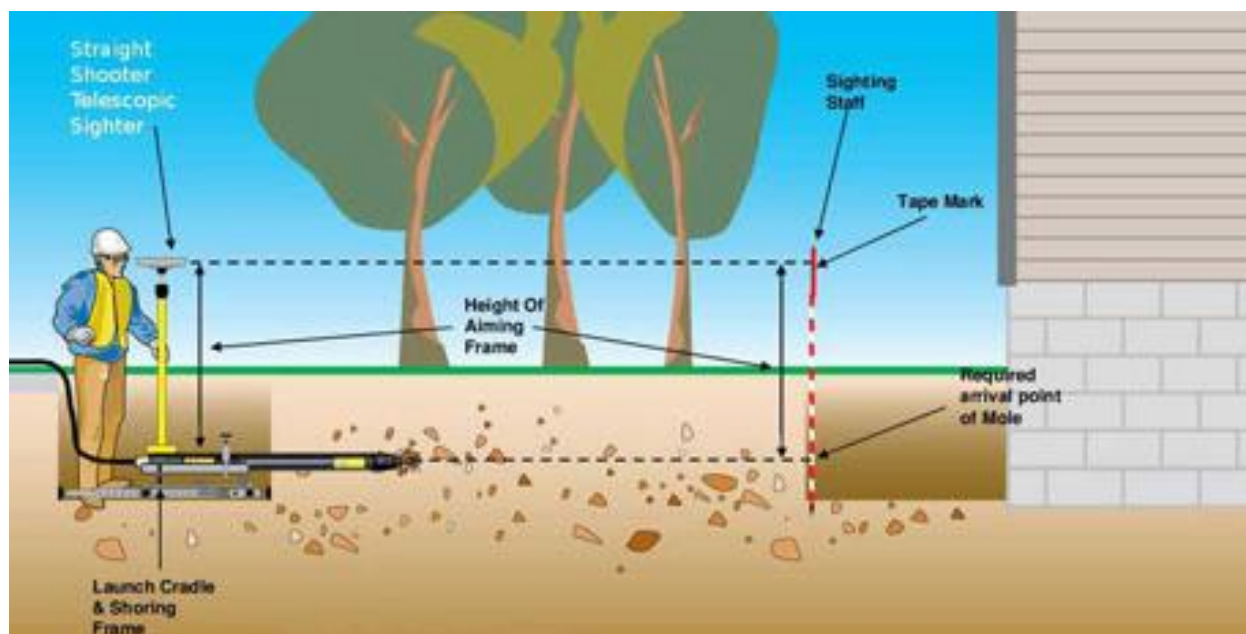
Horizontal boring (also referred to as the Bullet or Moling) is a pneumatic piercing tool which is basically driven by an air compressor.

As shown in **Figure 7-3** the tool is placed at the required elevation and uses equal skin friction on all sides to drive the tool forward. Typically, there are excavated pits placed at uniform intervals up to approximately 30-feet, which limits the distance to short runs thereby increasing control. An example of a typical setup is shown in **Figure 7-4** where the tool is set level at the require elevation and then follows the path to the intended arrival point.



**Figure 7-3: Example of a Horizontal Boring Tool**

*Photo Courtesy of Trenchless Group*



**Figure 7-4: Horizontal Boring Example Setup**

*Photo Courtesy of absoluteleakdetection.co.uk*

Disturbances to the property owner with this tool include cutting of the basement wall or floor. The size of the hole will vary. For slab on grade homes, the area removed is generally larger than for basements as a larger area is required to allow personnel to access and install the tool. The cutting of the floor creates concrete dust and associated debris. Therefore, the work areas and work zones need to be controlled to minimize the final area disturbed within the home. There is also the potential for the borehead to divert from its intended alignment, potentially damaging other utilities or site features, or it could travel onto adjacent property. To minimize this possibility, it is important to track the borehead to continuously monitor its location.

The tool is typically recommended where the water service already enters the front of the building. This will minimize the length of the home that the tool travels underneath the floor slab if it come up through the floor, or interior disturbance to basement walls if enters above the floor through the foundation wall.

Local contractors are familiar with this technology, and others can be trained in a relatively short period of time. This allows for contractors to easily ramp up production if there is at least one experienced operator on hand. More contractors are familiar with this trenchless method than the other trenchless methods presented herein.

For water services, the location of the launching pit where the tool is located is typically within the house, and the receiving pit is in the parkway placed at the location of the future valve box. The tool then travels from the launching to the receiving pit.

### **Surface Launched Horizontal Directional Drilling (HDD)**

Surfaced launched HDD utilizes a drill rig located outside of the property. The steerable head is used to drill a pilot hole to a target location located inside the property. The pipe is then pulled from inside the home to the drill rig. Because the equipment is located outside, time inside the property is minimized. **Figure 7-5** shows an example of the surface-launched equipment.



**Figure 7-5: Surface Launched HDD Set-Up**

*Photo Courtesy of WeeklySafety.com*

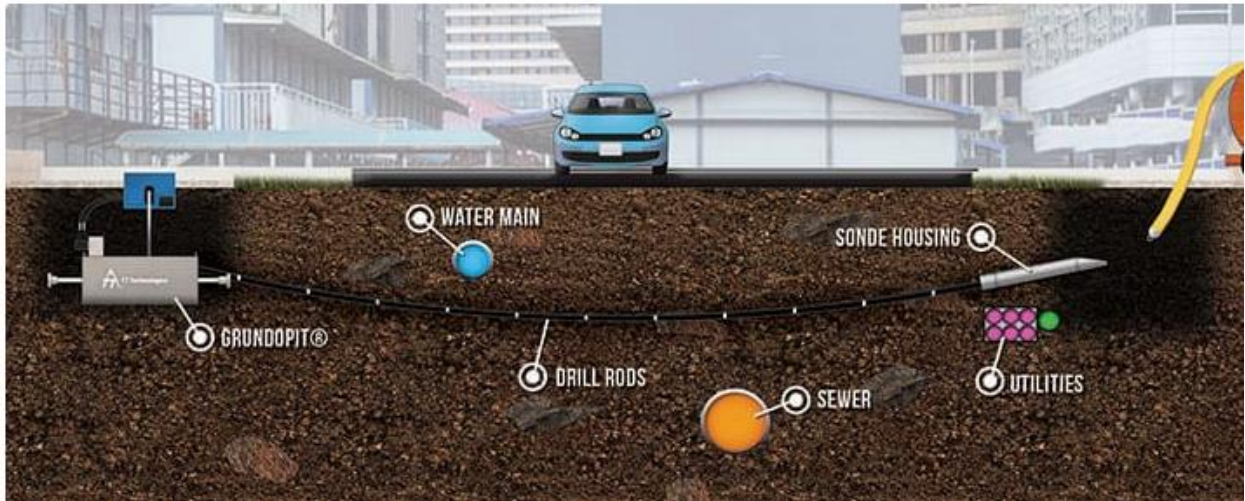
Disturbance from standard HDD consists of the pit to start the drilling and a pit inside the property where the pipe to be pulled is located and the final connection takes place. Typically, the standard HDD technique is precise enough that it can enter the property through a small pit (approximately 2-foot by 2-foot pit). For homes where the water service currently enters in the back of the house, the HDD technique can be used to enter next to the existing interior piping, which makes reconnection easier. Because this technique provides better control of the borehole, it performs better than horizontal boring at avoiding impacts to existing utilities.

While horizontal boring uses a pit to begin the work at the target elevation, the surface launched HDD technique instead drills down at angle from the surface to reach the target depth. Therefore, to achieve a depth of approximately 5 feet below ground surface, the head of the drill rig will need to be offset at least 30 feet horizontally from where the water service needs to be at its final depth. As a result, this method would most likely result in road closure of the street. However, when LSLRs are occurring as part of a wider program alongside water main replacement, the full street would need to be closed for every construction technique to replace water services on both sides of the street.

HDD is not the lowest cost option for sites where horizontal boring could be done, but two specific conditions would make it the most appropriate technique. First, if trenchless construction in the right-of-way is allowed, HDD could likely be used from the water main. This would result in substantial savings by minimizing the amount of pavement and sidewalk demolition and restoration. Instead of needing to excavate and restore a trench within the limits of the roadway, only a smaller pit would need to be dug. Second, HDD would be recommended for properties where the water service enters the back of the house. A horizontal bore would only be able to connect the water service to the front of the house. Using HDD, the borehead can be controlled to enter the home at specific locations, such as the homeowner's utility room, which is typically located at the rear of the house. This would allow for a direct connection to the homeowners interior plumbing without overhead interior copper installed within the home.

### **Pit Launched HDD**

Pit launched HDD is a fairly new technology that requires the excavation of a pit at least one foot deeper than the final pipe elevation. The machine is then lowered into the pit, a pilot/reamed hole is then drilled and advanced using drill rods to an excavation inside the home (receiving shaft), the new pipe is installed to the end of the boring head at the receiving shaft, and a new water service line is pulled back through the hole to the machine. The curb stop/bbox, connection to the watermain, and connection to the interior premise plumbing are performed to complete the installation. This technology reduces the working area required at ground surface when compared to the standard HDD but still provides the control and functionality of a standard HDD machine. The pit launched HDD machine has a smaller overall footprint than surface mounted HDD. This method has similar advanced control features to surfaced HDD but cannot drill for distances as far as the surface mounted units can drill. The unit can be easily rotated in the street using a backhoe that reorients the boring tool to perform water service replacements on both sides of the street from the same excavation. **Figure 7-6** below shows the general setup of the pit launched HDD process and required excavations.



**Figure 7-6: Pit Launched HDD**  
 Photo Courtesy of TT Technologies

### Portable HDD

Portable HDD uses an HDD machine that can be transported by a two-person crew either inside a home or into an exterior pit. As with other HDD technologies, the drill head can be navigated in



**Figure 7-7: Portable HDD – Basement Buddy**

various directions to avoid other utilities or obstructions and install the new water service in the proper alignment. An example portable HDD machine is the Basement Buddy shown in **Figure 7-7** below.

Advantages to this unit is that it gives the option of performing HDD from either inside or outside the house. It also has the smallest footprint of any of the HDD machines, easily transportable, and has a drill range of 200-feet (varies by the size of the unit). The drill stem lengths are typically 2-feet long. However, this unit is not typically used by local plumbers at this time.

A summary of the trenchless methods described above, including advantages and disadvantages, is included in **Table 7-1** below.

**Table 7-1: Comparison of Trenchless Construction Methods**

| Technology                                                    | Description                                                                                                            | Advantages                                                                                                                                                                                                                               | Disadvantages                                                                                                                                                                                                     |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pipe Pulling</b>                                           | Insert cable into water service and pull existing water service out while simultaneously pulling new water service in. | <ul style="list-style-type: none"> <li>▪ Relatively inexpensive</li> <li>▪ Minimize risk to impact other utilities</li> <li>▪ Minimal operating space</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>▪ Cable could break resulting in open cut being required</li> <li>▪ Cannot relocate service to an alternate alignment</li> </ul>                                           |
| <b>Horizontal Boring</b>                                      | Pneumatic piercing tool (also referred to as the Bullet) that cannot be steered or otherwise guided.                   | <ul style="list-style-type: none"> <li>▪ Commonly used by local contractors</li> <li>▪ Relatively inexpensive</li> <li>▪ Minimal operating space</li> <li>▪ Lightweight</li> <li>▪ Can use in a variety of soil conditions</li> </ul>    | <ul style="list-style-type: none"> <li>▪ Cannot steer or maneuver borehead</li> <li>▪ Not accurate in certain soil conditions</li> <li>▪ No ability to control if it goes off alignment</li> </ul>                |
| <b>Surface Launched Horizontal Directional Drilling (HDD)</b> | Standard directional drilling from surface utilized by many below grade utility contractors.                           | <ul style="list-style-type: none"> <li>▪ High level of borehead control</li> <li>▪ Borehead steerable and maneuverable</li> <li>▪ Can install water services long distances</li> </ul>                                                   | <ul style="list-style-type: none"> <li>▪ Large amount of working space required</li> <li>▪ Not typically used for water service installation</li> <li>▪ High level of training and experience required</li> </ul> |
| <b>Pit Launched HDD</b>                                       | Directional drilling when space limitations exist.                                                                     | <ul style="list-style-type: none"> <li>▪ Steering head is maneuverable</li> <li>▪ Good control</li> <li>▪ Less work area required than HDD</li> <li>▪ Potential to do services on either side of the street from the same pit</li> </ul> | <ul style="list-style-type: none"> <li>▪ Limited pool of contractors</li> <li>▪ Operators require training</li> </ul>                                                                                             |
| <b>Portable HDD</b>                                           | Directional drilling from inside home.                                                                                 | <ul style="list-style-type: none"> <li>▪ If need pipe at an angle to avoid an exterior obstruction, and use this technology</li> </ul>                                                                                                   | <ul style="list-style-type: none"> <li>▪ Limited pool of contractors</li> <li>▪ Operators require training</li> </ul>                                                                                             |

To encourage efficiency, a standard process for decision making should be applied at all properties. The flow chart below, **Figure 7-8**, shows how the construction method should be determined for each home.

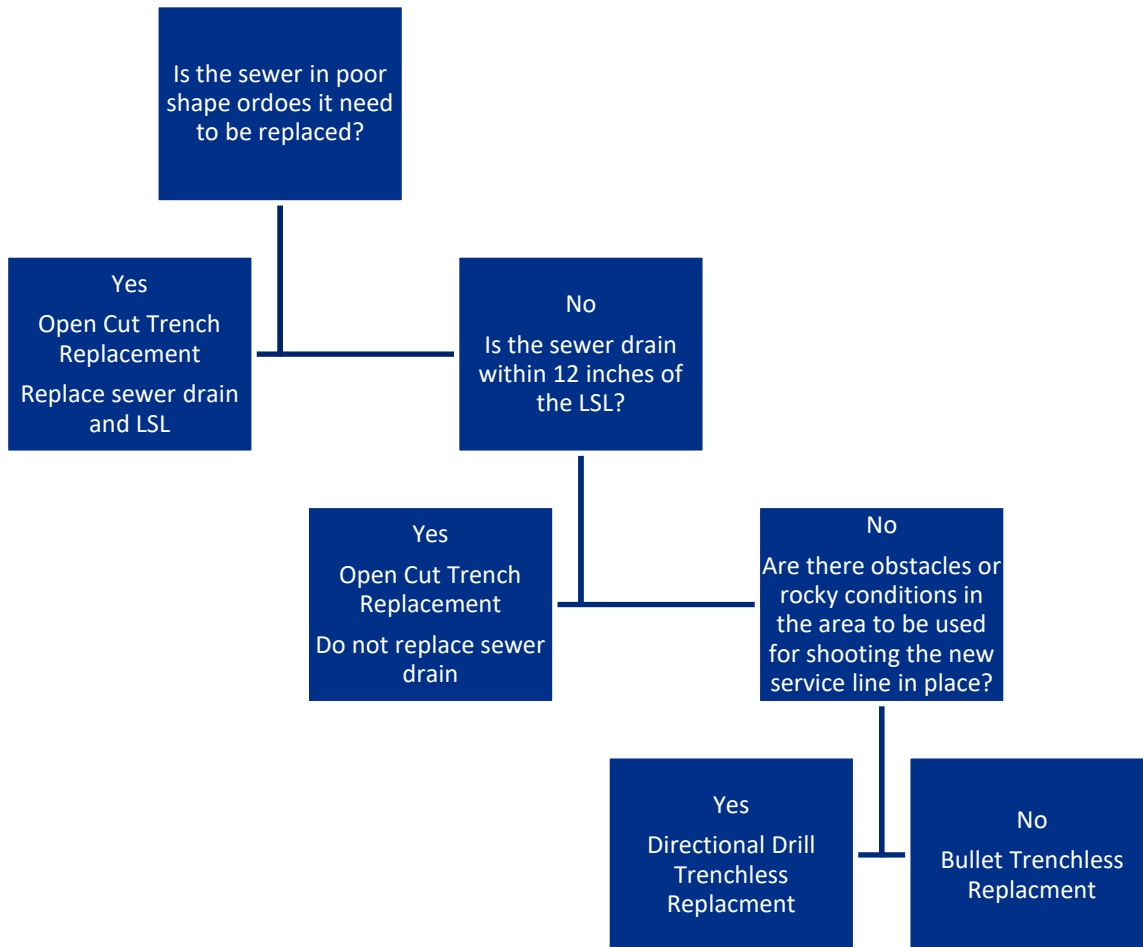


Figure 7-8. Flow chart to be used in determining construction method for each home.

## 7.3 Post-Construction

### 7.3.1 Restoration

Restoration costs can vary substantially between properties, depending on landscaping or if the basement is finished. Most programs cap the amount of funding that the utility will pay for private-side restoration. There needs to be clear early communication with the property owners regarding what level of restoration they can expect from the WWW versus what they will need to pay for themselves. Similarly, if the property owner would need to hire their own contractor to perform restoration (for example, to repair drywall) rather than use the contractor performing the LSLR, this should be made very clear to the property owner prior to the commencement of the work. Similar to the LSLR work itself, if restoration costs will be excessively borne by the property owner, this will reduce participation. However, the equity of the program will likely be less affected by capped restoration costs because it is unlikely that low-income property owners will have the most expensive landscaping / basements.

For safety and health, restoration will include at least backfilling to grade and replanting grass over any dug areas (sod or seed). Including these items and limiting restoration costs beyond this

will encourage equity by covering items that apply to every property. Before construction, residents may be asked to move any landscaping (brick, pavers, benches, pots, etc.) out of the way of construction areas until work is complete. By having the resident move structures, this can cut down on the liability, time and costs associated with restoration.

Custom landscaping, finished basements, and other installed structures can drive up restoration costs for some property and introduce inequity into how program resources are allocated. Including a limit on the hours or dollars spent on restoration, beyond the required backfilling and grass coverage, for each house may provide a more equitable option. Additionally, this limit should include restrictions on what qualifies to prevent residents from using the restoration funds to install new landscaping or make improvements. A cash allocation for each resident may also be considered to encourage participation from residents with finish basements while avoiding the need for WWW to be involved in interior restoration. Any allocation should be limited, though, to keep the program equitable and keep restoration from driving up the program costs unnecessarily.

### 7.3.2 Hazardous Waste Identification and Removal

Hazardous waste is a concern when performing construction activities within residential properties, specifically lead based paint (LBP) and asbestos. To address this concern, it is recommended that testing is done prior to the start of construction. The preconstruction site investigation is a good time to take LBP and asbestos samples in the home as the presence of lead and/or asbestos in the work area may be determined. If the results show the presence of lead and/or asbestos, then removal by qualified individuals should be addressed before construction begins.

Another potential encounter with hazardous waste is with the existing lead service line. Although the pipe is made from lead, lead is a recyclable material and can be sold for scrap at any metal processing facility. Because reclamation is preferred over disposal, it is recommended to establish a contact with the nearest recycling facility to minimize transport costs.

### 7.3.3 Pre-Construction Sampling

The federal ruling included in EPA's 2021 Lead and Copper Rule Revisions does not set forth any requirements for performing pre-construction sampling of lead and copper from a homeowner's water system before replacement. Additionally, current WWW practices do not require pre-construction sampling prior to the disturbance or a lead service line, pre-construction sampling is not considered at this time.

### 7.3.4 Post-Construction Sampling

The EPA's Revised Lead and Copper Rule Revisions outline post-LSLR sampling requirements in 40 CFR 141.84. WWW will need to implement the following after LSL replacement work:

- The water system must offer to collect a follow up tap sample between three months and six months after completion of LSLR.
- The water system must provide the results of the sample in accordance with 40 CFR 141.85(d).

- For samples that do not exceed 15 ppb of lead, the timing of the notification must be no later than 30 days after the water system learns of the tap monitoring results.
- For samples that exceed 15 ppb of lead, the timing of the notification must be as soon as practicable, but no later than 3 calendar days after the water system learns of the tap monitoring results.
- The collection procedure (outlined in 40 CFR 141.86) requires the collection of the first liter after water has sat stagnant for a minimum of six hours. Pre-flushing is not allowed. The samples must be collected in wide-mouth bottles.
- Additionally, following each LSLR, systems must provide pitcher filters/cartridges to each customer for 6 months after replacement. These items must be provided before the service line is returned to service (outlined in 40 CFR 141.84(e)(3)).

### 7.3.5 Filter Distribution and Flushing

The federal requirements require filters to be distributed after the disturbance of a LSL such as after a meter replacement or lead connector replacement. All filters distributed to property owners must be certified by an accredited third-party certification body to NSF/ANSI 53 and NSF/ANSI 42 for the reduction of lead and particulate matter. In an emergency repair, filter distribution is required to the impacted property owner until such time the remaining portions of the service line are replaced.

If complete replacement of a lead service line cannot be made due to denial by the property owner, the regulations require the property owner to be fully responsible for installing and maintaining point-of-use filters certified by an accredited third-party certification body to NSF/ANSI 53 and NSF/ANSI 42 for the reduction of lead and particulate matter at all fixtures intended to supply water for the purposes of drinking, food preparation, or making formula. The filters shall continue to be supplied by the property owner until the property owner has replaced the remaining portions of the partial lead service line.

## 7.4 Data Management and Program Tracking

### 7.4.1 Data Collection Requirements

Documentation of the work done during a LSLR program is critical for ensuring compliance with federal regulations, updating WWW records, and tracking program progress.

There are multiple documents that will need to be tracked to cover program progress. This includes:

- Right of entry form (signed by homeowners) authorizing WWW to perform the work on private property
- Record drawings showing the location of the newly installed water service
- Outreach documents, including the flushing flyer and lead education material required in the LCRR (examples in Appendix B).

- Documentation of homeowners that refused to replace the private side of the LSLR and documentation of outreach attempts for homeowners that cannot be reached to sign the waiver
- Follow-up lead sampling results and sampling attempts
- Documentation of filter distribution

In order to continually improve the WWW service line inventory, the existing service line material for all homes inspected and receiving replacements should be recorded. This will be used to track the accuracy of the existing inventory and continually update it.

WWW will also need a system for general construction tracking, including shop drawing reviews, construction quantities, requests for information, change orders, and permits.

### 7.4.2 Program Dashboards

As WWW develops the LSLR program, data tracking will be a key component for monitoring program progress, updating the public and other stakeholders, and evaluating program gaps. A program dashboard is useful to track updates to the inventory, findings at each LSLR site, and progress towards milestones. **Figures 7-9 and 7-10** each show an example of the dashboard available from CDM Smith. This dashboard can help WWW track progress towards various goals in the LSLR program, and between different priority groups or contractors used in the program.



Figure 7-9. Example of the program tracking dashboard software available from CDM Smith.

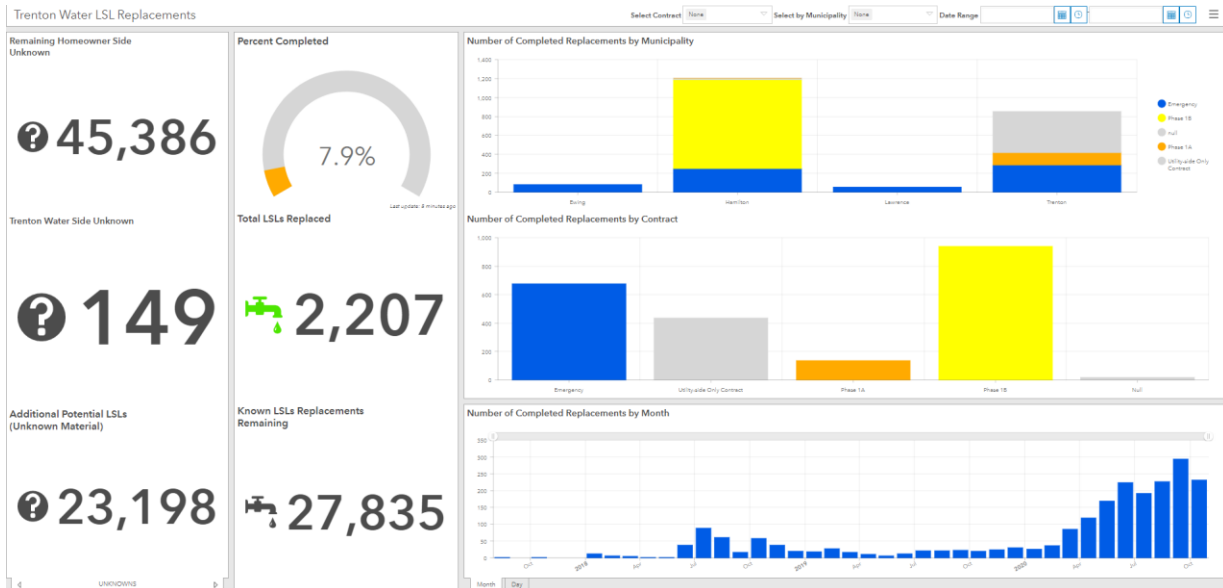


Figure 7-10. Example of the program tracking dashboard software available from CDM Smith.

Components of this dashboard may also be made available to the WI DNR and the public to share success stories, inform residents whether or when they may be eligible for the program, and track legal requirements for inventories and mandated replacement.

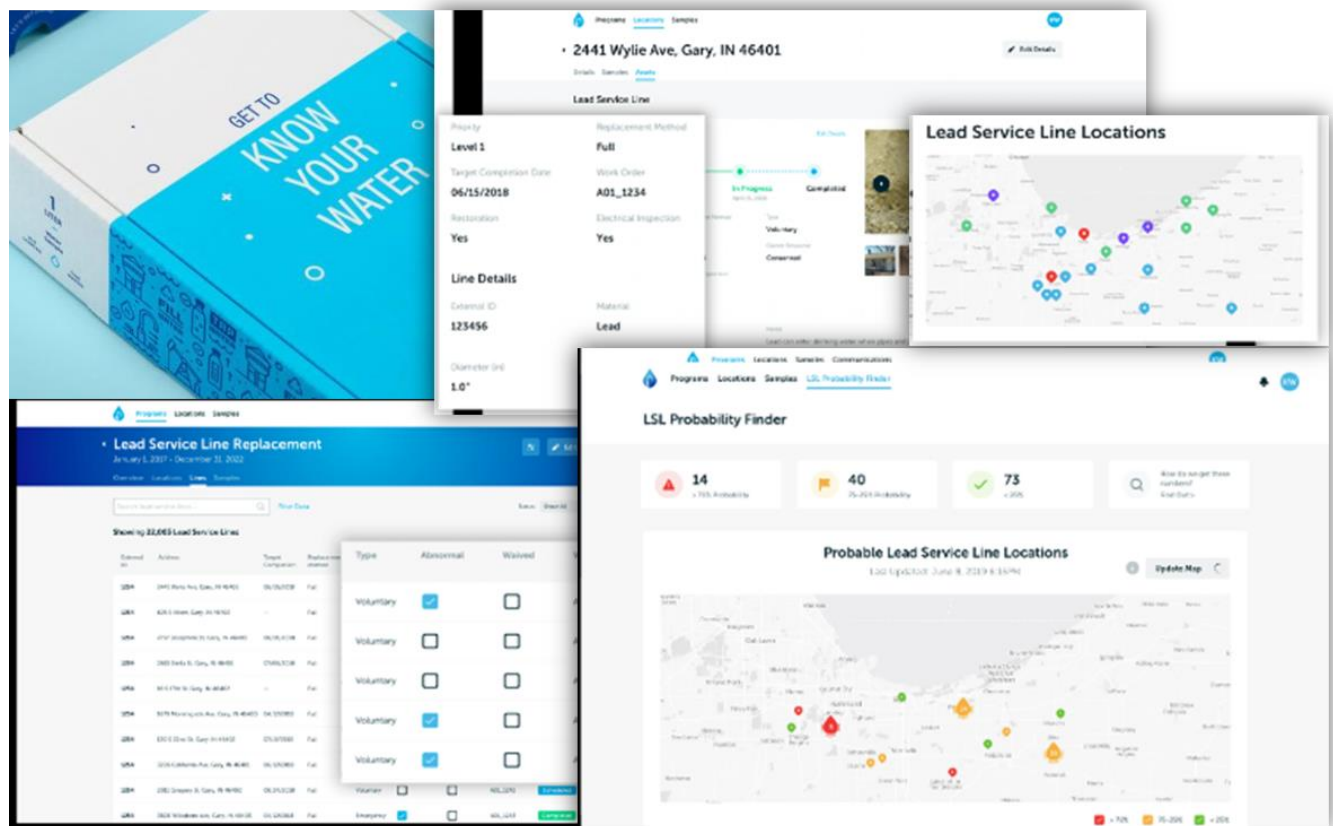
If WWW is only using the system for tracking program progress, dashboards can be built in PowerBI (a Microsoft program), Esri ArcGIS Dashboards, or Google Data Studio. These dashboards are easily customized to track specifically whatever WWW staff is interested in seeing.

### 7.4.3 Additional Program Tracking

There are several commercial software packages that integrate providing dashboards with more advanced features that can be useful in implementing LSLR programs, such as providing a portal for customers to upload documents related to LSLR or self-report their service line material. Some programs have also integrated shipping water sampling kits for the post-replacement lead sampling. The four main providers specifically for LSLR programs are 120 Water, leadCAST by Trinnex (a CDM Smith subsidiary), BlueConduit, and Esri's Lead Service Line Inventory Solutions.

#### 7.4.3.1: 120 Water

The 120Water platform (<https://120water.com/>) is a software-as-a-service (SaaS) solution hosted in the cloud for full LCRR compliance management; 120 Water started with school and day care tap sampling using an innovative approach to streamline the sampling process. They offer drop-ship sampling kits that can be sent direct to the customer, then to the lab. The results are available in their platform. They also offer inventory management including machine learning and a public map. The 120Water software can meet all the requirements above.

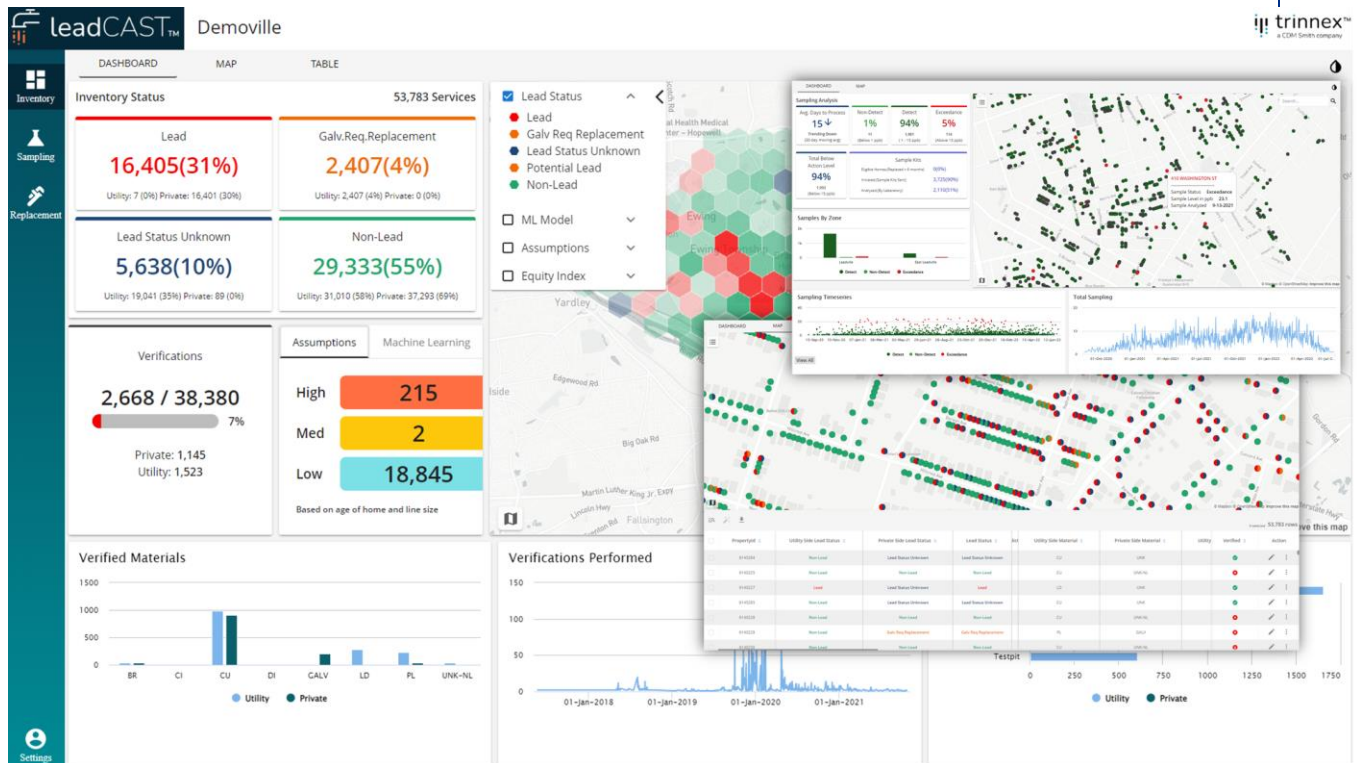


The 120Water platform was used for post-replacement sampling on Newark, NJ's LSLR program managed by CDM Smith.

#### 7.4.3.2: leadCAST by Trinnex

Trinnex is a wholly owned subsidiary of CDM Smith focusing on purpose-built software for utilities to solve today's challenges. leadCAST (<https://www.trinnex.io/products/leadcast>) is a (SaaS) management system for LCRR programs and was built using lessons learned for Newark and Trenton's fast-paced LSL replacement programs. The application was launched in February 2022 and offers inventory management, compliance sampling, public outreach, and compliance sampling. Trinnex has a partnership with SimpleLab to offer automated drop-ship sampling for water sampling.

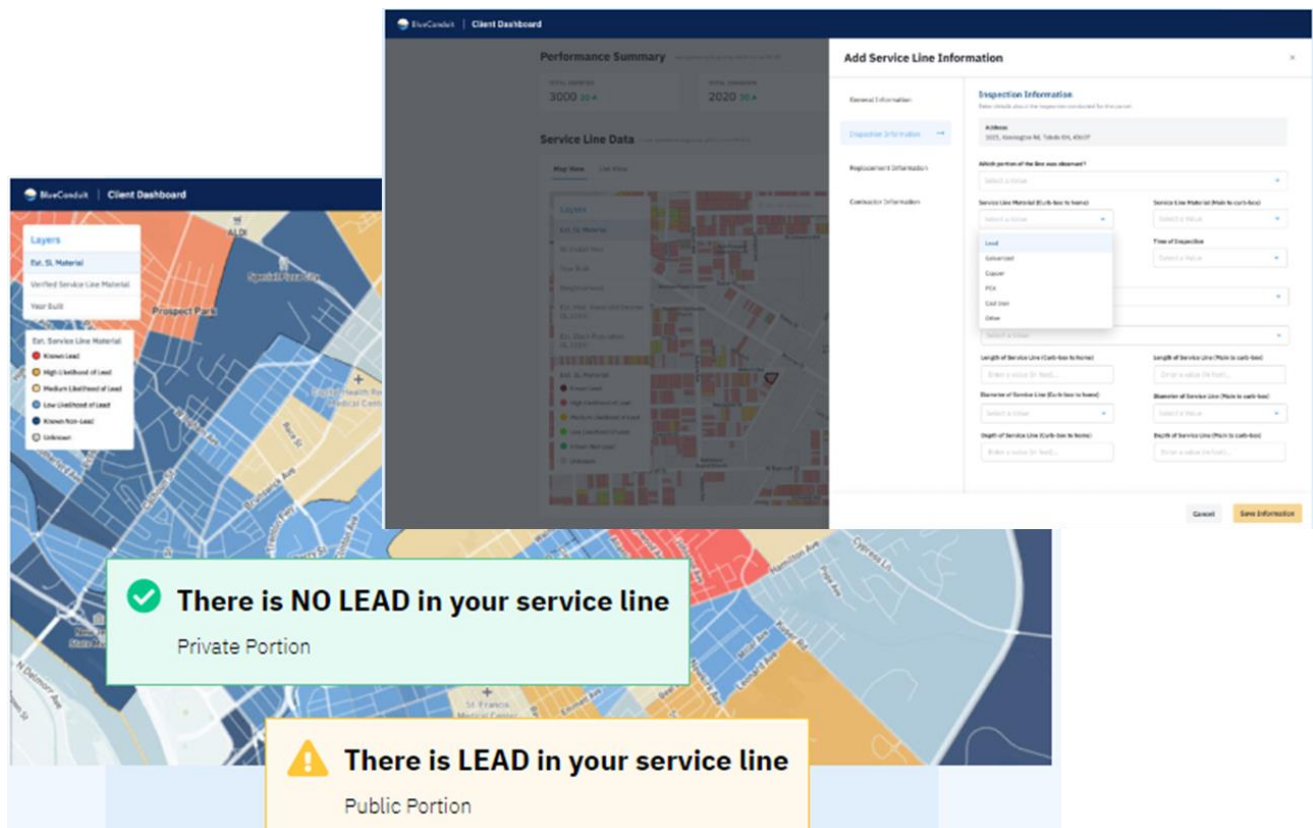
CDM Smith conceptualized leadCAST based on lessons learned from the Newark and Trenton programs and developed by Trinnex. The application has been deployed for a handful of clients.



#### 7.4.3.3: BlueConduit

BlueConduit (<https://blueconduit.com/>) is a SaaS solution hosted in the cloud for full LCRR compliance management. BlueConduit started by performing machine learning models for Flint, MI. The company recently launched a new version of their platform that focuses on inventory management and machine learning and announced a partnership with SimpleLab for drop-ship sampling. BlueConduit pioneered machine learning for identifying LSLs and has the strongest machine learning model of any of the software packages.

BlueConduit's machine learning model is in use for the Trenton, NJ, LSLR program managed by CDM Smith.

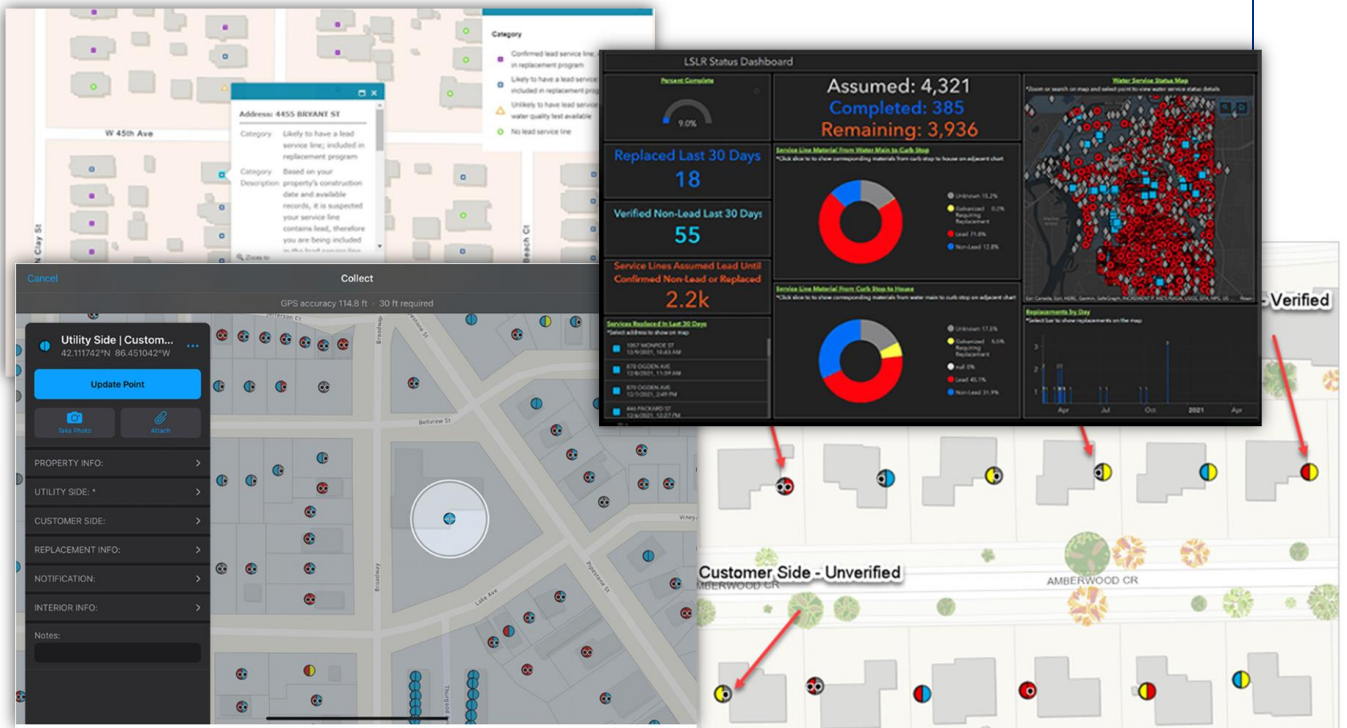


#### 7.4.3.4: Esri's Lead Service Line Inventory Solution

Esri offers a solution for developing and maintaining a service line inventory within ArcGIS Online (AGO) leveraging several of their existing applications. The solution is deployed to AGO with a template database and preconfigured applications for field collection and reporting using dashboards and their Hub portal. The solution offers a quick way for a utility to develop an inventory from existing GIS and easily integrates the inventory back into the GIS.

The potential limitations are that it requires a GIS expert to set it up and maintain. The solution is also limited to inventory development and does not offer anything for compliance sampling.

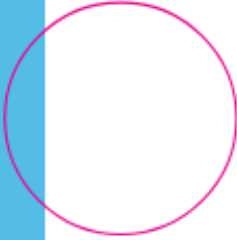
Additional information can be found at: <https://doc.arcgis.com/en/arcgis-solutions/latest/reference/introduction-to-lead-service-line-inventory.htm>



CDM Smith has used the data model and field inspection tools as a starting point for clients in the past.

## Appendix A

### Example Door Hangers




**Lead Service Line  
Replacement Program (LSLR)**  
[www.LeadSafeChicago.org](http://www.LeadSafeChicago.org)

**Interested in replacing your lead service line? Chicago has launched two programs to help!**

**HOMEOWNER-INITIATED LSLR PROGRAM**

***Waiver for standard permit fees for LSLR up to \$3,100***

The City will waive up to \$3,100 of permit fees for homeowners who hire their own licensed plumber to replace their lead service line.

This program is open to all Chicago properties.

For more informative visit  
[www.lead-safe-chicago.org/lead-service-line-replacement](http://www.lead-safe-chicago.org/lead-service-line-replacement)

**EQUITY LSLR PROGRAM**

***FREE lead service line replacement for low-income homeowners***

You may qualify if you:

- Own and live in your home
- Have a household income below 80% of the area median income (\$74,550 for a family of four)

*Interested in applying? Here's what to do next!*

**Submit your Equity LSLR Application today!**  
 Complete the online application at  
[www.ChicagoWaterQuality.org/LSLREquity](http://www.ChicagoWaterQuality.org/LSLREquity)  
**OR**  
 Call 312-742-2406 to have an application mailed to you to fill out & return to DWM



Scan for Equity Application

***Get your water tested for lead for FREE!***

Sign up by calling 311 OR at  
[www.ChicagoWaterQuality.org](http://www.ChicagoWaterQuality.org)



Scan for Water Testing

**REMINDER:**  
The Middlesex Water Company  
**RENEW** Program  
is coming to your street next week

DATE \_\_\_\_\_

The **RENEW** effort includes installing NEW below-ground meter pits and replacing cast iron water mains and water service lines in your area.

As part of your water main upgrade on your street, we will be digging “test pits”, small holes, where the customer service line starts.

These holes will be used to determine if your customer-owned service line has lead or galvanized (lead-containing material).



The hole will be temporarily closed up the same day. In a few months, once the new water main, new meter pits and new services lines are replaced, the hole will be permanently closed and the area restored to its former appearance.

The day we dig the hole, information about your service line will be left on your door indicating:

**✓ YES**  
Your service line IS lead or contains lead

Middlesex Water Company will replace your service line at no direct cost.

**✗ NO**  
Your service line DOES NOT contain lead

Middlesex Water Company will only replace the part of the service line from the main to the new meter pit. We will connect to your existing service line.

**For more information**

**Visit:** [www.waterfortomorrowmwc.com/renew/](http://www.waterfortomorrowmwc.com/renew/) to learn about **RENEW** and lead service lines

**Visit:** [www.middlesexwater.com/customer-care/get-the-lead-out/](http://www.middlesexwater.com/customer-care/get-the-lead-out/) to learn about lead service line replacement

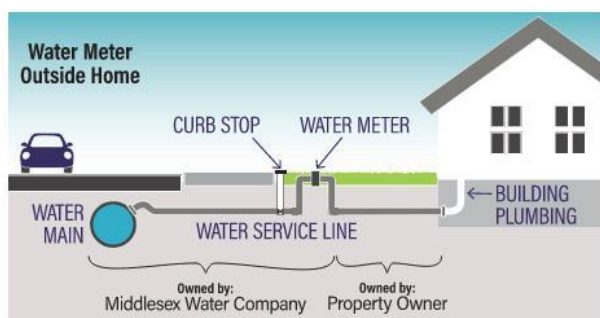
**Call:** 800-549-3802

## Who owns the water service line?

Service line ownership is shared between the Middlesex Water Company and property owners and depends on your water meter location.



If your water meter is located **inside** your home or building, the Middlesex Water Company owns the service line from the main in the street to the curb stop, typically at the property line or in the sidewalk. The property owner owns the service line from the curb stop to the meter inside the home.



If your water meter is in a pit **outside** your home or building, the Middlesex Water Company owns the service line from the main in the street to the meter, including the meter. The property owner owns the service line from the meter to the connection to the plumbing inside the home.

This is the start of Middlesex Water Company's lead service line replacement program. We will replace all lead and galvanized service lines, including those on the customer side, at no direct cost to the property owner.



The Middlesex Water Company  
**RENEW Program**

DATE

HOUSE NUMBER AND STREET

Today, construction crews dug a test pit (small hole) to identify your service line material in your yard, sidewalk, or driveway where the customer service line starts.

**RESULTS**

- ☐ Yes, your service line is **LEAD**.  
Your material is:
- ☐ Lead      ☐ Galvanized *(may contain lead)*
- ☐ No, your service line is **NOT LEAD**.  
Your material is:
- ☐ Plastic      ☐ Copper
- ☐ Other \_\_\_\_\_

Turn this card over for next steps!





**If your service line **IS NOT** lead or galvanized,** you do not have to take action.

You will get a new meter box and the service line owned by the Middlesex Water Company between the new water main and the meter box will be replaced in the coming weeks.



**If your service lines **IS** lead or galvanized,** Middlesex Water Company will replace it at no direct cost to you in the coming weeks.

To replace your service line, we will need inside access to your house to connect to your home plumbing.

Contact our contractor, **JF Kiely Construction**, to schedule a service replacement.

**Scan the QR code or call:**



**(888)-429-0437**

**<https://mwc.kielyconnects.com>**

#### **For more information**

**Visit:** [www.waterfortomorrowmwc.com/renew/](http://www.waterfortomorrowmwc.com/renew/)  
to learn about RENEW and lead service lines

**Visit:** [www.middlesexwater.com/customer-care/get-the-lead-out/](http://www.middlesexwater.com/customer-care/get-the-lead-out/)  
to learn about lead service line replacement

**Call:** 800-549-3802

## Appendix B

### Post-LSLR Flushing Instructions

## Flushing After your Lead Service Line Replacement

After your lead service line has been replaced, it is important to flush all of the pipes in your house. Flushing will remove any lead that may have entered the pipes in your house during construction. You should flush all interior plumbing the same day or before the next time you use your water. **DO NOT USE** hot water until the initial flushing is completed to prevent lead particles from settling in your hot water tank.



### Flushing Instructions

1. Find all the faucets that will drain, including the basement and all floors in your house.
2. Remove aerators and screens whenever possible, including the shower heads, from all faucets you plan to flush. Include the laundry tubs, hose-bibs, bathtubs, and showers as flushing points.
3. After all the aerators are off, open the faucets in the basement or lowest floor in the house. Leave all faucets running at highest rate possible, using cold water.
4. After the faucets are all open in lowest floor, open the faucets on next highest floor of the house. Continue until faucets are open on all floors.
5. After all faucets are opened, leave the water running for at least 30 minutes.
6. After 30 minutes, turn off the first faucet you opened; continue to turn off other faucets in the same order you turned them on.
7. Clean aerators/screens at each faucet. You may need to replace screens/aerators if too old or worn. Conduct a 30 minute flush every other week for three months.



### Cleaning Your Aerator

1. Remove faucet aerators and clean out any particles that may have accumulated there. The aerator is usually at the tip of the faucet and can be screwed off to clean.
2. After your lead service line is replaced, clean debris from aerators and screens once a month for six months. After six months, clean debris twice a year.

### Daily Flushing

Daily flushes should continue for six months after your lead service line is replaced as lead particles can get into the pipes from construction. Flush water through the plumbing in your house for 5 minutes each morning (or after an extended period of no water usage) before drinking.



**NOTE:** Taking a shower, running the dishwasher or flushing a toilet will flush your lines.

### Filters

Continue to use your point-of-use filters for at least 6 months after a lead service line replacement. Remember to change the cartridges as needed.

## Appendix C

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### Other Outreach Examples – Middlesex Water Company



## RENEW Program

Middlesex Water Company (Middlesex Water) is making improvements in your neighborhood to upgrade aging water infrastructure and remove lead service lines. The steps listed below describe the process of getting your lead service line replaced and where we need your help.



Lead and galvanized pipe should be replaced to minimize lead exposure and maintain good water quality

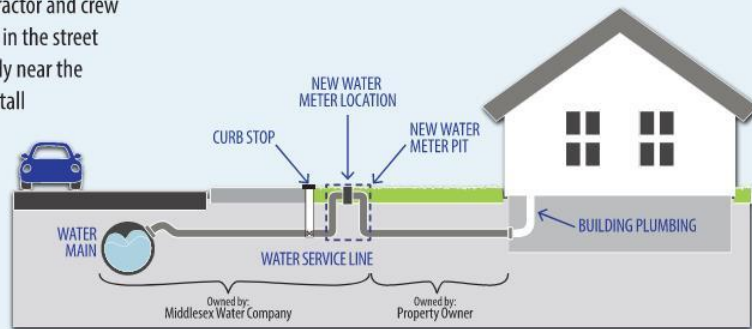
### BEFORE YOUR SERVICE LINE IS REPLACED

- 1 Middlesex Water will be making some water system upgrades on your street. To prepare for construction, we dug a small hole in front of your home and found that **the water service line on your property is made of lead or galvanized steel and needs to be replaced.**
- 2 Middlesex Water's contractor J.F. Kiely left a door hanger telling you that the water service line needs to be replaced. You will also receive a water filter pitcher, information about lead service line replacements, and a right-of-entry form. 
- 3 Sign the right-of-entry form and schedule your replacement by using the phone number, website link or QR code shown here. The right-of-entry form gives your permission to the contractor to work on your property.   
mwc.kielyconnects.com  
888-429-0437

### DURING YOUR SERVICE LINE REPLACEMENT

- 4 To get to the pipes underground, the contractor and crew will dig up two 4-foot by 4-foot areas – one in the street and one at the curb stop in the yard, probably near the sidewalk or curb. The contractor will also install a new water meter pit near the curb box.

- 5 The old service line will be replaced with a copper line. The new line will be connected to the water main in the street at one end and your building plumbing at the other.



- 6 Once the new service line is installed, the contractor will test the new pipe and run water through to flush out debris and lead particles.
- 7 The contractor will temporarily patch holes in the yard and street to allow for settling. A contractor will return to install a new water meter inside the new meter pit and remove the water meter inside your home. The holes in the yard will then be restored to pre-work conditions with seeding, concrete, or paving.



Temporary asphalt repair patch in street and/or sidewalk after service line replacement.



Permanent sidewalk repair at the curb stop.



Temporary backfilled holes in your yard are filled with soil and left to settle.



Final yard seeding occurs 3-4 months after the initial patch. Water seeds for best results!

#### QUESTIONS:

800-549-3802



For more information on the RENEW program, see: [waterfortomorrowmwc.com/renew](http://waterfortomorrowmwc.com/renew)

For more information on Middlesex Water's Get the Lead Out Program, visit: [middlesexwater.com/customer-care/get-the-lead-out](http://middlesexwater.com/customer-care/get-the-lead-out)



## RENEW Program



### FLUSHING YOUR PLUMBING AFTER YOUR SERVICE LINE REPLACEMENT

#### Whole Building Flushing Instructions

1. Find all the faucets that will drain, including the basement and on all floors in your house.
2. Remove aerators and screens whenever possible, including the shower heads, from all faucets you plan to flush. Include the laundry tubs, hose-bibs, bathtubs, and showers as flushing points.
3. Open the faucets in the basement or lowest floor in the house. Leave all faucets running at highest rate possible, using cold water.
4. Open the faucets on next highest floor of the house. Continue until faucets are open on all floors.
5. After all faucets are opened, leave the water running for at least 30 minutes.
6. After 30 minutes, turn off the first faucet you opened and continue to turn off other faucets in the same order you turned them on.
7. Clean aerators/screens at each faucet. You may need to replace screens/aerators if too old or worn. Conduct a 30 minute flush every other week for three months.



#### Cleaning Your Aerator

1. Remove faucet aerators and clean out any particles. The aerator is usually at the tip of the faucet and can be screwed off to clean.
2. After your lead service line is replaced, clean debris from aerators and screens once a month for six months. After six months, clean debris twice a year.



#### 5-Minute Daily Flushing

Continue smaller-scale daily flushes for at least 6 months after your lead service line is replaced. Flush water through the plumbing in your house for 5 minutes each morning (or after an extended period of no water usage) before drinking.



**NOTE:** Taking a shower, running the dishwasher or flushing a toilet will flush your lines.

#### USING A PITCHER FILTER

The Environmental Protection Agency recommends using a pitcher filter certified to NSF 53 standards for 6 months after replacing water pipes that have lead.

Follow the manufacturer's instructions included with your filter packaging to know when and how to change the filter cartridge.



#### SAMPLING AFTER SERVICE LINE REPLACEMENT

Middlesex Water will be contacting you in 3 to 6 months to schedule a time to take a water sample. The results of this free test will confirm if the lead has been flushed out of your new service line.

### PLUMBING FLUSHING AFTER SERVICE LINE REPLACEMENT

#### AFTER NEW SERVICE LINE IS INSTALLED

Complete the whole building flushing process, including cleaning faucet aerators

#### FOR 3 MONTHS AFTER INSTALLATION

Perform whole building flushing every other week and clean aerators

#### FOR 6 MONTHS AFTER INSTALLATION

Continue 5-minute daily flushing, use a filter pitcher, and schedule a free water sample test

#### QUESTIONS:

800-549-3802



For more information on the RENEW program, see: [waterfortomorrowmwc.com/renew](http://waterfortomorrowmwc.com/renew)

For more information on Middlesex Water's Get the Lead Out Program, visit: [middlesexwater.com/customer-care/get-the-lead-out](http://middlesexwater.com/customer-care/get-the-lead-out)

