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CASE MANAGEMENT
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December 10, 2019

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VIA FED. EX.
Honorable Jacob S. Gertsman, ALJ
Office of Administrative Law
3444 Quakerbridge Road
Quakerbridge Plaza, Building 9
Mercerville, NJ 08619

Re: In the Matter of the Petition of SUEZ Water New Jersey Inc. for Approval of a Pilot Program to Facilitate the Replacement of Lead Service Lines and a Related Cost Recovery Mechanism
OAL Docket No. PUC07138-2019S
BPU Docket No. WO19030381

Dear Judge Gertsman:

Pursuant to the schedule the parties agreed upon and Your Honor ordered, for your convenience attached please find 2 copies of the reply testimony of James Cagle in the above captioned matter. You will recall that Rate Counsel filed the testimony of Howard Woods earlier this fall. Additionally, Rate Counsel has circulated a proposed Statement of Material Facts Not in Dispute to which we are sending out a counter proposal today. While we do not yet know the Staff/DAG's intentions with respect to such a statement, at this time we expect to be discussing the details of any such statement with the other parties.

For everyone's convenience, I again provide the phone number and passcode for tomorrow afternoon's 4 pm status conference with Your Honor.

Call In Number: **1-866-842-3766**
Passcode: **7012814#**

Case Mgmt

Respectfully submitted,

Stephen B. Genzer

SBG/jg
Enclosure
cc: Nancy Demling, Judicial Assistant (w/encl., via email only)
Attached OAL Service List (w/encl., via email & regular mail)
Attached Service List (w/encl., via email)

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SUEZ Water New Jersey Inc. for Approval of a Pilot Program to Facilitate the Replacement of Lead Service Lines and a Related Cost Recovery Mechanism
OAL Docket No. PUC07138-2019S
BPU Docket No. WO19030381

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STATE OF NEW JERSEY

BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF SUEZ WATER NEW JERSEY INC. FOR APPROVAL OF A PILOT PROGRAM TO FACILITATE THE REPLACEMENT OF LEAD SERVICE LINES AND A RELATED COST RECOVERY MECHANISM

BPU DOCKET NO. WO19030381

OAL DOCKET NO. PUC07138-2019S

Rebuttal Testimony of

James C. Cagle

1 **Q. Please state your name and business address.**

2 A. I am James C. Cagle. My business address is 461 From Road, Paramus, NJ 07652.

3

4 **Q. Are you the same James Cagle who filed direct testimony in this proceeding?**

5 A. Yes.

6

7 **Q. What is the purpose of your rebuttal testimony in this proceeding?**

8 A. The purpose of my rebuttal testimony is to specifically discuss and rebut the Direct
9 Testimony filed on behalf of the Division of Rate Counsel in this matter.

10

11 **Q. Are you and Mr. Woods using the same terminology in his testimony and in your**
12 **reply testimony here?**

13 A. In certain instances we are not, but I believe we are speaking of the same things. For
14 example, Mr. Woods occasionally uses the words 'connecting line' (See page 3 line 6 of
15 his testimony) which we understand to be the non-Company owned portion of the service
16 line. In the Company's petition, the Company described the customer owned portion of
17 the service line as the "Customer Side" of the service line which is owned by the
18 Customer. This is the same thing as what I refer to as the non-company owned portion of
19 the 'Service Line' (or 'Lead Service Line' if the service line contains lead). The 'service
20 line' is the pipe which connects the company owned water main in the street to a
21 premises. There are usually two sides of such a 'service line', a company owned side
22 which connects the Company's water main in the street to a curb box usually located at
23 the customer's property line which is then connected to a non-company owned part of the

service line that then connects to the premises through a meter usually located within the premises. Often that is referred to as the customer side of the service line.

In an effort to be very clear in this testimony, I will distinguish the two sides as between the 'company side' and 'non-company side', since there are multiple properties that we believe are not actually owned by our customer based on our records. For example, in a rental situation, our customer might be the resident of the premises and user of the water service, but the property might be actually owned by someone or some other entity. So calling that the 'customer' side might be unclear. Since I believe this distinction is also what Mr. Woods means, I think this distinction may be useful for clarity sake. The Company believes what is or is not includible in the pilot program can be clarified in this proceeding in any Order by the Board.

Q. At the time of the petition, the count of Company owned service lines, goosenecks etc. were included in paragraph 14. Have those statistics been updated?

A. Yes. As time has progressed, more information has been gained as to these amounts. As of 11/27/2019, the statistics are:

a) Company lead service lines number – 6,423

b) Company lead goosenecks[1] – 21,845

c) Company unknown – 2,758

d) Non-company (Customer side) known lead service lines – 4,231

e) Non-company (Customer side) unknown – 70,144

[1] This is a short piece of pipe that connects the water main to the service line.

The parties to this case, have been updated as to these amounts.

Q. On page 7 of Mr. Woods' testimony, beginning on line 7, Mr. Woods states there is a mechanism already in place to allow recovery of the costs of replacing the company side portion of the service line including the cost associated with engineering and surveys. Is this correct?

A. I agree with Mr. Woods that the costs associated with company side service line replacements are includible in the Company's DSIC mechanism. The costs associated with engineering and surveys for work performed by the Company are includible as capital costs per the Uniform System of Accounts ("USOA"). As a result, there is a basis within the USOA to include the costs associated with inventorying LSLs on both the company and non-company side portions to be capitalized as a part of construction costs and recorded in Plant in Service (NARUC Account 101). For the avoidance of doubt, this should be a component of the New Jersey Board of Public Utilities (the "Board" or "BPU") decision in this case.

Q. On page 10 of Mr. Woods' testimony beginning on line 1, he suggests the purpose of including both the costs of replacing non-company side service lines as well as company side service lines was to avoid the 5% DSIC cap. Is that the case?

A. No. As the Company responded in its response to RCR-E-16 (Attached as Attachment 1), the purpose was to allow transparency as to the total cost of replacing the LSLs both on the Company and non-company sides. Such transparency would be beneficial in providing information to educate stakeholders regarding the pilot program as Mr. Woods

discusses on page 19 of his testimony. Understanding Mr. Woods' concerns, the Company does not object to the Company side replacements remaining as a part of the DSIC surcharge and the Company stated as much in that same response. However, the issue of the costs to replace the non-company side LSLs remains.

Q. On page 18 of Mr. Woods' Testimony beginning on line 4, he also discusses the inclusion of the cost of the replacement of Company owned LSLs. Please discuss.

A. The Company proposed pilot program included these costs in the associated proposed surcharge. Please note that in numbered paragraph 25, the Company's petition described a two phase process whereby such issues would be discussed and ultimately decided. However, as noted above, the Company understands Mr. Woods' concerns and does not object to the Company owned side remaining as a part of the DSIC surcharge thereby resolving this issue in an approved pilot.

Q. On page 9 of Mr. Woods' testimony, he warns against single issue ratemaking as it relates to the Company's proposed pilot program surcharge including the cost of Company side LSLs vs. including the costs in the DSIC surcharge. Considering the Company's response to RCR-E-16, is this now a concern?

A. I do not believe it is as Mr. Woods' concerns noted on page 9 would seem to be alleviated because the Company does not object to the Company side replacements remaining as a part of the DSIC surcharge as previously discussed. For the remaining costs the key issue to be aware of and consider is not just the incremental costs of the pilot program but to also consider any relevant cost decreases that may occur if the pilot

program is approved that should be considered at the same time. This issue is a consideration that is a key component of any ratemaking. The suggested pilot program would provide recovery of costs incurred specifically and transparently for the program which were not considered in the Company's last rate case filing. The work will be performed by outside contractors who must be supervised by a licensed plumber and whose invoices are easily auditable. If there were cost decreases, such changes could offset the overall cost of the pilot program. Unfortunately, there are no real cost decreases that would offset the cost of the pilot program that the Company can think of and, if any were discovered, as stated above, those changes could offset the costs either directly or through an allowance. Additionally, the proposed surcharge amount is designed to collect only the cost as described in the program so there is no mismatch between the revenue and the costs. A stated in the petition, during the course of the pilot program, its amortization, recoveries, and ongoing costs records would be fully open for examination and true-ups as needed. As an environmental/public health issue, I do not perceive Mr. Woods testimony as having the Company ignore the impact of these real NJDEP required actions.

The proposed pilot program surcharge is designed to take into account a whole new set of costs which could not have been considered in previous rate case decisions and to specifically track such costs for inclusion. The pilot program surcharge is designed to be transparent and by limiting the costs to those that are incremental and incurred, I do not believe this is the kind of 'single issue' ratemaking Mr. Woods criticizes and should not be considered as such. What may be considered traditional single issue ratemaking could

be problematic if it doesn't reflect all moving parts. Our suggested pilot program is designed to do so.

Q. The Company's petition stated the number of Company owned LSLs to be replaced in 2019 was 2,338. Was that number ultimately accepted by the New Jersey Department of Environmental Protection ("NJDEP") and has this number been updated?

A. The NJDEP, in its letter dated October 29, 2019, has approved and provided the Company with the required number of LSLs to be replaced in 2019 (See Attachment 2). The Company is required to replace 2,452 LSLs which is 7% of its approved initial LSL inventory of 35,034 LSLs.

Q. How is the amount calculated?

A. The updated amount was determined by the NJDEP which included updated information as available for the number of known Company LSLs. Specifically, the updated amount also includes an estimated amount of company side only LSLs. The 35,034 LSLs is comprised of the Company side LSLs, Goosenecks, known non-company side LSLs (less duplicates) and an estimate of LSLs that may be in the Company side unknown category. These amounts were 8,541 Company LSLs, 23,623 goosenecks, 1,240 Company side unknowns that are predicted to be LSLs or goosenecks (which is a portion of the Company side "unknowns"), and 1,630 non-company side, or Customer side only LSLs. It should be noted that in the Federal Environmental Protection Agency's ("EPA's") proposed update to the **Lead and Copper Rule ("L&CR")** (which is

currently out for comments), a partial LSL replacement will not count toward complying with a 7% replacement requirement under an Action Level Exceedance ("ALE").

Q. From this calculation, is it correct that the NJDEP is requiring the inclusion of non-company side, or 'customer side only' LSLs in the count of service lines to be replaced at the 7% per year rate?

A. Yes. The calculation included 1,630 non-company side LSLs. As the Company completes its required inventory of non-company side LSLs, this amount will grow as additional non-company side LSLs are determined.

Q. Has the Company received additional direction from the NJDEP regarding inventorying non-company side service lines since filing the petition?

A. Yes. In a letter (Attached as Attachment 3) dated September 5, 2019, the NJDEP is requiring the Company to develop a suitable action plan to complete an inventory of non-company side LSLs. "Due to the significant number of unknown lead service lines within SUEZ's distribution system, the Department has permitted SUEZ to not include the 153,000 unknowns when calculating their 7% replacement requirement for the first year. If SUEZ fails to provide an aggressive and satisfactory Action Plan and/or fails to implement the plan, SUEZ will be required to include the 153,000 unknowns in their 7% replacement requirements going forward." Please note the referenced 153,000 unknowns is now approximately 70,144 as noted above.

On October 2, 2019, the Company provided the NJDEP what it believes to be an aggressive and satisfactory Action Plan which would complete an inventory of non-company side LSLs by year end 2021. The Action Plan is currently under review and we anticipate the NJDEP will approve the Action Plan with few if any changes.

Q. Has the NJDEP issued other requirements which would impact the company's costs related to LSLs?

A. Yes. In a letter dated September 18, 2019, (attachment 4) the NJDEP required the Company to "Evaluate and compose a revised plan to distribute filters and replacement cartridges to all sites with lead service lines, not just ones with SUEZ owned lead service lines and/or with a high lead result. There are some very high results based on lead and copper sampling. Given that actual peak values can typically be 4-8 times higher than first draw results, the potential exposure of residents to very high levels of lead are a serious concern." Generally, the Company understands that requirement to be that pitcher filters and replacement filters are to be provided to customers who have an LSL or Gooseneck on the Company side, or an LSL on the non-company side. Utilizing the updated information above, this is approximately 32,000 customers.

Additionally, in the same letter dated September 18, 2019, the NJDEP stated "Since SUEZ is a large system and its existing treatment is not optimized, SUEZ will not be permitted to stop implementing CCT steps, regardless of whether lead and copper sampling demonstrates compliance with the action levels, without prior written approval from the Bureau." The Company therefore believes that the various items described in the letter will be made a continuing requirement of the NJDEP.

Q. What would be the estimated cost of this NJDEP requirement?

A. Using an assumption of $40 per filter pitcher (including one long-life filter) and $17 per long-life replacement filter (a 6 month filter) and including a 20% administration fee for an outside entity to administer the program, the approximate cost for the first issue of pitchers and filters would be about $69 per customer per year. To provide filters for a second issue would be for two long-life filters plus administration fees so the estimate of cost would be approximately $41 per customer. I believe in such an estimate, an allowance for breakage and reissuance should be included of approximately 10%. None of the above estimates includes sales tax. As an inventory of service lines has not yet been completed, the exact number is not known and until such an inventory is complete, the number of customers to which this would apply is difficult to estimate. If one were to estimate a number of customers using the updated information provided above for approximately 32,000 customers, the cost for the first year would be approximately $2.2M and $1.5M for the second year. These amounts would decrease as LSL replacements are made. It should be noted that these estimates will change as replacements are being made and as the inventorying efforts determine the composition of the unknowns.

Q. On page 15 of Mr. Woods' testimony, he discusses a portion of the L&CR, which describes the sampling method whereby a water utility is not required to replace an individual lead service line if the lead concentration in all service line samples from that line are less than 0.015 mg/L. Has this been addressed by the NJDEP?

A. Yes. In attachment 2 it clearly states, "The Bureau strongly discourages sampling in lieu of LSL replacement as it is not optimal for protection of public health". The L&CR allows states wide latitude in interpreting and implementing the Rule and states can adopt rules more stringent than the L&CR. It is clear from the language in Attachment 2 that the NJDEP will not accept this option regardless of this interpretation of the current L&CR. In addition, the EPA's proposed update to the L&CR (which is currently out for comments) eliminates this option.

Q. On page 15 of Mr. Woods' Testimony beginning on line 15, he discusses what he believes would occur if the Action Level Exceedance ("ALE") is lifted by achieving compliance for two consecutive six-month monitoring periods thereby releasing the Company from the obligation to replace Company-owned lead Services. Do you think his assumptions are correct?

A. To clarify, if the ALE is lifted, my understanding is that the obligation to replace lead service lines at the accelerated 7% per year rate would no longer be required *by the specific language of the rule*. However, as noted above, the NJDEP may adopt rules different from L&CR as long as they are more strict. The Company is committed to replacing our LSLs and intends to continue their replacement and it is certainly willing to engage the other parties and the BPU in discussions as to the manner and rate of replacement of an LSL program.

Q. On page 19 of Mr. Woods' testimony, he described a characterization of the Company's proposed pilot program as a continuing program. Is the characterization correct?

A. No. I agree with Mr. Woods that pilot programs generally include initiatives of limited duration and are often designed to educate stakeholders about a particular topic. In fact, that is what the Company's proposed pilot program is designed to do. It is clear from the Company's petition that in what we considered the second phase of the program, a pilot program would be used to determine the feasibility of a continuing program, but not in this case to design such a continuing program. It is our intention in cooperation with the parties in this proceeding to have discussions and make adjustments over time as we tried to make that clear in our petition and testimony.

Within the context of the pilot program, other issues such as what that program should accomplish and what specific operational goals should be included in the pilot would be determined in the second phase. It appears that Mr. Woods is interpreting the Company's proposal for a pilot program as a permanent program which is not subject to change based on new needs or facts, when in fact, it has always been intended to be a program subject to changing needs so the BPU could determine, based on new facts to make a judgement as to whether such a program is effective and should continue while completing all amortizations or other priorities. The specifics of any program going forward will be impacted by NJDEP, BPU and Company priorities which take into account program effectiveness, cost recovery, finances, and other regulatory and public health priorities. Other work and capital investments will have to continue.

Certainly, in the context of the Company's 7 year amortization suggestion, there would be a rolling recovery period, but that recovery period could be reduced or increased by changing the amortization period or adjusting the specifics of other components of the program. What is necessary is that the contours of the plan, its cost recovery mechanisms and priorities set standards so the Company can plan and minimize various cost components. For example, if the approved plan structured a target annual number of LSL replacements, the Company could more accurately plan the use of internal personnel and outside contractors to maximize the effectiveness of the workforce.

Q. Is there enough information to determine at this point, if a program to replace non-company LSLs should continue past the pilot?

A. No. The Company's proposed pilot program was designed to gain such information as Mr. Woods suggests. The Company could not propose a continuing program or develop a proposal for program costs for a continuing program if there is no approval of a realistic program including a cost recovery mechanism. However, doing nothing simply means that the public health concerns over lead will remain only partially and inefficiently addressed and the Company does not believe that to be a reasonable path going forward.

Q. Did the Company propose a specific end date to the pilot?

A. No. For the reasons I identified above, the Company left the pilot "open ended", intentionally giving the Board the flexibility to determine how long such a program

should last. As previously noted, the Company's petition (paragraph 25) described a two phase process whereby such issues would be discussed and ultimately decided.

Q. If the Board were to determine that the non-company or customer side LSLs should be replaced and included in a surcharge or other similar mechanism, what other issues does Mr. Woods appear to have with the Company's proposed pilot program?

A. In reviewing Mr. Woods' testimony, the only other issues he mentioned on page 20 were certain costs which he believes should not be included for recovery in the proposed pilot program surcharge. These relate to the cost of water quality sampling and customer education. The Company believes the pilot program should include all its costs in order to be transparent. Public health risks from lead is a home-by-home issue that necessitates public outreach and water quality sampling to both provide customers with awareness of possible health risks and influence customers to remediate lead solder and fixtures within their premises, if present. Clearly those costs exist and are beneficial to customers as a whole and should be included in rates for recovery.

Q. On page 12 of Mr. Woods' testimony, he points out that the Company's proposed pilot program includes only customers who have lead non company owned service lines that are supplied by lead company-side services. Why did the Company's pilot program propose this?

A. As a pilot program, the Company believes that it is appropriate to limit the program while the issue is being studied and the results of the program evaluated. If successful, as part

of a continuing program to remove LSLs after the pilot would be evaluated, the Board in its discretion could have the parties examine whether to include non-company side LSLs (even if the Company side is not lead). In addition, while being evaluated, limiting the pilot program in this manner would minimize the number of partial LSL replacements which would therefore minimize the potential increase in lead concentrations resulting from a partial replacement. The phased approach would also allow sufficient time for the Company to complete its non-company service line inventory, allowing for a more efficient replacement of non-company lead service lines should the Board decide to continue a program.

Q. On page 12 of Mr. Woods' testimony, he discusses the issue of carrying costs being included in the proposed pilot program surcharge. Did Mr. Woods specifically object to the inclusion of carrying costs in the surcharge or the level proposed by the Company?

A. No.

Q. **Is it appropriate to include carrying costs in an approved surcharge mechanism?**

A. Yes. Ignoring the carrying costs of investments made to replace LSLs in any funding mechanism is not part of my understanding of how utility regulation works. Reasonable and prudent costs of a valuable and necessary project of any kind include carrying costs and are essential. In the Company's proposal, we have included these essential carrying costs just as we have included cost of pipe, engineering, design, and administrative costs. All are essential components of the true total costs of any project.

1

2 The use of investment funds has a cost. One could not rationally expect to borrow money
3 or ask an investor to provide money without providing a return of the borrowed funds as
4 well as the carrying costs on those funds (interest and a return on the invested capital). As
5 a result, the cost to carry those investments is appropriately includible as a part of the
6 proposed surcharge. The Company's proposed pilot program, has already done much to
7 mitigate the impact of such carrying costs on the Company and its customers. For
8 example, by including the costs as a regulatory asset instead of proposing that such costs
9 be included in plant in service, as has been approved in other states, the amount of the
10 regulatory asset takes full advantage of the income tax effect by reducing the remaining
11 balance of the regulatory asset for the full effect of deferred income taxes. Also, the
12 Company has also proposed a limited term for recovery of the overall costs of the
13 surcharge which limits the period in which such funds are required. The details of
14 exactly how these costs must be reflected can certainly be discussed between the parties
15 and approved by the Board. But the fact of these costs or their recovery cannot be
16 seriously questioned. To avoid the need for some kind of carrying costs, a mechanism
17 could be designed where customers could provide funds up front so those investment
18 dollars would not need to be acquired from other sources. In that event, no carrying costs
19 would occur and no recovery of carrying costs would need to be reflected. In developing
20 the initial proposal, my experience in ratemaking led me to the conclusion consistent with
21 regulatory practice, that investors invest and customers reimburse those investments with
22 the return of and carrying costs on those investments.

23

1 **Q. What is the appropriate level of carrying costs?**

2 A. The level of carrying costs allowed should match the source providing the funding. The
3 Company's pilot program contemplated utilizing general corporate funds and therefore
4 the overall cost of capital is appropriate to be utilized. To arbitrarily determine a rate for
5 carrying without consideration of the source of the funds is inappropriate and could have
6 the effect of arbitrarily disallowing costs appropriately incurred by the utility which
7 would be considered confiscatory. Conversely, inadvertently providing an inappropriately
8 high level of carrying costs would also be inappropriate. Simply, neither of these
9 scenarios is appropriate. However, if no net outlay of capital is required, no carrying
10 costs are needed. As examples of ratemaking, if funds were provided through a loan
11 program from the State of New Jersey specifically for LSL replacement (albeit an
12 unlikely occurrence), the repayment and cost of those funds should be incorporated into
13 the calculation of a related surcharge, or if a grant were issued which required no
14 repayment and had no associated carrying costs, no costs should be included for either
15 repayment or carrying costs.

16

17

18 **Q. Have carrying costs been recognized by the Board?**

19 A. Yes. It is the Company's understanding that other surcharge mechanisms (including the
20 DSIC) approved by the Board include an appropriate level of carrying costs.

21

22 **Q. On page 20, Mr. Woods discusses the depreciation rate applied to the calculation of**
23 **the surcharge. Please discuss.**

A. The depreciation rate the Company proposed in the pilot program was the depreciation rate approved by the Board for account 345 Services. The depreciation rate utilized in the DSIC filing is a composite based upon the weighted average balances of all plant in service for the accounts eligible for DSIC recovery which changes over time dependent upon the weighting of the balances. If the Board approved depreciation rate was utilized for the pilot program surcharge, the depreciation rate would remain constant until changed by the Board and the DSIC depreciation rate would produce an average slightly less over time than it would be if the LSL services are included in DSIC. Overall, therefore, the depreciation expense would, except for some potential timing differences, be essentially equivalent over time and any difference would be accounted for in rate base through Accumulated Depreciation. Nevertheless, in light of the Company's response to RCR-E-16 as noted above (and attached as Attachment 1), I believe Mr. Woods' concerns in this are fully addressed.

Q. Mr. Woods refers to AWWA C810-17 on page 16 of his testimony. What is that?

A. AWWA C810-17 (Attached as Attachment 5) is an *operating procedure* outline adopted by the AWWA related to the replacement of lead service lines. It addresses numerous items including, but not limited to, location and replacement of lead service lines, notification of customers, and procedures to recommend to customers regarding the flushing of lines in the event of a full or partial replacement. SWNJ follows AWWA C810-17.

Q. On page 6 of Mr. Woods' testimony, he describes the current rule regarding the replacement of the non-company side lead service line. Please discuss.

A. As Mr. Woods states also on page 6, the current L&CR requires the Company to replace its portion of the Lead Service line and to offer to replace the non-company side (if lead) *at the customers cost* to minimize the partial replacement of lines that are known to be lead from the water main to the structure. A partial replacement creates a potential increase in lead concentration for some period of time that could result after a partial replacement as noted in AWWA C810-17. The Company believes the proposed pilot program would increase the number of full service line replacements thereby minimizing this potential increase in lead concentrations as would result from a partial. Failing to replace either or both the company or non-company side LSLs does not address the LSL issue going forward, but leaves the current situation in place. Having said that, as the Company has seen in its Lambertville system, there are instances of lead samples coming from residences with non-lead service lines on either the Company or non-company side. If there is lead within the premises, either in its plumbing or fixtures, the Company's proposed pilot program would not address that, and to my knowledge no party to this proceeding nor the NJDEP has suggested or required anything to resolve that in-home situation.

Q. Without approval of the pilot program, has the Company attempted to limit the number of partial replacements so far performed?

A. Yes. The Company has limited partials but has performed them in the following cases:

1) Emergencies such as leaking services. Note: If partials were not allowed then this would result in either:

   a) the leak not being addressed or

   b) the lead line being repaired, but leaving the lead line in place. (A repair could disturb the lead and could have the same effect on lead concentrations as if a partial was performed.)

2) As part of main replacement projects where the property owner has opted-out either in writing or by default (i.e. the notification period has expired) to deal with the non-company side LSL, but to provide service there must be a connection between the main in the street and the non-company side LSL. Here, too, a rework of the lead line would have the same effect as if a partial was done because there would be a disturbance in the line.

3) In towns where roads are scheduled to be paved and the property owner has opted-out either in writing or by default (i.e. the notification period has expired). If partials were not allowed then, depending on the length of the town's road moratorium (i.e. the time period in which the street is not to be opened), this could result in the service line not being able to be replaced for up to 10 years.

Without the pilot program, as of 11/27/19, out of 996 Opt-in/Opt-out letters sent (described in Mr. McKoy's earlier direct testimony in this proceeding), Customers have responded positively to only approximately 11% of the letters. However, only approximately 1.4% of those receiving letters have replaced their side at their cost. The

Company believes the pilot program would reduce the number of partial replacements significantly and has the potential to virtually eliminate partial replacements.

Q. Is there certainty that the proposed pilot program will be effective?

A. While the Company believes it will be effective, without specific data resulting from implementing an appropriate pilot program would bring, we have no statistically solid information as to whether or to what degree customers would be willing to replace their side even at a reduced cost. As noted in AWWA C810-17 part 4.2.4, "It is possible that a portion of the service may contain lead, be out of the utility's responsibility, and subsequently not be replaced. This circumstance may exist for a variety of reasons including cost, miscommunication, misunderstanding of the issues, ambivalence, or social defiance." It seems logical to assume customers would take such an opportunity, but such an assumption is and remains unverified.

Once a pilot program is implemented, the Board could, at its discretion after obtaining what it believes is sufficient data, adjust the confines of the program based on that new information. It would be essential at that point, however, to ensure that all the good faith costs on all sides be accounted for and all monies invested or monies spent would need to be recovered appropriately. Clearly, the more transparent and clear the accounting and tracking, the easier that should be.

Q. On page 17 of Mr. Woods' testimony beginning on line 10, he suggests, among other things, that the Board reject the Company's pilot program and continue to perform partial LSL replacements. What would this entail for partial replacements?

1 A. Partial LSL replacements would continue and the Company would continue to comply
2 with AWWA C810-17 and the requirements of the NJDEP.
3
4 **Q. Also on Page 17 of Mr. Woods testimony (lines 10-14), would Mr. Woods' suggestion**
5 **as to how the Board should proceed make meaningful progress on removing non-**
6 **company side LSLs from the Company's system?**
7 A. I don't believe so. While certainly every effort should be made, and is being made, to
8 adjust and optimize corrosion control in the Company's system, if the non-company side
9 LSLs remain, Mr. Woods' solution would not reduce the LSL risks, and the potential
10 health concerns remain.
11
12 **Q. On page 14 of Mr. Woods' testimony, he discusses whether or not the Company's**
13 **proposal will solve the issue of Lead. Do you have comments regarding this?**
14 A. Yes. Much of Mr. Woods comments in this section of his testimony have been addressed
15 above. However, in this section, he rightly states that the pilot program will not address
16 other plumbing components that may contain lead which would be addressed by the
17 individual property owner. That the pilot program does not address these internal
18 plumbing issues does not invalidate the need for a program to address and remove non-
19 company side lead service lines.
20
21 **Q. Should the Board approve a pilot program?**
22 A. Yes. Lead has become a significant public policy focus of customers, NJDEP and the
23 Board as well as the legislature. The replacement of LSLs should be addressed directly

and transparently, otherwise it does a disservice to our customers and the public bodies focused on it. The Company believes their expectation is for the Company, the Board, Rate Counsel as well as all public agencies dealing with this issue to do so. As noted above, with the magnitude of the impacts of the new requirements of the NJDEP related to the LSL issue, the only real impediment to an effective program is the recovery of costs associated with replacing non-company owned LSL from customers.

Q. Does this conclude your testimony?

A. Yes

In the Matter of the Joint Petition Of Suez Water New Jersey, Inc. for Approval of a Pilot Program to Facilitate the Replacement of Lead Service Lines and a Related Cost Recovery Mechanism

BPU DOCKET NO. WO19030381

RATE COUNSEL DISCOVERY REQUESTS

RCR-E-16
(Gary Prettyman)

RCR-E-16 Will the cost of the 2019 Company-owned lead service replacements be included in and recovered in the Company's DSIC surcharge?

Response: The Company's proposed mechanism is that lead related replacements be included in a single surcharge which would allow direct visibility as to the cost of the LSLs both on the Company side and the Customer side. Currently, Company side replacements are included in the amounts recovered under the DSIC mechanism and the Company would not object to the Company owned side remaining as a part of the DSIC surcharge.

SUEZ Water New Jersey
BPU Docket No. WO19030381

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

State of New Jersey
Department of Environmental Protection
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CATHERINE R. McCABE
Commissioner

October 29, 2019

Thomas M. Neilan
Director of Operations
SUEZ Water New Jersey Hackensack
200 Lake Shore
Haworth, NJ 07641

RE: Initial Lead Service Line Inventory Approval
SUEZ New Jersey Hackensack
PWSID: NJ0238001
Letter ID # LCR190003

Dear Mr. Neilan:

The New Jersey Department of Environmental Protection (DEP), Bureau of Water System Engineering (Bureau) has completed a technical review of SUEZ New Jersey Hackensack's (SUEZ's) revised Initial Lead Service Line (LSL) Inventory dated August 26, 2019. The Bureau is aware that the property owner's portion of the service lines are not included in the reported unknown values. However, the unknown property owner's portion of the service lines are being addressed separately and are a part of DEP's Inventory of SUEZ's LSLs. Based upon this review, the Bureau determines that the submitted document demonstrates compliance with the requirements of 40 CFR 141.84(b)(1) and 141.86(a)(1) and (2) so long as SUEZ meets the conditions below.

1. The LSL replacement program begins the first day following the end of the monitoring period in which the lead action level was exceeded. Therefore, SUEZ has from January 1, 2019 to December 31, 2019 to replace 2,452 LSLs[1], which is 7% of its initial LSL inventory of 35,034 LSLs.

   SUEZ must continue replacing the required percentage of LSLs each year until the system no longer exceeds the lead action level during two consecutive 6-month monitoring periods.

[1] LSLs include service lines that contain lead pipe, pipe that is lead-lined or dipped, or service lines connected by a lead gooseneck to the main.

SUEZ Water New Jersey
BPU Docket No. WO19030381

2. SUEZ must submit the Lead Service Line Replacement Report (BWSE – 20) within 12 months following the end of the monitoring period that triggered the LSL replacement program, and annually thereafter. SUEZ is required to submit the BWSE-20 with all sections completed by December 31, 2019. The form is available on DEP's webpage at https://www.state.nj.us/dep/watersupply/dws-sampreg.html .

3. SUEZ must update its LSL inventory as service line materials are identified and/or replaced. The system must maintain the material evaluation records and inventory on site and make them available upon request. Within 30 days of the change to the LSL inventory, i.e., within 30 days from the date of replacement, the Lead and Copper Sampling Plan must be updated to reflect the LSLs replaced and such records must be maintained onsite.

4. If sampling at a LSL site is conducted in accordance with 141.86(b)(3), the sampling result(s) must be maintained on site and reported to the Bureau on the Non-Compliance Sample form (BWSE-16). In addition, if any sample was collected in accordance with 40 C.F.R. 141.86(b)(3) to be considered as a LSL replacement, the detailed sampling protocol that the water system followed and supporting documentation (e.g. chains of custody, result) must be enclosed with the BWSE-20 annual submission noted in item 2 above. It is strongly recommended that SUEZ provide the DEP with the detailed sampling protocol for review and approval in advance of conducting sampling and/or considering a LSL be replaced based on a sampling result. ***The Bureau strongly discourages sampling in lieu of LSL replacement as it is not optimal for protection of public health.***

5. LSLs that have been replaced in full (no longer containing any lead) must be made inactive in the water system's lead and copper sampling pool and are no longer to be used for future lead and copper sampling as Tier 1 category (i) or Tier 2 category (iv) or (x). The Lead and Copper Sample Location Spreadsheet (BWSE – 18) must be updated and emailed to watersupply@dep.nj.gov to reflect the changes to the sampling pool in response to LSL replacements. Refer to the Materials Evaluation factsheet available on our website (https://www.state.nj.us/dep/watersupply/dwc-lead-public.html) for additional information evaluating materials within a distribution system.

SUEZ's May 13, 2019 LSL Replacement Plan is currently under review by the Bureau and will be addressed under a separate cover.

It is possible additional information and/or action may be necessary as both the Federal and State Safe Drinking Water programs continue to assess the implementation of the Federal Lead and Copper Rule to ensure continued protection of public health.

SUEZ Water New Jersey
BPU Docket No. WO19030381

If you have any questions regarding this matter, please contact Leronda Aviles at (609) 292-2957 or by email at leronda.aviles@dep.nj.gov . When contacting the Bureau please reference the PWSID No. NJ0238001 and Letter No. LCR190003.

Sincerely,

Kathleen Burchard for

Kristin Hansen, Section Chief
Water System Assistance Section
Bureau of Water System Engineering

cc: Northern Bureau of Water Compliance and Enforcement
Mark McCoy, Vice President, General Manager, SUEZ
Peter Fitzpatrick, Water Treatment Licensed Operator, SUEZ
Eric Vitale, Project Manager, SUEZ
Leronda Aviles, BWSE – Water System Assistance
Jacobine Dru, Division of Law
Kristen Heinzerling, Division of Law

PHILIP D. MURPHY
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SHEILA Y. OLIVER
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CATHERINE R. McCABE
Commissioner

CERTIFIED MAIL/RRR:
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September 5, 2019

Eric Vitale
Large Projects and Lead Program Manager
SUEZ Water New Jersey Hackensack
461 From Road
Paramus, NJ 07652

Re: Plan of Action for 153,000 Unknown Service Lines
SUEZ Water New Jersey Hackensack
PWSID: NJ0238001
Letter No. LCR19003

Dear Mr. Vitale:

The New Jersey Department of Environmental Protection (Department), Bureau of Water System Engineering (Bureau) has completed a thorough review of SUEZ Water New Jersey Hackensack's (SUEZ) May 13, 2019 plan of action (Item 1 of SUEZ's May 13, 2019 submission) for identifying whether or not the 153,000 unknown service lines in its distribution system contain lead (Action Plan). Based on this review, **the Bureau has determined that SUEZ must amend their Action Plan to address the concerns and questions outlined below and submit the amended Action Plan and responses to the Bureau no later than September 23, 2019:**

1. Since Summer 2016, during meter replacement visits, attempts were made to document customer side material. The details recorded at that time were simply lead or not lead.

    a. SUEZ must indicate if these meter replacement visits were specifically at locations that are a part of the 153,000 unknown service lines.
    b. The Bureau is requiring SUEZ to conduct a thorough distribution system material evaluation during any further operational activities (i.e. complaint investigations) at all sites to confirm or update records.
    c. **If these locations are separate from the 153,000 unknown service lines, this action is not considered part of the Action Plan referenced in this letter and the response for**

this item must be submitted under a cover letter separate from the amended Action Plan.

2. In 2018, SUEZ started using an external meter contractor to generate/validate compliance sampling pool customers. The meter contractor has been performing material surveys and if validated as a Tier 1 customer, leaves a sample bottle. Almost 400 homes were visited with just over 100 ending up being valid Tier 1 sites.

    a. SUEZ must state whether all the current 100 plus standard lead and copper sampling locations used for compliance monitoring were visited and verified to be valid Tier 1 sampling sites. Pursuant to 40 CFR § 141.86(a)(3)(i), single family residences that contain copper pipes with lead solder installed after 1982 or contain lead pipes also meet the criteria for a Tier 1 sample site. Therefore, if any of these residences were determined to be Tier 1 based on interior plumbing, they also should have been sampled.
    b. The 300 or so homes that were identified as not meeting Tier 1 criteria must be removed from the compliance lead and copper sampling pool, if they are currently still included in the sampling pool. Provide confirmation that the most recent Lead and Copper Sample Location Spreadsheet (BWSE-18) forms were submitted based on this knowledge obtained from the material surveys conducted by the meter contractor. Note that an updated BWSE-18 reflecting changes as a result of these material surveys is required to be submitted to the Bureau within 30 days of becoming aware of any change. If SUEZ believes it is unnecessary to update BWSE–18, explain in detail why.
    c. Confirm whether the samples collected within this action item were first draw samples collected for compliance purposes and whether the meter contractor left sampling instructions along with the sampling bottles.
    d. **The Bureau supports SUEZ's actions to confirm that sites within its sampling pool are in fact Tier 1 sites; however, this effort does not address the proper identification of the 153,000 unknown service lines within SUEZ's service area. Therefore, this action is not considered part of the Action Plan referenced in this letter and the responses for this item must be submitted under a cover letter separate from the amended Action Plan.**

3. Since exceeding the lead action level (AL), SUEZ has used the external meter contractor to perform customer side material surveys while taking the free flush sample for customers that have requested a sample after being identified as having lead, lead gooseneck or unknown material on the SUEZ owned portion. Approximately 2,000 customer owned service line materials have been recorded as of May 13, 2019. All information is being updated in GIS.

    a. If SUEZ's portion is known to be lead or have a lead gooseneck and lead was identified on the property owner side, these locations must be added to SUEZ's lead service line inventory provided on the Lead Service Line Replacement Report (Form BWSE-20) and resubmitted to the Bureau.
    b. SUEZ stated that they have tested 1,925 property owner's service lines, of which 316 are lead on the property owner side.
        i. SUEZ must explain why the remaining 75 property owner-side service lines were not sampled.

ii. Confirm that these 316 lead service lines are part of the lead service line inventory section provided on Form BWSE-20.

c. **The Bureau supports SUEZ's actions to confirm materials on the property-owner's side of locations where SUEZ's portion of the service line is lead or unknown; however, it is our understanding that these locations are separate from the 153,000 unknown service lines. Therefore, this effort does not address the proper identification of the 153,000 unknown service lines within SUEZ's service area; this action is not considered part of the Action Plan referenced in this letter. The responses for this item must be submitted under a cover letter separate from the amended Action Plan.**

4. Also, since exceeding the lead AL, SUEZ created an application for its internal meter shop to use to collect more detailed information (same information as collected in number 2 above) when making routine meter/RF visits. More than 900 customer side records have been collected as of May 13, 2019 and is being recorded in GIS.

   a. SUEZ must confirm that these routine meter/RF visits were specifically at locations that are a part of the 153,000 unknown service lines.
   b. SUEZ must provide the number of these 900 plus homes that were confirmed to be lead on the property owner's portion of the service line.
   c. **If these locations are separate from the 153,000 unknown service lines, this action is not considered part of the Action Plan referenced in this letter and the response for this item must be submitted under a cover letter separate from the amended Action Plan.**

5. Beginning in mid-May 2019, SUEZ's internal meter shop anticipated taking over item 3 above from the meter contractor.

   a. SUEZ must provide the total number of current requests for customer sampling.
   b. SUEZ must indicate how long it plans on continuing to provide customer sampling and filter distribution for customers with utility owned lead service lines/goosenecks or unknown materials on the SUEZ owned portion.
   c. **The Bureau supports SUEZ's actions to confirm materials on the property-owner's side of locations where SUEZ's portion of the service line is lead or unknown; however, it is our understanding that these locations are separate from the 153,000 unknown service lines. Therefore, this effort does not address the proper identification of 153,000 unknown service lines within SUEZ's service area; this action is not considered part of the Action Plan referenced in this letter. The responses for this item must be submitted under a cover letter separate from the amended Action Plan.**

6. SUEZ is now using the meter contractor to specifically target service addresses with unknown or suspected lead material (customer side) within the road paving and main replacement programs. If inconclusive, SUEZ will investigate at the curb. Additionally, as spelled out in the 60 Day Notice Process Document, for those addresses in the Main Replacement & Road Paving programs, SUEZ will contact the account holder of record approximately 1 week after the 60-day

notice is mailed out to verify property owner. If contact cannot be made, SUEZ will visit the home and leave a door hanger if no one answers.

a. Since this activity is to identify unknown lead service lines as well as meet the requirements of the lead service line replacements, SUEZ must include the following in its Action Plan:
   i. What information is SUEZ using to identify targeted addresses with unknown or suspected lead material on the customer side?
   ii. How many of the unknown or suspected lead material on the property owner's side locations (of the 153,000) are within the road paving and main replacement programs?
   iii. If lead is identified on the property-owner portion only, will SUEZ offer to replace these customer-side lead service lines as part of the lead service line replacement requirements and road paving program? If so, how is SUEZ planning to maintain/record this information?
b. It is our understanding that this effort is being conducted due to SUEZ's requirements under the Lead and Copper Rule, to replace 7% of the lead service lines within their distribution system; therefore, how long does SUEZ intend to continue to specifically target service addresses with unknown or suspected lead material on the property owner's side within the road paving and main replacement programs?

7. In additional correspondence provided, SUEZ has indicated "dig and determined" actions have been taken to further identify service line materials in the distribution system.

   a. Confirm the "dig and determine" effort is captured under a specific Action Plan item outlined above, identify which item, and explain how the "dig and determine" effort fits within that item
   b. If not, provide a detailed plan outlining the "dig and determine" effort in the amended Action Plan.

8. Provide the following in writing regarding the unknown service line locations in the amended Action Plan:

   a. The total number of unknown service line locations, including numbers detailing the *combinations of both SUEZ and property-owner portions unknown* as well as SUEZ portion known non-lead and property-owner portion unknown.
   b. If lead is known on either SUEZ's portion or the property owner's portion of the service line, but unknown for the other portion of the service line, confirm that these sites are included in SUEZ's lead service line inventory reported on the Form BWSE–20.
   c. A table that lists the towns in which the unknown service lines are located, how many there are per town, and the various combinations of SUEZ and property owner known or unknown LSLs.

9. The Action Plan must be amended to include proactive and detailed action items that will identify the service line material at all unknown service line locations, that are not eligible for receiving site visits/investigations from customer requested sampling nor that are locations

within the road paving or main replacement project areas. This focus of this Action Plan is for SUEZ to identify all 153,000 unknown service lines and is separate from the lead service line replacement actions that SUEZ is conducting. This Action Plan must be completed regardless of SUEZ's lead service line replacement requirements under the Lead and Copper Rule, i.e. even if for instance, SUEZ is no longer required to replace lead service lines annually, SUEZ must still identify the 153,000 unknown service lines.

10. What is SUEZ's target number for identifying the unknown service line materials (the 153,000) by December 31, 2019?

    a. If all the unknown service lines are not identified by December 31, 2019, provide SUEZ's action plan and timeframe to identify the remaining unknown service lines.

Due to the significant number of unknown lead service lines within SUEZ's distribution system, the Department has permitted SUEZ to not include the 153,000 unknowns when calculating their 7% replacement requirement for the first year. If SUEZ fails to provide an aggressive and satisfactory Action Plan and/or fails to implement the plan, SUEZ will be required to include the 153,000 unknowns in their 7% replacement requirements going forward.

If you have any questions regarding this matter, please contact Leronda Aviles at (609) 292-2957 or by email at Leronda.Aviles@dep.nj.gov When contacting the Bureau please reference the PWSID No. NJ0238001 and Letter No. LCR19003.

Sincerely,

Kristin Hansen, Section Chief
Water System Assistance Section
Bureau of Water System Engineering

cc: Peter Fitzpatrick, Licensed Operator 9 Cherrywood Drive Goshen, NY 109224
Thomas Neilan, Licensed Operator 100 Kiel Ave Kinnelon, NJ 07405
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Commissioner

CERTIFIED MAIL/RRR:
7017 1450 0001 4504 1170

September 18, 2019

Thomas M. Neilan, Director of Operations
SUEZ Water New Jersey Hackensack
200 Lake Shore Drive
Haworth, NJ 07641

Re: SUEZ Water New Jersey Hackensack – PWSID: NJ0238001
Approval LCR190002 to Conduct Corrosion Control Treatment Study

Dear Mr. Neilan:

The Bureau of Water System Engineering (Bureau) is in receipt of SUEZ New Jersey – Hackensack's (SUEZ) proposal to conduct a Corrosion Control Treatment (CCT) Study which is comprised of three correspondences dated February 5, 2019, February 27, 2019 and April 5, 2019 along with the Corrosion Control Treatment – Monitoring Plan Progress Reports dated May 20, 2019 and June 18, 2019. SUEZ is implementing this proposal in order to determine the measures necessary to reduce lead levels below the action level in accordance with the Lead and Copper Rule and to optimize the existing CCT.

SUEZ introduced zinc orthophosphate, a corrosion inhibitor, into its water system starting in October 2017, and then gradually lowered the pH from May 2018 through December 2018. During 2018, SUEZ sampled customer taps for lead and copper during six-month consecutive monitoring periods. SUEZ's tap water sampling for the period of July 1, 2018 through December 31, 2018 resulted in a lead action level exceedance. Consequently, pursuant to 40 C.F.R. § 141.81, SUEZ does not have optimal corrosion control and is required to ensure that the system has optimal corrosion control treatment by performing corrosion control studies, see 40 C.F.R. § 141.82(c). This letter 1) lists the CCT Study Tasks initiated and/or proposed by SUEZ and 2) lists additional CCT Study Tasks that the Bureau, having consulted with the US Environmental Protection Agency (USEPA), is requiring SUEZ to complete.

CCT Study Tasks

The Bureau acknowledges that SUEZ has already initiated, as per the May 20, 2019 and June 18, 2019 Progress Reports, and/or proposed the following CCT Study Tasks.

1. Distribution System Sampling to Evaluate Potential Causes of Action Level Exceedances
   A. Water Quality Data from Distribution System Locations
      i. Review and evaluation of historic data and data summary.
      ii. Continued evaluation of existing regulatory monitoring sites (as already required under 40 C.F.R. §§ 141.87 and .88 for lead and copper, and WQPs).
         - Lead and Copper monitoring (100 samples/Every 6 Months).
         - Water Quality Parameter (WQP) monitoring (50 samples/Every 6 Months) for pH, orthophosphate and alkalinity from the distribution system.
         - Revised Total Coliform Rule (RTCR) monitoring (270 samples/Month)
      iii. Evaluation of existing on-line monitors that are located within existing pumping stations throughout the distribution system.
         - Monitoring parameters including total chlorine, pH, temperature, turbidity and Oxidation Reduction Potential (ORP).
      iv. Additional monitoring to be conducted utilizing Process Research Solutions (PRS) Monitoring Stations (www.processresearch.net). The PRS Monitoring Stations are another type of pipe loop system which uses new lead coupons as compared to new or harvested pipe which are used in a conventional flow-through pipe loop system.
         - At locations
            - MHD45 New Durham Pump Station (JCMUA and Haworth mix)
            - MHD49A (JCMUA point of entry)
            - MDH20 Carlstadt Tank (Haworth water)
            - MHD73 River Vale Pump Station (Haworth water)
            - MHD72 Ridgefield (Haworth water)
         - Analyses to be conducted include but not limited to: total chlorine; free chlorine; oxidation/reduction potential (ORP); pH; temperature; conductivity; turbidity; orthophosphate; free ammonia; nitrate+nitrite; total phosphorus, total organic carbon; total alkalinity; chloride; sulfate; total calcium, total magnesium; total & dissolved lead, copper, iron, manganese, aluminum and zinc; along with adenosine triphosphate (ATP) and biofilm parameters.

   Timeframe for task completion is March 2019 through December 2019.

   B. Lead Profiling and Analyses (to be conducted quarterly)
      i. Sampling of five (5) Tier 1 sites for Total Lead and Dissolved Lead.
         - Location of the current Tier 1 sampling sites are:
            - 157 Roosevelt Avenue in Westwood, NJ (sampled in April 2019)
            - 264 Churchill Road in Teaneck, NJ (sampled in April 2019)
            - 218 W. Newell in Rutherford, NJ (sampled in May 2019)
            - 194 7th Street in Cresskill, NJ (sampled in May 2019)
            - 61 Walnut Street in Rutherford, NJ (sampled in June 2019)
         - Other locations sampled prior to a lead service line replacement

- 169 Slocum Avenue in Englewood, NJ (4 sampling events - February and March 2019)
- 420 Lincoln Avenue in Rutherford, NJ (sampled in March 2019)

- If the results of a sampling site show uniformity for two consecutive lead profiles, a third quarterly sample may not be necessary.
- If the results of samples within the distribution system do not show uniformity, additional samples including locations and/or frequency may be required.

Timeframe for task completion is March 2019 through December 2019.

C. Pipe Scale Analyses

i. Acquire and analyze lead service line pipe from the following locations.

Address	Town	Main to Curb	Curb to Building	Date Harvested
240 Feronia Way	Rutherford	Galvanized	Copper	5/14/2019
204 Donaldson Avenue	Rutherford	Lead	Copper	5/14/2019
207 Donaldson Avenue	Rutherford	Lead	Copper	5/14/2019
153 Lawrence Street	Hackensack	Galvanized	Copper	5/14/2019
170 Union Street	Hackensack	Lead	Copper	5/15/2019
656 Ridgewood Avenue	Oradell	Lead	Lead	6/7/2019
1414 11th Street	North Bergen	Lead	Copper	6/7/2019

Note: Water quality sampling in the vicinity of the harvested pipe was collected. Parameters included, free and total chlorine, pH, temperature, orthophosphate, ORP, conductivity, ammonia and turbidity.

ii. Dependent on data and location of pipe extractions, additional samples may be harvested and sent for analysis.

iii. Analysis will be conducted by Dr. J. Barry Maynard (www.corrosion-scales.com).

iv. Attempt to get lead profiling samples from locations of harvesting during the summer months after coordination with homeowner.

2. Point of Entry Sampling to Evaluate Potential Causes of Action Level Exceedances

A. Conduct Testing at the Haworth WTP

i. Lead Loop Testing using harvested lead pipe and new lead pipe.

ii. Utilization of two (2) PRS Monitoring Stations.

- Four-chamber PRS; and
- Two-chamber PRS

The Bureau has reviewed all information provided by SUEZ to date and has consulted with the USEPA. Based on the Bureau's and USEPA's review, the Bureau is requiring the following additional tasks be addressed by SUEZ's CCT Study.

Additional CCT Study Tasks

SUEZ provides service to a significant population and a large service area (approximately 792,000 residents in 57 municipalities within Bergen and Hudson Counties); therefore, the Bureau and USEPA are requiring SUEZ to expand the scope of its CCT Study Tasks. SUEZ has nine (9) pressure districts (PD) and three (3) sub-PDs. The main PD of the system is PD-10 which serves approximately 75% of the SUEZ service connections. PD-10 transmits most of the potable water for the system via transmission mains, pressure regulators, booster pump stations, and/or water storage tanks. Potable water from PD-10 is supplemented by the Jersey City interconnection source located in PD-40.

1. **Water Quality Data from Distribution System Locations**
   A. All lead and copper monitoring sites must be Tier 1 and the Bureau strongly recommends they all be Sample Category i (served by a lead service line).

   B. Increase the number of WQP monitoring sites from 25 to 50 per quarter which would total 100 samples/Every 6 Months for pH, orthophosphate and alkalinity. SUEZ must sample 50 sites quarterly. Additional WQP sites must be representative of differing water qualities within SUEZ's distribution system (i.e. interconnections, age of water associated with dead end areas within distribution system, established scale and microbiological activity, etc.). See 40 C.F.R. § 141.87.

   All WQP analytical results shall be submitted electronically via E2; however, if the analyses are conducted by a State approved party, the WQP analytical results shall be submitted on the WQP Monitoring Report Form for Approved Party and emailed as an attachment to watersupply@dep.nj.gov with "Month or Quarter/Year WQP Results for PWSID Submittal for PWSID02380010" in the subject line. The WQP Monitoring Report Form for Approved Party and instructions are located at http://www.state.nj.us/dep/watersupply/dws-sampreg.html .

   C. Submit an updated WQP Sampling Plan, including a distribution system map containing all WQP monitoring sites, prepared in accordance with 40 C.F.R. § 141.87 to the Bureau within 30 days from the date of this letter.

2. **Lead Profiling and Analyses**
   A. As mentioned above, SUEZ has a significant number of pressure districts (PD) within its service area; therefore, SUEZ shall conduct additional quarterly lead profiling to adequately assess the effectiveness of the existing CCT throughout SUEZ's distribution system.

i. PD-10 consists of 42 municipalities which contain at least 5,821 known SUEZ owned lead service lines. Therefore, SUEZ must select a sample location from within each municipality.
ii. In addition, SUEZ must select a site from each remaining PD, including the Upper Saddle River PD-32.
iii. Based on the above, SUEZ is required to sample from at least 53 sites. Previously selected lead profiling sites may be used.
iv. Lead profiling shall occur at Tier 1 Sample Category i sites (those served by a lead service line) for Total Lead and Dissolved Lead. All lead profiling sampling must include first draw samples.

B. SUEZ shall submit all lead profiling data to the Bureau as established below.

3. **Pipe Scale Analyses**

Based upon information provided, pipe scale harvesting has occurred in the PD-10 and PD-40 pressure districts, specifically within Rutherford, Hackensack, Oradell, North Bergen and West New York. SUEZ shall harvest and analyze additional lead service lines within the distribution system that are representative of the entire service area with differing water qualities including areas served primarily by Jersey City MUA (JCMUA) and in the area receiving a mix of JCMUA and SUEZ water. The Bureau strongly recommends that both lead profiling and pipe scale analysis be conducted at same locations.

4. **Monitoring**

A. SUEZ's proposal includes the use of PRS Monitoring Stations that utilize new lead coupons. There is well established science regarding the evaluation of orthophosphate effectiveness on new lead surfaces; therefore, the monitoring stations seem to be an unnecessary expenditure of time and resources. It is the Bureau's and USEPA's position that these resources would be more beneficial to the CCT Study if additional sampling sites within the distribution system representative of the differing water qualities were used. This would allow SUEZ to evaluate how effective the proposed CCT will be on existing lead pipes with decades of scale already established.

B. The CCT Study places too much emphasis on distribution system monitoring stations with new lead surfaces. This type of an approach does not represent how old lead service lines, including how they will react to changes in water quality and corrosion control practices. The idea of enhanced distribution system water quality monitoring to better understand water quality in the distribution system is acceptable; however, additional sampling from residences served by a lead service line, such as lead profiling, and incorporation of additional harvested lead service lines to the pipe loop located at the Haworth Treatment Plant is preferred.

C. Additionally, there is a discussion of the role of microbiology in the proposal in which only the Adenosine Triphosphate (ATP) analysis will be performed. The Bureau strongly recommends that other direct and appropriate microbiological quality measurements be made so conclusions about corrosion conditions/mechanisms can be supported later.

5. **Change in Treatment Analysis - Use of Chloramines**
SUEZ uses ammonium sulfate solution along with sodium hypochlorite solution to form chloramines as the supplied water residual disinfectant. Chloramine residual is used to prevent degradation of water quality in the distribution system and persists longer than free chlorine residual to help reduce the creation rate of Total Trihalomethanes. Chloramination systems may experience nitrification in the distribution system which may impact corrosion control; therefore, SUEZ shall address how the existing chloramination process (i.e. intermittent and full-time use) affects corrosion control initiatives in the distribution system.

6. **Evaluate and Implement a Revised Filter Distribution Program**
Evaluate and compose a revised plan to distribute filters and replacement cartridges to all sites with lead service lines, not just ones with SUEZ owned lead service lines and/or with a high lead result. There are some very high results based on lead and copper sampling. Given that actual peak values can typically be 4-8 times higher than first draw results, the potential exposure of residents to very high levels of lead are a serious concern.

7. **Lead Service Line Replacement**
SUEZ's lead service line replacement plan and the action plan to identify the 153,000 unknown service lines is currently under review by the Bureau. The Bureau's comments and requirements will be covered under separate correspondence; all conditions outlined in subsequent correspondence will be a requirement of this CCT Study approval.

In the meantime, there is a lot of information on how other utilities and states have approached getting funding and getting legal authority to perform lead service line replacement. USEPA's Office of Water can identify webinars on facilitating full lead service line replacement, as well as resources such as the Lead Service Line Removal Collaborative (https://www.lslr-collaborative.org/).

8. **Interconnection and Consecutive Systems**
Remedial measures undertaken to address a particular contaminant can adversely affect other analytes within the treatment train and/or distribution system. SUEZ has an interconnection with JCMUA and Contract Bulk Sales Interconnection with at least eight water systems. SUEZ must coordinate with these systems in order to address how the CCT Study may affect these water systems. SUEZ shall submit annual progress reports to the Department in the first quarter of each calendar year documenting coordinating efforts in the previous calendar year.

The USEPA has prepared a guidance document, "*Simultaneous Compliance Guidance Manual for the Long Term 2 and Stage 2 DBP Rules*", to assist water systems that need to address multiple analytes within their water system. This guidance manual can be accessed at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=60000E2Q.txt. In addition, if there is any change to SUEZ's existing CCT process, refer to the Department's Source Water Changes and Treatment Modifications Guidance available at https://www.state.nj.us/dep/watersupply/pdf/change-source-treatment-guidance.pdf.

After review of the supporting documentation provided in SUEZ's proposal, the Bureau approves SUEZ's request to conduct a CCT Study on the condition that it includes implementation and completion of the "Additional CCT Study Tasks" identified by the Bureau and USEPA.

SUEZ must complete the CCT Study, including the "Additional CCT Study Tasks", and submit an optimal CCT recommendation prepared in accordance with 40 C.F.R. § 141.82 (a) indicating the optimal treatment option that the CCT Study identifies for SUEZ by August 1, 2020. The final recommendation shall also include rationale for its recommendation with all supporting documentation specified in 40 C.F.R. § 141.82 (c)1 through 5 and shall be reviewed, approved and signed by the licensed operator of record.

SUEZ shall provide monthly updates to the Bureau, on or before the 15th of each month, that will include the results of the as completed sampling identified in CCT study and any changes proposed to the locations, quantity or frequency of remaining sampling.

Since SUEZ is a large system and its existing treatment is not optimized, SUEZ will not be permitted to stop implementing CCT steps, regardless of whether lead and copper sampling demonstrates compliance with the action levels, without prior written approval from the Bureau.

If you have questions regarding the above, please contact Steven Pudney or Syed Imteaz Rizvi of my staff at (609) 292-2957 or via email at Steven.Pudney@dep.nj.gov or Syed-Imteaz.Rizvi@dep.nj.gov. When contacting the Department please reference the PWSID No. NJ0238001 and Letter No. LCR190002.

Sincerely,

Linda Ofori, Bureau Chief
Bureau of Water System Engineering

cc: Northern Bureau of Water Compliance and Enforcement
Peter Fitzpatrick, SUEZ
Eric Vitale, SUEZ
Steven Pudney, BWSE – Engineering
Leronda Aviles, BWSE – Water System Assistance
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ANSI/AWWA C810-17
(First Edition)

American Water Works Association
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AWWA Standard

Replacement and Flushing of Lead Service Lines

Effective date: Nov. 1, 2017.
First edition approved by AWWA Board of Directors June 11, 2017.
This edition approved by AWWA Board of Directors June 11, 2017.
Approved by American National Standards Institute Sept. 1, 2017.

STANDARD
American Water Works Association
Since 1881

Approved American National Standard
ANSI

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ISBN-13, print: 978-1-62576-269-6 eISBN-13, electronic: 978-1-61300-453-1
DOI:http://dx.doi.org/10.12999/AWWA.C810.17

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C810.*

I. Introduction.

I.A. *Background.* Replacement of lead service lines and subsequent flushing are important processes for ensuring the delivery of safe drinking water. The AWWA Policy Statement on Lead Service Line Management supports protecting public health through the reduction of exposure to lead in drinking water and encourages communities to develop a lead reduction strategy that includes identifying and removing all lead service lines over time. This standard is intended to describe essential procedures for the replacement of lead service lines, including the following elements: appropriate tools and techniques; flushing a service line after replacement; factors to consider in optimizing flushing; instructions to inform customers affected by the replacement, including additional risk reduction measures; and verification of lead level management prior to return to service. Although partial replacements should be discouraged, this standard also describes procedures for partial replacement and repair situations where full service line replacement is not possible or practical.

This is the first edition of this standard and will likely result in valuable feedback from first users of the standard. As such, it is anticipated that a second edition with additional information and guidance will be necessary and issued well before AWWA's regular five-year revision schedule for standards.

I.B. *History.* Development of this standard was authorized by the AWWA Standards Council in 2015 and was assigned to the AWWA Standards Committee on Distribution Systems Operations and Management. A Subcommittee on Lead Service Lines was formed to draft the standard. This first edition of the standard was approved by the AWWA Board of Directors on June 11, 2017.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the Water Research Foundation (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). The

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American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. Specific policies of the state or local agency.
2. Two standards developed under the direction of NSF†: NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.
3. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,‡ and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 60 and 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," to NSF/ANSI 60 and 61 do not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

ANSI/AWWA C810 does not address additives requirements. Thus, users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

* Persons outside the United States should contact the appropriate authority having jurisdiction.

† NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

‡ Both publications available from National Academy of Sciences, 500 Fifth Street, NW, Washington, DC 20001.

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II. Special Issues.

II.A. *Prioritizing Lead Service Line Replacement.* Suggested items to consider when prioritizing lead service line replacement follow (not in order of priority):

- Any lead service line that is physically disturbed by dig-ins, excavations, repairs, or similar activities.
- Existing partial lead service line replacements.
- Lead service lines supplying schools, day care centers, or other identified sensitive populations as defined by the USEPA.
- Lead service lines where sample results are more than 15 ppb or other established health levels.
- Lead service lines located in scheduled underground infrastructure work or street restoration work zones that could be replaced concurrently, minimizing any negative impact to customers.
- Multiple lead services within a compact area (cost containment).
- Length of lead pipe present in a particular service line.
- Consideration of presence of lead goosenecks and galvanized service lines.

II.B. *Optimizing Corrosion Control Treatment.* Corrosion of piping and solder can be a primary source of lead contamination in drinking water. Optimizing corrosion control treatment may help a utility to minimize this source of lead contamination. Utilities may consider appropriate corrosion control treatments that include pH adjustment, alkalinity adjustment, addition of corrosion inhibitors, and other corrosion control treatments. Additional guidance on applying corrosion control treatments can be found in the AWWA Manual of Water Supply Practice M58—*Internal Corrosion Control in Water Distribution Systems*, the AWWA "Optimized Corrosion Control Treatment Primer," and the 2015 *Journal - AWWA* article "Strategies for Assessing Optimized Corrosion Control Treatment of Lead and Copper" (these documents are available through the AWWA Lead Resource page: www.awwa.org/lead).

II.C. *Reuse or Replacement of Service Line Fittings, Valves, and Water Meters.* The scope of this standard covers replacement of lead service lines. Utilities may choose to reuse or replace the related fittings, valves (corporation stops and curb stops), and water meters, based on the site-specific age and condition of those components and based on the utility-specific replacement schedules and practices. The Reduction of Lead in Drinking Water Act requires that all newly installed pipes, fittings, and fixtures meet the current definition of "lead free." The reuse of existing fittings (that may or may not meet the current definition of "lead free") is allowed by the Reduction of Lead in Drinking Water Act if reused in their original locations.

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II.D. *Utility Communication Planning for Lead in Drinking Water.* Water utilities are facing a new communications challenge related to lead in drinking water. Currently, utilities are required under the Safe Drinking Water Act to communicate lead risks when there is an exceedance of the lead action level as defined in the Lead and Copper Rule and annually as part of their consumer confidence reports. Utilities conducting mandatory lead service line replacements must meet specific outreach requirements targeting affected households. Beyond these requirements, many utilities also communicate lead exposure risks proactively in consumer confidence reports, on websites, and through other means.

Water utilities should be planning to communicate lead exposure risks in a proactive and targeted manner not only when lead service lines are repaired or replaced but also when routine maintenance work on water mains may disturb lead service lines. This change may dramatically alter the frequency of direct-to-customer lead communications and requires a new level of planning by utility managers and communicators.

Although the water utility and public health communities have made significant strides in reducing lead exposure, public health advocates and regulatory agencies are looking closely at the contribution of lead at the tap from lead service lines—particularly lead service lines that have been disturbed. Three typical scenarios raise concerns about elevated lead levels: lead service line replacement when required by the Lead and Copper Rule or proactively performed by the utility; infrastructure replacement when full or partial lead service line replacement occurs when other utility work is under way, such as during water main rehabilitation; and repairs to lead service lines.

Water providers should consider building on current communication plans to provide additional information to customers regarding lead and lead service line replacement. AWWA has assembled *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement* as a tool for preparing and expanding these communications (http://www.awwa.org/Portals/0/files/resources/publicaffairs/pdfs/FINALeadServiceLineCommGuide.pdf).

This guide is designed to help water utilities build on current communication strategies to address these new areas of concern and manage the increased frequency of communication with customers. It provides utilities with customizable messages and templates to communicate with customers in a variety of ways to better protect public health. For brevity, the content of the guide will not be repeated here.

Additional guidance on utility communications can be found on the Lead Service Line Replacement Collaborative website: http://www.lslr-collaborative.org/.

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II.E. *Grounding of Electrical Circuits on Piping.* If the lead service line is replaced with a nonmetallic pipe or if a nonconductive plastic coupling (dielectric coupling) is used within a few feet of the home, the home owner may need to take additional measures to ensure the structure has sufficient grounding. Historically, connection to the home piping system was used for grounding the home's electrical system. By removing the underground metal piping, an alternative grounding strategy may be needed.

All metal water systems should be "bonded." Failure to adequately bond the potable water piping systems to the electrical system increases the potential for both fire and electrocution should the piping system become energized (see National Electric Code).

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products and/or processes described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* This standard is written as though the replacement and flushing work will be performed by the purchaser's (generally the utility's) personnel. Where the work is to be performed using a separate contract or as part of a contract for replacing service lines,* appropriate provisions should be included in the purchase documents to ensure the constructor is specifically instructed as to its responsibilities. The following information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA C810, Replacement and Flushing of Lead Service Lines, of latest revision.

2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.

3. Details of other federal, state or provincial, and local requirements (Section 4).

4. Method of replacement to be used—open cut, trenchless on new route, or trenchless using existing route (Sec. 4.1).

III.B. *Modification to Standard.* Any modification of the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. This is the first edition of this standard.

V. Comments. If you have any comments or questions about this standard, please call the AWWA Engineering and Technical Services at 303.794.7711; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.

* Refer to other AWWA standards and manuals for design criteria for various service line materials.

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AWWA Standard

Replacement and Flushing of Lead Service Lines

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes essential procedures for the replacement of lead water service lines and flushing following replacement. Essential procedures include the following: appropriate tools and techniques; flushing a service line after replacement; factors to consider in optimizing flushing; and instructions to provide customers affected by the replacement, including additional risk reduction measures. This standard also describes procedures for partial replacement and repair situations where complete lead service line replacement is not possible or practical.

Sec. 1.2 Purpose

The purpose of this standard is to define the minimum process requirements for the replacement of lead service lines and for flushing following replacement.

Sec. 1.3 Application

This standard can be referenced in the purchase documents for the replacement of lead service lines and can be used as a guide for the appropriate replacement tools and techniques, flushing practices and procedures, communications with customers, and verification of successful completion. The stipulations of this standard apply when this document has been referenced and only to the extent referenced.

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SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, they form a part of this standard to the extent specified within the standard. In any case of conflict, the requirements of this standard shall prevail.

AWWA—*Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement.*

Safe Drinking Water Act (SDWA), 42 USC* 300.

USEPA†—Lead and Copper Rule (LCR), 40 CFR 141.

SECTION 3: DEFINITIONS

The following definitions shall apply in this standard:

1. *Constructor:* The party who provides the work and materials for placement or installation.

2. *Corporation stop:* A valve attached to the water main to which a service line is connected. It is used to interrupt flow during installation or maintenance of the service line (see Figure 1).

3. *Curb stop:* A valve installed in the service line, generally at the property line, and accessible for operation from the surface of the ground for routinely interrupting flow through the service line (see Figure 1).

4. *Customer:* The person, company, or organization receiving potable water service from the utility to a specific premise.

5. *Gooseneck:* A sweeping bend in a service line where it connects to the water main, resembling the shape of a goose's neck, that will allow soil movement without damaging the service line (see Figure 1).

6. *Manufacturer:* The party that manufactures, fabricates, or produces materials or products.

7. *Potable water:* Water that is safe and satisfactory for drinking and cooking.

8. *Purchaser:* The person, company, or organization that purchases any materials or work to be performed.

* United States Code, 732 North Capitol Street, NW, Washington, DC 20401-0001.

† US Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.

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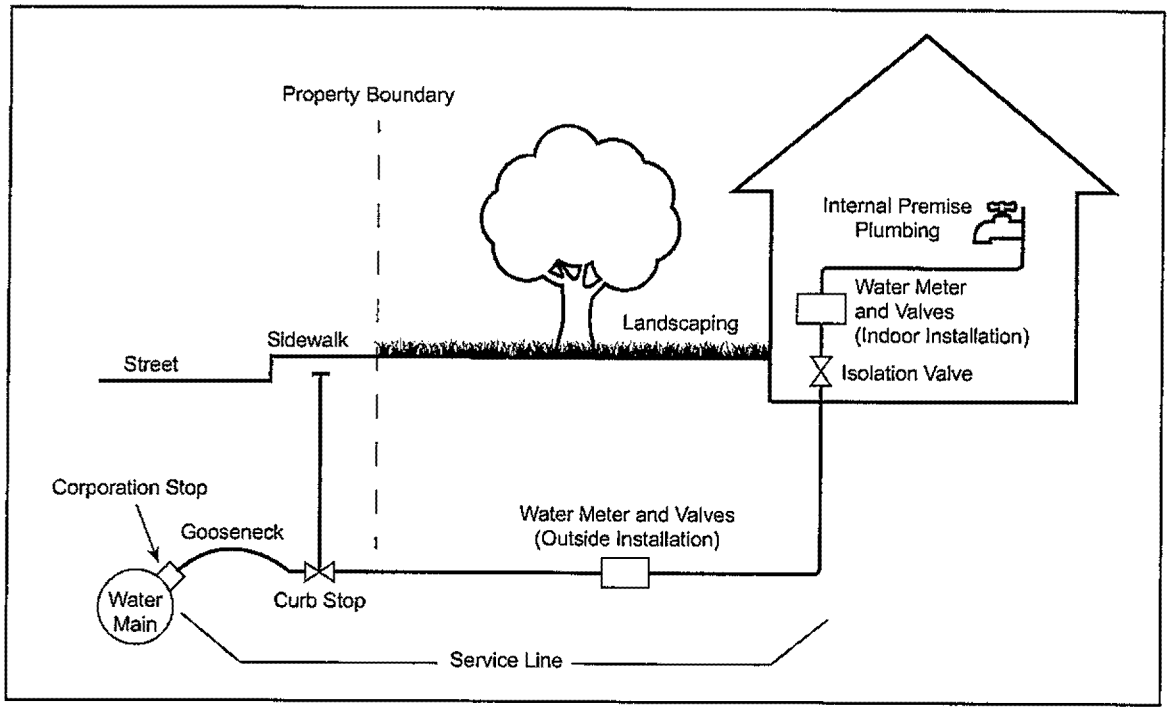

Figure 1 Typical water service line components

9. *Service line:* The pipe that runs between the utility's water main and the specific premises' plumbing, including both the portion owned by the utility, if any, and the private service line owned by the property owner (see Figure 1).

10. *Utility:* The organization or entity with the primary purpose of providing a designated area with potable water service.

11. *Water main:* The water pipe from which the domestic water supply is delivered by the utility to the service pipe leading to specific premises (see Figure 1).

12. *Water meter:* An instrument used for recording the quantity of water passing through the service line to specific premises. Water meters are typically installed with valves on inlet and outlet sides of the meter (see Figure 1).

SECTION 4: REQUIREMENTS

Materials shall comply with the requirements of the Safe Drinking Water Act and other federal regulations for potable water systems as applicable.

Water can be naturally corrosive and often dissolves lead as a result of water's contact with the service line as well as other plumbing components. A number of sampling and analytical techniques are available for customers to determine the

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level of lead in their drinking water. Some of these tests are collected and/or analyzed by the local water provider. Other tests may be conducted by the customers themselves but should be in compliance with sampling and analytical techniques accepted by the local utility. The data captured from the various tests can be used to assist the utility in adjusting the water chemistry by modifying the application of corrosion control chemicals.

Utility personnel should consider that the level of dissolved and particulate lead within the homes and/or businesses of their customers may be greater than the levels within their system based on the potential leaching from service lines and internal premise plumbing components. Lead service lines potentially represent the largest mass of lead in regular contact with potable water, hence the interest in removing lead service lines in their entirety. Utilities should also consider that lead levels may vary based on chemical and physical conditions, level of disturbance to the piping, sampling technique, and other factors when determining the number of samples to be collected. A single sample may not be adequate in determining how much lead is being released.

For planned lead service line replacements, the utility shall establish replacement agreements to be reviewed with and accepted by the customer before any work being accomplished. These agreements should detail the responsibilities of the customer as well as those of the utility and should be intended to reduce any ambiguity about what is to be accomplished and by whom. Any financial requirements essential to the completion of the project should also be identified.

Sec. 4.1 Location and Replacement of Lead Service Lines

The replacement of lead service lines can be generally accomplished by one of the following ways:

- Open cut full replacement—traditional technology with excavation on the full length of service line to be replaced.
- Trenchless replacement on new routes—methods such as directional drilling or pneumatic or hydraulic ramming tools (boring tools) to pull in the new service line on a new route (cutting and leaving the existing lead service in place and replacing it using a new service line).
- Trenchless replacement on existing routes—methods such as pipe splitting and/or pulling the existing lead service that is being replaced with a new pipe using the existing service line route (pipe splitting leaves the existing lead service in the ground, pulling removes the existing lead service line).

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4.1.1 *Locating lead service lines.* In order to replace the existing lead service line, the line must be appropriately identified and located. Some agencies have a database detailing the locations of their lead service lines. Such a record simplifies that portion of the replacement process. Other water providers do not have accurate records reflecting the locations of the lead assets. In this case, other means of identification shall be employed. It is highly recommended that utilities use more than one method of confirming the actual locations of the lead service lines. Utilities should record the service line material when observed during repairs, inspections, or other quality reports. Utilities should be aware that it is at times difficult to verify that a service line contains no portions made of lead, and that some degree of uncertainty may exist in a utility's inventory of lead service lines.

4.1.1.1 Identifying lead service lines at the meter, corporation stop, curb stop, or service box. Lead service lines can sometimes be identified at the main, curb stop, or meter box outside the house or adjacent to the meter inside the house. Typically, lead service lines have a distinctive "bulb-looking" section near the end at a brass, galvanized, compression, or other fitting that connects the service. The absence of the "bulb" section does not confirm the absence of lead. The observation of lead pipe in one location does not confirm the entire service line is lead. It is possible a portion of the lead service was previously replaced during repair or maintenance activity.

4.1.1.2 Using the scrape test to confirm the lead service line. Lead is a gray, nonmagnetic (a magnet will not stick to lead pipe), and relatively soft material compared with other pipe products. A coin scraped along the exterior of a lead pipe will create an indent and reveal a shiny-silver color. Care must be taken not to go too deep to avoid puncturing the pipe. Workers should use appropriate personal protective equipment, such as gloves and eye protection, to prevent exposure to lead. The scrape test identifies solid lead service lines. It will not identify lead-lined iron pipe.

4.1.1.3 Identifying lead service lines by water quality sampling. The concentration of lead found in the water sample can indicate if a lead service line is likely. A sample of the water from the service line should be taken to determine the level of lead. The line should be allowed to sit with no flow for at least 6 hours before sampling. Whether the water meter is inside the building, outside the building, or in an area that is unmetered, it is critical to flush a specific amount of water and then take a sample to be tested. The amount flushed prior to sampling should flush at least the volume of premise plumbing between the service line and the sampling tap. A single test may not be the most effective indicator of the existence of a lead service. The

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minimum lead concentration will be system specific, and multiple samples may be required to ensure the lead is not from lead solder or other internal plumbing sources. A low or nondetect lead sample cannot be used to verify the absence of a lead service line. Utilities should use care in interpreting water samples collected at one point in time because of the variability of lead occurrence in samples.

4.1.1.4 Utilizing hydro-excavation to determine the presence of lead. The hydro-excavation process creates a small boring hole to expose the service line at a depth at the water main, the curb box, and/or the meter box, allowing visual observation to identify whether the service line (or a portion) is lead or not. Care should be taken to minimize any physical disturbances to the pipe.

4.1.1.5 Full test-pit excavation. Dig or excavate a large pit down to the service line to expose the pipe. This method could physically disturb the pipe.

4.1.1.6 Other lead service identification techniques. A number of other techniques are used or offered for consideration to locate the presence of lead service lines. When considering other techniques, the utility should make sure such techniques minimize any physical disturbances to the pipe.

4.1.2 *Preparation.* Before the replacement of the lead service line, a number of related preparatory activities shall take place.

4.1.2.1 Customer notification. The impacted customers shall be notified to identify the process established for replacement, whether full or partial. Most agencies have agreements to be signed by both parties reflecting the responsibilities relative to the replacement effort. The type of replacement, the schedule, and other pertinent items shall be covered appropriately with the customer before the replacement activity. The customer notification should include any postreplacement responsibilities, such as flushing or the use of filters, and should include directions to the customer to make the workspace ready and safe prior to the replacement activity. Customers should also be made aware of the risks of a partial replacement, where applicable (see Sec. 4.2).

4.1.2.2 Underground utility locates. The location of other underground utilities shall be done prior to the work to avoid utility strikes and is critical to the success of the lead service line replacement. Locates shall be scheduled in a timely manner without disruption to the established work plan.

4.1.2.3 Lead service replacement plan. A replacement plan shall be established for the work crews to reflect the schedule of the effort, the typical amount of time the customers will be impacted, and so on. This information shall be used to inform the customer of the coming replacement activity and communicated to the customer in a timely manner.

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4.1.2.4 Water shutoff and service line isolation. Prior to beginning the replacement work, the water supply to the service line and the customer shall be shut off to avoid release of particulate lead into the customer's premises caused by vibration of the service during any excavation. The service line to be removed shall be isolated by shutting off appropriate valves at each end of the area to be removed.

4.1.3 *Open-cut full replacement of lead service lines.* The open-cut full replacement approach to lead service line removal involves the extraction of all the surface treatment and earth material above the level of the pipe. Care must be taken because other underground utilities, including the water main, may have not been properly located.

4.1.3.1 Proper equipment and material usage for open-cut full replacement. The excavation equipment used for the open-cut full replacement approach shall be sized to accommodate the full depth of the hole. Safety precautions shall be taken in consideration of the customer's property as well as any local pedestrian and/or vehicular traffic.

4.1.3.2 Use of adequate trench safety. Based on the depth of the excavation, an adequate level of trench safety shall be used to guarantee compliance with applicable requirements.

4.1.3.3 Lead service line removal. Once properly exposed and identified, the existing lead service line shall be disconnected from the main as well as the customer's side of the connection. When a utility elects to remove the lead pipe from the ground, the discarded lead line shall be carefully cut or bent into manageable sections and taken for processing for ultimate disposal. The amount of lead removed and the location of the removal along with any other pertinent information shall be documented. If the existing lead pipe is left in the ground, the impacted customer(s) should be made aware of the abandoned pipe.

4.1.3.4 Connecting the new service line. The new pipe shall be measured and placed with enough material to properly connect to the main as well as to the customer's side. The new pipe material shall comply with the requirements of the Safe Drinking Water Act and other federal regulations for potable water systems as applicable. When dissimilar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion (see Sec. II.E regarding grounding of electrical circuits on piping).

4.1.3.5 Backfill and surface restoration. Select bedding and/or a specified fill material, in conjunction with the identified surface treatment, shall be placed in a manner consistent with all applicable requirements to reduce or eliminate the possibility of settling beyond the allowable amount along the course of the excavation.

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4.1.4 *Trenchless replacement on new routes.* The directional drilling or pneumatic/hydraulic installation methods of replacing lead service lines make use of a pilot hole that is created by drilling or pneumatically or hydraulically pushing a rod into the soil from an open access pit at the main to an access pit at the meter box or at an area adjacent to the wall where the new service will be connected on the customer's side. In a number of these installation scenarios, the existing lead pipe is disconnected on either end and left in place. When the existing lead pipe is left in the ground, the impacted customer(s) should be made aware of the abandoned pipe.

4.1.4.1 Required access pits. Based on the length of the service to be replaced, access pits shall be excavated down to the depth of the main on one side and to the depth of the service connection on the customer's side. As with any excavation, utility locates shall be requested and received prior to the work being performed, and all applicable trench safety devices shall be used. If the distance between the access pits is great or other underground utilities that are a cause for concern exist, an intermediate access pit may be required.

4.1.4.2 Proper use of boring tools. The boring tool shall be placed in the launching access pit level and pointed in the direction of the receiving pit. The horizontal and vertical directions of the tool shall be monitored until it reaches the receiving pit. Proper service line installation depth is critical and must be maintained in accordance with local requirements.

4.1.4.3 Connecting the new service line. Once the boring tool reaches the receiving pit, the new service line shall be connected to the boring tool and pulled through the bore hole with enough length of the new service pipe material to add fittings to connect to the main as well as on the customer's side. When dissimilar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion (see Sec. II.E regarding grounding of electrical circuits on piping).

4.1.4.4 Backfill and surface restoration. Select bedding and/or a specified fill material, in conjunction with the identified surface treatment, shall be placed in the access pits in a manner consistent with all applicable requirements to reduce or eliminate the possibility of settling beyond the allowable amount along the extent of the excavation.

4.1.5 *Trenchless replacement on existing routes.* The pipe-splitting method employs the use of a tool pulled through the existing lead service line that splits the pipe. The existing lead service line remains in the ground and a new service line is pulled into place. Another related method is to disconnect the lead service on each end and to connect a fitting to one side with an extraction device and to connect

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the new pipe material on the other end in order to pull the new service into place, while removing the existing lead service line.

4.1.5.1 Required pipe- splitting and -pulling access pits. As in the directional drilling and pneumatic/hydraulic installation approaches, access pits shall be excavated to the depth of the main on one side and to the depth of the service connection on the customer's side. Other underground utility locates shall be obtained prior to the work, and all applicable trench safety devices shall be used.

4.1.5.2 Use of the splitting tool. Care must be taken to disconnect the existing lead service line and to cut it in a manner that facilitates pushing a cable through it with the splitting tool attached. The splitting tool is then used to displace the existing lead pipe and draws the new pipe material through it to the other end of the project. When the existing lead pipe is left in the ground, the impacted customer(s) should be made aware of the abandoned pipe.

4.1.5.3 Connecting the new service line. Once the splitting tool reaches the receiving access pit, the new service line shall be pulled through to allow enough material to adequately connect to both sides. When dissimilar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion (see Sec. II.E regarding grounding of electrical circuits on piping).

4.1.5.4 Backfill and surface restoration. Select bedding and/or a specified fill material, in conjunction with the identified surface treatment, shall be placed in the access pits in a manner consistent with all applicable requirements to reduce or eliminate the possibility of settling beyond the allowable amount along the extent of the excavation.

Sec. 4.2 Partial Replacements

4.2.1 *General.* It may not always be practical or possible to replace all of a lead service line at the same time. Coordination among the utility, the property owner, and constructor could result in situations in which partial replacement may be unavoidable. Although every effort shall be made to avoid partial replacements, it may be necessary to accommodate partial replacement situations as an interim measure. Partial replacement is not desirable because of the potential for increased release of lead into the water. This section describes additional requirements and recommendations for partial lead service line replacements.

4.2.2 *Existing conditions.* For services where partial replacements have previously occurred and a portion of the service still contains lead pipe, it is recommended that these locations be identified and re-evaluated for removal of the remaining material. For example, some utilities, property owners, or constructors,

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in a manner that does not expose the customer's side to potential lead fragments. Flushing shall be accomplished in a manner consistent with Sec. 4.4.

Sec. 4.3 Communications and Instructions to Customers

4.3.1 *General.* It is important to inform all customers that may be affected by lead service line activities. The utility shall provide communication to customers regarding the following items:

1. Advanced notice of planned lead service line replacement projects (45 days prior is recommended).
2. Informational point-of-contact for the project.
3. Additional notice prior to actual planned work affecting service line (day prior).
4. On-site utility point-of-contact during construction.
5. Postconstruction instructions regarding customer flushing, use of a point-of-use (POU) filter or bottled water, water sampling, and testing to be completed.
6. Clear guidance regarding the increased risk of lead entering the water associated with a partial lead service line replacement condition (if a full-service line replacement was not completed). Customers with partial replacements should avoid consuming their water unless they are using a filter certified for lead removal or they should consume bottled water until sample results show that their lead levels are less than the regulatory guideline.

In addition to water shutoff and service-line-isolation actions (Sec. 4.1.2.4), customers should be advised not to use water during excavation and construction activities.

Additional guidance to utilities for completing these customer communications is available in the foreword of this standard and in the AWWA document *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement.*

Sec. 4.4 Flushing Service Lines After Full or Partial Replacement

4.4.1 *Flushing by the utility immediately after lead service replacement.* After all connections have been completed, flush the water from an outside connection (such as hose-bib or hose leading from the house side of the meter installation) to remove any particles in the service line and near point-of-entry. The flushing is best done, if possible and practical, before the meter is connected in the service using a "jumper" or straight pipe in place of the meter. The straight pipe will allow for a higher velocity flush and protects the meter from potential damage from lead pipe and other construction-related fragments. Flush at full velocity for at least

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10 minutes. If the meter was replaced with a "jumper," it may be reconnected in the service after utility flushing. Following completion of flushing by the utility, the customer shall flush the interior premise plumbing as described in Sec. 4.4.2.

In situations where flushing by the utility is not performed, the customer should be notified with instructions to flush before using any water.

4.4.2 *Flushing by the customer after lead service replacement.* The customer should flush all interior premise plumbing the same day or before next water use following the replacement. Subsequent flushing by the customer should be done once every two weeks for three months or at other intervals based on monitoring results if available. Utilities may want to encourage best times to flush based on water demand and operations (for example, when neighbors' water usage is low, e.g., midmorning to dinner time or late at night). Customers shall be advised to not use hot water in the premise plumbing until initial flushing is completed to prevent sedimentation of lead particles in premise hot water tanks.

4.4.2.1 Suggested instructions for customers.

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.

3. Include the laundry tubs, hose-bibs, bathtubs, and showers as flushing points.

4. 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.

5. 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.

6. After all faucets are opened, leave the water running for at least 30 minutes.

7. 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.

8. Clean aerators/screens at each faucet. You may need to replace screens/aerators if too old or worn.

Utilities and customers may consider an optional approach by coordinating a targeted flush of a few faucets at a time before opening all the faucets for the whole house flush. The targeted flush would start with a pattern of opening all faucets in a single area or single floor and then moving to the next to increase the flow velocities, followed by the whole house flush described above, with all faucets open.

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4.4.2.2 Additional daily miniflush. As a precaution, the customer should do a miniflush of premise plumbing by running tap water each morning or when the water sits in the pipe for at least 6 hours. Flush for 5 minutes to displace water that has been sitting in the pipes inside the house and in the service line. This could include taking a shower, running the dishwasher, flushing a toilet, collecting water for plants/garden, or running the faucet. The customer should do this before using any water for drinking, cooking, infant formula, and so on. Daily miniflushes should continue for six months or until lead sample results show the lead level is below the regulatory guideline. The customer should clean debris from aerators and screens once a month for six months. After six months, clean debris twice a year.

4.4.2.3 Sampling. Water sampling and testing, following replacement and flushing, shall be conducted per Sec. 5.2.

SECTION 5: VERIFICATION

Sec. 5.1 Documentation of Construction Activities

Documentation of construction activities for each service line work activity may support verification that the lead service line has been fully or partially replaced. The following information shall be documented and recorded:

- Picture of home with house number
- Picture of test pits and meter pit showing new pipe or pipe ends and old lead pipe if in same location
- Length and material type of new pipe installed
- Type of pipe material the new pipe is connected to inside home
- Method of installation (trenchless, hand-excavation, etc.)
- Length and location of any abandoned lead service line pipe left in the ground

Flushing time and location(s) (for example, an outside hose-bib) shall be recorded. Some homes may not have an outside hose-bib turned on or other situations may arise that do not allow for postflushing by the utility. These situations shall be documented in field reports along with any communication attempted with the customer.

Sec. 5.2 Water Testing Following Replacement

Testing the water following the replacement shall be done to determine if appreciable lead is still present in the drinking water. Lead may still exist inside

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home plumbing (lead solder, redeposited lead in scale of plumbing, and brass components) and could be disturbed during service line work. Therefore, lead present in the water following a full replacement does not mean the lead service has not been replaced. This condition should be explained to the customer. Flushing recommendations described in Sec. 4.4 can help remove released particles.

5.2.1 *Testing initiation.* Testing the water shall commence at least one month after the replacement to allow for sufficient in-house flushing and a period of normal use of water to occur. Utilities may consider initiating testing within the one-month period if supported by performance data. When only a partial replacement is completed and the lead service line replacement was mandatory as part of compliance with the Lead and Copper Rule (LCR), testing shall be conducted within 72 hours after the completion of the partial replacement of the service line per the requirements of the LCR.

5.2.2 *Test samples.* Testing shall include first-draw and second-draw samples. First-draw sample shall be the initial draw from the tap when it is turned on. Second-draw sample shall be collected with the objective of collecting water that stagnated in the service line, generally the fourth to seventh liter depending on site-specific conditions. Utilities may be able to omit the second draw sample if supported by documentation that the construction activities completely removed the lead service line and by acceptable first-draw lead data. Samples shall be collected from a frequently used tap inside the home, preferably the kitchen tap as the residents' consumption would likely be from the kitchen tap. Samples shall also be collected with the aerator on. Samples should be collected at the maximum flow rate of the tap and should be collected in wide-mouth bottles.

5.2.3 *Profile sampling.* Lead levels higher than expected from full lead replacements may occur and the utility or homeowner could investigate further with profile sampling. A profile is a series of bottles filled continuously following the stagnation period. The trend of lead concentrations coupled with measurements of the inside plumbing and service line will show which portion of plumbing or service contributes the highest lead by the liter number.

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ISBN 978-1-62576-269-6

9 781625 762696

1P-2M 43810-2017 (11/17) IW

Printed on Recycled Paper

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