



Lead Pig Tail Investigation and Removal Program

PNWS-AWWA Section Conference April 27, 2018

Presented By

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Presentation Outline

- Brief History of Medford's Water System
- Historical Documentation
- Flint Michigan 2015-16
- Research historical use of Lead Pigtails (LPT's)
- LPT investigation
- Initial investigation - Tally & Tracker Worksheets
- Public Information
- Pot Holes/LPT removal
- Tracker Document(s)
- Summary of Data
- Cost
- Corrosion Study
- Lessons Learned

History of Medford's Water Distribution System

- ❖ Small amount of cast iron pipe installed between 1885 to 1907 by the City of Medford
- ❖ Continued build out of system; oldest documented line still in service is from the year 1895



Records and Standards

The only documentation of water works materials during the early buildout of Medford's water system is pipe location, type, and size which are noted on maps and old roll files.

Formation of the Medford Water Commission

City of Medford elected to form the Medford Water Commission by the vote of the people on November 7, 1922.

How does this relate to Lead Pigtails?

From the inception of the City of Medford's Water System, to the formation of the Medford Water Commission, there were no records of the use of lead pigtails or their locations.

Flint Michigan in 2015-2016



Flint, Michigan brought a higher level of awareness to the water industry, water professionals, and placed a spotlight on the 1992 Lead and Copper Rule.

This new level of awareness also cast a light on the Commission's past practice of removing LPT's as they were discovered from water service line leaks, or opportunities to upgrade water services in advance of major road reconstruction projects.

The Lead Industry and Lead Water Pipes

“A MODEST CAMPAIGN”

| Richard Rabin, MSPH

Lead pipes for carrying drinking water were well recognized as a cause of lead poisoning by the late 1800s in the United States. By the 1920s, many cities and towns were prohibiting or restricting their use. To combat this trend, the lead industry carried out a prolonged and effective campaign to promote the use of lead pipes. Led by the Lead Industries Association (LIA), representatives were sent to speak with plumbers' organizations, local water authorities, architects, and federal officials. The LIA also published numerous articles and books that extolled the advantages of lead over other materials and gave practical advice on the installation and repair of lead pipes. The LIA's activities over several decades therefore contributed to the present-day public health and economic cost of lead water pipes. (*Am J Public Health*. 2008;98:1584–1592. doi:10.2105/AJPH.2007.113555)

SINCE THE CENTERS FOR

Disease Control and Prevention began to establish acceptable blood lead levels for young children in the 1960s, the concentration at which blood lead levels have been thought to have significant health effects has steadily declined. That concentration has been reduced from 60 µg/dL to the current level of 10 µg/dL, which was established in 1991.¹ Research conducted in the past few years, however, suggests that there are health effects below that level, and that IQ declines at a faster rate below 10 µg/dL than above.^{2,3}

Although lead-based paint is the single most important contributor to elevated blood lead levels in children, if just a few micrograms of lead per deciliter of blood are of concern and if we prevent the health exposure to the United States water, as well as sources of lead, must be reduced. Water consumption contributes about 10% to 20% of total lead intake, and in infant formula, 40% to 50% of lead exposure.⁴

In the past 2 decades, regulations and regulatory enforcement have helped reduce water lead concentrations. Nevertheless, lead in water continues to be a public health concern. Over several years, significant lead levels in water have provoked public health concerns in Boston, MA;⁵ NC;⁶ and Camden, NJ.⁷ In Washington, DC, in 2004, there was

public concern when more than half the homes with lead service pipes were found to exceed the Environmental Protection Agency's (EPA's) action level of

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BACKGROUND

Although the use of lead pipes for water distribution has a centuries-old history, installation of lead pipes in the United States on a major scale began in the late 1800s, particularly in the larger cities.¹⁹ By 1900, more than 70% of cities with populations greater than 30,000 used lead water lines.¹⁹ Although lead was more expensive than iron (the material of choice until that time), lead pipes had 2 significant advantages over iron ones: they lasted much longer than iron (about 35 years compared with 16) and, because they are more malleable, they could be more easily bent around existing structures.¹⁹

Concerns about the potential toxicity of lead from water that passes through lead pipes were documented even before lead came into widespread use. In 1859 a collection of articles was published presenting the views of various engineers, physicians, and public health officials. The editor of those articles began by noting the objections raised by residents of New York City and Boston to the introduction of lead for service pipes (the pipes that carry water from the street main to a building) and indoor plumbing:

In other cities of the United States and of Europe the same feeling has at times more or less agitated the public mind, without leading however, thus far, to any serious modification of the long established practice [of installing lead pipes], that I am aware of, except in Hartford, Conn.²⁰

With the large-scale introduction of lead service pipes, numerous public health and newspaper accounts of lead poisoning from drinking water began to appear with increasing frequency. From

the late 1800s to the early 1900s, numerous journal articles and reports appeared documenting the dangers of lead pipes.²¹⁻²⁸ One bibliography in 1943 listed more than 100 articles and reports in English on lead poisoning from drinking water.²⁹ In 1890 the Massachusetts State Board of Health advised the state's cities and towns to avoid the use of lead pipes.¹⁹ By the turn of the century, there was little doubt in the public health community that lead water pipes were to be avoided. By the 1920s, many cities had concluded that the engineering advantages of lead were outweighed by the public health risks, and local and state plumbing codes were revised to prohibit or limit the use of lead in pipes for water distribution.^{19,30}

THE LEAD INDUSTRIES ASSOCIATION

The Lead Industries Association (LIA) was formed in 1928 as the lead industry's trade organization. Its membership encompassed both producers and users of lead products and included all the major producers. Lead mining and manufacturing was dominated by just 6 companies (all LIA members) until the 1960s: the National Lead Company, American Smelting and Refining, Anaconda, the Hecla Mining Company, Eagle Picher, and the St Joseph Lead Company.³¹ The National Lead Company was by far the largest.³²

As would be expected of an industrial trade association, a central function of the LIA was to promote the sale of its members' products. Lead pipe, of course, was one of them.

We are endeavoring to keep abreast of any impending changes in plumbing codes. . . .

We have also been investigating the use of lead in service pipe and other applications. We have been accumulating useful information pertaining to lead and expect soon to make it the basis of a modest educational campaign within the limits of the drive.

Although most of the lead industry's efforts to promote the use of lead in plumbing emphasized the positive (i.e., the advantages of lead over other materials), there clearly was some concern that the potential health hazard of lead pipes could jeopardize the market for lead pipes. In his 1929 report to the membership, the secretary noted that,

Water is much more wholesome from earthenware pipes than from lead pipes. For it seems to be made injurious by lead, because white lead paint is produced from it; and this is said to be harmful to the human body.

—Plinius, first-century-BC Roman architect and engineer, *De architectura*

Of late the lead industries have been receiving much desirable publicity regarding lead poisoning. I feel the association should be wise to devote time and money on an impartial investigation which would show once and for all whether or not lead is detrimental to health under certain conditions of use.³³

This public alarm over lead exposure can be attributed at least in part to reports in the popular press. In 1924, the *New York Times* reported on a medical conference that highlighted nonindustrial sources of lead, including lead paint.³⁴ During the Depression, it was not uncommon for poor persons to use old battery casings for fuel, and there were newspaper reports of families being lead poisoned.^{35,36}

Although the use of lead pipes for water distribution has a centuries-old history, installation of lead pipes in the United States on a major scale began in the late 1800s, particularly in the larger cities. By 1900, more than 70% of cities with populations greater than 30,000 used lead water lines. Although lead was more expensive than iron (the material of choice until that time), lead pipes had 2 significant advantages over iron ones: they lasted much longer than iron (about 35 years compared with 16) and, because they are more malleable, they could be more easily bent around existing structures.

By the 1920s, many cities had concluded that the engineering advantages of lead were outweighed by the public health risks, and local and state plumbing codes were revised to prohibit or limit the use of lead in pipes for water distribution..

Other City's use of Lead Pig Tails

City #1

Prior to 1940, lead pigtails, short 2 to 3 foot pipes connecting a galvanized service line to the main, were used on some homes

Pigtails were typically installed in the 1920s and 1930s.

City #2

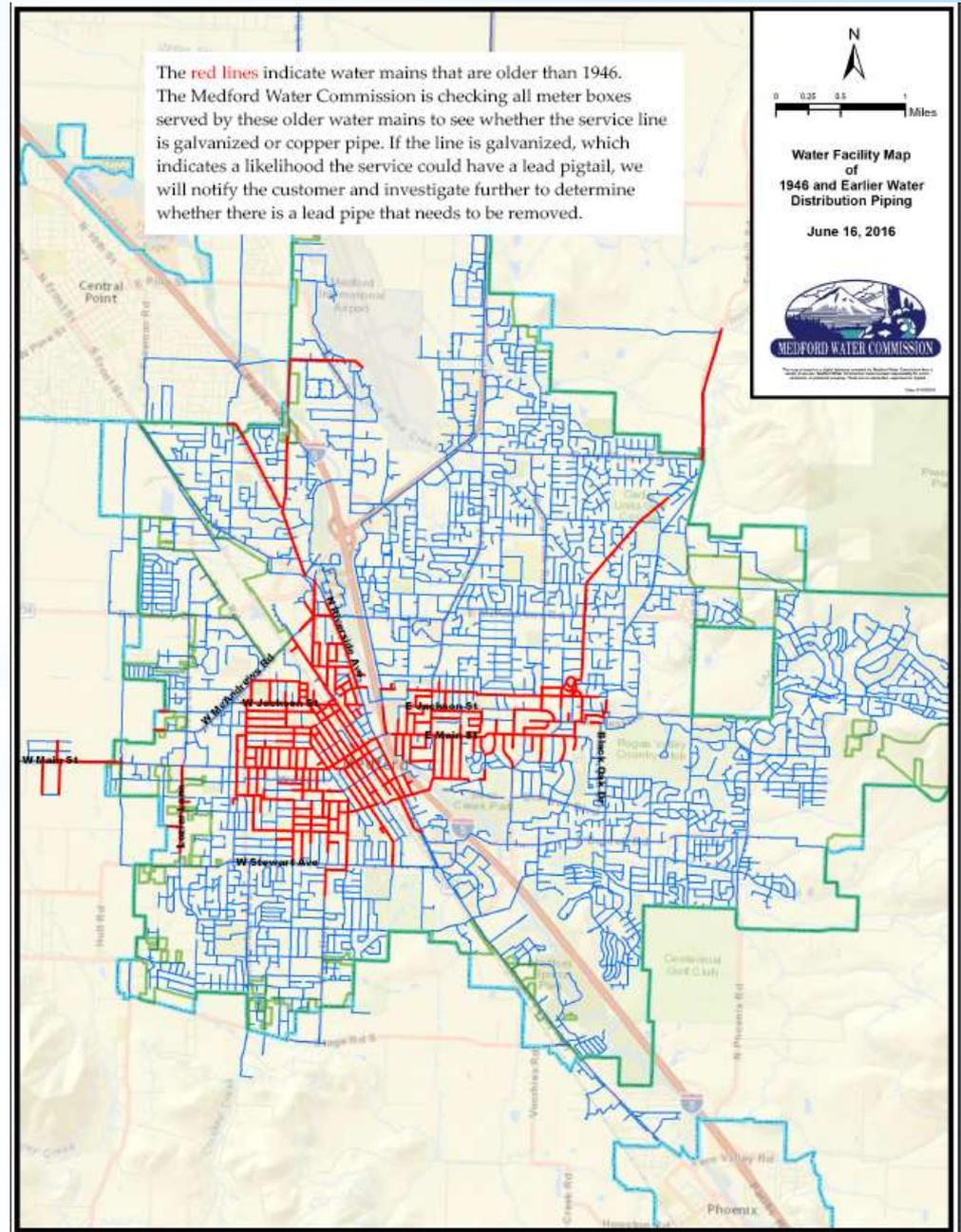
“Between 1900 and 1940, short pieces of lead pipe were sometimes used to connect the water main to customers' service lines”.

“The criteria used to identify lead goosenecks includes the service install date - 1939 and older (this is 10 years past the oldest known gooseneck service), material type, water main install date - 1939 and older, and size of the service line- 2-inch and smaller service lines.

City #3

“Before the 1940s, a galvanized steel pipe went from your water meter to the main water line in the street. The gooseneck fittings connect the steel pipe to the main line”.

Research of national and regional use of lead pigtails led the Commission to select 1946 aged pipe and older for the investigation of the possibility of the presence of LPT's. A map was generated that highlighted pipes from this era that could be investigated.



June 15th, 2016

Official beginning of formal LPT Investigation

1. Field Investigations and system inventory of service line type of metered services

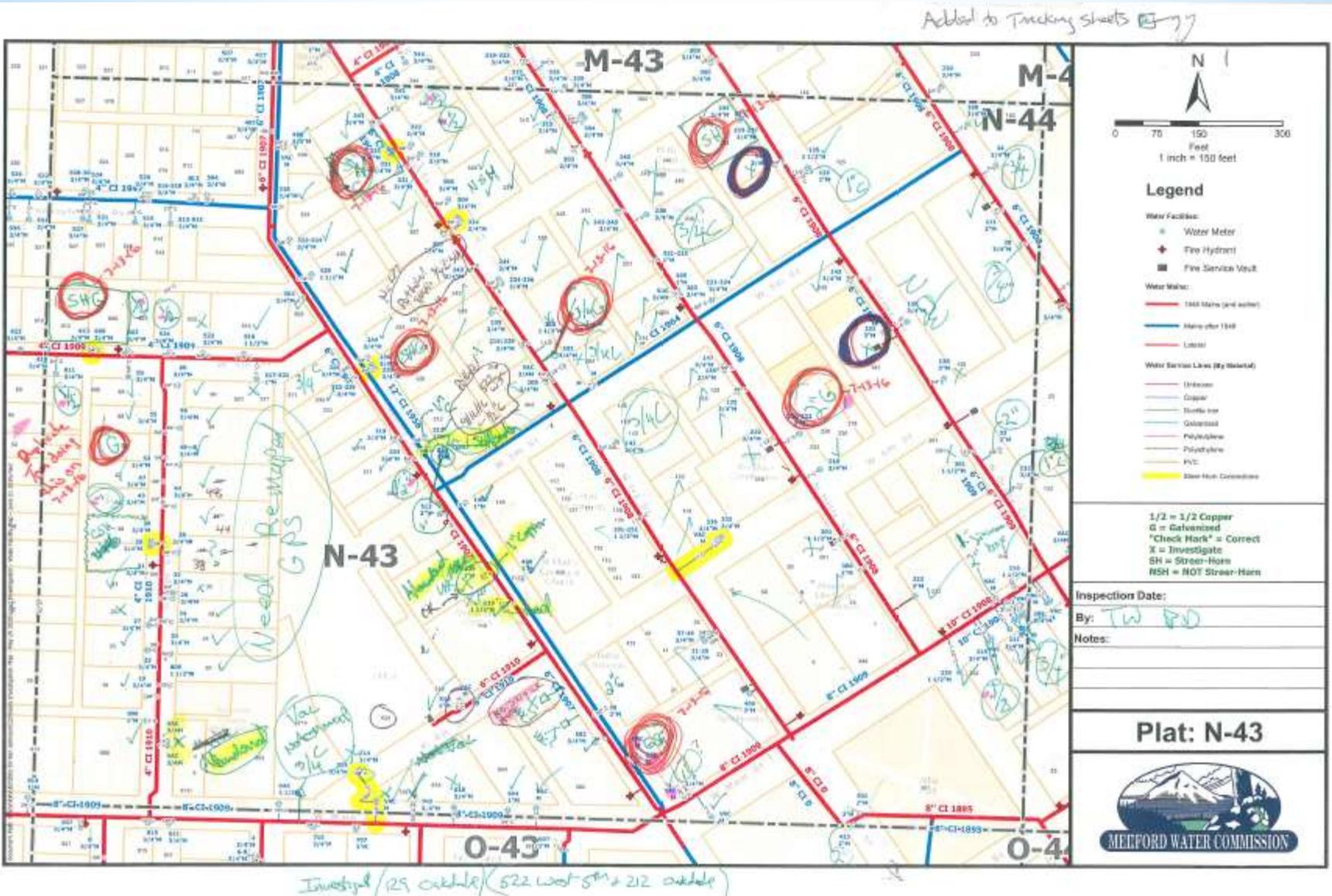
Initial Probability matrix of the presence of LPTs based on service line material evident in meter box.

Service line type visible in meter box	Probability of lead pigtail existing
Galvanized with straight stop	High
½ copper with straight stop	Very Low to low
Steer horn service	Not enough data exist
¾ copper with angle-stop	None

2. Creation of customer information handouts/letters/flyers
3. *Begin pot holes of suspect service lines*
4. Sampling for lead at homes with LPT's

Investigative Plats - 1946 Age Pipe of Older

77 Plat Maps Created for the Initial Investigation- (With field notes)



Plat Tally Sheet "Initial"

Date of Initial Investigation: _____ Added to Tally/Tracker Worksheet Yes

Platt # N-43

Initial Investigation	Quantity After Investigation	
Total Investigated on Plat	= 125	
Galvanized Single	= 1	Galvanized Single =
Galvanized Steer Horn-Initial Investigation	= 5	Galvanized Steer Horn =
Copper Steerhorn - Initial Investigation	= 3	Copper Steerhorn =
Not Steer Horn Initial Investigation	= 2	Not Steer Horn =
1/2" Copper	= 13	1/2" Copper =
Investigate	= 11	

Address to Investigate with X on map

No.	Address	Street	Map Status	Investigation status
1	522	W 4 th St	3/4 C	
2	27	Orange St	3/4 C	
3	32	Orange St	3/4 C	
4	521-517	W 4 th St	1" C	
5	Parcel 502 or west Main St at N 2 nd St		1" Dead Meter	
6	235	N. Ivy St	3/4 C	
7	215/229	N. Ivy St	3/4 C	
8	310	W 6 th St	1 1/2 C	
9	240	N. Holly St.	1" C	
10	130	W 6 th St	3/4 C (any 3' meter)	
11	301	W 6 th St	1 1/2 C	
12	101	N. Gage St	2"	
13	N. Gage St 180 ft sb w 4 th St		3/4	
14	201	W 6 th St	1 1/2	
15	618	W Main St	3/4	
16	720	W. Main St	3/4	
17	vacant parcel on W Main St at W. 6 th St?			

Plat Tally Sheet "Final"

Date of Initial Investigation: _____ Added to Tally/Tracker Worksheet Yes

Platt # N-43

Initial Investigation	Quantity After Investigation	
Total Investigated on Plat	= 125	
Galvanized Single	= 2	Galvanized Single =
Galvanized Steer Horn-Initial Investigation	= 5	Galvanized Steer Horn =
Copper Steerhorn - Initial Investigation	= 3	Copper Steerhorn =
Not Steer Horn Initial Investigation	= 2	Not Steer Horn =
1/2" Copper	= 9	1/2" Copper =
Investigate	= 17	

Address to Investigate with X on map

No.	Address	Street	Map Status	Investigation status
1	522	W 4 th St	3/4 C	3/4 CF STRAIGHT
2	27	Orange St	3/4 C	3/4 CF STRAIGHT
3	32	Orange St	3/4 C	3/4 C ANNI-STEP
4	521-517	W 4 th St	1" C	1" C ANN-STEP
5	Parcel 502 or west Main St at N 2 nd St		1" Dead Meter	1" C ANN-STEP
6	235	N. Ivy St	3/4 C	3/4 C ANN-STEP
7	215/229	N. Ivy St	3/4 C	3/4 C ANN-STEP
8	310	W 6 th St	1 1/2 C	3/4 C ANN-STEP
9	240	N. Holly St.	1" C	3/4 CF STRAIGHT
10	130	W 6 th St	3/4 C (any 3' meter)	3/4 C ANN-STEP
11	301	W 6 th St	1 1/2 C	1 1/2 C ANN-STEP
12	101	N. Gage St	2"	2" C GV
13	N. Gage St 180 ft sb w 4 th St		3/4	- 3/4 - 3/4 ANN-STEP
14	201	W 6 th St	1 1/2	1 1/2 C GV
15	618	W Main St	3/4	1" C ANN-STEP
16	720	W. Main St	3/4	3/4 CF STRAIGHT
17	vacant parcel on W Main St at W. 6 th St?			3/4 CF STRAIGHT

Complete Address to Tally 8/24/16

Master Tally Sheet-Condensed Version

Investigation Tally Work Sheet

MASTER: Updated 12/29/2016 4:10PM

Note: Once Platt has been completely investigated and all lead pig tails removed Column H will change from No to Yes

Platt	Total	Single Galvanized	Steer Horn Galvanized	Steer Horn-other	Initial <i>Not a Steer Horn</i>	Old style <i>Straight Stop</i>	Yellow Highlighted <i>On map with check mark</i>	1/2" Copper	Final Review addition (SHs)(Singles)	Investigate Further	Total to Pothole after Investigation	Platt Completely Investigated (Yes/No)
Q-43	99	3	2	3	0		0	10		4	0	Yes
Q-44	27	2	0	0	0		0	1		0	0	Yes
P-44	103	1	0	0	2		1	3		3	0	Yes
P-43	240	6	8	9	4			8		15	2	Yes
Q-43	111	0	0	1	3		1	1	1	5	0	Yes
R-45	0	0	0	0	0		0	0		0	0	Yes
R-44	7	0	0	0	0		0	0		0	0	Yes
Q-45	39	0	1	0	0		0	0		0	0	Yes
M-43	128	2	2	0	5			5		3	1	Yes
K-44	15	0	0	0	0		0	0		0	0	Yes
Q-45	82	2	0	0	0		0	1		8	2	Yes
P-45	32	0	0	0	0		0	0		0	0	Yes
Q-40	8	0	0	0	0		0	1		2	0	Yes
Q-40	23	0	1	0	0		0	0		9	0	Yes
P-40	39	0	0	0	0		0	0		8	0	Yes
Q-44	136	2	3	3			6	3		6	0	Yes
E-41	36	0	0	0	2		0	0		0	0	Yes
N-44	142	2	3	3	1		0	2		6	0	Yes
L-44	58	0	0	0	0		0	0		0	0	Yes
M-44	41	1	0	0	0		0	1		1	0	Yes
K-43	176	0	0	0	0		4	2	3	10	0	Yes
J-43	50	0	0	0	0		0	0		0	0	Yes
I-43	24	0	0	0	0		0	1		1	0	Yes
L-43	127	0	2	2	0		2	3	4	7	0	Yes
STARTING OF EAST SIDE PLATTS												
L-46	65	0	0	3	0		0	2		7	0	Yes
Q-46	77	1	2	0	0		0	2	4	2	0	Yes
L-47	35	0	0	0	0		0	0		0	0	Yes
M-45	153	0	0	24	0		2	1		14	1	Yes
N-46	179	1	3	2	0		1	6	6	14	0	Yes
B-43	4	0	0	0	0		0	0		0	0	Yes
B-44	1	0	0	0	0		0	0		0	0	Yes
N-47	68	0	0	0	0		0	1		0	0	Yes
N-45	143	2	1	2	1	1	1	6	3	7	0	Yes
M-49	66	3	0	0	0	0	0	0	1	5	0	Yes
Q-47	6	0	0	0	0	0	0	0		0	0	Yes
L-45	47	0	0	0	0	0	0	0		0	0	Yes
M-47	114	3	0	0	0	9	0	1		15	0	Yes
M-46	162	0	1	2	0	15	0	1		2	1	Yes
Total	4770	42	63	69	46	42	33	113	28	243	8	---

Creation of Website Lead Page. PUBLIC INFORMATION

34°F Light Snow Fog/WAC | Monday, January 09 2017 | 8:32:11 PM | MY ACCOUNT | BIRKENWIDOS | CONTACT US | ABOUT MWC | HOME

Search Site | The Board | Omissions | Doing Business | Water Quality | Water Resources | Conservation | Jobs

Back to Water Quality

Lead Testing

Water Quality Report 2016

Lead and Copper Report 2016

Calified del Agua

Water Quality Reports 2010-2015

Annual Analyses

Water Treatment

Backflow prevention

Hydrant flushing

Chromium testing conducted

Fluoride

Water Filters - In-line brewers

300 S. Ivy St. - RM 177
Medford, OR 97501
Phone: 541-774-2728, 541-774-2744
Fax: 541-526-5402
Contact: Rose Priddy, Water Quality Director, Jim Stoddard, Water Treatment Director
Email: water@cityofmedford.
Hours: 8:00 AM - 5:00 PM



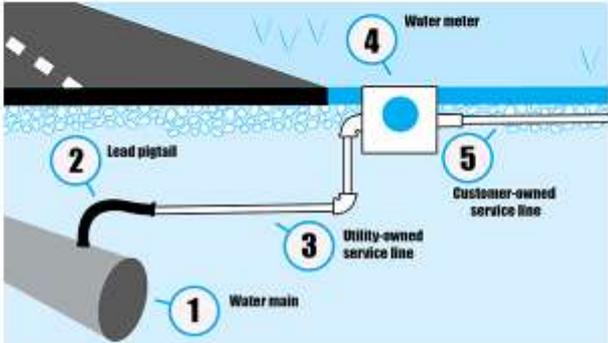
Medford Water Commission
300 S. Ivy St. - Room 177
Medford, Oregon 97501
OS/Staffing: 541-774-2430

541.774.2430

Medford Water Commission

Looking for lead in Medford

Water quality has been in the national spotlight this year following news that residents of Flint, Mich., had been exposed to high levels of lead in their drinking water. Unlike in Flint, lead service lines were not used extensively within Medford's distribution system and Medford Water Commission's system fully complies with state and federal rules regarding testing for lead. However, short lead pipes known as "pigtails" exist within our system. It has been our longstanding policy to remove these lead pigtails as they were found, and in June 2016, MWC launched an extensive effort to track down and remove any lead lines that remain within our system.



1 Water main
2 Lead pigtail
3 Utility-owned service line
4 Water meter
5 Customer-owned service line

What is a lead pigtail?

In the early 1900s, short pieces of lead pipe were sometimes used to connect the water main to customers' service lines. These lead pipes could be easily bent and allowed for a flexible connection between the rigid pipes. For many years, the Medford Water Commission has removed lead pigtails whenever they were found in our system. However, because of the age of these service lines, we simply do not have records of where lead pigtails were installed. Since the pigtails are buried underground near the main, it's challenging to confirm where they remain in our system.

What are we doing to find the lead pigtails?

In June 2016, Medford Water Commission crews began investigating all meter boxes served by water mains installed before 1946. (Click here to see a map.) We believe lead pipes were not used in our system after World War II, and the pigtails we've found so far in this investigation date to the early 1900s.

While we can't see lead pipes at the meter box, our experience indicates that the lead pigtails in our system are usually connected to galvanized pipes. Our crews are checking each meter box within the search area to see whether the service line is a galvanized or copper pipe. Sometimes this process requires some digging.

If we find a galvanized pipe at the meter box, we are notifying customers that they could have a lead service line and we will be investigating further. The next step is to "pothole," or dig a hole in the street where the service line connects to the meter, enabling us to see whether there is a lead pigtail underground. If we find a lead pigtail, MWC will offer to test the customer's water for lead and then we'll replace the lead with a new copper service line. Click here for lead testing results.

Pigtail search: By the numbers

Search began June 20, 2016
Current as of Dec. 29th, 2016

Meter boxes investigated	4770
Services on list to pothole	331
Potholes completed	331
Lead pigtails found	27
Lead pigtails removed	25

Dash Board

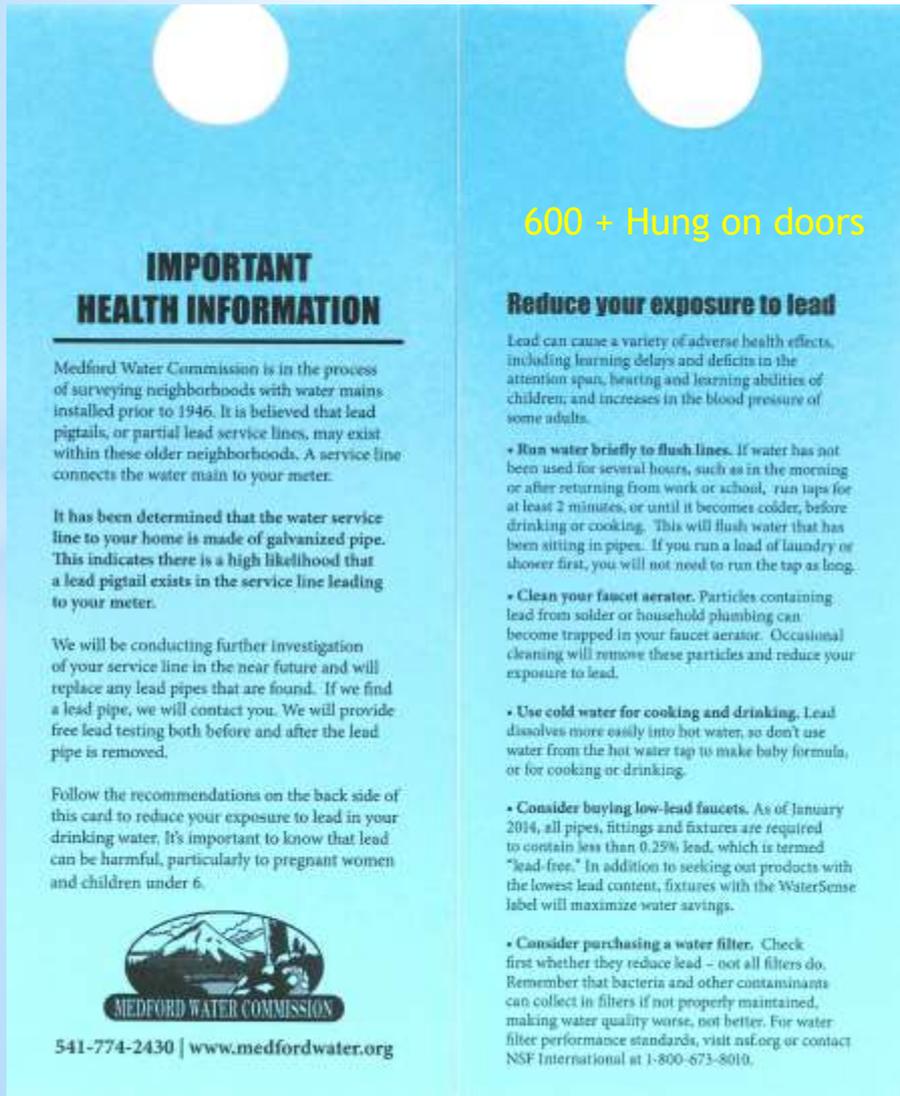
Pigtail search: By the numbers

Search began June 20, 2016

Current as of Jan. 18th, 2017

Meter boxes investigated	4770
Services on list to pothole	331
Potholes completed	331
Lead pigtails found	27
Lead pigtails removed	27

Door Hangers for Pothole Locations



A blue door hanger with two circular punch holes at the top. The text is white and yellow. The top right section has a yellow background with the text '600 + Hung on doors' in yellow. The rest of the text is white on a blue background.

600 + Hung on doors

IMPORTANT HEALTH INFORMATION

Medford Water Commission is in the process of surveying neighborhoods with water mains installed prior to 1946. It is believed that lead pigtails, or partial lead service lines, may exist within these older neighborhoods. A service line connects the water main to your meter.

It has been determined that the water service line to your home is made of galvanized pipe. This indicates there is a high likelihood that a lead pigtail exists in the service line leading to your meter.

We will be conducting further investigation of your service line in the near future and will replace any lead pipes that are found. If we find a lead pipe, we will contact you. We will provide free lead testing both before and after the lead pipe is removed.

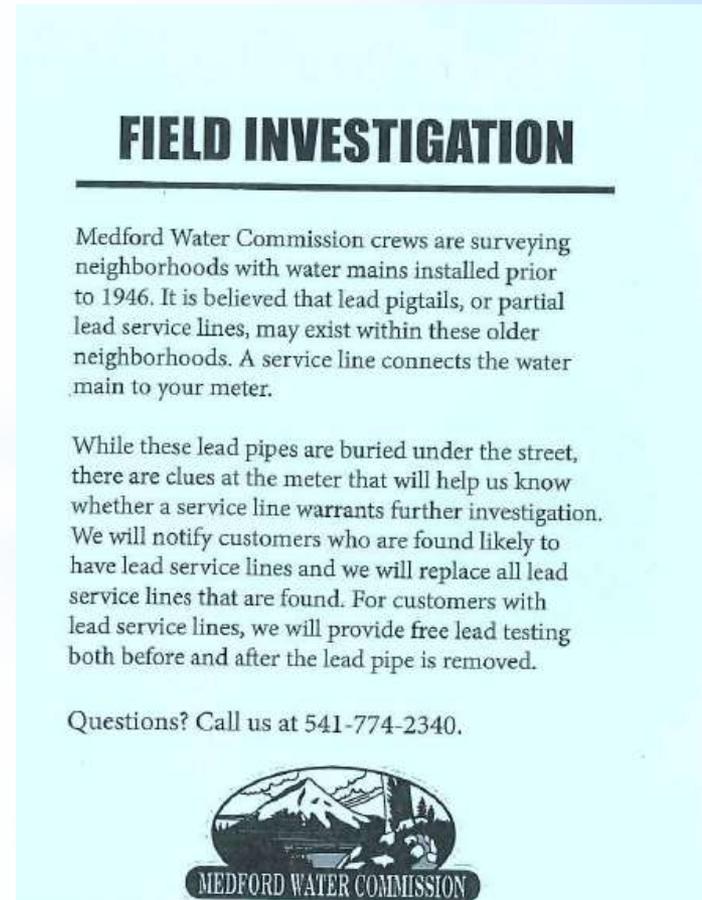
Follow the recommendations on the back side of this card to reduce your exposure to lead in your drinking water. It's important to know that lead can be harmful, particularly to pregnant women and children under 6.



MEDFORD WATER COMMISSION

541-774-2430 | www.medfordwater.org

Informational Flyer for Investigation



A white informational flyer with a blue header and footer. The main text is black. The title 'FIELD INVESTIGATION' is in large, bold, black letters. The text is arranged in a clear, readable layout with bullet points and a logo at the bottom.

FIELD INVESTIGATION

Medford Water Commission crews are surveying neighborhoods with water mains installed prior to 1946. It is believed that lead pigtails, or partial lead service lines, may exist within these older neighborhoods. A service line connects the water main to your meter.

While these lead pipes are buried under the street, there are clues at the meter that will help us know whether a service line warrants further investigation. We will notify customers who are found likely to have lead service lines and we will replace all lead service lines that are found. For customers with lead service lines, we will provide free lead testing both before and after the lead pipe is removed.

Questions? Call us at 541-774-2340.



MEDFORD WATER COMMISSION

Public Information

Lead Service Line Notice



200 S. Ivy Street – Room 177, Medford, Oregon 97501
Customer Service (541) 774-2430 • Administration (541) 774-2440
Fax (541) 774-2555 • water@cityofmedford.org
www.medfordwater.org

1/6/2017

Address

Dear customer,

Please be advised that Medford Water Commission recently replaced the water service line to your home with copper pipe. Because a portion of the original pipe was made of lead, it's important to know that lead in drinking water can be harmful and studies have shown that when lead service lines are disturbed, they can release lead. Lead service lines also may be an indication that portions of your home plumbing may contain lead and should be investigated for replacement.

Because your service line contained lead, Medford Water Commission will provide lead testing at your home if desired. Call our Water Quality Director to make arrangements: Rosie Pindilli, 541-774-2728.

After replacing your service line, our practice is to flush the outdoor faucet (hose bib) if a spigot is accessible. However, be advised that you should also **conduct a thorough flush of your indoor plumbing** to minimize your exposure to any lead. Do not consume tap water, open hot water faucets, or use the icemaker or filtered water dispenser until flushing is complete.

The American Water Works Association recommends flushing all your faucets using these steps:

1. Remove faucet aerators from all cold water taps in the home.
2. Beginning in the lowest level of the home, fully open the cold water taps throughout the home.
3. Let the water run for at least 30 minutes at the last tap you opened (top floor).
4. Turn off each tap starting with the taps in the highest level of the home. Be sure to run water in bathtubs and showers as well as faucets.
5. If your refrigerator has an automatic icemaker, empty it and allow it to refill regularly to clear out standing water.

You may also wish to use a home filter for water to be used for drinking and cooking. If you use a home treatment device to reduce your exposure to lead, make sure it is independently certified to reduce lead according to NSF/ANSI-53 (www.nwf.org or 800-673-8010) and make sure to maintain the device as specified by the manufacturer.

For more information, contact:

Medford Water Commission: 541-774-2430
National Lead Information Center: 800-424-LEAD
EPA Safe Drinking Water Hotline: 800-426-4791

No Lead Letter Notice

566 Hand Delivered



200 S. Ivy Street – Room 177, Medford, Oregon 97501
Customer Service (541) 774-2430 • Administration (541) 774-2440
Fax (541) 774-2555 • water@cityofmedford.org
www.medfordwater.org

1/6/2017

Address

Dear Customer,

Medford Water Commission has surveyed your neighborhood for lead pigtails and has found that your connection from the water main is a copper line that had **no** lead pigtail.

Please note that your service line from the meter to your house and your internal plumbing materials may or may not contain lead and can only be verified by the owner. If you have any concerns, we recommend having your water tested by a certified drinking water lab. Medford does have a local certified lab:

Neilson Research Corporation
245 South Grape Street
Medford, OR 97501
(541) 770-5678
www.nrclabs.com

For more information, contact:

Medford Water Commission: 541-774-2461
National Lead Information Center: 800-424-LEAD
EPA Safe Drinking Water Hotline: 800-426-4791

Lead Sampling

Proved problematic due to customer leaks and or water leaks between the water main and meter. Possible disturbed LPT's during excavation elevated lead levels.

Customers services tested: 18

Total lead tests: 137

Neilson Research Corporation
245 South Grape Street, Medford, Oregon 97501 541-770-5678 Fax 541-770-2901

Analysis Report

Medford Water Commission 200 S. Dry Room 177 Medford, OR 97501	Lab Order: 1409511 NRC Sample ID: 1409511-00A Collection Date: 8/13/2016 2:30 PM Received Date: 8/13/2016 4:09 PM Reported Date: 8/18/2016 9:38 AM
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Sample Information

Client Sample ID: <input type="text"/>	Client Sample ID: Bette #22470
Collector Name: <input type="text"/>	Collector Name: Steve Puzick
Sample Location: <input type="text"/>	Sample Location: Meter, 3rd Line
Source: <input type="text"/>	Source: City Water

ANALYTICAL RESULTS

Analytes	NELAP			Qual	MRL	Units	EPA Limit	Date Analyzed	Analyst
	Method	Accredited	Result						
Copper	EPA 200.0	A	0.0128		0.0005	mg/L	1.3 AL	8/15/2016	ONS
Lead	EPA 200.9	A	0.00127		0.0001	mg/L	0.015 AL	8/16/2016	ONS

Notes: **ND** - Not Detected at the MRL **M.L.** - On Limit **MRL** - Maximum Reporting Limit

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Statistical Summary of Investigation Findings

Type of Service	Qty. of Potholes	Qty. of LPT's	% of PH's to LPT	Qty. of Flange Corp Adapters
Single Galvanized	46	17	37.0%	3
Steerhorn-All	208	7	3.4%	105
1/2" Copper	28	0	0.0%	20
Old Style Straight Stop	38	0	0.0%	3
Risers	5	0	0.0%	1
Other	6	0	0.0%	0
LPT/Vacant (Discovered during leak)	0	2	NA	
3/4" Copper to 1/2" Copper to LPT (Discovered during leak)	0	1	NA	
TOTAL	331	27	8.2%	132

June 15th, 2016 Initial Thoughts

Total Services on Initial Investigation List	4770
Potholes Completed	331
Percentage of Initial Investigations Potholed	6.9%
Total LPT's	27
% LPT's Found to Total Investigations	0.6%

Service line type visible in meter box	Probability of lead pigtail existing
Galvanized with straight stop	High
½ copper with straight stop	Very Low to low
Steer horn service	Not enough data exist
¾ copper with anglestop	None

Service Line Material Description from Meter Box to Water Main with LPT Present

Meter Box Material Type	Svc. Material	Qty.
Galvanized (Single)	Galvanized	17
Galvanized Steer horn	Copper	5
Galvanized Steer horn	Galvanized	2
Galvanized (Single)	Copper	1
Copper (Riser/Resetter)	Copper	1
3/4" Copper	1/2" copper	1
Total		27

Lead Pig Tails by Year of Pipe	
YEAR	QTY
1907	1
1908	2
1909	11
1910	4
1911	3
1912	2
1927	1
1934	1
Other	2

Year of pipe and quantity with
LPT's discovered

What a Steer Horn?

Galvanized Steer-Horn to Copper to Lead Pigtail



Cost of the LPT Investigation/Removal Program

1. Initial Investigation
2. City of Medford Permits and Traffic Control Plans
3. Potholes
4. LPT removal
5. Saw-cutting/Concrete flat work, curb/gutter restoration
6. Paving

Cost

Fiscal Year	CIP-Service Line Replacement	Service Line Investigation	
FY15/16	\$ 7,934	\$ 31,661	
FY16/17	\$87,582	\$356,492	
<i>Sub-Total</i>	\$95,516	\$388,153	
		Total	\$483,669

Cost per removal/each =\$3,821

Cost per LPT all costs=\$17,913

Corrosion Study

Commission entered into contract with Black & Veatch to perform a Water Quality Corrosion Study.

Study involves the following:

Step 1 - Plan, Study

1. Workshop - Set the Work Plan
2. Existing information-Collection and study
3. Testing, Sampling, and Public Outreach

Step 2- Test, Report

1. Distribution Sampling Plan
2. Bench-scale testing-screen conditions
3. Pipe Loop Testing-focused conditions
4. Optimization and Treatment Strategies
5. Project Final Report

Completion date: January 2019

Lessons Learned

- Daunting tasks to investigate services for the presence or absence of LPT.
- Distribution crews have wealth of knowledge on history of material types.
- Galvanized service pipe between water main and meter has high probability of a LPT on old cast iron pipe.
- Permitting and pavement management proved to be challenging.
- Transparency.

Questions?