

Parsons, Susan

From: Dee White <deewhite1@mindspring.com>
Sent: Monday, March 06, 2017 3:10 PM
To: Moore-Love, Karla
Subject: 10 Agenda item 215/235 for March 8 PWB contract with Confluence
Attachments: 03-01-17 Council Session Rev 5 (1).pdf

Karla,

Nevermind, I found it online. Could you please place in the record for Agenda item 215-235

Thanks
Dee

Hey Karla,

Is there any way I could request that the Power Point presentation that the Water Bureau gave at last week's meeting be placed into the record?

Agenda number 215-235 Confluence Corrosion Contract

Thank you
Dee White



PORTLAND WATER BUREAU: Corrosion Improvement Project Update

Portland City Council
March 1, 2017

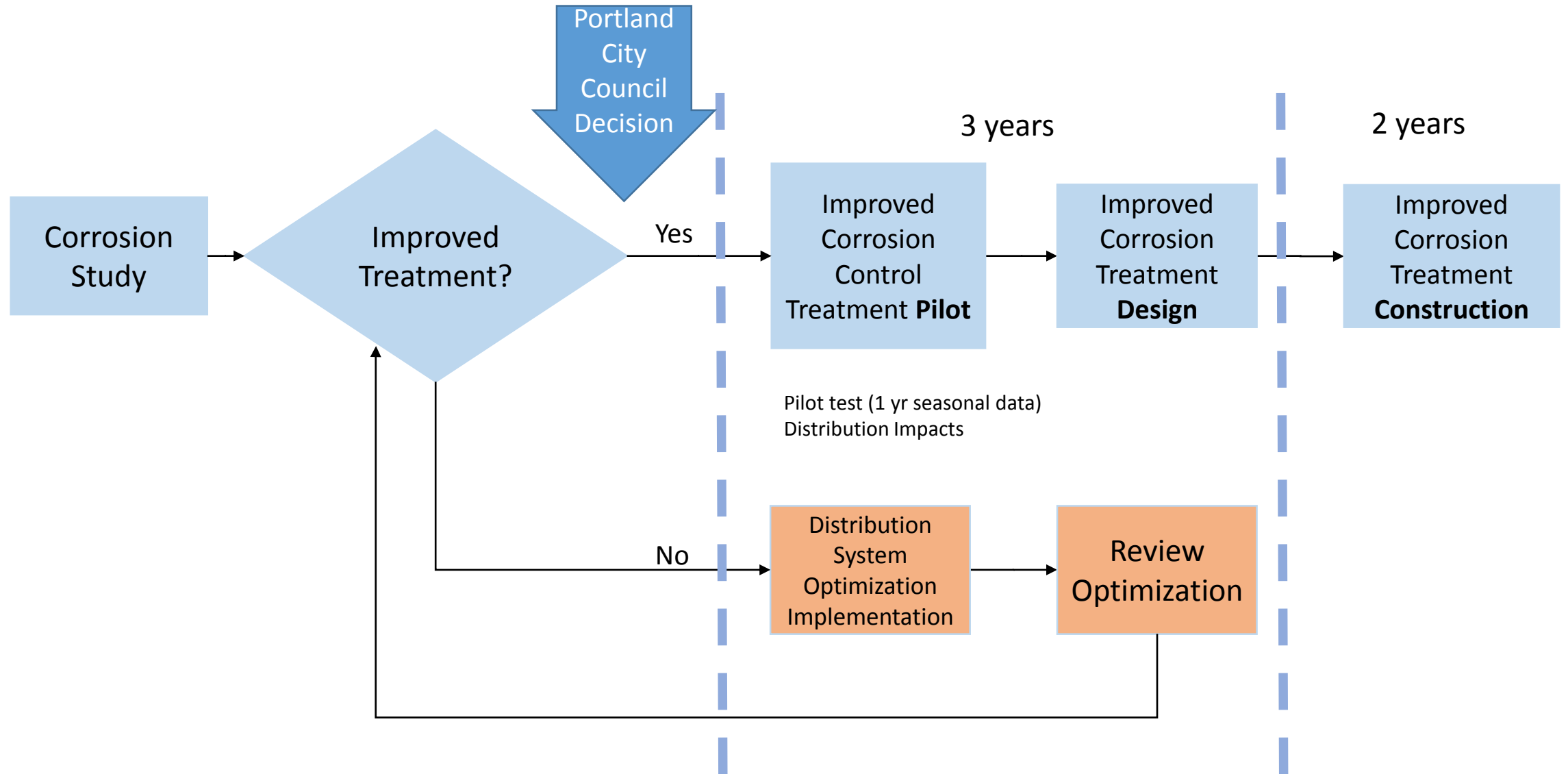
Michael Stuhr, Director
Gabriel Solmer, Deputy Director
Scott Bradway, Water Quality Information



Presentation Outline

- Introduction
 - Recap
 - System Overview
 - Lead and Copper Rule (LCR) Overview and Compliance
- Current Status
 - Recent Timeline
 - Water Quality Corrosion Study
- Recommendation
 - Next Steps
 - Treatment Pilot

Decision Tree

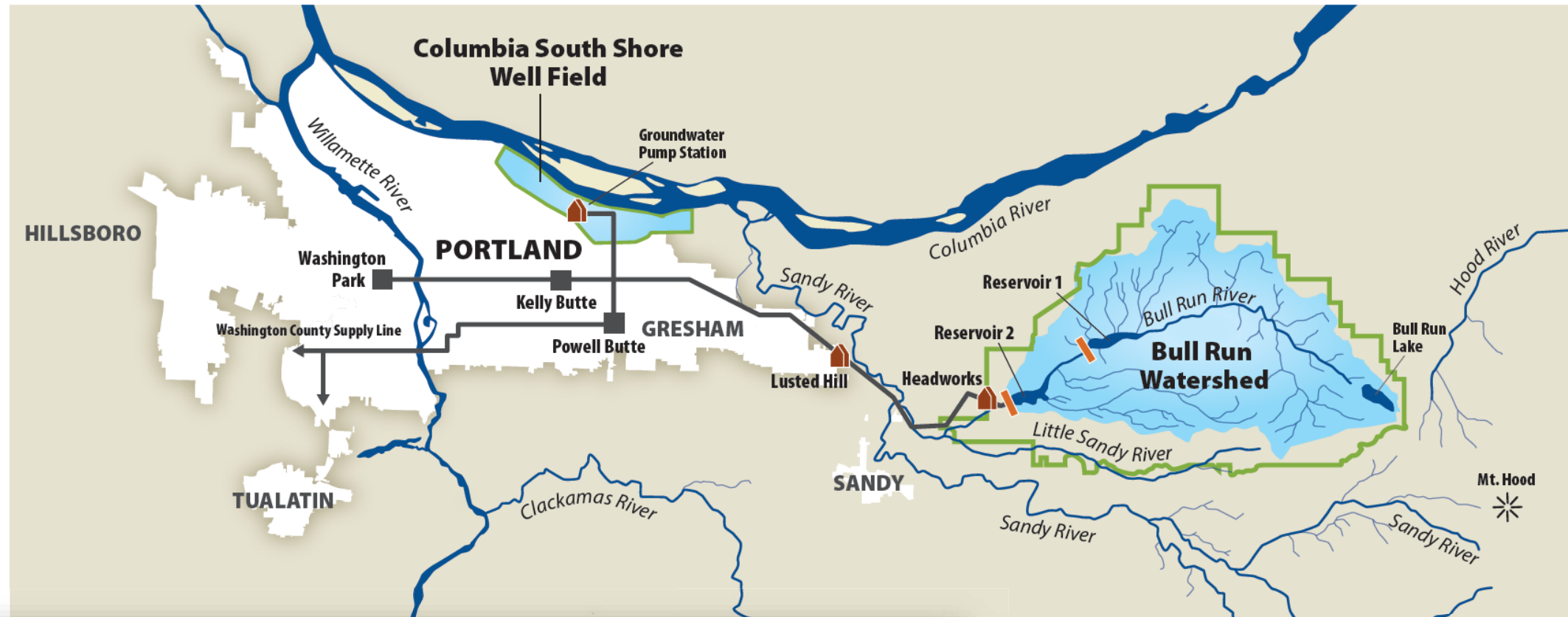


Recommendation

Approve contract with Confluence Engineering Group, LLC in the amount of \$664,930 for the Corrosion Control Treatment Pilot Project

System Overview

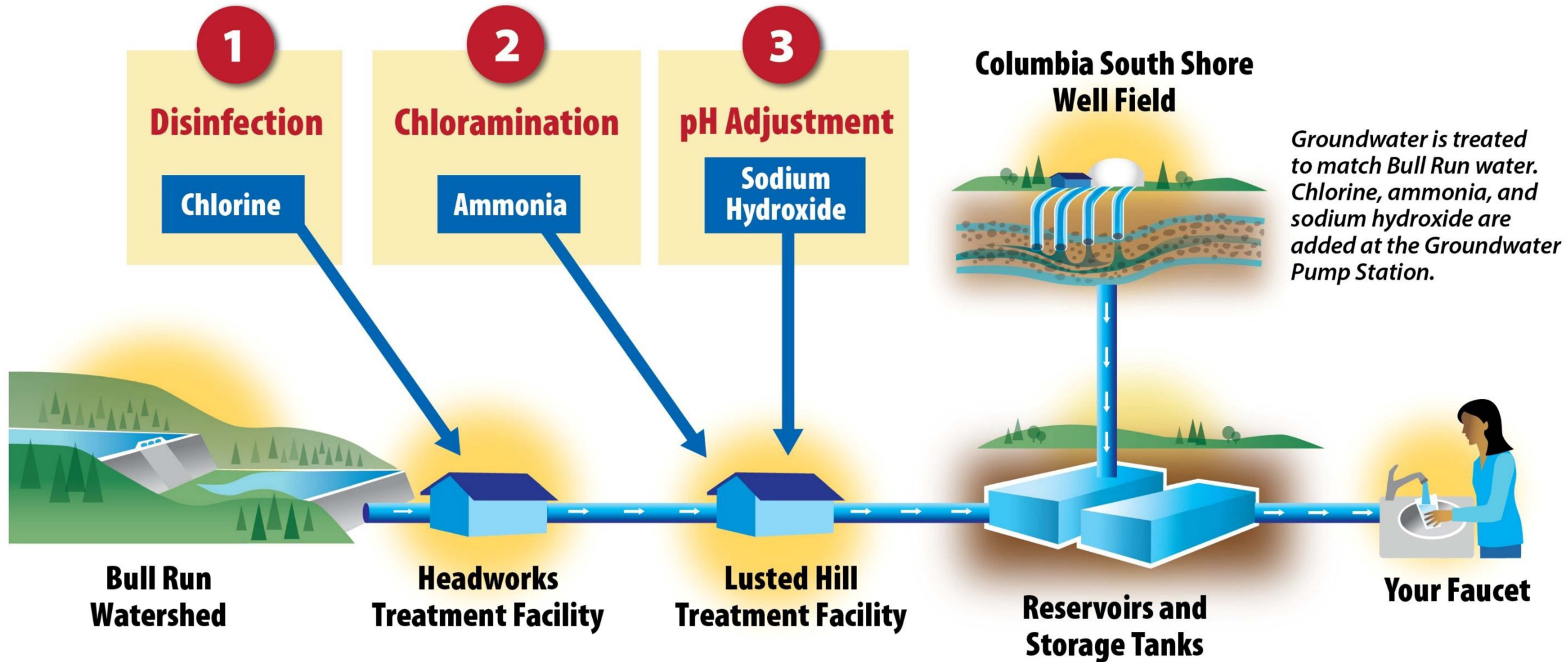
Service Area and Water Sources



- | | |
|---|---|
|  Water Storage Facility |  Portland Water System Distribution Area |
|  Water Supply Pipes |  Water Source |
|  Water Treatment Facility |  Protected Area |
|  Dam | |

- 588,000 retail customers
- 370,400 wholesale customers
- 19 wholesale water districts
- 101 million gallons per day average

Supply System Overview



Sources of Lead in Portland

Where it is *not*



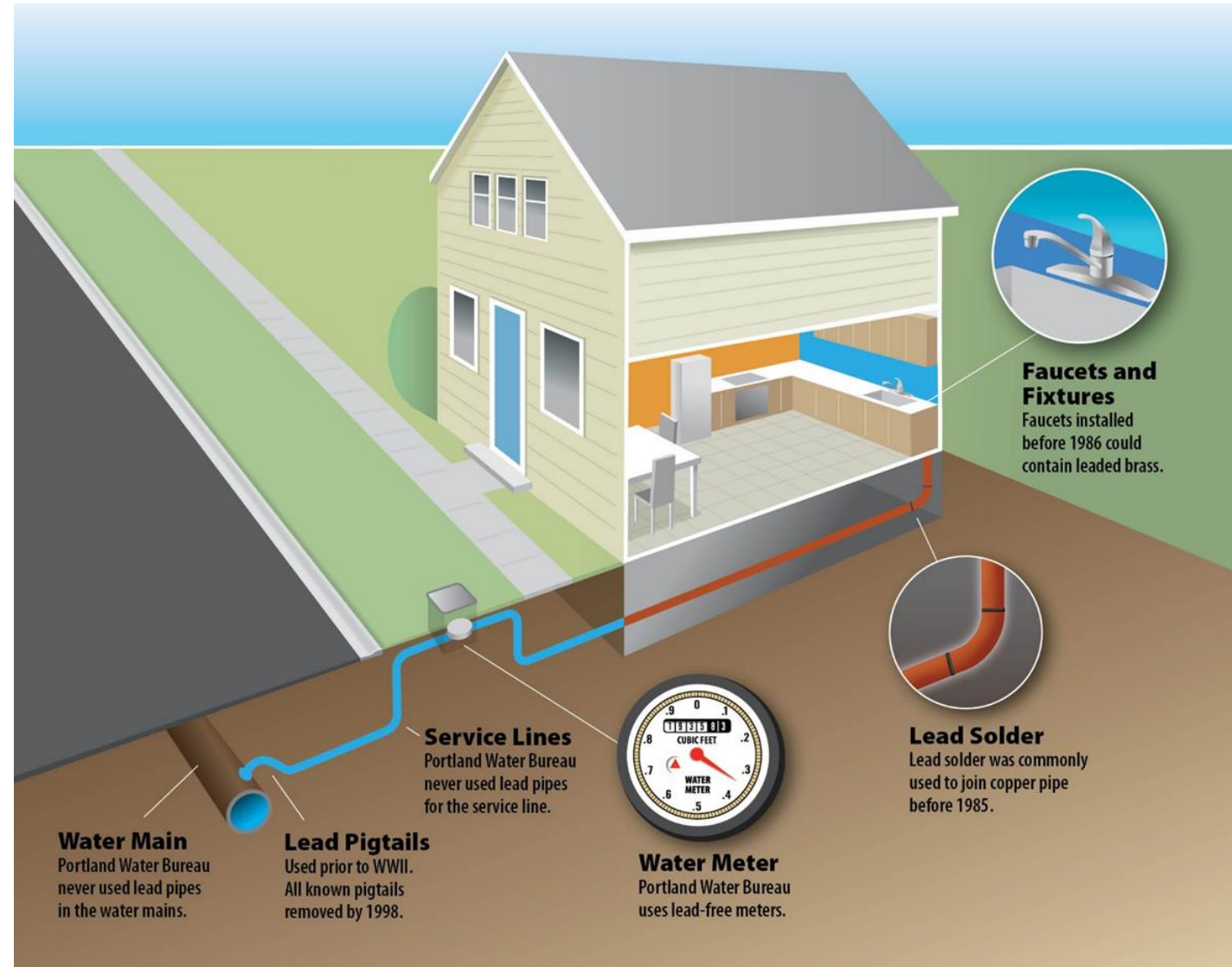
- Not in water supply
- No lead service lines - Portland never used lead service lines
- No lead pigtails - Removed all known lead pigtails



Sources of Lead in Portland

Where it *can be*

- Copper pipes and lead solder - most common in homes plumbed or built from 1970 - 85
- Home plumbing fixtures installed prior to 1985 can also contribute to lead in water
- In Portland lead paint is the greatest source of exposure to lead



Water System Improvements

- Solder
 - Advocated State ban of lead-based solder in water systems in 1985
- Pigtails
 - Removed all known lead pigtails (>10,000) in the distribution system by 1998 (\$10M)
- Meters
 - Replaced 364 large lead-component meters serving schools, hospitals, childcare facilities, community centers, public housing, and large apartment buildings from 2001-2008.



Lead and Copper Rule (LCR) Overview and Compliance

Lead and Copper Rule (LCR)

- Published by EPA in 1991
- Requires large utilities (>50,000) to maintain optimal corrosion control treatment (OCCT)
- Requires utilities to conduct lead monitoring at high risk customer taps
- Context: More than 10% of high risk homes tested cannot exceed action level of 15 parts per billion (ppb)

Lead and Copper Rule Compliance

1994

Optimized Treatment Study

- Recommends pH 9.0, alkalinity 20 mg/L as Optimized Corrosion Control Treatment
- City Council directs PWB to investigate alternatives to recommended treatment

1997

City proposes a comprehensive Lead Hazard Reduction Program (LHRP)

1997

State approves LHRP as Optimized Corrosion Control Treatment

**1997-
present**

City remains in compliance with Lead and Copper Rule

Lead Hazard Reduction Program

- State Approved Compliance Program (1997)
- 4-part program meets federal regulatory requirements

Water Treatment & Monitoring



Education & Testing



Public Education & Community Outreach

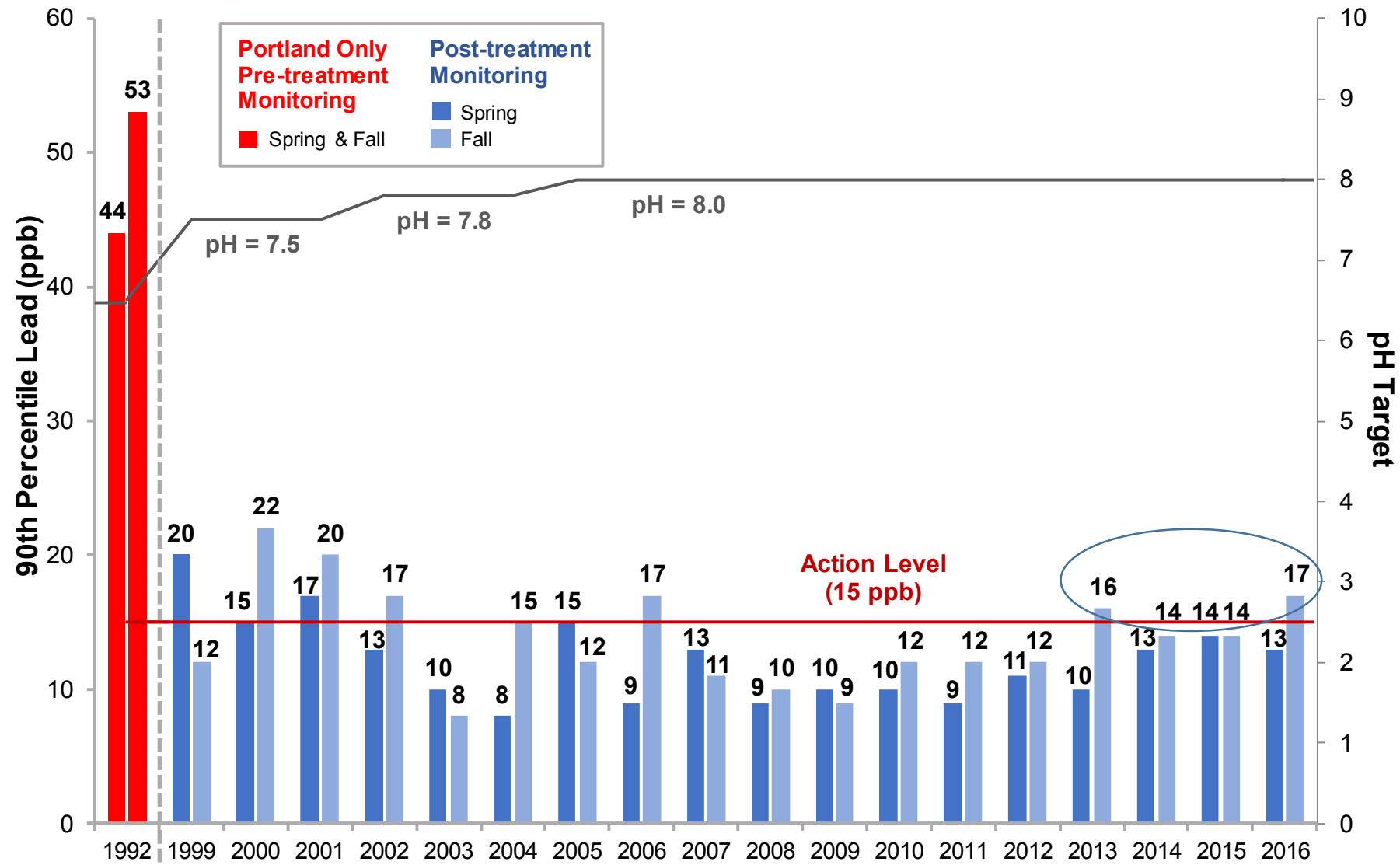


Lead Paint Removal Grants



LCR Sampling History

Portland Joint Monitoring 90th Percentile Lead Levels Tier 1 Homes



Recent Timeline

Recent Timeline

2014

Spring

PWB begins Water Quality Corrosion Study

2016

April

PWB begins conversations with OHA and EPA

Sept. 8

PWB proposes improved corrosion control treatment schedule to OHA

Oct. 11

City Council Work Session

Nov. 4

OHA approves PWB's proposed schedule and requests interim lead reduction plan

Dec. 2

PWB submits interim lead reduction plan to OHA

2017

Jan. 24

OHA accepts PWB's interim lead reduction plan

Feb. 7

PWB raises entry point pH from 8.0 to 8.1

Water Quality Corrosion Study

Water Quality Corrosion Study

- Authorized by Council in 2014
- Data gathered over entire year to see seasonal variations
- Goal: better understand role of water quality on metals release
- Panel of utility, consultant, and academic experts

DRAFT

WATER QUALITY CORROSION STUDY

Summary Report

PWB CONTRACT# 30003222

B&V PROJECT NO. 182435



PREPARED FOR

City of Portland, Portland Water Bureau

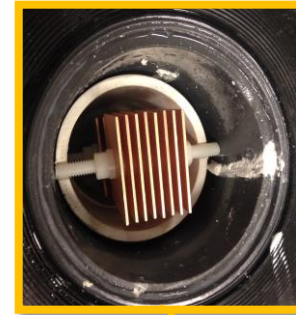
07 FEBRUARY 2017

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Water Quality Corrosion Study

Evaluated 3 corrosion mechanisms in premise plumbing

- Uniform Corrosion: influences dissolved lead release
- Biostability (microbial induced corrosion): influences dissolved and particulate lead release
- Scale/transport release: influences particulate lead release



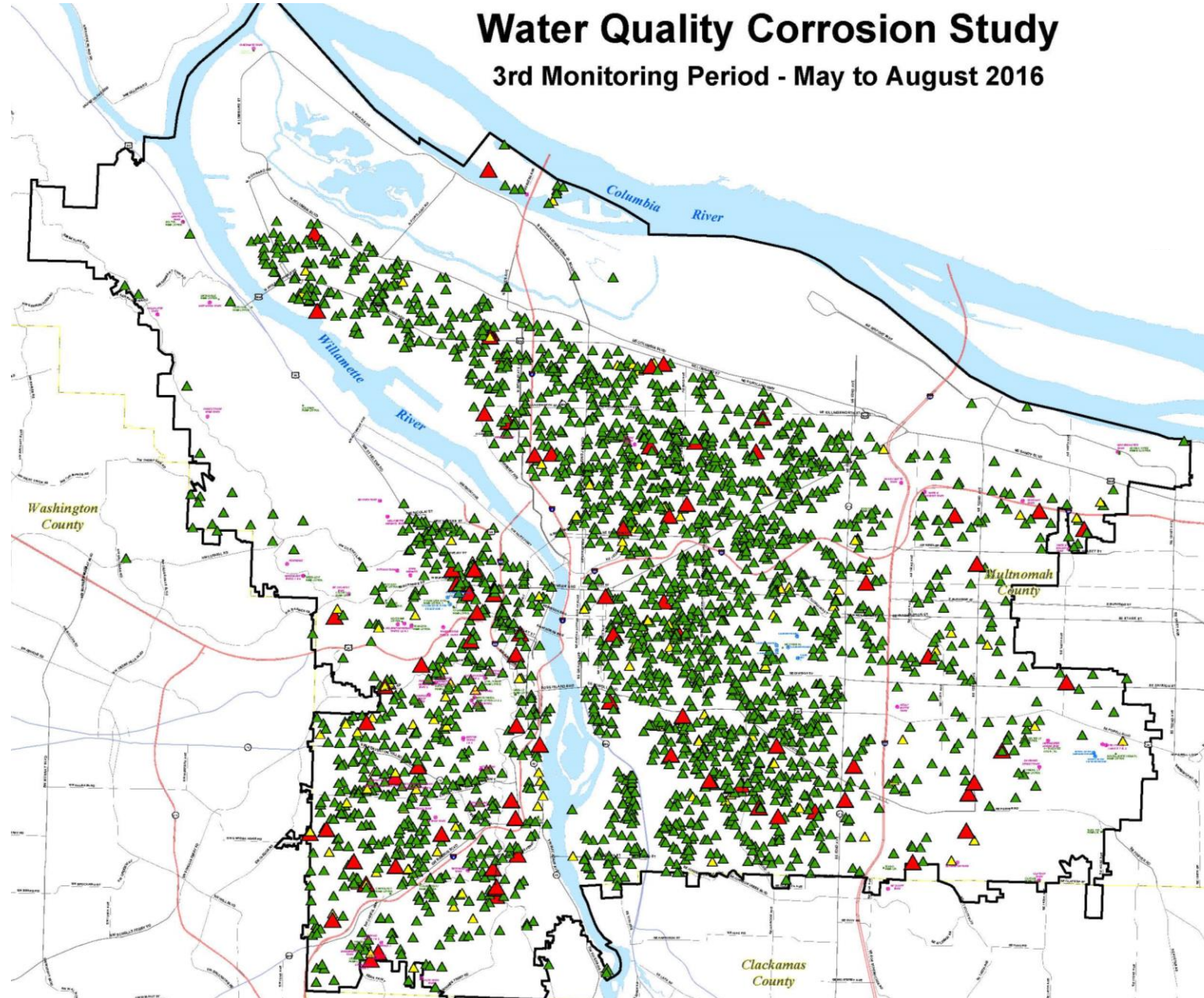
Corrosion Study: What did we test?

Data Set	TCR Monitoring (Alk, Cl2, pH, Temp., Turbidity)	Nitrification Monitoring (Cl2, ORP, HPC, Free NH3, Nitrite, Nitrate, pH, Temp., Turbidity)	LCR Compliance (Total Pb, Cu, Fe, Mn, Zn)	WQP Compliance (Alk, pH)	Voluntary Lead (Total Pb, Cu, Fe, Mn, Zn)	Supplemental In-home (All parameters)	Extended WQSS and PRS Station (All parameters)
Uniform Corrosion	Alk, pH, Temp.	ORP, pH, Temp.	Total Pb	Alk, pH	Total Pb	All parameters describing uniform corrosion	All parameters describing uniform corrosion
Biostability of Water	Cl2, Temp.	Cl2, Free NH3, Nitrite, Nitrate, ORP, Temp.	Total Pb, Cu	N/A	Total Pb, Cu	All parameters describing biostability	All parameters describing biostability
Scale Transport	Turbidity	Turbidity	Total Pb, Cu, Fe, Mn, Zn	N/A	Total Pb, Cu, Fe, Mn, Zn	All parameters describing scale transport	All parameters describing scale transport

Corrosion Study: Conclusions

- All three corrosion mechanisms contribute to lead release in household plumbing
- Water chemistry can influence all three corrosion mechanisms
- Household plumbing materials dominant source of lead
- No geographic patterns to lead release or water quality trends

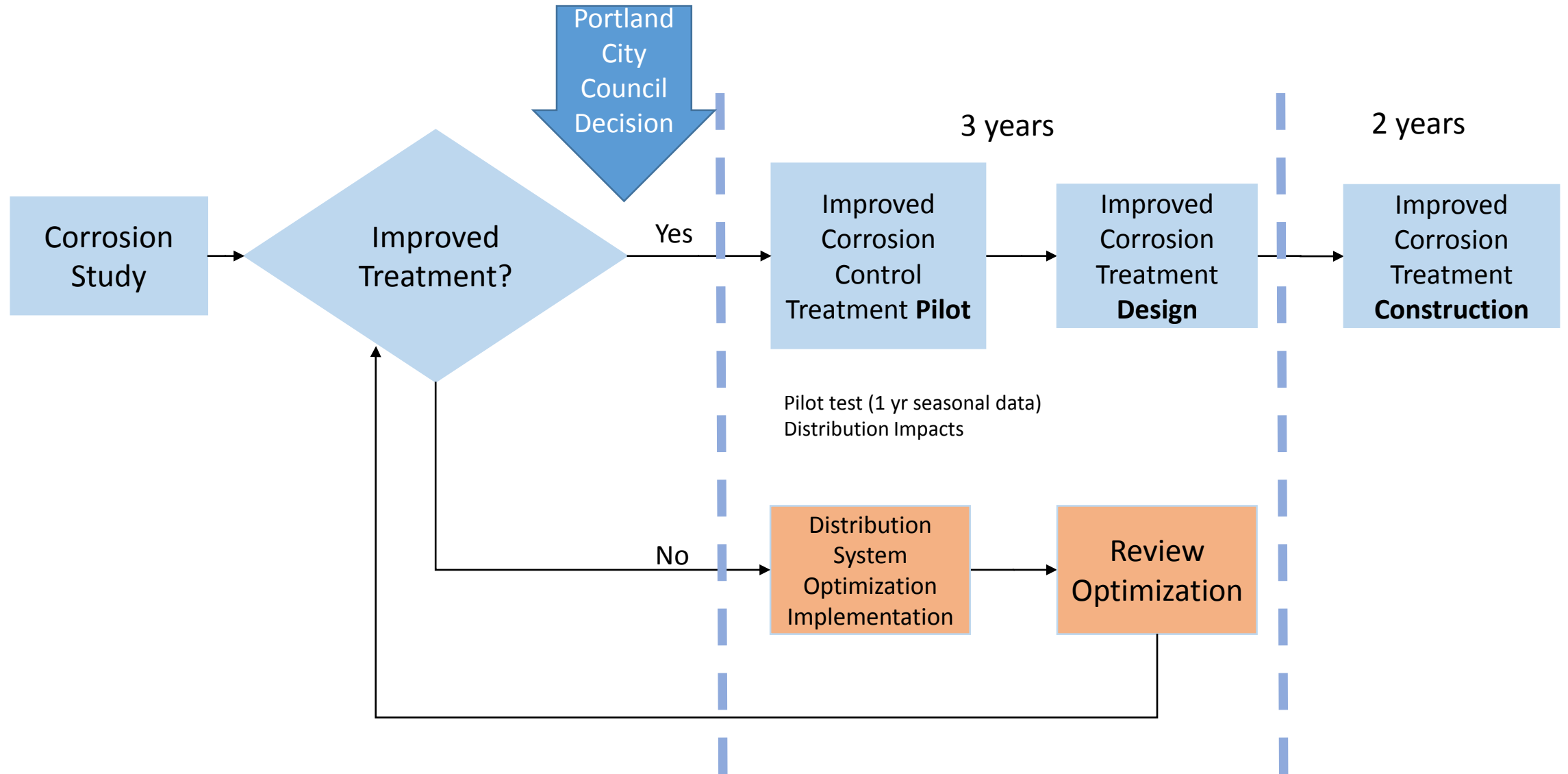
Corrosion Study: Results



- LCR Sites
- △ Customer Sites
- Lead = 12 ppb or higher
- Lead = 5 to 11.9 ppb
- Lead = 0 to 4.9 ppb

Next Steps

Decision Tree



Treatment Pilot

- What treatment options will the Pilot consider?
 - pH and/or alkalinity adjustment (water chemistry)
 - Phosphate-based corrosion inhibitors (pipe coating)
- What factors will be evaluated?
 - Lead reduction
 - Impacts to sensitive and industrial users
 - Costs
 - Simultaneous compliance with other water quality regulations
 - Compatibility with multiple sources of supply
 - Sanitary and stormwater discharge considerations

Corrosion Control Treatment Options

pH and/or Alkalinity Adjustment

Chemical Name	Other common uses	Other considerations
Baking Soda (sodium bicarbonate)	Baking leaveners, antacids, toothpaste	Most expensive of alkalinity adjustment chemicals
Carbon Dioxide	Carbonated beverages	Used in combination with other chemicals
Caustic Soda (sodium hydroxide)	Soap making, food processing	
Hydrated Lime (calcium hydroxide)	Food processing, calcium supplements	Labor intensive O&M
Soda Ash (sodium carbonate)	Soaps and detergents, glass making, water softening, food processing	

Corrosion Control Treatment Options

Corrosion Inhibitors

Chemical Name	Other common uses	Other considerations
Orthophosphate (Phosphoric Acid)	Carbonated beverages, cheese making, baking leaveners	Sanitary and stormwater discharge concerns; compatibility with wholesale customers using other sources
Zinc orthophosphate	Dental cement	Sanitary and stormwater discharge concerns; compatibility with wholesale customers using other sources

Corrosion Control Treatment Practices

Other Utilities

Utility	Treatment Chemical
South Fork Water Board, Oregon City, OR	Soda ash
Clackamas River Water, Clackamas, OR	Soda Ash
City of Salem, OR	Soda ash
Eugene Water and Electric Bd, Eugene, OR	Sodium hydroxide
Lake Oswego-Tigard Water Partnership, Lake Oswego, OR	Sodium hydroxide
Joint Water Commission, Hillsboro, OR	Sodium hydroxide
North Clackamas County Water Commission, Oregon City, OR	Soda ash

Utility	Treatment Chemical
Seattle Public Utilities* Seattle, WA	Lime and carbon dioxide
Metro Vancouver* Vancouver, BC	Lime and soda ash
Massachusetts Water Resources Authority* Boston, MA	Soda ash and carbon dioxide
DC Water Washington, DC	Orthophosphate
Los Angeles Department of Water & Power Los Angeles, CA	Zinc orthophosphate
Southern Nevada Water Authority Las Vegas, NV	Zinc orthophosphate

*unfiltered water system

Recommendation

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Approve contract with Confluence Engineering Group, LLC in the amount of \$664,930 for the Corrosion Control Treatment Pilot Project

What's next?

- Conduct Corrosion Control Treatment Pilot
 - Pilot is first step in multi-phase project to design and construct a corrosion control treatment facility
- Follow joint PWB/OHA's compliance schedule for improved Corrosion Control Treatment
 - Design contract - July 2017
 - Construction contract - Fall 2018
- Continue Interim Lead Reduction Plan
- Continue to work with community partners