Drinking Water Quality

WSAC

March 9, 2016

Seattle Public Utilities

Agenda

- Lead and Copper Rule (LCR)
- Monitored, Not Detected
- Annual Water Quality Report

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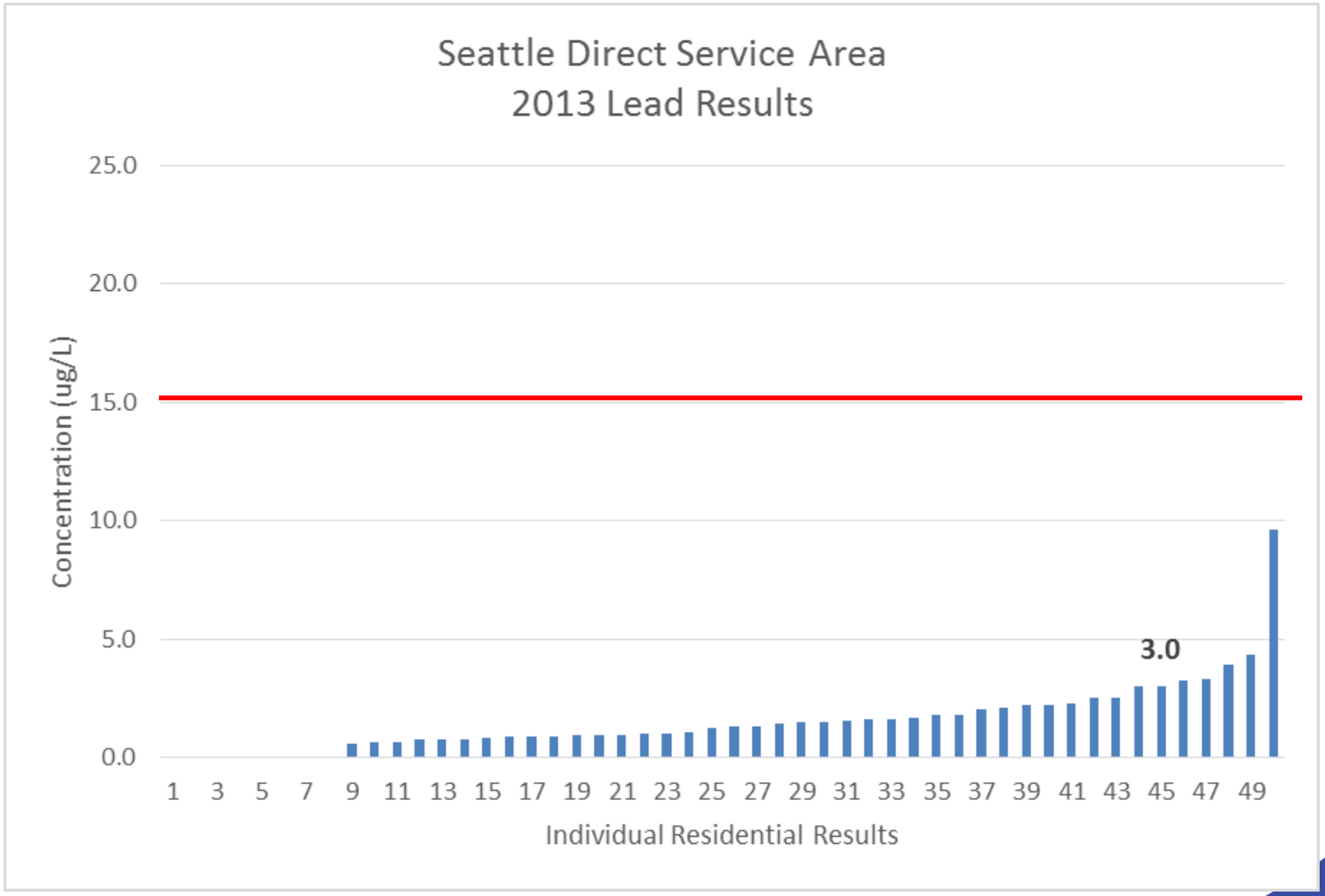
LCR Update



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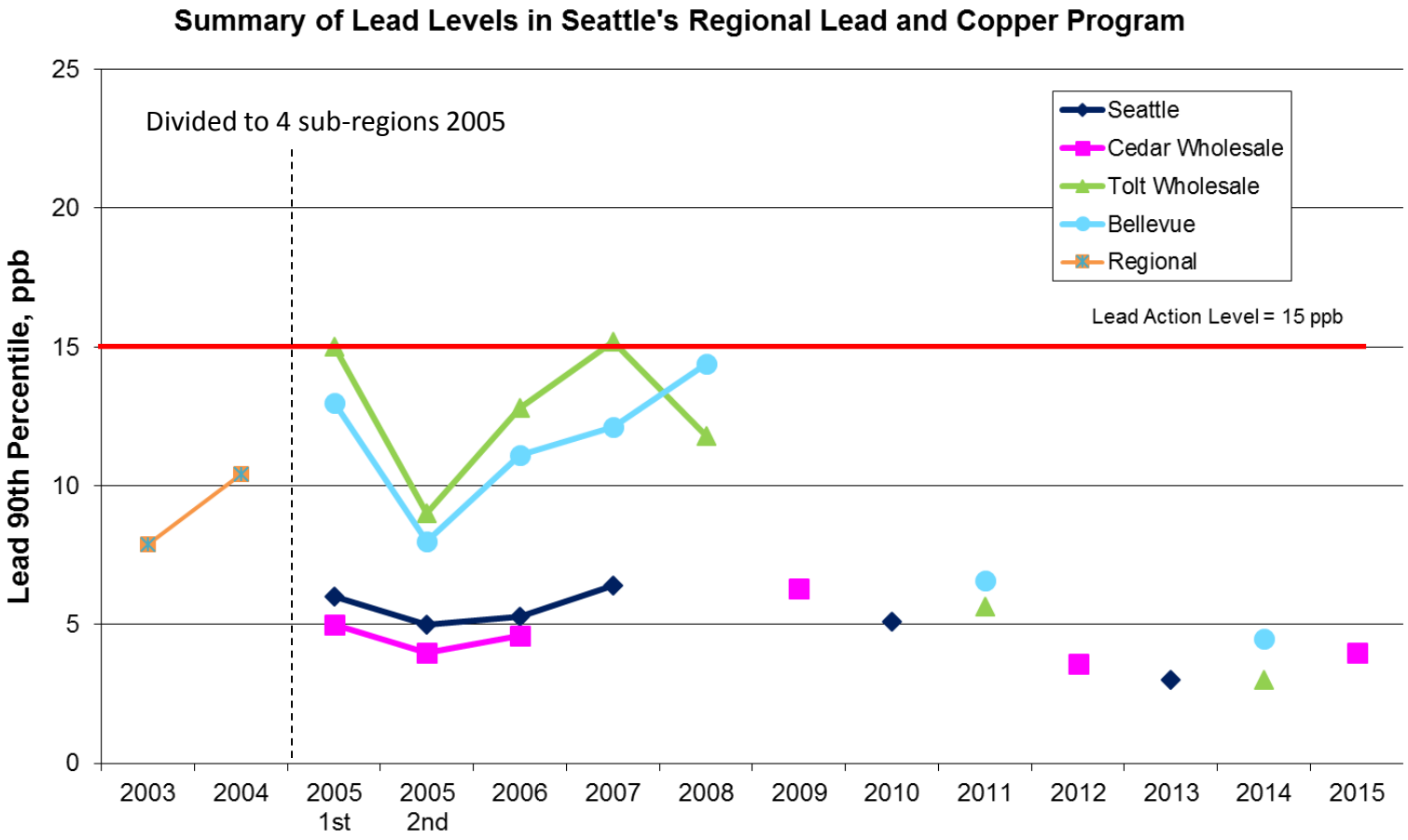
LCR Update



Sampling frequency is now once every three years for each region.

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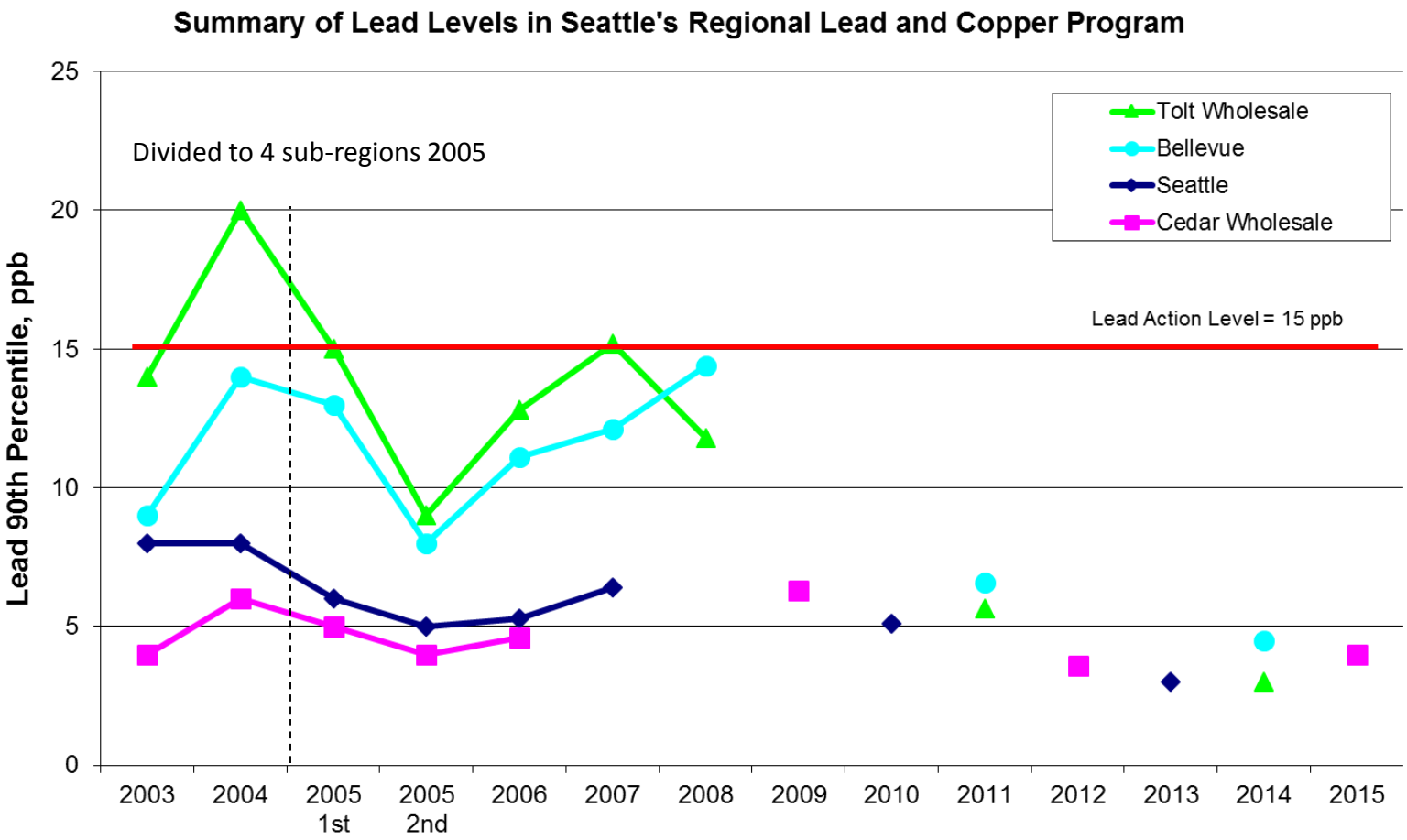
LCR Update



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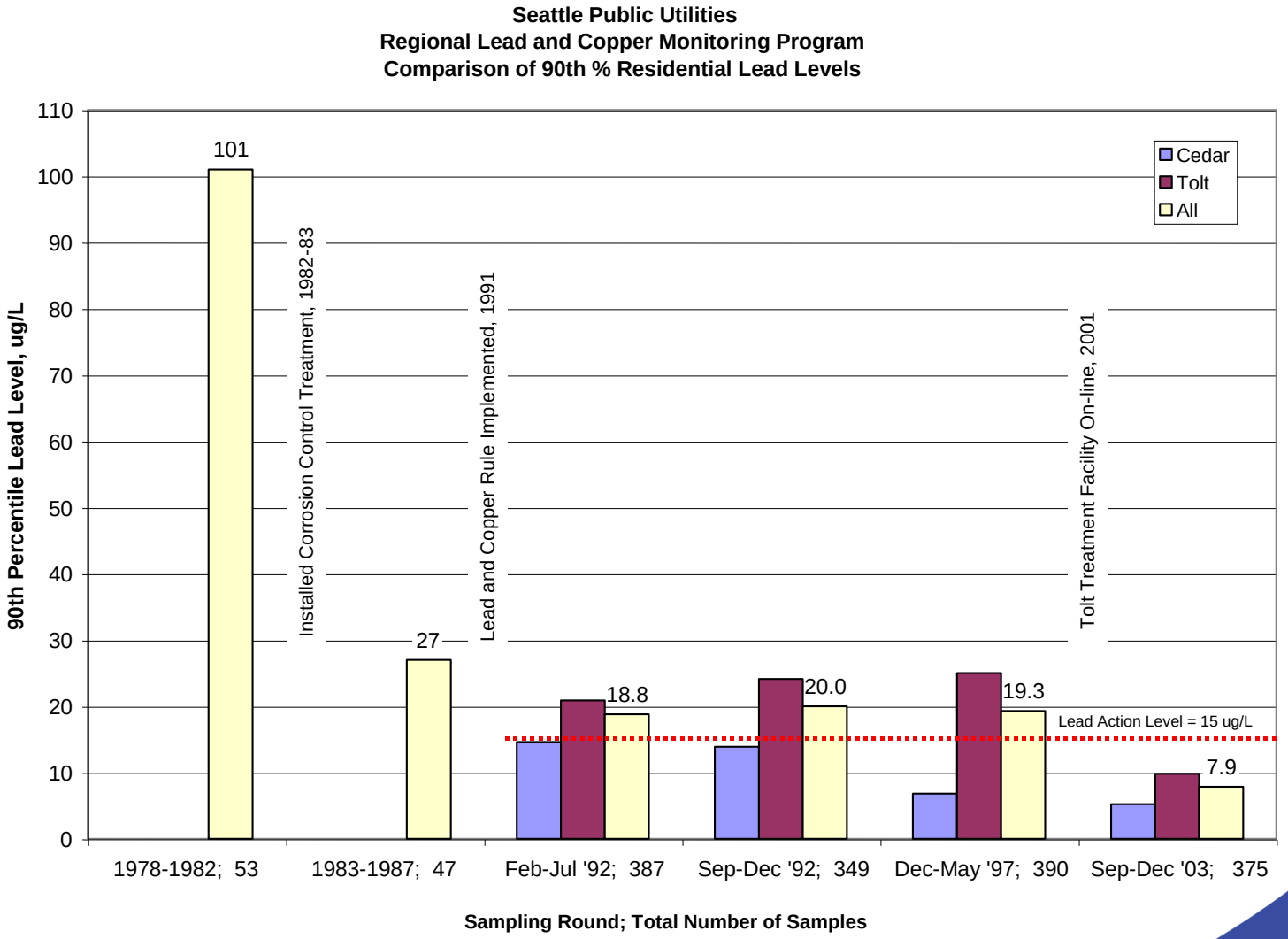
LCR Update



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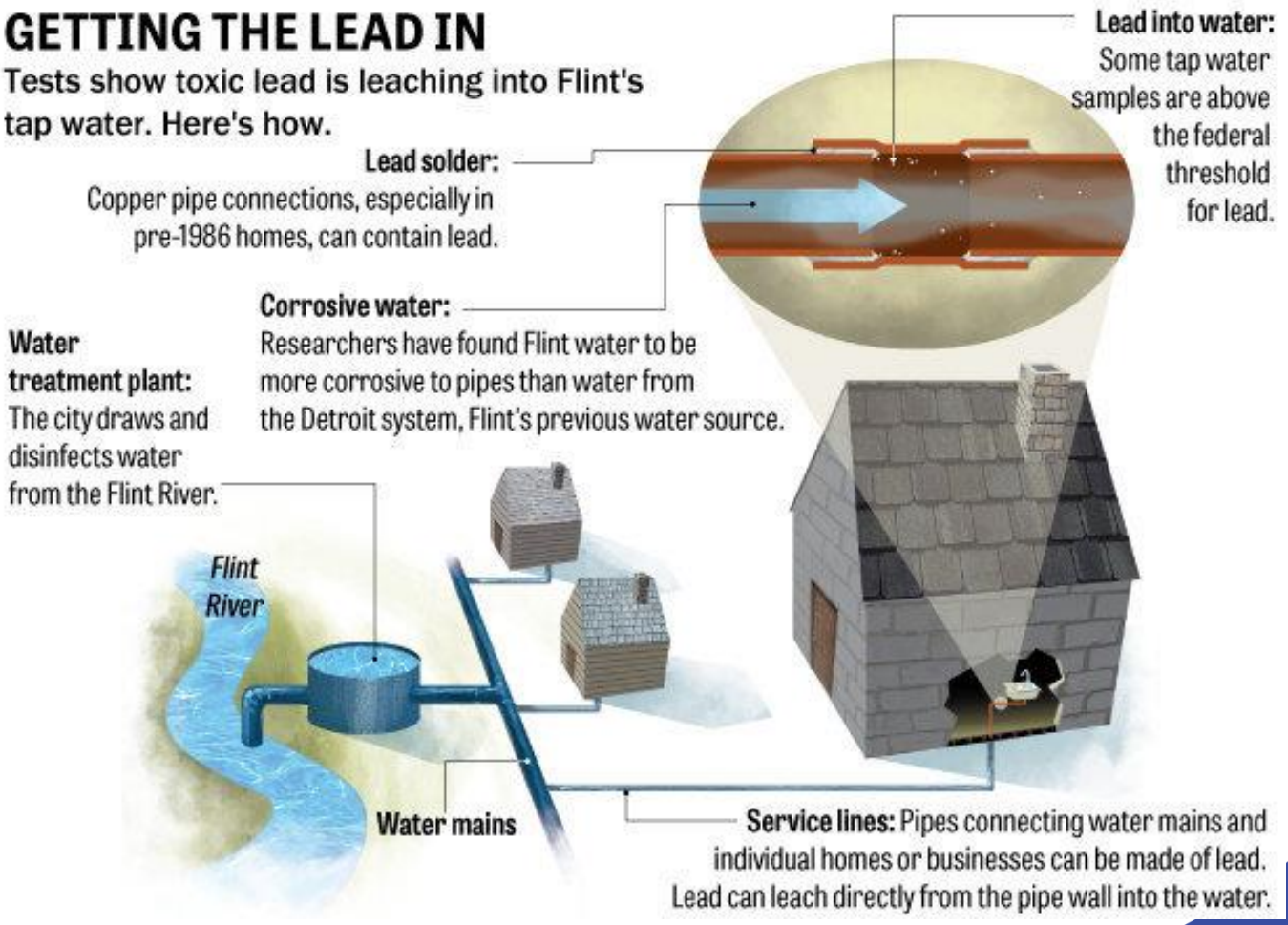
LCR Update – lead sources, Flint



Graphic from http://www.mlive.com/news/flint

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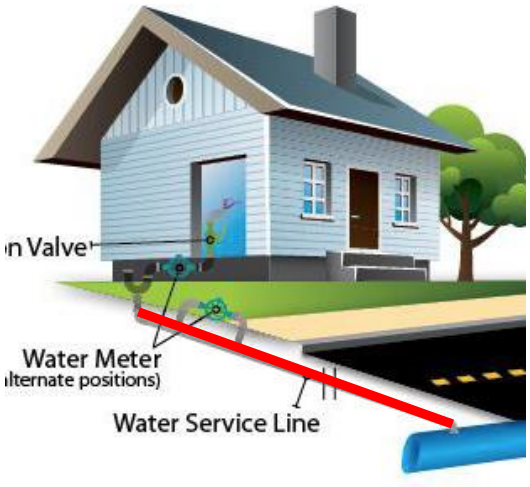
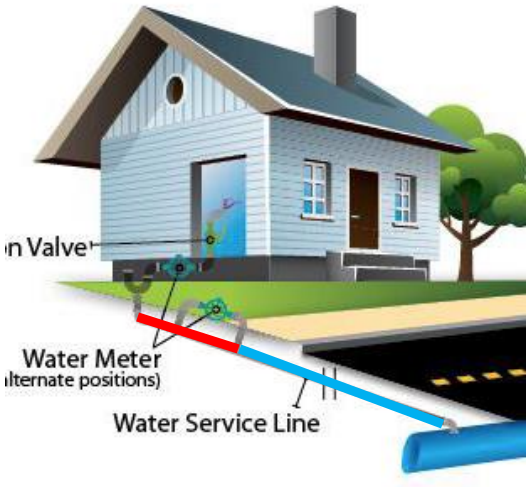
LCR Update – lead sources

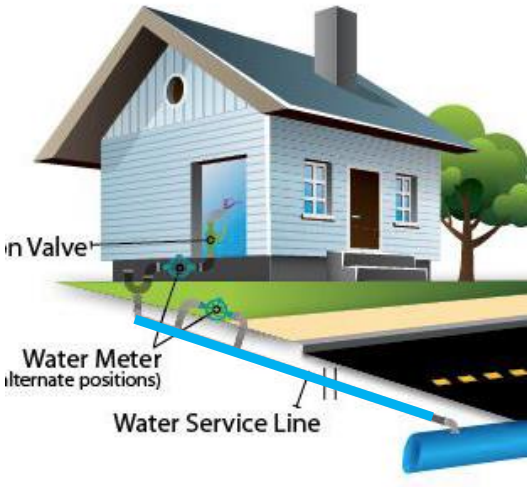
Flint



Chicago



Seattle



Graphic edited from http://avonlakewater.org/for-our-customers

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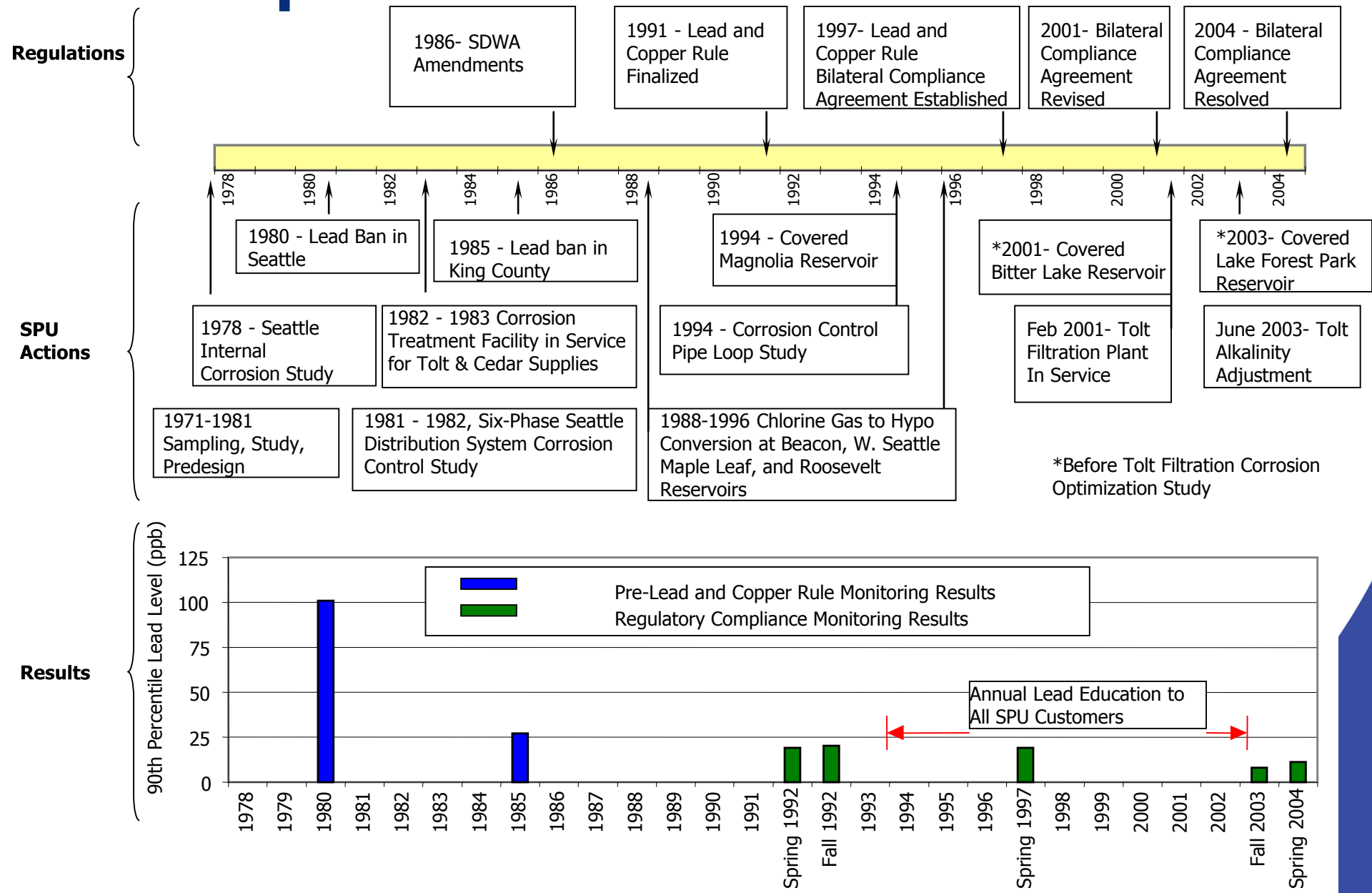
LCR Update


SPU Corrosion Control History
Regulations
1986- SDWA Amendments
1991 - Lead and Copper Rule Finalized
1997- Lead and Copper Rule Bilateral Compliance Agreement Established
2001- Bilateral Compliance Agreement Revised
2004 - Bilateral Compliance Agreement Resolved
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
SPU Actions
1980 - Lead Ban in Seattle
1985 - Lead ban in King County
1994 - Covered Magnolia Reservoir
*2001- Covered Bitter Lake Reservoir
*2003- Covered Lake Forest Park Reservoir
1978 - Seattle Internal Corrosion Study
1982 - 1983 Corrosion Treatment Facility in Service for Tolt & Cedar Supplies
1994 - Corrosion Control Pipe Loop Study
Feb 2001- Tolt Filtration Plant In Service
June 2003- Tolt Alkalinity Adjustment
1971-1981 Sampling, Study, Predesign
1981 - 1982, Six-Phase Seattle Distribution System Corrosion Control Study
1988-1996 Chlorine Gas to Hypo Conversion at Beacon, W. Seattle Maple Leaf, and Roosevelt Reservoirs
*Before Tolt Filtration Corrosion Optimization Study
Results
90th Percentile Lead Level (ppb)
125
100
75
50
25
0
Pre-Lead and Copper Rule Monitoring Results
Regulatory Compliance Monitoring Results
Annual Lead Education to All SPU Customers
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Spring 1992
Fall 1992
1993
1994
1995
1996
Spring 1997
1998
1999
2000
2001
2002
Fall 2003
Spring 2004

LCR Update - Corrosion Control

- Seattle's untreated source water is considered "soft"
- Snow melt and rainwater have low mineral content
- Can be aggressive or corrosive to plumbing materials
- Untreated:
  - pH is 6.8 – 7.4
  - alkalinity 6.4 – 8.9 mg/L as $CaCO_3$
- Multiple corrosion control studies set optimized targets:
  - pH 8.2
  - alkalinity 19 mg/L

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LCR Update - Corrosion Control

- Monitored daily at the treatment facilities
  - Tolt: addition of lime and CO^2

pH	Outlet connection to Tolt Pipeline No. 1. (1).	Between 7.5 and 8.5, as stipulated by SPU, ± 0.2 pH units 95% of the time and ± 0.4 pH units 100% of the time, based upon continuous monitoring.
Alkalinity (mg/L as CaCO3)	Outlet connection to Tolt Pipeline No. 1. (1).	Between 10.0 and 30.0 mg/L as $CaCO_3$, as stipulated by SPU, ± 2.0 mg/L based upon a daily grab sample. (10)

  - Cedar: addition of lime

pH	Outlet from each clearwell (1)	Between 7.5 and 8.5, as stipulated by SPU, ± 0.2 pH units 95% of the time and ± 0.4 pH units 100% of the time, based upon continuous monitoring.

- 10 distribution sites (direct service and wholesale) monitored/ reported monthly to WDOH
- Additional locations monitored several times each week

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LRC Update - Participants

Region 1	Region 2	Region 3:	Region 4:
Cedar:	**Tolt:**		
Cedar River	Bothel	Bellevue	Seattle
Mercer Island	Duvall		
Soos Creek	Kirkland		
Tukwila	Northshore		
WD125	Shoreline		
WD 20	Woodinville		
WD 45	WD119		
WD 49			

Systems that collect independently:

Highline, Redmond, Olympic View, Edmonds, Skyway, WD90, Lake Forest Park, Renton, SeaTac, Covington, Issaquah

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LCR Update - Where do we sample?

- **At residential customer taps**
- **From volunteer participants**
- **With "High Risk" homes, defined as….**

… a home with the potential for higher levels of lead in the drinking water due to the leaching of metals from the plumbing system containing copper piping and tin-lead solder. The City of Seattle banned the use of tin-lead solder in 1980, so homes built or replumbed with copper piping prior to 1980 are in the "high risk" category.

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LCR Update - How do we sample?

- 1 Liter Plastic Bottles
- Delivered to customer residences
- With Instructions
  - Filled from cold water tap
  - After minimum 6-hour standing time

Residential Sampling Instructions

Thank you for participating again in the Lead and Copper Monitoring Program. The information collected at your homes helps us determine if we are providing optimum treatment of our drinking water. To insure the information collected is accurate, please follow the instructions below.

1. It is very important that no water is used for at least six hours before collecting the morning standing water sample. Please indicate the approximate time of last water use and the time of sample collection so that we can record the standing time for your sample.

2. At the COLD WATER KITCHEN TAP and before using water anywhere in or outside the house, slowly fill the larger (1 liter) bottle to the fill line near the top. Please take care not to spill any of this water or overfill the bottle.

3. If water was accidentally used prior to sampling, or other difficulties were experienced, please notify the contact person listed below to arrange for another collection.

4. Please leave the bottles by you front door for pick-up the same morning.

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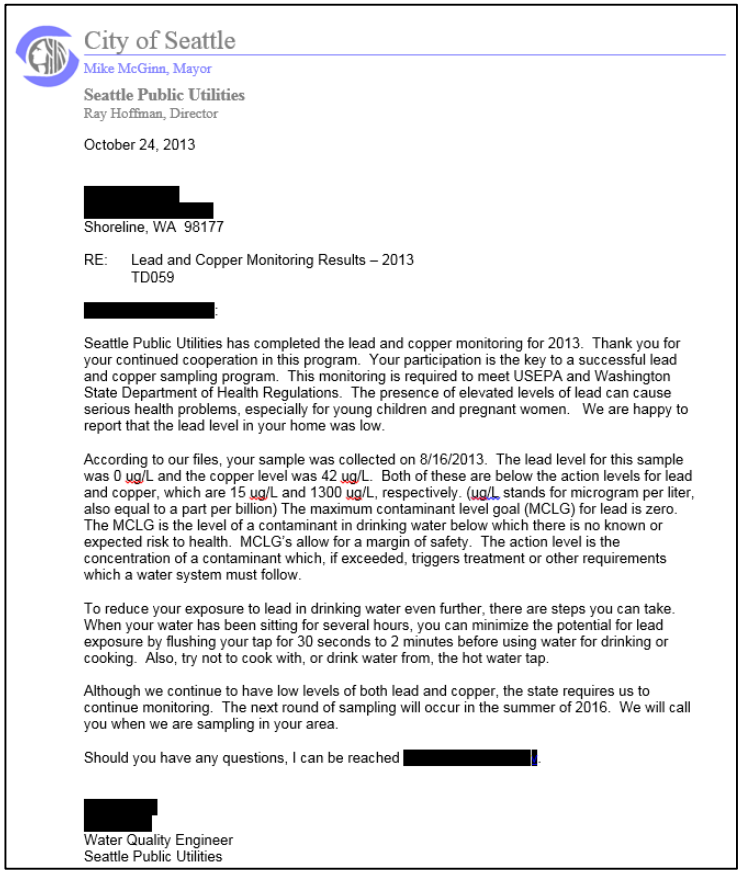
LCR Update - Who receives results?

- Every participating resident gets an individual letter



City of Seattle
Mike McGinn, Mayor
Seattle Public Utilities
Ray Hoffman, Director

October 24, 2013

[redacted]
Shoreline, WA 98177

RE: Lead and Copper Monitoring Results – 2013
TD059

[redacted]:

Seattle Public Utilities has completed the lead and copper monitoring for 2013. Thank you for your continued cooperation in this program. Your participation is the key to a successful lead and copper sampling program. This monitoring is required to meet USEPA and Washington State Department of Health Regulations. The presence of elevated levels of lead can cause serious health problems, especially for young children and pregnant women. We are happy to report that the lead level in your home was low.

According to our files, your sample was collected on 8/16/2013. The lead level for this sample was 0 ug/L and the copper level was 42 ug/L. Both of these are below the action levels for lead and copper, which are 15 ug/L and 1300 ug/L, respectively. (ug/L stands for microgram per liter, also equal to a part per billion) The maximum contaminant level goal (MCLG) for lead is zero. The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety. The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

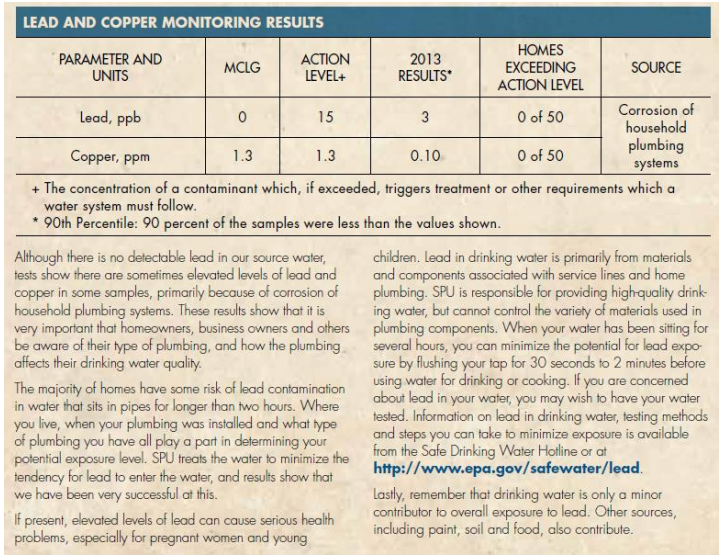
To reduce your exposure to lead in drinking water even further, there are steps you can take. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Also, try not to cook with, or drink water from, the hot water tap.

Although we continue to have low levels of both lead and copper, the state requires us to continue monitoring. The next round of sampling will occur in the summer of 2016. We will call you when we are sampling in your area.

Should you have any questions, I can be reached [redacted].

[redacted]
Water Quality Engineer
Seattle Public Utilities

- Every customer receiving the SPU Annual Water Quality Report



LEAD AND COPPER MONITORING RESULTS

PARAMETER AND UNITS	MCLG	ACTION LEVEL+	2013 RESULTS*	HOMES EXCEEDING ACTION LEVEL	SOURCE
Lead, ppb	0	15	3	0 of 50	Corrosion of household plumbing systems
Copper, ppm	1.3	1.3	0.10	0 of 50	

+ The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
* 90th Percentile: 90 percent of the samples were less than the values shown.

Although there is no detectable lead in our source water, tests show there are sometimes elevated levels of lead and copper in some samples, primarily because of corrosion of household plumbing systems. These results show that it is very important that homeowners, business owners and others be aware of their type of plumbing, and how the plumbing affects their drinking water quality.

The majority of homes have some risk of lead contamination in water that sits in pipes for longer than two hours. Where you live, when your plumbing was installed and what type of plumbing you have all play a part in determining your potential exposure level. SPU treats the water to minimize the tendency for lead to enter the water, and results show that we have been very successful at this.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. SPU is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at **http://www.epa.gov/safewater/lead**.

Lastly, remember that drinking water is only a minor contributor to overall exposure to lead. Other sources, including paint, soil and food, also contribute.

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LCR Update – What can customers do?

- A few simple steps you can take in the home to reduce the risk of lead in your drinking water…
  - If water has been standing in pipes for over 2 hours, flush out the pipes by running the tap until you feel a temperature change before using for drinking or cooking
  - Always draw drinking and cooking water from COLD water tap -- lead dissolves more quickly in hot water.
  - Never make baby formula or other drinks or food for children from the HOT water tap. Start with water taken from the cold water faucet (after flushing) and warm it if necessary
  - If you are making plumbing changes, be sure to select low-lead or no-lead fixtures. As of January 2014, a new federal law is in effect, reducing the amount of lead in plumbing fixtures from 8 percent to 0.25 percent. Manufacturers are already offering faucets that meet the new standard

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Monitored, Not Detected

Last Revised – February 26, 2016

THE FOLLOWING WERE MONITORED FOR, BUT NOT DETECTED FOR EITHER THE CEDAR OR TOLT SUPPLIES
(Monitoring location is after treatment, prior to entry to distribution system for report covering 2015 data):

REGULATED VOCs $$	UNREGULATED VOCs $$	REGULATED SOCs %	UNREGULATED SOCs%
1,1 - Dichloroethylene (DCE)	1,1 - Dichloroethane	Alachlor	Arochlor 1221
1,1,1 - Trichloroethane (TCA)	1,1 - Dichloropropene	Atrazine	Arochlor 1232
1,1,2 - Trichloroethane	1,1,1,2 - Tetrachloroethane	Benzo(a)pyrene	Arochlor 1242
1,2 - Dichloroethane	1,1,2,2 -Tetrachloroethane	Chlordane	Arochlor 1248
1,2 - Dichloropropane	1,2,3 - Trichlorobenzene	Di(2-ethylhexyl)adipate	Arochlor 1254
1,2,4 - Trichlorobenzene	1,2,3 - Trichloropropane	Di(2-ethylhexyl)phthalate	Arochlor 1260
Benzene	1,2,4 - Trimethylbenzene	Endrin	Arochlor 1016
Carbon tetrachloride	1,3 - Dichloropropane	Heptachlor	Aldrin
Chlorobenzene	1,3,5 - Trimethylbenzene	Heptachlor epoxide	Butachlor
cis - 1,2 - Dichloroethylene	2,2 - Dichloropropane	Hexachlorobenzene	Dieldrin
Methylene chloride	Bromobenzene	Hexachloro-cyclopentadiene	Metolachlor
Ethylbenzene	Bromochloromethane	Lindane	Metribuzin
1,4 - Dichlorobenzene	Bromoform	Methoxychlor	Propachlor
1,2 - Dichlorobenzene	Bromomethane	Pentachlorophenol	Bromacil
Styrene	Chlorodibromomethane	Polychlorinated biphenyls (PCBs)	Terbacil
Tetrachloroethylene	Chloroethane	Simazine	Diazinon
Toluene	Chloromethane	Toxaphene	EPTC
trans - 1,2 - Dichloroethylene	cis 1,3 - Dichloropropene	**RADIONUCLIDES #**	4,4 – DDD
Trichloroethylene (TCE)	Dibromomethane	Gross Alpha	4,4 - DDE
Vinyl Chloride	Dichlorodifluoromethane	Gross Beta	4,4 – DDT
Xylenes (total)	Hexachlorobutadiene	Radium 228	Malathian
o-xylene	Isopropylbenzene		Parathion
m/p xylenes	m-Dichlorobenzene		Trifluralin
1,2 -Dibromo - 3 - chloropropane	n - Butylbenzene		PAHs (14)
Ethylene dibromide	n - Propylbenzene		Phthalates(4)
INORGANICS @	Naphthalene		Cyanazine
Antimony / Nickel	o-Chlorotoluene		
Asbestos / Nitrite	p - Isopropyltoluene		
Beryllium / Silver	p-Chlorotoluene		**UNREGULATED CONTAMINANT MONITORING ****
Cyanide / Cadmium	sec - Butylbenzene		2,4-dinitrotoluene
Mercury / Thallium	tert - Butylbenzene		2,6-dinitrotoluene
	trans 1,3 - Dichloropropene		Acetochlor
	Trichlorofluoromethane		

Pharmaceuticals/PCPs^	Synthetic Organics – Extended List^		
Sulfadimethoxine	Carboxin	Diphenamide	DCPA di-acid degradate
Sulfamethazine	Tebuthiuron	Endosulfan I	DCPA mono-acid degradate
Sulfamethoxazole	Ametryn	Endosulfan II	Molinate
Sulfathiazole	Atraton	Endosulfan Sulfate	MTBE (8/27/2007)
Lincomycin	BHC, Alpha	Endrin Aldehyde	Nitrobenzene
Tylosin	BHC, Beta	Ethoprop	Perchlorate
Carbamazepine	BHC, Delta	Etridiazole	Total DCPA degradates
Trimethoprim	Butylate	Fenamiphos	1,2-diphenylhydrazine
Acetaminophen	Chlordane, Alpha	Fenarimol	2-methylphenol
Ibuprofen	Chlordane, Gamma	Fluridone	2,4-dichlorophenol
Cotinine, Nicotine metabolite	Chlordane, Trans-nonachlor	Hexazinone	2,4-dinitrophenol
Caffeine	Chlorobenzilate	Mevinphos / Propazine	2,4,6-trichlorophenol
DEET	Chloroneb	MGK-264 / Simetryn	Alachlor ESA
Triclosan	Chlorothalonil	Napropamide / Stirofos	Disulfoton
Bisphenol A	Chlorpropham	Norflurazon / Terbutryn	Diuron
	Chlorpyrifos	Pebulate / Triadimefon	Fonofos
(^Conducted 2008)	Cycloate	Prometryn / Tricyclazole	Linuron
	Dacthal	Pronamide / Vernolate	Terbufos
	Dichlorvos	Permethrin, Cis- and Trans-	Prometon

$$ Monitoring conducted May 24, 2011 (Cedar) and September 15, 2015 (Tolt).
\# Monitoring conducted October 22, 2015.
@ Monitoring conducted May 13, 2014, except Asbestos, which was Sept. 1, 2009.
% Monitoring conducted December 11, 2013.
** Monitoring conducted September and December 2002.

UCMR 2 Contaminants

Analytes not detected:
Dimethoate
Terbufos sulfone
Flame Retardants
2,2',4,4'-tetrabromodiphenyl ether (BDE-47)
2,2',4,4',5-pentabromodiphenyl ether (BDE-99)
2,2',4,4',5,5'-hexabromobiphenyl (HBB)
2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153)
2,2',4,4',6-pentabromodiphenyl ether (BDE-100)
Explosives
1,3-dinitrobenzene
2,4,6-trinitrotoluene (TNT)
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
Parent Acetanilides
Acetochlor
Alachlor
Metolachlor
Acetanilide Degradates
Acetochlor ethane sulfonic acid (ESA)
Acetochlor oxanilic acid (OA)
Alachlor ethane sulfonic acid (ESA)
Alachlor oxanilic acid (OA)
Metolachlor ethane sulfonic acid (ESA)
Metolachlor oxanilic acid (OA)
Nitrosamines
N-nitroso-diethylamine (NDEA)
N-nitroso-dimethylamine (NDMA)
N-nitroso-di-n-butylamine (NDBA)
N-nitroso-di-n-propylamine (NDPA)
N-nitroso-methylethylamine (NMEA)
N-nitroso-pyrrolidine (NPYR)

UCMR 3 Contaminants

Analytes not detected:	
1,2,3-trichloropropane	17-β-estradiol
chlorodifluoromethane (HCFC- 22)	17-α-ethynylestradiol
bromomethane (methyl bromide)	estriol
chloromethane (methyl chloride)	equilin
bromochloromethane (Halon 1011)	estrone
1,3-butadiene	testosterone
1,1-dichloroethane	4-androstene-3,17-dione
1,4-dioxane	molybdenum
perfluorooctanoic acid (PFOA)	cobalt
perfluorononanoic acid (PFNA)	
perfluorobutanesulfonic acid (PFBS)	
perfluorohexanesulfonic acid (PFHxS)	
perfluoroheptanoic acid (PFHpA)	
perfluorooctanesulfonic acid (PFOS)	

Seattle Public Utilities

Annual Water Quality Report

- Also known as the Consumer Confidence Report
- Regulatory requirement
  - Must be mailed to customers by the end of July
  - Covers previous calendar year
- Much of the data and language must be used verbatim
- Flexibility in format, font, color and additional narrative

Seattle Public Utilities

Questions?

Seattle Public Utilities