



Water Quality

City of Columbia Council Presentation

March 1, 2016



Presentation Overview

- Water Quality Monitoring and Reporting
- Lead in Drinking Water
- Pending Distribution System Improvements / Capital Improvement Plan



Water Quality Monitoring and Reporting

- Daily Monitoring
 - Clarity (turbidity), disinfectant residual, bacteriological quality, pH, etc.
- Monthly Monitoring
 - Bacteriological Quality – average 200 samples per month
 - Disinfection By-products - 12 sites monthly
 - Distribution System Water Quality – 23 tank sites
 - Corrosion Control Parameters
- Water Quality Laboratory analyzes over 200,000 samples per year to ensure compliance
- **Our water meets or is better than all drinking water quality standards and is safe for our customers**



Water Quality Monitoring and Reporting

- Results communicated in annual Water Quality Report released each summer - www.COLACCR.com



City of Columbia 2014 Water Quality Report

Public Water System 401001 | Columbia, SC | City of Columbia Water Works

A Publication of the City of Columbia's Department of Utilities and Engineering



Columbia Water: Quality on Tap Since 1835

The United States Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (DHEC) have established strict quality standards for drinking water. These standards are designed to protect consumers against disease-causing bacteria and other harmful substances. EPA requires public water systems to send their customers an annual report containing information about their drinking water quality and compliance with the standards. The City of Columbia hopes that this report will be both informative and helpful in making personal, health-based decisions regarding your drinking water consumption.

We welcome your comments and questions. We may be reached during normal business hours by calling 803-545-3300. You are also welcome to attend regularly scheduled meetings of City Council that are generally held the first and third Tuesdays of each month at City Hall, 1137 Main Street at 6:00 p.m. Contact the Public Relations Department at 803-545-3020 for time and location or visit www.columbiaskc.net.

FUN FACT
DROPLET

City of Columbia water customers pay **LESS THAN A PENNY PER GALLON** for water available 24/7 — on tap!

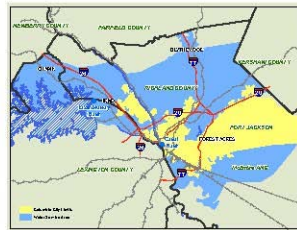


Where Does Columbia's Water Come From?

The City of Columbia operates two drinking water treatment plants. One draws water from the Broad River Diversion Canal (Canal Plant) and the other draws from Lake Murray (Lake Plant). The two plants together produce an average of 60 million gallons of water per day. This water is furnished to approximately 375,000 people in Richland and Lexington counties through more than 2,400 miles of underground pipeline. The Lake Plant generally serves the area west of the Broad River and the area north of Interstate 20; the Canal Plant serves the remaining area.

The City of Columbia uses the following series of treatment techniques to produce its drinking water:

1. Water is pumped into the treatment plants, intake areas screen out floating debris such as plastic bottles, plants, and fish.
2. Aluminum sulfate (alum) and other treatment chemicals are rapidly mixed into the water to help particles in the water clump together or coagulate. This forms heavier particles, which are referred to as floc. The water mixture is then gently mixed so that coagulating particles continue to merge into larger floc particles.



3. These floc particles pass into a sedimentation basin where they settle to the bottom and are eventually removed.

4. The water then passes through filters that contain layers of sand and anthracite coal that remove any remaining particles. The small floc particles cling to filter material as water passes through.

5. After all particles have been removed, a small amount of chlorine is added to the water to keep bacteria from developing as it travels to your home or business. A small amount of fluoride is also added to the water to assist in preventing tooth decay.

DHEC has completed a comprehensive water assessment report on the Broad River Diversion Canal (also referred to as the Columbia Canal) and Lake Murray. These Source Water Assessment reports are available and can be reviewed at 1136 Washington Street or by contacting 803-545-3300.

City of Columbia 2014 Water Quality Report

What is in Columbia's Drinking Water?

The City's drinking water met all state and federal requirements during 2014, and is considered safe to drink. The City's DHEC-certified laboratory performs more than 200,000 analyses each year to ensure that the water the City supplies to its customers meets all EPA and DHEC standards. Additional analyses are performed by DHEC, the state agency that regulates and oversees public water systems. Samples are tested at every stage of the treatment process

and at hundreds of points throughout more than 2,400 miles of pipeline that make up the City's distribution system. The City also conducts voluntary testing for microbial contaminants. Since 2004, the City has been participating in the Partnership for Safe Water. The Partnership's mission is to improve the quality of water delivered to customers by improving water system operations. The substances listed below were detected in the City's water supply during 2014.

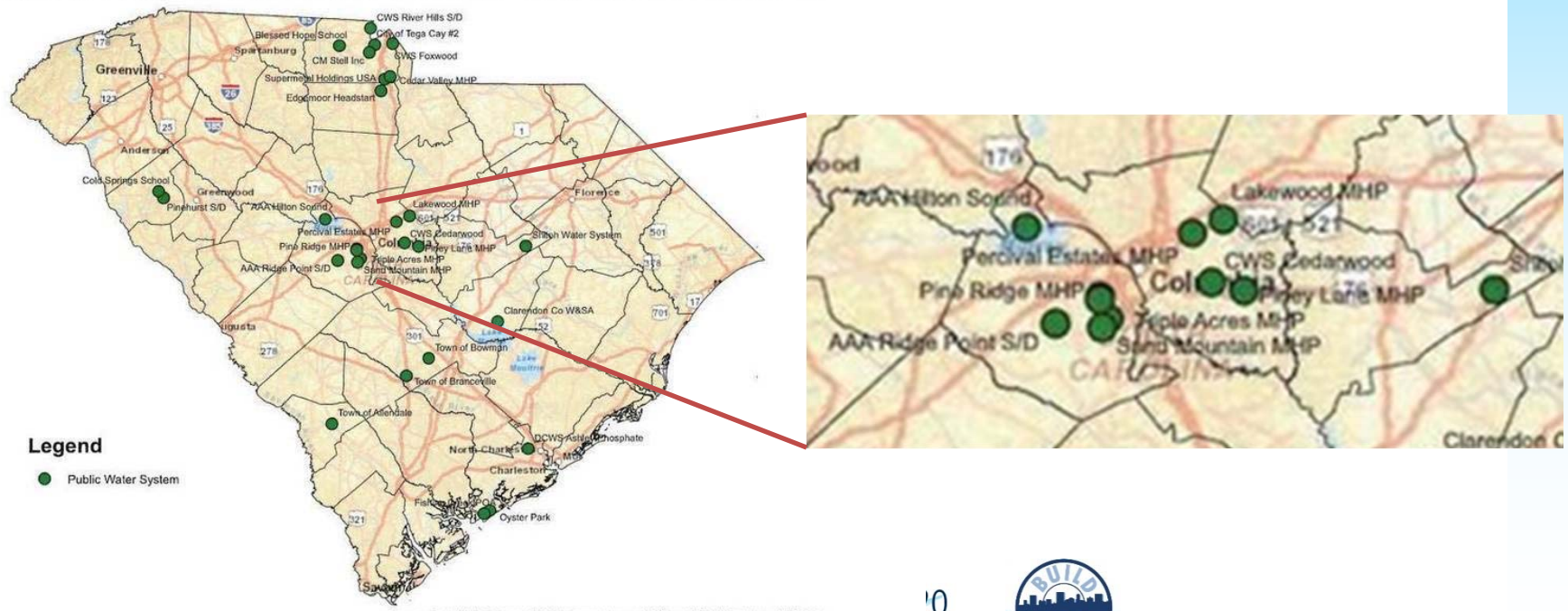
Substance	Highest Level Allowed (MCL)	Detected Level	Range of Detection	Goal (MCLG)	Violated	Year Sampled	Source of Contaminant
INORGANIC COMPOUNDS							
Lead	15 ppb (Action Level)	0.0 ppb (90th%) 0-7 ppb (range)	No sites exceeded the action level	0	None	2014	Corrosion of household plumbing systems & naturally occurring in the environment*
Copper	1.3 ppm (Action Level)	0.059 ppm (90th%) 0-0.089 ppm (range)	No sites exceeded the action level	0	None	2014	Corrosion of household plumbing systems & naturally occurring in the environment
Fluoride	4 ppm	0.54 ppm	0.52-0.56 ppm	4 ppm	None	2014	Naturally occurring in the environment by erosion of natural deposits and added at the treatment plants as an aid in preventing tooth decay
Nitrate/Nitrite (as Nitrogen)	10 ppm	0.23 ppm	0.1-0.36 ppm	10 ppm	None	2014	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits
Chlorite (Lake Plant)	1 ppm	0.664 ppm	0.342-0.664 ppm	0.8 ppm	None	2014	By-product of drinking water chlorination
Chlorite (Canal Plant)	1 ppm	0.589 ppm	0.275-0.589 ppm	0.8 ppm	None	2014	By-product of drinking water chlorination
ORGANIC COMPOUNDS							
Total Trihalomethanes (THMs) (Chloroform, Bromochloroform, Dibromochloroform, Bromoform)	80 ppb	33 ppb (RAA - Local/Annual Running Annual Average)	17-48 ppb	0	None	2014	By-product of drinking water chlorination formed when chlorine reacts with organic matter
Haloacetic Acids (HAAs) (Monochloroacetic Acid, Monobromoacetic Acid, Dichloroacetic Acid, Trichloroacetic Acid, Dibromoacetic Acid)	60 ppb	37 ppb (RAA - Local/Annual Running Annual Average)	22-47 ppb	0	None	2014	By-product of drinking water chlorination formed when chlorine reacts with organic matter
Total Organic Carbon (Lake Plant)	TT	45.26% removal (36.22% removal required)	36.30-58.10% removal	None	None	2014	Naturally occurring in the environment
Total Organic Carbon (Canal Plant)	TT	44.48% removal (35.42% removal required)	31.90-61.50%**	None	None	2014	Naturally occurring in the environment
MICROORGANISMS							
Turbidity (Lake Plant)	<0.3 NTU TT	0.20 NTU-highest single measurement 100%-lowest monthly percentage meeting standard	N/A	None	None	2014	Naturally occurring in the environment
Turbidity (Canal Plant)	<0.3 NTU TT	0.23 NTU-highest single measurement 100%-lowest monthly percentage meeting standard	N/A	None	None	2014	Naturally occurring in the environment
Total Coliform Bacteria	Presence of coliform bacteria in <5% of monthly samples.	4.4% (highest monthly percentage positive)	N/A	0	None	2014	Naturally occurring in the environment
DISINFECTANTS							
Chloramine	4 ppm	2.5 ppm @ highest quarterly average	2.2-2.6 ppm	4 ppm	None	2014	Water additive to control microbial growth
Chlorine Dioxide (Lake Plant)	800 ppb	190 ppb	0-190 ppb	800 ppb	None	2014	Water additive to control microbial growth
Chlorine Dioxide (Canal Plant)	800 ppb	497 ppb	0-497 ppb	800 ppb	None	2014	Water additive to control microbial growth

*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. The City of Columbia 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 in your pipes 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 at (800) 426-4791 or online at <http://www.epa.gov/leadinwater>.

National Concerns - Lead in Drinking Water

- “Unsafe levels of lead have turned up in tap water in city after city — in Durham and Greenville, NC in 2006; in **Columbia, S.C., in 2005;**” – **Unsafe Lead Levels in Tap Water Not Limited to Flint**, New York Times, February 8, 2016
- **Lead tainted water in SC communities**, The State Newspaper, February 19, 2016

Public Water Systems with Lead Action Level Exceedances for 2011-2015



Lead in Drinking Water


- Columbia's water was **below the USEPA action level for lead in 2005** and remains well below the action level
- Staff have been monitoring challenges of mid-western utility and understand causes
- Measures are and have been in place for 20 years to ensure those issues don't happen here

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D H E C
PROMOTE PROTECT PROSPER
C. Earl Hunter, Commissioner
Promoting and protecting the health of the public and the environment.
BUREAU OF WATER
December 9, 2005

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To: John Dooley
City of Columbia (4010001)
PO Box 147
Columbia, SC 29217

From: Amanda J. Kraft 
Drinking Water Compliance Monitoring Section
Water Enforcement Division



Re: **Lead and Copper Sampling Results**

Enclosed are the Lead and Copper test results for the monitoring period June 1 – September 30, 2005. Your water system did not exceed the action levels for lead or copper at the 90th Percentile. The action levels for lead and copper are 0.015 mg/l and 1.3 mg/l, respectively. These results must be kept on file for at least twelve (12) years.

Your water system is scheduled to sample again **June 1, 2008 – September 30, 2008**. Please remember to use the same sampling sites and their corresponding tracking codes (T-Codes). If a site is not available, a Justification for Change of Sample Site form must be submitted.

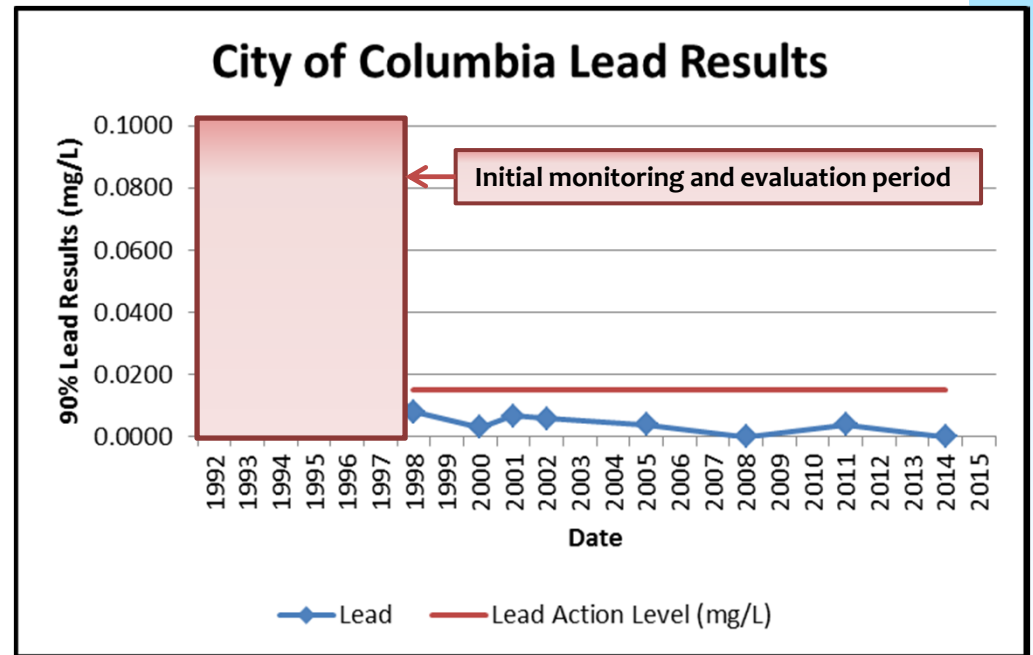
If you have any questions, please contact me at (803) 898-3794 or E-mail kraftaj@dhec.sc.gov

Enclosure



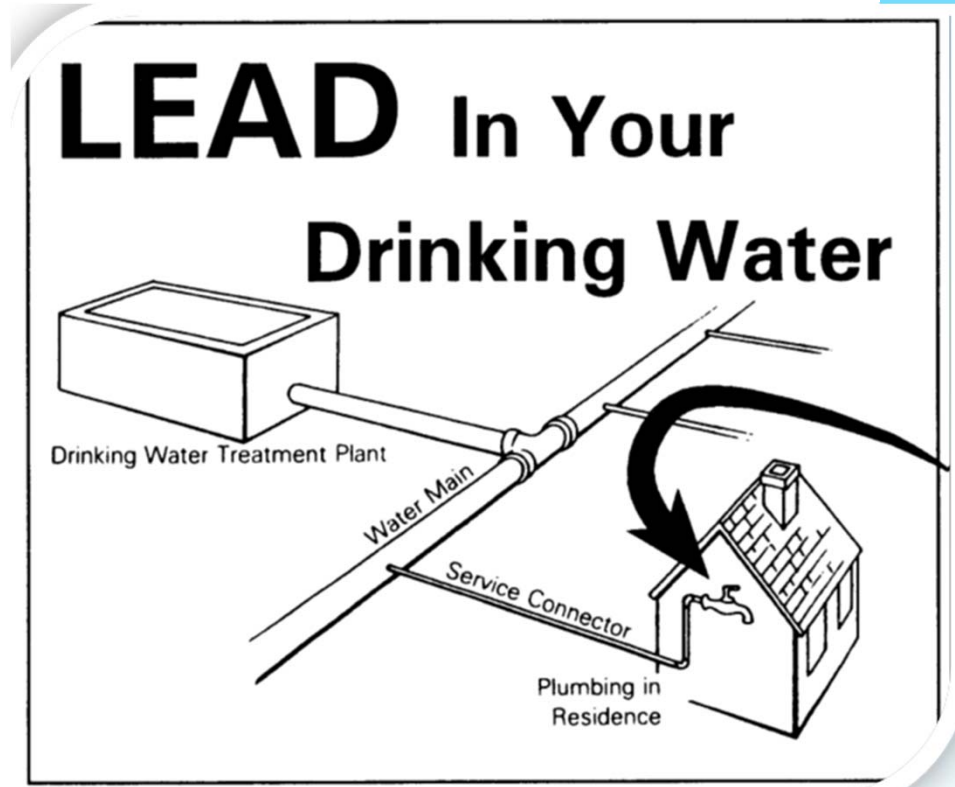
Lead in Drinking Water

- Required Monitoring
 - Monthly – corrosion control parameters to verify effectiveness of treatment
 - First draw lead sampling at higher risk customer taps every three years
- Voluntary Testing
 - Customer taps per request
 - Analysis by City's certified Water Quality Laboratory
 - No charge, call Customer Care at (803) 545-3300
- Columbia's water is below the USEPA action level for lead – **NO sites above the action level in last round of sampling**



Sources of Lead in Drinking Water

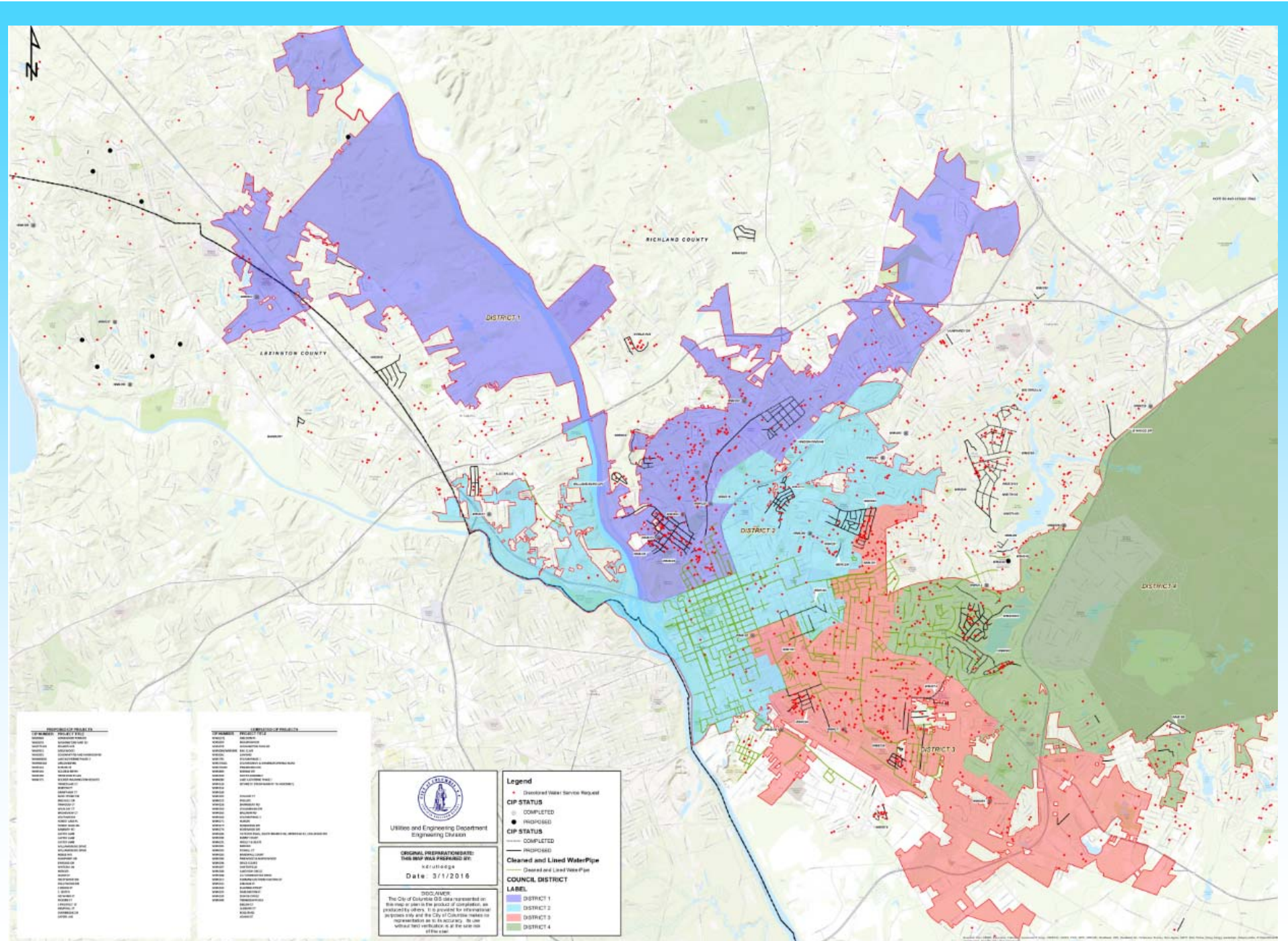
- Public education is important
- Home plumbing materials and lead service lines
- Policy of replacing lead services lines when they are discovered
- Customers are encouraged to flush their faucets for 30 seconds to 2 minutes to minimize exposure from lead in their water



Pending Improvements / CIP

- Red or brown discolored water does not mean lead is present – generally an indicator of iron in the water
- Objectionable due to color and taste, typically not indicative of health concern
- Several areas of distribution system still served by older galvanized lines
- Yearly investments in projects to address these problems
- Pending improvements to resolve water quality issues






EXISTING UTILITIES

Water	Sanitary Sewer	Storm Sewer
Electric	Gas	Telecommunications
...

PLANNED PROJECTS

Water	Sanitary Sewer	Storm Sewer
Electric	Gas	Telecommunications
...



Utilities and Engineering Department
Engineering Division

ORIGINAL PREPARATION DATE:
THIS MAP WAS PREPARED BY:
Kerutanga
Date: 3/11/2016

DISCLAIMER
The City of Columbia GIS data represented on this map is used to the product of computer-aided processing by others. It is provided for informational purposes only and the City of Columbia makes no representation as to its accuracy. Be sure to check the metadata of all the data used in this map.

Legend

- Red dot: Disconnected Water Service Request
- CIP STATUS:
 - Green circle: COMPLETED
 - Black circle: IN PROGRESS
 - Grey circle: COMPLETED
- CIP STATUS:
 - Red line: COMPLETED
 - Grey line: IN PROGRESS
- Cleaned and Lined WaterPipe**
 - Green line: Cleaned and Lined Water Pipe
- COUNCIL DISTRICT LABEL**
 - Blue: DISTRICT 1
 - Light Blue: DISTRICT 2
 - Red: DISTRICT 3
 - Green: DISTRICT 4

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