

WATER QUALITY UPDATE

May 8, 2014

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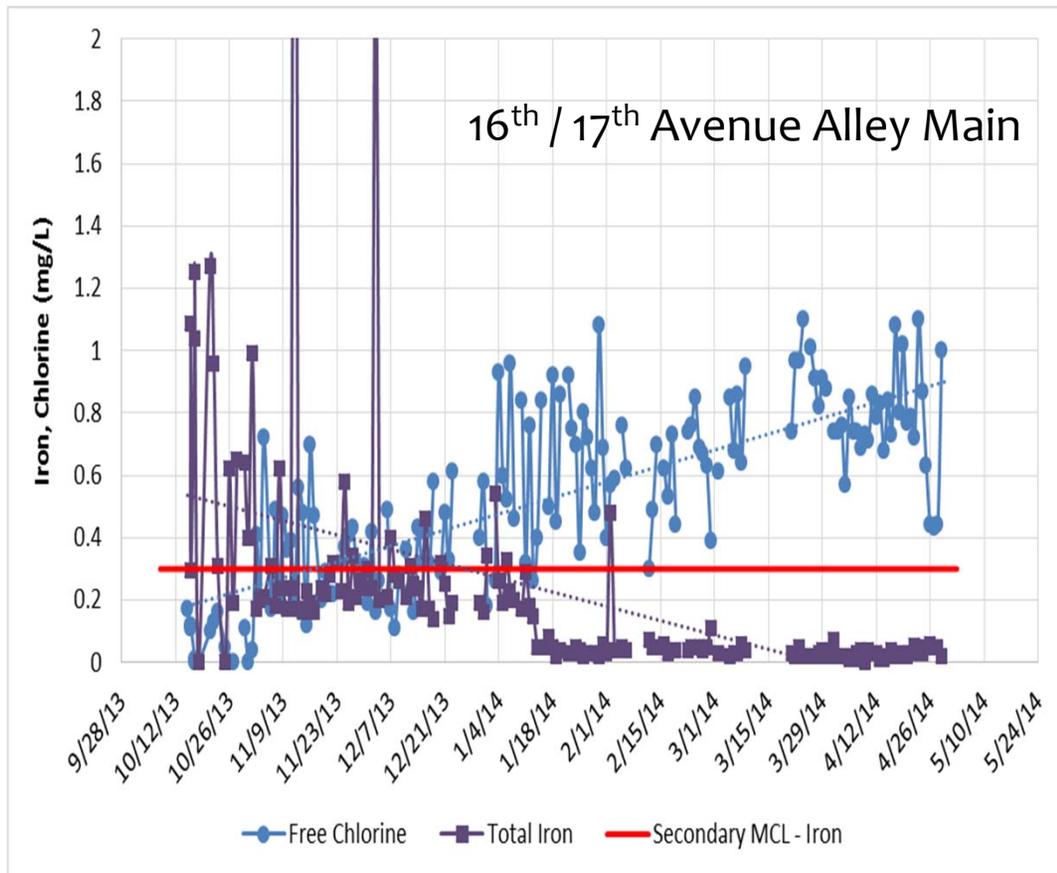
Presentation Outline

- * Customer Service
- * Emergency Main Replacement
- * Baltimore Area Water Quality
- * Distribution System Water Quality
- * Dissolved Oxygen Trials
- * Other Current Activities
- * What's Next?

Customer Service

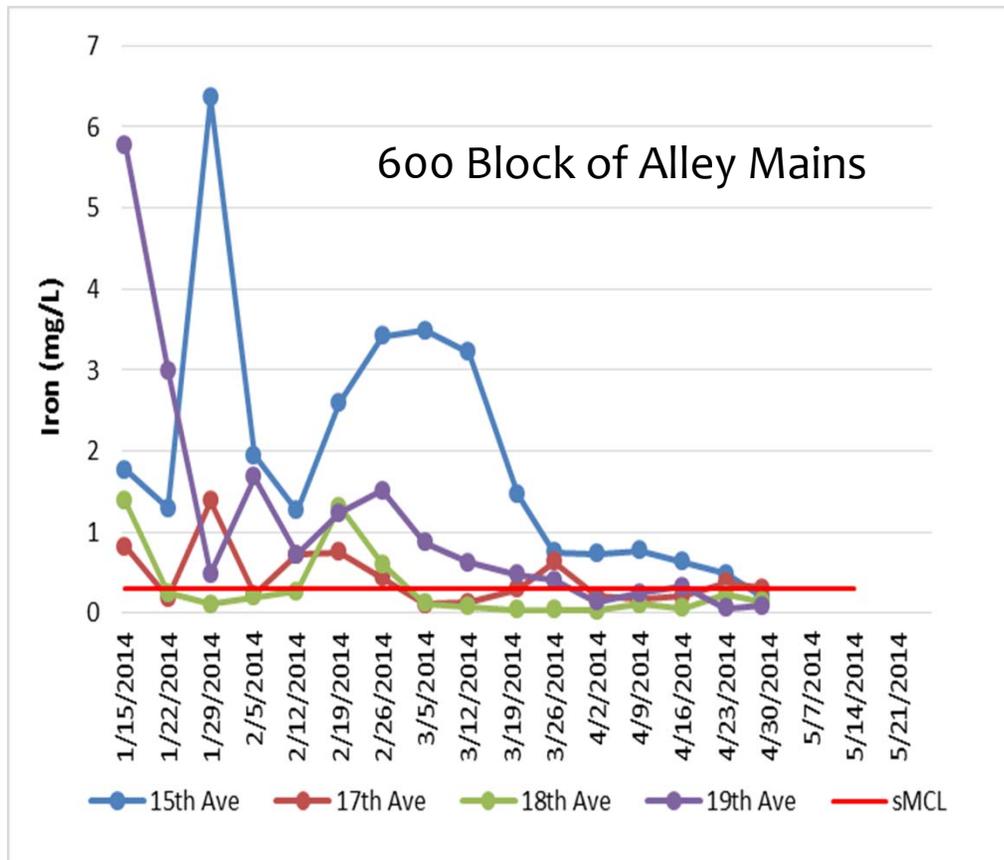
- * Bottled Water Delivery: 10-15 Homes
- * Water Quality Complaints: 5 per week average
- * Requests for WQ Testing: 9 since Jan 1, 2014
- * YMCA Shower Privileges: No use
- * 6-month Rate Reductions: Expired mid April, 2014
- * 2-month Rate Reductions: 2 active; expire May 24

Emergency Main Replacement



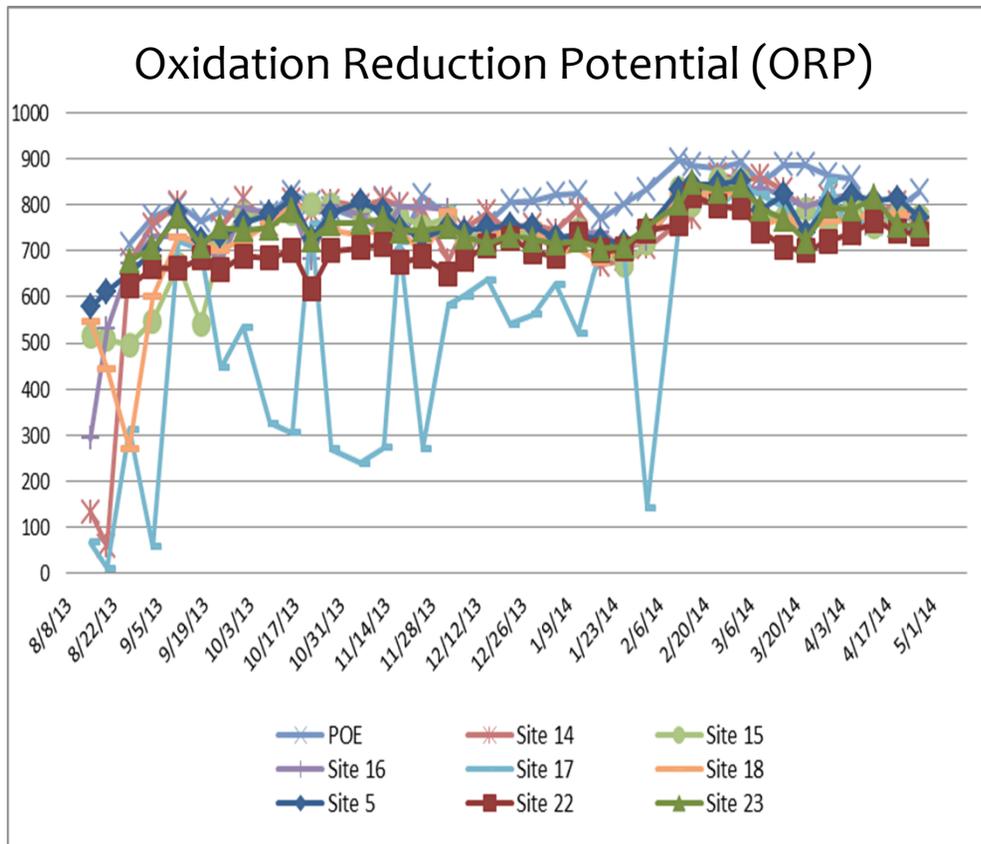
- * Complete April 23, 2014
- * 1 meter tested daily
- * Fe, Mn below SMCL's
- * Chlorine above 0.2 ppm

Baltimore Area Water Quality



- * 4 Hydrants tested weekly
- * Mn below SMCL
- * Fe declining but elevated
- * Moving auto flushers from Nichols to Baltimore

Distribution System Water Quality



- * 9 sites tested weekly
- * Fe, Mn below SMCL's
- * Chlorine meets target of 0.6-0.8 ppm in most areas
- * Stable ORP
- * All signs indicate system continues to stabilize
- * Refining test parameters for on-going monitoring

Dissolved Oxygen Trials

* OBJECTIVE:

- * Add DO to see if we can cut back on chlorine but maintain ORP to prevent Fe and Mn release

* APPROACH:

- * Use pipe rigs to represent worse case scenario
- * Vary flow, stagnation, and re-circ to simulate real life
- * Compare low, moderate and high DO levels
- * Monitor Fe, Mn release and change in ORP, chlorine

Dissolved Oxygen Trials

Dissolved Oxygen Containers



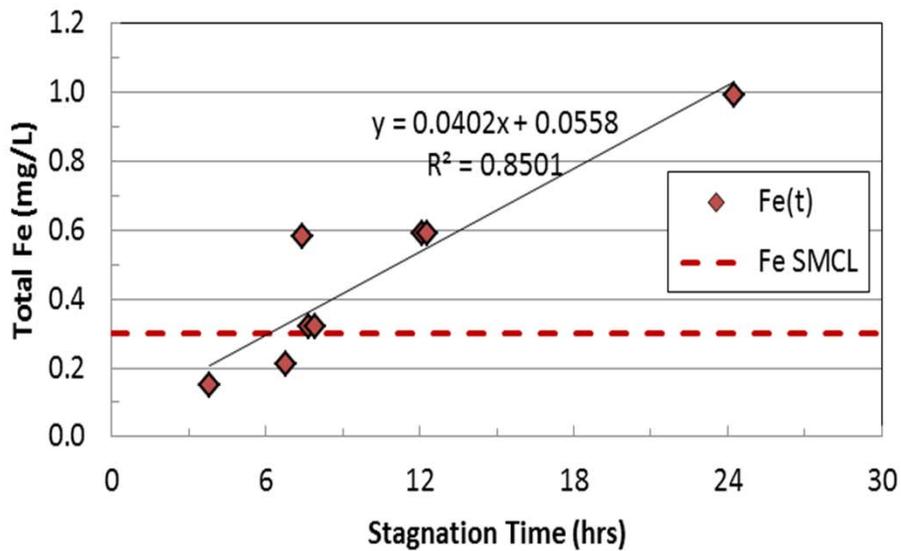
Pipe rigs and injection piping



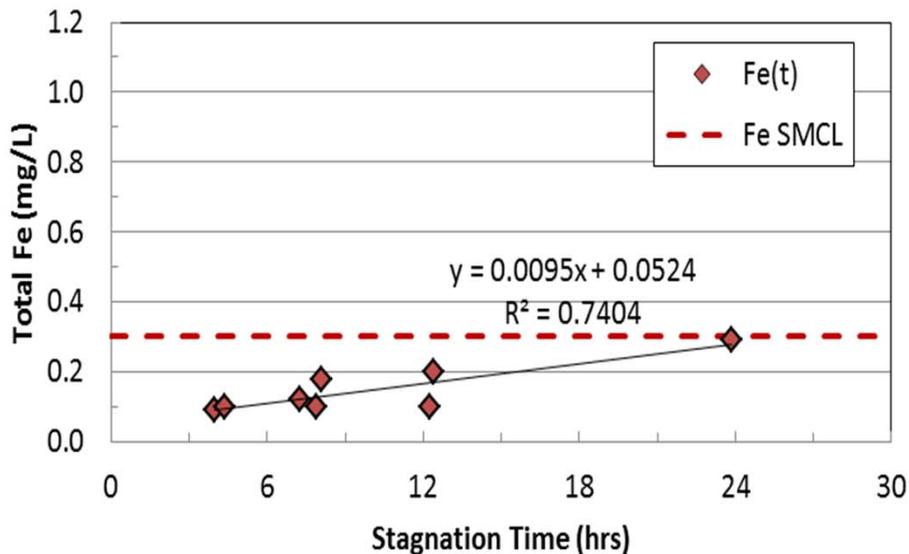
Low vs. Moderate DO: the iron story

- * Low DO (0-1 mg/L):
 - * Fe exceeded SMCL after 7-hours
- * Moderate DO (4-5 mg/L):
 - * Fe less than SMCL during 24-hour stagnation
 - * Preliminary results positive

Low DO: Total Fe vs Stagnation Time



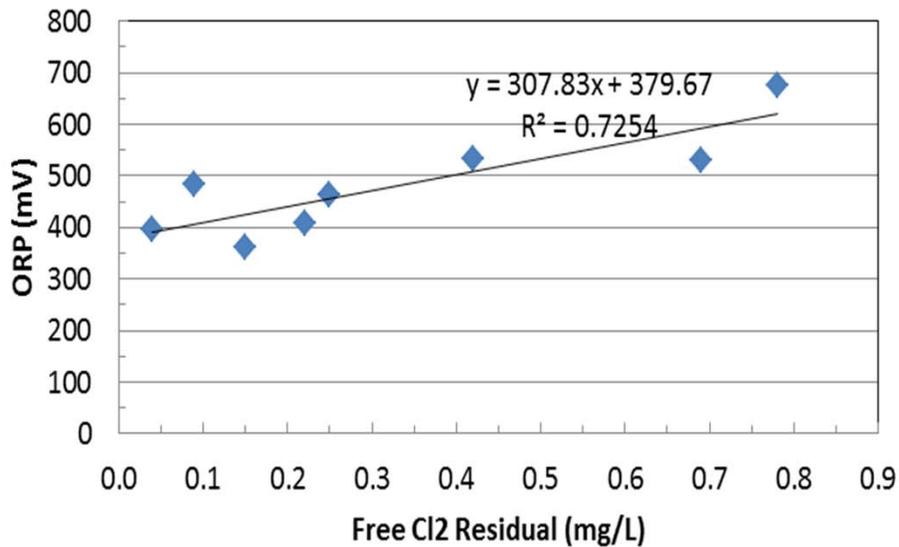
Moderate DO: Total Fe vs Stagnation Time



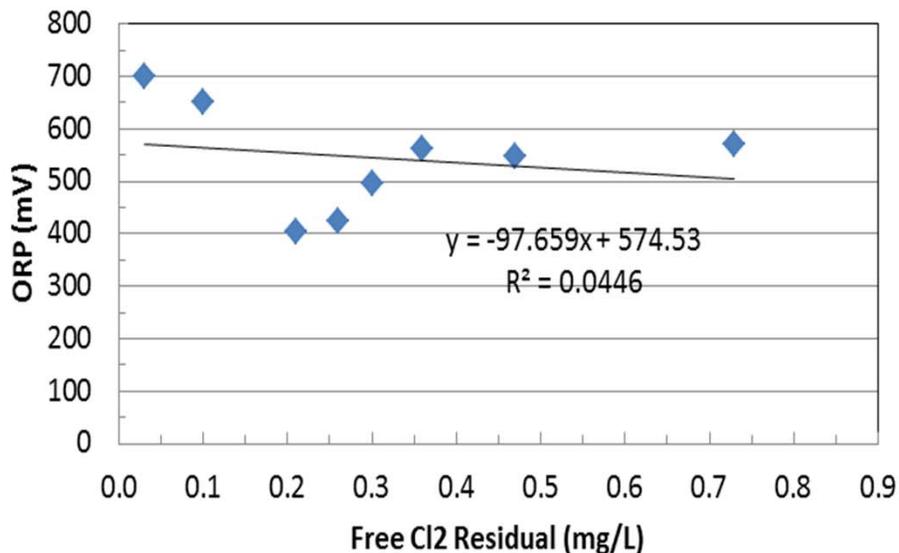
Low vs. Moderate DO: the chlorine story

- * Low DO (0-1 mg/L):
 - * ORP directly correlates to free chlorine
- * Moderate DO (4-5 mg/L):
 - * ORP becomes independent of chlorine concentration
 - * Preliminary results positive

Low DO: ORP vs Free Cl2



Moderate DO: ORP vs Free Cl2



Other Current Activities

- * x-Ray Fluorescence and x-Ray Diffraction testing by EPA
 - * Results expected within 2-3 weeks
- * Health assessment by independent toxicologist underway - Intertox
 - * No adverse health effects identified or expected based on initial review

	Maximum Tolerable Intake (mg/day)	Water Consumption to Reach Maximum (# 8-oz glasses)
Iron	56	40
Manganese	9.8	150
Hardness (Calcium)	1000	35
Silica	1500	68

- * Design of post-chlorination system at treatment plant underway
 - * Construction start/end : October – December 2014

What's Next?

- * DO injection analysis
 - * Estimate DO injection system costs
 - * Additional DO trials depending on cost/benefit analysis
 - * Final recommendation
- * Final health assessment fact sheets by Intertox