

EXPERTISE

EPCOR OPERATORS

- Some friendly and familiar faces
- The City has made offers of employment to EPCOR's five certified operators.
- Accepted the offers
- Historical knowledge and experience with existing system
- Work with EPCOR on smooth transition

UTILITIES ENGINEER

The City is currently in the process of hiring a project engineer of utilities who will:

- Manage the staff & training program;
- Manage the capital program;
- Coordinate the installation of storm, sanitary and water projects;
- Ensure the safe operation of the water treatment plants; and
- Oversee the completion of the TWQMP

THE CITY'S CURRENT OPERATIONS INCLUDE:

- Manage the storm and sanitary sewer pipe network & pump stations
- Sanitary and drainage master plans
- Computerized models of the sewer systems
- Financial & capital planning for replacement of infrastructure
- Review all water utility works in the City's right-of-way
- Many municipalities manage their own pipe network and treatment plants

DAY TO DAY OPERATIONS

The City is committed and obligated to provide safe reliable drinking water. The City must meet stringent federal guidelines and regulations.

THE CITY WILL

- Run the day to day operations
- Operate the water treatment plant
- Review water servicing for development
- Prepare servicing agreements for development
- Install water services
- Read water meters
- Repair watermain breaks
- Perform water quality testing
- Answer public inquiries
- Prepare annual reports
- Implement a cross connection program (back-flow preventer)
- Prepare and execute capital and maintenance plans

TOTAL WATER QUALITY MANAGEMENT PLAN

ABOUT THE PLAN

1. Disinfection of distribution system
 - Fraser Health requirements 0.2mg/L chlorine residual by June 30, 2016
2. Increase storage capacity at Oxford and Merklin sites
 - Seismic upgrade at Merklin site – removal of existing water tower
3. Additional supply to meet the future demand in 2031
4. Arsenic removal if limit exceeds the Guideline for Canadian Drinking Water Quality (GCDWQ)
 - Arsenic concentration are within current limits
 - Fraser Health requirements by December 31, 2018
5. Manganese removal if GCDWQ establishes a limit for health effects
 - Currently there is only an aesthetic limit

PHASING

Phase 1 Oxford Site

Construction of a treatment plant and reservoir
Boost pumping capacity
Construction is almost complete

Phase 2 Merklin Site

Construction of a treatment plant and reservoir
Demolishing existing water tower
Work is scheduled to start in December 2015 continue until December 2016

Phase 3 High Site (adjacent to Mann Park Bowling)

Seasonal well
New disinfection system required

METRO VANCOUVER OPTION

Connecting to the Metro Vancouver would occur at the closest tie in point: South Surrey Athletic Park (SSAP) located at 148th Street and 20th Ave.

This would require the City to:

- Purchase property and build a pump station on Surrey property at SSAP
- Construct distribution lines to get the water to both Oxford and Merklin reservoirs
- Pay Metro Vancouver for the cost of the water

Metro Vancouver would need to perform upstream improvements to their system to meet the additional population demand

- The City would be required to pay for these improvements
- These improvements would need to be designed and scheduled by Metro Vancouver
- Could take years to fully implement

The TWQP project would still be required as the project addresses:

- Storage, pumping and seismic deficiencies

CHEMICAL DISINFECTION

TWO OPTIONS

1. SODIUM HYPOCHLORITE (FREE CHLORINE)

- Reacts with manganese and will cause staining of laundry and plumbing fixtures
- Lowers aesthetic quality of water
- Customer complaints due to staining
- Possible additional maintenance as chlorine reacts with manganese
- Possible additional dosing station to maintain effectiveness through the system
- Environmental concerns must be addressed

Note: Both processes involve trace amounts of chemicals and are approved for use in public water supplies.

Sodium Hypochlorite Bench-Scale Test

Oxford Water (Wells 1, 2, & 3) Treated With Hypochlorite					Untreated Water
Contact Time	Targeted Free Residual Chlorine (mg/L after 15 min. of contact)				
	0.0	0.5	1.0	2.0	
10 Minutes					
4 Hours					
24 Hours					

Source: EPCOR bench-scale chlorination of White Rock well water April 2015

2. CHLORAMINE (CHLORINE AND SMALL AMOUNT OF AMMONIA)

- Chloramination is the process that adds chloramines to drinking water
- Many cities in Canada have been using the chloramination process for decades to purify drinking water and eliminate the bacteria that cause waterborne diseases, i.e. Abbotsford
- Chloramine is a more stable and persistent disinfectant than chlorine
- Preserves the quality of water disinfected at the water treatment plant as it travels through the distribution system
- Chloramine reduces the taste and odour of chlorine in tap water
- Does not react with manganese so may minimize complaints due to staining
- Environmental concerns must be addressed

Chloramine Bench-Scale Test

Oxford Water (Wells 1, 2 & 3) Treated With Monochloramine					Untreated Water
Contact Time	Targeted Combined Residual Chlorine (mg/L after 15 min. of contact)				
	0.0	0.5	1.0	2.0	
10 Minutes	Not Analyzed				
4 Hours	Not Analyzed				
24 Hours					

Source: EPCOR bench-scale chloramination of White Rock well water April 2015

GIVE YOUR FEEDBACK

OPTION 2 is being recommended to the City. Lab testing with chloramines showed positive results with maintaining aesthetic quality of water. Fraser Health has reviewed the disinfection process. What do you think? Fill out a feedback form.

ARSENIC AND MANGANESE

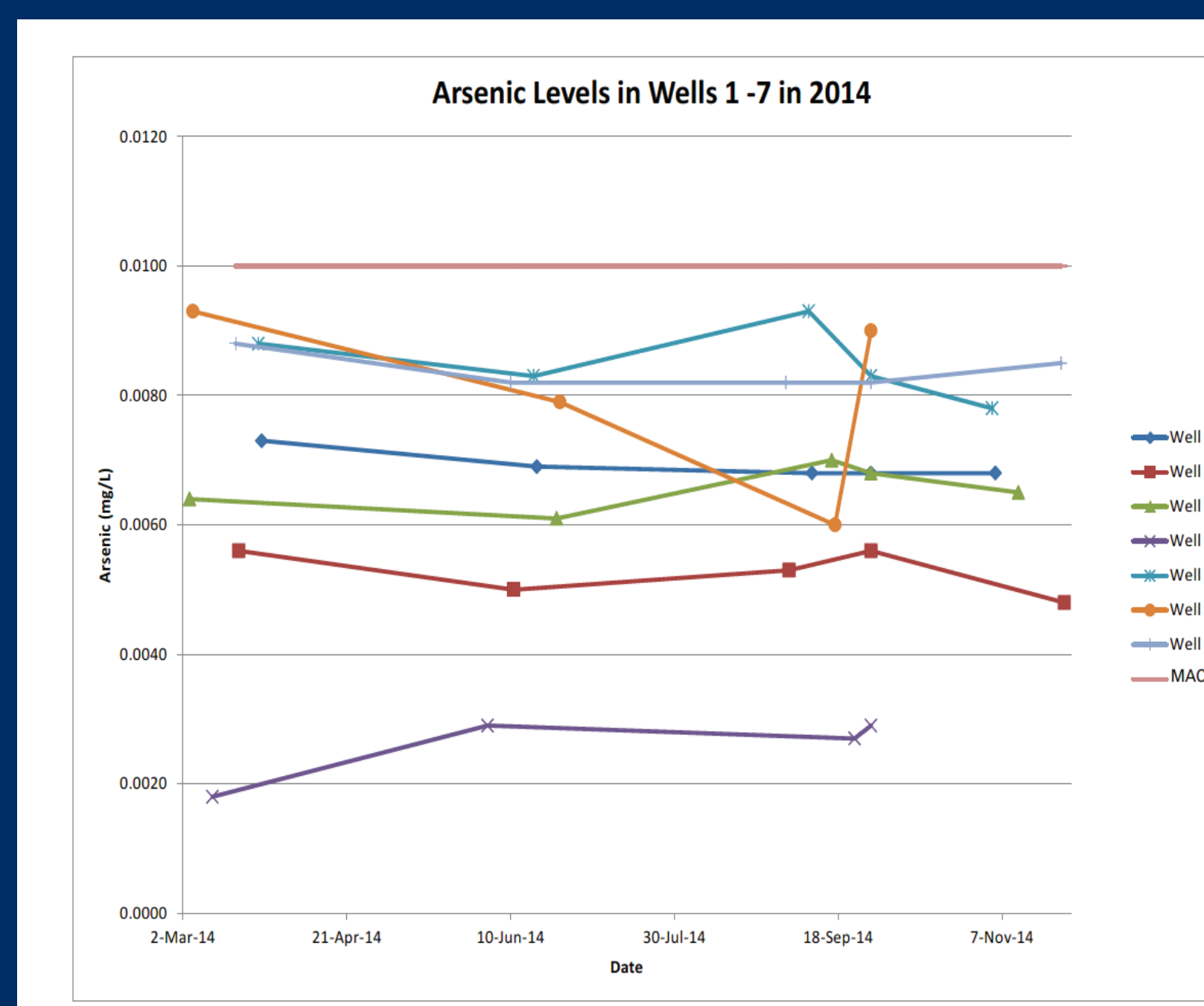
ARSENIC TREATMENT

Guideline for Canadian Drinking Water Quality (GCDWQ) published by Health Canada

- Sets out microbial, radiological, chemical and physical parameters

Arsenic

- Naturally occurring in ground water
- Maximum acceptable concentration of 0.010 mg/L by GCDWQ
- Fraser Health requirement to provide treatment if limits exceeds GCDWQ by December 31, 2018
- The EPCOR 2014 Performance Report indicates 209 samples were taken
- Minimum concentration of 0.0018 mg/L
- Maximum concentration of 0.0099 mg/L
- Average concentration of 0.008 mg/L



EPCOR has been monitoring naturally occurring arsenic levels routinely in conjunction with Fraser Health. In 2007, Health Canada reduced the Maximum Acceptable Concentration (MAC) levels for arsenic from 0.025 mg/L to 0.010 mg/L. They also communicated that although the new MAC for arsenic is set at 0.010 there may be health risks associated at lower levels.

In 2014, our tests show arsenic levels under the MAC.

Source: EPCOR 2014 Performance Report

MANGANESE TREATMENT

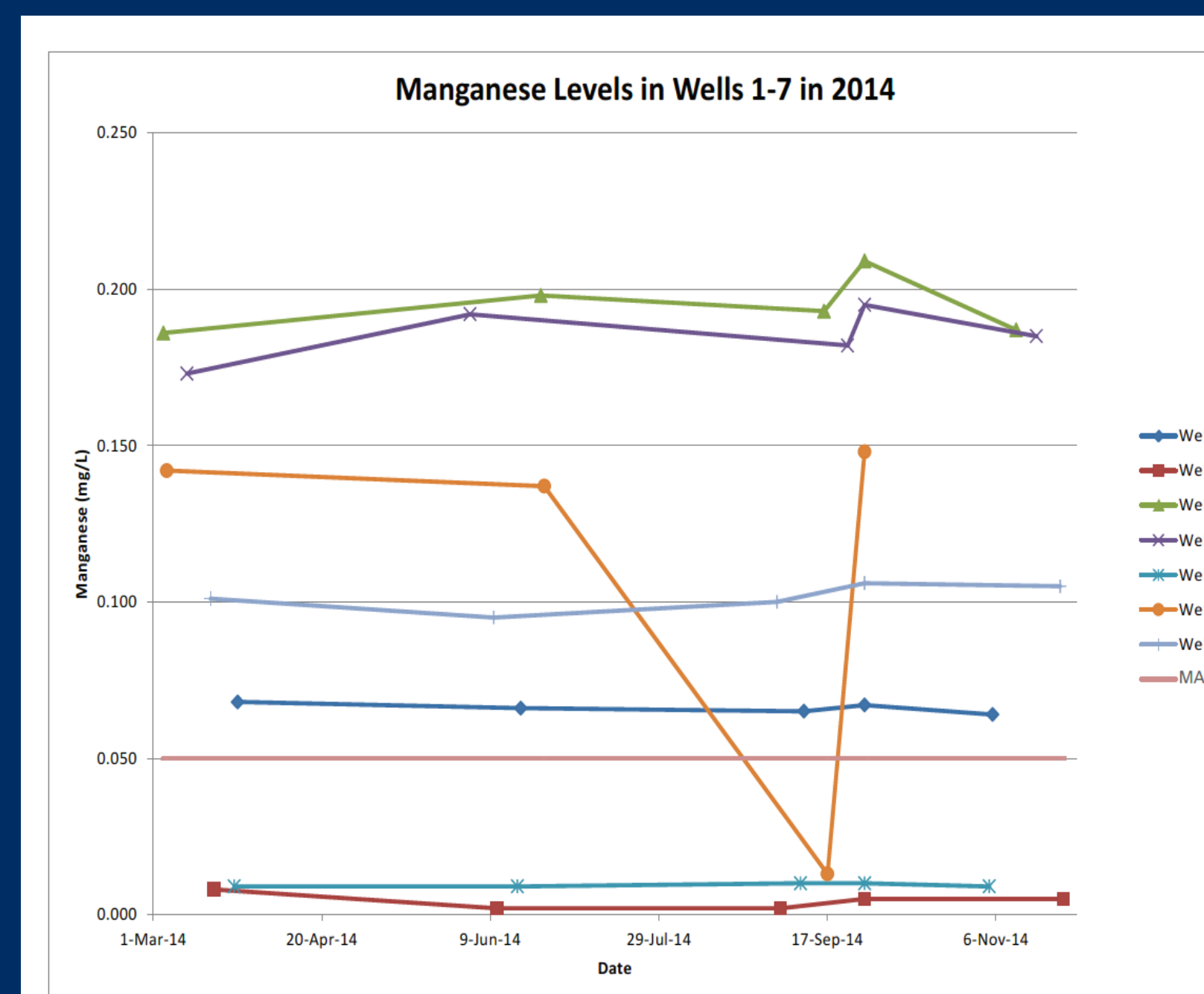
Guideline for Canadian Drinking Water Quality (GCDWQ) published by Health Canada

Aesthetic level of less than 0.05 mg/L

Manganese

- Causes staining of laundry and plumbing fixtures
- Can affect taste of water
- The EPCOR 2014 Performance Report indicates 209 samples were taken
- Minimum concentration of 0.001 mg/L
- Maximum concentration of 0.209 mg/L
- Average concentration of 0.076 mg/L

The same treatment method removes both arsenic and manganese. The layout and design of the Oxford and Merklin sites have been sized to accommodate future arsenic and manganese treatment, if required.



The GCDWQ aesthetic objective (AO) for manganese is 0.05 mg/L. At levels above 0.15 mg/L it can cause staining of plumbing and laundry, as well as an objectionable taste.

Source: EPCOR 2014 Performance Report