

City of Estevan
WT/WWT Service Division
2015
Annual Report on Drinking Water

Annual notice to consumers

44(1) At least once each year, every permittee of a waterworks supplying water intended or used for human consumptive use or hygienic use shall provide consumers supplied by the waterworks with a notification of:

- (a) the quality of water produced or supplied by the waterworks in comparison with the levels set out in these regulations; and
- (b) the permittee's compliance with sample submission requirements described in the permittee's permit.

(2) As soon as possible after complying with subsection (1), the permittee shall provide the minister with written notice of the permittee's compliance.

13 Dec 2002 cE-10.21 Reg 1 s44.

This report has been developed to meet this regulation and is available for the public to review.



CITY OF ESTEVAN



MEMORANDUM

DATE: January 12, 2016
TO: Jeff Ward, City Manager
FROM: Kevin Sutter, AScT - WTP/WWTP Manager

RE: 2015 Annual Water Quality Report

The Environmental Management and Protection Act, 2002 and the related Water Regulations, 2002, state in section 44 that at least once each year, every permittee of a waterworks intended or used for human consumptive use shall provide consumers supplied by the waterworks with a notification of:

- (a) the quality of water produced or supplied by the waterworks in comparison to the levels set out in the regulations, and
- (b) the permittee's compliance with sample submission requirements

The attached is a copy of the 2015 Annual Report and a copy of the 2015 Notice to the consumers. The 2015 Annual Report will be available at City Hall and at the Estevan Public Library as well as on a PDF format on the City Web Site. The Notice to consumers will be placed in two consecutive editions of the City Page and will also be placed on the City Web Site. The Water Security Agency will be notified that the requirements of the Act and Regulations for the notification will be met in this fashion.

Our annual average Total Trihalomethanes (TTHM) is above the Maximum Acceptable Concentration (MAC) set by the Water Security Agency for 2015. The limit is 100 parts per billion and 2015's average was 125 ppb leaving the plant. TTHM's are created when free chlorine comes into contact with carbon based organics and are regulated because of the possible carcinogenic properties these compounds hold. In 2012 the Water Security Agency and the environmental protection officer stipulated that the City must develop a plan by September 2013 on how it plans to lower the TTHM's. The City hired a consultant to study the possibility of using Rafferty water as our raw water source as it contains lower amounts of dissolved organic carbons. In doing this and utilizing the WTP improvements we have put in place over the last 8 years the study found that the TTHM levels can be reduced meeting the regulatory requirements. WSA was notified that this would be the City's plan and the City has applied for grant funding under the Canada Builds Grant to help finance this project and will implement it when funding is available.

In July 2015 a leak occurred at the WTP on a manifold pipe that ties all the transmission mains together. It was isolated and the manifold was taken off line as it could not be repaired and requires replacement. We bypassed the water around the manifold to get the system up and running but this distribution manifold will need to be replaced in 2016 and budget has been set for this purpose.

The Waterline Replacement Program has been limited in the past few years while the City reduces its overall debt, but it will need to continue to keep both the quality and quantity of the water supplied to an optimal level in the coming years. The proposed 5 year plan will allow for this work to commence.

The design has been completed for the Water Treatment Plant Residuals Management Area. This project was also included in the grant application. The residuals management would include stilling ponds to de-water the solids removed during water treatment and allow us to discharge the WTP backwash and blowdown water into the river without impact to the environment.

We received a few consumer complaints at the WTP over the year and each of them was rectified when a closed valve was found which created a dead end. These dead ends allow for the residual chlorine levels to drop which quickly reduces the water quality. When we received the complaint the area was flushed and the valve(s) opened which remedied the situation.

The WTP roof over stage 2 Treatment Plant has been replaced with a new membrane and it is under warranty for the next 2 years. Leakage was causing a lot of problems with the interior of the plant as well as endangering the roof structure. Work started and completed on this project in 2015.

City of Estevan - 2015 Notice to consumers for Water Quality Estevan Waterworks

Call 634-1822 for further explanation

Parameter	Required Testing by Permit each year	Number of Tests Completed in 2015	Number of Tests Not Meeting the Permit in 2015
<p>1. Bacteriological A harmless form of bacteria called Total Coliform is routinely monitored in the distributed water. If found, coliform show a break down in the disinfection process or possible outside contamination. Positive results require additional testing to test for pathogens</p>	<p>154 Regular Samples A sample after each main repair or construction</p>	<p>156 34</p>	<p>0 0</p>
<p>2. Turbidity (on-site) - Turbidity is a measure of the clarity of the water. - For our water supply, turbidity shall not exceed 0.3 NTU from any filter.</p>	<p>1. After each filter on a continuous basis. 2. Daily from the storage reservoir before entering the distribution system 3. At the same frequency and locations as for bacteriological samples.</p>	<p>1. Continuous 2. Every 2 hours 3. Completed for the bacteriological samples</p>	<p>0 0 0</p>
<p>3. Fluoride (on-site) - Fluoride is added as a dental aid - Levels not to exceed 1.5 mg/l</p>	<p>365</p>	<p>365</p>	<p>0</p>
<p>4. Fluoride (off-site testing) Levels not to exceed 1.5 mg/l</p>	<p>52</p>	<p>52</p>	<p>0</p>
<p>5. Chlorine Residual (on-site) - Chlorine is added to disinfect the water and the levels must be maintained at: - a chloramine residual of not less than 0.5 mg/l throughout the distribution system. - free ammonia of >0.1 mg/l < 0.5 mg/l</p>	<p>1. Every four (4) hours per day for treated water entering the distribution system 2. At the same frequency and locations as for bacteriological sampling, for free and total residuals.</p>	<p>1. Every 2 hours operators perform an analysis and also monitored continuous with on-line instruments 2. Completed for the bacteriological samples 190 samples and 304 spot checks</p>	<p>0 0</p>
<p>6. Chemical & Health Panel alkalinity; bicarbonate; calcium; carbonate; chloride; conductivity; hardness; magnesium; nitrate; pH; sodium; sulphate; and total dissolved solids; aluminium; arsenic; barium; boron; cadmium; chromium; copper; iron; lead; manganese; selenium; uranium; and zinc</p>	<p>4</p>	<p>4</p>	<p>0</p>
<p>7. Pesticides and Organics</p>	<p>1 every 2 years</p>	<p>1</p>	<p>0</p>
<p>8. Total Trihalomethanes (TTHM's) THM's are a disinfection by-product and are not an immediate risk but over time THM ingestion is a suspected carcinogen. Each individual sample is not to exceed 350 ppb and annual average not to exceed 100ppb</p>	<p>4</p>	<p>4</p>	<p>4 exceeding 100 ppb The levels of TTHM's have been reduced by switching to Chloramination but the annual average is still above 100 ppb. We are working toward another raw water source in Rafferty that contains less organics and therefore less TTHM's will be formed during disinfection.</p>
<p>9. Cyanide and Mercury</p>	<p>1 every 2 years</p>	<p>1</p>	<p>0</p>

The City of Estevan Water Treatment Plant is a surface water plant that focuses on the removal of suspended solids and the inactivation of pathogenic organisms through a multiple barrier approach, i.e. chemical aided settling, filtration, disinfection. All limits that each parameter must be within, comes from the Environmental Protection Act 2002 and associated Regulations to that Act. Go to www.saskh2o.ca for details and a complete listing of all levels throughout the province. A full detailed listing of all the levels of these parameters as well as the Waterworks Annual Report is located at www.estevan.ca or is available at the Estevan Library and City Hall.

**CITY OF ESTEVAN
TREATED DRINKING WATER ANALYSIS
SUMMARY
2015**

NOTES:

- A value given in box denotes a calculated average over the given time period. All other values indicate the latest one time grab sample.
- All values in mg/l unless indicated otherwise.
- MAC is the Maximum Acceptable Concentration as per the Department of Environment
- IMAC is the Interim Maximum Acceptable Concentration as per the Department of Environment
- AO is the Aesthetic Objective set by the Department of Environment and Resource management
- PO is our Plant Objective.
- * Indicates a problem constituent, see comments at the end of the report for explanation.

PHYSICAL PARAMETERS:

	<u>2015</u>	<u>2014</u>	RECOMMENDED OBJECTIVE
Colour, units	4	6	15 AO
Temperature, deg C	14.6	12.9	15.0 AO
pH	7.23	7.02	6.5-9.0 AO
*Turbidity, NTU	0.07	0.08	0.30 MAC
Chlorine Free Residual leaving plant, mg/l	2.43	2.12	2.5<>1.5 PO
Fluoride, mg/l	0.8	0.6	1.5 MAC
Total Dissolved Solids, mg/l	1209	1096	1500 AO

HEALTH AND TOXICITY AND OTHER METALS: (mg/l)

	<u>2015</u>	<u>2014</u>	RECOMMENDED OBJECTIVE
Boron	0.46	0.40	5 IMAC
Cyanide Total	<0.002	<0.002	0.2 MAC
Mercury	<0.000010	<0.00002	0.001 MAC
Selenium	0.0028	0.00245	0.01 MAC
Aluminium	0.0612	0.0532	0.2 PO
Arsenic	0.00244	0.00241	0.025 MAC
Barium	0.0888	0.0953	1 MAC
Calcium	81.6	82.2	
Cadmium	0.000026	0.000027	0.005 MAC
Chromium	0.0004	0.00031	0.05 MAC
Copper	0.0075	0.0081	1 MAC
Iron	<0.020	<0.02	0.3 MAC
Potassium	21.0	19.7	
Magnesium	59.1	60.7	500 MAC
Sodium	183	179	300 AO
Lead	0.00018	0.00017	0.01 MAC
Zinc	<0.0060	<0.0050	5 AO
Uranium	0.00295	0.00286	0.02 MAC
* Total Trihalomethanes In Distribution System	125	113	One year ave < 0.10 MAC

BACTERIOLOGICAL:

	<u>2015</u>	<u>2014</u>	RECOMMENDED OBJECTIVE
Total Samples Taken	156	158	No sample to contain >200 background
<200 Background	0	0	
*>200 Background	0	0	
Positive Coliform Bacteria	0	0	0 MAC
Giardia			
Cryptosporidium			

OTHER IN-HOUSE LAB RESULTS:

	<u>2015</u>	<u>2014</u>	RECOMMENDED OBJECTIVE	
Alkalinity	236	221	500	AO
Conductivity	1473	1391		
Iron	0.02	0.02	0.3	AO
Chlorides	62	11	250	AO
Hardness	448	434	800	AO
Nitrates	2.0	1.9	45	MAC
Sulphates	400	376	500	MAC
Manganese	0.032	0.037	0.05	AO

PESTICIDES and OTHER ORGANICS:

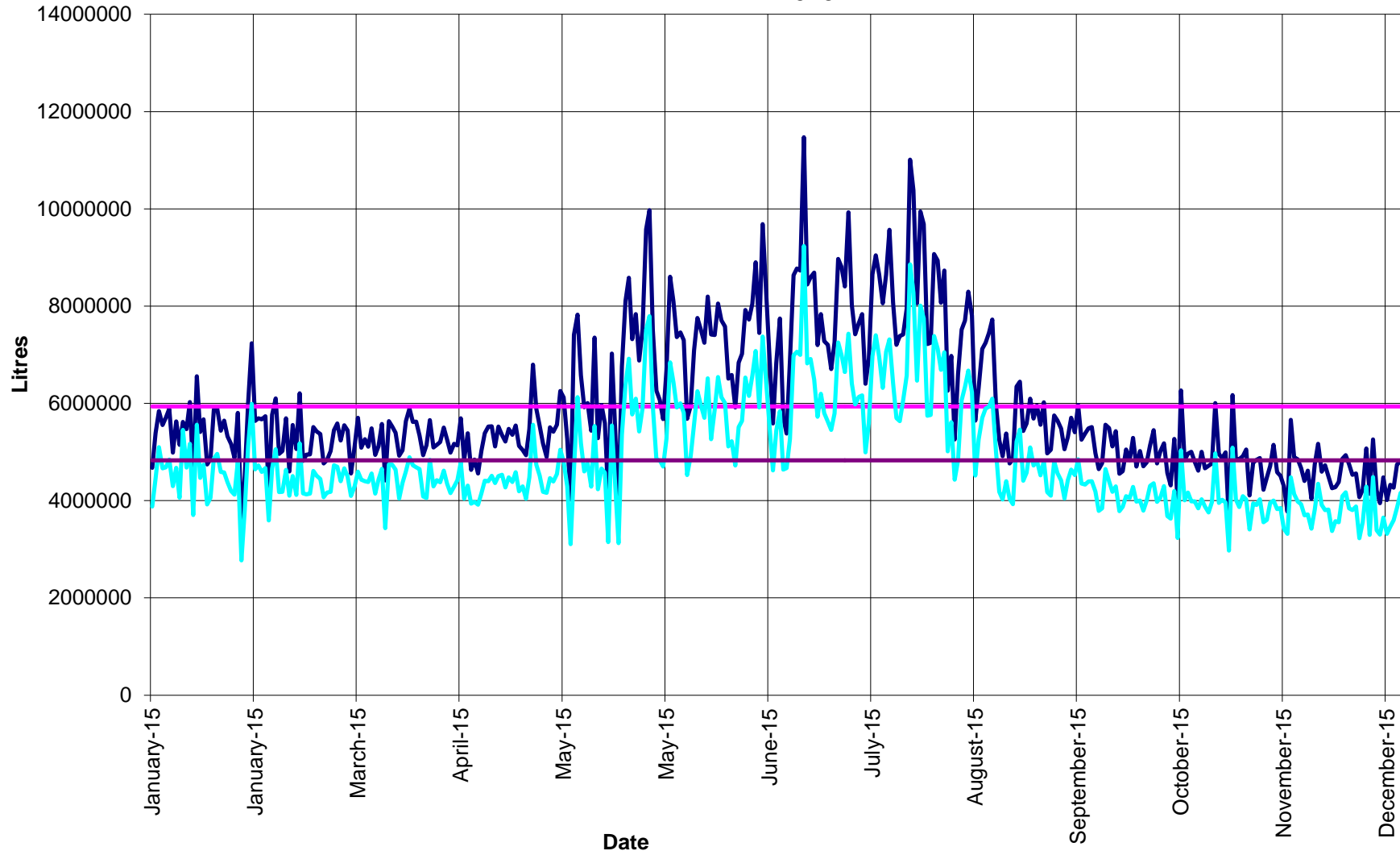
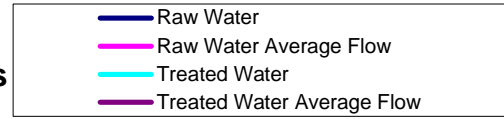
	<u>2015</u>	<u>2014</u>	RECOMMENDED OBJECTIVE	
2,4-D	<0.00010	<0.00015	0.1	IMAC
1,1-Dichloroethylene	<0.001	<0.001	0.014	MAC
1,2-Dichlorobenzene	<0.00050	<0.001	0.02	MAC
1,2-Dichloroethane	<0.001	<0.001		
1,4-Dichlorobenzene	<0.001	<0.001		
2,3,4,6-Tetrachlorophenol	<0.0005	<0.0005	0.1	MAC
2,4-Dichlorophenol	<0.0005	<0.0005	0.9	MAC
2,4,6-Trichlorophenol	<0.0005	<0.0005	0.005	MAC
Atrazine	<0.00020	<0.0001	0.009	IMAC
Benzene	<0.0005	<0.0005	0.005	MAC
Benzo (a) pyrene	<0.00001	<0.00001	0.00001	MAC
Bromoxynil	<0.00010	<0.00010	0.005	IMAC
Carbon Tetrachloride	<0.00010	<0.00010	0.005	MAC
Chlorobenzene	<0.001	<0.001	0.08	MAC
Chlorpyrifos	<0.00020	<0.00010	0.09	MAC
Carbofuran	<0.00020	<0.00010	0.09	MAC
Dichloromethane/Methylene chloride	<0.0050	<0.0010	0.05	MAC
Dimethoate	<0.00020	<0.00010	0.2	IMAC
Dicamba	<0.00010	<0.00010	0.12	MAC
Diclofop-methyl	<0.00020	<0.00010	0.009	MAC
Ethylbenzene	<0.00050	<0.00050		
Malathion	<0.00020	<0.00010	0.19	MAC
Pentachlorophenol (PCP)	<0.00050	<0.0001	0.06	MAC
Picloram	<0.0001	<0.0001	0.19	IMAC
Trifluralin	<0.00020	<0.00010	0.045	IMAC
Toluene	<0.00050	<0.0005	0.024	AO
Tetrachloroethylene	<0.0010	<0.0010	0.05	MAC
Vinyl chloride	<0.00050	<0.0005	0.002	MAC
Xylene	<0.00050	<0.0005	0.3	AO

COMMENTS:

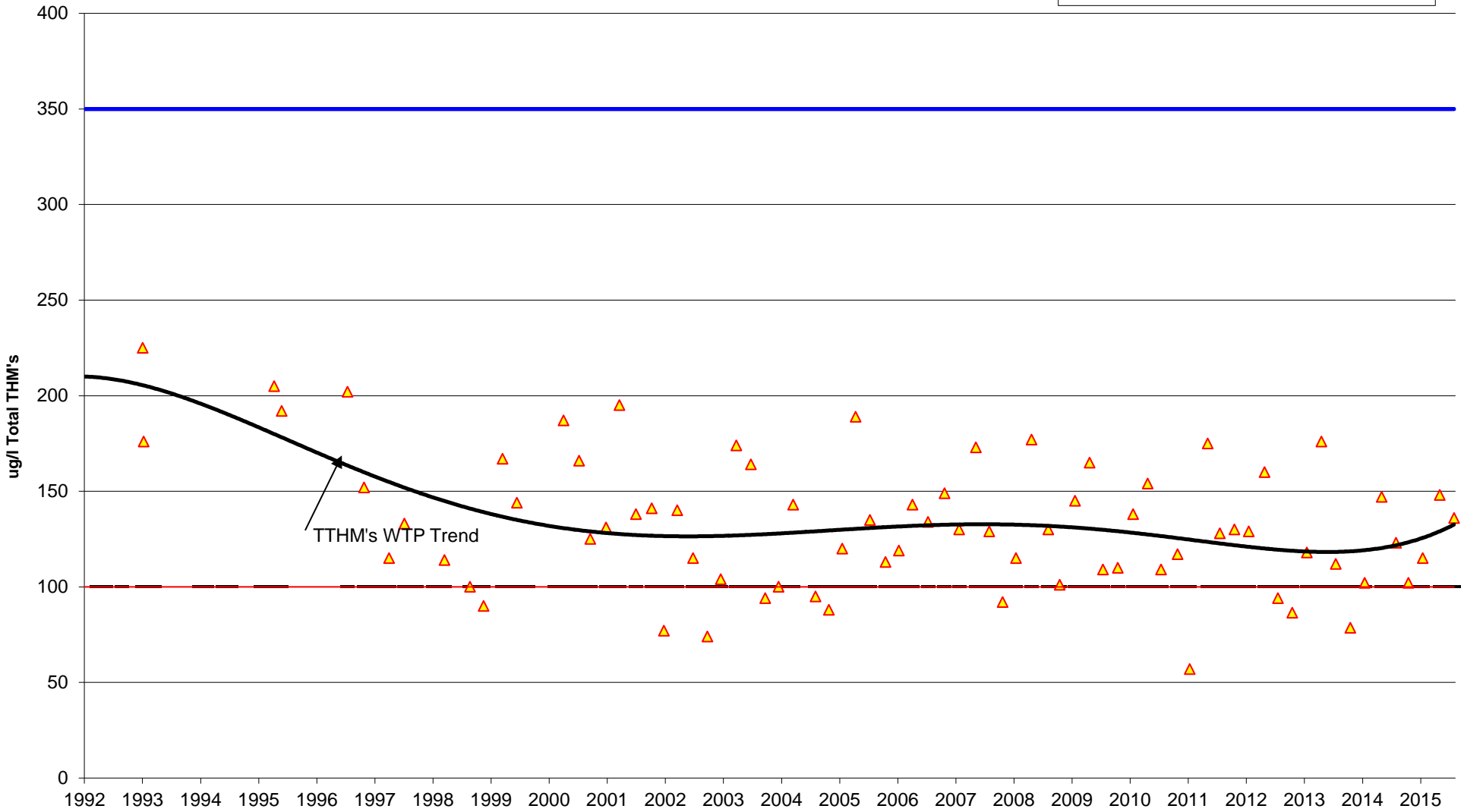
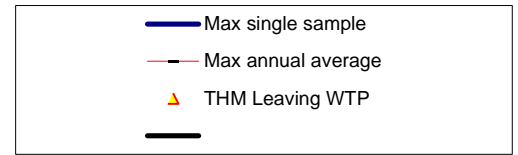
Total Trihalomethanes (THM)

The maximum concentration of THMs in any one sample is 0.35 mg/l, which we are under. Over the long term, the average concentration in the samples collected throughout the year should be below 0.10 mg/l. We will not be able to achieve this without major changes to both the water treatment plant, and the distribution systems. THMs are created when chlorine reacts with the dissolved organics in the water. Money and resources are being set aside to reduce this contaminant.

City of Estevan Water Treatment Plant Flows 2015



City of Estevan Water Distribution System 1992 to 2015



**CITY OF ESTEVAN
RAW WATER ANALYSIS
SUMMARY**

2015

NOTES:

- A sample of Boundary Dam water is sent away to an independent lab 4 times a year as is required by permit. The following chart lists these results.
- Many other analysis are completed in house on the raw water for operation reasons, but this is the testing that we are required to report.
- All values in mg/l unless indicated otherwise.

Parameter	2-Feb-2015	3-May-2015	4-Aug-2015	9-Nov-2015
Suspended Solids (fixed)	4	1	6	1
Suspended Solids (volatile)	1	2	2	2
Suspended Solids (Total)	5	3	8	3
Conductivity	1654	1297	1470	1545
Sulphate	598	423	505	541
pH	8.3	8.1	262.0	8.5
Total Alkalinity	301	232	262	279
Bicarbonate	365	283	314	323
Sodium	214	152	175	192
Magnesium	69	49	57	59
Calcium	93	71	81	81
Total Hardness	516	379	437	445
Chloride	25.1	20	22	25
Potassium	20	18	19	20
BOD	0.0	0.0	0.0	0.0
Dissolved Organic Carbon	44.6	16.3	14.5	13.9
Total Nitrogen	1.80	1.70	1.40	1.30
TKN	1.2	1.1	0.9	0.9
Phosphorus (Total)	0.47	0.42	0.47	0.49
Phosphorus (Ortho)	0.45	0.34	0.42	0.45
E.Coli	10	0	0	0
MPN Coliforms (Total)	20	1314	75400	318
TDS	1388	1018	1178	1251
% UV Transmittance	37	36	37	42

2015 Average
3 mg/l
1.75 mg/l
5 mg/l
1492 uS/cm
517 mg/l
71.7 units
268.5 mg/l
321 mg/l
183.25 mg/l
58.5 mg/l
81.5 mg/l
444.25 mg/l
23 mg/l
19 mg/l
0.0 mg/l
22.3 mg/l
1.55 mg/l
1.0 mg/l
0.46 mg/l
0.42 mg/l
2.50 orgs/100ml
19263 orgs/100ml
1209 mg/l
38 %

2014 Average
5 mg/l
2 mg/l
6.5 mg/l
1379.25 uS/cm
470 mg/l
8.3 units
248 mg/l
299 mg/l
160 mg/l
53 mg/l
77.5 mg/l
411.75 mg/l
19.725 mg/l
16.75 mg/l
0 mg/l
16.0 mg/l
1.65 mg/l
1.0 mg/l
0.71 mg/l
0.40 mg/l
10.25 orgs/100ml
29490 orgs/100ml
1099 mg/l
37 %

**City of Estevan
Water Treatment Plant
2015 Quarterly Summary
January - March**

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	7,236,100	3,553,000	5,334,012
Treated Water	5,990,900	2,769,600	4,469,236

Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	10.5	4.0	7.0
Turbidity (NTU)	0.14	0.05	0.08
Colour (Units)	9	1	5
Ph	7.36	7.19	7.28

General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Chlorine residual (mg/l)	2.31	1.93	2.14
Fluoride (mg/l)	1.18	0.48	0.81
Alkalinity (mg/l)	304	244.00	275
Conductivity (microohms/cm3)	1700	1510	1651
Iron (mg/l)	0.04	0.01	0.02
Manganese (mg/l)	0.059	0.007	0.040
Chlorides (mg/l)	59	57.000	58
Hardness (mg/l)	560	484	522
Nitrates (mg/l)	2.3	1.9	2.1
Sulfates (mg/l)	480	360	420

Outside lab analysis

One time grab samples treated water	
Trihalomethanes (ug/l)	102
Calcium (mg/l)	92
Magnesium (mg/l)	69
Sodium (mg/l)	216
Sulphate (mg/l)	631
TDS (mg/l)	1374

City of Estevan
Water Treatment Plant
2015 Quarterly Summary
April - June

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	9,974,000	3,853,100	6,444,306
Treated Water	7,794,100	3,102,700	5,145,212
Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	19.5	9.5	14.1
Turbidity (NTU)	0.12	0.05	0.07
Colour (Units)	9	1	4
pH	7.28	6.94	7.08
General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
WTP Chlorine residual (mg/l)	2.88	2.00	2.28
Fluoride (mg/l)	1.07	0.16	0.75
Alkalinity (mg/l)	232	116	201
Conductivity (microohms/cm3)	1370	1240	1295
Iron (mg/l)	0.03	0.01	0.01
Manganese (mg/l)	0.053	0.017	0.029
Chlorides (mg/l)	65	60	63
Hardness (mg/l)	420	362	388
Nitrates (mg/l)	2.1	1.8	1.9
Sulfates (mg/l)	610	270	350
Outside lab analysis			
One time grab samples treated water			
Trihalomethanes (ug/l)		115	
Calcium (mg/l)		71	
Magnesium (mg/l)		50	
Sodium (mg/l)		151	
Sulphate (mg/l)		457	
TDS (mg/l)		1007	

**City of Estevan
Water Treatment Plant
2015 Quarterly Summary
July - September**

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	11,473,000	4,766,500	7,190,279
Treated Water	9,235,900	3,928,500	5,779,950
Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	25.2	19.4	23.1
Turbidity (NTU)	0.09	0.04	0.06
Colour (Units)	8	1	4
Ph	7.70	6.72	7.35
General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Chlorine residual (mg/l)	3.29	1.69	2.56
Fluoride (mg/l)	1.14	0.39	0.80
Alkalinity (mg/l)	272	214	236
Conductivity (microohms/cm3)	1500	1360	1438
Iron (mg/l)	0.03	0.01	0.01
Manganese (mg/l)	0.051	0.012	0.026
Chlorides (mg/l)	64	62	63
Hardness (mg/l)	440	368	421
Nitrates (mg/l)	2	1.8	1.9
Sulfates (mg/l)	470	360	405
Outside lab analysis			
One time grab samples treated water			
Trihalomethanes (ug/l)		148	
Calcium (mg/l)		80	
Magnesium (mg/l)		57	
Sodium (mg/l)		188	
Sulphate (mg/l)		539	

**City of Estevan
Water Treatment Plant
2015 Quarterly Summary
October - December**

Daily Flows	Daily Maximum (l)	Daily Minimum (l)	Daily Average (l)
Raw Water	6,264,500	3,583,600	4,775,578
Treated Water	5,087,700	2,971,400	3,924,946
Physical Parameters	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Temperature (Deg C)	20.6	8.1	13.9
Turbidity (NTU)	0.09	0.04	0.06
Colour (Units)	8	1	4
Ph	7.50	7.08	7.22
General Chemical Composition	Daily Maximum	Daily Minimum	Daily Average
Treated Water			
Chlorine residual (mg/l)	3.20	2.15	2.72
Fluoride (mg/l)	1.77	0.40	0.76
Alkalinity (mg/l)	272	212	235
Conductivity (microohms/cm3)	1540	1460	1505
Iron (mg/l)	0.11	0.01	0.03
Manganese (mg/l)	0.072	0.001	0.031
Chlorides (mg/l)	63	61	63
Hardness (mg/l)	504	420	460
Nitrates (mg/l)	2.0	1.7	1.9
Sulfates (mg/l)	510	370	425
Outside lab analysis			
One time grab samples treated water			
Trihalomethanes (ug/l)		136	
Calcium (mg/l)		80	
Magnesium (mg/l)		60	
Sodium (mg/l)		194	
Sulphate (mg/l)		577	
TDS (mg/l)		1248	

Waterworks Compliance Inspection - Human Consumptive Use (Part I)

System Name: ESTEVAN WATERWORKS

Remote Inspection ID:
242008

Approval No: 00002174-04-00

Population: 12000

Announced: No

Date: 27-MAR-2015 07:15

Person Interviewed: SUTTER, KEVIN

General Section

Water Supplies in Service : SURFACE WATER **System Classification:** FOUR WT TWO WD

of Service Connections: 3850 **System Type:** MUNICIPAL SYSTEM

Service Connection Metering: Yes

Comments:

N/A

Contacts

Name	Position	Phone / Fax	Email
SUTTER, KEVIN	MANAGER	Phone: (306) 388-2545 Business: (306) 634-1822 Cell: (306) 421-0114	N/A
MARCOTTE, NICOLE	CERTIFIED OPERATOR	Business: (306) 634-1822	N/A
VELESTUK-FICHTER, TRACY	CERTIFIED OPERATOR	Business: (306) 634-1822	N/A
MESSNER, TYSON	CERTIFIED OPERATOR	Business: (306) 634-1822	N/A

Complaints:

PERIODIC CONSUMER COMPLAINTS. USUALLY RESULTS IN TESTING OF LOCATION

Information Delivered to Operator:

NONE

Operator Certification Section

Operator Name	Certification Levels		Expiry Date	Operator is a Supervisor	Certification Exam Written	Taken Training	Plans to Test or Take Training
	Water Distribution	Water Treatment				# of CEUs	
SUTTER, KEVIN	TWO	FOUR	15-SEP-2015	Yes	Yes	.0	Yes
MARCOTTE, NICOLE	TWO	FOUR	15-SEP-2015	No	Yes	.0	Yes
VELESTUK-FICHTER, TRACY	TWO	FOUR	15-SEP-2015	No	Yes	.0	Yes
MESSNER, TYSON	TWO	THREE	15-APR-2016	No	Yes	.6	Yes

Test Results

Station #	Sample ID	Location/Comments	Variable	Flag	Measurement	Qualifier
SK05NB0007	2015065131	WATER PLANT	CHLORINE (FREE)	N/A	.120 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	2.940 mg/l	N/A
"	"	"	FLUORIDE TOTAL (SPADNS)	N/A	1.040 mg/l	N/A
"	"	"	TURBIDITY	N/A	.202 NTU	N/A
"	2015065132	WELLOCK	CHLORINE (FREE)	N/A	.770 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	1.950 mg/l	N/A
"	"	"	TURBIDITY	N/A	.268 NTU	N/A
"	2015065133	SMITH	CHLORINE (FREE)	N/A	.790 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	2.320 mg/l	N/A
"	"	"	TURBIDITY	N/A	.212 NTU	N/A
"	2015065134	DRADER	CHLORINE (FREE)	N/A	.100 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	1.720 mg/l	N/A
"	"	"	TURBIDITY	N/A	.297 NTU	N/A
"	2015065135	CHINOOK	CHLORINE (FREE)	N/A	.370 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	1.750 mg/l	N/A
"	"	"	TURBIDITY	N/A	.271 NTU	N/A
SK05NB0029	2015065136	AFTER FILTER 1	TURBIDITY	N/A	.197 NTU	N/A
"	2015065137	AFTER FILTER 2	TURBIDITY	N/A	.298 NTU	N/A
SK05NB0007	2015065138	AFTER FILTER 3	TURBIDITY	N/A	.235 NTU	N/A
"	2015065139	AFTER FILTER 4	TURBIDITY	N/A	.258 NTU	N/A
"	2015065140	AFTER FILTER 5	TURBIDITY	N/A	.238 NTU	N/A
"	N/A	OPERATORS TEST OF WATER PLANT	CHLORINE (FREE)	N/A	.150 mg/l	N/A
"	"	"	CHLORINE (TOTAL)	N/A	2.860 mg/l	N/A
"	"	"	FLUORIDE TOTAL (SPADNS)	N/A	1.000 mg/l	N/A

"	"	"	TURBIDITY	N/A	.127 NTU	N/A
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Equipment Validation

Turbidity

Equipment Type	Equipment Name/Number	STD1(L) (Expected, Test)	STD2 (Expected, Test)	STD3 (Expected, Test)	STD4 (Expected, Test)	Result	Gel Standard
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Chlorine

Equipment Type	Equipment Name/Number	STD1 (Expected, Test)	STD2 (Expected, Test)	STD3 (Expected, Test)	Result
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Human Consumptive Regulatory Section

C=Compliant NC=Non-Compliant N/A=Not Applicable

C	NC	NA	General	Comments
X			Approved system EMPA 21(1)	
X			Certified operator 63	
			Distribution System	
X			Common trenching 26(1,2,3)	
X			Disinfection of new and repaired pipelines 26(4) 30(4)	
			Water Storage Reservoirs	
X			Water tight cover 27(2)a	
X			In good repair 27(2)b	
X			Manholes 27(3,4)	
X			Pipe entries installed to prevent contamination 27(5)	
X			Vents 27(6)	
			Water Treatment Plants and Pumphouses	
X			Floor drainage 28(a)	
X			Drain lines to sanitary sewers have trap 28(b)	
X			Backflow prevention device 28(c)	
X			Water meter(s) installed 28(d)	
X			Adjustable chemical feeder 28(e)	
X			Facility is clean and in orderly condition 28(f)	
X			Approved chemicals being used 30(3)	
X			Proper fluoride chemical dosage 30(7)	
			Disinfection	
X			Continuous disinfection 30(5)	
X			A free chlorine residual as required in the Permit to Operate a Waterworks - EMPA2002 Section 23(1)(b) and 34(1)&(2)	FREE CHLORINE REQUIRED PRIOR TO AMMONIA ADDITION.
X			A total chlorine residual of not less than 0.5 mg/L OR a free chlorine residual of not less than 0.1 mg/L in water throughout the distribution system 30(6)b	

			Standards	
X			Bacteriological 32	
			Turbidity	
			Surface	
			Chemically Assisted Filtration	
			Source Water Greater than or equal to 1.5	
X			Less than or equal to 0.3 NTU discrete measurements (95%) 33(2)a(i)A(I)	
X			Less than or equal to 0.3 NTU continuous measurements (95%) 33(2)a(i)A(II) (2)a(i)B	
X			Not to exceed 1.0 NTU 33(2)a(i)C	
			Source Water less than 1.5	
			Membrane Filtration	
			Slow Sand/Diatomaceous Earth Filtration	
			Other Filtration Technology	
X			3-log reduction of Giardia lamblia and Cryptosporidium parvum 33(2)d(i)	
X			4-log reduction of viruses 33(2)d(ii)	
X			Waterworks turbidity levels meet the standards (Effective Dec 2006 2008)	
	X		Chemical standards 29(4,5) and 34	THE THM ISSUE HAS STALLED WITH THE ONLY FEASIBLE OPTION BACK TO A DIFFERENT WATER SOURCE. THE AVG FOR 2014 WAS 112UG/L. THIS ISSUE MUST BE RECTIFIED ASAP
	X		Waterworks meets the chemical health and pesticide related standards (Effective Dec 2008 2010)	SEE ABOVE
			Assessment	
X			Proper waterworks assessment 35	ASSESSMENT IS IN THE DRAFT STAGE. FINAL COPY DUE BY DECEMBER 31, 2015
			Operational Anomalies	
X			Reported upset condition 37(1)	
X			Reported chlorine upset 37(2)	
			Testing	
X			Bacteriological testing 39(1)	
X			Bacteriological follow-up 39(4) (9)	
X			Bacteriological sample after completion, alteration, extension or repair 40	
X			Chlorine monitoring 39(1)	
X			Fluoride monitoring 41	
			Other Constituents 39(1)a	
X			General chemical sampling conducted	DONE AS REQUIRED

X			Health and toxicity sampling conducted	DONE AS REQUIRED
X			Trihalomethane sampling conducted	DONE AS REQUIRED
X			Pesticides sampling conducted	DONE AS REQUIRED
X			On-site turbidity tests conducted	
X			Accredited laboratory 39(2)	
			Operational Records	
X			Daily water meter reading 42(1)a	
X			Types, dosages and total amounts of chemical 42(1)b	
X			Samples - locations, sampler, and results 42(1)c	
X			Abnormal operating procedures 42(1)d (1)e	
X			Upset conditions 42(1)f	
X			Chlorine upsets 42(1)g	
X			Calibration of equipment 42(1)h	
X			Maintenance 42(1)i	
X			Chronological order 42(2)a	
X			Permittee recorder 42(2)b	
X			Identification of recorder 42(2)c	
X			Five year history of log 42(2)d	
X			Explanatory notes 42(2)e	
X			Factual data entry 42(2)f	
X			No default values used 42(2)g	
			QA/QC and Recordkeeping	
X			QA/QC in place 43(1)	
X			Monthly review 43(2)	
X			Report abnormal records 43(3)	
			Annual Notice To Customers	
X			Quality 44(1)a	
X			Compliance 44(1)b	
X			Notification of consumer report to Minister 44(2)	RECEIVED
			General	
			General comments	THE CITY HAS A DESIGN COMPLETED FOR BACKWASH WATER REMEDIATION. THE PROJECT WAS PROPOSED FOR 2013 BUT IT WAS CUT FROM THE BUDGET AND THEN IT WAS PROPOSED FOR 2014 AND CUT AGAIN. THE CITY MUST FINALIZE THIS PROJECT TO ENSURE THE RESIDUALS DO NOT ENTER THE RIVER. TENDER PACKAGES COMPLETED AND THE CITY HAS APPLIED FOR GRANT MONEY. ALSO THE CITY SHOULD INVESTIGATE

				WITH THE CHEMICAL MANUFACTURERS TO ENSURE THE CHEMICAL ROOM SET BACK DISTANCES FOR EACH CHEMICAL IS ACCURATE. THIS WAS REVIEWED IN THE WSA.
X			Split sampling with the operator was completed	
X			Operator's test equipment is performing adequately	
X			Representative of the waterworks signature was obtained	YES
X			Representative of the waterworks agreed with the inspection statements	YES



(Operator/Supervisor Signature)



Agree with statements



(EPO Signature)

