



POINT PLEASANT WATER TREATMENT PLANT

2022 ANNUAL REPORT

Drinking Water System Number: 220001851
Drinking Water System Owner: City of Kingston
Drinking Water System Category: Large Municipal Residential

DOCUMENT:

Point Pleasant Water Treatment Plant Annual Report

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1 EXECUTIVE SUMMARY

Utilities Kingston is proud to present this annual report on drinking water quality. This report has been prepared in accordance to Section 11 of Ontario Regulation 170/03. Regulation 170/03 sets requirements for public waterworks with regard to sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality. Free copies of this report and the Summary report prepared in accordance to Schedule 22 of Ontario Regulation 170/03, are available by public request at any City of Kingston offices, at our water plant locations, and at <http://www.utilitieskingston.com>. Notices of availability are generally made through the local newspapers and radio. More information on the Drinking Water Regulations can be found on the Ministry of the Environment web site at <http://www.ene.gov.on.ca>. For further information about this report or any questions regarding accessibility, contact Robert Cooney with email at rcooney@utilitieskingston.com, or call 613-546-1181 Ext 2291.

2 PLANT DESCRIPTION AND TREATMENT PROCESS

2.1 RAW WATER SOURCE

The source of water treated by this plant is Lake Ontario at the mouth of the St. Lawrence River. The 1.2 m diameter intake extends about 570 m and is located directly south of the treatment plant, at a depth of approximately 18 m.

2.2 ZEBRA MUSSEL CONTROL

Pre-chlorination takes place at the mouth of the intake. This protects the intake from becoming encrusted with zebra mussels, which would restrict the flow of water through the intake.

2.3 SCREENING

A revolving screen and a coarse screen in the suction well of the low lift building remove any large debris such as weeds, fish, etc.

2.4 LOW LIFT PUMPS

Four low lift pumps draw water from the suction wells and lift that water from lake level through a common discharge header and then through two separated headers (750mm and 900mm) to the process building.

2.5 FLOCCULATION

Devices called flocculators agitate the water in these tanks allowing proper mixing of the chlorine and Poly Aluminum Chloride (PACl) with the water. The dirt particles in water will join together with the PACl to form larger particles called floc.

2.6 FILTERS

Eight dual media (95% granular activated carbon and 5% silica sand) filters operating in parallel remove the floc particles formed in the floc tanks, as well as compounds that may cause tastes and odours. Water flows through the filters to a clean water reservoir called the clear well.

2.7 BACKWASH

Filters are washed regularly to remove the particulates they have collected. The filter is air scoured to break up any large particles, and clean water from the clear well is pumped backwards through the filter to wash it.

2.8 PROCESS WASTE FACILITY

Effluent from the filter backwash process is directed to the process waste facility for further treatment. Supernatant from the process is de-chlorinated using a 30% Calcium Thiosulphate solution, and then directed back to Lake Ontario. The sludge is pumped to the sanitary sewer system for further treatment at the Cataraqui Bay Water Treatment Plant.

2.9 POST CHLORINATION

A chlorine solution is added to the water as it enters the contact tanks to ensure proper disinfection is achieved through adequate chlorine contact time, and to provide chlorine residual which remains in the distribution system. This ensures protection to the customers' tap.

2.10 CLEAR WELL/TREATED WATER RESERVOIR

Filtered water is stored in the clear well/treated water reservoir. From here it is pumped to the distribution system or used for filter washing. The reservoir at the plant site holds approximately 14.0 million litres.

2.11 HIGH LIFT PUMPS

The high lift (HL) pumping system at the Point Pleasant Water Treatment Plant consists of five (5) HL pumps which pump treated water from the high lift suction well to the distribution system, storage reservoirs and elevated tanks, through two (2) 900 m distribution headers.

2.12 STANDBY EQUIPMENT

A combination diesel/natural gas generator provides electricity to run the necessary operational components of the plant. In addition, one Low Lift Pump 1 is equipped with a dual drive system and diesel backup engine to allow continued low lift pumping when electrical power is not available. High Lift Pump 5 is equipped with a diesel drive system complete with a variable speed diesel engine and is used only as a backup pump upon electrical system failure within the facility. These diesel driven pumps are maintained to provide a continuous supply of water during power failures. These provide enough capacity to meet fire-fighting requirements as well as normal flows during power outages.

FIGURE 1 – POINT PLEASANT WATER TREATMENT PLANT PROCESS FLOW DIAGRAM

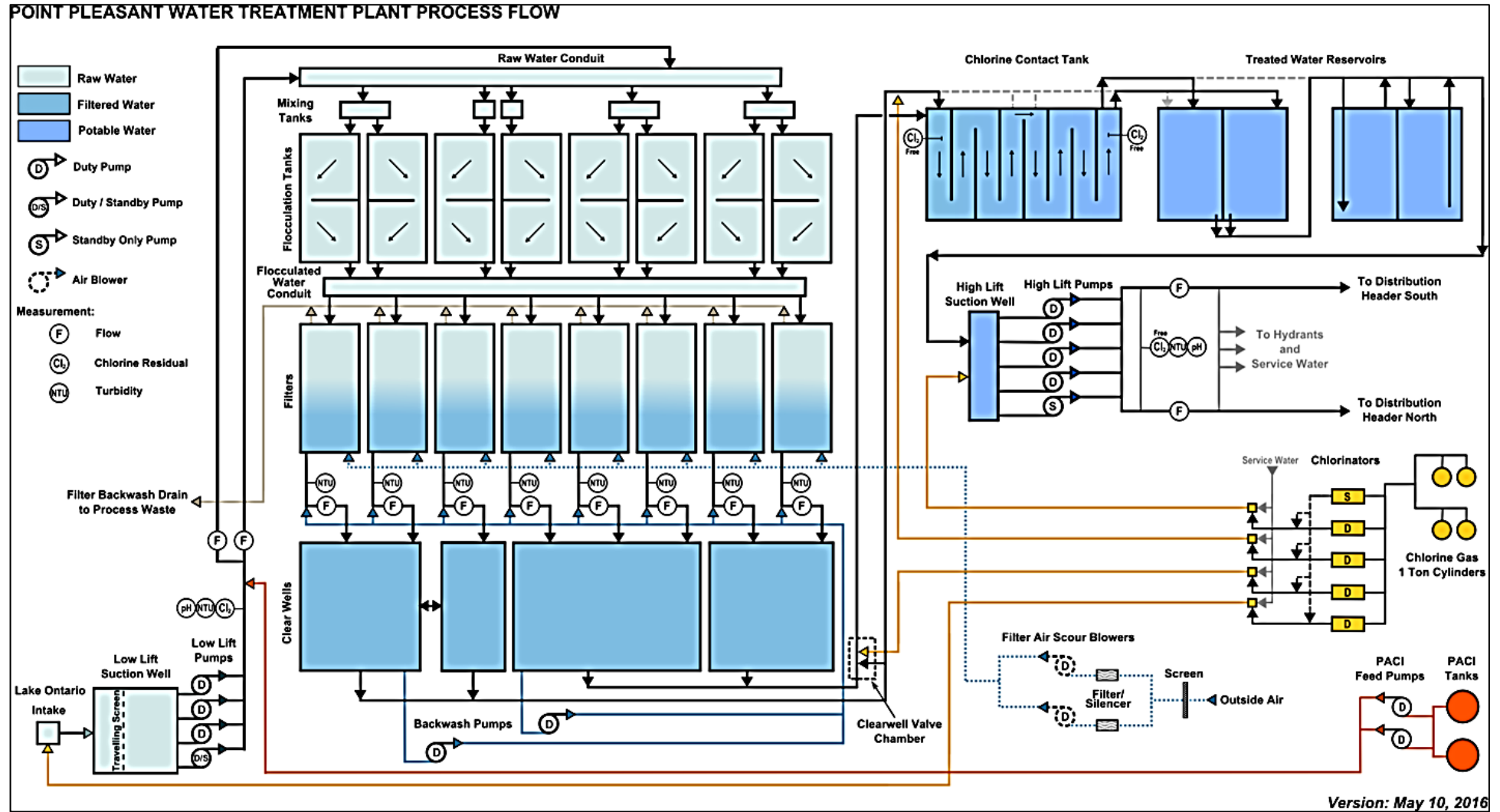
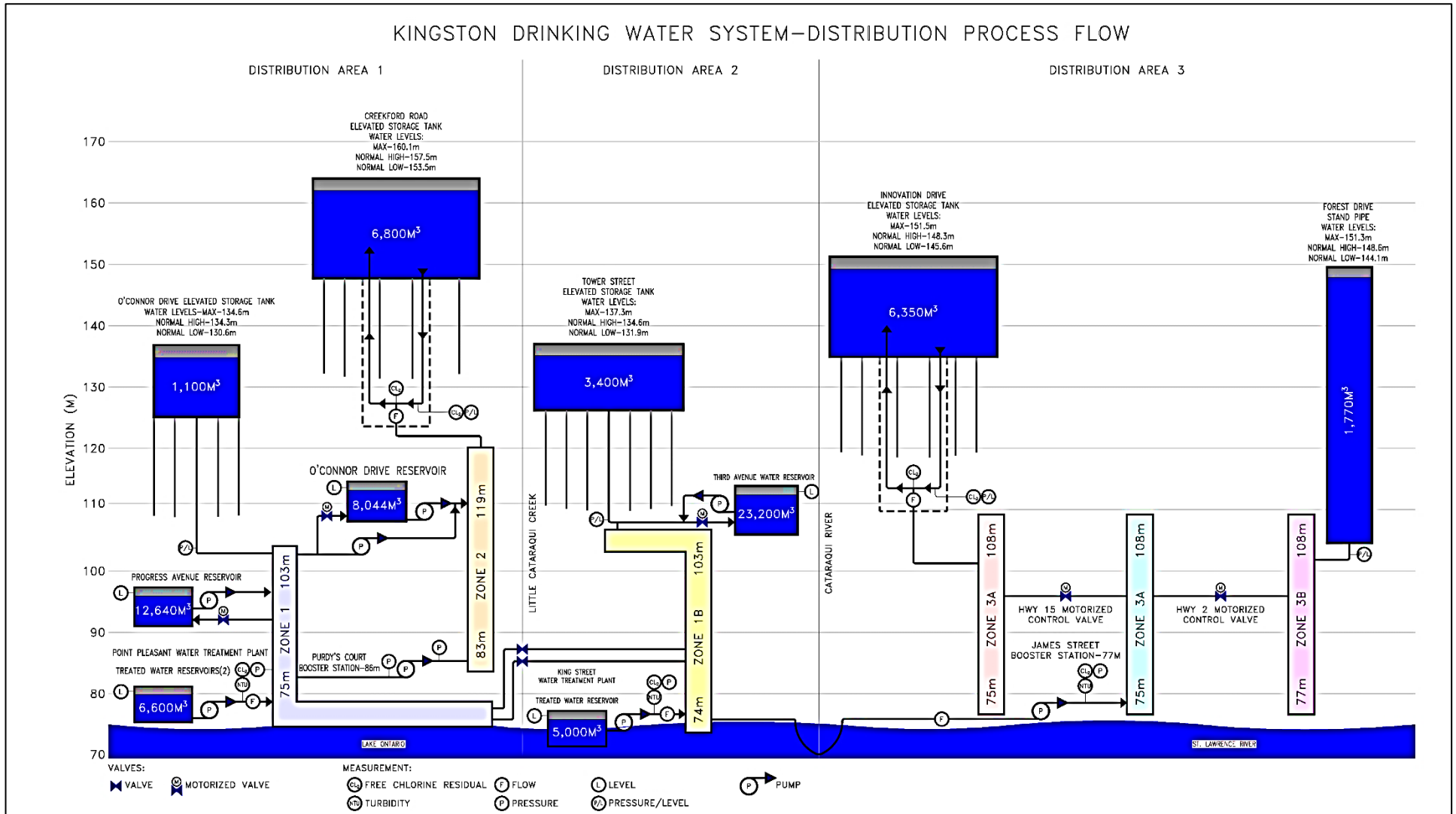


FIGURE 2 – KINGSTON DISTRIBUTION SYSTEM PROCESS FLOW DIAGRAM



3 DISTRIBUTION SYSTEM

The Kingston Drinking Water System, which receives water from both the King Street Water Treatment Plant and the Point Pleasant Water Treatment Plant, has a service population of approximately 132,485 (population from Census data for 2021). The distribution system is divided into three distribution areas.

3.1 DISTRIBUTION AREA 1

Distribution Area 1 is that area west of the Little Cataraqui Creek, south of Highway 401 and east of Coronation Boulevard, and north of Highway 401 along Sydenham Road northward to Mildred Street and eastward from Sydenham Road along Sunnyside Road for approximately 1.2 kilometers.

Distribution Area 1 is comprised of approximately 220 km of water mains, 2 ground level reservoir/pumping stations, 2 elevated storage tanks, 4 booster stations, over 2,500 main line valves, and over 1,300 fire hydrants and their associated isolation valves.

3.2 DISTRIBUTION AREA 2

Distribution Area 2 is that area which is east of the Little Cataraqui Creek, west of the Cataraqui River, and south of Highway 401. A small area on the east side of the Cataraqui River upstream of the pumps at the James Street Booster Station is part of distribution Area 2. In addition, Collins Bay Institution, which is west of the Little Cataraqui Creek on Bath Road, is supplied with water from this area and from Area 1.

Distribution Area 2 is comprised of over 250km of water mains, 1 ground level reservoir/pumping station, 1 elevated storage tank, over 2,000 main line valves, and over 1,200 fire hydrants and their associated isolation valves. The King Street Water Treatment Plant provides water to Distribution Area 2. The Tower Street Elevated Storage Tank and the Third Avenue Reservoir are located within this distribution area.

3.3 DISTRIBUTION AREA 3

Distribution Area 3 is that area which is east of the Cataraqui River. Distribution Area 3 is comprised of over 70km of water mains, 1 water booster station, 2 elevated storage facilities, over 250 main line valves, and over 300 fire hydrants and their associated isolation valves.

Water is supplied to Distribution Area 3 from Distribution Area 2 through the James Street Booster Station.

4 MONETARY EXPENSES

Under Section 11 of Ontario Regulation 170/03, a description of any major expenses incurred during this reporting period must be included in the annual report.

4.1 MAJOR EXPENSES:

- Water main replacement projects throughout the city were continued throughout the reporting year.
- Extensive leakage testing, hydrant maintenance and replacement, valve maintenance and operation programs were also conducted on the system.
- Improvements to the chlorine gas feed system continued in 2022.
- Raw, treated and filtered water turbidimeters were replaced.
- Intake inspections were completed, including a rebuild of the intake crib.

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- Granular Activated Carbon was replaced in two filters.
- UPS battery system upgrades were completed for redundancy.
- Valving was replaced in the process waste facility.
- Tower inspections were completed for Milton Standpipe and O'Connor Tower.

5 NOTIFICATIONS

Under Ontario Regulation 170/03, notifications were required for any instances where a sample result indicated that a parameter used to measure water quality exceeded a Maximum Acceptable Concentration (MAC). Once a notification is received from a laboratory or an observation of any other indicator of adverse water quality is made by operations personnel, corrective action as dictated by the regulations is initiated in an effort to confirm the initial result. If confirmed, further action may be recommended by the Medical Officer of Health. If not confirmed sampling will typically return to the normal schedule, or depending on the parameter, Utilities Kingston may choose to increase the sampling frequency to monitor the parameter more closely for a period of time.

5.1 EVENTS REQUIRING NOTIFICATIONS:

- There were no events within the Point Pleasant Water Treatment Plant that required notification during this reporting period

6 GLOSSARY

TCU – True Colour Units

mg – Milligram

N/A – Not Applicable

N/D – Non-Detectable

NTU – Nephelometric Turbidity Units - A measure of the amount of particles in water.

mg/L – Milligrams per litre. This is a measure of the concentration of a parameter in water, also called parts per million (ppm).

µg/L – Micrograms per litre, also called parts per billion.

ng/L – Nanograms per litre, also called parts per trillion.

Parameter – A substance that we sample and analyze for in the water.

AO – Aesthetic Objective. AOs are not health related, but may affect the taste, odour, colour, or clarity of the water

OG – Operational guideline. Set to ensure efficient treatment and distribution of water.

MAC – Maximum Acceptable Concentration. This is a health-related drinking water standard established for contaminants having known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter

7 WATER QUALITY TEST RESULTS

Table 1 – Microbiological Testing

(Performed Under Regulation 170/03)

Type	MAC (E. Coli & Total Coliforms)	Number of Samples	Range of E. Coli Results (Min - Max)	Range of Total Coliform Results (Min - Max)	Number of HPC Samples	Range of HPC Results (Min - Max)
Raw	N/A	52	0 - 5	0 - 191	N/A	N/A
Treated	0	52	0	0	52	Under 1 - 10
Kingston Drinking Water System	0	1389	0	0 - 51	733	Under 1 - 260

Note: Total Coliforms are an indicator of adverse water quality if detected

Table 2 – Operational Testing

(Performed under Schedule 7, 8, or 9 of Regulation 170/03)

Parameter	MAC	Number of Samples	Range of Results (min - max)	Parameter Description
Raw Water Turbidity (NTU)	N/A	Continuous	0.03 - 32.6	Turbidity is a measure of particles in water
Treated Water Turbidity (NTU)	N/A	Continuous	0.03 - 0.66	Turbidity is a measure of particles in water
Treated Chlorine Residual (mg/L)	See Parameter Description	Continuous	1.18 - 2.36	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality. 0.05 mg/l minimum required.
Kingston Drinking Water System Chlorine Residual (mg/L)	See Parameter Description	Continuous	0.64 - 3.05	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality. 0.05 mg/l minimum required.

Note: Turbidity range determined through in house lab testing

Table 3 – Filter Operational Testing

Parameter	MAC	Number of Samples	Range of Results (min - max)	Results Average
Filter #1 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.03 - 2.69	0.08
Filter #2 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.03 - 1.36	0.07
Filter #3 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.02 - 1.51	0.06
Filter #4 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.03 - 2.62	0.06
Filter #5 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.02 - 1.43	0.06
Filter #6 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.03 - 4.99	0.07
Filter #7 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.04 - 1.88	0.07
Filter #8 Effluent Turbidity (NTU)	1.0 for Over 15 minutes	Continuous	0.02 - 5.00	0.06

Table 4 – Process Waste Facility Effluent Testing and Sampling

Parameter	MAC	Number of Samples	Results Average	Parameter Description
Total Suspended Solids (mg/L)	25	12	3.83	A measure of the particulates collected in the filtration process.
Chlorine Residual (mg/L)	0.04	12	0.014	Residual of 0.04 mg/L as required by the drinking water license for this facility

Note: Testing and sampling in accordance with the requirements of the Municipal Drinking Water License

Table 5 – Additional Process Waste Facility Effluent Testing and Sampling

Parameter	MAC	Number of Samples	Results Average	Parameter Description
BOD5 (mg/L)	N/A	12	Under 3	Biological Oxygen Demand
Aluminum (mg/L)	N/A	12	0.87	Residual from treatment process
pH	N/A	12	7.72	An indicator of the acidity of water

Table 6 – Raw Water Testing (Analyzed by Accredited Laboratories)

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Alkalinity as CaCO ₃ (mg/L)	N/A	4	91 - 111	N/A	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum (mg/L)	N/A	3	0.01 - 0.05	N/A	May be naturally present.
Ammonia Nitrogen (mg/L)	N/A	2	0.01 - 0.03	N/A	Occurs naturally from organic nitrogen containing compounds.
Antimony (mg/L)	N/A	2	0.0001 - 0.0002	N/A	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (mg/L)	N/A	2	0.0008 - 0.0009	N/A	Naturally occurring in surface waters / mine drainage
Barium (mg/L)	N/A	2	0.023 - 0.026	N/A	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Boron (mg/L)	N/A	2	0.015 - 0.019	N/A	Erosion of natural deposits, industrial waste effluents.
Cadmium (mg/L)	N/A	2	Under 0.000015	N/A	Industrial discharge
Calcium (mg/L)	N/A	2	35.4 - 38.1	N/A	Naturally occurring.

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Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Chloride (mg/L)	N/A	2	22.9 - 23.1	N/A	A common naturally occurring non-toxic material that may produce a salty taste in water.
Chromium (mg/L)	N/A	2	Under 0.002	N/A	Industrial residues
Colour (TCU)	N/A	12	Under 2 - 16	N/A	Typically, the result of organic matter in surface waters.
Conductivity (Us / cm)	N/A	2	297 - 300	N/A	A measure of ability of water to carry an electric current due to the presence of ions.
Copper (mg/L)	1 OG	2	Under 0.002	N/A	Domestic plumbing (Aesthetic objective)
Dissolved Organic Carbon (mg/L)	N/A	4	21.3 - 3.3	N/A	High DOC is an indicator of potential for chlorination by-product problems.
Fluoride (mg/L)	N/A	4	Under 0.1	N/A	Naturally occurring.
Hardness (mg/L)	N/A	4	127 - 137	N/A	Naturally occurring from dissolved calcium and magnesium.
Iron (mg/L)	N/A	2	Under 0.005 - 0.066	N/A	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Lead (mg/L)	N/A	10	Under 0.00002 - 0.00074	N/A	Internal corrosion of household plumbing, erosion of natural deposits.
Manganese (mg/L)	N/A	4	Under 0.002 - 0.117	N/A	Erosion of natural deposits.
Microcystin (µg/L)	N/A	22	Under 0.15 - 0.25	N/A	Naturally occurring (released from blooms of blue-green algae)
Nitrate (mg/L)	N/A	4	0.2 - 0.3	N/A	Runoff from fertilizer use, erosion of natural deposits
Nitrite (mg/L)	N/A	4	Under 0.1	N/A	A natural component of water at this level.
Nitilotriacetic Acid (mg/L)	0.4	0	N/A	N/A	A human made organic compound

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Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
N-Nitrosodimethylamine (mg/L)	0.0009	0	N/A	N/A	An organic chemical often found as an industrial biproduct
pH	N/A	12	7.30 - 8.25	N/A	An indicator of the acidity of water.
Selenium (mg/L)	N/A	1	Under 0.001	N/A	Discharge from refineries, mines, chemical manufacture
Sodium (mg/L)	20	4	13.3 - 14.7	No	Occurs naturally in the earth's crust.
Sulphate (mg/L)	N/A	4	20 - 22	N/A	An inorganic constituent that may cause tastes at high levels.
Total Kjeldahl Nitrogen (mg/L)	N/A	4	0.2 - 0.6	N/A	Indicator of organic contamination or the potential for taste and odour problems.
Total Phenols (mg/L)	N/A	4	Under 0.001	N/A	A chemical compound found in nature and used in a wide variety of products.
Uranium (mg/L)	N/A	1	0.00027 - 0.00031	N/A	Erosion of natural deposits.
Zinc (mg/L)	N/A	2	Under 0.005	N/A	An inorganic constituent that may cause tastes.

Table 7 – Treated Water Schedule 23 Inorganic Parameters

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Antimony (mg/L)	0.006	2	0.0002 - 0.0003	No	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (mg/L)	0.025	3	0.0005 - 0.0006	No	Naturally occurring in surface waters / mine drainage
Barium (mg/L)	1	2	0.021 - 0.024	No	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Boron (mg/L)	5	2	0.012 - 0.019	No	Erosion of natural deposits, industrial waste effluents.
Cadmium (mg/L)	0.005	2	Under 0.000015	No	Industrial discharge
Chromium (mg/L)	0.05	2	Under 0.002	No	Industrial residues
Mercury (mg/L)	0.001	2	Under 0.00002	No	Erosion of natural deposits, industrial discharges.

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Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Selenium (mg/L)	0.01	2	Under 0.001	No	Discharge from refineries, mines, chemical manufacture
Uranium (mg/L)	0.02	2	0.00013 - 0.00023	No	Erosion of natural deposits.

Table 8 – Treated Water Schedule 24 Inorganic Parameters

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Alachlor (µg/L)	5	2	Under 0.3	No	Agricultural herbicide
Atrazine + N-Dealkylated Metabolites (µg/L)	5	2	Under 0.5	No	Agricultural herbicide
Azinphos-methyl (µg/L)	20	2	Under 1	No	Insecticide
Benzene (µg/L)	5	2	Under 0.5	No	Discharge from plastics manufacturing, leaking fuel tanks
Benzo(a)pyrene (µg/L)	0.01	2	Under 0.006	No	Formed from the incomplete burning of organic matter.
Bromoxynil (µg/L)	5	2	Under 0.5	No	Agricultural herbicide
Carbaryl (µg/L)	90	2	Under 3	No	Agricultural/Forestry/Household insecticide
Carbofuran (µg/L)	90	2	Under 1	No	Agricultural insecticide
Carbon Tetrachloride (µg/L)	5	2	Under 0.2	No	Discharge from chemical and industrial activities
Chlorpyrifos (µg/L)	90	2	Under 0.5	No	Agricultural/Household insecticide
Diazinon (µg/L)	20	2	Under 1	No	Agricultural/ Livestock Operation/ Residential insecticide
Dicamba (µg/L)	120	1	Under 10	No	Agricultural herbicide
1,2-Dichlorobenzene (µg/L)	200	2	Under 0.5	No	Discharge from industrial chemical factories
1,4-Dichlorobenzene (µg/L)	5	2	Under 0.5	No	Discharge from industrial chemical factories
1,2-Dichloroethane (µg/L)	5	2	Under 0.5	No	Discharge from industrial chemical factories
1,1-Dichloroethylene (µg/L)	14	2	Under 0.5	No	Discharge from industrial chemical factories

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Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Dichloromethane (µg/L)	50	2	Under 5	No	Discharge from pharmaceutical and chemical factories
2,4-Dichlorophenol (µg/L)	900	2	Under 0.2	No	Industrial contamination/ reaction with chlorine
2,4-Dichlorophenoxy Acetic Acid (µg/L)	100	2	Under 1	No	Agricultural/ Residential herbicide
Diclofop-methyl (µg/L)	9	2	Under 0.9	No	Agricultural herbicide
Dimethoate (µg/L)	20	2	Under 1	No	Agricultural/ Livestock Operation/ Forestry insecticide
Diquat (µg/L)	70	2	Under 5	No	Agricultural/ Aquatic herbicide
Diuron (µg/L)	150	2	Under 5	No	Agricultural/ Industrial/ herbicide
Glyphosate (µg/L)	280	2	Under 25	No	Agricultural/Forestry/ Household herbicide
Malathion (µg/L)	190	2	Under 5	No	Fruit & Vegetable / pest control insecticide
2-methyl-4-chlorophenoxyacetic Acid (mg/L)	100	2	Under 0.01	No	Leaching and/or runoff from agricultural and other uses
Metolachlor (µg/L)	50	2	Under 3	No	Agricultural herbicide
Metribuzin (µg/L)	80	2	Under 3	No	Agricultural herbicide
Monochlorobenzene (µg/L)	80	2	Under 0.5	No	Discharge from industrial and agricultural chemical factories and dry cleaning facilities
Paraquat (µg/L)	10	2	Under 1	No	Agricultural/ Aquatic herbicide
Pentachlorophenol (µg/L)	60	2	Under 0.2	No	Pesticide/ wood preservative residue
Phorate (µg/L)	2	2	Under 0.3	No	Agricultural insecticide
Picloram (µg/L)	190	2	Under 5	No	Industrial herbicide
Polychlorinated Biphenyls (µg/L)	3	2	Under 0.05	No	Residue from various industrial uses
Prometryne (µg/L)	1	2	Under 0.1	No	Agricultural herbicide
Simazine (µg/L)	10	2	Under 0.5	No	Agricultural herbicide or its residue
Terbufos (µg/L)	1	2	Under 0.5	No	Agricultural insecticide

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Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Tetrachloroethylene (µg/L)	30	2	Under 0.5	No	Leaching from PVC pipes; discharge from factories, dry cleaners and auto shops (metal degreaser)
2,3,4,6-Tetrachlorophenol (µg/L)	100	2	Under 0.2	No	Wood preservative
Triallate (µg/L)	230	2	Under 10	No	Agricultural herbicide
Trichloroethylene (µg/L)	5	2	Under 0.5	No	Discharge from metal degreasing sites and other factories
2,4,6-Trichlorophenol (µg/L)	5	2	Under 0.2	No	Pesticide manufacturing
Trifluralin (µg/L)	45	2	Under 0.5	No	Agricultural herbicide
Vinyl Chloride (µg/L)	2	2	Under 0.2	No	Leaching from PVC pipes; discharge from plastics factories

Table 9 – Other Regulatory Treated Water Parameters

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Fluoride (mg/L)	1.5	4	Under 0.1	No	Naturally occurring.
Nitrite (mg/L)	1	12	Under 0.1	No	A natural component of water at this level.
Nitrate (mg/L)	10	12	Under 0.1 - 0.4	No	Runoff from fertilizer use, erosion of natural deposits
Sodium (mg/L)	20	12	13.6 - 15.4	No	Occurs naturally in the earth's crust. Notification is required every 60 months if greater than 20 mg/L

Table 10 – Treated Water Testing
(Analyzed by Accredited Laboratories)

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Alkalinity CaCO ₃ (mg/L)	N/A	4	86 - 100	N/A	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Aluminum (mg/L)	0.1 OG	12	0.04 - 0.36	N/A	Naturally occurring in surface waters / mine drainage
Ammonia Nitrogen (mg/L)	N/A	4	Under 0.01	N/A	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Calcium (mg/L)	N/A	4	35.1 - 36.8	N/A	Erosion of natural deposits, industrial waste effluents.
Chloride (mg/L)	250	4	25.3 - 25.7	No	Industrial discharge
Colour (TCU)	5	12	Under 2	No	Industrial residues
Conductivity (Us/cm)	N/A	4	300 - 309	N/A	Erosion of natural deposits, industrial discharges.
Cyanide (mg/L)	N/A	0	N/A	N/A	Discharge from refineries, mines, chemical manufacture
Dissolved Organic Carbon (mg/L)	N/A	4	>0.8 - 2	N/A	Erosion of natural deposits.
Gross Alpha (bg/L)	0.5	0	N/A	N/A	Measure of radioactivity
Gross Beta (bg/L)	1	0	N/A	N/A	Measure of radioactivity
Total Haloacetic Acids (mg/L)	0.08 (Annual Average)	12	Under 0.0053 - 0.0113	No	By-product of drinking water disinfection with chlorine. Based on a running annual average
Hardness (mg/L)	100 OG	4	126 - 127	No	Naturally occurring from dissolved calcium and magnesium.
Iron (mg/L)	0.3 AO	2	Under 0.005	N/A	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Lead (mg/L)	0.01	10	Under 0.00002 - 0.00005	No	Internal corrosion of household plumbing, erosion of natural deposits.
Manganese (mg/L)	0.05 AO	4	Under 0.001	N/A	Erosion of natural deposits.
Microcystin (µg/L)	1.5	22	Under 0.15	No	Naturally occurring (released from blooms of blue-green algae)
Nitrilotriacetic acid/NTA	N/A	0	N/A	N/A	A human made organic compound
N-Nitrosodimethylamine (µg/L)	0.0009	0	N/A	N/A	An organic chemical often found as an industrial biproduct
pH	N/A	12	7.69 - 8.00	N/A	An indicator of the acidity of water.
Sulphate (mg/L)	500 OG	4	21 - 22	N/A	An inorganic constituent that may cause tastes at high levels.
Total Trihalo-methanes (µg/L)	100 (Annual avg.)	12	8 - 26	No	By-product of chlorination. * The MAC for THMs of 100 µg/L is based on a running annual average.
Total Kjeldahl Nitrogen (mg/L)	N/A	4	0.1 - 0.2	N/A	Indicator of organic contamination or the potential for taste and odour problems.
Tritium (bg/L)	7000	0	N/A	N/A	A form of hydrogen
Zinc (mg/L)	5	3	Under 0.005	No	An inorganic constituent that may cause tastes.

Table 11 – Distribution Water Testing

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Total Haloacetic Acids (mg/L)	0.08 (Annual avg.)	12	0.006 - 0.0382	No	By-product of drinking water disinfection with chlorine. Based on a running annual average
Total Trihalomethanes (µg/L)	100 (Annual avg.)	12	21 - 79	No	By-product of chlorination. * The MAC for THMs of 100 µg/L is based on a running annual average.

Table 12 – Lead Testing

Parameter	MAC mg/L	Number of Sample Locations	Results Exceeding 0.01 mg/L	Results Range mg/L (min - max)	pH Range (min - max)	Alkalinity (CaCO ₃) Range mg/L (min - max)
Residential	0.01	12	1	0.00006 - 0.0148	6.96 - 7.94	N/A
Non-Residential	0.01	12	0	0.000003 - 0.00187	7.08 - 7.48	88 - 90

Table 13 – Regulatory Distribution Water Testing

(Analyzed by Accredited Laboratories)

Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Alkalinity CaCO ₃ (mg/L)	N/A	18	88 - 105	N/A	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum (mg/L)	0.1 OG	8	0.04 - 0.09	N/A	May be naturally present or a residual from the coagulation process.
Ammonia Nitrogen (mg/L)	N/A	8	Under 0.01	N/A	Occurs naturally from organic nitrogen containing compounds.
Arsenic (mg/L)	0.025	2	0.0004 - 0.0005	No	Naturally occurring in surface waters / mine drainage
Benzo(a)pyrene (µg/L)	N/A	0	N/A	N/A	Formed during the combustion of organic matter
Calcium (mg/L)	N/A	8	34.3 - 37.3	N/A	Naturally occurring.
Chloride (mg/L)	250	8	25.3 - 27.3	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Colour (TCU)	5	0	Under 2	No	Typically the result of organic matter in surface waters.
Conductivity (Us/cm)	N/A	8	302 - 314	N/A	A measure of ability of water to carry an electric current due to the presence of ions.
Copper (mg/L)	1 OG	8	Under 0.002 - 0.005	N/A	Domestic plumbing (Aesthetic objective)
Cyanide (mg/L)	0.2	0	N/A	N/A	Compound used in a variety of industrial processes
Dissolved Organic Carbon (mg/L)	5 AO	8	0.9 - 2.4	N/A	High DOC is an indicator of potential for chlorination by-product problems.
Fluoride (mg/L)	1.5	2	Under 0.1	No	Naturally occurring.
Gross Alpha (bg/L)	0.5	0	N/A	N/A	Measure of radioactivity
Gross Beta (bg/L)	1	0	N/A	N/A	Measure of radioactivity

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Parameter	MAC	Number of Samples	Results Range (min - max)	MAC Exceedance (Yes or No)	Parameter Description
Hardness (mg/L)	100 OG	8	121 - 129	N/A	Naturally occurring from dissolved calcium and magnesium.
Iron (mg/L)	0.3 AO	8	Under 0.005 - 0.017	N/A	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Manganese (mg/L)	0.05 AO	8	Under 0.001 - 0.002	N/A	Erosion of natural deposits.
Nitrite (mg/L)	1	2	Under 0.1	No	A natural component of water at this level.
Nitrate (mg/L)	10	2	0.3 - 0.4	No	Runoff from fertilizer use, erosion of natural deposits
Nitrilotriacetic Acid (mg/L)	0.4	0	N/A	N/A	A human made organic compound
Nitrosodi-methylamine (µg/l)	0.0009	0	N/A	N/A	An organic chemical often found as an industrial biproduct
pH	6.5–8.5 OG	8	7.49 - 8.14	N/A	An indicator of the acidity of water.
Sodium (mg/L)	20	8	13.9 - 17	No	Occurs naturally in the earth's crust.
Sulphate (mg/L)	500 OG	8	21 - 23	N/A	An inorganic constituent that may cause tastes at high levels.
Total Kjeldahl Nitrogen (mg/L)	N/A	8	Under 0.1 - 0.2	N/A	Indicator of organic contamination or the potential for taste and odour problems.
Tritium (bg/L)	7000	0	N/A	N/A	A form of hydrogen
Zinc (mg/L)	5	8	Under 0.005 - 0.108	No	An inorganic constituent that may cause tastes.

Table 14 – Raw Water Testing
(Analyzed by In House Laboratory)

Parameter	MAC	Number of Samples	Average Results	MAC Exceedance (Yes or No)	Parameter Description
Alkalinity (mg/L)	N/A	41	86	N/A	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Hardness (mg/L)	N/A	44	125	N/A	Naturally occurring from dissolved calcium and magnesium.
pH	N/A	361	7.81	N/A	An indicator of the acidity of water
Temperature (Degrees Celsius)	N/A	364	16.1	N/A	Intensity of heat present in a substance or object

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Table 15 – Treated Water Testing

(Analyzed by In House Laboratory)

Parameter	MAC	Number of Samples	Average Results	MAC Exceedance (Yes or No)	Parameter Description
Alkalinity (mg/L)	N/A	41	85	N/A	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum (mg/L)	0.1 OG	334	0.06	N/A	May be naturally present or a residual from the coagulation process.
Hardness (mg/L)	100 OG	43	130	N/A	Naturally occurring from dissolved calcium and magnesium.
pH	6.5 - 8.5 OG	361	7.7	N/A	An indicator of the acidity of water.
Temperature (Degrees Celsius)	N/A	365	12.34	N/A	Intensity of heat present in a substance or object