



SYDENHAM WATER TREATMENT PLANT 2023 ANNUAL SUMMARY REPORT

Drinking Water System Number: 260069290
Drinking Water System Owner: Township of South Frontenac
Drinking Water System Category: Large Municipal Residential

Submitted by:
David Fell
President & C.E.O.

TABLE OF CONTENTS

1 INTRODUCTION..... 3

2 NON COMPLIANCE..... 3

3 COMPLIANCE..... 3

4 NOTIFICATIONS..... 4

4.1 EVENTS REQUIRING NOTIFICATIONS..... 4

5 QUANTITY OF WATER SUPPLIED..... 5

6 FLOW RATE EXCEEDANCES 5

7 TREATMENT CHEMICALS USED..... 5

8 SUMMARY..... 5

9 FLOW 5

Table 1 – Raw Water Flow Daily Totals (m3) 6

Table 2 – Peak Raw Water Flow Daily Totals (L/min)..... 7

Table 3 – Treated Water Flow Daily Totals (m3) 8

1 INTRODUCTION

This annual summary report has been prepared as required under Ontario Regulation 170/03 of the Safe Drinking Water Act (SDWA) to acknowledge compliance with the terms and conditions of the Drinking Water Works Permit (DWWP) and Municipal Drinking Water License (MDWL) issued for the Sydenham Drinking Water System, to comment on any incidents of non-compliance during the reporting period, to summarize the quantities of the water supplied and to compare the summaries to the rated capacity and flow rates approved in the system's permits and approvals during the reporting period.

This report is specific to the Sydenham Water Treatment Plant (WTP) located at Point Rd. in Sydenham, and its associated distribution system which serves Sydenham's municipal water customers in the village of Sydenham. The WTP and its associated distribution system are owned by the Township of South Frontenac, with Utilities Kingston acting as the operating authority.

2 NON COMPLIANCE

There were no issues of non-compliance with the terms and conditions of the DWWP or MDWL during this reporting period.

3 COMPLIANCE

The Treatment Group of Utilities Kingston, for the Township of South Frontenac, operates and maintains the Sydenham Water Treatment Plant (WTP) and complies with the terms and conditions of the Drinking Water Works Permit (DWWP) and Municipal Drinking Water License (MDWL) issued for the WTP. The Utilities Kingston Systems Operations department and the Treatment Group of Utilities Kingston operate and maintain the associated distribution system and storage facilities. Staffing is maintained at levels to ensure adequate numbers of trained and licensed personnel are available for proper operations during emergency or upset conditions, vacation/sick relief, or to deal with equipment breakdown.

Quality management systems (QMS), contingency plans, and operations manuals are established and are located in the appropriate facilities and available to appropriate staff.

A QMS for the Township of South Frontenac's drinking water supply systems has been developed and implemented by Utilities Kingston management and staff to ensure the continued safety and security of the community's drinking water by meeting or exceeding the requirements of all relevant legislation and regulations, and the Drinking Water Quality Management Standard (DWQMS).

Operations manuals include information necessary for the day to day operations and maintenance of the WTP and distribution system as well as information that may not be regularly used but that might be required to be accessed quickly for various purposes. Contingency plans include information that may be required for proper operation of the WTP or distribution system during emergency or upset conditions and contain items such as emergency plans and contact lists, alternate materials supply sources and notification lists.

The operations strategy of Utilities Kingston includes ensuring that permits and approvals are in place, that efficient maintenance and operations ensures the quality of water supplied to its customers meets or exceeds the minimum requirements as set out in the SDWA, and that permissible flow rates are not exceeded. The Township of South Frontenac, as a means of source water protection, considers the impact of decisions made within its authority on the drinking water supply source for the WTP.

Flow measuring devices for measuring the amount of water taken from Sydenham Lake, and the amount of water supplied to the distribution system are calibrated annually by a third party. Accuracy in these measurements ensures that treatment chemicals are precisely applied and that flows do not

exceed the capacity at which the WTP is designed to be effective. These flows are recorded to provide current and historical information, which is used for operational decision making, and to allow both the public and the Ministry of the Environment, Conservation and Parks (MECP) the ability to review WTP operations.

Water quality analyzers that monitor parameters such as chlorine residual and turbidity of critical process streams and of the water directed to the distribution system are alarm equipped and are maintained in accordance with the manufacturer's recommendations as well as the conditions of the DWWP and MDWL.

Water sampling is conducted to the minimum requirements of schedule 13 of Ontario Regulation 170/03 of the Safe Drinking water Act. Raw water sampling is conducted to give operational staff information required to determine the level of treatment to make the water potable. In-plant process stream samples provide monitoring of treatment processes. Treated and distribution system sampling provides information regarding the quality of water delivered to customers. All of these samples are analyzed by either licensed staff or by laboratories accredited by the Standards Council of Canada through the Canadian Association for Environmental Analytical Laboratories.

All sampling information, annual reports, and all other documentation required by the DWWP, MDWL and regulations are available for public viewing on the Utilities Kingston website as well as at the Utilities Kingston and Township of South Frontenac offices. Residents of the village of Sydenham are encouraged to review this information, the availability of which is advertised through various local media.

4 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 (MOH). 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. The details of any events requiring notifications are listed below.

4.1 EVENTS REQUIRING NOTIFICATIONS

- Notification of a potential adverse water quality incident was provided to the Medical Officer of Health and Spills Action Centre on **February 12th**, due to a failure of the chemical delivery system allowing water to be filtered to the clearwell without a coagulating agent. No advisory was issued by the Medical Officer of Health as plant performance data and bacteriological samples collected indicated there was no risk to public health.
- Notification of an indicator of adverse water quality was received from Caduceon Environmental Laboratories regarding a sample collected on **June 28th** for Total Coliform (TC) with a count of **1 cfu/100mL**. Combined chlorine residual at the time of sampling was **1.26 mg/L**. Notifications were made to the Spills Action Centre and to the Environmental Health Division of the local Ministry of Health. Resamples were collected from the same location, upstream and downstream, and sent to the lab for analysis. With the combined chlorine residual present in the original sample and the subsequent re-samples not indicating any adverse conditions, a contaminated sample bottle or sampling error is suspected.

- Notification of a potential adverse water quality incident was provided to the Medical Officer of Health and Spills Action Centre on **August 7th**, due to a failure of the chemical delivery system allowing water to be filtered to the clearwell without a coagulating agent. No advisory was issued by the Medical Officer of Health as plant performance data and bacteriological samples collected indicated there was no risk to public health.

5 QUANTITY OF WATER SUPPLIED

Listed in Table 3 following this report are the treated water flows for the Sydenham Water Treatment Plant. The typical Canadian average water usage per person is 220 litres per person per day (source: Stats Canada 2017). Once all services to the water distribution system are completed, an accurate calculation of water usage per person for the village of Sydenham can be calculated.

6 FLOW RATE EXCEEDANCES

There were no instances during this reporting period where daily total flows exceeded the maximum allowable flow rate of 1290 m³/day. Listed in Tables 1 and 2 following this report are the raw water flows (water taken from Sydenham Lake) for the Sydenham Water Treatment Plant.

7 TREATMENT CHEMICALS USED

There are three treatment chemicals in use at this treatment plant. Sodium Hypochlorite is used for primary disinfection, XL1900 (Polyaluminum Chloride) used as the coagulant and Ammonium Sulphate combined with Sodium Hypochlorite to form chloramines for secondary chlorination for the WTP.

Sodium Hypochlorite is dosed at the treatment plant at a rate which ensures that an adequate chlorine Contact Time (CT) value is maintained for the rate of flow. Average chlorine dosages for this treatment plant are approximately 4.91 mg/l. Ammonium Sulphate is added at an approximate rate of 3.5:1 ratio (chlorine/ammonia) to react with the free chlorine to form chloramines for secondary chlorination. Chloramine residuals are routinely measured in the distribution system, and dosages are adjusted as required to ensure the chloramine residual stays above the critical control limit of 1.00 mg/L. The critical control limit is chosen to ensure operators have ample time to respond and correct issues before the combined chlorine residual reaches the regulatory limit of 0.25 mg/L.

Typically, XL1900 (Polyaluminum Chloride) dosages for this treatment plant were in the range of 3.40 – 17.65 mg/l. This dosage is also adjusted to ensure efficiency in the coagulation process as various changes occur in the raw water. Changes are based on things such as filter head loss, pH, temperature, turbidity, and the aluminum residual in the treated water.

8 SUMMARY

The Sydenham Water Treatment Plant supplied water to residents of Sydenham at rates which allowed adequate treatment while not exceeding permitted flows. Water of good quality which is safe to drink was produced by the treatment plant during this reporting period.

Further information is available for this system and is included in the annual reports which can be accessed from the Utilities Kingston Website at <http://www.utilitieskingston.com> or is available at Kingston City Hall, or the Utilities Kingston offices. For further information about this report or any questions regarding accessibility, contact Robert Cooney at rocooney@utilitieskingston.com, or call 613-546-1181 Ext 2291.

9 FLOW

Raw and Treated flows are summarized in the tables below.

UTILITIES KINGSTON – WATER TREATMENT – ANNUAL REPORT

DOCUMENT:
Sydenham Water Treatment Plant Annual Summary Report

Table 1 – Raw Water Flow Daily Totals (m3)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	245	279	1	N/A	212	154	156	268	169	88	331	128
2	N/A	206	262	333	476	57	316	395	93	484	N/A	N/A
3	316	N/A	212	80	2	419	N/A	N/A	341	31	245	174
4	155	333	N/A	N/A	233	N/A	304	244	N/A	289	448	259
5	N/A	180	230	361	301	197	183	171	359	167	N/A	1
6	366	191	187	109	N/A	526	N/A	N/A	303	236	275	306
7	210	215	N/A	N/A	173	12	369	331	N/A	141	190	49
8	204	1	291	288	248	362	322	333	327	78	2	N/A
9	104	340	213	159	26	301	N/A	N/A	181	297	282	289
10	273	67	N/A	N/A	316	N/A	298	292	N/A	N/A	288	124
11	152	N/A	N/A	318	262	315	228	230	324	301	N/A	N/A
12	N/A	354	314	137	N/A	178	1	N/A	175	320	187	292
13	281	81	199	N/A	357	N/A	357	295	N/A	206	403	132
14	214	1	N/A	343	194	264	240	295	339	N/A	N/A	N/A
15	105	310	312	151	30	294	N/A	N/A	255	157	518	266
16	368	137	66	122	346	N/A	351	235	N/A	393	N/A	168
17	N/A	N/A	N/A	243	368	326	110	462	320	N/A	N/A	N/A
18	272	299	202	N/A	N/A	83	N/A	N/A	192	317	308	275
19	188	122	228	301	311	219	341	36	N/A	106	139	155
20	N/A	N/A	N/A	162	146	225	469	483	312	233	1	N/A
21	254	319	298	N/A	N/A	306	N/A	2	248	143	291	301
22	299	185	176	346	336	158	N/A	212	N/A	93	134	154
23	N/A	N/A	N/A	133	182	310	320	332	322	304	N/A	N/A
24	366	298	281	235	229	57	346	N/A	210	N/A	282	172
25	99	131	183	228	156	174	N/A	316	2	277	174	224
26	N/A	N/A	N/A	272	297	174	306	43	348	423	N/A	N/A
27	367	282	377	90	88	N/A	283	N/A	243	N/A	235	254
28	168	152	38	315	89	82	N/A	333	N/A	169	208	94
29	183	N/A	1	64	377	480	277	406	362	333	1	N/A
30	160	N/A	325	12	N/A	1	302	1	175	1	317	223
31	N/A	N/A	127	N/A	341	N/A	N/A	311	N/A	222	N/A	180
Total	5,349	4,483	4,523	4,802	6,096	5,674	5,879	6,026	5,600	5,809	5,259	4,220
Average	233	204	206	209	234	227	280	262	255	223	239	192
Min	99	1	1	12	2	1	1	1	2	1	1	1
Max	368	354	377	361	476	526	469	483	362	484	518	306

Permit To Take Water (m3/day)	1,290
Yearly Total (m3)	63,720
Yearly Average (m3)	230
Yearly Min (m3)	1
Yearly Max (m3)	526

UTILITIES KINGSTON – WATER TREATMENT – ANNUAL REPORT

DOCUMENT:

Sydenham Water Treatment Plant Annual Summary Report

Table 2 – Peak Raw Water Flow Daily Totals (L/min)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	443	469	362	N/A	469	412	439	425	458	433	396	436
2	N/A	400	465	447	460	461	405	424	445	463	N/A	2
3	460	N/A	402	403	406	406	N/A	N/A	462	470	452	456
4	392	465	N/A	N/A	462	N/A	439	444	N/A	448	427	442
5	N/A	410	449	450	465	462	441	403	442	421	N/A	361
6	454	465	403	401	N/A	464	1	N/A	446	454	433	440
7	449	407	1	N/A	470	411	459	447	N/A	449	447	402
8	462	305	447	456	440	470	450	448	452	438	384	N/A
9	409	451	306	405	466	458	1	N/A	464	404	451	447
10	458	385	N/A	N/A	456	N/A	463	457	N/A	275	451	413
11	454	1	N/A	458	405	454	396	461	455	452	1	N/A
12	N/A	454	218	405	1	404	409	1	460	453	449	443
13	455	399	399	N/A	459	N/A	450	435	N/A	449	447	438
14	403	357	N/A	460	462	447	430	442	454	1	N/A	N/A
15	463	459	449	427	468	460	N/A	N/A	457	442	447	447
16	408	406	403	461	464	N/A	449	454	N/A	422	N/A	399
17	1	N/A	N/A	406	466	447	390	447	441	N/A	N/A	N/A
18	458	449	455	N/A	N/A	398	N/A	N/A	462	437	444	443
19	430	399	409	465	453	456	453	459	N/A	380	390	441
20	N/A	N/A	N/A	406	410	407	465	447	217	441	271	N/A
21	457	452	461	N/A	N/A	456	N/A	421	470	396	405	449
22	450	389	404	456	456	407	N/A	442	N/A	437	441	436
23	N/A	N/A	N/A	408	406	451	485	452	437	434	N/A	N/A
24	465	456	456	464	464	381	442	59	460	N/A	443	456
25	398	395	457	410	415	442	N/A	442	424	439	445	406
26	N/A	N/A	N/A	471	445	406	463	391	445	422	N/A	N/A
27	457	451	450	408	410	N/A	455	1	441	N/A	446	439
28	451	456	430	462	451	446	N/A	462	N/A	429	437	381
29	464	N/A	387	409	406	456	462	445	443	425	423	N/A
30	410	N/A	455	455	N/A	47	427	334	445	404	432	449
31	N/A	N/A	406	N/A	458	N/A	N/A	446	N/A	429	N/A	438
Max	465	469	465	471	470	470	485	462	470	470	452	456

Permit To Take Water (m3/day)	1,334
Yearly Max (m3)	485

UTILITIES KINGSTON – WATER TREATMENT – ANNUAL REPORT

DOCUMENT:
Sydenham Water Treatment Plant Annual Summary Report

Table 3 – Treated Water Flow Daily Totals (m3)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	192	280	N/A	N/A	153	120	154	239	109	78	297	70
2	N/A	187	252	338	442	59	286	316	93	438	N/A	N/A
3	317	N/A	196	60	N/A	400	N/A	N/A	295	14	230	177
4	136	344	N/A	N/A	248	N/A	306	224	N/A	273	366	211
5	1	132	233	364	239	N/A	151	152	364	130	N/A	N/A
6	318	172	167	82	N/A	474	N/A	N/A	249	243	289	307
7	174	198	N/A	N/A	167	N/A	340	286	N/A	90	137	20
8	212	N/A	256	291	214	359	269	263	320	82	N/A	N/A
9	80	346	229	136	24	264	N/A	N/A	141	269	284	287
10	260	46	N/A	N/A	302	N/A	281	298	N/A	N/A	241	73
11	114	N/A	N/A	329	246	334	204	106	325	268	N/A	N/A
12	N/A	364	300	109	N/A	137	N/A	N/A	122	257	182	297
13	284	48	177	N/A	338	N/A	346	296	N/A	186	335	72
14	205	N/A	N/A	349	167	262	199	245	337	N/A	N/A	N/A
15	103	316	308	126	N/A	243	N/A	N/A	191	158	476	231
16	347	99	38	120	343	N/A	359	239	N/A	328	N/A	152
17	N/A	N/A	N/A	226	310	N/A	77	379	298	N/A	N/A	N/A
18	266	318	190	N/A	N/A	69	N/A	N/A	163	315	307	278
19	165	81	211	293	315	222	343	36	N/A	73	113	96
20	N/A	N/A	N/A	155	130	197	398	431	310	225	N/A	N/A
21	248	258	287	N/A	N/A	271	N/A	N/A	196	123	297	299
22	253	158	138	355	349	146	N/A	208	N/A	90	82	113
23	N/A	N/A	N/A	105	159	300	315	40	312	287	N/A	N/A
24	355	273	278	243	254	32	271	N/A	160	N/A	267	173
25	71	125	155	203	125	155	N/A	333	N/A	240	130	194
26	N/A	N/A	N/A	280	305	163	306	N/A	313	357	N/A	N/A
27	366	278	387	58	65	N/A	234	N/A	179	N/A	222	252
28	127	103	9	316	102	86	N/A	315	N/A	163	163	79
29	180	N/A	N/A	49	349	382	281	356	349	293	N/A	N/A
30	144	N/A	330	N/A	N/A	17	219	N/A	143	N/A	326	225
31	N/A	N/A	114	N/A	358	N/A	N/A	323	N/A	218	N/A	129
Total	4,918	4,126	4,255	4,587	5,704	4,692	5,339	5,085	4,969	5,198	4,744	3,735
Average	205	206	213	209	238	213	267	254	237	208	250	178
Min	1	46	9	49	24	17	77	36	93	14	82	20
Max	366	364	387	364	442	474	398	431	364	438	476	307

Municipal Drinking Water Licence Max (m3/day)	1,290
Yearly Total	57,352
Yearly Average (m3)	223
Yearly Min (m3)	1
Yearly Max (m3)	476