

# Essex Drinking Water System

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Waterworks # 210000130  
System Category – Large Municipal Residential

## Annual Water Report

Prepared For: The Corporation of the Town of Essex

Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup> 2022

Issued: February 15, 2022

Revision: 0

Operating Authority:



This report has been prepared to satisfy the annual reporting requirements in O.Reg 170/03 Section 11 and Schedule 22

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## Revision History

Date	Revision #	Revision Notes
February 2023	0	Created report

## Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to residents at the Essex Centre Municipal Office. Notification will be at the Town Hall and copies provided free of charge if requested. The Essex Town Hall is located at 33 Talbot St S, Essex, ON N8M 1A8.

## Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	<p>The Drinking Water System Inspection Report for the Essex Drinking Water System (Harrow-Colchester South) (DWS#210000130). The review period for this inspection was November 1, 2021 to October 31, 2022. There were no Non-Compliance/Non-Conformance Items identified during this review period. A field visit to the water treatment plant, low lift station and elevated storage tank was conducted on December 20, 2022.</p> <p>Final Inspection Rating 100.00%</p>
QEMS External Audit	<p>SAI Global conducted an System (Stage 1) audit of Town of Essex on Aug 18, 2022 and an Accreditation audit (Stage 2) on Sept 8 to DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017.</p> <p>No Non conformances were identified.</p> <p>The Certificate of Accreditation was issued October 10, 2022</p>
AWQI's/BWA	No AWQI's/BWA occurred
Non-Compliance	No Non-Compliance's occurred
Community Complaints	<p>Two complaints occurred in 2022</p> <ol style="list-style-type: none"> <li>1. Noise complaint – tenders were all ready issued to replace the clarifier equipment in question, adjustments were made to minimize the noise until the equipment is replaced.</li> <li>2. Taste and colour – the homeowners filter was determined to be the cause of the complaint.</li> </ol>
Spills	No spills occurred

## System Process Description

### Raw Source

The Harrow Colchester South surface water treatment facility draws water from Lake Erie through an intake structure which was constructed circa 1957-58.

### Treatment

The Harrow-Colchester South Water Treatment Plant is a conventional treatment process consisting of a raw water intake, low lift pumping, chemical coagulation, clarification, dual media filters, disinfection by chlorination, an on-site reservoir, high lift pumping and waste residue management.

#### *Treatment Chemicals used during the reporting year:*

Chemical Name	Use	Supplier
Clarion A5	Coagulant	Chemtrade
Polymer Norfloc 122	Coagulant-aid	Northland Chemical Inc.
Powdered Activated Carbon (PAC)	Taste and odour removal	Brenntag
Chlorine Gas	Disinfection	Brenntag
Sodium Hybochlorite	Zebra mussel control	LAVO
Cat-Floc 8103	Filter-aid	NALCO

### Distribution

The Essex Water Distribution System which receives treated water from the Harrow-Colchester South Water Treatment Plant and includes an elevated storage tank and approximately 145 km of watermains. The Essex (Harrow-Colchester South Water Distribution System and the Essex (Union) Water Distribution System are physically connected.

## Summary of Non-Compliance

### Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
There was no adverse water quality incidents reported during the reporting period.						

### Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There was no non-compliance issues reported during the reporting period.				

**Non-Compliance Identified in a Ministry Inspection:**

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There was no Non-Compliance Identified in a Ministry Inspection during this period.				

**Flows**

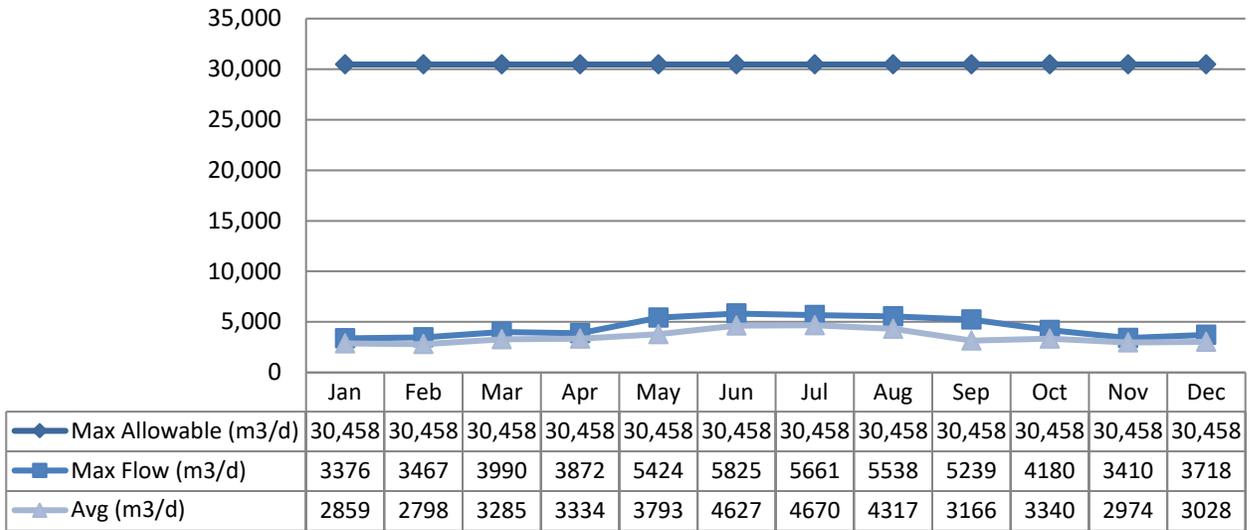
The Essex Drinking Water System is operating on average under half the rated capacity (46.3%).

**Raw Water Flows**

The Raw Water flows are regulated under the Permit to Take Water. 2022 Raw Flow Data was submitted to the Ministry electronically under permit #4088-9KDN6D. The confirmation and a copy of the data that was submitted are attached in Appendix A.

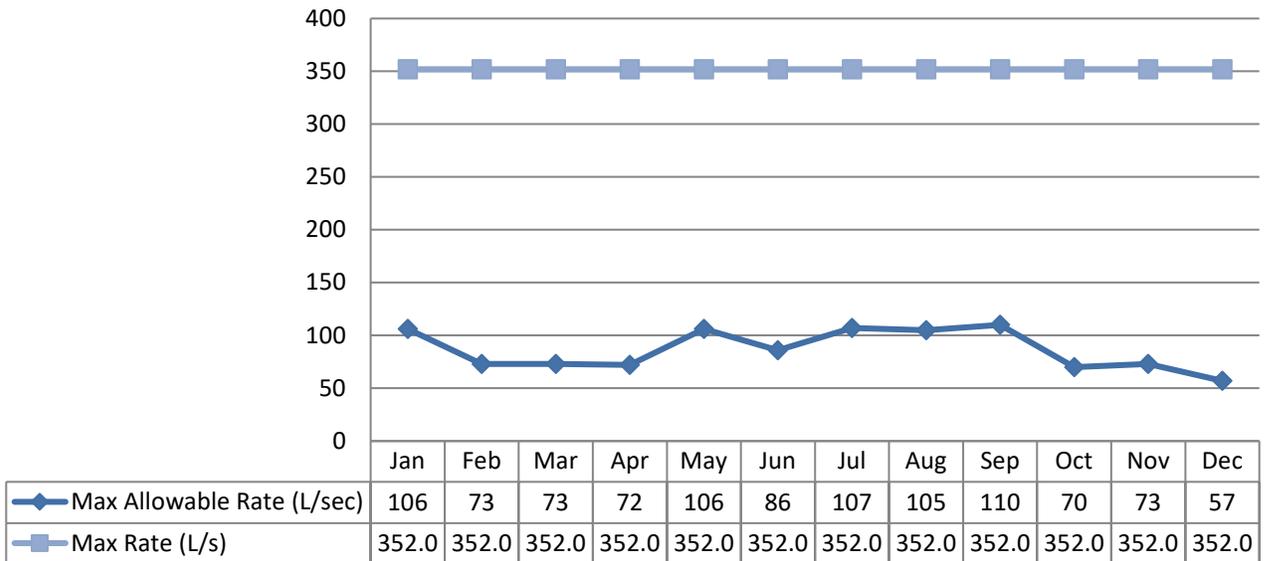
**Total Monthly Flows (m<sup>3</sup>/d)**

Max Allowable PTTW



Monthly Rated Flows (L/s)

Max allowable rate - PTTW

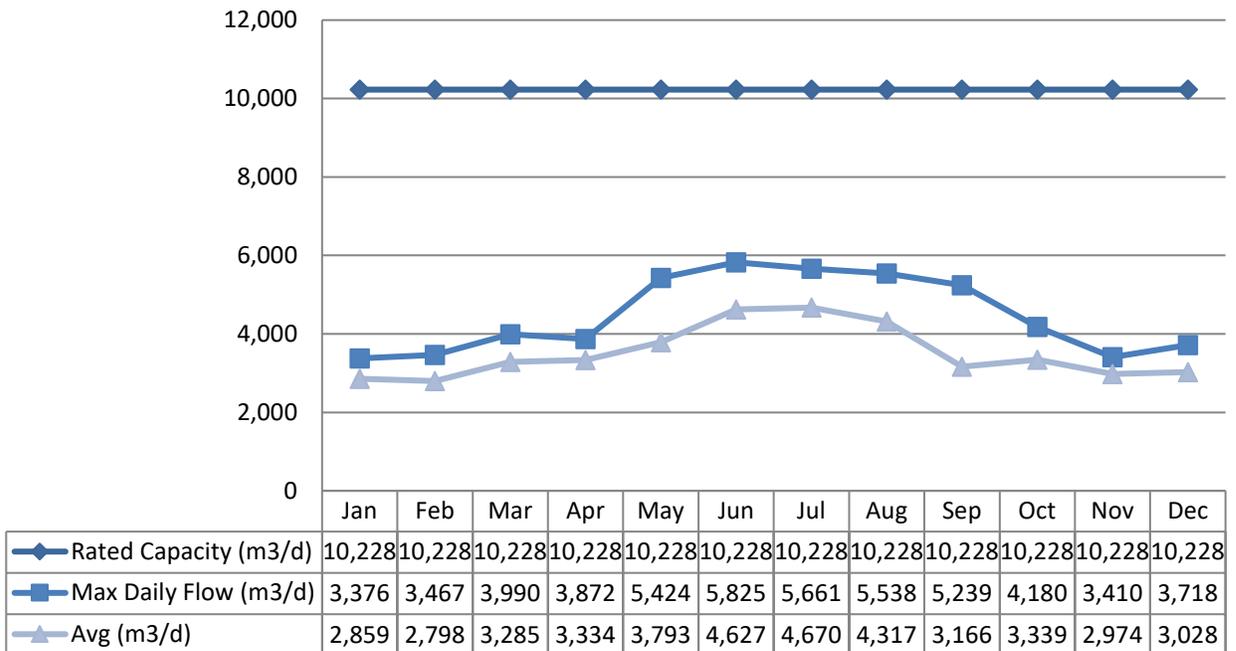


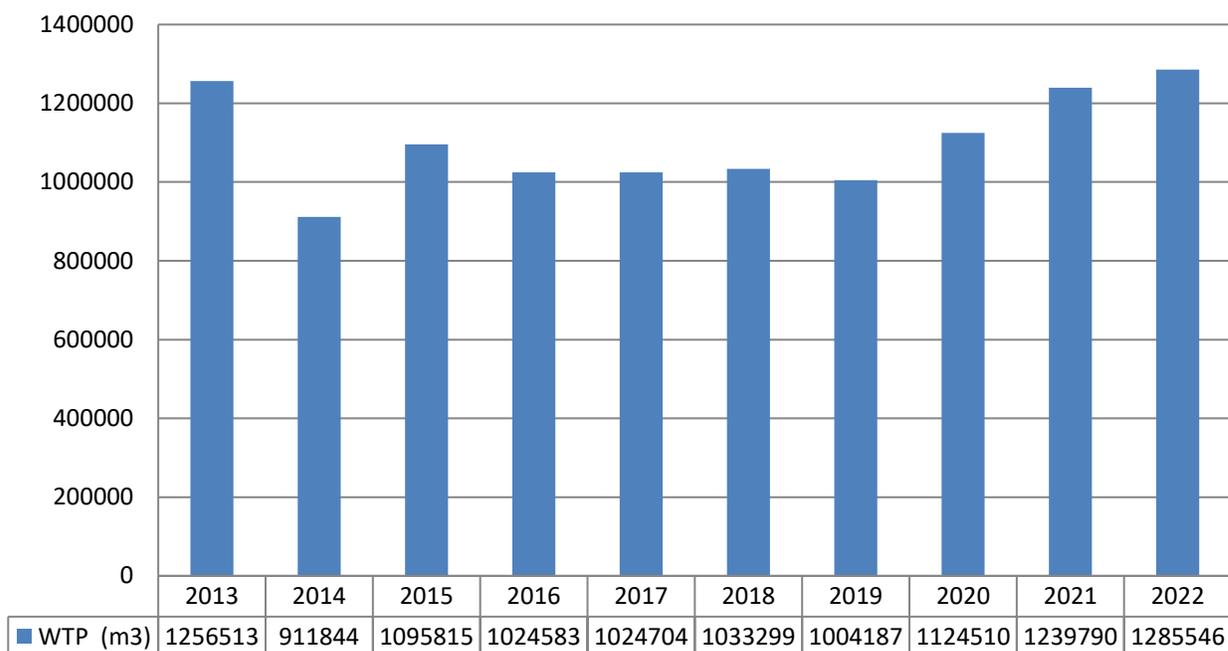
Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence.

Monthly Rated Flows

Rated Capacity - MDWL



Annual Total Flow ComparisonTotal Annual m<sup>3</sup>

## Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli Results		Range of Total Coliform Results		Range of HPC Results	
		Min	Max	Min	Max	Min	Max
Raw Water	52	2	60	2	2000		
Treated Water	52	0	0	0	0	10	20
Distribution Water	260	0	0	0	0	10	50

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, On-Line (NTU) - Filt1	8760	0	0.39
Turbidity, On-Line (NTU) - Filt2	8760	0	1.62
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.48	1.68
Total Chlorine Residual, In-House (mg/L) - TW	359	1.22	1.70
Free Chlorine Residual, In-House (mg/L) - DW1	104	0.73	1.22
Free Chlorine Residual, In-House (mg/L) - DW2	104	0.61	1.23
Free Chlorine Residual, In-House (mg/L) - DW3	104	0.59	1.16
Free Chlorine Residual, In-House (mg/L) - DW4	52	0.65	1.15

NOTE: spikes recorded by on-line instrumentation were a result of air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O.Reg 170/03

## Inorganic Parameters

These parameters are tested as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrate and Nitrite are tested quarterly and the metals are tested annually as required under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Antimony: Sb (µg/L) - TW	2022/04/04	<MDL 0.6	6.0	No	No
Arsenic: As (µg/L) - TW	2022/04/04	0.3	10.0	No	No
Barium: Ba (µg/L) - TW	2022/04/04	15.6	1000.0	No	No
Boron: B (µg/L) - TW	2022/04/04	26.0	5000.0	No	No
Cadmium: Cd (µg/L) - TW	2022/04/04	0.012	5.0	No	No
Chromium: Cr (µg/L) - TW	2022/04/04	0.17	50.0	No	No
Mercury: Hg (µg/L) - TW	2022/04/04	<MDL 0.01	1.0	No	No
Selenium: Se (µg/L) - TW	2022/04/04	0.13	50.0	No	No
Uranium: U (µg/L) - TW	2022/04/04	0.051	20.0	No	No
<b>Additional Inorganics</b>					
Fluoride (mg/L) - TW	2022/04/04	<MDL 0.06	1.5	No	No
Nitrite (mg/L) - TW	2022/01/10	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2022/04/04	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2022/07/04	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2022/10/03	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2022/01/10	1.33	10.0	No	No
Nitrate (mg/L) - TW	2022/04/04	0.555	10.0	No	No
Nitrate (mg/L) - TW	2022/07/04	0.216	10.0	No	No
Nitrate (mg/L) - TW	2022/10/03	0.15	10.0	No	No
Sodium: Na (mg/L) - TW	2022/04/04	9.75	20*	No	No

\*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified mg/L when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

### Schedule 15 Sampling:

The Schedule 15 Sampling is required under O.Reg 170/03. This system is under reduced sampling. No plumbing samples were collected.

Distribution System	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Alkalinity (mg/L)	17	63	84	n/a	n/a
pH	17	7.1	7.92	n/a	n/a
Lead (ug/l)	17	0.11	0.5	10	0

## Organic Parameters

These parameters are tested annually as a requirement under O.Reg 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Alachlor (ug/L) - TW	2022/04/04	<MDL 0.02	5.0	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2022/04/04	<MDL 0.01	5.0	No	No
Azinphos-methyl (ug/L) - TW	2022/04/04	<MDL 0.05	20.0	No	No
Benzene (ug/L) - TW	2022/04/04	<MDL 0.32	1.0	No	No
Benzo(a)pyrene (ug/L) - TW	2022/04/04	<MDL .004	0.01	No	No
Bromoxynil (ug/L) - TW	2022/04/04	<MDL 0.33	5.0	No	No
Carbaryl (ug/L) - TW	2022/04/04	<MDL 0.05	90.0	No	No
Carbofuran (ug/L) - TW	2022/04/04	<MDL 0.01	90.0	No	No
Carbon Tetrachloride (ug/L) - TW	2022/04/04	<MDL 0.17	2.0	No	No
Chlorpyrifos (ug/L) - TW	2022/04/04	<MDL 0.02	90.0	No	No
Diazinon (ug/L) - TW	2022/04/04	<MDL 0.02	20.0	No	No
Dicamba (ug/L) - TW	2022/04/04	<MDL 0.2	120.0	No	No
1,2-Dichlorobenzene (ug/L) - TW	2022/04/04	<MDL 0.41	200.0	No	No
1,4-Dichlorobenzene (ug/L) - TW	2022/04/04	<MDL 0.36	5.0	No	No
1,2-Dichloroethane (ug/L) - TW	2022/04/04	<MDL 0.35	5.0	No	No
1,1-Dichloroethylene (ug/L) - TW	2022/04/04	<MDL 0.33	14.0	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2022/04/04	<MDL 0.35	50.0	No	No
2,4-Dichlorophenol (ug/L) - TW	2022/04/04	<MDL 0.15	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2022/04/04	<MDL 0.19	100.0	No	No
Diclofop-methyl (ug/L) - TW	2022/04/04	<MDL 0.4	9.0	No	No
Dimethoate (ug/L) - TW	2022/04/04	<MDL 0.06	20.0	No	No
Diquat (ug/L) - TW	2022/04/04	<MDL 1.0	70.0	No	No
Diuron (ug/L) - TW	2022/04/04	<MDL 0.03	150.0	No	No
Glyphosate (ug/L) - TW	2022/04/04	<MDL 1.0	280.0	No	No
Malathion (ug/L) - TW	2022/04/04	<MDL 0.02	190.0	No	No
Metolachlor (ug/L) - TW	2022/04/04	<MDL 0.01	50.0	No	No
Metribuzin (ug/L) - TW	2022/04/04	<MDL 0.02	80.0	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2022/04/04	<MDL 0.3	80.0	No	No
Paraquat (ug/L) - TW	2022/04/04	<MDL 1.0	10.0	No	No
PCB (ug/L) - TW	2022/04/04	<MDL 0.04	3.0	No	No
Pentachlorophenol (ug/L) - TW	2022/04/04	<MDL 0.15	60.0	No	No
Phorate (ug/L) - TW	2022/04/04	<MDL 0.01	2.0	No	No
Picloram (ug/L) - TW	2022/04/04	<MDL 1.0	190.0	No	No
Prometryne (ug/L) - TW	2022/04/04	<MDL 0.03	1.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Simazine (ug/L) - TW	2022/04/04	<MDL 0.01	10.0	No	No
Terbufos (ug/L) - TW	2022/04/04	<MDL 0.01	1.0	No	No
Tetrachloroethylene (ug/L) - TW	2022/04/04	<MDL 0.35	10.0	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2022/04/04	<MDL 0.2	100.0	No	No
Triallate (ug/L) - TW	2022/04/04	<MDL 0.01	230.0	No	No
Trichloroethylene (ug/L) - TW	2022/04/04	<MDL 0.44	5.0	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2022/04/04	<MDL 0.25	5.0	No	No
Trifluralin (ug/L) - TW	2022/04/04	<MDL 0.02	45.0	No	No
Vinyl Chloride (ug/L) - TW	2022/04/04	<MDL 0.17	1.0	No	No
<b>Distribution Water</b>					
Trihalomethane: Total (µg/L) Annual Average - DW	2022	18.75	100.0	No	No
HAA Total (ug/L) Annual Average - DW	2022	5.775	80.0*	No	No

MAC = Maximum Allowable Concentration as per O.Reg 169/03

BDL = Below the laboratory detection level

### Additional Legislated Samples

#### Backwash Water Decant Pond Effluent

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
MDWL 029-101 Dated: April 3, 2021	Backwash Water	01/08/22	3.0	mg/L
	Decant	02/09/22	2.0	mg/L
	Suspended Solids	03/02/22	18.0	mg/L
	Annual Average	04/05/22	3.0	mg/L
	<25 mg/L	05/03/22	<2.0	mg/L
		06/07/22	<2.0	mg/L
		07/04/22	3.0	mg/L
		08/02/22	<2.0	mg/L
		09/07/22	2.0	mg/L
		10/03/22	4.0	mg/L
		11/02/22	2.0	mg/L
		12/06/22	3.0	mg/L
		Annual Average		4.4

#### Harmful Algal Bloom (HAB) Sampling

A Harmful Algal Bloom Monitoring, reporting, and sampling plan was implemented and maintained on site. Staff receive training on the plan prior to June 1<sup>st</sup>. Microcystin sampling is conducted commencing June 1 until October 31.

Microcystin was detected in the Raw water on July 25<sup>th</sup> sample and was reported to SAC, the Ministry of

Health and the MECP. The report #1-20ZL8P required continued monitoring until 3 clear samples were taken. After “no detection” results for the weeks of October 11, 17, 24 the MECP closed the file on October 31.

## Major Maintenance Summary

<b>Harrow-Colchester South WTP</b>	
Rebuild Filter #2	\$147,332
Raw Flow Meter Replacement	\$9,866
Reservoir Inspection and repairs	\$8,162
Low Lift Hydro Pole Replacement	\$10,570
Low Lift Waste Pump Replacement	\$19,176
Window Replacement	\$69,062
Clarifier Influent Pipe Replacement	\$101,620
New Air Dryer for the Compressors	\$4,052
<b>Total</b>	<b>\$369,843</b>

# Appendix A

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## WTRS Data and Submission Confirmation



Location: WTRS / WT DATA / Input WT Record

WTRS-WT-008

**Water Taking Data submitted successfully.**

**Confirmation:**

Thank you for submitting your water taking data online.

Permit Number: 4088-9KDN6D

Permit Holder: THE CORPORATION OF THE TOWN OF ESSEX.

Received on: Feb 9, 2023 2:40 PM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

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