REVISION FROM THE FEBRUARY 22, 2024 SUBMITTED REPORT

March 26, 2024
Municipality of West Grey
402813 Grey Road 4
RR#2
Durham, ON
N0G 1R0

Attention: Geoff Aitken, Manager of Public Works

RE: Durham Drinking Water System
2023 Annual and Summary Reports

Geoff,

Please find attached the 2023 Annual and Summary Reports for the Durham Drinking Water System, in accordance with Section 11(1) of O. Reg. 170/03. This report covers the period from January 1 to December 31, 2023 and meets the requirement of being prepared by February 28 of this year.

Please ensure that a copy of this report is given, without charge, to every person who requests a copy. In addition, please make certain that effective steps are taken to advise residents that copies of the report are available, and of how a copy can be obtained.

Finally, as per Schedule 22 of O. Reg. 170/03, please ensure that at least a copy of the Summary Report is given to the members of municipal council no later than March 31, 2023.

If you have any questions regarding the report, we would be pleased to address them and you should contact the undersigned accordingly.

Sincerely,

Scott Gowan
Project Manager

Veolia North America
555 Rene-Levesque Blvd W
Montreal, QC H2Z 1B1
www.Veolianorthamerica.com

Part 1 - ANNUAL REPORT (as required by O. Reg 170/03, Section 11)

Drinking-Water System Number:	220001771
Drinking-Water System Name:	Durham Drinking Water System
Drinking-Water System Owner:	Municipality of West Grey
Drinking-Water System Category:	Large Municipality Residential
Period being reported:	January 1 - December 31, 2023

Complete if your Category is Large Municipal Residential or Small Municipal Residential		Complete for all other Categories	
Does your Drinking-Water System serve more than 10,000 people?	☐ Yes ☑ No	Number of Designated Facilities served:	n/a
Is your annual report available to the public at no charge on a website on the Internet?	☑ Yes ☐ No	Did you provide a copy of your annual report to all Designated Facilities you serve?	☐ Yes ☐ No
Location where Summary Report required under O.Reg. 170/03 Schedule 22 will be available for inspection. **Municipality of West Grey** **402813 Grey Road #4** **Durham, ON N0G 1R0**		Number of Designated Facilities served:	n/a
		Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?	☐ Yes ☐ No

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:	
Drinking Water System Name	**Drinking Water System Number**
n/a	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?
n/a

Indicate how you notified system users that your annual report is available, and is free of charge.		
☑ Public access/notice via the Web	☑ Public access/notice via Government Office	☐ Public access/notice via a newspaper
☐ Public access/notice via the Public Request	☐ Public access/notice via a Public Library	☐ Public access/notice via other method

Describe your Drinking Water System

Well No. 1B Pumphouse

A GUDI well, 300mm diameter and 77 m deep equipped with a VFD submersible well pump rated at 15.9 L/s at a TDH of 71-133 m. The pumphouse enclosure building is 4.9 m x 3.1 m x 3.3 m high and houses the water treatment equipment including, but not limited to, flow meters, UV disinfection system, cartridge filters, sodium hypochlorite disinfection system, online chlorine and turbidity analyzers, low level alarms, autodialer and backup diesel generator.

Well No. 2 Pumphouse

A GUDI well, 300mm diameter and 74.7 m deep equipped with a VFD submersible well pump rated at 17 L/s at a TDH of 75-139 m. The pumphouse contains the water treatment equipment including, but not limited to, flow meters, UV disinfection system, cartridge filters, sodium hypochlorite disinfection system, online chlorine and turbidity analyzers, low level alarms, autodialer and backup power source available.

Well #2A is located just outside the well#2 pumphouse. It is 250mm diameter well about 68m deep. The variable speed submersible pump has a capacity of 1134L/min. The capacity of the wellhouse is 18.9L/s.

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite - 12%

Please provide a brief description and a breakdown of monetary expenses incurred

Well 2 Pump Replacement
Well 2A Level Sensor Replaced
Well 2 - New Treated Water Turbidity Analyzer Installed

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of 0.Reg. 170/03 and reported to Spills Action Centre				
Incident Date	**Parameter**	**Result**	**Corrective Action**	**Corrective Action Date**
Feb. 22, 2023	Chlorine	0.13 mg/L	The Operator backflushed low chlorine water out of the system. The free chlorine analyzer reading increased from 0.13 to 0.90 mg/L. A sample was taken and the test results showed 0 for E.Coli & TC.	Feb. 27, 2023

Microbiological testing done under the Schedule 10, 11, 12 of Regulation 170/03, during this reporting period					
	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 (Well 1B)	52	0 - 0	0 - 0	n/a	n/a
Raw (Well 2)	47*	0 - 1	0 - 1	n/a	n/a
Raw (Well 2A)	51	0 - 0	0 - 0	n/a	n/a
Treated POE 1	52	0 - 0	0 - 0	51	<10 - 10
Treated POE 2	52	0 - 0	0 - 0	52	<10 - 20
Distribution	156	0 - 0	0 - 0	53	0 - 70

***Well was offline in January so no samples were collected.**

Operational testing under Schedule 7, 8, or 9 of Regulation 170/03 during the period covered			
	Number of Grab Samples	**Range of Results** (min #) - (max #)	**Units**
Turbidity - Well 1B Treated	8760	0.01 - 4.00 *See corresponding table below*	NTU
Turbidity - Well 2 Treated	8760	0.01 - 4.00 *See corresponding table below*	NTU
Chlorine - Well 1B Treated	8760	0.40 - 2.00 A max of 2.00 occurs due to a chlorine spike when the well starts. The max the SCADA will record is 2.00 mg/L.	mg/L
Chlorine - Well 2 Treated	8760	0.13* - 2.00 * Refer to adverse on page 3. A max of 2.00 occurs due to a chlorine spike when the well starts. The max the SCADA will record is 2.00 mg/L	mg/L
Chlorine - Distribution	469	0.71 - 1.49	mg/L

***For continuous monitors use 8760 as the number of samples**

PLEASE NOTE THE EXPLANATIONS FOR RESULT NUMBERS REMOVED:

July 31 - Well #1B NTU Result of 0.00 NTU was removed because of low read due to analyzer flow rate adjustment.

Turbidity - Well 1B Treated (for all results above 1 NTU) Explanation	
April 18 (4.00 NTU)	*Due to annual calibration.*
April 19 (4.00 NTU) *Sept 20 (4.00)*	*Clean turbidity meter when the system was off.*
Sept 16 (1.11 NTU) *Sept 17 (4.00 NTU)* *Sept 18 (2.04 NTU)* *Sept 19 (4.00 NTU)* *Nov 28 (4.00 NTU)* *Dec 28 (4.00 NTU)* *Dec 29 (1.25 NTU)*	*The turbidity was over 1 for less than 15 min.*

Turbidity - Well 2 Treated (for all results with a 0.00 NTU) Explanation	
January 20	*Zero read due to reset of PLC power supply due to level transmitter missed signal at reservoir.*
April 12	*Zero read due to install of new turbidimeter*
July 11	*Restart the turbidity meter when the system was off.*
November 15	*HACH updated the turbidity meter software and the system was off.*

Turbidity - Well 2 Treated (for all results above 1 NTU) Explanation	
April 12	*Max read due to install of new turbidimeter*
June 22	*Max turb. read due to system flush maintenance while off line for repair of UV unit # 4 log book notes.*
June 23	*Max turb due to well system shut down for rotation of UV units to unit # 4 on line currently as per log book notes.*
June 25	*Max read due to flow rate adjustment .18 L/min up to .36 L/min there by causing air bubbles to go through analyzer causing high read as per log book.*
June 27 *July 9/11* *August 8/28*	*Maximum was over 1 for 1 minute when maintaining the turbidity analyzer.*
November 15	*HACH update the turbidity meter software and the system was off.*

Chlorine - Well 1B Treated (0.00-0.36 mg/L results removed & explanation)	
February 8 *March 22* *June 27* *July 20/25/26* *November 16/18*	*The following dates have been removed due to 0 reading due to maintenance, cleaning chlorine analyzer and injector when the system's off.*
March 15	*Well #1B min AIT02 zero due pump fitting break.*
May 27	*AIT 02 zero read review trending not shown on trending possible low read when system shut down for filter change however not supplying distributor then.*
July 9/24/29 *August 7* *September 9* *November 5/24/25*	*The system shut down due to low chlorine*
September 30	*Low read due to pump fitting fault the system was not supply to the distribution at the time.*
November 12/13	*The system shut down due to a power outage.*

There were no instances of untreated water being delivered into the distribution system. Well pumps automatically shut off when chlorine levels drop below a preset value, or if Turbidity exceeds 1.0NTU for 10 minutes. SCADA system reads all values, even when well pumps are off or equipment service is being conducted.

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument				
Date of legal instrument issued	**Parameter**	**Date Sampled**	**Range of Results**	**Units of Measure**
December 1, 2009	UV Transmittance (#1B)	Jan-Dec 2023	99.0-100.0	% Transmittance
December 1, 2009	UV Transmittance (#2)	Jan-Dec 2023	98.0-99.0	% Transmittance

Summary of Inorganic parameters tested during this reporting period or the most recent sample results						
Parameter	**Sample Date**	**Result Value POE 1**	**Result Value POE 2**	**Distribution**	**Unit of Measure**	**Exceedance**
Alkalinity	Mar. 27, 2023 Aug. 14, 2023	-	-	227 267 270 258	mg/L	No
Antimony	Aug. 14, 2023	<0.6	<0.6	-	µg/L	No
Arsenic	Aug. 14, 2023	<0.2	<0.2	-	µg/L	No
Barium	Aug. 14, 2023	15.3	15.5	-	µg/L	No
Boron	Aug. 14, 2023	11	17	-	µg/L	No
Cadmium	Aug. 14, 2023	0.007	0.007	-	µg/L	No
Chromium	Aug. 14, 2023	0.11	0.16	-	µg/L	No
Lead-see summary below						
Mercury	Aug. 14, 2023	<0.01	<0.01	-	µg/L	No
Selenium	Aug. 14, 2023	1.00	1.05	-	µg/L	No
Sodium	Aug. 4, 2020	6.2	11.0	-	mg/L	No
Uranium	Aug. 14, 2023	2.15	3.50	-	µg/L	No
Fluoride	Aug. 30, 2021	0.20	0.67	-	mg/L	No
Nitrite	Feb. 6, 2023 May 8, 2023 Aug. 14, 2023 Nov. 13, 2023	<0.003 <0.003 <0.003 <0.003	<0.003 <0.003 <0.003 <0.003	-	mg/L	No
Nitrate	Feb. 6, 2023 May 8, 2023 Aug. 14, 2023 Nov. 13, 2023	1.320 1.460 1.480 1.420	1.090 0.869 0.931 1.220	-	mg/L	No

Summary of Lead Results during this reporting period (Winter: Dec. 15/21 - Apr. 15/22; Summer: June 15/22- Oct. 15/22)				
Sampling Period	**Range of Results (µg/L) from Residential Samples** (# of Samples Taken)	**Distribution Locations**	**Distribution System ug/L**	**Any Adverse Water Quality Incidents?**
Winter April 11, 2022	n/a	WWTP County Shed	0.12 0.19	NO
Summer October 3, 2022	n/a	WWTP County Shed	0.17 0.88	NO

Summary of Organic parameters sampled during this reporting period or the most recent sample results					
Parameter	**Sample Date**	**Result Value POE 1**	**Result Value POE 2**	**Unit of Measure**	**Exceedance**
Alachlor	Aug. 14, 2023	<0.02	<0.02	µg/L	No
Atrazine + N-dealkylated metabolites	Aug. 14, 2023	<0.01	<0.01	µg/L	No
Azinphos-methyl	Aug. 14, 2023	<0.05	<0.05	µg/L	No
Benzene	Aug. 14, 2023	<0.32	<0.32	µg/L	No
Benzo(a)pyrene	Aug. 14, 2023	<0.004	<0.004	µg/L	No
Bromoxynil	Aug. 14, 2023	<0.33	<0.33	µg/L	No
Carbaryl	Aug. 14, 2023	<0.05	<0.05	µg/L	No
Carbofuran	Aug. 14, 2023	<0.01	<0.01	µg/L	No
Carbon Tetrachloride	Aug. 14, 2023	<0.17	<0.17	µg/L	No
Chlorpyrifos	Aug. 14, 2023	<0.02	<0.02	µg/L	No
Diazinon	Aug. 14, 2023	<0.02	<0.02	µg/L	No
Dicamba	Aug. 14, 2023	<0.20	<0.20	µg/L	No
1,2-Dichlorobenzene	Aug. 14, 2023	<0.41	<0.41	µg/L	No
1,4-Dichlorobenzene	Aug. 14, 2023	<0.36	<0.36	µg/L	No
1,2-Dichloroethane	Aug. 14, 2023	<0.35	<0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	Aug. 14, 2023	<0.33	<0.33	µg/L	No

Dichloromethane	Aug. 14, 2023	<0.35	<0.35	µg/L	No
2-4 Dichlorophenol	Aug. 14, 2023	<0.15	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Aug. 14, 2023	<0.19	<0.19	µg/L	No
Diclofop-methyl	Aug. 14, 2023	<0.40	<0.40	µg/L	No
Dimethoate	Aug. 14, 2023	<0.06	<0.06	µg/L	No
Diquat	Aug. 14, 2023	<1.0	<1.0	µg/L	No
Diuron	Aug. 14, 2023	<0.03	<0.03	µg/L	No
Glyphosate	Aug. 14, 2023	<1.0	<1.0	µg/L	No
HAA	Feb. 6, 2023 May 8, 2023 Aug. 14, 2023 Nov. 13, 2023	<5.30 (distribution) <5.30 (distribution) <5.30 (distribution) <5.30 (distribution)		µg/L	No
Malathion	Aug. 14, 2023	<0.02	<0.02	µg/L	No
MCPA	Aug. 14, 2023	<0.00012	<0.00012	µg/L	No
Metolachlor	Aug. 14, 2023	<0.01	<0.01	µg/L	No
Metribuzin	Aug. 14, 2023	<0.02	<0.02	µg/L	No
Monochlorobenzene	Aug. 14, 2023	<0.30	<0.30	µg/L	No
Paraquat	Aug. 14, 2023	<1.0	<1.0	µg/L	No
Pentachlorophenol	Aug. 14, 2023	<0.15	<0.15	µg/L	No
Phorate	Aug. 14, 2023	<0.01	<0.01	µg/L	No
Picloram	Aug. 14, 2023	<1.0	<1.0	µg/L	No
Polychlorinated Biphenyls(PCB)	Aug. 14, 2023	<0.04	<0.04	µg/L	No
Prometryne	Aug. 14, 2023	<0.03	<0.03	µg/L	No
Simazine	Aug. 14, 2023	<0.01	<0.01	µg/L	No
THM (NOTE: show latest annual average)	**2023 Average**	4.78 (distribution)		µg/L	No
Terbufos	Aug. 14, 2023	<0.01	<0.01	µg/L	No
Tetrachloroethylene	Aug. 14, 2023	<0.35	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	Aug. 14, 2023	<0.20	<0.20	µg/L	No
Triallate	Aug. 14, 2023	<0.01	<0.01	µg/L	No

Trichloroethylene	Aug. 14, 2023	<0.44	<0.44	µg/L	No
2,4,6-Trichlorophenol	Aug. 14, 2023	<0.25	<0.25	µg/L	No
Trifluralin	Aug. 14, 2023	<0.02	<0.02	µg/L	No
Vinyl Chloride	Aug. 14, 2023	<0.17	<0.17	µg/L	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Sample Date	Result Value	Unit of Measure	ODWS Criteria
n/a				

Part 2 - SUMMARY REPORT (as required by O. Reg 170/03, Section 22)

Non-Compliance with Legislations, Regulations, Approvals & Orders

During this period, the Facility was operated in full compliance with the Act, the regulations and the Facility's approval, save and except for the following:

During the MECP Inspection conducted November 21, 2023 - December 1, 2023, the following Non-Compliance was identified:

Question:

Do records indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a DWWP and/or MDWL issued under Part V of the SDWA at all times that water was being supplied to consumers?

Compliance Response(s)/Corrective Action(s)/Observation(s):

Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under O. Reg. 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers. Primary disinfection is achieved through cartridge filtration, UV disinfection and chlorination to meet a combined 4-log inactivation of viruses, as required in Schedule E of License #096-101, Issue No. 7. A new licence and permit was issued in March 2022 classifying Well 1B as groundwater. The requirement for chlorine as part of the primary disinfection was removed, as UV disinfection alone is adequate for a groundwater source.

UV equipment must provide a minimum dosage of 40 mJ/cm2 to meet primary disinfection requirements for all wells. During the inspection review period, primary disinfection criteria were met, with the following exception: On February 22, 2023, during well pump replacement, the valve to the distribution system wasn't fully closed and allowed raw water to enter the distribution system for approximately 2.5 hours. The free chlorine in the distribution system dropped to 0.13 mg/L. The operating authority reported the incident to MECP and Grey Bruce Public Health as well, and ***completed corrective actions***. The system was backflushed through the pumphouse. Free chlorine in the distribution system was 0.9mg/L. Microbiological samples collected were negative for E. coli and total coliform.

Permit to Take Water (PTTW) Flow Comparison

Well #1 Raw Water Flow

Month	Raw Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	529	946	16,385
Feb '23	539	635	15,105
Mar '23	531	585	16,468
Apr '23	549	690	16,460
May '23	581	660	18,021
Jun '23	566	704	16,989
Jul '23	538	627	16,685
Aug '23	524	577	16,230
Sep '23	572	679	17,158
Oct '23	519	653	16,089
Nov '23	417	485	12,523
Dec '23	428	481	13,260
Annual Summary			
Average	524		
Maximum		946	
Total			191,373
PTTW Capacity	1375	1375	
% Capacity	38.1	68.8	

Well #2 Raw Water Flow

Month	Raw Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	15	182	472
Feb '23	343	484	9,602
Mar '23	240	386	7,433
Apr '23	230	352	6,904
May '23	287	456	8,912
Jun '23	254	454	7,633
Jul '23	240	459	7,441
Aug '23	256	310	7,921
Sep '23	296	693	8,882
Oct '23	244	425	7,574
Nov '23	220	316	6,590
Dec '23	209	278	6,493
Annual Summary			
Average	235		
Maximum		693	
Total			85,857
PTTW Capacity	1634	1634	
% Capacity	14.4	42.4	

Well #2A Raw Water Flow

Month	Raw Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	408	513	12,657
Feb '23	131	333	3,669
Mar '23	250	340	7,751
Apr '23	242	349	7,263
May '23	238	421	7,377
Jun '23	267	489	8,018
Jul '23	258	347	7,996
Aug '23	259	375	8,042
Sep '23	274	418	8,217
Oct '23	275	495	8,526
Nov '23	214	423	6,435
Dec '23	213	272	6,608
Annual Summary			
Average	254		
Maximum		513	
Total			92,557
PTTW Capacity	1634	1634	
% Capacity	15.5	31.4	

Combined Raw Water Flow

Month	Raw Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	952	1,120	29,514
Feb '23	1,013	1,120	28,376
Mar '23	1,021	1,154	31,652
Apr '23	1,021	1,132	30,627
May '23	1,107	1,257	34,309
Jun '23	1,088	1,342	32,640
Jul '23	1,036	1,195	32,122
Aug '23	1,038	1,149	32,192
Sep '23	1,142	1,299	34,257
Oct '23	1,038	1,306	32,189
Nov '23	852	967	25,548
Dec '23	850	956	26,362
Annual Summary			
Average	1,013		
Maximum		1,342	
Total			369,788
PTTW Capacity	3009	3009	
% Capacity	33.7	44.6	

Municipal Drinking Water Licence (MDWL) Flow Comparison

Well #1 Treated Water Flow

Month	Treated Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	537	962	16,656
Feb '23	548	643	15,333
Mar '23	539	594	16,715
Apr '23	556	698	16,683
May '23	589	669	18,257
Jun '23	574	715	17,208
Jul '23	547	639	16,942
Aug '23	531	587	16,458
Sep '23	581	690	17,437
Oct '23	527	663	16,330
Nov '23	424	492	12,731
Dec '23	434	488	13,463
Annual Summary			
Average	532		
Maximum		962	
Total			194,212
Rated Capacity	1375	1375	
% Capacity	38.7	70.0	

Well #2 Treated Water Flow

Month	Treated Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	415	481	12,859
Feb '23	472	540	13,217
Mar '23	486	594	15,072
Apr '23	478	539	14,345
May '23	527	599	16,347
Jun '23	512	638	15,349
Jul '23	501	578	15,540
Aug '23	517	580	16,019
Sep '23	572	743	17,164
Oct '23	517	653	16,024
Nov '23	431	534	12,922
Dec '23	419	477	12,982
Annual Summary			
Average	487		
Maximum		743	
Total			177,841
Rated Capacity	1636	1636	
% Capacity	29.8	45.4	

Combined Treated Water Flow

Month	Treated Water Flow		
	Average Daily m3	Maximum Daily m3	Monthly Total m3
Jan '23	952	1,037	29,515
Feb '23	1,020	1,131	28,549
Mar '23	1,025	1,126	31,787
Apr '23	1,034	1,140	31,028
May '23	1,116	1,268	34,604
Jun '23	1,085	1,353	32,557
Jul '23	1,048	1,210	32,481
Aug '23	1,048	1,159	32,478
Sep '23	1,153	1,312	34,601
Oct '23	1,044	1,316	32,353
Nov '23	855	976	25,654
Dec '23	853	965	26,445
Annual Summary			
Average	1,019		
Maximum		1,353	
Total			372,053
Rated Capacity	3011	3011	
% Capacity	33.8	44.9	