



2016 ANNUAL REPORT FOR MITCHELL DRINKING WATER SYSTEM

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

Drinking-Water System Number:	210000577
Drinking-Water System Name:	Mitchell Drinking Water System
Drinking-Water System Owner:	Municipality of West Perth
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	Operating year 2016

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 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 10,000 people?	Number of Designated Facilities served: 6
Is your annual report available to the public at no charge on a web site on the Internet? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Did you provide a copy of your annual report to all Designated Facilities you serve? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection. Municipal Office, Mitchell Public Library and Municipality of West Perth Website	Number of Designated Facilities served: 6
	Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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.

<input checked="" type="checkbox"/> Public access/notice via the web	<input checked="" type="checkbox"/> Public access/notice via Government Office	<input type="checkbox"/> Public access/notice via a newspaper
<input checked="" type="checkbox"/> Public access/notice via Public Request	<input checked="" type="checkbox"/> Public access/notice via a Public Library	<input type="checkbox"/> Public access/notice via Other Method _____

Describe your Drinking Water System

Mitchell currently obtains its water supply from 4 bedrock wells. There are two treatment facilities; Treatment 123 and Treatment 4. Treatment 123 obtains disinfection through 2 chlorine dosing pumps, 1 used as primary and the other as backup. Disinfection at Treatment 4 (T4) is provided by injecting a mixed-oxidant solution (primarily comprised of "Chlorine compounds") into the pumped well water, before it enters the distribution system. The mixed oxidant solution is generated using on-site equipment that was installed at Treatment 4 in 2007. This oxidant solution is added to disinfect the pumped well water and to maintain the chlorine residual in the distribution network. In addition to the disinfection process, a sodium silicate food grade chemical is injected into the pumped well water to sequester dissolved iron (i.e., to help prevent oxidation of iron and other dissolved metals that are naturally present in the water, as this can lead to "red" water appearance and staining of household fixtures and laundry, an aesthetic problem). Sodium silicate is approved for use in drinking water.

Treated water from Wells # 1, 2, 3 discharge chlorinated water into a baffled 138m³ concrete ground-level reservoir which flows into a 190m³ concrete ground level reservoir located at 132 St. George St. which is identified as Treatment 123.

Treated water is drawn from that reservoir, using high-lift pumps, and discharged into the distribution system.

Treated water from Well # 4 discharges into baffled 250 m³ reservoir located at 50 Arthur St. and is identified as Treatment 4. Treated water is drawn from the reservoir using a high lift pump and discharged into the system.

Treatment 123 or Treatment 4 both operate as independent systems. Either system can be in the lead mode with the other system as a backup or in second mode to handle high peak demand.

The 1000m³ Water Tower and 3900m³ provide system water storage and sustains pressure in the distribution system. A booster pump located at the base of the standpipe, is used during emergency situations (e.g., fires), when the standpipe liquid level drops below that needed to sustain desired system flows and pressures under such circumstances.

The Mitchell water works currently services a population of approximately 4,000.



List all water treatment chemicals used over this reporting period

Mixed Oxidant solution produced onsite (NSF)
 Liquid Chlorine 12% - NSF
 Sodium Silicate - NSF

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

St. David St. underground infrastructure replaced between Ontario Rd. and Montreal St.
 Montreal St. underground infrastructure replaced between St. David St. and Arthur St.
 Construction completed of new elevated storage tank located on Clark St.

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 O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
N/A				

Microbiological testing done under the Schedule 10, 11 or 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 #1	52	0	0	N/A	N/A
Raw Well #2	52	0	0	N/A	N/A
Raw Well #3	52	0	0	N/A	N/A
Raw Well #4	49	0	0	N/A	N/A
POE #123	50	0	0	50	0-2
POE #4	49	0	0	49	0-6
Distribution	206	0	0	54	0-1

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report			
	Number of Grab Samples	Range of Results (min #) – (max #)	Units
Turbidity Raw Well #1	12	0.13-0.60	NTU
Turbidity Raw Well #2	12	0.13-0.62	NTU
Turbidity Raw Well #3	12	0.08-0.91	NTU
Turbidity Raw Well #4	12	0.16-0.64	NTU
Chlorine-POE 123 Continuous Monitoring	8760	0.00 – 5.00	mg/L
Chlorine-POE 4 Continuous Monitoring	8760	0.00 – 4.85	mg/L
Fluoride	N/A	N/A	mg/L

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	Result	Unit of Measure
N/A				



Treatment 123 (Reservoir and Distribution Center)

Summary of Inorganic Parameters

Summary of Inorganic parameters tested during this reporting period or the most recent sample results				
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	Apr 27, 2015	ND	µg/L	No
Arsenic	Apr 27, 2015	3.3	µg/L	No
Barium	Apr 27, 2015	61	µg/L	No
Boron	Apr 27, 2015	100	µg/L	No
Cadmium	Apr 27, 2015	ND	µg/L	No
Chromium	Apr 27, 2015	ND	µg/L	No
Lead-see results below				
Mercury	Apr 27, 2015	ND	µg/L	No
Selenium	Apr 27, 2015	ND	µg/L	No
Sodium	Apr 27, 2015	41	mg/L	Yes
Uranium	Apr 27, 2015	ND	µg/L	No
Fluoride	Dec 08, 2014	1.8	mg/L	Yes
Nitrite	Jan. 11 2016	ND	µg/L	No
Nitrate	Jan. 11 2016	ND	µg/L	No
Nitrite	April 4 2016	ND	µg/L	No
Nitrate	April 4 2016	ND	µg/L	No
Nitrite	July 4 2016	ND	µg/L	No
Nitrate	July 4 2016	ND	µg/L	No
Nitrite	October 3 2016	ND	µg/L	No
Nitrate	October 3 2016	ND	µg/L	No

ND = Not detected



Treatment 4 (Reservoir and Distribution Center)

Summary of Inorganic Parameters

Summary of Inorganic parameters tested during this reporting period or the most recent sample results				
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	Dec. 12 2016	ND	µg/L	No
Arsenic	Dec. 12 2016	1.5	µg/L	No
Barium	Dec. 12 2016	59	µg/L	No
Boron	Dec. 12 2016	110	µg/L	No
Cadmium	Dec. 12 2016	ND	µg/L	No
Chromium	Dec. 12 2016	ND	µg/L	No
Lead-see results below				
Mercury	Dec 12, 2016	ND	µg/L	No
Selenium	Dec 12, 2016	ND	µg/L	No
Sodium	Dec 12, 2016	44	mg/L	Yes
Uranium	Dec 12, 2016	0.22	µg/L	No
Fluoride	Dec 08, 2014	1.9	mg/L	Yes
Nitrite	Jan. 11 2016	ND	µg/L	No
Nitrate	Jan. 11 2016	ND	µg/L	No
Nitrite	April 4 2016	ND	µg/L	No
Nitrate	April 4 2016	ND	µg/L	No
Nitrite	July 25 2016	ND	µg/L	No
Nitrate	July 25 2016	ND	µg/L	No
Nitrite	October 3 2016	ND	µg/L	No
Nitrate	October 3 2016	ND	µg/L	No

N/D = Not detected



Lead Testing Results

Summary of Lead Results during this reporting period (Winter: Dec. 15/13-April 15/14; Summer: June 15-Oct. 15/14)				
Sampling Period	Location	Distribution System mg/L Lead	Distribution System mg/L Alkalinity	Any Adverse Water Quality Incidents?
Jan 11, 2016	Well #3 SS	N/A	210	N
Jan 11, 2016	WWTP Hydrant	N/A	210	N
Jan 11, 2016	Hydrant#167	N/A	210	N
Aug 8, 2016	Well #3 SS	N/A	200	N
Aug 8, 2016	WWTP Hydrant	N/A	220	N
Aug 8, 2016	Hydrant #167	N/A	220	N

ND: Non-detect

Point of Entry 123 Summary of Organic Parameters

Summary of Organic parameters tested during this reporting period or the most recent sample results				
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Apr. 27 2015	ND	µg/L	No
Aldicarb	Apr. 27 2015	ND	µg/L	No
Aldrin + Dieldrin	Apr. 27 2015	ND	µg/L	No
Atrazine + N-dealkylated metabolites	Apr. 27 2015	ND	µg/L	No
Azinphos-methyl	Apr. 27 2015	ND	µg/L	No
Bendiocarb	Apr. 27 2015	ND	µg/L	No
Benzene	Apr. 27 2015	ND	µg/L	No
Benzo(a)pyrene	Apr. 27 2015	ND	µg/L	No
Bromoxynil	Apr. 27 2015	ND	µg/L	No
Carbaryl	Apr. 27 2015	ND	µg/L	No
Carbofuran	Apr. 27 2015	ND	µg/L	No
Carbon Tetrachloride	Apr. 27 2015	ND	µg/L	No
Chlordane (Total)	Apr. 27 2015	ND	µg/L	No
Chlorpyrifos	Apr. 27 2015	ND	µg/L	No
Cyanazine	Apr. 27 2015	ND	µg/L	No

Summary of Organic parameters tested during this reporting period or the most recent sample results				
Diazinon	Apr. 27 2015	ND	µg/L	No
Dicamba	Apr. 27 2015	ND	µg/L	No
1,2-Dichlorobenzene	Apr. 27 2015	ND	µg/L	No
1,4-Dichlorobenzene	Apr. 27 2015	ND	µg/L	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Apr. 27 2015	ND	µg/L	No
1,2-Dichloroethane	Apr. 27 2015	ND	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	Apr. 27 2015	ND	µg/L	No
Dichloromethane	Apr. 27 2015	ND	µg/L	No
2-4 Dichlorophenol	Apr. 27 2015	ND	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Apr. 27 2015	ND	µg/L	No
Diclofop-methyl	Apr. 27 2015	ND	µg/L	No
Dimethoate	Apr. 27 2015	ND	µg/L	No
Dinoseb	Apr. 27 2015	ND	µg/L	No
Diquat	Apr. 27 2015	ND	µg/L	No
Diuron	Apr. 27 2015	ND	µg/L	No
Glyphosate	Apr. 27 2015	ND	µg/L	No
Heptachlor + Heptachlor Epoxide	Apr. 27 2015	ND	µg/L	No
Lindane (Total)	Apr. 27 2015	ND	µg/L	No
Malathion	Apr. 27 2015	ND	µg/L	No
Methoxychlor	Apr. 27 2015	ND	µg/L	No
Metolachlor	Apr. 27 2015	ND	µg/L	No
Metribuzin	Apr. 27 2015	ND	µg/L	No
Monochlorobenzene	Apr. 27 2015	ND	µg/L	No
Paraquat	Apr. 27 2015	ND	µg/L	No
Parathion	Apr. 27 2015	ND	µg/L	No
Pentachlorophenol	Apr. 27 2015	ND	µg/L	No
Phorate	Apr. 27 2015	ND	µg/L	No
Picloram	Apr. 27 2015	ND	µg/L	No
Polychlorinated Biphenyls(PCB)	Apr. 27 2015	ND	µg/L	No
Prometryne	Apr. 27 2015	ND	µg/L	No
Simazine	Apr. 27 2015	ND	µg/L	No
THM (NOTE: show latest annual average)	Q1-Q4 2016	28.2	µg/L	No

Summary of Organic parameters tested during this reporting period or the most recent sample results				
Temephos	Apr. 27 2015	ND	µg/L	No
Terbufos	Apr. 27 2015	ND	µg/L	No
Tetrachloroethylene	Apr. 27 2015	ND	µg/L	No
2,3,4,6-Tetrachlorophenol	Apr. 27 2015	ND	µg/L	No
Triallate	Apr. 27 2015	ND	µg/L	No
Trichloroethylene	Apr. 27 2015	ND	µg/L	No
2,4,6-Trichlorophenol	Apr. 27 2015	ND	µg/L	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	Apr. 27 2015	ND	µg/L	No
Trifluralin	Apr. 27 2015	ND	µg/L	No
Vinyl Chloride	Apr. 27 2015	ND	µg/L	No

ND= non-detect

Point of Entry 4 Summary of Organic Parameters

Summary of Organic parameters tested during this reporting period or the most recent sample results				
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
2,3,4,6-Tetrachlorophenol	Dec. 12 2016	ND	µg/L	No
2,4,6-Trichlorophenol	Dec. 12 2016	ND	µg/L	No
2,4-D	Dec. 12 2016	ND	µg/L	No
2,4-Dichlorophenol	Dec. 12 2016	ND	µg/L	No
Alachlor	Dec. 12 2016	ND	µg/L	No
Atrazine	Dec. 12 2016	ND	µg/L	No
Des-ethyl atrazine	Dec. 12 2016	ND	µg/L	No
Atrazine+Desethyl-atrazine	Dec. 12 2016	ND	µg/L	No
Bromoxynil	Dec. 12 2016	ND	µg/L	No
Carbaryl	Dec. 12 2016	ND	µg/L	No
Carbofuran	Dec. 12 2016	ND	µg/L	No
Chlorpyrifos (Dursban)	Dec. 12 2016	ND	µg/L	No
Diazinon	Dec. 12 2016	ND	µg/L	No
Dicamba	Dec. 12 2016	ND	µg/L	No
Diclofop-methyl	Dec. 12 2016	ND	µg/L	No

Summary of Organic parameters tested during this reporting period or the most recent sample results

Dimethoate	Dec. 12 2016	ND	µg/L	No
Malathion	Dec. 12 2016	ND	µg/L	No
MCPA	Dec. 12 2016	ND	µg/L	No
Metolachlor	Dec. 12 2016	ND	µg/L	No
Metribuzin (Sencor)	Dec. 12 2016	ND	µg/L	No
Pentachlorophenol	Dec. 12 2016	ND	µg/L	No
Phorate	Dec. 12 2016	ND	µg/L	No
Picloram	Dec. 12 2016	ND	µg/L	No
Prometryne	Dec. 12 2016	ND	µg/L	No
Simazine	Dec. 12 2016	ND	µg/L	No
Terbufos	Dec. 12 2016	ND	µg/L	No
Triallate	Dec. 12 2016	ND	µg/L	No
Trifluralin	Dec. 12 2016	ND	µg/L	No
Benzo(a)pyrene	Dec. 12 2016	ND	µg/L	No
1,1-Dichloroethylene	Dec. 12 2016	ND	µg/L	No
1,2-Dichlorobenzene	Dec. 12 2016	ND	µg/L	No
1,2-Dichloroethane	Dec. 12 2016	ND	µg/L	No
1,4-Dichlorobenzene	Dec. 12 2016	ND	µg/L	No
Benzene	Dec. 12 2016	ND	µg/L	No
Carbon Tetrachloride	Dec. 12 2016	ND	µg/L	No
Chlorobenzene	Dec. 12 2016	ND	µg/L	No
Methylene Chloride (Dichloromethane)	Dec. 12 2016	ND	µg/L	No
Tetrachloroethylene	Dec. 12 2016	ND	µg/L	No
Toluene	Dec. 12 2016	ND	µg/L	No
Trichloroethylene	Dec. 12 2016	ND	µg/L	No
Vinyl Chloride	Dec. 12 2016	ND	µg/L	No
Total PCB	Dec. 12 2016	ND	µg/L	No
Glyphosate	Dec. 12 2016	ND	µg/L	No
Diquat	Dec. 12 2016	ND	µg/L	No
Diuron	Dec. 12 2016	ND	µg/L	No
THM (NOTE: show latest annual average)	Q1-Q4 2016	28.2	µg/L	No
Guthion (Azinphos- methly)	Dec. 12 2016	ND	µg/L	No
Paraquat	Dec. 12 2016	ND	µg/L	No
Temephos	Dec. 12 2016	ND	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
Sodium (T4)	Dec 12, 2016	44	mg/L	20

Part 2 – SUMMARY REPORT (as required by O. Reg. 170/03, Schedule 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:

-The facilities were operated within full compliance in 2016.

Well #1

System Capability Assessment

Comparison of Flow Rates (raw flow; m³):

Month	Average Daily Flow	Maximum Daily Flow	*Max flow (L/min)
January	5.23	22	1209.00
February	8.76	166	1201.2
March	41.97	361.99	1173.6
April	53.43	443	1270.8
May	24.94	247.01	1177.8
June	6.73	33.01	1161.6
July	0.74	13	1137.0
August	5.45	57.02	1752.0
September	28.76	648.01	1705.8
October	49.97	397.99	1785.6
November	42.17	255.01	1753.8
December	31.94	137.01	1228.2
*MAXIMUM	N/A	648.01	1785.6
AVERAGE	25.01	231.75	1379.7
PTTW	N/A	2617.92	1818
% of PTTW MAX	-	24.75%	98.22%
% of PTTW AVG	-	8.85%	75.89%

Well #2

System Capability Assessment			
Comparison of Flow Rates (raw flow; m ³):			
Month	Average Daily Flow	Maximum Daily Flow	*Max flow (L/min)
January	1.42	29.99	1980.6
February	3.28	31	1989
March	19.48	281	2010.6
April	12.33	150	1926.6
May	12.29	253.01	1811.4
June	5.97	40.02	1797.6
July	1.32	23.02	1805.4
August	1.06	15	2079.0
September	16.48	380.01	2001.0
October	4.45	53	1986.0
November	3.77	38.99	2048.4
December	6.16	67.99	2057.4
*MAXIMUM	N/A	380.01	2079.0
AVERAGE	7.33	113.59	1957.75
PTTW	N/A	3024	2100
% of PTTW MAX	-	12.57%	99.00%
% of PTTW AVG	-	3.76%	93.23%

Well #3

System Capability Assessment			
Comparison of Flow Rates (raw flow; m ³):			
Month	Average Daily Flow	Maximum Daily Flow	*Max flow (L/min)
January	851.19	2389.02	2809.8
February	394.62	2178.01	2813.4
March	925.19	2335.99	2827.2
April	906.4	2375	2818.8
May	1060.26	2661.02	2824.2
June	1173.30	2696.99	2822.4
July	1759.45	2390	2808.0
August	1012.49	2436.02	2814.0
September	907.13	2335.97	2817.0
October	894.26	2521.02	2826.0
November	896.13	2101.01	2818.8
December	898.55	2199	2839.2
*MAXIMUM	N/A	2696.99	2839.20
AVERAGE	973.25	2384.92	2819.90
PTTW	N/A	3900.0	2880.0
% of PTTW MAX	-	69.15%	98.58%
% of PTTW AVG	-	61.15%	97.91%

Well #4

System Capability Assessment			
Comparison of Flow Rates (raw flow; m ³):			
Month	Average Daily Flow	Maximum Daily Flow	*Max flow (L/min)
January	1028.74	2080	4183.8
February	1570.34	2542	5184.6
March	939.61	2220	4717.8
April	1100.33	2923	5127.6
May	1078.94	2571	5120.4
June	976.5	2488	5316.6
July	282.71	2203	5011.2
August	1129.16	3477	5458.8
September	1082.45	2586	4603.69
October	1086.23	3083	4290.00
November	972.5	2557	4488.67
December	969.48	2457	4669.60
*MAXIMUM	N/A	3477.00	5458.80
AVERAGE	1018.08	2598.92	4880.37
PTTW	N/A	8640	6000
% of PTTW MAX	-	40.24%	90.98%
% of PTTW AVG	-	30.08%	81.34%

Notes: All max flow data is taken from L/s data from the SCADA system and converted to L/min to coincide with the PTTW.

Treatment 123

System Capability Assessment		
Comparison of Flow Rates (total treated flow; m ³ /d):		
Month	Average Flow	Maximum Daily Flow
January	826.82	2332.26
February	371.36	2144.26
March	943.35	2324.26
April	945.25	2460.42
May	1058.47	2555.59
June	1144.34	2607.94
July	1696.68	2286.31
August	960.9	2388.17
September	971.31	2612.15
October	922.5	2495.99
November	918.31	2064.75
December	912.04	2233.27
*AVERAGE	972.61	N/A
MAXIMUM	N/A	2612.15
SYSTEM CAPACITY	8640	8640
% CAPACITY	11.26%	30.23%

Treatment 4

System Capability Assessment		
Comparison of Flow Rates (total treated flow; m ³ /d):		
Month	Average Flow	Maximum Flow
January	1019.65	2063
February	1558.03	2506
March	932.1	2198
April	1090.60	2897
May	1069.55	2583
June	944.13	2472
July	272.58	2184
August	1115.52	3402
September	1069.07	2562
October	1073.52	3045
November	961.17	2507
December	957.84	2400
*AVERAGE	1005.31	N/A
MAXIMUM	N/A	3402
SYSTEM CAPACITY	8640	8640
% CAPACITY	11.64%	39.38%