



WATER QUALITY DEPARTMENT
 10100 EAST JEFFERSON AVENUE
 DETROIT, MICHIGAN 48214
 PHONE: 313-926-8102 / 313-926-8127

Lake Huron Water Treatment Plant Mineral Report

Sample Date: 09/13/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	0.40	0.05	0.3/95% (1)		
Total Solids		mg/L	160	155		500	10
Total Dissolved Solids		mg/L	101	0		500	10
Aluminum	Al	mg/L	< 0.050	0.060		0.05-0.2	0.005
Iron	Fe	mg/L	0.072	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.007	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	7.59	8.05			0.5
Calcium	Ca	mg/L	25.3	26.0			0.1
Sodium	Na	mg/L	3.74	3.68		20 (2)	0.1
Potassium	K	mg/L	0.79	0.79			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO ₂	mg/L	0.7	0.9			0.4
Sulfate	SO ₄ ²⁻	mg/L	17.0	19.8		250	
Chloride	Cl ⁻	mg/L	7.5	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.29			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.3	1.7			
Total Hardness (3), (4), (5)		mg/L	100	98			
Total Alkalinity (3)		mg/L	86	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	86	78			
Non-Carbonate Hardness (3)		mg/L	14	20			
Chemical Oxygen Demand		mg/L	4.8	2.4			2
Dissolved Oxygen		mg/L	10.2	10.5			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.27	0.26	10		0.1
Fluoride	F ⁻	mg/L	0.07	0.85	4.0	2.0	0.5
pH			8.10	7.97	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	225			
Temperature		°C	20.6	22.4			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 5.68 GPG
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument detection limit.
IV: Invalid Sample	

Analyst: Brian Brown Chemist-I Initial **B. B.** Date: 01/26/2017
 Reviewed By: Patrick Williford Chemist-II Initial **P. W.** Date: 02/24/2017

Great Lakes Water Authority



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Southwest Water Treatment Plant Mineral Report

Sample Date: 09/13/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	3.10	0.05	0.3/95% (1)		
Total Solids		mg/L	164	148		500	10
Total Dissolved Solids		mg/L	105	102		500	10
Aluminum	Al	mg/L	0.282	0.129		0.05-0.2	0.005
Iron	Fe	mg/L	0.278	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.011	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.31	7.94			0.5
Calcium	Ca	mg/L	25.6	26.2			0.1
Sodium	Na	mg/L	3.67	3.86		20 (2)	0.1
Potassium	K	mg/L	0.81	0.79			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO ₂	mg/L	0.8	0.9			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	23.0		250	
Chloride	Cl ⁻	mg/L	7.5	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.34			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.5	1.2			
Total Hardness (3), (4), (5)		mg/L	100	106			
Total Alkalinity (3)		mg/L	70	82			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	70	82			
Non-Carbonate Hardness (3)		mg/L	30	24			
Chemical Oxygen Demand		mg/L	3.6	6.8			2
Dissolved Oxygen		mg/L	8.6	8.5			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.25	0.23	10		0.1
Fluoride	F ⁻	mg/L	0.08	0.80	4.0	2.0	0.5
pH			7.97	8.14	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	230	223			
Temperature		°C	22.0	22.8			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 6.15 GPG
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

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Water Works Park Water Treatment Plant Mineral Report

Sample Date: 09/13/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	6.81	0.08	0.3/95% (1)		
Total Solids		mg/L	156	165		500	10
Total Dissolved Solids		mg/L	94	88		500	10
Aluminum	Al	mg/L	0.323	0.157		0.05-0.2	0.005
Iron	Fe	mg/L	0.320	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.008	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.18	7.80			0.5
Calcium	Ca	mg/L	27.8	26.2			0.1
Sodium	Na	mg/L	3.91	3.61		20 (2)	0.1
Potassium	K	mg/L	0.87	0.83			0.1
Manganese	Mn	mg/L	0.003	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.0	23.0		250	
Chloride	Cl ⁻	mg/L	7.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.32			0.05
Free Carbon Dioxide	CO ₂	mg/L	6.2	2.9			
Total Hardness (3), (4), (5)		mg/L	106	104			
Total Alkalinity (3)		mg/L	78	72			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	78	72			
Non-Carbonate Hardness (3)		mg/L	28	32			
Chemical Oxygen Demand		mg/L	< 2.0	2.0			2
Dissolved Oxygen		mg/L	7.9	9.8			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.30	0.30	10		0.1
Fluoride	F ⁻	mg/L	0.07	0.74	4.0	2.0	0.5
pH			7.40	7.70	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	226	238			
Temperature		°C	23.6	23.0			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 6.03 GPG
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

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Northeast Water Treatment Plant Mineral Report

Sample Date: 09/13/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	6.81	0.06	0.3/95% (1)		
Total Solids		mg/L	156	144		500	10
Total Dissolved Solids		mg/L	94	0		500	10
Aluminum	Al	mg/L	0.323	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.320	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.008	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.18	8.09			0.5
Calcium	Ca	mg/L	27.8	25.8			0.1
Sodium	Na	mg/L	3.91	3.70		20 (2)	0.1
Potassium	K	mg/L	0.87	0.82			0.1
Manganese	Mn	mg/L	0.003	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	< 0.010		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.0	21.7		250	
Chloride	Cl ⁻	mg/L	7.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.22			0.05
Free Carbon Dioxide	CO ₂	mg/L	6.2	2.3			
Total Hardness (3), (4), (5)		mg/L	106	98			
Total Alkalinity (3)		mg/L	78	74			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	78	74			
Non-Carbonate Hardness (3)		mg/L	28	24			
Chemical Oxygen Demand		mg/L	< 2.0	7.2			2
Dissolved Oxygen		mg/L	7.9	8.7			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.30	0.23	10		0.1
Fluoride	F ⁻	mg/L	0.07	0.62	4.0	2.0	0.5
pH			7.40	7.80	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	226	229			
Temperature		°C	23.6	23.7			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 5.68 GPG
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

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Springwells Water Treatment Plant Mineral Report

Sample Date: 09/13/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	6.81	0.04	0.3/95% (1)		
Total Solids		mg/L	156	173		500	10
Total Dissolved Solids		mg/L	94	0		500	10
Aluminum	Al	mg/L	0.323	0.159		0.05-0.2	0.005
Iron	Fe	mg/L	0.320	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.008	0.013	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	8.18	7.71			0.5
Calcium	Ca	mg/L	27.8	26.6			0.1
Sodium	Na	mg/L	3.91	3.56		20 (2)	0.1
Potassium	K	mg/L	0.87	0.83			0.1
Manganese	Mn	mg/L	0.003	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015 (AL)		0.002
Zinc	Zn	mg/L	< 0.010	0.09		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.0	23.5		250	
Chloride	Cl ⁻	mg/L	7.5	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.11			0.05
Free Carbon Dioxide	CO ₂	mg/L	6.2	1.7			
Total Hardness (3), (4), (5)		mg/L	106	104			
Total Alkalinity (3)		mg/L	78	74			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	78	74			
Non-Carbonate Hardness (3)		mg/L	28	30			
Chemical Oxygen Demand		mg/L	< 2.0	4.8			2
Dissolved Oxygen		mg/L	7.9	9.5			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.30	0.22	10		0.1
Fluoride	F ⁻	mg/L	0.07	0.62	4.0	2.0	0.5
pH			7.40	7.93	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	226	230			
Temperature		°C	23.6	23.7			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 6.03 GPG
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

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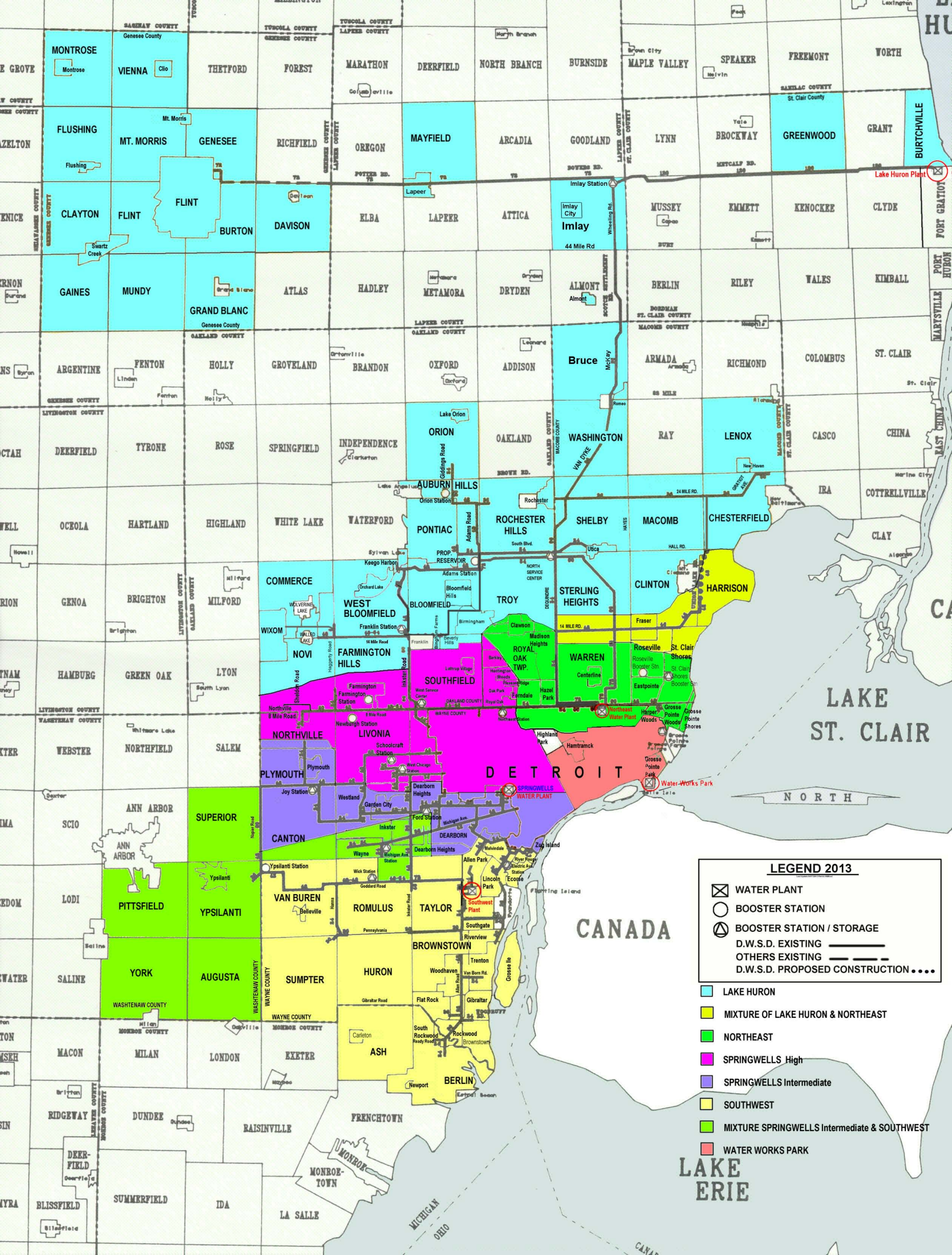
All GLWA Water Treatment Plant Mineral Reports

Parameter	Formula	Units	09/13/2016		09/13/2016		09/13/2016		09/13/2016		09/13/2016		MCL	Sec.Std	MDL		
			Lake Huron		Southwest		Belle Isle		Water Works Park		Northeast					Springwells	
			Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap					
Turbidity		NTU	0.40	0.05	3.10	0.05	6.81	0.08	0.06	0.04	0.3/95% (1)						
Total Solids		mg/L	160	155	164	148	156	165	144	173			500	10			
Total Dissolved Solids		mg/L	101	0	105	102	94	88	0	0			500	10			
Aluminum	Al	mg/L	< 0.050	0.060	0.282	0.129	0.323	0.157	< 0.050	0.159			0.05-0.2	0.005			
Iron	Fe	mg/L	0.072	< 0.050	0.278	< 0.050	0.320	< 0.050	< 0.050	< 0.050			0.3	0.005			
Copper	Cu	mg/L	0.007	< 0.005	0.011	< 0.005	0.008	< 0.005	< 0.005	0.013	1.3 (AL)		1.0	0.002			
Magnesium	Mg	mg/L	7.59	8.05	8.31	7.94	8.18	7.80	8.09	7.71				0.5			
Calcium	Ca	mg/L	25.3	26.0	25.6	26.2	27.8	26.2	25.8	26.6				0.1			
Sodium	Na	mg/L	3.74	3.68	3.67	3.86	3.91	3.61	3.70	3.56			20 (2)	0.1			
Potassium	K	mg/L	0.79	0.79	0.81	0.79	0.87	0.83	0.82	0.83				0.1			
Manganese	Mn	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	0.003	< 0.002	< 0.002	< 0.002			0.05	0.002			
Lead	Pb	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)			0.002			
Zinc	Zn	mg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.09			5	0.1			
Silica	SiO ₂	mg/L	0.7	0.9	0.8	0.9	1.0	1.0	1.0	1.0				0.4			
Sulfate	SO ₄ ²⁻	mg/L	17.0	19.8	15.5	23.0	16.0	23.0	21.7	23.5			250				
Chloride	Cl ⁻	mg/L	7.5	9.0	7.5	10.0	7.5	9.5	9.5	10.0			250	5			
Phosphorus	P	mg/L	< 0.05	0.29	< 0.05	0.34	< 0.05	0.32	0.22	0.11				0.05			
Free Carbon Dioxide	CO ₂	mg/L	1.3	1.7	1.5	1.2	6.2	2.9	2.3	1.7							
Total Hardness (3), (4), (5)		mg/L	100	98	100	106	106	104	98	104							
Total Alkalinity (3)		mg/L	86	78	70	82	78	72	74	74							
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0							
Bi-Carbonate Alkalinity (3)		mg/L	86	78	70	82	78	72	74	74							
Non-Carbonate Hardness (3)		mg/L	14	20	30	24	28	32	24	30							
Chemical Oxygen Demand		mg/L	4.8	2.4	3.6	6.8	< 2.0	2.0	7.2	4.8					2		
Dissolved Oxygen		mg/L	10.2	10.5	8.6	8.5	7.9	9.8	8.7	9.5							
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1			0.1			
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.27	0.26	0.25	0.23	0.30	0.30	0.23	0.22	10			0.1			
Fluoride	F ⁻	mg/L	0.07	0.85	0.08	0.80	0.07	0.74	0.62	0.62	4.0		2.0	0.5			
pH			8.10	7.97	7.97	8.14	7.40	7.70	7.80	7.93	6.5-8.5		6.5-8.5				
Specific Conductance @ 25 °C.		micromhos	222	225	230	223	226	238	229	230							
Temperature		°C	20.6	22.4	22.0	22.8	23.6	23.0	23.7	23.7							

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of samples in any month and always be < 1 NTU
Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
mg/L: Milligram Per Liter	mg/L is equivalent to part per million (ppm)
AL: Action Level	
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon multiply value by 0.058 (Grains/Gallon)/(mg/L)
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

Analyst: Brian Brown Chemist-I Initial **B. B.** Date: 01/26/2017
 Reviewed By: Patrick Williford Chemist-II Initial **P. W.** Date: 02/24/2017

Great Lakes Water Authority



LEGEND 2013

- WATER PLANT
- BOOSTER STATION
- BOOSTER STATION / STORAGE
- D.W.S.D. EXISTING
- OTHERS EXISTING
- D.W.S.D. PROPOSED CONSTRUCTION

- LAKE HURON
- MIXTURE OF LAKE HURON & NORTHEAST
- NORTHEAST
- SPRINGWELLS High
- SPRINGWELLS Intermediate
- SOUTHWEST
- MIXTURE SPRINGWELLS Intermediate & SOUTHWEST
- WATER WORKS PARK

LAKE ERIE

NORTH

CANADA

MICHIGAN OHIO