

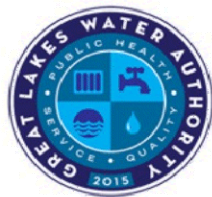
Great Lakes Water Authority
Water Quality Department
Laboratory Analysis of Water Samples Collected at
Lake Huron Plant
01/12/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	2.20	0.08	0.3/95% (1)		
Total Solids		mg/L	148	150		500	10
Total Dissolved Solids		mg/L	128	127		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	0.096	1.3	1.0	0.002
Magnesium	Mg	mg/L	9.29	10.74			0.5
Calcium	Ca	mg/L	21.0	21.7			0.1
Sodium	Na	mg/L	4.48	4.65		20 (2)	0.1
Potassium	K	mg/L	1.37	0.90			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	1.0	1.0			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.0	18.3		250	
Chloride	Cl ⁻	mg/L	7.5	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.34			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.5	2.9			
Total Hardness (3), (4), (5)		mg/L	102	100			
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	16	22			
Chemical Oxygen Demand		mg/L	< 2.0	7.2			2
Dissolved Oxygen		mg/L	11.3	11.6			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.26	0.23	10		0.1
Fluoride	F ⁻	mg/L	0.09	0.63	4.0	2.0	0.5
pH			7.84	7.73	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	214	217			
Temperature		°C	3.3	3.3			

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 5.80 GPG
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 Initial **B. B.** Date: 03/28/2016
Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 03/28/2016

Detroit Water & Sewerage Department



Great Lakes Water Authority
Water Quality Department
Laboratory Analysis of Water Samples Collected at
Southwest Plant
01/12/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	12.00	0.04	0.3/95% (1)		
Total Solids		mg/L	154	145		500	10
Total Dissolved Solids		mg/L	122	134		500	10
Aluminum	Al	mg/L	0.105	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.090	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.012	0.062	1.3	1.0	0.002
Magnesium	Mg	mg/L	11.81	9.97			0.5
Calcium	Ca	mg/L	22.6	22.9			0.1
Sodium	Na	mg/L	4.68	4.76		20 (2)	0.1
Potassium	K	mg/L	1.01	0.98			0.1
Manganese	Mn	mg/L	0.008	< 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	1.1			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.8	28.6		250	
Chloride	Cl ⁻	mg/L	7.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.33			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.4	3.7			
Total Hardness (3), (4), (5)		mg/L	104	102			
Total Alkalinity (3)		mg/L	90	80			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	90	80			
Non-Carbonate Hardness (3)		mg/L	14	22			
Chemical Oxygen Demand		mg/L	3.2	< 2.0			2
Dissolved Oxygen		mg/L	12.1	12.2			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.26	0.31	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.57	4.0	2.0	0.5
pH			7.87	7.63	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	219	226			
Temperature		°C	3.1	3.1			

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 5.92 GPG
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 Initial **B. B.** Date: 03/28/2016
Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 03/28/2016

Detroit Water & Sewerage Department



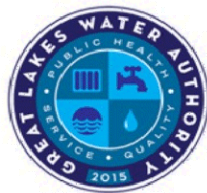
Great Lakes Water Authority
Water Quality Department
Laboratory Analysis of Water Samples Collected at
Water Works Park Plant
01/12/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.80	0.04	0.3/95% (1)		
Total Solids		mg/L	150	149		500	10
Total Dissolved Solids		mg/L	138	139		500	10
Aluminum	Al	mg/L	0.218	0.057		0.05-0.2	0.005
Iron	Fe	mg/L	0.058	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	9.75	8.60			0.5
Calcium	Ca	mg/L	20.5	22.9			0.1
Sodium	Na	mg/L	5.14	5.03		20 (2)	0.1
Potassium	K	mg/L	0.85	0.95			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	1.1	1.2			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.8	21.2		250	
Chloride	Cl ⁻	mg/L	7.0	9.0		250	5
Phosphorus	P	mg/L	< 0.05	0.34			0.05
Free Carbon Dioxide	CO ₂	mg/L	6.2	3.8			
Total Hardness (3), (4), (5)		mg/L	98	100			
Total Alkalinity (3)		mg/L	80	74			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	74			
Non-Carbonate Hardness (3)		mg/L	18	26			
Chemical Oxygen Demand		mg/L	9.6	4.0			2
Dissolved Oxygen		mg/L	12.8	13.7			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.28	0.33	10		0.1
Fluoride	F ⁻	mg/L	0.09	0.71	4.0	2.0	0.5
pH			7.41	7.59	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	212	225			
Temperature		°C	10.3	10.6			

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 5.80 GPG
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 Initial **B. B.** Date: 03/28/2016
Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 03/28/2016

Detroit Water & Sewerage Department



Great Lakes Water Authority
Water Quality Department
Laboratory Analysis of Water Samples Collected at
Northeast Plant
01/12/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.80	0.06	0.3/95% (1)		
Total Solids		mg/L	150	151		500	10
Total Dissolved Solids		mg/L	138	129		500	10
Aluminum	Al	mg/L	0.218	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.058	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	9.75	9.00			0.5
Calcium	Ca	mg/L	20.5	22.6			0.1
Sodium	Na	mg/L	5.14	5.60		20 (2)	0.1
Potassium	K	mg/L	0.85	1.00			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	1.1	1.1			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.8	25.0		250	
Chloride	Cl ⁻	mg/L	7.0	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.30			0.05
Free Carbon Dioxide	CO ₂	mg/L	6.2	5.0			
Total Hardness (3), (4), (5)		mg/L	98	102			
Total Alkalinity (3)		mg/L	80	76			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	76			
Non-Carbonate Hardness (3)		mg/L	18	26			
Chemical Oxygen Demand		mg/L	9.6	3.6			2
Dissolved Oxygen		mg/L	12.8	12.6			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.28	0.30	10		0.1
Fluoride	F ⁻	mg/L	0.09	0.59	4.0	2.0	0.5
pH			7.41	7.48	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	212	223			
Temperature		°C	10.3	5.5			

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 5.92 GPG
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 Initial **B. B.** Date: 03/28/2016
Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 03/28/2016

Detroit Water & Sewerage Department



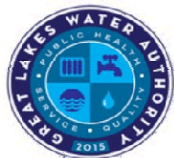
Great Lakes Water Authority
Water Quality Department
Laboratory Analysis of Water Samples Collected at
Springwells Plant
01/12/2016

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	5.80	0.02	0.3/95% (1)		
Total Solids		mg/L	150	147		500	10
Total Dissolved Solids		mg/L	138	123		500	10
Aluminum	Al	mg/L	0.218	0.053		0.05-0.2	0.005
Iron	Fe	mg/L	0.058	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	9.75	9.12			0.5
Calcium	Ca	mg/L	20.5	22.0			0.1
Sodium	Na	mg/L	5.14	4.88		20 (2)	0.1
Potassium	K	mg/L	0.85	1.06			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	0.05		5	0.1
Silica	SiO ₂	mg/L	1.1	1.1			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.8	22.7		250	
Chloride	Cl ⁻	mg/L	7.0	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.28			0.05
Free Carbon Dioxide	CO ₂	mg/L	6.2	3.4			
Total Hardness (3), (4), (5)		mg/L	98	106			
Total Alkalinity (3)		mg/L	80	76			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	76			
Non-Carbonate Hardness (3)		mg/L	18	30			
Chemical Oxygen Demand		mg/L	9.6	2.8			2
Dissolved Oxygen		mg/L	12.8	13.1			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.28	0.23	10		0.1
Fluoride	F ⁻	mg/L	0.09	0.61	4.0	2.0	0.5
pH			7.41	7.65	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	212	221			
Temperature		°C	10.3	3.0			

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 6.15 GPG
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 Initial **B. B.** Date: 03/28/2016
Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 03/28/2016

Detroit Water & Sewerage Department



**Great Lakes Water Authority
Water Quality Department
Laboratory Analysis of Water Samples Collected at Each Plant**

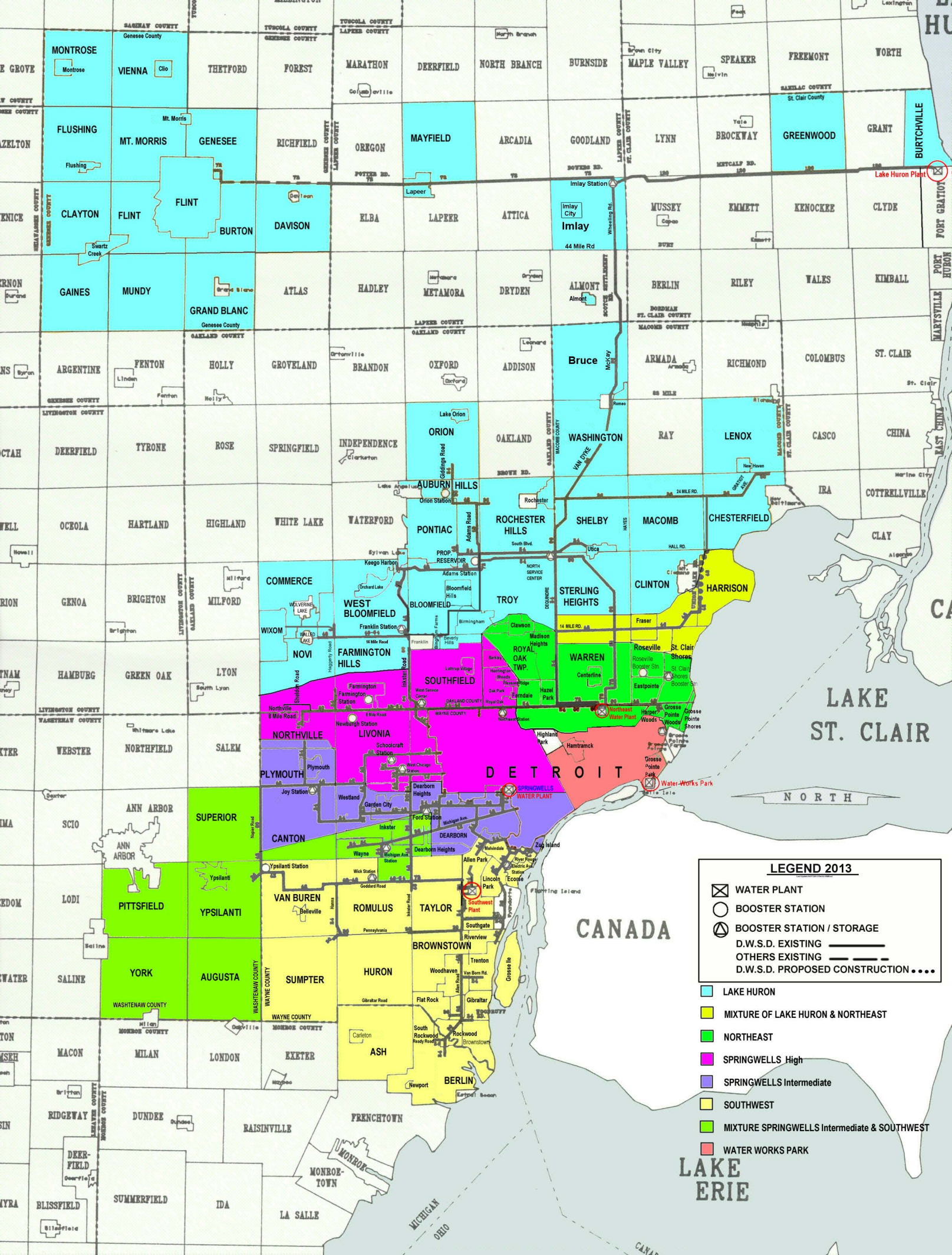
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Parameter	Formula	Units	Lake Huron		Southwest		Belle Isle	Water Works Park	Northeast	Springwells	MCL	Sec.Std	MDL
			Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap			
Turbidity		NTU	2.20	0.08	12.00	0.04	5.80	0.04	0.06	0.02	0.3/95% (1)		
Total Solids		mg/L	148	150	154	145	150	149	151	147		500	10
Total Dissolved Solids		mg/L	128	127	122	134	138	139	129	123		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050	0.105	< 0.050	0.218	0.057	< 0.050	0.053		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050	0.090	< 0.050	0.058	< 0.050	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	0.096	0.012	0.062	< 0.005	< 0.005	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	9.29	10.74	11.81	9.97	9.75	8.60	9.00	9.12			0.5
Calcium	Ca	mg/L	21.0	21.7	22.6	22.9	20.5	22.9	22.6	22.0			0.1
Sodium	Na	mg/L	4.48	4.65	4.68	4.76	5.14	5.03	5.60	4.88		20 (2)	0.1
Potassium	K	mg/L	1.37	0.90	1.01	0.98	0.85	0.95	1.00	1.06			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002	0.008	< 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	0.05		5	0.1
Silica	SiO ₂	mg/L	1.0	1.0	1.0	1.1	1.1	1.2	1.1	1.1			0.4
Sulfate	SO ₄ ²⁻	mg/L	16.0	18.3	15.8	28.6	15.8	21.2	25.0	22.7		250	
Chloride	Cl ⁻	mg/L	7.5	9.0	7.5	9.5	7.0	9.0	9.5	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.34	< 0.05	0.33	< 0.05	0.34	0.30	0.28			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.5	2.9	2.4	3.7	6.2	3.8	5.0	3.4			
Total Hardness (3), (4), (5)		mg/L	102	100	104	102	98	100	102	106			
Total Alkalinity (3)		mg/L	86	78	90	80	80	74	76	76			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	86	78	90	80	80	74	76	76			
Non-Carbonate Hardness (3)		mg/L	16	22	14	22	18	26	26	30			
Chemical Oxygen Demand		mg/L	< 2.0	7.2	3.2	< 2.0	9.6	4.0	3.6	2.8			2
Dissolved Oxygen		mg/L	11.3	11.6	12.1	12.2	12.8	13.7	12.6	13.1			
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	0.26	0.23	0.26	0.31	0.28	0.33	0.30	0.23	10		0.1
Fluoride	F ⁻	mg/L	0.09	0.63	0.10	0.57	0.09	0.71	0.59	0.61	4.0	2.0	0.5
pH			7.84	7.73	7.87	7.63	7.41	7.59	7.48	7.65	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	214	217	219	226	212	225	223	221			
Temperature		°C	3.3	3.3	3.1	3.1	10.3	10.6	5.5	3.0			

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 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 detection limit.
IV: Invalid Sample	

Analyst: Brian Brown	Chemist	Initial	B. B.	Date: 03/28/2016
Reviewed By: Patrick Williford	Chemist	Initial	P. W.	Date: 03/28/2016

Detroit Water & Sewerage Department



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