



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Lake Huron Plant
08/11/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	0.39	0.08	0.3/95% (1)		
Total Solids		mg/L	210	164		500	10
Total Dissolved Solids		mg/L	155	162		500	10
Aluminum	Al	mg/L	< 0.050	0.052		0.05-0.2	0.005
Iron	Fe	mg/L	0.070	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.91	7.63			0.5
Calcium	Ca	mg/L	24.0	23.2			0.1
Sodium	Na	mg/L	4.48	4.37		20 (2)	0.1
Potassium	K	mg/L	0.79	0.79			0.1
Manganese	Mn	mg/L	0.004	< 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	0.6	0.9			0.4
Sulfate	SO ₄ ²⁻	mg/L	17.0	18.4		250	
Chloride	Cl ⁻	mg/L	8.0	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.32			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.8	4.8			
Total Hardness (3), (4), (5)		mg/L	106	98			
Total Alkalinity (3)		mg/L	90	82			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	90	82			
Non-Carbonate Hardness (3)		mg/L	16	16			
Chemical Oxygen Demand		mg/L	6.4	4.0			2
Dissolved Oxygen		mg/L	6.2	6.5			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.34	0.32	10		0.1
Fluoride	F ⁻	mg/L	0.08	0.68	4.0	2.0	0.5
pH			8.00	7.53	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	217	218			
Temperature		°C	23.1	23.4			

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
IV: Invalid Sample	detection limit.

Analyst: Brian Brown Chemist Initial **B. B.** Date: 12/17/2015
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 12/17/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Southwest Plant
08/11/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	3.00	0.06	0.3/95% (1)		
Total Solids		mg/L	155	186		500	10
Total Dissolved Solids		mg/L	152	180		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.071	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.013	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.34	8.22			0.5
Calcium	Ca	mg/L	23.7	23.9			0.1
Sodium	Na	mg/L	5.53	5.62		20 (2)	0.1
Potassium	K	mg/L	0.93	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	0.5	0.7			0.4
Sulfate	SO ₄ ²⁻	mg/L	17.3	30.3		250	
Chloride	Cl ⁻	mg/L	10.5	12.5		250	5
Phosphorus	P	mg/L	< 0.05	0.33			0.05
Free Carbon Dioxide	CO ₂	mg/L	0.7	8.1			
Total Hardness (3), (4), (5)		mg/L	102	120			
Total Alkalinity (3)		mg/L	86	74			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	86	74			
Non-Carbonate Hardness (3)		mg/L	16	46			
Chemical Oxygen Demand		mg/L	3.2	8.4			2
Dissolved Oxygen		mg/L	6.3	6.2			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.44	0.39	10		0.1
Fluoride	F ⁻	mg/L	0.10	0.55	4.0	2.0	0.5
pH			8.37	7.26	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	231	244			
Temperature		°C	24.9	24.6			

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 6.96 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: 12/17/2015
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 12/17/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Water Works Park Plant
08/11/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.10	0.08	0.3/95% (1)		
Total Solids		mg/L	182	159		500	10
Total Dissolved Solids		mg/L	130	173		500	10
Aluminum	Al	mg/L	0.527	0.210		0.05-0.2	0.005
Iron	Fe	mg/L	0.118	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.11	7.94			0.5
Calcium	Ca	mg/L	26.7	24.6			0.1
Sodium	Na	mg/L	4.77	4.83		20 (2)	0.1
Potassium	K	mg/L	0.81	0.80			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	0.5			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.1	21.4		250	
Chloride	Cl ⁻	mg/L	8.0	10.5		250	5
Phosphorus	P	mg/L	< 0.05	0.23			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.0	3.8			
Total Hardness (3), (4), (5)		mg/L	98	100			
Total Alkalinity (3)		mg/L	96	76			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	96	76			
Non-Carbonate Hardness (3)		mg/L	2	24			
Chemical Oxygen Demand		mg/L	10.0	7.6			2
Dissolved Oxygen		mg/L	6.3	7.3			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.29	0.29	10		0.1
Fluoride	F ⁻	mg/L	0.08	0.57	4.0	2.0	0.5
pH			8.27	7.60	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	219	228			
Temperature		°C	25.3	25.1			

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 5.80 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: 12/17/2015
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 12/17/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Northeast Plant
08/11/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.10	0.07	0.3/95% (1)		
Total Solids		mg/L	182	165		500	10
Total Dissolved Solids		mg/L	130	167		500	10
Aluminum	Al	mg/L	0.527	0.064		0.05-0.2	0.005
Iron	Fe	mg/L	0.118	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.11	8.06			0.5
Calcium	Ca	mg/L	26.7	23.1			0.1
Sodium	Na	mg/L	4.77	4.96		20 (2)	0.1
Potassium	K	mg/L	0.81	0.80			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	0.7			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.1	22.2		250	
Chloride	Cl ⁻	mg/L	8.0	10.5		250	5
Phosphorus	P	mg/L	< 0.05	0.23			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.0	4.8			
Total Hardness (3), (4), (5)		mg/L	98	102			
Total Alkalinity (3)		mg/L	96	86			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	96	86			
Non-Carbonate Hardness (3)		mg/L	2	16			
Chemical Oxygen Demand		mg/L	10.0	8.8			2
Dissolved Oxygen		mg/L	6.3	6.0			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.29	0.25	10		0.1
Fluoride	F ⁻	mg/L	0.08	0.59	4.0	2.0	0.5
pH			8.27	7.55	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	219	225			
Temperature		°C	25.3	25.0			

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 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: 12/17/2015
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 12/17/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Springwells Plant
08/11/2015

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.10	0.08	0.3/95% (1)		
Total Solids		mg/L	182	159		500	10
Total Dissolved Solids		mg/L	130	149		500	10
Aluminum	Al	mg/L	0.527	0.448		0.05-0.2	0.005
Iron	Fe	mg/L	0.118	2.273		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	8.11	8.37			0.5
Calcium	Ca	mg/L	26.7	24.2			0.1
Sodium	Na	mg/L	4.77	4.94		20 (2)	0.1
Potassium	K	mg/L	0.81	0.80			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	0.04		5	0.1
Silica	SiO ₂	mg/L	0.7	0.8			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.1	22.6		250	
Chloride	Cl ⁻	mg/L	8.0	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.29			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.0	4.8			
Total Hardness (3), (4), (5)		mg/L	98	98			
Total Alkalinity (3)		mg/L	96	88			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	96	88			
Non-Carbonate Hardness (3)		mg/L	2	10			
Chemical Oxygen Demand		mg/L	10.0	9.2			2
Dissolved Oxygen		mg/L	6.3	6.6			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.29	0.24	10		0.1
Fluoride	F ⁻	mg/L	0.08	0.62	4.0	2.0	0.5
pH			8.27	7.56	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	219	224			
Temperature		°C	25.3	24.7			

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.

Analyst: Brian Brown Chemist Initial **B. B.** Date: 12/17/2015
 Reviewed By: Patrick Williford Chemist Initial **P. W.** Date: 12/17/2015

Detroit Water & Sewerage Department



**Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at Each Plant**

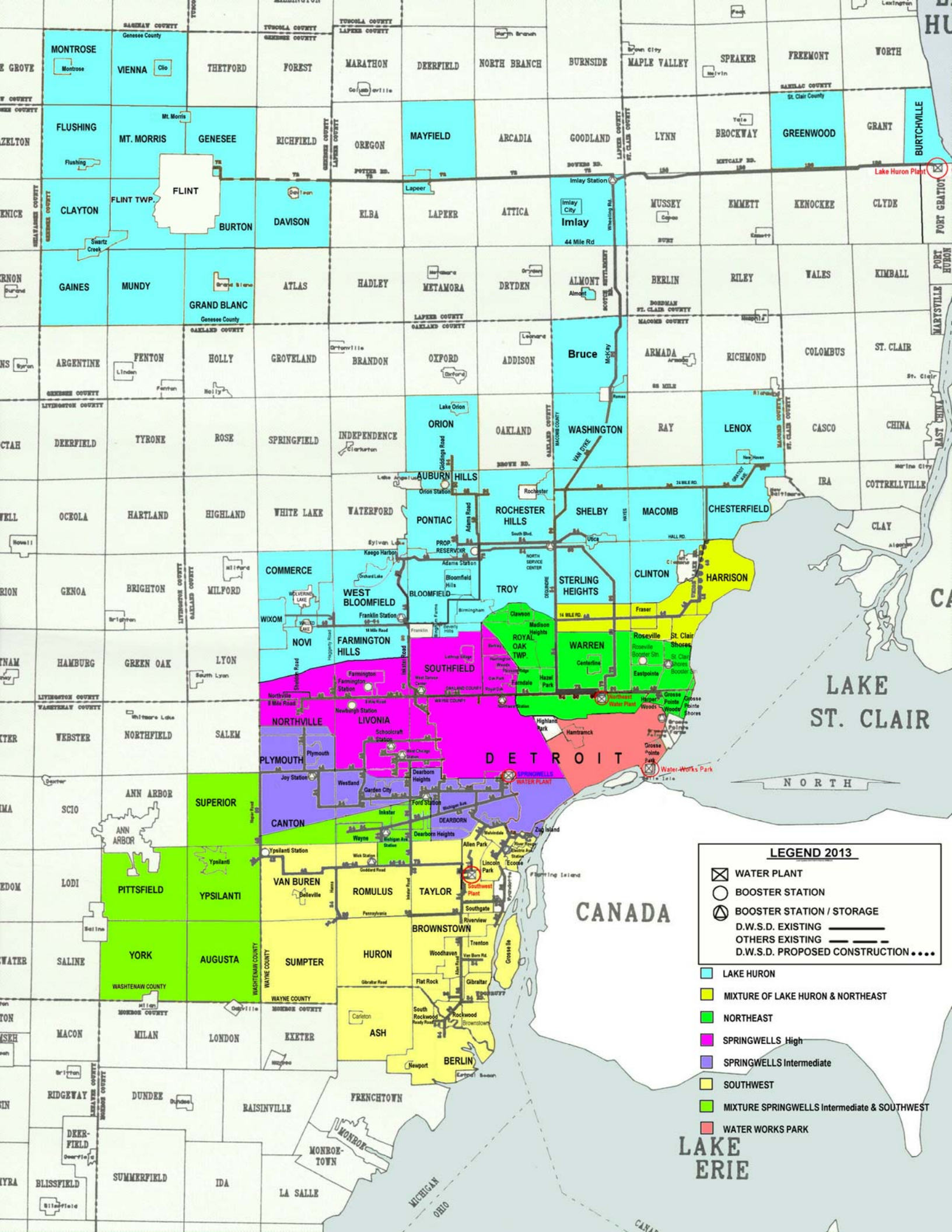
Date: 08/11/2015 08/11/2015 08/11/2015 08/11/2015 08/11/2015 08/11/2015 08/11/2015 08/11/2015

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	0.39	0.08	3.00	0.06	1.10	0.08	0.07	0.08	0.3/95% (1)		
Total Solids		mg/L	210	164	155	186	182	159	165	159		500	10
Total Dissolved Solids		mg/L	155	162	152	180	130	173	167	149		500	10
Aluminum	Al	mg/L	< 0.050	0.052	< 0.050	< 0.050	0.527	0.210	0.064	0.448		0.05-0.2	0.005
Iron	Fe	mg/L	0.070	< 0.050	0.071	< 0.050	0.118	< 0.050	< 0.050	2.273		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	0.013	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.91	7.63	8.34	8.22	8.11	7.94	8.06	8.37			0.5
Calcium	Ca	mg/L	24.0	23.2	23.7	23.9	26.7	24.6	23.1	24.2			0.1
Sodium	Na	mg/L	4.48	4.37	5.53	5.62	4.77	4.83	4.96	4.94		20 (2)	0.1
Potassium	K	mg/L	0.79	0.79	0.93	0.95	0.81	0.80	0.80	0.80			0.1
Manganese	Mn	mg/L	0.004	< 0.002	0.003	< 0.002	< 0.002	< 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	0.04		5	0.1
Silica	SiO ₂	mg/L	0.6	0.9	0.5	0.7	0.7	0.5	0.7	0.8			0.4
Sulfate	SO ₄ ²⁻	mg/L	17.0	18.4	17.3	30.3	15.1	21.4	22.2	22.6		250	
Chloride	Cl ⁻	mg/L	8.0	9.5	10.5	12.5	8.0	10.5	10.5	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.32	< 0.05	0.33	< 0.05	0.23	0.23	0.29			0.05
Free Carbon Dioxide	CO ₂	mg/L	1.8	4.8	0.7	8.1	1.0	3.8	4.8	4.8			
Total Hardness (3), (4), (5)		mg/L	106	98	102	120	98	100	102	98			
Total Alkalinity (3)		mg/L	90	82	86	74	96	76	86	88			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	90	82	86	74	96	76	86	88			
Non-Carbonate Hardness (3)		mg/L	16	16	16	46	2	24	16	10			
Chemical Oxygen Demand		mg/L	6.4	4.0	3.2	8.4	10.0	7.6	8.8	9.2			2
Dissolved Oxygen		mg/L	6.2	6.5	6.3	6.2	6.3	7.3	6.0	6.6			
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	0.34	0.32	0.44	0.39	0.29	0.29	0.25	0.24	10		0.1
Fluoride	F ⁻	mg/L	0.08	0.68	0.10	0.55	0.08	0.57	0.59	0.62	4.0	2.0	0.5
pH			8.00	7.53	8.37	7.26	8.27	7.60	7.55	7.56	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	217	218	231	244	219	228	225	224			
Temperature		°C	23.1	23.4	24.9	24.6	25.3	25.1	25.0	24.7			

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 detection limit.
IV: Invalid Sample	

Analyst: Brian Brown	Chemist	Initial	B. B.	Date: 12/17/2015
Reviewed By: Patrick Williford	Chemist	Initial	P. W.	Date: 12/17/2015

Detroit Water & Sewerage Department

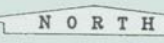


LEGEND 2013

- ☒ 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



CANADA

MICHIGAN OHIO