



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Lake Huron Plant
09/09/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	0.45	0.06	0.3/95% (1)		
Total Solids		mg/L	186	185		500	10
Total Dissolved Solids		mg/L	110	135		500	10
Aluminum	Al	mg/L	0.692	0.947		0.05-0.2	0.005
Iron	Fe	mg/L	0.128	0.439		0.3	0.005
Copper	Cu	mg/L	0.010	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.04	8.46			0.5
Calcium	Ca	mg/L	26.7	26.3			0.1
Sodium	Na	mg/L	5.00	5.15		20 (2)	0.1
Potassium	K	mg/L	0.99	1.00			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	0.7	0.6			0.4
Sulfate	SO ₄ ²⁻	mg/L	24.7	20.1			
Chloride	Cl ⁻	mg/L	8.0	9.5		250	5
Phosphorus	P	mg/L	< 0.05	0.41			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.2	6.1			
Total Hardness (3), (4), (5)		mg/L	100	100			
Total Alkalinity (3)		mg/L	82	72			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	72			
Non-Carbonate Hardness (3)		mg/L	18	28			
Chemical Oxygen Demand		mg/L	2.4	< 2.0			2
Dissolved Oxygen		mg/L	7.8	8.0			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.31	0.28	10	10	0.1
Fluoride	F ⁻	mg/L	0.13	0.62	4		0.5
pH			7.87	7.37	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	221	225			
Temperature		°C	23.3	22.9			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
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 Sr. Analytical Chemist Initial **B. B.** Date: 12/19/2014
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/07/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Southwest Plant
09/09/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	IV	0.05	0.3/95% (1)		
Total Solids		mg/L	IV	173		500	10
Total Dissolved Solids		mg/L	IV	130		500	10
Aluminum	Al	mg/L	IV	0.414		0.05-0.2	0.005
Iron	Fe	mg/L	IV	0.436		0.3	0.005
Copper	Cu	mg/L	IV	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	IV	10.51			0.5
Calcium	Ca	mg/L	IV	29.1			0.1
Sodium	Na	mg/L	IV	6.04		20 (2)	0.1
Potassium	K	mg/L	IV	1.29			0.1
Manganese	Mn	mg/L	IV	< 0.002		0.05	0.002
Lead	Pb	mg/L	IV	< 0.002	0.015		0.002
Zinc	Zn	mg/L	IV	< 0.10		5	0.1
Silica	SiO ₂	mg/L	IV	0.6			0.4
Sulfate	SO ₄ ²⁻	mg/L	IV	26.7			
Chloride	Cl ⁻	mg/L	IV	10.5		250	5
Phosphorus	P	mg/L	IV	0.33			0.05
Free Carbon Dioxide	CO ₂	mg/L	IV	4.1			
Total Hardness (3), (4), (5)		mg/L	IV	106			
Total Alkalinity (3)		mg/L	IV	74			
Carbonate Alkalinity (3)		mg/L	IV	0			
Bi-Carbonate Alkalinity (3)		mg/L	IV	74			
Non-Carbonate Hardness (3)		mg/L	IV	32			
Chemical Oxygen Demand		mg/L	IV	< 2.0			2
Dissolved Oxygen		mg/L	IV	7.4			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	IV	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	IV	0.24	10	10	0.1
Fluoride	F ⁻	mg/L	IV	0.58	4		0.5
pH			IV	7.56	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	IV	232			
Temperature		°C	IV	24.0			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
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 Sr. Analytical Chemist Initial **B. B.** Date: 12/19/2014
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/07/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Water Works Park Plant
09/09/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.00	0.12	0.3/95% (1)		
Total Solids		mg/L	160	183		500	10
Total Dissolved Solids		mg/L	115	137		500	10
Aluminum	Al	mg/L	0.300	1.057		0.05-0.2	0.005
Iron	Fe	mg/L	0.257	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	0.022	1.3		0.002
Magnesium	Mg	mg/L	10.60	8.43			0.5
Calcium	Ca	mg/L	25.0	25.7			0.1
Sodium	Na	mg/L	4.56	4.90		20 (2)	0.1
Potassium	K	mg/L	1.07	1.00			0.1
Manganese	Mn	mg/L	0.005	< 0.002		0.05	0.002
Lead	Pb	mg/L	0.000	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	AE	0.4			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	24.2			
Chloride	Cl ⁻	mg/L	8.0	10.5		250	5
Phosphorus	P	mg/L	< 0.05	0.31			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.7	4.6			
Total Hardness (3), (4), (5)		mg/L	100	101			
Total Alkalinity (3)		mg/L	80	72			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	72			
Non-Carbonate Hardness (3)		mg/L	20	29			
Chemical Oxygen Demand		mg/L	5.6	2.8			2
Dissolved Oxygen		mg/L	7.4	9.9			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.21	0.23	10	10	0.1
Fluoride	F ⁻	mg/L	0.14	0.59	4		0.5
pH			7.77	7.49	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	225	232			
Temperature		°C	25.8	25.5			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 5.86 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 Sr. Analytical Chemist Initial **B. B.** Date: 12/19/2014
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/07/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Northeast Plant
09/09/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.00	0.10	0.3/95% (1)		
Total Solids		mg/L	160	182		500	10
Total Dissolved Solids		mg/L	115	101		500	10
Aluminum	Al	mg/L	0.300	0.639		0.05-0.2	0.005
Iron	Fe	mg/L	0.257	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.60	9.67			0.5
Calcium	Ca	mg/L	25.0	30.4			0.1
Sodium	Na	mg/L	4.56	5.73		20 (2)	0.1
Potassium	K	mg/L	1.07	0.96			0.1
Manganese	Mn	mg/L	0.005	< 0.002		0.05	0.002
Lead	Pb	mg/L	0.000	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	AE	0.5			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	23.0			
Chloride	Cl ⁻	mg/L	8.0	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.33			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.7	5.4			
Total Hardness (3), (4), (5)		mg/L	100	101			
Total Alkalinity (3)		mg/L	80	70			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	70			
Non-Carbonate Hardness (3)		mg/L	20	31			
Chemical Oxygen Demand		mg/L	5.6	< 2.0			2
Dissolved Oxygen		mg/L	7.4	7.8			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.21	0.21	10	10	0.1
Fluoride	F ⁻	mg/L	0.14	0.53	4		0.5
pH			7.77	7.41	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	225	229			
Temperature		°C	25.8	24.6			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
MDL: Method Detection Limit	(4) By Titration
< : Less than	(5) Tap Water Hardness in Grains per Gallon 5.86 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 Sr. Analytical Chemist Initial **B. B.** Date: 12/19/2014
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/07/2015

Detroit Water & Sewerage Department



Detroit Water and Sewerage Department
Water Quality Division
Laboratory Analysis of Water Samples Collected at
Springwells Plant
09/09/2014

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.00	0.11	0.3/95% (1)		
Total Solids		mg/L	160	150		500	10
Total Dissolved Solids		mg/L	115	118		500	10
Aluminum	Al	mg/L	0.300	0.527		0.05-0.2	0.005
Iron	Fe	mg/L	0.257	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.60	10.51			0.5
Calcium	Ca	mg/L	25.0	27.6			0.1
Sodium	Na	mg/L	4.56	5.19		20 (2)	0.1
Potassium	K	mg/L	1.07	0.93			0.1
Manganese	Mn	mg/L	0.005	< 0.002		0.05	0.002
Lead	Pb	mg/L	0.000	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	AE	0.5			0.4
Sulfate	SO ₄ ²⁻	mg/L	15.5	22.7			
Chloride	Cl ⁻	mg/L	8.0	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.38			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.7	7.8			
Total Hardness (3), (4), (5)		mg/L	100	103			
Total Alkalinity (3)		mg/L	80	73			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	80	73			
Non-Carbonate Hardness (3)		mg/L	20	30			
Chemical Oxygen Demand		mg/L	5.6	3.2			2
Dissolved Oxygen		mg/L	7.4	8.4			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.21	0.20	10	10	0.1
Fluoride	F ⁻	mg/L	0.14	0.51	4		0.5
pH			7.77	7.27	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	225	229			
Temperature		°C	25.8	24.5			

Legend

MCL: Maximum Contaminant Level
 Sec.Std: Secondary Standard
 NTU: Nephelometric Turbidity Unit
 mg/L: Milligram Per Liter
 µg/L: Microgram Per Liter
 MDL: Method Detection Limit
 < : Less than
 AE: Analytical Error
 IV: Invalid Sample

Notes:

(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
 (2) EPA Guidance Level
 (3) As Calcium Carbonate
 mg/L is equivalent to part per million (ppm)
 µg/L is equivalent to part per billion (ppb)
 (4) By Titration
 (5) Tap Water Hardness in Grains per Gallon **5.97 GPG**
 (6) Reported results are below the low calibration standard but above the instrument detection limit.

Analyst: Brian Brown Sr. Analytical Chemist Initial **B. B.** Date: 12/19/2014
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/07/2015

Detroit Water & Sewerage Department



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

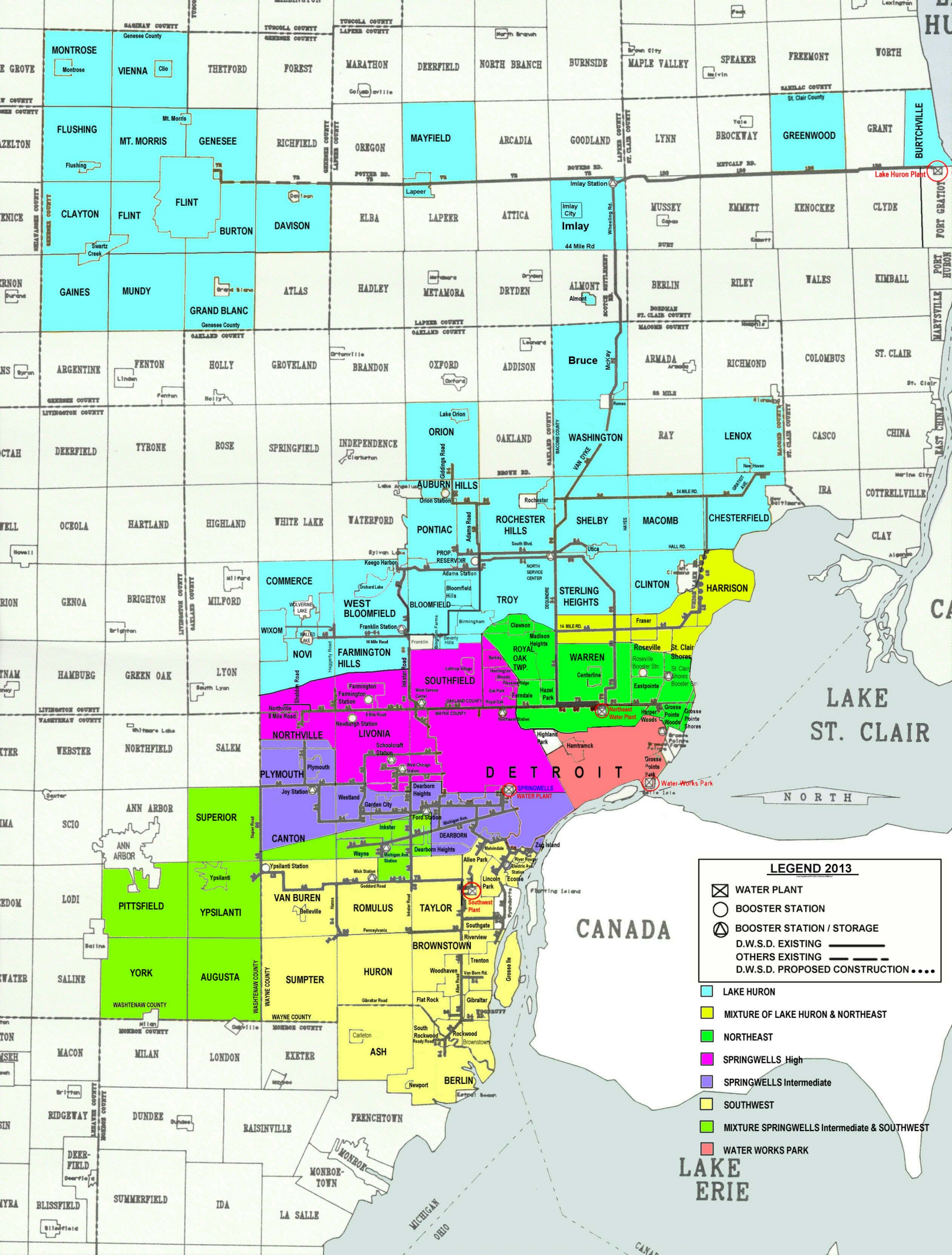
Date: 09/09/2014 09/09/2014 09/09/2014 09/09/2014 09/09/2014 09/09/2014 09/09/2014 09/09/2014

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	0.45	0.06	IV	0.05	1.00	0.12	0.10	0.11	0.3 / 95% (1)		
Total Solids		mg/L	186	185	IV	173	160	183	182	150		500	10
Total Dissolved Solids		mg/L	110	135	IV	130	115	137	101	118		500	10
Aluminum	Al	mg/L	0.692	0.947	IV	0.414	0.300	1.057	0.639	0.527		0.05 - 0.2	0.005
Iron	Fe	mg/L	0.128	0.439	IV	0.436	0.257	< 0.050	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.010	< 0.005	IV	< 0.005	< 0.005	0.022	< 0.005	< 0.005	1.3		0.002
Magnesium	Mg	mg/L	10.04	8.46	IV	10.51	10.60	8.43	9.67	10.51			0.5
Calcium	Ca	mg/L	26.7	26.3	IV	29.1	25.0	25.7	30.4	27.6			0.1
Sodium	Na	mg/L	5.00	5.15	IV	6.04	4.56	4.90	5.73	5.19		20 (2)	0.1
Potassium	K	mg/L	0.99	1.00	IV	1.29	1.07	1.00	0.96	0.93			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002	IV	< 0.002	0.005	< 0.002	< 0.002	< 0.002		0.05	0.002
Lead	Pb	mg/L	< 0.002	< 0.002	IV	< 0.002	0.000	< 0.002	< 0.002	< 0.002	0.015		0.002
Zinc	Zn	mg/L	< 0.10	< 0.10	IV	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10		5	0.1
Silica	SiO ₂	mg/L	0.7	0.6	IV	0.6	AE	0.4	0.5	0.5			0.4
Sulfate	SO ₄ ²⁻	mg/L	24.7	20.1	IV	26.7	15.5	24.2	23.0	22.7			
Chloride	Cl ⁻	mg/L	8.0	9.5	IV	10.5	8.0	10.5	10.0	10.0		250	5
Phosphorus	P	mg/L	< 0.05	0.41	IV	0.33	< 0.05	0.31	0.33	0.38			0.05
Free Carbon Dioxide	CO ₂	mg/L	2.2	6.1	IV	4.1	2.7	4.6	5.4	7.8			
Total Hardness (3), (4), (5)		mg/L	100	100	IV	106	100	101	101	103			
Total Alkalinity (3)		mg/L	82	72	IV	74	80	72	70	73			
Carbonate Alkalinity (3)		mg/L	0	0	IV	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	72	IV	74	80	72	70	73			
Non-Carbonate Hardness (3)		mg/L	18	28	IV	32	20	29	31	30			
Chemical Oxygen Demand		mg/L	2.4	< 2.0	IV	< 2.0	5.6	2.8	< 2.0	3.2			2
Dissolved Oxygen		mg/L	7.8	8.0	IV	7.4	7.4	9.9	7.8	8.4			
Nitrite Nitrogen	NO ₂ ⁻ -N	mg/L	< 0.1	< 0.1	IV	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO ₃ ⁻ -N	mg/L	0.31	0.28	IV	0.24	0.21	0.23	0.21	0.20	10	10	0.1
Fluoride	F ⁻	mg/L	0.13	0.62	IV	0.58	0.14	0.59	0.53	0.51	4		0.5
pH			7.87	7.37	IV	7.56	7.77	7.49	7.41	7.27	6.5 - 8.5	6.5 - 8.5	
Specific Conductance @ 25 °C.		micromhos	221	225	IV	225	225	232	229	229			
Temperature		°C	23.3	22.9	IV	24.0	25.8	25.5	24.6	24.5			

Legend	Notes:
MCL: Maximum Contaminant Level	(1) Turbidity must not exceed 0.3 NTU in 95% of daily samples in any month
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)
µg/L: Microgram Per Liter	µg/L is equivalent to part per billion (ppb)
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 Sr. Analytical Chemist Initial **B. B.** Date: 12/19/2014
 Reviewed By: Patrick Williford Principal Chemist Initial **P. W.** Date: 01/07/2015

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

NORTH

CANADA

MICHIGAN OHIO