



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Lake Huron Plant**  
**09/16/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.10	0.10	0.3/95% (1)		
Total Solids		mg/L	136	147		500	10
Total Dissolved Solids		mg/L	138	143		500	10
Aluminum	Al	mg/L	< 0.050	0.059		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.59	8.06			0.5
Calcium	Ca	mg/L	23.2	22.4			0.1
Sodium	Na	mg/L	4.49	4.57		20 (2)	0.1
Potassium	K	mg/L	0.80	0.80			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 <sub>2</sub>	mg/L	0.8	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	13.5	17.3		250	
Chloride	Cl <sup>-</sup>	mg/L	6.5	8.5		250	5
Phosphorus	P	mg/L	< 0.05	0.34			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	2.1	4.7			
Total Hardness (3), (4), (5)		mg/L	100	122			
Total Alkalinity (3)		mg/L	98	82			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	98	82			
Non-Carbonate Hardness (3)		mg/L	2	40			
Chemical Oxygen Demand		mg/L	6.4	< 2.0			2
Dissolved Oxygen		mg/L	5.3	5.4			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	0.36	0.29	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.11	0.80	4.0	2.0	0.5
pH			7.96	7.54	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	195			
Temperature		°C	23.2	23.2			

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 <b>7.08 GPG</b>
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: 12/03/2015  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 12/03/2015

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Southwest Plant**  
**09/16/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	1.96	0.04	0.3/95% (1)		
Total Solids		mg/L	144	155		500	10
Total Dissolved Solids		mg/L	146	148		500	10
Aluminum	Al	mg/L	< 0.050	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	0.060	< 0.050		0.3	0.005
Copper	Cu	mg/L	0.010	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.92	8.01			0.5
Calcium	Ca	mg/L	23.4	24.8			0.1
Sodium	Na	mg/L	4.63	4.69		20 (2)	0.1
Potassium	K	mg/L	0.81	0.82			0.1
Manganese	Mn	mg/L	0.005	< 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 <sub>2</sub>	mg/L	0.9	0.9			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.3	22.7		250	
Chloride	Cl <sup>-</sup>	mg/L	6.0	8.0		250	5
Phosphorus	P	mg/L	< 0.05	0.33			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	1.3	4.3			
Total Hardness (3), (4), (5)		mg/L	110	128			
Total Alkalinity (3)		mg/L	84	82			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	84	82			
Non-Carbonate Hardness (3)		mg/L	26	46			
Chemical Oxygen Demand		mg/L	7.2	< 2.0			2
Dissolved Oxygen		mg/L	5.5	5.5			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	0.24	0.23	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.10	0.83	4.0	2.0	0.5
pH			8.11	7.58	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	245	199			
Temperature		°C	22.0	22.0			

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 <b>7.42 GPG</b>
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: 12/03/2015  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 12/03/2015

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Water Works Park Plant**  
**09/16/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	3.30	0.08	0.3/95% (1)		
Total Solids		mg/L	148	153		500	10
Total Dissolved Solids		mg/L	143	164		500	10
Aluminum	Al	mg/L	0.117	0.085		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.69	8.25			0.5
Calcium	Ca	mg/L	22.3	23.3			0.1
Sodium	Na	mg/L	4.57	4.57		20 (2)	0.1
Potassium	K	mg/L	0.98	0.85			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 <sub>2</sub>	mg/L	0.8	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	15.3	20.4		250	
Chloride	Cl <sup>-</sup>	mg/L	6.5	AE		250	5
Phosphorus	P	mg/L	< 0.05	0.32			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	0.8	5.4			
Total Hardness (3), (4), (5)		mg/L	102	102			
Total Alkalinity (3)		mg/L	62	88			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	62	88			
Non-Carbonate Hardness (3)		mg/L	40	14			
Chemical Oxygen Demand		mg/L	8.0	9.6			2
Dissolved Oxygen		mg/L	6.7	7.7			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	0.30	0.29	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.11	0.70	4.0	2.0	0.5
pH			8.21	7.51	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	206	233			
Temperature		°C	23.8	23.3			

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
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:      12/03/2015  
 Reviewed By: Patrick Williford      Chemist      Initial    **P. W.**      Date:      12/03/2015

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Northeast Plant**  
**09/16/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	3.30	LS	0.3/95% (1)		
Total Solids		mg/L	148	151		500	10
Total Dissolved Solids		mg/L	143	150		500	10
Aluminum	Al	mg/L	0.117	0.068		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.69	7.60			0.5
Calcium	Ca	mg/L	22.3	22.8			0.1
Sodium	Na	mg/L	4.57	4.61		20 (2)	0.1
Potassium	K	mg/L	0.98	0.81			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 <sub>2</sub>	mg/L	0.8	0.8			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	15.3	22.2		250	
Chloride	Cl <sup>-</sup>	mg/L	6.5	8.0		250	5
Phosphorus	P	mg/L	< 0.05	0.31			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	0.8	5.2			
Total Hardness (3), (4), (5)		mg/L	102	104			
Total Alkalinity (3)		mg/L	62	78			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	62	78			
Non-Carbonate Hardness (3)		mg/L	40	26			
Chemical Oxygen Demand		mg/L	8.0	3.6			2
Dissolved Oxygen		mg/L	6.7	5.9			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	0.30	0.20	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.11	0.59	4.0	2.0	0.5
pH			8.21	7.48	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	206	233			
Temperature		°C	23.8	23.1			

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
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:      12/03/2015  
 Reviewed By: Patrick Williford      Chemist      Initial      **P. W.**      Date:      12/03/2015

**Detroit Water & Sewerage Department**



**Detroit Water and Sewerage Department**  
**Water Quality Division**  
**Laboratory Analysis of Water Samples Collected at**  
**Springwells Plant**  
**09/16/2015**

Parameter	Formula	Units	Raw	Tap	MCL	Sec.Std	MDL
Turbidity		NTU	3.30	0.05	0.3/95% (1)		
Total Solids		mg/L	148	147		500	10
Total Dissolved Solids		mg/L	143	146		500	10
Aluminum	Al	mg/L	0.117	< 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	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.69	9.57			0.5
Calcium	Ca	mg/L	22.3	23.5			0.1
Sodium	Na	mg/L	4.57	4.58		20 (2)	0.1
Potassium	K	mg/L	0.98	0.81			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	0.05		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	15.3	53.5		250	
Chloride	Cl <sup>-</sup>	mg/L	6.5	8.0		250	5
Phosphorus	P	mg/L	< 0.05	0.34			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	0.8	5.5			
Total Hardness (3), (4), (5)		mg/L	102	102			
Total Alkalinity (3)		mg/L	62	82			
Carbonate Alkalinity (3)		mg/L	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	62	82			
Non-Carbonate Hardness (3)		mg/L	40	20			
Chemical Oxygen Demand		mg/L	8.0	2.4			2
Dissolved Oxygen		mg/L	6.7	5.7			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -N	mg/L	< 0.1	< 0.1	1		0.1
Nitrate Nitrogen	NO <sub>3</sub> <sup>-</sup> -N	mg/L	0.30	0.30	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.11	0.64	4.0	2.0	0.5
pH			8.21	7.47	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	206	202			
Temperature		°C	23.8	22.0			

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 <b>5.92 GPG</b>
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: 12/03/2015  
 Reviewed By: Patrick Williford      Chemist      Initial **P. W.**      Date: 12/03/2015

**Detroit Water & Sewerage Department**



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

Date: 09/16/2015 09/16/2015 09/16/2015 09/16/2015 09/16/2015 09/16/2015 09/16/2015 09/16/2015

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	1.10	0.10	1.96	0.04	3.30	0.08	LS	0.05	0.3/95% (1)		
Total Solids		mg/L	136	147	144	155	148	153	151	147		500	10
Total Dissolved Solids		mg/L	138	143	146	148	143	164	150	146		500	10
Aluminum	Al	mg/L	< 0.050	0.059	< 0.050	< 0.050	0.117	0.085	0.068	< 0.050		0.05-0.2	0.005
Iron	Fe	mg/L	< 0.050	< 0.050	0.060	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050		0.3	0.005
Copper	Cu	mg/L	< 0.005	< 0.005	0.010	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3	1.0	0.002
Magnesium	Mg	mg/L	7.59	8.06	7.92	8.01	7.69	8.25	7.60	9.57			0.5
Calcium	Ca	mg/L	23.2	22.4	23.4	24.8	22.3	23.3	22.8	23.5			0.1
Sodium	Na	mg/L	4.49	4.57	4.63	4.69	4.57	4.57	4.61	4.58		20 (2)	0.1
Potassium	K	mg/L	0.80	0.80	0.81	0.82	0.98	0.85	0.81	0.81			0.1
Manganese	Mn	mg/L	0.003	< 0.002	0.005	< 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	0.05		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.8	1.0	0.9	0.9	0.8	1.0	0.8	1.0			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	13.5	17.3	17.3	22.7	15.3	20.4	22.2	53.5		250	
Chloride	Cl <sup>-</sup>	mg/L	6.5	8.5	6.0	8.0	6.5	AE	8.0	8.0		250	5
Phosphorus	P	mg/L	< 0.05	0.34	< 0.05	0.33	< 0.05	0.32	0.31	0.34			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	2.1	4.7	1.3	4.3	0.8	5.4	5.2	5.5			
Total Hardness (3), (4), (5)		mg/L	100	122	110	128	102	102	104	102			
Total Alkalinity (3)		mg/L	98	82	84	82	62	88	78	82			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	98	82	84	82	62	88	78	82			
Non-Carbonate Hardness (3)		mg/L	2	40	26	46	40	14	26	20			
Chemical Oxygen Demand		mg/L	6.4	< 2.0	7.2	< 2.0	8.0	9.6	3.6	2.4			2
Dissolved Oxygen		mg/L	5.3	5.4	5.5	5.5	6.7	7.7	5.9	5.7			
Nitrite Nitrogen	NO <sub>2</sub> <sup>-</sup> -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 <sub>3</sub> <sup>-</sup> -N	mg/L	0.36	0.29	0.24	0.23	0.30	0.29	0.20	0.30	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.11	0.80	0.10	0.83	0.11	0.70	0.59	0.64	4.0	2.0	0.5
pH			7.96	7.54	8.11	7.58	8.21	7.51	7.48	7.47	6.5-8.5	6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	222	195	245	199	206	233	233	202			
Temperature		°C	23.2	23.2	22.0	22.0	23.8	23.3	23.1	22.0			

<b>Legend</b>	<b>Notes:</b>
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. B.</b>	Date: 12/03/2015
Reviewed By: Patrick Williford	Chemist	Initial	<b>P. W.</b>	Date: 12/03/2015

**Detroit Water & Sewerage Department**



