



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

### GLWA Water Treatment Plants - Mineral Reports

Sample Dates: 11/13/2017 11/13/2017 11/13/2017 11/13/2017 11/15/2017 11/15/2017 11/13/2017 11/13/2017

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	0.47	0.09	3.80	0.07	6.40	0.15	0.06	0.05	0.3/95% (1)		
Total Solids		mg/L	146	153	162	169	173	149	154	164		500	10
Total Dissolved Solids		mg/L	135	140	130	142	134	142	134	141		500	10
Aluminum	Al	mg/L	< 0.05	0.067	0.247	0.067	0.408	0.172	< 0.05	0.133		0.05-0.2	0.005
Iron	Fe	mg/L	0.009	< 0.005	0.129	< 0.005	0.201	< 0.005	< 0.005	< 0.005		0.3	0.005
Copper	Cu	mg/L	0.012	< 0.005	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)	1.0	0.002
Magnesium	Mg	mg/L	7.80	7.93	8.30	8.93	7.93	8.25	7.90	8.00			0.5
Calcium	Ca	mg/L	27.2	27.6	25.1	25.5	25.2	26.6	24.4	25.0			0.1
Sodium	Na	mg/L	5.53	5.26	4.55	4.73	4.86	4.50	4.59	4.69		20 (2)	0.1
Potassium	K	mg/L	0.79	0.80	1.05	0.92	0.86	0.81	0.80	0.80			0.1
Manganese	Mn	mg/L	< 0.002	< 0.002	0.003	< 0.002	0.005	< 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)		0.001
Zinc	Zn	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5	0.1
Silica	SiO <sub>2</sub>	mg/L	0.9	1.0	0.9	1.0	0.9	1.0	1.0	0.9			0.4
Sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/L	17.4	20.5	19.4	25.5	18.2	23.8	25.8	28.0		250	
Chloride	Cl <sup>-</sup>	mg/L	5.9	8.4	8.9	9.9	8.4	8.9	8.9	8.9		250	5
Phosphorus	P	mg/L	< 0.05	0.38	< 0.05	0.37	< 0.05	0.37	0.32	0.50			0.05
Free Carbon Dioxide	CO <sub>2</sub>	mg/L	6.7	4.7	1.6	9.5	1.3	6.2	10.5	9.2			
Total Hardness (3), (4), (5)		mg/L	98	102	102	104	98	102	100	100			
Total Alkalinity (3)		mg/L	82	74	88	74	84	74	74	70			
Carbonate Alkalinity (3)		mg/L	0	0	0	0	0	0	0	0			
Bi-Carbonate Alkalinity (3)		mg/L	82	74	87	74	83	74	74	70			
Non-Carbonate Hardness (3)		mg/L	16	28	14	30	14	28	26	30			
Chemical Oxygen Demand		mg/L	3.3	3.3	5.8	3.3	3.8	4.2	2.9	4.6			2
Dissolved Oxygen		mg/L	10.6	13.3	11.9	11.7	11.6	12.3	11.7	13.7			
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	0.35	0.29	0.30	0.25	0.32	0.29	0.25	0.25	10		0.1
Fluoride	F <sup>-</sup>	mg/L	0.08	0.73	0.10	0.59	0.07	0.63	0.49	0.47	4.0	2.0	0.5
pH			7.39	7.50	8.05	7.19	8.11	7.38	7.15	7.18		6.5-8.5	
Specific Conductance @ 25 °C.		micromhos	216	217	236	238	222	230	228	227			
Temperature		°C	15.7	15.7	8.0	11.1	10.8	11.3	12.4	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) Hardness in Grains per Gallon = 0.058 × (Hardness in mg/L)
AE: Analytical Error	(6) Reported results are below the low calibration standard but above the instrument
IV: Invalid Sample	detection limit.

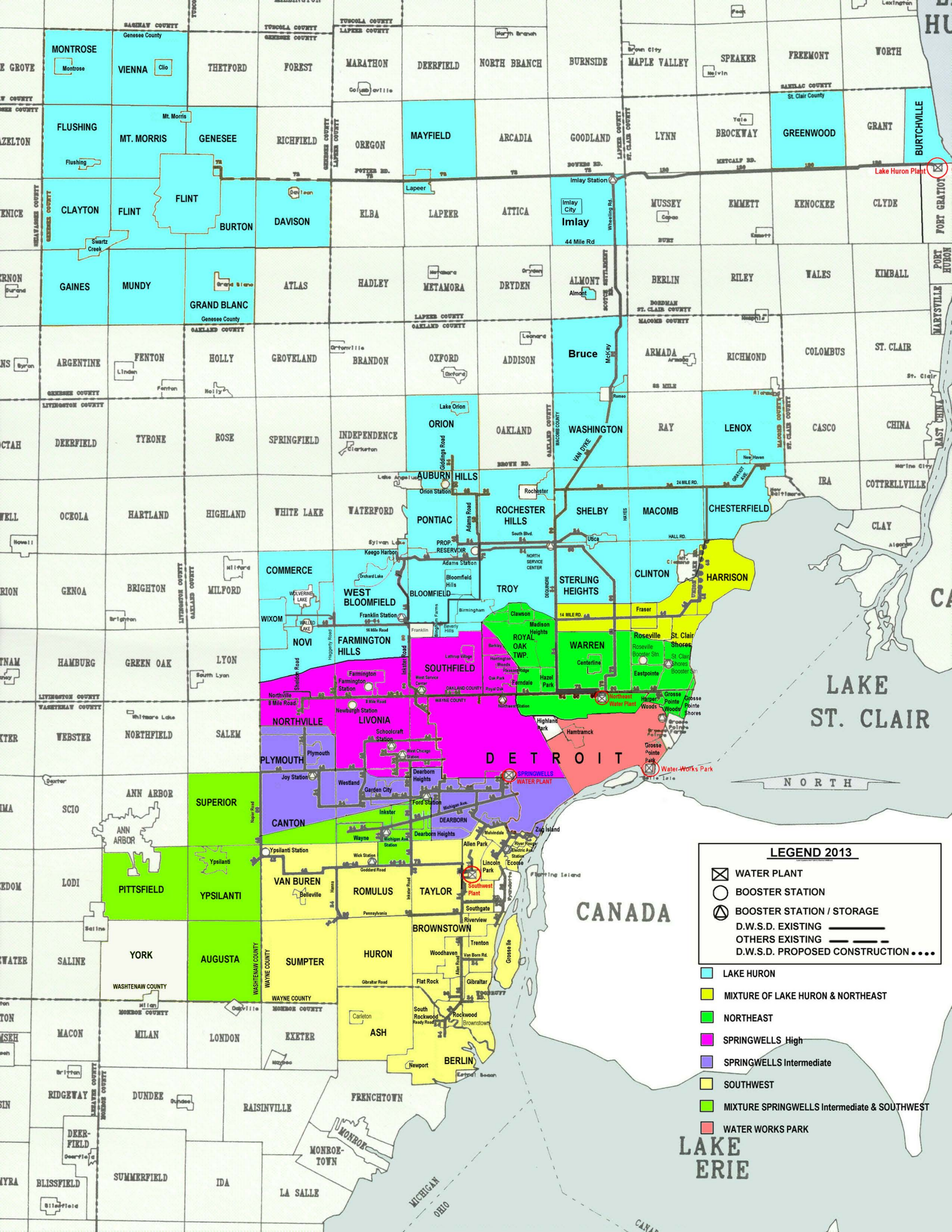
Analyst: Raupach & Brown  
 Reviewed By: Patrick Williford

Chemist-I  
 Management Professional - Ops.

Initials: **B. B.**  
 Initials: **P. W.**

Date: 12/15/2017  
 Date: 01/26/2018

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**



MICHIGAN OHIO

CANADA

LAKE ST. CLAIR

DETROIT

MONTRÖSE VIENNA THETFORD FOREST MARATHON DEERFIELD NORTH BRANCH BURNSIDE MAPLE VALLEY SPEAKER FREEMONT WORTH

FLUSHING MT. MORRIS GENESEE RICHFIELD OREGON MAYFIELD ARCADIA GOODLAND LYNN BROCKWAY GREENWOOD GRANT BURCHVILLE

CLAYTON FLINT FLINT BURTON DAVISON ELBA LAPEER ATTICA Imlay Imlay City ALMONT BERLIN RILEY WALES KIMBALL

GAINES MUNDY GRAND BLANC ATLAS HADLEY METAMORA DRYDEN ALMONT BRUCE BURLIN RAY WALE KIMBALL

ARGENTINE FENTON HOLLY GROVELAND BRANDON OXFORD ADDISON WASHINGTON RAY LENOX CASCO CHINA

DEERFIELD TYBONE ROSE SPRINGFIELD INDEPENDENCE OAKLAND WASHINGTON RAY LENOX CASCO CHINA

OCOLA HARTLAND HIGHLAND WHITE LAKE WATERFORD PONTIAC ROCHESTER HILLS SHELBY MACOMB CHESTERFIELD

GENOA BRIGHTON MILFORD COMMERCE WEST BLOOMFIELD BLOOMFIELD TROY STERLING HEIGHTS CLINTON HARRISON

HAMBURG GREEN OAK LYON WIXOM NOVIFARMINGTON HILLS SOUTHFIELD ROYAL OAK TWP WARREN

WEBSTER NORTHFIELD SALEM NORTHVILLE LIVONIA SOUTHFIELD ROYAL OAK TWP WARREN