



Water: RAW
Year: 2019

Plant Name: Lake Huron (LH)

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

Monthly Mineral Analyses Annual Averages

Sample Date:					01/15/2019	02/12/2019	03/05/2019	04/16/2019	05/14/2019	06/11/2019	07/16/2019	08/13/2019	09/10/2019	10/15/2019	11/12/2019	12/10/2019				
Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	2.55	0.29	0.74	1.40	0.30	0.29	2.55	0.30	0.34	0.50	0.42	0.32	0.33	1.71	0.38	0.3/95% (1)			0.74
Total Solids	mg/L	153	100	123	126	110	107	137	116	126	153	126	140	104	125	100		500	10	16
Total Dissolved Solids	mg/L	151	82	113	88	115	120	111	93	124	151	82	136	95	97	143		500	10	23
Aluminum	mg/L	0.177	0.007	0.048	AE	AE	AE	0.177	AE	0.062	0.007	0.010	0.024	0.011	0.045	0.051		0.05-0.2	0.005	0.056
Iron	mg/L	0.066	ND	0.023	0.066	0.045	0.045	0.033	0.058	0.024	< 0.005	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.3	0.005	0.015
Copper	mg/L	0.015	ND	0.006	0.007	< 0.005	< 0.005	0.006	< 0.005	0.006	0.015	0.012	0.006	0.006	0.006	0.006	1.3 (AL)		0.002	0.003
Magnesium	mg/L	9.08	5.88	7.78	8.23	7.78	8.25	7.63	5.88	7.75	7.75	7.75	7.75	7.70	7.88	9.08			0.5	0.72
Calcium	mg/L	30.7	26.3	28.3	26.3	26.4	27.9	28.3	26.6	30.7	28.7	28.3	28.7	29.7	29.7	28.9			0.1	1.4
Sodium	mg/L	5.65	4.20	4.99	5.31	4.96	5.65	4.56	4.72	4.62	5.50	5.20	5.00	4.20	5.22	4.98		20 (2)	0.1	0.42
Potassium	mg/L	1.15	0.82	0.94	1.15	0.82	0.92	0.96	0.89	0.91	0.94	0.99	0.95	0.94	0.92	0.85			0.1	0.08
Manganese	mg/L	0.004	ND	0.000	0.002	< 0.002	< 0.002	0.004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	0.001
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.015 (AL)		0.002
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5		0.1
Silica	mg/L	2.4	1.5	1.9	2.1	1.8	2.0	2.1	1.9	1.7	1.5	2.4	1.7	1.9	2.0	2.0			0.4	0.2
Sulfate	mg/L	19.0	14.9	16.4	16.1	17.2	16.7	15.3	15.3	16.5	16.1	14.9	16.6	15.2	19.0	17.6				1.2
Chloride	mg/L	9.9	7.3	8.2	8.2	7.9	8.9	7.7	7.4	9.9	8.9	9.7	7.3	7.4	7.5	7.9		250	5	0.9
Phosphorus	mg/L	ND	ND	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			0.05	
Free Carbon Dioxide	mg/L	1.6	0.9	1.1	1.0	1.3	1.0	1.6	1.0	1.0	1.0	1.3	0.9	1.0	1.2	1.3				0.2
Total Hardness (3), (4), (5)	mg/L	102	96	99	100	97	100	98	96	98	102	100	101	100	97	102				2
Total Alkalinity (3)	mg/L	88	78	81	80	82	82	79	80	80	80	81	88	79	78	80				3
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	86	77	80	79	81	81	78	79	79	79	80	86	79	77	79				2
Non-Carbonate Hardness (3)	mg/L	22	13	19	20	15	18	19	16	18	22	19	13	21	19	22				3
Chemical Oxygen Demand	mg/L	40.0	ND	5.9	4.9	2.9	< 2	3.2	2.8	2.6	< 2	3.2	3.4	4.1	40.0	4.0			2	11.6
Dissolved Oxygen	mg/L	14.2	7.1	10.1	12.1	12.7	14.2	12.9	N/A	11.1	9.8	7.1	8.7	9.5	11.3	12.0				2.1
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		1	0.1	
Nitrate Nitrogen	mg/L	0.54	0.29	0.37	0.30	0.32	0.35	0.33	0.33	0.54	0.43	0.34	0.30	0.41	0.48	0.29		10	10	0.08
Fluoride	mg/L	0.14	0.08	0.10	0.14	0.13	0.11	0.14	0.09	0.08	0.09	0.11	0.09	0.09	0.09	0.09		4	0.5	0.02
pH		8.30	8.00	8.16	8.20	8.10	8.20	8.00	8.20	8.20	8.20	8.10	8.30	8.20	8.10	8.10		6.5-8.5	6.5-8.5	0.08
Specific Conductance @ 25 °C.	µmhos	240	199	215	201	199	240	205	215	216	232	214	213	210	209	224				12
Temperature	°C	22.6	5.9	12.5	8.5	6.6	7.2	5.9	10.0	14.4	21.8	22.6	19.0	14.9	12.4	6.7				6.0

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 Hardnessin 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	ND = Not detected above the reporting limit
Below detection limit	Blue text indicates value was less than the detection limit and is considered zero for calculation purposes.

Maximum	Minimum	Average	
5.9	5.6	5.8	GPG



Water: TAP
Year: 2019

Plant Name: Lake Huron (LH)

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Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	0.10	0.04	0.07	0.05	0.08	0.08	0.04	0.05	0.06	0.08	0.10	0.08	0.05	0.06	0.09	0.3/95% (1)			0.02
Total Solids	mg/L	159	106	132	126	106	113	130	127	138	147	159	145	148	121	128		500	10	16
Total Dissolved Solids	mg/L	142	94	121	118	122	119	123	94	121	142	131	133	115	126	104		500	10	13
Aluminum	mg/L	0.122	0.028	0.076	AE	AE	AE	0.065	AE	0.028	0.091	0.122	0.107	0.087	0.052	0.056		0.05-0.2	0.005	0.031
Iron	mg/L	0.036	ND	0.013	0.033	0.027	0.033	< 0.005	0.036	0.031	< 0.005	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.3	0.005	0.003
Copper	mg/L	ND	ND	0.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)		0.002	
Magnesium	mg/L	9.23	6.35	7.93	8.25	7.78	8.23	7.58	6.35	7.75	7.75	7.75	7.75	7.68	9.23	9.10			0.5	0.74
Calcium	mg/L	36.9	26.1	28.6	26.2	26.8	27.9	26.6	26.1	27.4	28.6	28.3	28.0	30.5	30.5	36.9			0.1	3.0
Sodium	mg/L	5.66	4.30	5.00	5.34	4.93	5.66	4.60	4.56	4.74	5.40	5.20	5.00	4.30	5.23	5.01		20 (2)	0.1	0.40
Potassium	mg/L	1.15	0.81	0.93	1.15	0.81	0.92	0.95	0.88	0.93	0.92	0.99	0.95	0.94	0.86	0.88			0.1	0.08
Manganese	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5	0.1	
Silica	mg/L	2.5	1.5	2.1	2.3	1.5	2.2	2.5	2.1	2.3	1.8	2.2	1.9	2.2	2.3	2.1			0.4	0.3
Sulfate	mg/L	21.9	16.2	19.4	21.9	20.5	20.5	20.0	17.5	18.4	18.3	16.2	20.4	18.0	20.9	20.5				1.7
Chloride	mg/L	12.6	8.7	9.7	9.9	8.9	10.2	9.4	8.7	12.6	10.6	10.9	8.7	8.9	8.7	8.9		250	5	1.2
Phosphorus	mg/L	1.18	0.31	0.49	0.31	0.35	0.41	0.38	0.34	0.36	0.35	0.34	1.18	0.38	0.37	1.07			0.05	0.30
Free Carbon Dioxide	mg/L	6.0	4.4	5.3	5.6	4.5	5.9	5.6	5.7	4.7	4.8	6.0	5.9	4.4	4.5	6.0				0.6
Total Hardness (3), (4), (5)	mg/L	102	94	99	100	97	100	98	100	98	98	102	100	100	94	96				2
Total Alkalinity (3)	mg/L	76	70	73	70	72	74	70	72	74	76	76	74	70	72	76				2
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	76	70	73	70	72	74	70	72	74	76	76	74	70	72	76				2
Non-Carbonate Hardness (3)	mg/L	30	20	26	30	25	26	28	28	24	22	26	26	30	22	20				3
Chemical Oxygen Demand	mg/L	4.8	ND	1.7	4.0	< 2	3.2	< 2	< 2	< 2	< 2	3.4	4.8	2.4	< 2	2.1			2	1.0
Dissolved Oxygen	mg/L	14.4	8.2	11.4	12.6	11.0	14.4	13.4	12.0	11.5	10.2	8.2	9.3	9.9	11.7	12.6				1.8
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	0.46	0.25	0.35	0.29	0.32	0.36	0.35	0.31	0.46	0.40	0.29	0.33	0.39	0.46	0.25	10	10	0.1	0.07
Fluoride	mg/L	0.76	0.61	0.68	0.70	0.64	0.68	0.70	0.63	0.61	0.67	0.75	0.65	0.76	0.72	0.66	4		0.5	0.05
pH		7.50	7.40	7.44	7.40	7.50	7.40	7.40	7.40	7.50	7.50	7.40	7.40	7.50	7.50	7.40	6.5-8.5	6.5-8.5		0.05
Specific Conductance @ 25 °C.	µmhos	245	204	219	204	207	244	208	216	220	245	219	218	211	212	219				13
Temperature	°C	22.5	3.6	11.7	5.4	3.6	4.0	7.4	9.0	14.0	20.3	22.5	20.1	14.1	10.7	9.7				6.5

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)
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< : Less than	(5) Tap Water Hardnessin in Grains per Gallon multiply value by 0.058 (Grains/Gallon)/(mg/L) -->
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Maximum	Minimum	Average	
5.9	5.5	5.7	GPG



Water: RAW
Year: 2019

Plant Name: **Southwest (SW)**

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Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	17.00	1.10	4.22	17.00	1.10	2.60	9.80	2.00	1.80	1.20	1.80	1.94	2.60	4.50	4.30	0.3/95% (1)			4.68
Total Solids	mg/L	168	103	134	136	140	103	108	125	168	159	141	136	132	103	157		500	10	22
Total Dissolved Solids	mg/L	142	110	126	118	138	110	142	111	137	140	120	112	123	126	140		500	10	12
Aluminum	mg/L	0.486	0.042	0.264	AE	AE	AE	0.486	AE	AE	AE	AE	AE	AE	AE	0.042		0.05-0.2	0.005	0.314
Iron	mg/L	0.691	ND	0.121	0.691	0.038	0.111	0.106	0.106	0.050	0.030	< 0.1	< 0.1	0.160	< 0.1	0.165		0.3	0.005	0.204
Copper	mg/L	0.313	0.013	0.078	AE	0.066	0.143	0.313	AE	0.093	0.021	0.013	0.013	AE	0.014	0.022	1.3 (AL)		0.002	0.099
Magnesium	mg/L	10.98	6.46	8.26	10.98	8.23	8.53	8.30	7.03	9.00	8.00	AE	AE	7.83	6.46	8.23			0.5	1.20
Calcium	mg/L	42.5	21.8	27.9	25.1	28.2	AE	28.5	21.8	29.6	24.0	23.3	24.9	29.7	29.7	42.5			0.1	5.6
Sodium	mg/L	5.80	5.24	5.57	AE	5.66	AE	AE	AE	AE	5.80	AE	AE	AE	5.24	AE		20 (2)	0.1	0.29
Potassium	mg/L	2.04	0.86	1.14	2.04	0.86	1.05	1.12	1.01	1.28	0.96	AE	AE	0.98	1.01	1.10			0.1	0.33
Manganese	mg/L	0.003	ND	0.000	< 0.002	< 0.002	< 0.002	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5		0.1
Silica	mg/L	2.8	1.2	1.8	2.8	1.6	2.0	1.7	1.5	1.2	1.3	2.0	1.6	1.8	1.9	2.2			0.4	0.4
Sulfate	mg/L	22.1	15.1	17.9	22.1	18.3	17.9	17.0	16.5	19.2	16.9	15.1	17.3	15.8	19.9	18.4				1.9
Chloride	mg/L	18.3	7.4	10.4	16.5	8.9	10.9	8.7	8.9	18.3	9.2	9.9	7.8	7.4	8.2	9.9		250	5	3.4
Phosphorus	mg/L	ND	ND	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			0.05	
Free Carbon Dioxide	mg/L	1.9	0.5	1.1	1.3	1.4	1.1	1.1	1.4	1.2	0.5	0.5	0.7	1.0	1.2	1.9				0.4
Total Hardness (3), (4), (5)	mg/L	130	98	107	130	104	104	105	108	130	98	100	100	98	101	100				11
Total Alkalinity (3)	mg/L	104	80	87	104	84	86	86	84	100	82	82	86	80	81	92				8
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	102	79	86	102	83	85	85	83	98	79	79	84	80	80	91				8
Non-Carbonate Hardness (3)	mg/L	30	8	19	26	20	18	19	24	30	16	18	14	18	20	8				6
Chemical Oxygen Demand	mg/L	6.4	ND	4.5	6.4	< 2	4.4	2.5	5.2	6.1	2.9	5.4	6.1	5.1	4.6	5.6			2	1.3
Dissolved Oxygen	mg/L	14.4	7.7	9.9	12.3	13.3	14.4	11.9	N/A	9.0	9.2	7.7	8.6	9.1	11.5	12.4				2.2
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	1.40	0.22	0.54	1.40	0.41	0.54	0.36	0.49	0.97	0.37	0.22	0.26	0.40	0.52	0.50	10	10	0.1	0.33
Fluoride	mg/L	0.14	0.08	0.10	0.14	0.13	0.11	0.12	0.09	0.10	0.09	0.08	0.09	0.09	0.10	0.10	4		0.5	0.02
pH		8.54	7.98	8.23	8.21	8.08	8.20	8.18	8.08	8.23	8.54	8.54	8.36	8.20	8.11	7.98	6.5-8.5	6.5-8.5		0.17
Specific Conductance @ 25 °C.	µmhos	279	211	235	277	211	260	219	230	279	236	216	220	213	223	240				24
Temperature	°C	24.5	1.9	12.1	6.6	1.9	3.5	7.8	10.3	18.0	23.9	24.5	20.7	14.9	7.4	5.2				8.0

Legend	Notes:
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Sec.Std: Secondary Standard	(2) EPA Guidance Level
NTU: Nephelometric Turbidity Unit	(3) As Calcium Carbonate
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Maximum

Minimum

Average

GPG



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Plant Name: Southwest (SW)

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

Monthly Mineral Analyses Annual Averages

Sample Date:					01/15/2019	02/12/2019	03/05/2019	04/16/2019	05/14/2019	06/11/2019	07/16/2019	08/13/2019	09/10/2019	10/15/2019	11/12/2019	12/10/2019				
Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	0.61	0.03	0.20	0.16	0.61	0.20	0.13	0.05	0.20	0.18	0.20	0.20	0.03	0.16	0.30	0.3/95% (1)			0.15
Total Solids	mg/L	179	124	146	166	126	130	142	131	179	151	152	152	147	124	148		500	10	16
Total Dissolved Solids	mg/L	162	13	119	162	73	128	130	112	152	156	128	126	128	121	13		500	10	41
Aluminum	mg/L	0.361	0.029	0.104	AE	AE	AE	0.062	AE	0.030	0.092	0.361	0.162	0.066	0.029	0.033		0.05-0.2	0.005	0.113
Iron	mg/L	0.140	ND	0.023	0.026	0.035	0.023	< 0.005	0.039	0.016	< 0.005	0.140	< 0.1	< 0.1	< 0.1	< 0.1		0.3	0.005	0.047
Copper	mg/L	ND	ND	0.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)		0.002	
Magnesium	mg/L	10.63	6.63	8.50	10.63	8.13	8.48	8.13	6.63	9.00	8.00	8.00	8.00	7.80	9.38	9.85			0.5	1.06
Calcium	mg/L	39.3	27.7	31.0	39.3	27.9	29.9	31.2	28.1	34.0	29.0	27.7	29.1	29.7	29.7	36.9			0.1	3.7
Sodium	mg/L	9.34	4.60	6.23	9.34	5.84	7.51	5.56	5.36	7.25	5.70	5.60	5.30	4.60	5.74	6.99		20 (2)	0.1	1.30
Potassium	mg/L	1.80	0.86	1.09	1.80	0.86	1.12	1.03	0.98	1.29	0.94	1.04	0.99	0.97	0.94	1.11			0.1	0.25
Manganese	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5	0.1	
Silica	mg/L	2.8	1.6	2.1	2.8	1.9	2.2	1.8	1.8	1.8	1.6	2.6	1.9	2.1	1.8	2.4			0.4	0.4
Sulfate	mg/L	33.4	20.5	24.9	33.4	20.5	24.5	25.7	22.8	25.8	25.1	21.6	23.1	21.0	25.9	29.7				3.7
Chloride	mg/L	21.3	8.9	12.4	18.7	10.1	13.3	10.4	11.9	21.3	11.1	11.1	9.2	8.9	9.7	12.9		250	5	3.8
Phosphorus	mg/L	1.18	0.23	0.46	0.36	0.32	0.35	0.32	0.36	0.35	0.30	0.23	1.18	0.37	0.39	1.01			0.05	0.30
Free Carbon Dioxide	mg/L	17.4	6.6	9.5	17.4	6.6	6.9	10.7	7.9	10.1	8.2	7.0	8.5	8.4	7.7	14.9				3.3
Total Hardness (3), (4), (5)	mg/L	145	90	107	145	102	108	107	112	122	90	100	102	96	98	102				14
Total Alkalinity (3)	mg/L	89	68	75	89	68	76	74	70	84	70	72	74	70	72	78				6
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	89	68	75	89	68	76	74	70	84	70	72	74	70	72	78				6
Non-Carbonate Hardness (3)	mg/L	56	20	32	56	34	32	33	42	38	20	28	28	26	26	24				10
Chemical Oxygen Demand	mg/L	5.1	ND	2.0	4.9	< 2	3.7	< 2	2.1	2.4	< 2	2.4	5.1	< 2	< 2	3.0			2	1.2
Dissolved Oxygen	mg/L	14.4	8.2	11.1	12.7	13.0	14.4	12.1	11.5	9.4	9.1	8.2	8.9	9.4	11.7	12.8				2.0
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	1.60	0.21	0.56	1.60	0.37	0.59	0.41	0.50	0.99	0.32	0.21	0.29	0.36	0.51	0.56	10	10	0.1	0.38
Fluoride	mg/L	0.84	0.45	0.69	0.45	0.62	0.72	0.66	0.72	0.74	0.70	0.73	0.84	0.76	0.76	0.61	4		0.5	0.10
pH		7.34	7.01	7.21	7.01	7.31	7.34	7.14	7.25	7.22	7.23	7.31	7.24	7.22	7.27	7.02	6.5-8.5	6.5-8.5		0.11
Specific Conductance @ 25 °C.	µmhos	294	218	244	294	219	271	229	238	280	243	223	226	218	225	262				26
Temperature	°C	24.2	1.7	11.3	3.0	1.7	1.9	7.4	10.0	17.7	23.6	24.2	20.2	13.9	6.7	5.6				8.3

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 Hardnessin 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	ND = Not detected above the reporting limit
Below detection limit	Blue text indicates value was less than the detection limit and is considered zero for calculation purposes.

Maximum	Minimum	Average	
8.4	5.2	6.2	GPG



Water: RAW
Year: 2019

Plant Name: **Belle Isle (WWP-SPW-NE)**

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

Monthly Mineral Analyses Annual Averages

Sample Date:					01/15/2019	02/12/2019	03/05/2019	04/16/2019	05/14/2019	06/11/2019	07/16/2019	08/13/2019	09/10/2019	10/15/2019	11/12/2019	12/10/2019	MCL	Sec.Std	MDL	STDEV
Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
Turbidity	N.T.U.	26.00	1.31	5.64	14.00	1.60	1.60	4.30	2.45	26.00	1.90	1.31	2.40	5.60	2.74	3.80	0.3/95% (1)			7.29
Total Solids	mg/L	156	113	132	135	125	121	154	114	134	156	141	140	113	122	132		500	10	14
Total Dissolved Solids	mg/L	137	89	118	125	123	99	120	89	125	137	111	128	110	123	130		500	10	14
Aluminum	mg/L	0.272	0.037	0.087	AE	AE	AE		AE	AE	0.040	AE	AE	AE	0.272	0.037		0.05-0.2	0.005	0.135
Iron	mg/L	0.431	0.050	0.169	0.431	0.264	0.057	0.149	0.117	0.130	0.050	0.145	0.116	0.207	0.230	0.126		0.3	0.005	0.104
Copper	mg/L	ND	ND	0.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	AE	AE	< 0.005	1.3 (AL)		0.002	
Magnesium	mg/L	9.23	6.58	8.06	9.23	8.55	8.45	AE	6.58	8.00	8.00	AE	AE	7.93	7.80	8.00			0.5	0.71
Calcium	mg/L	33.7	18.0	26.1	19.0	18.0	AE	AE	22.0	24.4	28.6	23.6	24.9	33.7	33.7	33.7			0.1	6.0
Sodium	mg/L	5.70	5.70	5.70	AE	AE	AE	AE	AE	AE	5.70	AE	AE	AE	AE	AE		20 (2)	0.1	
Potassium	mg/L	1.54	0.94	1.07	1.54	1.08	0.96	AE	1.00	1.09	0.94	AE	AE	1.03	1.00	1.01			0.1	0.18
Manganese	mg/L	0.003	ND	0.000	< 0.002	< 0.002	< 0.002	AE	< 0.002	< 0.002	0.003	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5	0.1	
Silica	mg/L	2.2	1.4	1.9	2.2	2.0	2.1	2.1	1.5	1.4	1.4	2.1	1.6	1.9	2.0	2.1			0.4	0.3
Sulfate	mg/L	18.7	15.2	17.1	17.5	17.7	17.4	17.0	15.2	16.9	17.3	16.3	16.8	15.6	18.7	18.5				1.0
Chloride	mg/L	13.3	7.4	9.5	12.6	11.1	9.1	9.4	8.4	13.3	9.2	9.9	7.8	7.4	7.5	8.7		250	5	1.9
Phosphorus	mg/L	ND	ND	0.00	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05			0.05	
Free Carbon Dioxide	mg/L	1.4	0.7	1.1	1.1	1.0	1.4	1.2	1.2	1.3	0.7	0.7	0.8	1.2	1.2	1.2				0.2
Total Hardness (3), (4), (5)	mg/L	106	98	102	104	98	100	106	104	106	102	100	100	98	103	102				3
Total Alkalinity (3)	mg/L	88	80	83	80	84	86	86	84	88	84	83	84	80	80	82				3
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	87	79	82	79	83	85	85	83	87	82	81	82	80	79	81				2
Non-Carbonate Hardness (3)	mg/L	24	14	19	24	14	14	20	20	18	18	17	16	18	23	20				3
Chemical Oxygen Demand	mg/L	13.7	2.9	5.5	5.4	4.3	3.4	8.4	3.5	4.9	2.9	13.7	5.1	5.3	4.3	4.7			2	2.9
Dissolved Oxygen	mg/L	15.0	8.0	11.2	13.6	13.8	15.0	11.9	11.0	9.4	8.1	8.0	9.4	9.1	11.9	13.6				2.4
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	0.56	0.23	0.41	0.38	0.37	0.35	0.42	0.44	0.56	0.40	0.23	0.53	0.38	0.49	0.34	10	10	0.1	0.09
Fluoride	mg/L	0.16	0.08	0.11	0.11	0.14	0.12	0.16	0.10	0.09	0.10	0.08	0.10	0.09	0.10	0.09	4		0.5	0.02
pH		8.35	8.08	8.19	8.17	8.20	8.08	8.14	8.15	8.13	8.35	8.34	8.32	8.11	8.13	8.12	6.5-8.5	6.5-8.5		0.10
Specific Conductance @ 25 °C.	µmhos	288	210	231	225	211	244	227	226	239	237	213	220	288	210	227				21
Temperature	°C	23.1	4.4	12.8	6.0	6.0	5.5	10.0	12.5	18.0	23.0	23.1	21.0	16.0	4.4	8.5				7.1

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)
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< : Less than	(5) Tap Water Hardness in Grains per Gallon multiply value by 0.058 (Grains/Gallon)/(mg/L) -->
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IV: Invalid Sample	ND = Not detected above the reporting limit
Below detection limit	Blue text indicates value was less than the detection limit and is considered zero for calculation purposes.

Maximum	Minimum	Average	
6.1	5.7	5.9	GPG



Water: TAP
Year: 2019

Plant Name: Water Works Park (WWP)

WATER OPERATING SERVICES
WATER QUALITY
10100 EAST JEFFERSON AVENUE
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Monthly Mineral Analyses Annual Averages

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Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	0.11	0.06	0.08	0.08	0.07	0.08	0.06	0.07	0.08	0.07	0.11	0.10	0.08	0.07	0.07	0.3/95% (1)			0.01
Total Solids	mg/L	159	117	135	130	133	125	147	117	153	156	117	159	142	118	127		500	10	16
Total Dissolved Solids	mg/L	193	55	127	55	125	112	135	124	105	156	134	152	193	117	111		500	10	33
Aluminum	mg/L	0.241	0.037	0.119	AE	AE	AE	0.051	AE	0.070	0.169	0.232	0.241	0.110	0.037	0.046		0.05-0.2	0.005	0.084
Iron	mg/L	0.031	ND	0.010	0.031	0.014	0.026	< 0.005	0.031	0.022	< 0.005	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.3	0.005	0.007
Copper	mg/L	0.009	ND	0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.009	< 0.005	< 0.005	1.3 (AL)		0.002	
Magnesium	mg/L	9.50	6.80	8.25	8.75	8.33	8.30	8.25	6.80	8.25	8.00	8.00	7.75	7.75	9.38	9.50			0.5	0.73
Calcium	mg/L	38.5	28.1	30.5	28.1	28.3	28.6	29.3	28.2	33.1	28.8	28.3	29.2	32.9	32.9	38.5			0.1	3.2
Sodium	mg/L	10.22	4.90	6.10	7.87	10.22	6.47	5.31	5.34	6.62	5.70	5.30	5.20	4.90	5.09	5.22		20 (2)	0.1	1.55
Potassium	mg/L	1.32	0.93	1.02	1.32	0.98	1.03	1.04	0.98	1.03	0.93	0.99	0.99	0.97	0.99	0.95			0.1	0.10
Manganese	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5	0.1	
Silica	mg/L	2.5	1.6	2.1	2.5	2.2	2.3	2.3	2.0	1.7	1.6	2.3	2.0	2.2	2.3	2.4			0.4	0.3
Sulfate	mg/L	25.7	18.0	23.0	25.7	24.2	22.4	25.6	23.9	23.0	22.5	18.0	22.6	21.7	25.0	21.8				2.1
Chloride	mg/L	17.1	9.4	11.7	14.3	16.8	11.5	9.9	10.4	17.1	11.1	10.9	9.7	9.9	9.4	9.4		250	5	2.8
Phosphorus	mg/L	1.09	0.27	0.46	0.34	0.38	0.36	0.40	0.38	0.30	0.28	0.27	0.94	0.40	0.35	1.09			0.05	0.27
Free Carbon Dioxide	mg/L	9.0	4.8	7.2	6.8	5.9	8.1	9.0	7.9	7.3	8.5	7.2	6.9	6.7	7.7	4.8				1.1
Total Hardness (3), (4), (5)	mg/L	110	96	102	110	101	100	104	106	104	100	102	101	96	100	104				4
Total Alkalinity (3)	mg/L	78	70	72	70	72	72	70	70	78	72	72	74	70	70	74				2
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	78	70	72	70	72	72	70	70	78	72	72	74	70	70	74				2
Non-Carbonate Hardness (3)	mg/L	40	26	30	40	29	28	34	36	26	28	30	27	26	30	30				4
Chemical Oxygen Demand	mg/L	6.1	ND	2.2	4.0	2.0	3.2	< 2	< 2	< 2	< 2	2.2	< 2	4.8	3.6	6.1			2	1.4
Dissolved Oxygen	mg/L	17.2	10.5	13.2	15.4	16.7	17.2	14.7	12.9	11.6	11.0	10.6	10.5	10.7	13.0	14.1				2.4
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	0.51	0.24	0.38	0.38	0.40	0.36	0.41	0.40	0.49	0.38	0.24	0.30	0.37	0.51	0.31	10	10	0.1	0.08
Fluoride	mg/L	0.83	0.61	0.71	0.71	0.73	0.83	0.81	0.79	0.66	0.62	0.76	0.66	0.70	0.68	0.61	4		0.5	0.07
pH		7.49	7.19	7.30	7.31	7.39	7.25	7.19	7.25	7.33	7.23	7.30	7.33	7.32	7.26	7.49	6.5-8.5	6.5-8.5		0.08
Specific Conductance @ 25 °C.	µmhos	253	211	230	222	234	253	227	233	246	244	217	226	222	211	229				12
Temperature	°C	23.5	4.5	13.1	5.0	5.0	4.5	9.0	11.0	17.0	23.5	23.0	21.0	17.0	11.0	10.0				7.0

Legend	Notes:
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Maximum	Minimum	Average	
6.4	5.6	5.9	GPG



Water: TAP
Year: 2019

Plant Name: **Northeast (NE)**

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

Monthly Mineral Analyses Annual Averages

Sample Date:					01/15/2019	02/12/2019	03/05/2019	04/16/2019	05/14/2019	06/11/2019	07/16/2019	08/13/2019	09/10/2019	10/15/2019	11/12/2019	12/10/2019				
Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	0.08	0.06	0.07	0.08	0.08	0.08	0.08	0.06	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.3/95% (1)			0.01
Total Solids	mg/L	154	74	135	137	146	126	144	129	153	139	154	151	74	136	133		500	10	21
Total Dissolved Solids	mg/L	156	88	125	128	125	114	156	88	141	153	120	125	101	139	115		500	10	20
Aluminum	mg/L	0.119	0.025	0.074	AE	AE	AE	0.094	AE	0.025	0.109	0.119	0.082	0.074	0.044	0.045		0.05-0.2	0.005	0.034
Iron	mg/L	0.038	ND	0.013	0.027	0.038	0.024	< 0.005	0.038	0.026	< 0.005	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.3	0.005	0.007
Copper	mg/L	0.012	ND	0.001	< 0.005	< 0.005	< 0.005	0.012	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)		0.002	
Magnesium	mg/L	9.38	6.63	8.16	8.78	8.20	8.03	8.08	6.63	8.25	8.00	7.75	7.75	7.83	9.38	9.28			0.5	0.74
Calcium	mg/L	41.7	27.0	30.0	28.2	28.1	28.2	28.8	27.0	28.8	28.4	27.9	29.4	32.1	32.1	41.7			0.1	4.0
Sodium	mg/L	10.12	4.70	6.07	7.59	10.12	6.46	5.38	5.01	6.37	6.10	5.30	5.20	4.70	5.25	5.34		20 (2)	0.1	1.51
Potassium	mg/L	1.31	0.90	1.00	1.31	0.97	1.02	1.02	0.95	1.04	0.94	0.96	0.99	0.97	0.90	0.92			0.1	0.10
Manganese	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5	0.1	
Silica	mg/L	2.4	1.6	2.0	2.4	1.6	2.2	1.9	1.9	1.9	1.9	2.2	2.0	2.1	2.0	2.3			0.4	0.2
Sulfate	mg/L	27.8	20.6	24.3	27.8	25.5	24.1	26.3	23.7	22.6	22.2	20.6	22.5	21.5	27.7	27.3				2.5
Chloride	mg/L	17.6	9.2	11.7	13.7	17.6	11.2	10.9	10.2	17.1	11.1	10.4	9.2	9.4	9.7	9.9		250	5	2.9
Phosphorus	mg/L	1.44	0.34	0.53	0.34	0.44	0.37	0.37	0.41	0.42	0.35	0.36	1.05	0.44	0.37	1.44			0.05	0.35
Free Carbon Dioxide	mg/L	14.8	5.9	8.7	8.8	9.4	7.9	9.9	9.5	14.8	6.3	5.9	7.5	7.7	9.2	8.0				2.3
Total Hardness (3), (4), (5)	mg/L	110	96	103	108	100	102	104	106	110	104	105	100	98	96	98				4
Total Alkalinity (3)	mg/L	78	68	72	68	73	70	72	70	74	72	74	78	70	70	68				3
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	78	68	71	68	73	70	72	70	74	72	74	78	70	70	68				3
Non-Carbonate Hardness (3)	mg/L	40	22	31	40	27	32	32	36	36	32	31	22	28	26	30				5
Chemical Oxygen Demand	mg/L	40.0	ND	4.3	< 2	< 2	2.8	< 2	< 2	< 2	40.0	2.4	2.7	< 2	< 2	3.7			2	16.6
Dissolved Oxygen	mg/L	14.7	8.2	11.2	13.2	12.8	14.7	12.8	8.6	10.2	9.3	8.2	9.5	9.5	12.2	12.9				2.1
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	0.52	0.23	0.36	0.38	0.38	0.35	0.34	0.40	0.48	0.31	0.23	0.26	0.36	0.52	0.33	10	10	0.1	0.08
Fluoride	mg/L	0.73	0.55	0.65	0.55	0.61	0.64	0.64	0.64	0.72	0.73	0.66	0.72	0.65	0.61	0.58	4		0.5	0.06
pH		7.40	7.00	7.23	7.19	7.19	7.25	7.16	7.17	7.00	7.36	7.40	7.32	7.26	7.18	7.23	6.5-8.5	6.5-8.5		0.11
Specific Conductance @ 25 °C.	µmhos	254	218	232	218	239	254	227	233	246	244	221	225	218	227	228				12
Temperature	°C	24.6	6.4	13.5	6.6	7.0	6.9	9.7	12.8	18.5	24.4	24.6	21.5	16.5	6.7	6.4				7.3

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	ND = Not detected above the reporting limit
Below detection limit	Blue text indicates value was less than the detection limit and is considered zero for calculation purposes.

Maximum	Minimum	Average	
6.4	5.6	5.9	GPG



Water: TAP
Year: 2019

Plant Name: **Springwells (SPW)**

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

Monthly Mineral Analyses Annual Averages

Sample Date:					01/15/2019	02/12/2019	03/05/2019	04/16/2019	05/14/2019	06/11/2019	07/16/2019	08/13/2019	09/10/2019	10/15/2019	11/12/2019	12/10/2019				
Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	3.40	0.03	0.51	0.08	1.90	0.09	0.13	3.40	0.09	0.07	0.15	0.05	0.12	0.03	0.03	0.3/95% (1)			1.05
Total Solids	mg/L	164	107	136	107	144	135	141	123	164	161	138	140	122	119	140		500	10	17
Total Dissolved Solids	mg/L	163	95	129	117	134	95	133	106	142	163	133	128	153	124	115		500	10	19
Aluminum	mg/L	0.160	0.007	0.070	AE	AE	AE	0.007	AE	0.027	0.160	0.122	0.080	0.066	0.058	0.041		0.05-0.2	0.005	0.050
Iron	mg/L	0.038	ND	0.014	0.036	0.031	0.030	< 0.005	0.038	0.027	< 0.005	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.3	0.005	0.005
Copper	mg/L	ND	ND	0.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.3 (AL)		0.002	
Magnesium	mg/L	9.28	6.70	8.20	8.63	8.20	8.18	8.40	6.70	8.50	8.00	7.75	7.75	7.70	9.28	9.28			0.5	0.71
Calcium	mg/L	30.5	27.5	28.7	27.5	28.5	28.6	28.2	27.6	29.8	29.3	28.1	29.0	28.9	28.9	30.5			0.1	0.9
Sodium	mg/L	10.68	4.68	5.90	6.45	10.68	6.24	5.33	4.68	6.37	5.80	5.30	5.20	4.70	4.90	5.09		20 (2)	0.1	1.63
Potassium	mg/L	1.25	0.90	1.00	1.25	0.97	1.02	1.01	0.96	1.07	0.94	0.97	0.98	0.97	0.98	0.90			0.1	0.09
Manganese	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002		0.05	0.002	
Lead	mg/L	ND	ND	0.000	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 (AL)		0.002	
Zinc	mg/L	ND	ND	0.00	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		5		0.1
Silica	mg/L	2.4	1.5	2.0	2.4	1.5	2.2	2.1	1.8	1.7	1.9	1.7	2.3	2.1	1.6	2.2			0.4	0.3
Sulfate	mg/L	27.6	21.3	24.6	25.9	23.7	25.5	23.4	22.1	24.0	21.3	24.4	24.7	25.2	26.8	27.6				1.8
Chloride	mg/L	18.3	9.7	11.6	11.5	18.3	10.9	10.9	10.4	16.0	11.1	10.9	9.7	9.7	9.9	10.1		250	5	2.7
Phosphorus	mg/L	1.22	ND	0.49	0.54	0.40	0.35	0.43	< 0.05	0.33	0.29	0.32	1.22	0.44	0.44	1.13			0.05	0.33
Free Carbon Dioxide	mg/L	11.2	5.2	8.4	11.2	8.2	6.4	7.8	10.2	5.2	7.5	8.2	7.2	9.1	9.9	9.5				1.7
Total Hardness (3), (4), (5)	mg/L	110	96	101	106	100	100	98	104	110	96	102	101	98	96	98				4
Total Alkalinity (3)	mg/L	75	64	70	66	75	70	74	72	74	70	70	72	64	67	70				3
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	75	64	70	66	75	70	74	72	74	70	70	72	64	67	70				3
Non-Carbonate Hardness (3)	mg/L	40	24	30	40	25	30	24	32	36	26	32	29	34	29	28				5
Chemical Oxygen Demand	mg/L	3.0	ND	0.6	< 2	< 2	< 2	< 2	2.4	< 2	< 2	< 2	< 2	2.2	< 2	3.0			2	0.5
Dissolved Oxygen	mg/L	15.4	8.5	11.9	13.5	14.0	15.4	13.1	13.1	10.4	9.4	8.5	10.3	9.9	12.4	13.1				2.1
Nitrite Nitrogen	mg/L	ND	ND	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1		0.1	
Nitrate Nitrogen	mg/L	0.52	0.23	0.36	0.36	0.39	0.31	0.36	0.39	0.48	0.30	0.23	0.27	0.37	0.52	0.32	10	10	0.1	0.08
Fluoride	mg/L	0.72	0.52	0.64	0.60	0.66	0.59	0.69	0.65	0.66	0.72	0.59	0.68	0.65	0.62	0.52	4		0.5	0.06
pH		7.45	7.07	7.23	7.07	7.26	7.34	7.28	7.15	7.45	7.27	7.23	7.30	7.15	7.13	7.17	6.5-8.5	6.5-8.5		0.11
Specific Conductance @ 25 °C.	µmhos	256	213	232	213	239	256	225	235	248	245	222	223	221	227	228				13
Temperature	°C	24.2	1.0	12.3	6.1	8.0	1.0	7.0	10.0	17.5	23.9	24.2	20.9	15.7	7.0	6.0				7.8

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)
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Maximum	Minimum	Average	
6.4	5.6	5.8	GPG



Water: TAP
Year: 2019

Plant Name: Detroit (WWP-SPW-NE-SW)

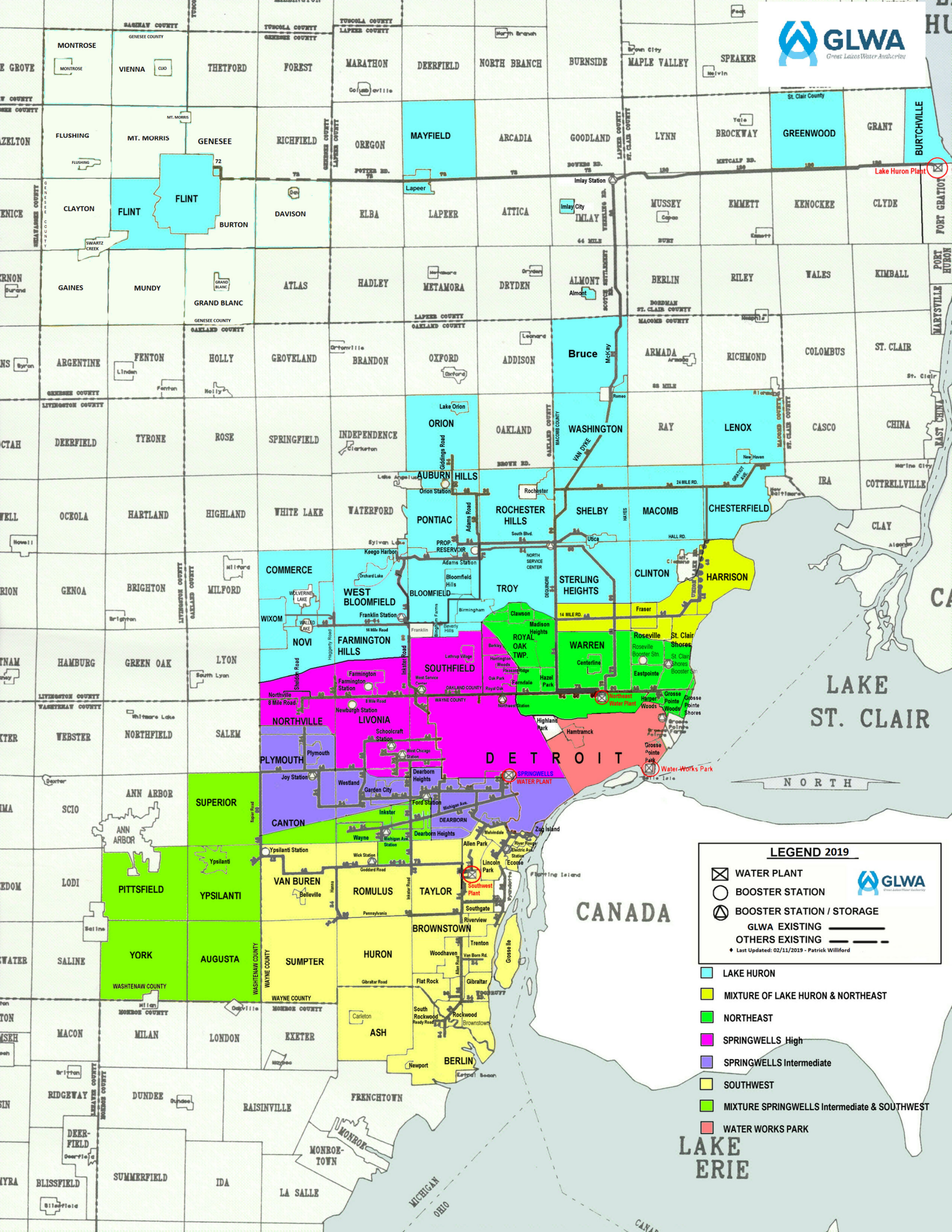
WATER OPERATING SERVICES
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Parameter	Units	Max.	Min.	Avg.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	MCL	Sec.Std	MDL	STDEV
Turbidity	N.T.U.	3.40	0.03	0.22	0.10	0.67	0.11	0.10	0.90	0.11	0.10	0.13	0.11	0.08	0.08	0.12	0.3/95% (1)			0.27
Total Solids	mg/L	179	74	138	135	137	129	144	125	162	152	140	150	121	124	137		500	10	12
Total Dissolved Solids	mg/L	193	13	125	115	114	112	138	107	135	157	129	133	144	125	89		500	10	18
Aluminum	mg/L	0.361	0.007	0.061	0.000	0.000	0.000	0.053	0.000	0.038	0.133	0.208	0.141	0.079	0.042	0.041		0.05-0.2	0.005	0.067
Iron	mg/L	0.140	0.014	0.015	0.030	0.030	0.026	0.000	0.037	0.023	0.000	0.035	0.000	0.000	0.000	0.000		0.3	0.005	0.016
Copper	mg/L	0.012	0.009	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	1.3 (AL)		0.002	0.001
Magnesium	mg/L	10.63	6.63	8.28	9.19	8.21	8.24	8.21	6.69	8.50	8.00	7.88	7.81	7.77	9.35	9.48			0.5	0.78
Calcium	mg/L	41.7	27.0	30.1	30.8	28.2	28.8	29.4	27.7	31.4	28.9	28.0	29.2	30.9	30.9	36.9			0.1	2.5
Sodium	mg/L	10.68	4.60	6.07	7.81	9.22	6.67	5.40	5.10	6.65	5.83	5.38	5.23	4.73	5.25	5.66		20 (2)	0.1	1.31
Potassium	mg/L	1.80	0.86	1.03	1.42	0.95	1.05	1.02	0.97	1.11	0.94	0.99	0.99	0.97	0.95	0.97			0.1	0.13
Manganese	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.05	0.002	0.000
Lead	mg/L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015 (AL)		0.002	0.000
Zinc	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5	0.1	0.00
Silica	mg/L	2.8	1.5	2.1	2.5	1.8	2.2	2.0	1.9	1.8	1.8	2.2	2.1	2.1	1.9	2.3			0.4	0.2
Sulfate	mg/L	33.4	18.0	24.2	28.2	23.5	24.1	25.3	23.1	23.9	22.8	21.2	23.2	22.3	26.3	26.6				2.0
Chloride	mg/L	21.3	8.9	11.9	14.6	15.7	11.7	10.5	10.8	17.9	11.1	10.8	9.4	9.5	9.7	10.6		250	5	2.7
Phosphorus	mg/L	1.44	0.23	0.49	0.40	0.39	0.36	0.38	0.29	0.35	0.31	0.30	1.10	0.41	0.39	1.17			0.05	0.31
Free Carbon Dioxide	mg/L	17.4	4.8	8.5	11.1	7.5	7.3	9.4	8.8	9.4	7.6	7.1	7.5	8.0	8.6	9.3				1.2
Total Hardness (3), (4), (5)	mg/L	145	90	103	117	101	103	103	107	112	98	102	101	97	98	101				6
Total Alkalinity (3)	mg/L	89	64	72	73	72	72	73	71	78	71	72	75	69	70	73				2
Carbonate Alkalinity (3)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
Bi-Carbonate Alkalinity (3)	mg/L	89	64	72	73	72	72	72	70	77	71	72	74	68	70	72				2
Non-Carbonate Hardness (3)	mg/L	56	20	31	44	29	31	31	37	34	27	30	27	29	28	28				5
Chemical Oxygen Demand	mg/L	40.0	2.0	2.3	2.2	0.5	2.4	0.0	1.1	0.6	10.0	1.8	1.9	1.8	0.9	4.0			2	2.7
Dissolved Oxygen	mg/L	17.2	8.2	11.8	13.7	14.1	15.4	13.2	11.5	10.4	9.7	8.9	9.8	9.9	12.3	13.2				2.1
Nitrite Nitrogen	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1		0.1	0.0
Nitrate Nitrogen	mg/L	1.60	0.21	0.41	0.68	0.39	0.40	0.38	0.42	0.61	0.33	0.23	0.28	0.36	0.51	0.38	10	10	0.1	0.13
Fluoride	mg/L	0.84	0.45	0.67	0.58	0.65	0.70	0.70	0.70	0.70	0.69	0.68	0.72	0.69	0.67	0.58	4		0.5	0.05
pH		7.49	7.00	7.24	7.15	7.29	7.30	7.19	7.21	7.25	7.27	7.31	7.30	7.24	7.21	7.23	6.5-8.5	6.5-8.5		0.05
Specific Conductance @ 25 °C.	µmhos	294	211	234	237	233	258	227	234	255	244	221	225	219	223	237				13
Temperature	°C	24.6	1.0	12.5	5.2	5.4	3.6	8.3	11.0	17.7	23.9	24.0	20.9	15.8	7.9	7.0				7.5

Legend	Notes:
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Sec.Std: Secondary Standard	(2) EPA Guidance Level
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Below detection limit	Blue text indicates value was less than the detection limit and is considered zero for calculation purposes.

Maximum	Minimum	Average	
8.4	5.2	6.0	GPG



LEGEND 2019

WATER PLANT
 BOOSTER STATION
 BOOSTER STATION / STORAGE
 GLWA EXISTING
 OTHERS EXISTING
 ♦ Last Updated: 02/11/2019 - Patrick Williford

- LAKE HURON
- MIXTURE OF LAKE HURON & NORTHEAST
- NORTHEAST
- SPRINGWELLS High
- SPRINGWELLS Intermediate
- SOUTHWEST
- MIXTURE SPRINGWELLS Intermediate & SOUTHWEST
- WATER WORKS PARK