

July, 2021 Update

Subject: PFOA and PFOS Investigation

The Marinette Water Utility has committed to continued sampling, once per quarter, of the public drinking water treatment system to gather more data involving the location and quantity of PFAS compounds throughout the drinking water treatment system. The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples from the public drinking water system have been taken on November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, September 30, 2020, December 30, 2020, March 30, 2021, and June 17, 2021 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, September 30, 2020, December 30, 2020, March 30, 2021, and June 17, 2021 samples.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]

Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]
Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]
Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.28 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	2-12-2020	[1.75]	1.52	[1.25]	1.03	[0.38]	[0.626]
Raw Drinking Water After Carbon Addition	2-12-2020	[1.67]	1.57	[1.27]	[0.864]	Non-Detectable	[0.49]
Finished Drinking Water at Drinking Water Plant	2-12-2020	[1.51]	[0.862]	[1.34]	[0.849]	Non-Detectable	[0.516]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.31 LOQ=1.0	PFOS (ppt) LOD=0.45 LOQ=1.5	PFHxA (ppt) LOD=0.41 LOQ=1.4	PFHpA (ppt) LOD=0.34 LOQ=1.1	PFNA (ppt) LOD=0.45 LOQ=1.5	PFHxS (ppt) LOD=0.53 LOQ=1.8
Raw Drinking Water from the Bay of Green Bay	5-13-2020	1.97	1.84	1.63	1.17	Non-Detectable	[0.68]
Raw Drinking Water After Carbon Addition	5-13-2020	1.90	1.79	1.71	1.15	Non-Detectable	[0.59]
Finished Drinking Water at Drinking	5-13-2020	1.57	[1.26]	[1.22]	[0.94]	Non-Detectable	[0.60]

Water Plant							
Raw Drinking Water from the Bay of Green Bay	9-30-2020	1.88	1.94	[1.34]	1.29	Non-Detectable	[0.69]
Raw Drinking Water After Carbon Addition	9-30-2020	2.14	1.86	[1.24]	1.25	Non-Detectable	[0.72]
Finished Drinking Water at Drinking Water Plant	9-30-2020	1.86	[0.77]	[1.21]	1.10	Non-Detectable	[0.70]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.26 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	12-30-2020	[1.55]	1.37	[1.33]	[0.84]	Non-Detectable	[0.48]
Raw Drinking Water After Carbon Addition	12-30-2020	[1.52]	1.24	[1.42]	[0.88]	Non-Detectable	[0.47]
Finished Drinking Water at Drinking Water Plant	12-30-2020	[1.42]	[0.78]	1.89	1.05	Non-Detectable	[0.46]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.70 LOQ=2.30	PFHxA (ppt) LOD=1.10 LOQ=3.60	PFHpA (ppt) LOD=0.74 LOQ=2.50	PFNA (ppt) LOD=0.87 LOQ=2.90	PFHxS (ppt) LOD=0.82 LOQ=2.70
Raw Drinking Water from the Bay of Green Bay	3-30-2021	[1.16]	[1.11]	Non-Detectable	[0.83]	Non-Detectable	Non-Detectable
Raw Drinking Water After Carbon Addition	3-30-2021	[1.07]	[1.02]	Non-Detectable	Non-Detectable	Non-Detectable	Non-Detectable
Finished Drinking Water at Drinking Water Plant	3-30-2021	[1.32]	[0.85]	Non-Detectable	[0.74]	Non-Detectable	Non-Detectable
Raw Drinking Water from the Bay of Green Bay	6-17-2021	[1.92]	[1.89]	Non-Detectable	[1.18]	Non-Detectable	[0.89]
Raw Drinking Water After Carbon Addition	6-17-2021	[2.00]	[1.76]	[1.41]	[1.08]	Non-Detectable	[0.87]
Finished Drinking Water at Drinking Water Plant	6-17-2021	[1.96]	[1.32]	[1.25]	[1.27]	Non-Detectable	[0.91]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

April, 2021 Update

Subject: PFOA and PFOS Investigation

The Marinette Water Utility has committed to continued sampling, once per quarter, of the public drinking water treatment system to gather more data involving the location and quantity of PFAS compounds throughout the drinking water treatment system. The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples from the public drinking water system have been taken on November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, September 30, 2020, December 30, 2020, and March 30, 2021 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, September 30, 2020, December 30, 2020, and 3-30-2021 samples.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
-----------------	-------------	----------------------------------	----------------------------------	-----------------------------------	------------------------------------

Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]
Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
-----------------	-------------	----------------------------------	----------------------------------	-----------------------------------	------------------------------------

Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]
Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.28 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	2-12-2020	[1.75]	1.52	[1.25]	1.03	[0.38]	[0.626]
Raw Drinking Water After Carbon Addition	2-12-2020	[1.67]	1.57	[1.27]	[0.864]	Non-Detectable	[0.49]
Finished Drinking Water at Drinking Water Plant	2-12-2020	[1.51]	[0.862]	[1.34]	[0.849]	Non-Detectable	[0.516]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.31 LOQ=1.0	PFOS (ppt) LOD=0.45 LOQ=1.5	PFHxA (ppt) LOD=0.41 LOQ=1.4	PFHpA (ppt) LOD=0.34 LOQ=1.1	PFNA (ppt) LOD=0.45 LOQ=1.5	PFHxS (ppt) LOD=0.53 LOQ=1.8
Raw Drinking Water from the Bay of Green Bay	5-13-2020	1.97	1.84	1.63	1.17	Non-Detectable	[0.68]
Raw Drinking Water After Carbon Addition	5-13-2020	1.90	1.79	1.71	1.15	Non-Detectable	[0.59]
Finished Drinking Water at Drinking Water Plant	5-13-2020	1.57	[1.26]	[1.22]	[0.94]	Non-Detectable	[0.60]
Raw Drinking Water from the Bay of Green Bay	9-30-2020	1.88	1.94	[1.34]	1.29	Non-Detectable	[0.69]
Raw Drinking Water After Carbon Addition	9-30-2020	2.14	1.86	[1.24]	1.25	Non-Detectable	[0.72]
Finished Drinking Water at Drinking Water Plant	9-30-2020	1.86	[0.77]	[1.21]	1.10	Non-Detectable	[0.70]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.26 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	12-30-2020	[1.55]	1.37	[1.33]	[0.84]	Non-Detectable	[0.48]
Raw Drinking Water After Carbon Addition	12-30-2020	[1.52]	1.24	[1.42]	[0.88]	Non-Detectable	[0.47]
Finished Drinking Water at Drinking Water Plant	12-30-2020	[1.42]	[0.78]	1.89	1.05	Non-Detectable	[0.46]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.70 LOQ=2.30	PFHxA (ppt) LOD=1.10 LOQ=3.60	PFHpA (ppt) LOD=0.74 LOQ=2.50	PFNA (ppt) LOD=0.87 LOQ=2.90	PFHxS (ppt) LOD=0.82 LOQ=2.70
Raw Drinking Water from the Bay of Green Bay	3-30-2021	[1.16]	[1.11]	Non-Detectable	[0.83]	Non-Detectable	Non-Detectable
Raw Drinking Water After Carbon Addition	3-30-2021	[1.07]	[1.02]	Non-Detectable	Non-Detectable	Non-Detectable	Non-Detectable
Finished Drinking Water at	3-30-2021	[1.32]	[0.85]	Non-Detectable	[0.74]	Non-Detectable	Non-Detectable

Drinking Water Plant							
-----------------------------	--	--	--	--	--	--	--

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

January, 2021 Update

Subject: PFOA and PFOS Investigation

The Marinette Water Utility has committed to continued sampling, once per quarter, of the public drinking water treatment system to gather more data involving the location and quantity of PFAS compounds throughout the drinking water treatment system. The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples from the public drinking water system have been taken on November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, September 30, 2020, and December 30, 2020 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, September 30, 2020, and December 30, 2020 samples.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]
Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
-----------------	-------------	----------------------------------	----------------------------------	-----------------------------------	------------------------------------

Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]
Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.28 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	2-12-2020	[1.75]	1.52	[1.25]	1.03	[0.38]	[0.626]
Raw Drinking Water After Carbon Addition	2-12-2020	[1.67]	1.57	[1.27]	[0.864]	Non-Detectable	[0.49]
Finished Drinking Water at Drinking Water Plant	2-12-2020	[1.51]	[0.862]	[1.34]	[0.849]	Non-Detectable	[0.516]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.31 LOQ=1.0	PFOS (ppt) LOD=0.45 LOQ=1.5	PFHxA (ppt) LOD=0.41 LOQ=1.4	PFHpA (ppt) LOD=0.34 LOQ=1.1	PFNA (ppt) LOD=0.45 LOQ=1.5	PFHxS (ppt) LOD=0.53 LOQ=1.8
Raw Drinking Water from the Bay of Green Bay	5-13-2020	1.97	1.84	1.63	1.17	Non-Detectable	[0.68]
Raw Drinking Water After Carbon Addition	5-13-2020	1.90	1.79	1.71	1.15	Non-Detectable	[0.59]
Finished Drinking Water at Drinking Water Plant	5-13-2020	1.57	[1.26]	[1.22]	[0.94]	Non-Detectable	[0.60]
Raw Drinking Water from the Bay of Green Bay	9-30-2020	1.88	1.94	[1.34]	1.29	Non-Detectable	[0.69]
Raw Drinking Water After Carbon Addition	9-30-2020	2.14	1.86	[1.24]	1.25	Non-Detectable	[0.72]
Finished Drinking Water at Drinking Water Plant	9-30-2020	1.86	[0.77]	[1.21]	1.10	Non-Detectable	[0.70]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.26 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	12-30-2020	[1.55]	1.37	[1.33]	[0.84]	Non-Detectable	[0.48]
Raw Drinking Water After Carbon Addition	12-30-2020	[1.52]	1.24	[1.42]	[0.88]	Non-Detectable	[0.47]
Finished Drinking Water at Drinking Water Plant	12-30-2020	[1.42]	[0.78]	1.89	1.05	Non-Detectable	[0.46]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

October, 2020 Update

Subject: PFOA and PFOS Investigation

The Marinette Water Utility has committed to continued sampling, once per quarter, of the public drinking water treatment system to gather more data involving the location and quantity of PFAS compounds throughout the drinking water treatment system. The current plan is to sample in the months of February, May, September, and November of 2020. The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples from the public drinking water system have been taken on November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, and September 30, 2020 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, May 13, 2020, and September 30, 2020 samples.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]

Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]
Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.28 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	2-12-2020	[1.75]	1.52	[1.25]	1.03	[0.38]	[0.626]
Raw Drinking Water After Carbon Addition	2-12-2020	[1.67]	1.57	[1.27]	[0.864]	Non-Detectable	[0.49]
Finished Drinking	2-12-2020	[1.51]	[0.862]	[1.34]	[0.849]	Non-Detectable	[0.516]

Water at Drinking Water Plant							
--------------------------------------	--	--	--	--	--	--	--

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.31 LOQ=1.0	PFOS (ppt) LOD=0.45 LOQ=1.5	PFHxA (ppt) LOD=0.41 LOQ=1.4	PFHpA (ppt) LOD=0.34 LOQ=1.1	PFNA (ppt) LOD=0.45 LOQ=1.5	PFHxS (ppt) LOD=0.53 LOQ=1.8
Raw Drinking Water from the Bay of Green Bay	5-13-2020	1.97	1.84	1.63	1.17	Non-Detectable	[0.68]
Raw Drinking Water After Carbon Addition	5-13-2020	1.90	1.79	1.71	1.15	Non-Detectable	[0.59]
Finished Drinking Water at Drinking Water Plant	5-13-2020	1.57	[1.26]	[1.22]	[0.94]	Non-Detectable	[0.60]
Raw Drinking Water from the Bay of Green Bay	9-30-2020	1.88	1.94	[1.34]	1.29	Non-Detectable	[0.69]
Raw Drinking Water After Carbon Addition	9-30-2020	2.14	1.86	[1.24]	1.25	Non-Detectable	[0.72]
Finished Drinking Water at Drinking	9-30-2020	1.86	[0.77]	[1.21]	1.10	Non-Detectable	[0.70]

Water Plant							
--------------------	--	--	--	--	--	--	--

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

July, 2020 Update

Subject: PFOA and PFOS Investigation

As part of the ongoing investigation of PFOA and PFOS contamination in the City of Marinette Sanitary Sewer System, Wastewater Utility Staff collected samples directly from industries, designated collection system manhole locations, and Wastewater Treatment Plant Influent and Effluent previously sampled in this PFOA and PFOS investigation. The results of the investigative sampling are listed in the tables below.

Wastewater Analysis:

Industrial Sewer Sampling

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Tyco/JCI Industrial Parkway South Wastewater	12-6-2018	253	3670
Tyco/JCI Stanton Street Wastewater	12-6-2018	116	7.1
ChemDesign Wastewater	12-6-2018	1120	48.3
Tyco/JCI Industrial Parkway South Wastewater	1-29-2020	28.4	71.8
Tyco/JCI Stanton Street Wastewater	1-29-2020	34	3.91
ChemDesign Wastewater	1-29-2020	1980	50.7
Tyco/JCI Industrial Parkway South Wastewater	6-18-2020	20	18
Tyco/JCI Stanton Street Wastewater	6-18-2020	14	2.6
ChemDesign Wastewater	6-18-2020	3700	<46

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Treatment Plant Influent and Effluent Sampling

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Wastewater Influent	11-20-2017	34.3	9.28
Wastewater Effluent	11-20-2017	38.2	42.8
Wastewater Influent	5-14-2018	43.5	25.4
Wastewater Effluent	5-14-2018	50.3	13.3
Wastewater Influent	10-30-2019	28	[3.8]
Wastewater Effluent	10-30-2019	37	5.4
Wastewater Influent	6-18-2020	28	8.4
Wastewater Effluent	6-18-2020	38	9.3

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Designated Manhole Sampling

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Manhole #428	7-9-2018	9.92	Non-Detectable
Manhole #346A	7-9-2018	41.5	Non-Detectable
Manhole #433	7-9-2018	38.2	211
Manhole # 700A	7-9-2018	10.3	Non Detectable
Manhole #001A	7-9-2018	178	Non-Detectable
Manhole #428	6-18-2020	13	8.0
Manhole #346A	6-18-2020	86	13
Manhole #433	6-18-2020	8.5	4.9
Manhole # 700A	6-18-2020	14	6.7
Manhole #001A	6-18-2020	31	9.1

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

June, 2020 Update

Subject: PFOA and PFOS Investigation

The Marinette Water Utility has committed to continued sampling, once per quarter, of the public drinking water treatment system to gather more data involving the location and quantity of PFAS compounds throughout the drinking water treatment system. The current plan is to sample in the months of February, May, September, and November of 2020. The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples from the public drinking water system have been taken on November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, February 12, 2020, and May 13, 2020 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019 samples, February 12, 2020, and May 13, 2020.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]

Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]
Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.28 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	2-12-2020	[1.75]	1.52	[1.25]	1.03	[0.38]	[0.626]
Raw Drinking Water After Carbon Addition	2-12-2020	[1.67]	1.57	[1.27]	[0.864]	Non-Detectable	[0.49]
Finished Drinking	2-12-2020	[1.51]	[0.862]	[1.34]	[0.849]	Non-Detectable	[0.516]

Water at Drinking Water Plant							
--------------------------------------	--	--	--	--	--	--	--

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

Sample Location	Sample Date	PFOA (ppt) LOD=0.31 LOQ=1.0	PFOS (ppt) LOD=0.45 LOQ=1.5	PFHxA (ppt) LOD=0.41 LOQ=1.4	PFHpA (ppt) LOD=0.34 LOQ=1.1	PFNA (ppt) LOD=0.45 LOQ=1.5	PFHxS (ppt) LOD=0.53 LOQ=1.8
Raw Drinking Water from the Bay of Green Bay	5-13-2020	1.97	1.84	1.63	1.17	Non-Detectable	[0.68]
Raw Drinking Water After Carbon Addition	5-13-2020	1.90	1.79	1.71	1.15	Non-Detectable	[0.59]
Finished Drinking Water at Drinking Water Plant	5-13-2020	1.57	[1.26]	[1.22]	[0.94]	Non-Detectable	[0.60]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

May, 2020 Update

Subject: PFOA and PFOS Investigation

As part of the ongoing investigation of PFOA and PFOS contamination in the City of Marinette Sanitary Sewer System, Wastewater Utility Staff collected samples directly from industries previously sampled in this PFOA and PFOS investigation. The industries sampled were Tyco/JCI on Industrial Parkway South, Tyco/JCI on Stanton Street, and ChemDesign Products Incorporated. The results of the investigative sampling are listed in the table below.

Wastewater Analysis:

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Tyco/JCI Industrial Parkway South Wastewater	12-6-2018	253	3670
Tyco/JCI Stanton Street Wastewater	12-6-2018	116	7.1
ChemDesign Wastewater	12-6-2018	1120	48.3
Tyco/JCI Industrial Parkway South Wastewater	1-29-2020	28.4	71.8
Tyco/JCI Stanton Street Wastewater	1-29-2020	34	3.91
ChemDesign Wastewater	1-29-2020	1980	50.7

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Due to continued presence of PFOA and PFOS in the sanitary wastewater being transported to the treatment facility, samples of current biosolids being stored after conventional anaerobic digestion sludge treatment have been analyzed. The stored post-conventional anaerobic digestion sludge treatment sample is from a collection of all biosolids processed upon completion of cleaning out the storage tank of the heavily PFAS contaminated biosolids in the fall of 2019 (Biosolids Holding Tank). Also, primary clarifier raw biosolids processed through a dewatering treatment technology and a subsequent biosolids drying technology were sampled to further understand the treatment capability of those primary clarifier raw biosolids with regards to the transport of PFOA and PFOS through the different technologies.

To verify the validity of results the utility chose to send samples of the Primary-Dewatered and Primary-Dried biosolids to two separate laboratories for analytical comparisons.

- (1) = Wisconsin State Laboratory of Hygiene
- (2) = Eurofins TestAmerica Laboratories, Inc.

Biosolids Analysis:

Sample Location	Sample Date	PFOA (ug/Kg)	PFOS (ug/Kg)
Biosolids Holding Tank	5-23-2018	10	210
Biosolids Holding Tank	2-13-2020	5.3	30
Primary - Dewatered Biosolids (1)	2-13-2020	1.64	5.99

Primary - Dewatered Biosolids (2)	2-13-2020	2.2	8.0
Primary - Dried Biosolids (1)	2-25-2020	1.45	4.48
Primary - Dried Biosolids (2)	2-25-2020	2.0	6.3

Note: Not included in this report are the results for other PFAS compounds that we had analyzed that do not have a health advisory limit set forth by any regulatory agency. These results were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

February, 2020 Update
Subject: PFOA and PFOS Investigation

The Marinette Water Utility has committed to continued sampling, once per quarter, of the public drinking water treatment system to gather more data involving the location and quantity of PFAS compounds throughout the drinking water treatment system. The current plan is to sample in the months of February, May, September, and November of 2020. The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples from the public drinking water system have been taken on November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019, and February 12, 2020 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the November 20, 2017, December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, October 8, 2019 samples, and February 12, 2020.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA’s assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:
(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]

Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]
Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]

Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

Sample Location	Sample Date	PFOA (ppt) LOD=0.66 LOQ=2.2	PFOS (ppt) LOD=0.28 LOQ=0.87	PFHxA (ppt) LOD=0.54 LOQ=1.8	PFHpA (ppt) LOD=0.27 LOQ=0.89	PFNA (ppt) LOD=0.37 LOQ=1.2	PFHxS (ppt) LOD=0.28 LOQ=0.93
Raw Drinking Water from the Bay of Green Bay	2-12-2020	[1.75]	1.52	[1.25]	1.03	[0.38]	[0.626]
Raw Drinking Water After Carbon Addition	2-12-2020	[1.67]	1.57	[1.27]	[0.864]	Non-Detectable	[0.49]
Finished Drinking Water at Drinking Water Plant	2-12-2020	[1.51]	[0.862]	[1.34]	[0.849]	Non-Detectable	[0.516]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 12 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 12 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

As shown by the table above, some compounds previously not-detected are now detected and quantified in this table due to lower LOD and LOQ values. This happens due to test method development and refinement at the contracted laboratory and is normal for emerging contaminants.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

January, 2020 Update
Subject: PFOA and PFOS Investigation

As part of the ongoing investigation of PFOA and PFOS contamination in the City of Marinette Sanitary Sewer System, Marinette Water and Wastewater Utility staff collected samples of influent and effluent wastewater at the City Wastewater Treatment Facility on October 30, 2019. Listed below are all sample results taken from the City of Marinette Wastewater treatment facility's influent and effluent.

Wastewater Analysis:

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Wastewater Influent	11-20-2017	34.3	9.28
Wastewater Effluent	11-20-2017	38.2	42.8
Wastewater Influent	5-14-2018	43.5	25.4
Wastewater Effluent	5-14-2018	50.3	13.3
Wastewater Influent	10-30-2019	28	[3.8]
Wastewater Effluent	10-30-2019	37	5.4

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

November, 2019 Update
Subject: PFOA and PFOS Investigation

At the November 2018 Water Commission meeting, additional sampling was approved by the Water Commission at intervals determined by the Water Commission for PFOA and PFOS. The intervals approved are as follows: Sample PFOA and PFOS once per month for two months immediately following the November Commission meeting (December 2018 and January 2019), followed by quarterly PFOA and PFOS samples for the 2019 calendar year (April 2019, July 2019, October 2019). The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples have been taken on December 4, 2018 and January 3, 2019, April 15, 2019, July 1, 2019, and October 8, 2019 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the December 4, 2018, January 3, 2019, April 15, 2019, July 1, 2019, and October 8, 2019 samples.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]
Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]

Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

Sample Location	Sample Date	PFOA (ppt) LOD=1.6 LOQ=5.3	PFOS (ppt) LOD=2.7 LOQ=9.1	PFHxA (ppt) LOD=1.3 LOQ=4.3	PFHpA (ppt) LOD=0.57 LOQ=1.9
Raw Drinking Water from the Bay of Green Bay	10-8-2019	[2.44]	Non-Detectable	[1.87]	[1.02]
Raw Drinking Water After Carbon Addition	10-8-2019	[1.94]	Non-Detectable	[1.48]	[0.96]
Finished Drinking Water at Drinking Water Plant	10-8-2019	[1.93]	Non-Detectable	[1.56]	[1.19]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

July, 2019 Update

Subject: PFOA and PFOS Investigation

At the November 2018 Water Commission meeting, additional sampling was approved by the Water Commission at intervals determined by the Water Commission for PFOA and PFOS. The intervals approved are as follows: Sample PFOA and PFOS once per month for two months immediately following the November Commission meeting (December 2018 and January 2019), followed by quarterly PFOA and PFOS samples for the 2019 calendar year (April 2019, July 2019, October 2019). The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples have been taken on December 4, 2018 and January 3, 2019, April 15, 2019, and July 1, 2019 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the December 4, 2018, January 3, 2019, April 15, 2019, and July 1, 2019 samples.

The next drinking water samples taken for PFOA and PFOS analysis will be in October 2019.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:
(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]

Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	7-1-2019	[1.77]	[2.06]	[1.64]	[0.93]
Raw Drinking Water After Carbon Addition	7-1-2019	[1.48]	[1.72]	[1.81]	[0.97]
Finished Drinking Water at Drinking Water Plant	7-1-2019	[1.73]	Non-Detectable	[1.98]	[1.12]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

April, 2019 Update

Subject: PFOA and PFOS Investigation

At the November 2018 Water Commission meeting, additional sampling was approved by the Water Commission at intervals determined by the Water Commission for PFOA and PFOS. The intervals approved are as follows: Sample PFOA and PFOS once per month for two months immediately following the November Commission meeting (December 2018 and January 2019), followed by quarterly PFOA and PFOS samples for the 2019 calendar year (April 2019, July 2019, October 2019). The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples have been taken on December 4, 2018 and January 3, 2019, and April 15, 2019 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the December 4, 2018, January 3, 2019, and April 15, 2019 samples.

The next drinking water samples taken for PFOA and PFOS analysis will be in July 2019.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Through conversations with the Wisconsin DNR and the City of Marinette Water and Wastewater staff, it has been decided to include ALL detected PFAS compounds in the drinking water being distributed to the public. Results in the table below have been updated to show all PFAS compounds detected in the drinking water samples collected and analyzed.

Drinking Water Analysis:

(Bolded results indicate water distributed for human consumption)

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3	PFHxA (ppt) LOD=1.3 LOQ=4.0	PFHpA (ppt) LOD=0.80 LOQ=2.6
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]	[2.04]	[1.04]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable	[2.34]	[1.03]
High School	11-20-2017	[1.81]	Non-Detectable	[3.13]	[1.05]
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable	4.11	[1.07]
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94	[1.8]	[1.09]
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]	[1.78]	[1.01]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]	[1.66]	[1.14]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable	[1.61]	[0.89]
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]	[1.67]	[0.82]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable	Non-Detectable	[0.86]
Raw Drinking Water from the Bay of Green Bay	4-15-2019	[1.93]	[1.96]	[1.36]	[0.99]
Raw Drinking Water After Carbon Addition	4-15-2019	[1.3]	[2.03]	[1.34]	[1.01]
Finished Drinking Water at Drinking Water Plant	4-15-2019	[1.68]	Non-Detectable	Non-Detectable	[0.86]

LOD= Limit of Detection: As low as the instrument can detect.

LOQ= Limit of Quantitation: As low as the instrument can detect with 100% certainty.

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for 8 other PFAS compounds that we had analyzed that have not been detected in ANY drinking water sample taken. These results for the 8 other compounds were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

February, 2019 Update

Subject: PFOA and PFOS Investigation

At the November 2018 Water Commission meeting, additional sampling was approved by the Water Commission at intervals determined by the Water Commission for PFOA and PFOS. The intervals approved are as follows: Sample PFOA and PFOS once per month for two months immediately following the November Commission meeting (December 2018 and January 2019), followed by quarterly PFOA and PFOS samples for the 2019 calendar year (April 2019, July 2019, October 2019). The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples have been taken on December 4, 2018 and January 3, 2019 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the December 4, 2018 and January 3, 2019 samples.

The next drinking water samples taken for PFOA and PFOS analysis will be in April 2019.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

Drinking Water Analysis:

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]
Raw Drinking Water from the Bay of Green Bay	1-3-2019	[1.87]	Non-Detectable
Raw Drinking Water After Carbon Addition	1-3-2019	[2.06]	[1.95]
Finished Drinking Water at Drinking Water Plant	1-3-2019	[2.10]	Non-Detectable

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for other PFAS compounds that we had analyzed that do not have a health advisory limit set forth by any regulatory agency. These results were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

January, 2019 Update

Subject: PFOA and PFOS Investigation

At the November 2018 Water Commission meeting, additional sampling was approved by the Water Commission at intervals determined by the Water Commission for PFOA and PFOS. The intervals approved are as follows: Sample PFOA and PFOS once per month for two months immediately following the November Commission meeting (December 2018 and January 2019), followed by quarterly PFOA and PFOS samples for the 2019 calendar year (April 2019, July 2019, October 2019). The locations of sampling are the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. Samples have been taken on December 4, 2018 and January 3, 2019 by Marinette Water and Wastewater Utility staff. Results are listed in the table below for the December 4, 2018 sample. Results have not been generated for the January 3, 2019 sample due to analysis time; the utility will update when results are available.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

As part of the ongoing investigation of the transport of the contaminants through Marinette's wastewater collection and treatment system, Wastewater Utility Staff collected samples directly from industries where previous manhole sampling, done on 7-9-2018, showed elevated results in the wastewater collection system areas. The industries sampled were Tyco/JCI on Industrial Parkway South, Tyco/JCI on Stanton Street, and ChemDesign Products Incorporated. The results of the investigative sampling are listed in the table below.

Drinking Water Analysis:

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3
Raw Drinking Water from the Bay of Green Bay	12-4-2018	[3.54]	5.94
Raw Drinking Water After Carbon Addition	12-4-2018	[2.69]	[3.14]
Finished Drinking Water at Drinking Water Plant	12-4-2018	[2.08]	[1.95]

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Wastewater Analysis:

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Tyco/JCI Industrial Parkway South Wastewater	12-6-2018	253	3670
Tyco/JCI Stanton Street Wastewater	12-6-2018	116	7.1
ChemDesign Wastewater	12-6-2018	1120	48.3

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Note: Not included in this report are the results for other PFAS compounds that we had analyzed that do not have a health advisory limit set forth by any regulatory agency. These results were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.

November, 2018

Subject: PFOA and PFOS Investigation

Over the past year the Marinette Water and Wastewater Utility staffs have been undertaking sampling and testing measures to understand the extent and impact of PFOA and PFOS contamination in our community as it pertains to both our municipal water and municipal wastewater. The City of Marinette officials gave the directive to initiate sampling of the public drinking water system at multiple locations, the wastewater collection and treatment systems at multiple locations, and all private drinking water wells located in the city limits.

In regards to the drinking water sampling frequency, we have sampled only once due to the results either being between the limit of detection and limit of quantification, and in some cases non-detectable. In response to public concerns and questions from city officials, our intention is to discuss at our November 2018 Water Commission meeting additional sampling approval from the Water Commission at intervals determined by the Water Commission for PFOA and PFOS. The locations of sampling would be the Bay of Green Bay water to be treated, raw drinking water after powder activated carbon addition, and finished drinking water being distributed to the public. If the additional sampling indicates continued low concentration results, the frequency of sampling could be decreased as determined by the Water Commission.

City officials requested that the Marinette Water Utility staff sample private drinking water wells located in the City of Marinette, which TYCO/JCI did not sample, for PFOA and PFOS. The results for this sampling are also listed in this report.

In 2016 the EPA announced the release of health advisory levels for the PFAS compounds PFOA and PFOS in **DRINKING WATER**. The health advisory level set forth by the EPA identified the concentration of PFOA and PFOS in drinking water at or below which adverse health effects are not anticipated to occur over a lifetime of exposure. The Health advisory level is 70 parts per trillion for

PFOA and PFOS. Health advisory levels are non-regulatory and reflect the EPA's assessment of the best available peer reviewed science.

After reporting our findings from Wastewater Influent and Effluent sampling to the Wisconsin DNR a request was made from them to also sample the wastewater biosolids. When the results from the 5-23-2018 biosolids sampling were submitted to the DNR, they had inquired if we had the storage capacity to hold our biosolids until they had more time to investigate appropriate biosolids spreading guidance. We had informed them that we did have the capacity to hold biosolids for up to November of 2019. On 9-10-2018 the Wisconsin DNR made a formal request for Marinette to hold our biosolids for this year (2018).

What we have found has been both interesting and informative and the results are outlined in the tables below.

Drinking Water Analysis:

Sample Location	Sample Date	PFOA (ppt) LOD=1.2 LOQ=3.9	PFOS (ppt) LOD=1.7 LOQ=5.3
Raw Drinking Water at Drinking Water Plant	11-20-2017	[2.11]	[1.87]
Finished Water at Drinking Water Plant	11-20-2017	[1.79]	Non Detectable
High School	11-20-2017	[1.81]	Non-Detectable
Hydrant Next to New REC Center	11-20-2017	[1.75]	Non Detectable

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Private Drinking Water Well Analysis:

Sample Location	Sample Date	PFOA (ppt) LOD=0.70 LOQ=2.2	PFOS (ppt) LOD=1.5 LOQ=4.7
2907 Taylor Street	6-14-2018	3.44	Non-Detectable
4030 Hall Ave	6-14-2018	Non-Detectable	Non-Detectable
2017 Marinette Ave	6-14-2018	3.64	Non-Detectable
2025 Marinette Ave	6-14-2018	Non-Detectable	Non-Detectable
2033 Marinette Ave	6-14-2018	Non-Detectable	Non-Detectable
4161 Frontage Road	7-27-2018	[2.35]	Non-Detectable

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Wastewater Analysis:

Sample Location	Sample Date	PFOA (ppt)	PFOS (ppt)
Wastewater Influent	11-20-2017	34.3	9.28

Wastewater Effluent	11-20-2017	38.2	42.8
Wastewater Influent	5-14-2018	43.5	25.4
Wastewater Effluent	5-14-2018	50.3	13.3
Manhole #428	7-9-2018	9.92	Non-Detectable
Manhole #346A	7-9-2018	41.5	Non-Detectable
Manhole #433	7-9-2018	38.2	211
Manhole # 700A	7-9-2018	10.3	Non Detectable
Manhole #001A	7-9-2018	178	Non-Detectable

ppt = parts per trillion or nanograms per liter (ng/L)

Non-Detectable = Substance was not found above laboratory limit of detection

[] = Substance was found between laboratory limit of detection and limit of quantification

Biosolids Analysis:

Sample Location	Sample Date	PFOA (ug/Kg)	PFOS (ug/Kg)
Biosolids Holding Tank	5-23-2018	10	210
Biosolids Holding Tank	9-25-2018	Results Pending	Results Pending

Note: Not included in this report are the results for other PFAS compounds that we had analyzed that do not have a health advisory limit set forth by any regulatory agency. These results were included in the test method run at the contracted laboratory in conjunction with the PFOA and PFOS and can be obtained upon request.

For more information regarding PFAS in the environment please visit <https://www.epa.gov/pfas>.