Year 16
Water Quality Monitoring & Assessment Program

Water Quality Testing Report
for Sampling Conducted on
June 21, 2018

Prepared for:

Village of Mount Prospect
Cook County, IL

Manhard CONSULTING

Contents

List of Figures

Tables

List of Appendices

I. Introduction

Executive Summary

The Village of Mount Prospect developed this Water Quality Monitoring & Assessment Program as required by the Illinois Environmental Protection Agency (IEPA) under the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program. The NPDES MS4 permit program regulates the discharge of storm water from MS4s based on amendments to the Clean Water Act in 1987 and the subsequent 1990 and 1999 regulations by the United States Environmental Protection Agency (USEPA). In Illinois, the USEPA delegated administration of the federal NDPES MS4 permit program to the IEPA. Under the NPDES MS4 permit program, all MS4s partially or fully in urbanized areas based on the 2000 census are required to obtain storm water permits for their discharges into receiving waters.

On December 20, 1999, the IEPA issued a General NPDES Storm Water Permit for all MS4s (ILR40 permit). The IEPA reissued the ILR40 permit on February 20, 2012 and again on February 10, 2016. In the 2016 permit, a new requirement was included in the ILR40 permit for water quality monitoring and assessment. The Village started water quality testing in 2012 under the previous permit.

This document describes the Water Quality Monitoring & Assessment Program that is implemented by the Village of Mount Prospect to evaluate the effectiveness of Best Management Practices (BMPs) implemented by the Village to reduce pollutant loadings and water quality impacts. This is accomplished through annual water quality testing of receiving waters upstream and downstream of the Village.

Permit Coverage

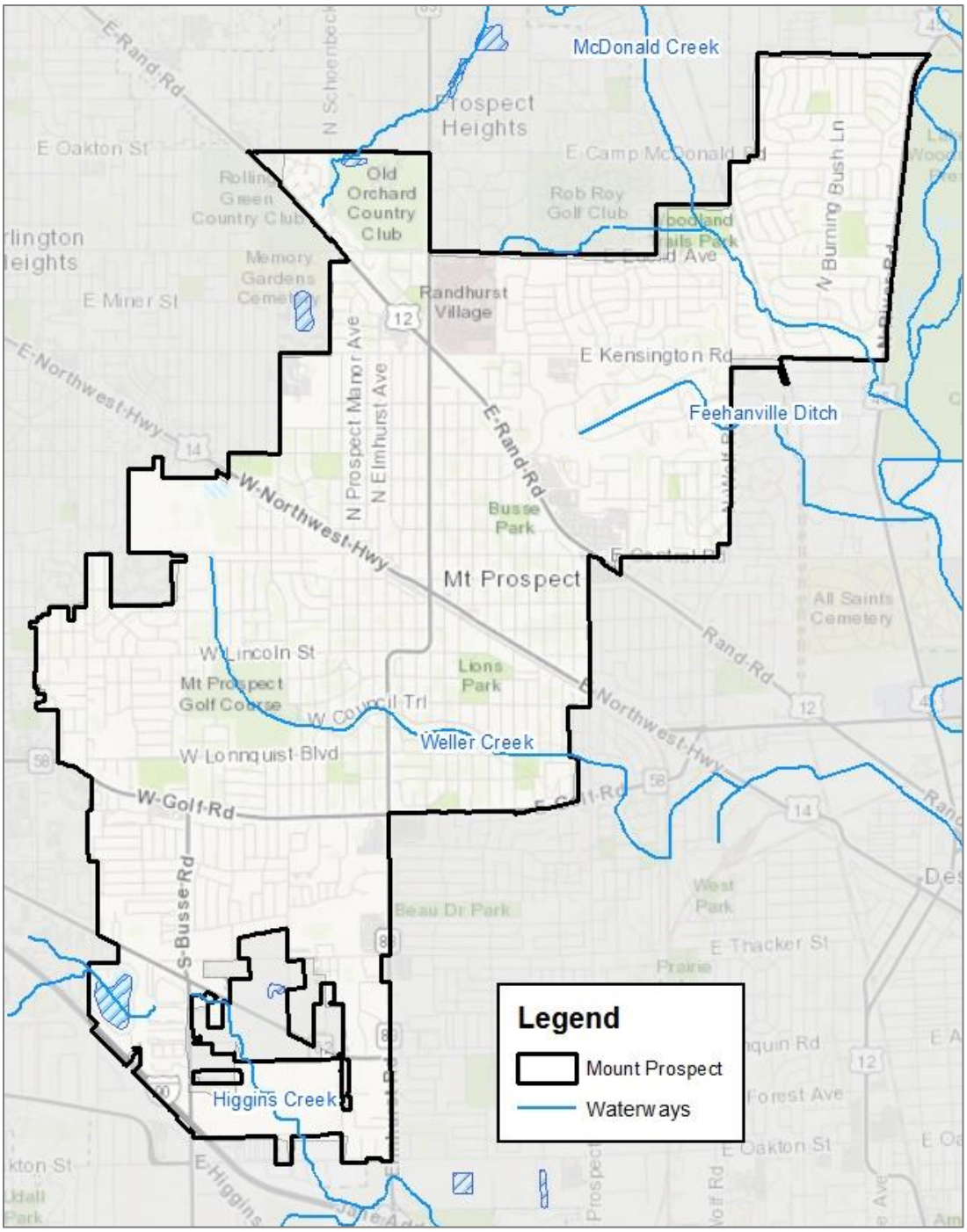
As previously noted, the ILR40 permit authorizes the discharge of storm water from MS4s into receiving waters. Storm water is defined in the ILR40 permit as “storm water runoff, snow melt runoff, and surface runoff and drainage”. MS4s contain a conveyance or system of conveyances that are: owned by a state, Village, town, or other public entity that discharges storm water to waters of the U.S.; designed or used to collect or convey storm water (e.g., storm drains, pipes, ditches); not a combined sewer; and not part of a sewage treatment plant, or publicly owned treatment works. Regulated conveyance systems typically include roadway drainage systems, storm sewers, catch basins, gutters, ditches, swales, manmade channels, and storm sewers.

Receiving Waters

A receiving water is a natural or man-made system into which storm water is discharged, including major rivers such as the Des Plaines River and its tributary stream systems. Receiving waters within the Village include (see Figure 1):

- McDonald Creek
- Feehanville Ditch
- Weller Creek
- Higgins Creek

Figure 1 Receiving Waters



Storm Water Pollutants of Concern

Polluted storm water runoff is commonly transported through MS4s, and then often discharged, untreated, into local waterways. Storm water runoff naturally contains numerous constituents; however, urbanization and urban activities (including municipal activities) typically increase concentrations to levels that may impact water quality. The typical pollutants found in urban storm water include sediment, nutrients, fecal coliform, chlorides, oil and grease, pesticides, herbicides,

and metals. Table 1 identifies the pollutants of concern for the Village and their potential sources. Table 2 identifies a list of municipal activities that have the potential for generating pollutants.

Table 1 Typical Pollutants and Potential Sources

Pollutants	Sources	
Sediment	Construction sites	Streambank erosion
Nutrients	Fertilizers Pet waste	Sanitary sewer overflows
Fecal Coliform	Untreated sewage Pet waste	Improper restaurant practices Excessive organic debris
Chlorides	De-icing salts	Sanitary sewer overflows Illicit connections
Oil & Grease	Parking lots and streets Automotive facilities Illicit discharges	Spills and leaks Motor lubricants Hydraulic fluids
Pesticides & Herbicides	Residential lawn care	Commercial lawn care
Metals	Rust from automobiles Moving engine parts Lubricating oil	Tire and brake lining wear Diesel fuel and gasoline exhaust

Table 2 Municipal Activities with Potential for Generating Pollutants

Fixed Facilities Activities	Field Program Activities
Building Maintenance and Repair	Street Sweeping and Cleaning
Parking Lot Maintenance	Street Repair and Maintenance
Landscape Maintenance	Bridge and Structure Maintenance
Waste Handling and Disposal	Sidewalk Surface Repair and Cleaning
Vehicle Fueling and Storage Tank Filling	Landscape Mowing/Trimming/Planting
Equipment Maintenance and Repair	Fertilizer and Pesticide Application
Vehicle and Equipment Storage	Solid Waste Collection and Recycling
Vehicle and Equipment Cleaning	
Material Handling and Storage	
Material Loading and Unloading	

Status of Waters

The most recent Integrated Water Quality Report and Section 303(d) List prepared by the IEPA can be found at http://www.epa.state.il.us/water/water-quality/index.html. The assessment completed in 2016 by the IEPA identified impairments to water quality in Higgins Creek and placed it on the Illinois Integrated Water Quality Report Section 303(d) (impaired waters) List. Impaired waters within the Village are shown on Figure 2. A summary of the IEPA 2016 assessment for receiving waters in the Village is presented in Table 3. At this time, no TMDL requirements have been issued for the portion of Higgins Creek located within the Village (see Table 3).

Figure 2 Impaired Waters

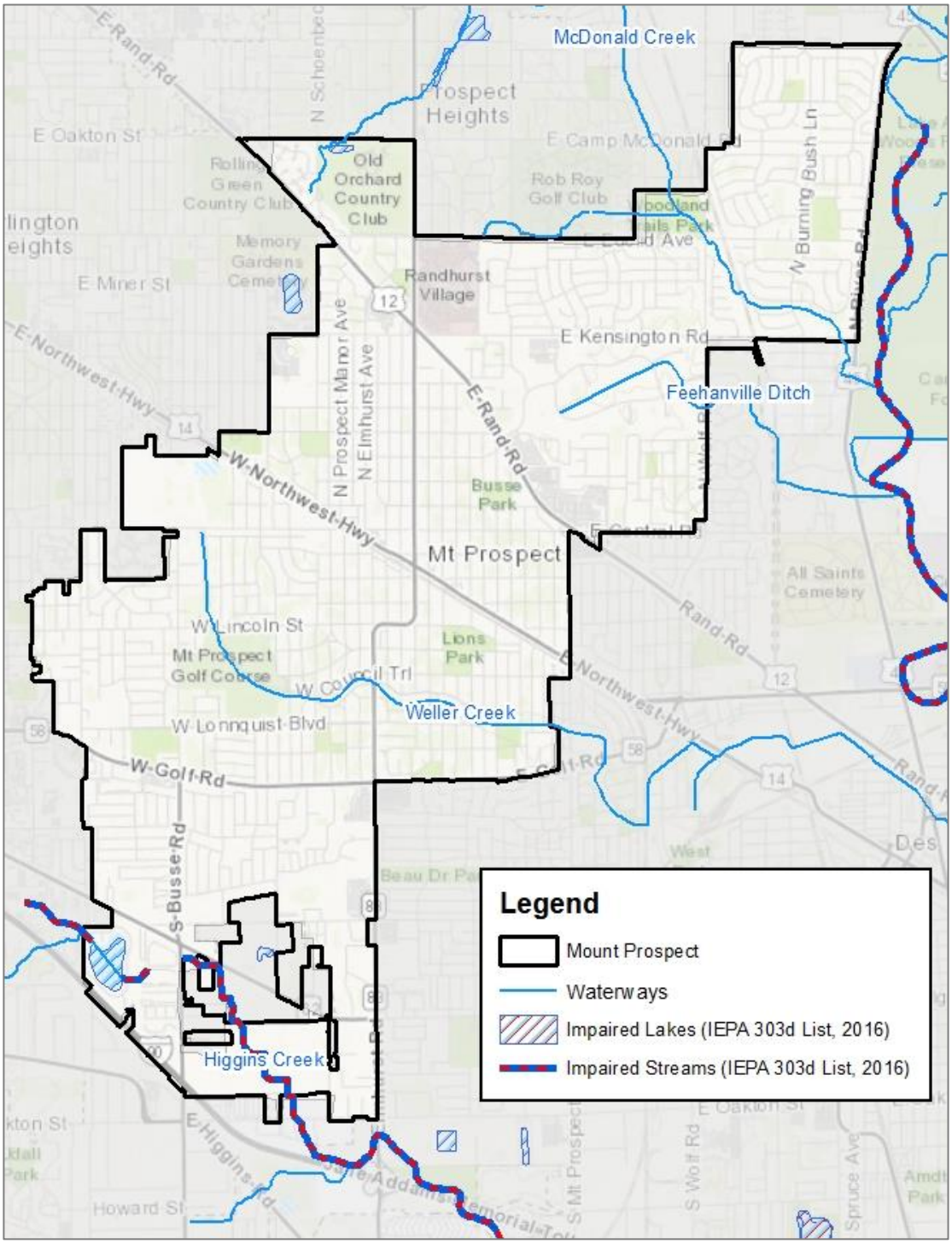


Table 3 IEPA Assessment Summary (2016 and Draft 2018)

Waterway	Designated Use	Causes	Sources	TMDL Status
Higgins Creek GOA-02	• Aquatic Life (Not Supporting) • Primary Contact Recreation (Not Supporting)	• Chloride • Fecal Coliform • Dissolved Oxygen	Urban Runoff/Storm Sewers	Approved 8/26/2013 (does not include the section of Higgins Creek within the Village limits)

II. Water Quality Monitoring & Assessment Program

Monitoring

This Water Quality Monitoring & Assessment Program has been developed for the Village of Mount Prospect for the purpose of demonstrating compliance with the minimum standards required by the ILR40 permit for discharges from MS4s. The ILR40 permit requires annual monitoring of receiving waters upstream and downstream of MS4 discharges, use of indicators to gauge the effects of storm water discharges on the physical/habitat-related aspects of the receiving waters, and/or monitoring of the effectiveness of the BMPs. Per the ILR40 permit, monitoring of storm water discharges must be performed within 48 hours of a precipitation event greater than or equal to 0.25" in a 24-hour period. The ILR40 permit requires analysis of storm water for the following parameters:

- Total suspended solids
- Total nitrogen
- Total phosphorous
- Fecal coliform
- Chlorides
- Oil and grease

Assessment

Illinois' water pollution control program is designed to protect the beneficial uses of water resources. Illinois has set water quality standards (WQS) that protect these beneficial uses, commonly referred to as "designated uses". In Illinois, waters are designated for various uses including aquatic life, wildlife, agricultural use, primary contact (e.g., swimming, water skiing), secondary contact (e.g., boating, fishing), industrial use, drinking water, food-processing water supply, and aesthetic quality. Illinois' WQS provide the basis for assessing whether the beneficial uses of the state's waters are being attained. This Water Quality Monitoring & Assessment Program includes an assessment of the quality of receiving waters based on annual testing.

Annual test results are compared against the water quality standards (WQS) established by the Illinois Pollution Control Program (IPCB). Not all the constituents included in the Village's Water Quality Monitoring & Assessment Program have an established limit under the General Use Water Quality Standard and are therefore compared to an industry accepted standard. The Illinois WQS are located in the Illinois Administrative Rules Title 35, Environmental Protection; Subtitle C, Water Pollution; Chapter I, Pollution Control Board; Part 302, Water Quality Standards. The purpose of these standards is to protect existing uses of all waters of the State of Illinois, maintain above standard water quality, and prevent unnecessary deterioration of waters of the State. Table 4 identifies the section of the IPCB standards (or other reference material) used for the purposes

of this analysis. This analysis is in no way meant to identify violations of the IPCB Standards.

III. Test Locations

Water samples are taken at locations upstream and downstream of the Village's discharge into receiving waters. Upstream and downstream results are compared to identify any areas of concern that are potentially contributing to water pollution in receiving waters. In the Village of Mount Prospect, eight (8) sites have been chosen for water quality testing at upstream and downstream locations. A location map is included in Appendix 1 of this report which identifies the testing locations.

McDonald Creek

SITE 1

The test site is an unnamed tributary to McDonald Creek, located east of Fairway Drive between Golf View Circle and Fairway Court on the boundary between the Village of Mount Prospect and the Village of Prospect Heights. In this report, this site is considered an upstream location for McDonald Creek.

SITE 2

The test site is McDonald Creek located south of Edward Road on the boundary between the Village of Mount Prospect and the Village of Prospect Heights. In this report, this site is considered an upstream location for McDonald Creek.

SITE 3

The test site is McDonald Creek located on the south side of Kensington Road, east of North Woodland Drive and west of North River Road on the boundary between the Village of Mount Prospect and Unincorporated Cook County. In this report, this site is considered a downstream location for McDonald Creek.

Feehanville Ditch

SITE 4

The test site is Feehanville Ditch located on the east side of North Wolf Road, north of Longford Drive on the boundary between the Village of Mount Prospect and the City of Des Plaines. In this report, this site is considered a downstream location for Feehanville Ditch.

Weller Creek

SITE 5

The test site is Weller Creek located just west of the intersection of West Cleven Avenue and Weller Lane in the Village of Mount Prospect. In this report, this site is considered an upstream location for Weller Creek.

SITE 6

The test site is Weller Creek located on the west side of Mount Prospect Road, north of South Josephine Court and south of Fletcher Drive on the boundary between the Village of Mount Prospect and the City of Des Plaines. In this report, this site is considered a downstream location for Weller Creek.

Higgins Creek

SITE 7

The test site is Higgins Creek located 1,000 feet south of Algonquin Road between the Village of Mount Prospect and the Village of Arlington Heights. In this report, this site is considered an upstream location for Higgins Creek.

SITE 8

The test site is Higgins Creek located at the east end of Terminal Drive east of the intersection of Terminal Drive and Badger Drive between the Village of Mount Prospect and Unincorporated Cook County. In this report, this site is considered a downstream location for Higgins Creek.

IV. Testing Parameters

Water samples are collected at each location once per year (within 48 hours of a 0.25" rain event). Each sample is sent to a lab and analyzed for the following parameters: total suspended solids; total nitrogen; total phosphorous; fecal coliform; chlorides; and fats, oils, and grease.

While not specifically required by the ILR40 permit, the following on-site measurements are completed based on common practice for evaluating general water quality: temperature, dissolved oxygen, total dissolved solids, conductivity, turbidity, and pH.

Sampling is conducted in accordance with EPA standard protocols. Parameters are analyzed according to Standard Methods, 17th and 18th Editions, and USEPA methods.

Table 4 Accepted Limits for Water Quality Parameters

Water Quality Parameters	Illinois Water Pollution Control Board WQS[1]	IPCB Standards or Accepted Limits
Total Suspended Solids	304 Effluent Standards	15.0-30.0 mg/L
Total Nitrogen	United States Environmental Protection Agency Volunteer Stream Manual	<6.0 mg/L
Total Phosphorus	302.205	0.05 mg/L
Fecal Coliform	Illinois Administrative Code. Title 35: Environmental Protection; Subtitle C: Water Pollution; Chapter I: Pollution Control Board; Part 302 Water Quality Standards Section 302.209	200 cfu/100 ml geometric mean based on a minimum of 5 samples taken over any 30-day period; 400 cfu/100 ml maximum not to be exceeded in more than 10% of samples taken during any 30-day period.
Chlorides	302.304	500.0 mg/L
Fats, Oils and Grease	Federation of Sewage Works Associations (now known as the Water Environment Federation [WEF]) published a Manual of Practice (MOP) (1949)	100 mg/L
On-Site Testing		
Temperature (°F)	302.211	December – March 60.0°F Max April – February 90.0°F Max
Dissolved Oxygen	302.206	March - July at least 5.0 mg/L August – February at least 3.5 mg/L
Total Dissolved Solids	302.304	1,000 ppm
Conductivity	USEPA Volunteer Stream Monitoring Manual	50.0 – 1500.00 µs/cm
Turbidity	D.H. Franklin, J.L. Steiiner and G.Wheeler (2001)	<50 NTU
pH	302.304	6.5 – 9.0

[1]Title 35 Part 302 Water Quality Standards unless otherwise noted.

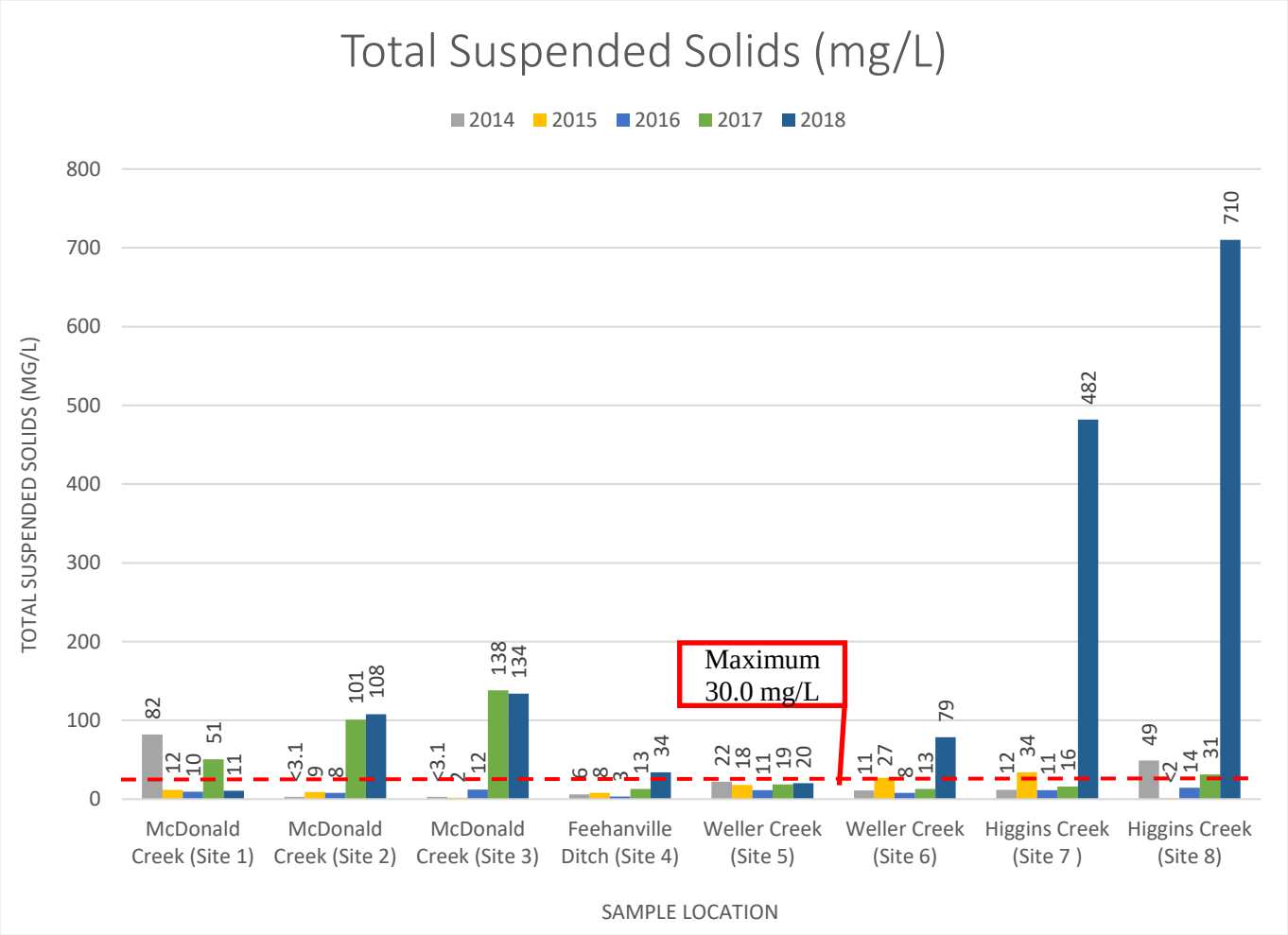
V. Results

On June 21, 2018, Aquatic Ecosystems Management collected water samples at eight (8) designated locations. The sampling was conducted within twenty-four hours of 1.17" rain event. The following is a summary of each water quality parameter tested and the results.

Total Suspended Solids (TSS)

Total suspended solids (TSS) are particulate solid materials (organic and inorganic) that have relatively low density and are too small to settle. Usually TSS includes silt, mud, decaying plant material and animal matter, industrial wastes and sewage. As TSS increases, turbidity increases (meaning the transparency of the water decreases). High concentrations of TSS can lower water quality by absorbing light which raises the temperature of the water thereby decreasing levels of dissolved oxygen. The combination of warmer water, less light, and less oxygen makes it difficult for some forms of life to exist. None of the receiving waters within the Village are designated as impaired for total suspended solids.

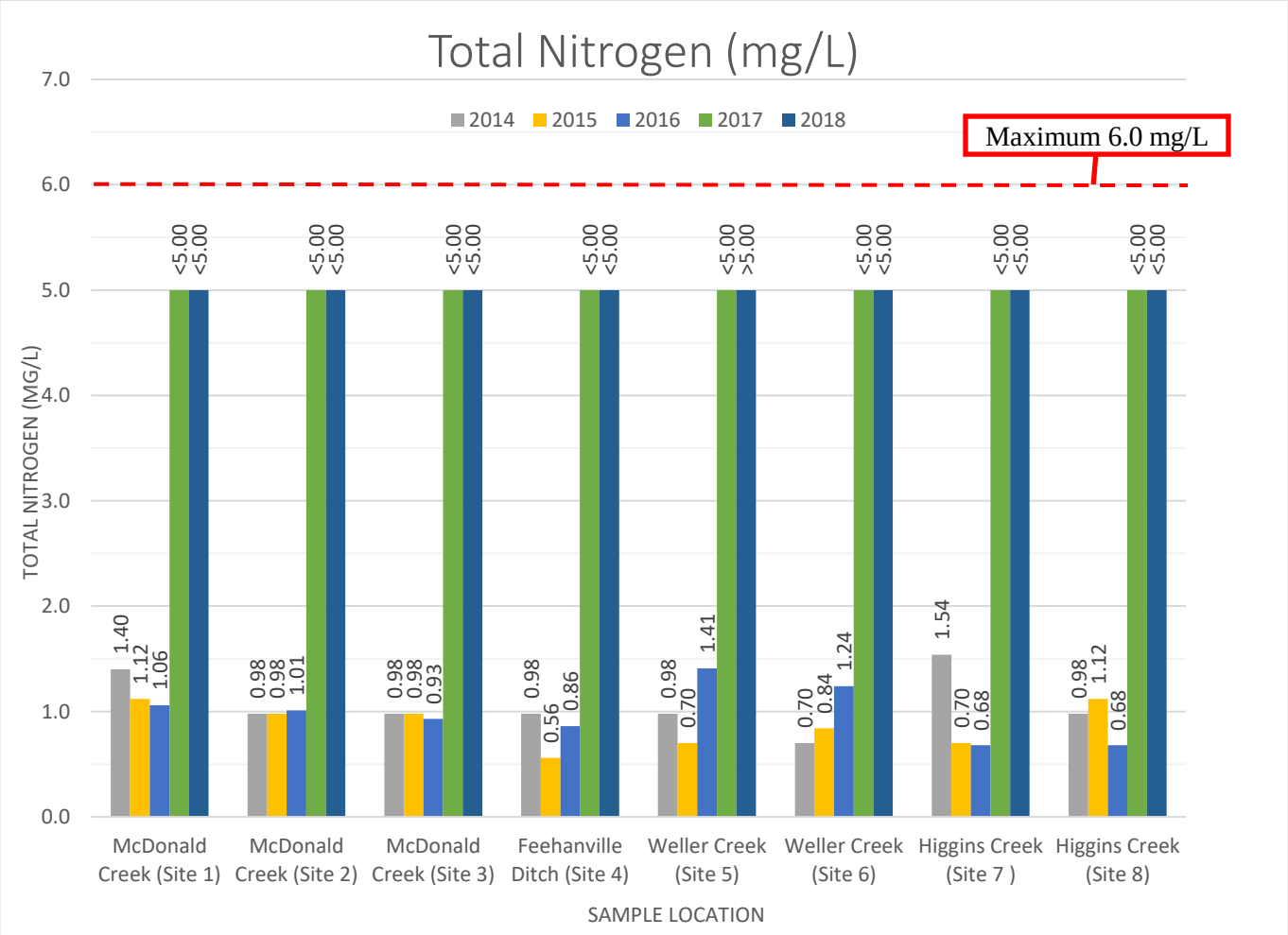
The established limit for TSS is 15.0 – 30.0 mg/L. Results of the TSS testing conducted from 2014 through 2018 are provided in the graph below. In 2018, six of the test locations exceeded the 30 mg/L threshold.



Total Nitrogen

Total nitrogen is an essential nutrient for plants and animals. However, an excess amount of nitrogen in a waterway may lead to low levels of dissolved oxygen and negatively alter various plant life and organisms. Sources of nitrogen include wastewater treatment plants, runoff from fertilized lawns, runoff from animal manure and storage areas, and industrial discharges that contain corrosion inhibitors. None of the receiving waters within the Village are designated as impaired for nitrogen.

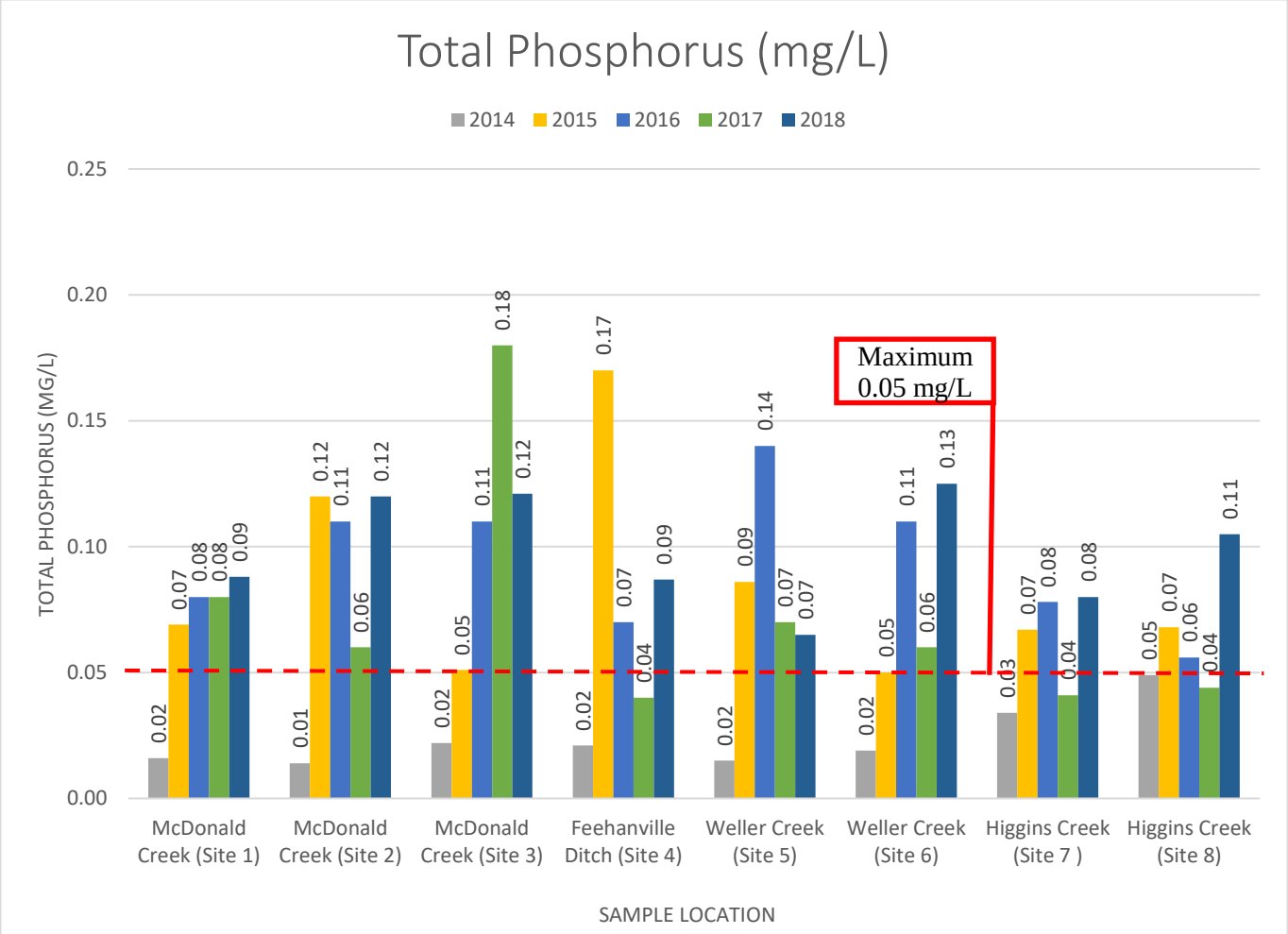
An acceptable range of total nitrogen is 2 mg/L – 6 mg/L. Results of the total nitrogen testing conducted from 2014 through 2018 are provided in the graph below. None of the test results exceeded the 6 mg/L threshold.



Total Phosphorus

Total phosphorus is one of the key elements necessary for animal and plant growth. Phosphorus stimulates the growth of algae and aquatic plants that provide food for fish. This may cause an increase in the fish population. However, excess phosphorus may cause disproportionate growth in algae and aquatic plants, choking waterways and using up large amounts of oxygen. Rainfall causes varying amounts of phosphorus (from fertilized lawns) to wash away from urban areas into local waterways in the form of runoff. None of the receiving waters within the Village are designated as impaired for phosphorus.

The established limit for total phosphorous is 0.05 mg/L for any reservoir or lake with a surface area of ≥ 20.0 acre, or in any stream at the point where it enters any such reservoir or lake. Results of the phosphorus testing conducted from 2014 through 2018 are provided in the graph below. All of the sites exceeded the 0.05 mg/L threshold in 2018. It should be noted that this threshold is used for streams as a guideline only as it is relevant to reservoirs and lakes.



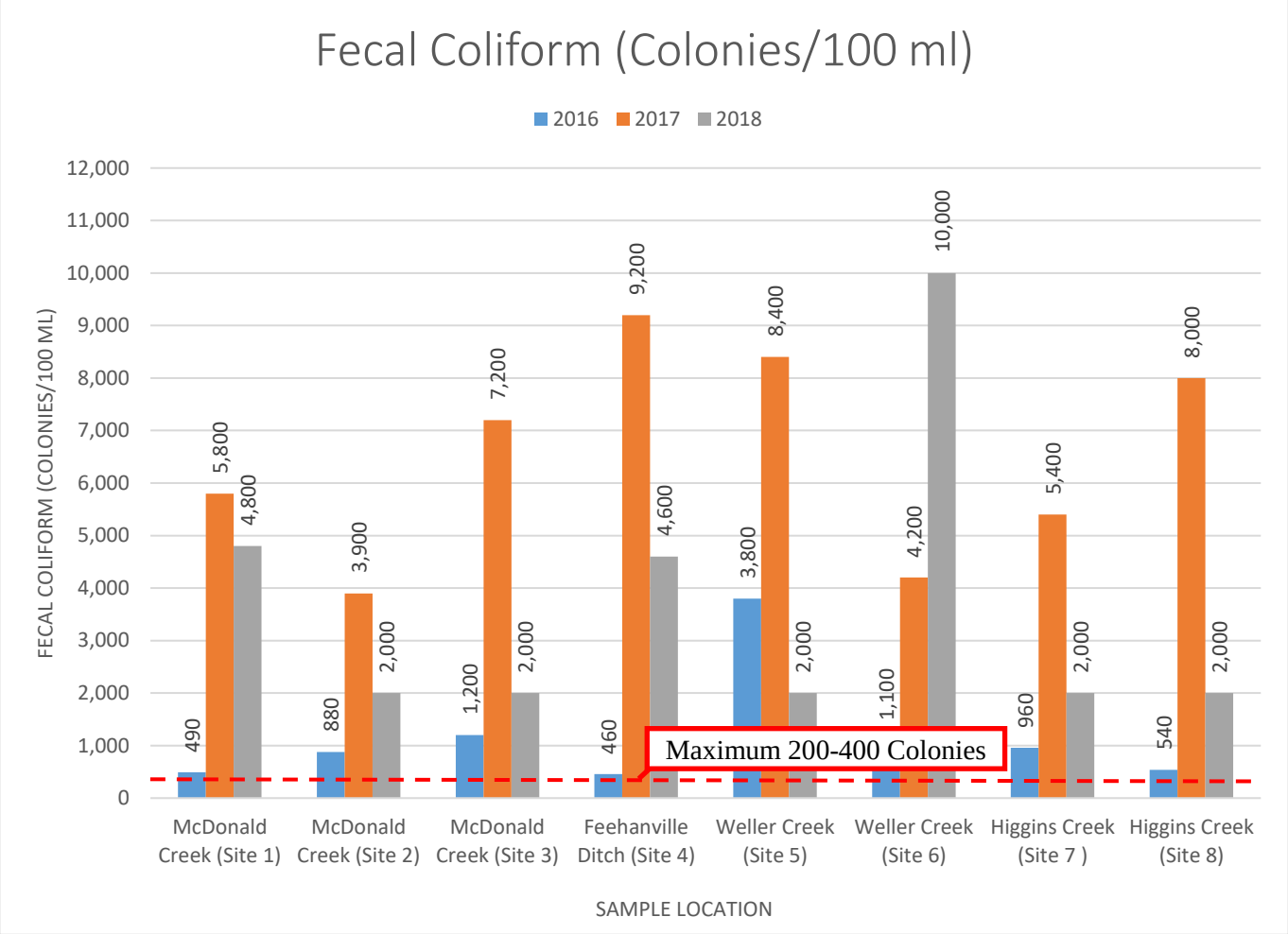
Fecal Coliform

E. coli is an anaerobic bacterium that grows in the intestinal track of animals. Its presence is an indication of fecal contamination and other disease-causing organisms, which are more difficult to identify and quantify, may also be present. The accepted limits for fecal coliform in Illinois are expressed in colony forming units (cfus) per 100 milliliters of water. Fully Supporting Use or "Good Water Quality" for designated beneficial uses, such as recreation or primary contact, is observed when the following limits are not exceeded:

- 200 cfu/100 ml geometric mean based on a minimum of 5 samples taken over any 30-day period;
- 400 cfu/100 ml maximum not to be exceeded in more than 10% of samples taken during any 30-day period.

The IEPA has determined that Higgins Creek is impaired for fecal coliform (IEPA Assessment,

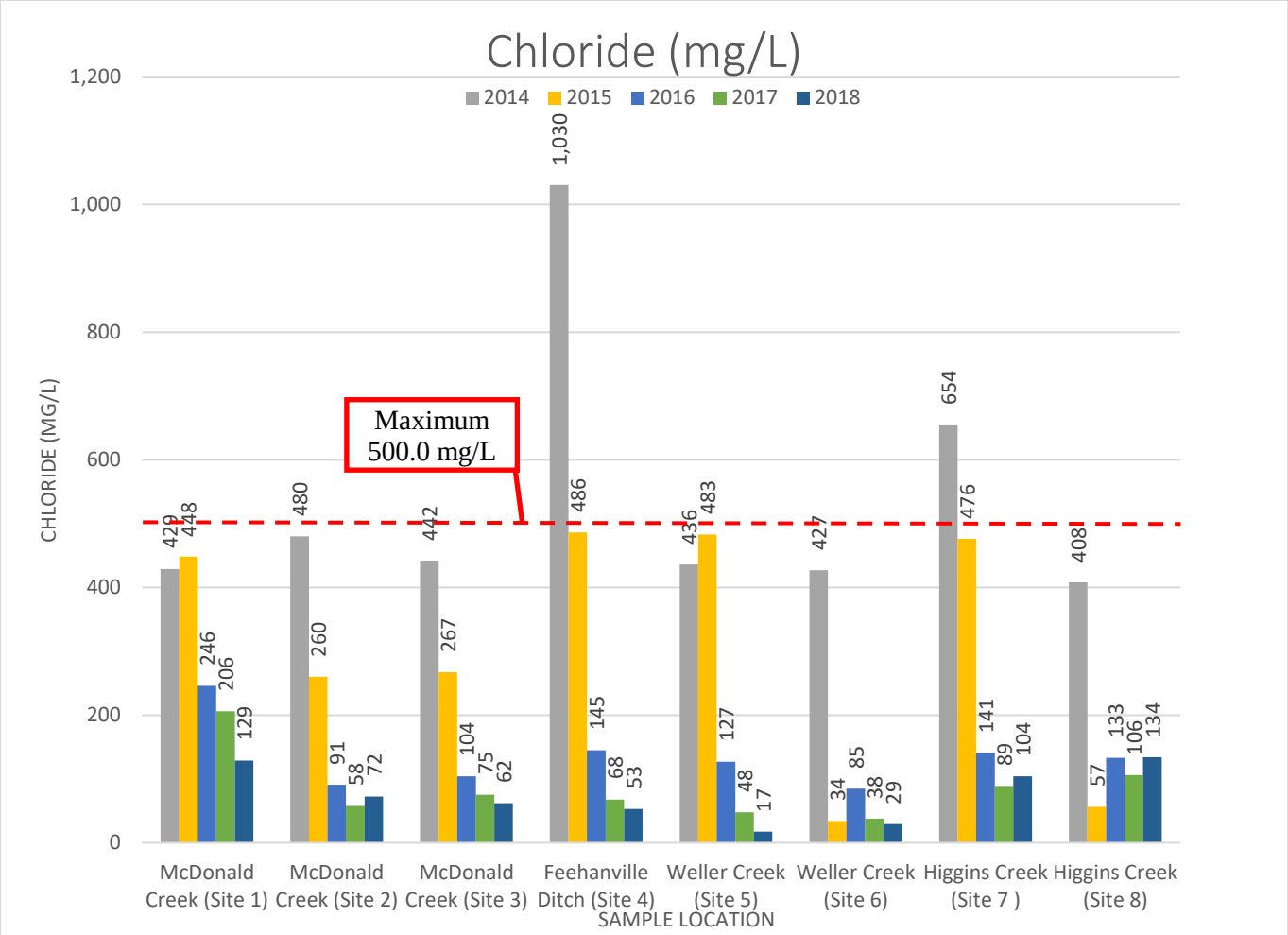
2016). Fecal coliform testing began in 2016 to meet the monitoring requirements of the 2016 NPDES ILR40 permit. Results of the fecal coliform testing conducted from 2016 through 2018 are provided in the graph below. In 2018, all sites exceeded the 400 cfu/100 ml threshold.



Chloride

Chloride is essential to life in small doses. Chloride may enter a water system from rocks containing chlorides, agricultural runoff, industrial wastewater, oil well wastes, wastewater treatment plant effluents, and road salts. However, when chloride builds up in large quantities, it can have negative impacts on the survival of aquatic life. The IEPA has determined that Higgins Creek is impaired for Chloride (IEPA Assessment, 2016).

The established limit for chloride is 500.0 mg/L. Results of the chloride testing conducted from 2014 through 2018 are provided in the graph below. None of the 2018 test results exceed the 500 mg/L standard.



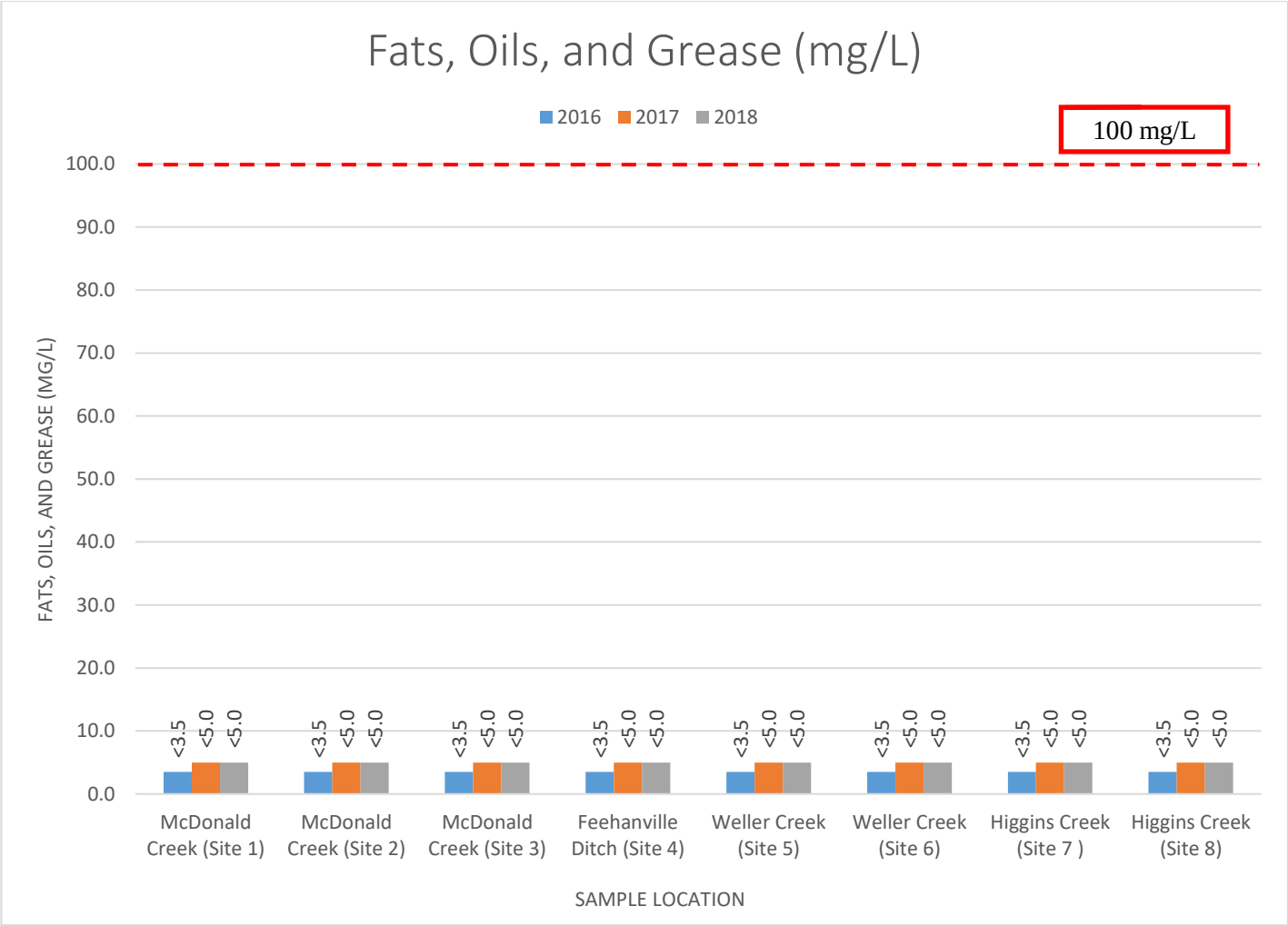
Fats, Oils, and Grease

Oil and grease are found in wastewater and storm water either as an emulsion or as free-floating agglomerates. Chemicals, such as detergents and solvents, and mechanical agitation can cause oil and grease to become emulsified. According to the Water Environment Federation's Pretreatment of Industrial Wastes, Manual of Practice FD-3, "Grease is a general classification for grouping such materials as fats, oils, waxes, and soaps according to their effect on wastewater collection and treatment systems or their physical (semisolid) forms." For the purpose of this document, the acronym "FOG" will be used as a general term for fats, oils, and grease.

By its very nature, grease will adhere to many types of surfaces, with sewers especially vulnerable to grease build-up. Over a period of time, clumps of grease will build up to the point that the sewer is completely choked. Grease also accumulates due to cooling and dilution of surfactants. None of the receiving waters within the Village are designated as impaired for fats, oils, and grease.

The most commonly used numerical limit for FOG is 100 mg/L. This limit does not appear to be based upon any empirical evidence but rather on general correlations and an industry consensus that this level limits the build-up of FOG in the collection system. FOG testing began in 2016 to meet the monitoring requirements of the 2016 NPDES ILR40 permit. Results of the FOG testing conducted in 2016 through 2018 are provided in the graph below. In 2018, none of the sites

exceeded the 100 mg/L threshold.

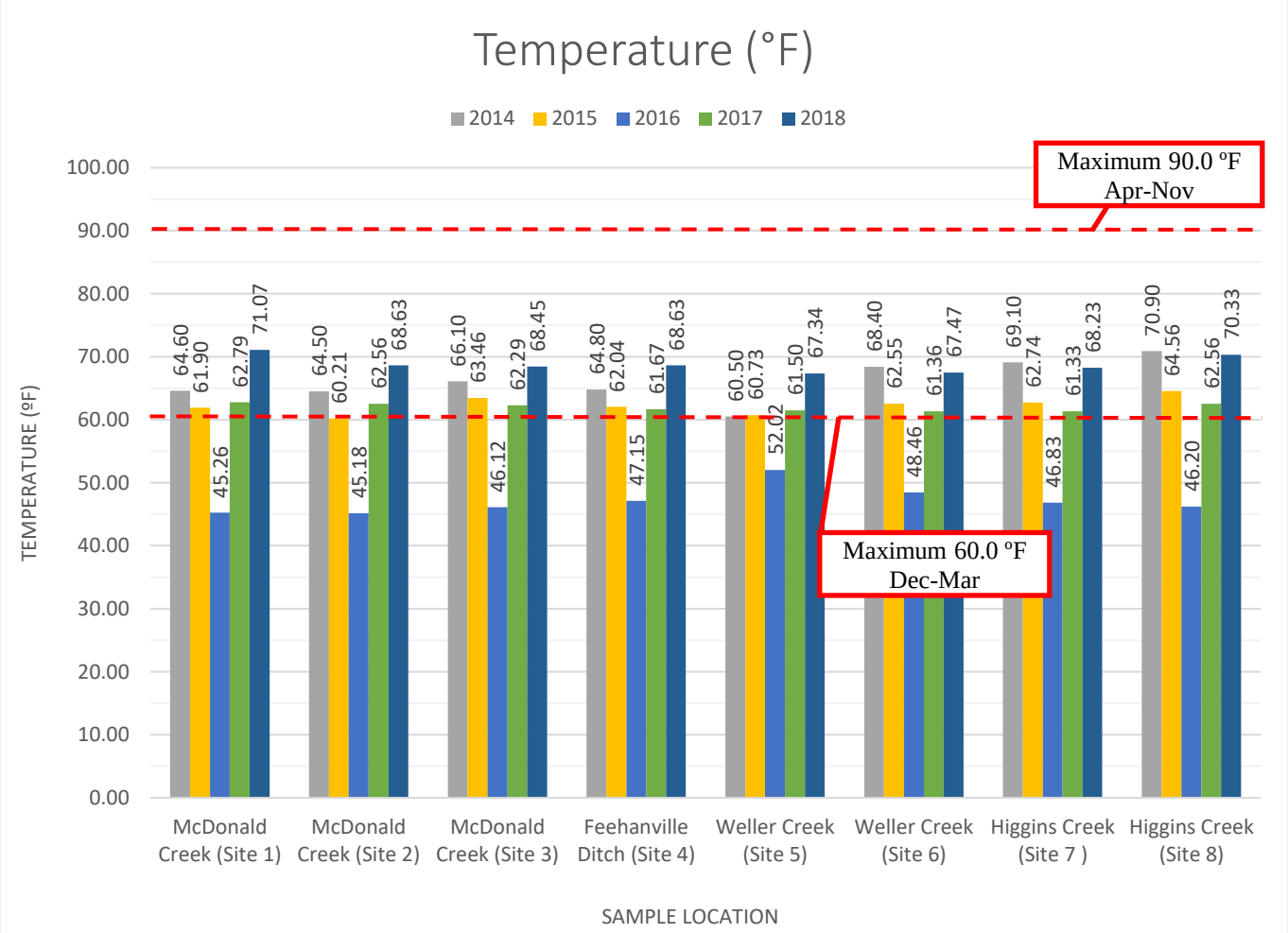


Temperature

The rates of biological and chemical processes depend on temperature. Organisms are dependent on certain temperature ranges for their optimal health. Optimal temperatures for fish depend on the species: some survive better in colder water, whereas others prefer warmer water. Benthic macroinvertebrates are also sensitive to temperature and will relocate to find their optimal temperature. If temperatures are outside this optimal range for a prolonged period, organisms become stressed and can die.

Temperature also affects the oxygen content of the water (oxygen levels become lower as temperature increases), the rate of photosynthesis by aquatic plants, the metabolic rates of aquatic organisms, and the sensitivity of organisms to toxic wastes, parasites, and diseases. Causes of temperature change include weather, removal of shading streambank vegetation, impoundments, discharge of cooling water, and urban storm water inflows to the stream. None of the receiving waters within the Village are designated as impaired for temperature.

The established limit for temperature is a maximum of 60º F from December through March and 90° F from April through November. Temperature readings from 2014 through 2018 are provided in the graph below. All locations are within the normal temperature range.

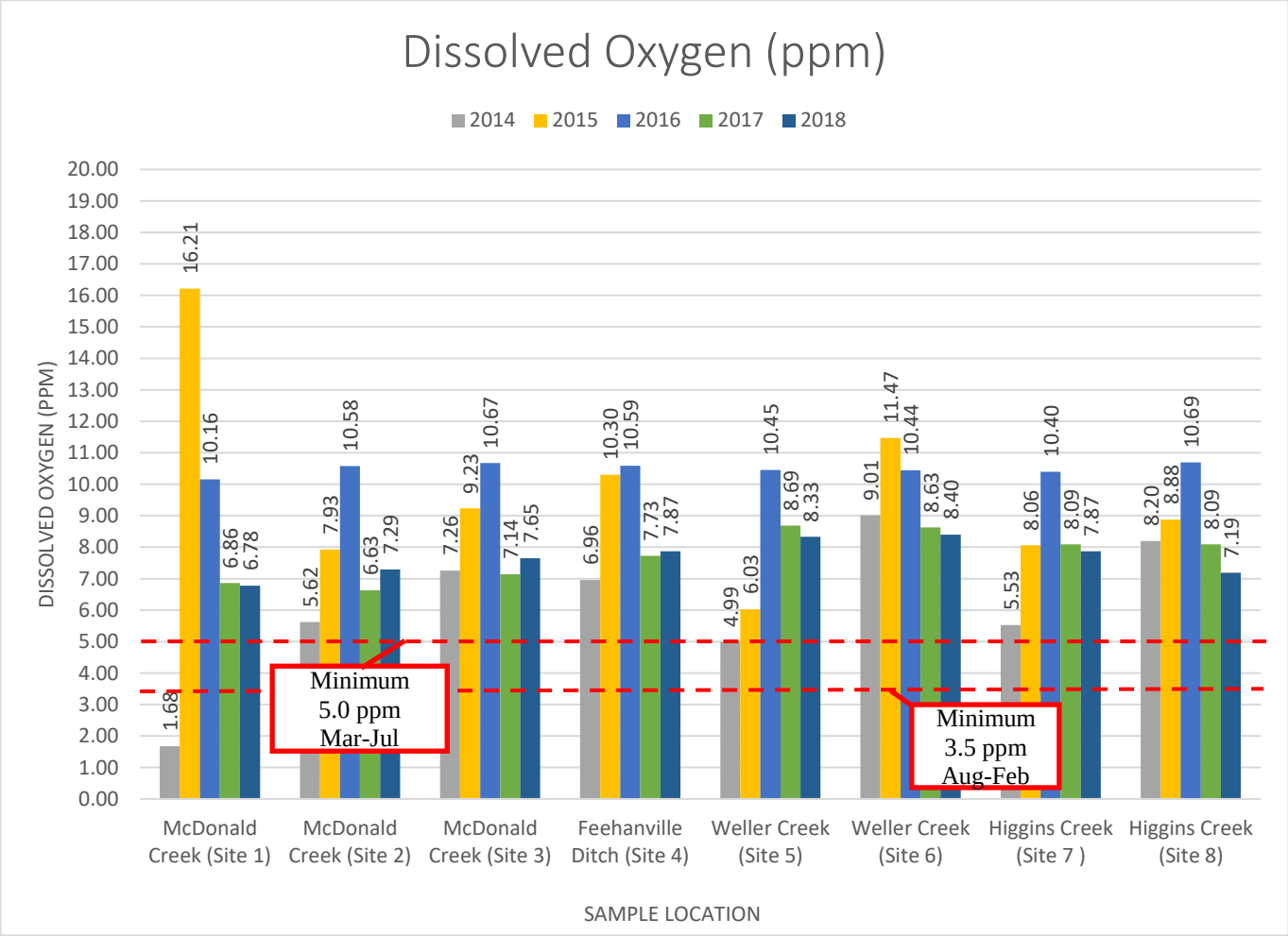


Dissolved Oxygen (DO)

One of the most important measures of the health of a stream is the amount of available dissolved oxygen (DO) in the water. Oxygen gas dissolves in water through the mixing of the water surface with the atmosphere. Oxygen is vital to fish and other animals for respiration. If the levels of DO fall too low, many species of fish, macroinvertebrates, and plants cannot survive.

The level of DO in the water is inversely related to water temperature. The lower the temperature, the more oxygen can dissolve in the water. Aquatic animals are most vulnerable to lowered DO levels in the early morning on hot summer days when stream flows are low, water temperatures are high and aquatic plants have not been producing oxygen since sunset. The IEPA determined that Higgins Creek is impaired for DO (IEPA Assessment, 2016).

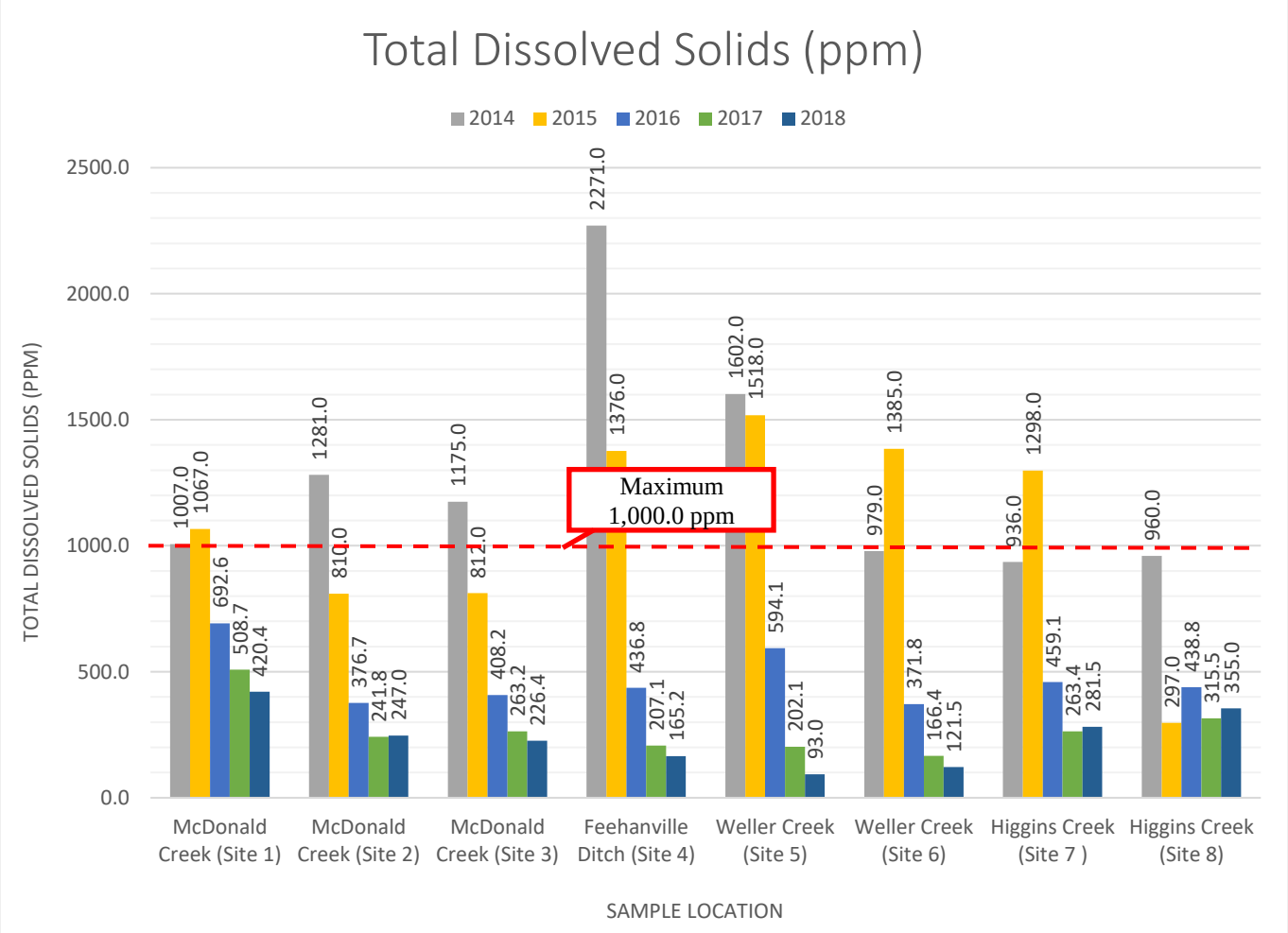
The established minimum for DO level is 5.0 parts per million (ppm) between March and July and 3.5 ppm between August and February. Results of the DO testing conducted from 2014 through 2018 are provided in the graph below. All of the test results met the minimum levels.



Total Dissolved Solids (TDS)

Total dissolved solids (TDS) comprise of inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulfates) and some small amounts of organic matter that are dissolved in water. While not a health hazard, elevated TDS levels decrease the aesthetic quality of water and can cause the water to become corrosive. Additionally, elevated TDS concentrations in water can cause a salty or brackish taste, interference and decreased efficiency of hot water heaters and lime-scale formation. Elevated TDS concentrations indicate elevated levels of ions that are above the Primary or Secondary Drinking Water Standards. None of the receiving waters within the Village are designated as impaired for TDS.

The established limit for TDS is 1000.0 mg/L. Results of the TDS testing conducted from 2014 through 2018 are provided in the graph below. None of the 2018 test results exceeded the 1,000.0 mg/L threshold.

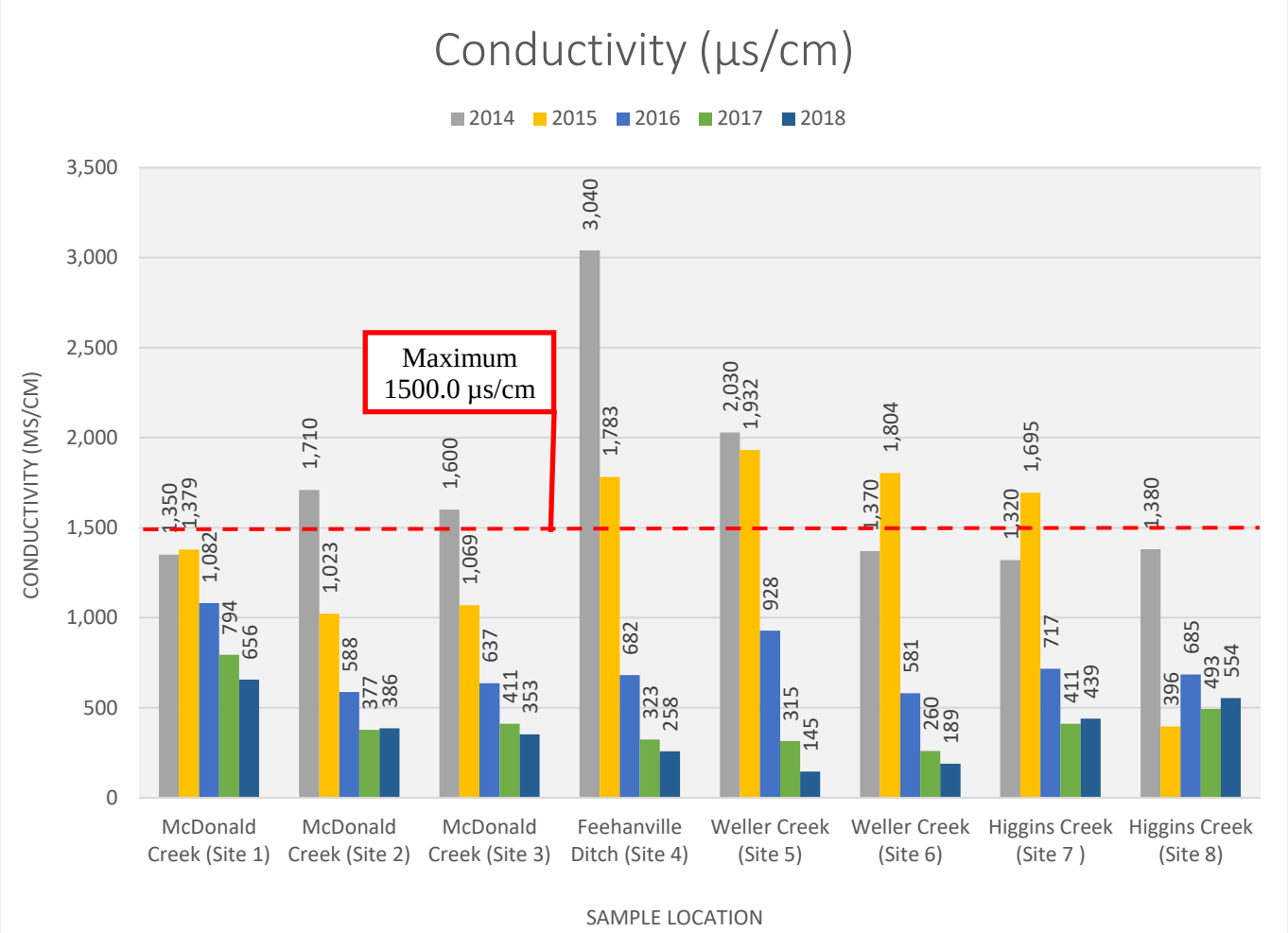


Conductivity

Conductivity is the measure of water's ability to carry an electrical current. Conductivity in waterbodies is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, sodium, magnesium, calcium, iron, and aluminum cations (ions that carry a positive charge). Organic compounds like oil, phenol, alcohol, and sugar do not conduct electrical current very well and therefore have a low conductivity level in water. Conductivity is also affected by temperature: the warmer the water, the higher the conductivity.

Discharges to streams can change the conductivity depending on their composition. For example, a failing sewage system would raise conductivity due to the presence of chloride, phosphate, and nitrate, while an oil spill would lower conductivity. None of the receiving waters within the Village are designated as impaired for conductivity.

The established range for conductivity is 50-1500 µs/cm. Results of the conductivity testing from 2014 through 2018 are provided in the graph below. In 2018, none of the test locations exceeded the 1500.0 µs/cm threshold.

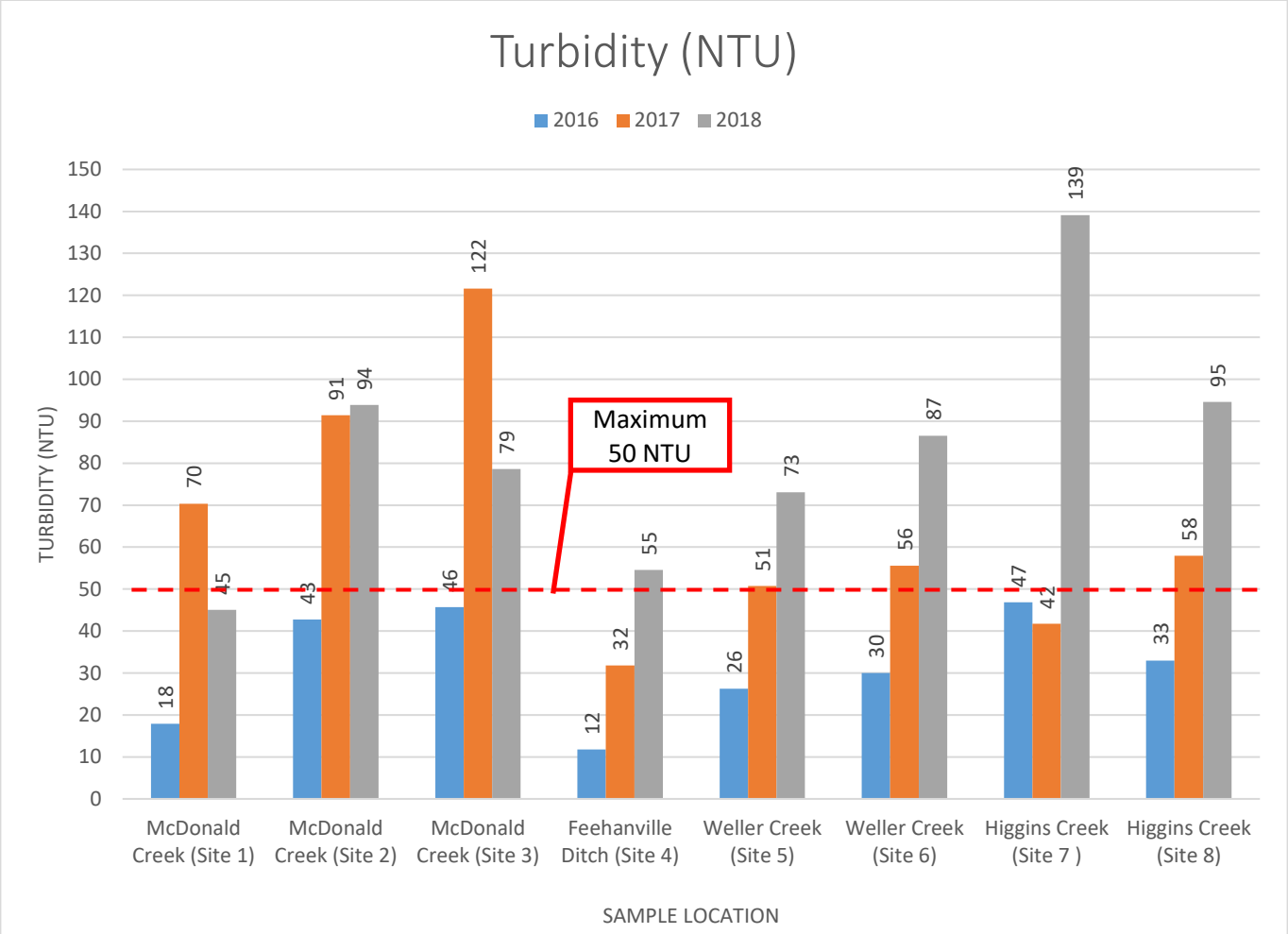


Turbidity

Turbidity is the measure of the relative clarity of a liquid. Material that causes water to be turbid includes clay, silt, finely divided inorganic and organic matter, algae, soluble colored organic compounds, and other microscopic organisms.

High concentrations of particulate matter affects light penetration and productivity, recreational values, and habitat quality. In streams, increased sedimentation and siltation can occur, which can result in harm to habitat areas for fish and other aquatic life. Particles also provide attachment places for other pollutants (e.g. metals and bacteria). For this reason, turbidity readings can be used as an indicator of potential pollution in a water body. None of the receiving waters within the Village are designated as impaired for turbidity.

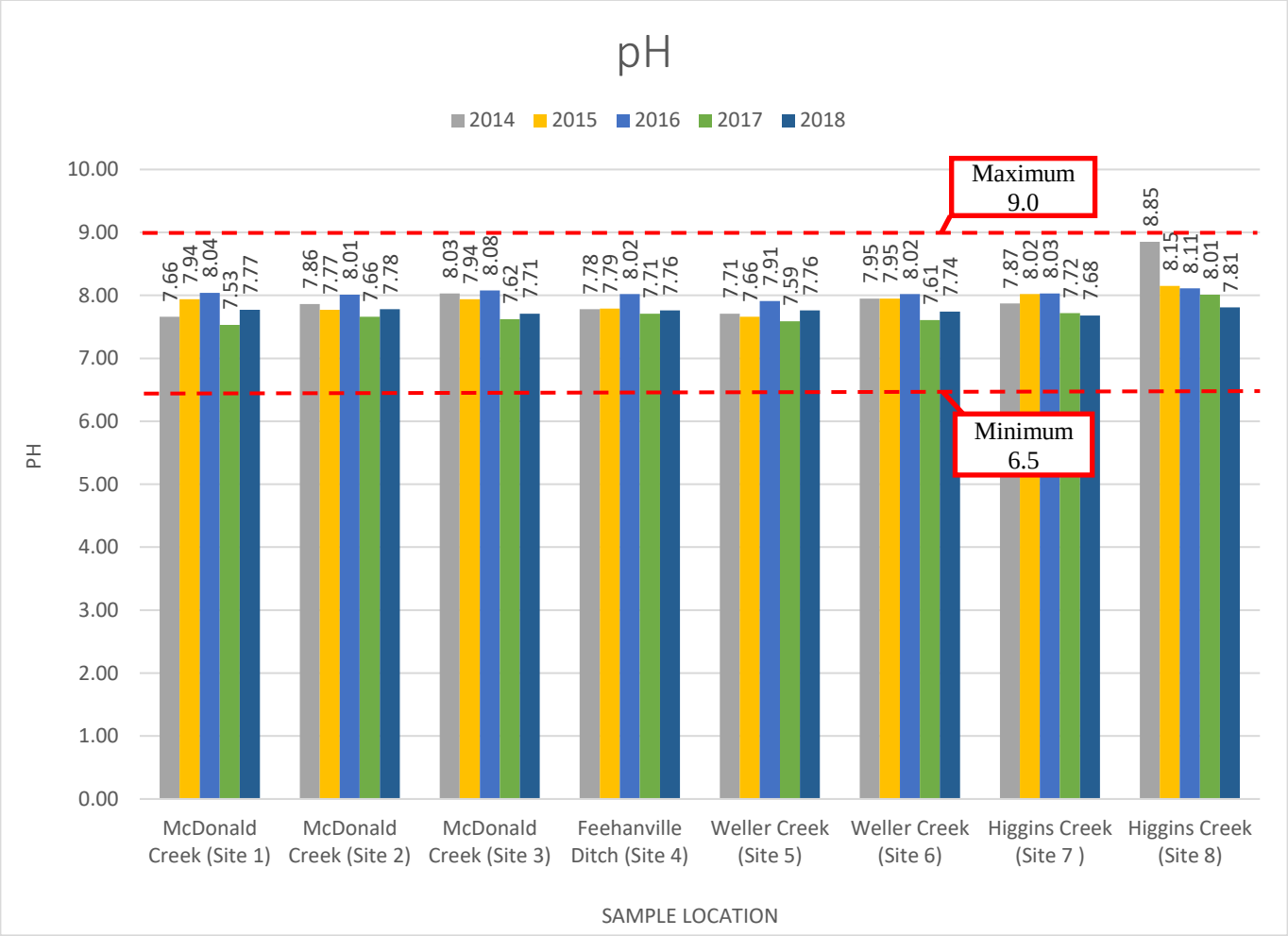
While there is no water quality standard in Illinois for turbidity, other states have ambient water quality standards ranging from 10 NTU to 50 NTU, depending on the water body. Therefore, a value of 50 NTU is established for turbidity in this analysis. Turbidity testing began in 2016 to meet the monitoring requirements of the 2016 NPDES ILR40 permit. Results of the turbidity testing conducted from 2016 through 2018 are provided in the graph below. In 2018, 7 of the locations exceeded the 50 NTU threshold.



pH

Most discharge flow types are neutral, having a pH value of approximately 7.0, (although groundwater concentrations can be somewhat variable). pH is a reasonably good indicator for liquid wastes from industries, which can have very high or low pH (ranging from 3.0 to 12.0). The pH of residential wash water tends to be basic (pH of 8.0 or 9.0). Although pH data is often not conclusive by itself, it can identify problem areas that merit follow-up investigations using more effective indicators. None of the receiving waters within the Village are designated as impaired for pH.

The established range for pH is 6.5-9.0 (General Use WQS). pH readings from 2014 through 2018 are provided in the graph below. All results have been within the established range.



VI. Summary

McDonald Creek

Samples #1, #2, and #3 are from the west branch, north branch, and outflow into the Des Plaines River of McDonald Creek, respectively. The creek flows predominately through single family residential neighborhoods with narrow buffers. Total suspended solids were still elevated at Sites 2 and 3. The turbidity readings reflected this increase as well. This could be from the different intensities of each rain event, increased erosion in the watershed, or any development/construction occurring. Levels of fecal coliform were generally lower this year, most likely due to dilution from more rainfall.

Feehanville Ditch

Sample #4 is from Feehanville Ditch, which eventually flows into the Des Plaines River. Upstream of this sampling location, Feehanville Ditch is surrounded by an industrial park containing corporate buildings, parking lots and detention facilities. In 2018, levels of fecal coliform decreased while turbidity, phosphorus and total suspended solids levels increased. Conductivity levels continued to decrease, most likely due to less salt being used on roads.

Weller Creek

Samples #5 and #6 are from Weller Creek where it begins in and then leaves the Village limits. The creek flows through single family residential areas and a golf course. Fecal coliform levels were high at both sites, but Site 6 was significantly higher with a measurement of 10,000 colonies/100 ml. Small increases were also seen in phosphorus, total suspended solids and turbidity. Chloride decreased slightly, and the closely related parameters of conductivity and total dissolved solids decreased as well. Again, this is probably due to less salt being used on roads.

Higgins Creek

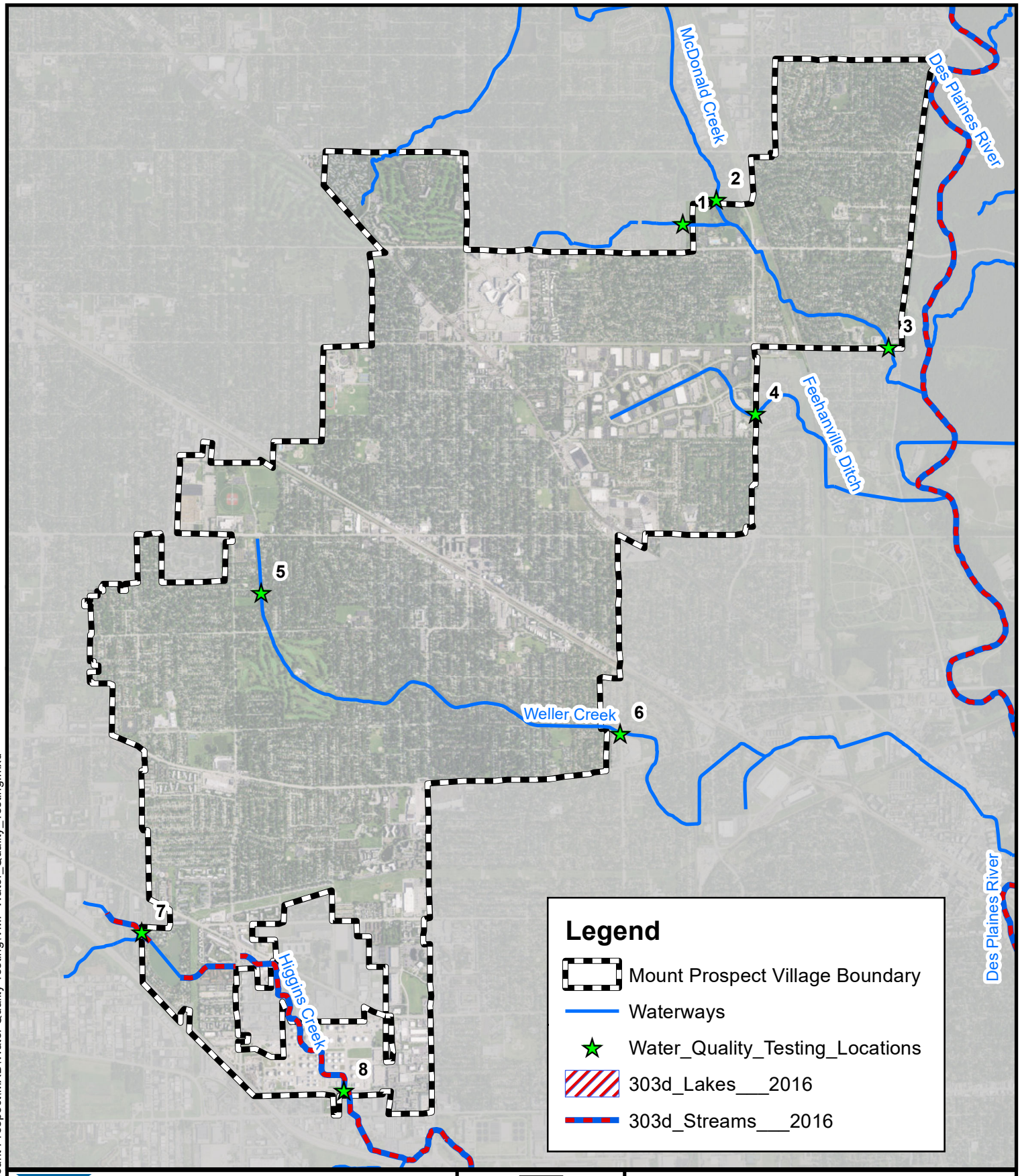
Samples #7 and #8 are from Higgins Creek where it flows into Briarwood Lake and then under Terminal Drive east of Badger Rd. The creek travels through Briarwood Lake, apartment complexes and industrial areas. While fecal coliform levels were lower this year at both sites, chloride, turbidity, phosphorus and total suspended solids increased. The total suspended solids levels significantly increased since 2017 (16 mg/L in 2017 to 482 mg/L in 2018 at Site 7 and 31 mg/L in 2017 to 710 mg/L in 2018 at Site 8).

VII. Follow Up

1. Further investigation is recommended along Weller Creek to determine the source of the elevated fecal coliform levels at the downstream location of Weller Creek (Site 6). Manhard recommends additional testing of Weller Creek immediately upstream and downstream of the Mount Prospect Golf Club and also within areas between the golf course and Site 6. Additional testing should help narrow down the source of the fecal coliform.
2. Further investigation is recommended along Higgins Creek to determine the source that is causing significantly elevated levels of total suspended solids.

Appendix 1

Location Map



L:\GIS\Illinois\Municipality\Mount Prospect\MXD\Water Quality Testing\VMP Water_Quality_Testing.mxd

Manhard CONSULTING

900 Woodlands Parkway, Vernon Hills, Illinois 60061
ph: 847-634-5550 manhard.com

NORTH

Not to Scale

Date: 06/12/2017

WATER QUALITY TESTING LOCATIONS
VILLAGE OF MOUNT PROSPECT

Proj: 000.0MPMP2.02

Appendix 2

Lab Report

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

	Mount Prospect Sample Locations				Date: 11/29/2016	
	Total Suspended Solids mg/l	Total Nitrogen mg/l	Total Phosphorous mg/l	Chloride mg/l	Fats / Oils/ Grease mg/l	Fecal Coliform Colonies/100 ml
Mount Prospect #1	9.60	1.06	0.08	246.00	<3.5	490
Mount Prospect #2	8.00	1.01	0.11	91.10	<3.5	880
Mount Prospect #3	12.30	0.93	0.11	104.00	<3.5	1,200
Mount Prospect #4	3.20	0.86	0.07	145.00	<3.5	460
Mount Prospect #5	11.40	1.41	0.14	127.00	<3.5	3,800
Mount Prospect #6	8.00	1.24	0.11	84.90	<3.5	1,100
Mount Prospect #7	11.30	0.68	0.078	141.00	<3.5	960
Mount Prospect #8	14.40	0.68	0.056	133.00	<3.5	540

	Mount Prospect Sample Locations				Date: 10/11/2017	
	Total Suspended Solids mg/l	Total Nitrogen mg/l	Total Phosphorous mg/l	Chloride mg/l	Fats / Oils/ Grease mg/l	Fecal Coliform Colonies/100 ml
Mount Prospect #1	50.70	<5	0.08	206.00	<5	5,800
Mount Prospect #2	101.00	<5	0.06	57.50	<5	3,900
Mount Prospect #3	138.00	<5	0.18	75.20	<5	7,200
Mount Prospect #4	13.00	<5	0.04	67.90	<5	9,200
Mount Prospect #5	18.70	<5	0.07	48.00	<5	8,400
Mount Prospect #6	12.80	<5	0.06	37.80	<5	4,200
Mount Prospect #7	16.00	<5	0.041	88.80	<5	5,400
Mount Prospect #8	31.40	<5	0.044	106.00	<5	8,000

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

	Mount Prospect Sample Locations				6/21/2018	
	Total Suspended Solids mg/l	Total Nitrogen mg/l	Total Phosphorous mg/l	Chloride mg/l	Fats / Oils/ Grease mg/l	Fecal Coliform Colonies/100 ml
Mt Prospect #1	10.5	<5	0.088	129	<5	4,800
Mt Prospect #2	108	<5	0.12	72.4	<5	2,000
Mt Prospect #3	134	<5	0.121	62.1	<5	2,000
Mt Prospect #4	34	<5	0.087	52.9	<5	4,600
Mt Prospect #5	20.1	<5	0.065	17.3	<5	2,000
Mt Prospect #6	78.7	<5	0.125	29.1	<5	10,000
Mt Prospect #7	482	<5	0.08	104	<5	2,000
Mt Prospect #8	710	<5	0.105	134	<5	2,000

Stated value is the detection limit for this parameter. Actual value will be lower.

* MP1 - NE parking lot of Woodland Trails driving range, west of foot bridge.
MP2 - NE of Woodland Trails Driving Range, east of cell tower.
MP3 - underneath Kinsington Rd.
MP4 - underneath Wolf Rd.
MP5 - Weller and Cleven Ave.
MP6 - underneath Mt. Prospect Rd.
MP7 - Channel between NW corner of Briarwood Lake and S. Briarwood Dr. W.
MP8 - just east of Terminal Dr. and Badger Rd.

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

	Mount Prospect Sample Locations					Date: 11/29/2016	
	Water Temperature degrees F	pH	Dissolved Oxygen mg/l	DO % Saturation	Conductivity mmhos/cm	Total Dissolved Solids mg/l	Turbidity (NTU)
MP 1	45.26	8.04	10.16	86.7	1.082	692.6	17.89
MP 2	45.18	8.01	10.58	90.1	0.588	376.7	42.75
MP3	46.12	8.08	10.67	92	0.637	408.2	45.69
MP4	47.15	8.02	10.59	92.6	0.682	436.8	11.76
MP5	52.02	7.91	10.45	97.5	0.928	594.1	26.24
MP6	48.46	8.02	10.44	92.9	0.581	371.8	30.01
MP7	46.83	8.03	10.4	90.6	0.717	459.1	46.88
MP8	46.2	8.11	10.69	92.3	0.685	438.8	32.98

	Mount Prospect Sample Locations					Date: 10/11/2017	
	Water Temperature degrees F	pH	Dissolved Oxygen mg/l	DO % Saturation	Conductivity mmhos/cm	Total Dissolved Solids mg/l	Turbidity (NTU)
MP 1	62.79	7.53	6.86	73.1	0.794	508.7	70.35
MP 2	62.56	7.66	6.63	70.3	0.377	241.8	90.46
MP3	62.29	7.62	7.14	75.5	0.411	263.2	121.6
MP4	61.67	7.71	7.73	81.1	0.323	207.1	31.81
MP5	61.5	7.59	8.69	91	0.315	202.1	50.74
MP6	61.36	7.61	8.63	90.2	0.26	166.4	55.57
MP7	61.33	7.72	8.09	84.6	0.411	263.4	41.72
MP8	62.56	8.01	8.09	85.9	0.493	315.5	57.94

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

	Mount Prospect Sample Locations					Date: 6/21/2018	
	Water Temperature	pH	Dissolved Oxygen mg/l	DO % Saturation	Conductivity mmhos/cm	Total Dissolved Solids	Turbidity (NTU)
MP 1	71.07	7.77	6.78	79.2	0.656	420.4	45.06
MP 2	68.63	7.78	7.29	82.9	0.386	247	93.89
MP3	68.45	7.71	7.65	86.8	0.353	226.4	78.62
MP4	68.63	7.76	7.87	89.3	0.258	165.2	57.54
MP5	67.34	7.76	8.33	93.2	0.145	93	73.07
MP6	67.47	7.74	8.4	94.1	0.189	121.5	86.57
MP7	68.23	7.68	7.87	89	0.439	281.5	139.1
MP8	70.33	7.81	7.19	83.2	0.554	355	94.59

*Field Instrument: Eureka WaterProbe Manta 35

Samples were collected at 1' depth, if possible, otherwise 0.5'.

The water sampling provides a snapshot of the dynamic conditions present throughout the watershed and the influxes from nutrients, sedimentation, and pollutants within the municipality.

If you have any questions, please contact the offices of Aquatic Ecosystems Management.

Respectfully Submitted,

Michael Perkaus
Aquatic Biologist

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

Lake County Environmental Laboratory

Sample: 18F0335-07
Name: Mt. Prospect 1
Matrix: Surface Water **Type:** Grab
Sampled: 06/21/18 10:20
Received: 06/21/18 14:43
Collected By: Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**129**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	**4800 EST**	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		06/27/2018 07:30	MBD	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.088**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 15:23	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**10.5**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

Sample: 18F0335-08
Name: Mt. Prospect 2
Matrix: Surface Water **Type:** Grab
Sampled: 06/21/18 10:30
Received: 06/21/18 14:43
Collected By: Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**72.4**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	>2000	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		06/27/2018 07:30	MBD	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.120**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 15:36	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**108**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

Analytical Results (Continued)

Lake County Environmental Laboratory

Sample: 18F0335-09 **Sampled:** 06/21/18 10:50
Name: Mt. Prospect 3 **Received:** 06/21/18 14:43
Matrix: Surface Water **Type:** Grab **Collected By:** Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**62.1**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	>2000	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		06/29/2018 07:30	MBD	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.121**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 15:54	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**134**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

Sample: 18F0335-10 **Sampled:** 06/21/18 11:00
Name: Mt. Prospect 4 **Received:** 06/21/18 14:43
Matrix: Surface Water **Type:** Grab **Collected By:** Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**52.9**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	**4600 EST**	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		06/29/2018 07:30	MBD	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.087**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 16:02	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**34.0**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

Analytical Results (Continued)

Lake County Environmental Laboratory

Sample: 18F0335-11
Name: Mt. Prospect 5
Matrix: Surface Water **Type:** Grab
Sampled: 06/21/18 11:30
Received: 06/21/18 14:43
Collected By: Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**17.3**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	>2000	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		06/29/2018 07:30	MBD	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.065**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 16:11	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**20.1**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

Sample: 18F0335-12
Name: Mt. Prospect 6
Matrix: Surface Water **Type:** Grab
Sampled: 06/21/18 11:50
Received: 06/21/18 14:43
Collected By: Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**29.1**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	>10000	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		07/03/2018 08:10	EW	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.125**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 16:36	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**78.7**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

AQUATIC ECOSYSTEMS MANAGEMENT
P.O. Box 82 Golf, IL 60029-0082 Phone: 847-579-3090 Fax: 847-724-8212

Analytical Results (Continued)

Lake County Environmental Laboratory

Sample: 18F0335-13
Name: Mt. Prospect 7
Matrix: Surface Water **Type:** Grab

Sampled: 06/21/18 12:05
Received: 06/21/18 14:43
Collected By: Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**104**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	>2000	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		07/03/2018 08:10	EW	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.080**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 16:48	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**482**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed

Sample: 18F0335-14
Name: Mt. Prospect 8
Matrix: Surface Water **Type:** Grab

Sampled: 06/21/18 12:20
Received: 06/21/18 14:43
Collected By: Eric Martin

Parameter	Result	Unit	RL	Qualifier	Analyzed	Analyst	Method
Chloride	**134**	mg/L	2.50		07/09/2018 14:06	JS	SM-4500Cl-D-Rev 1997, 21st Ed
Fecal Coliform	>2000	CFU/100 ml	1.00		06/21/2018 15:50	TCS	SM-9222-D-Rev 2006, 22nd Ed
Oil & Grease (HEM)	<5.00	mg/L	5.00		07/03/2018 08:10	EW	EPA-1664-Rev A, 1999
Phosphorus, Total (as P)	**0.105**	mg/L	0.010		07/05/2018 12:24	SC	SM-4500P-E-Rev 1999, 21st Ed
Total Nitrogen (as N)	<5.00	mg/L	5.00		06/28/2018 17:01	ah	Internal-ShimadzuTN
Residue, Non-Filterable (TSS)	**710**	mg/L	1.30		06/26/2018 11:46	SC	SM-2540-D-Rev 1997, 21st Ed