DRSCW ILR40 Activities
March 2020– February 2021

PART I. COVERAGE UNDER GENRAL PERMITS ILR40

Not applicable to the work of the DRSCW.

PART II. NOTICE OF INTENT (NOI) REQUIREMENTS

Not applicable to the work of the DRSCW.

PART III. SPECIAL CONDITIONS

Not applicable to the work of the DRSCW.

PART IV. STORM WATER MANAGEMENT PROGRAMS

A. Requirements

Not applicable to the work of the DRSCW.

B. Minimum Control Measure

1. Public Education and Outreach on Stormwater Impacts

DRSCW outreach activities for the year ending 2020 included:

- The DRSCW website was updated and maintained during the reporting period and periodically updated with presentations and material (www.drscw.org).
- A searchable database with information on local aquatic biodiversity (IBIs), habitat (QHEI), and sediment and water column chemistry was maintained and periodically updated.
- Public information available on the website includes:
  - Chloride Fact Sheets aimed at mayors and managers, public works staff, commercial operators, and homeowners.
  - Model salt Storage and Handling Ordinances and Policies.
  - Model Facilities Plan for Snow and Ice Control.
  - A fact sheet summarizing alternative deicing products.
  - Information of effective operating parameters for commonly used anti icing compounds.
  - Parking lots chloride application rate guidance example sheet and aide memoire.
  - A brochure on coal tar sealants as a source of Polycyclic Aromatic Hydrocarbons (PAHs) aimed at homeowners (produced by the University of New Hampshire Stormwater Center).
  - Detailed reports on the biolocal and chemical conditions of area waterways.

Technical Presentations

Workgroup meetings: The Workgroup hosts bimonthly meetings where technical presentations are made on a variety of water quality topics and surface water management subjects. The audience consists of mainly stormwater and wastewater professionals but the public is welcome to attend. Presentations made during the period March 1, 2020 to February 28, 2021 are listed below. Selected presentations are made available on the DRSCW website and upon request.

April 29, 2020 – The Survivability of the COVID-19 Virus in Air, Water, Wastewater, and Various Surfaces. Presenter: Charles P. Gerba, Professor of Epidemiology and Bio-statistics in the Department of Environmental Science. University of Arizona.

April 29, 2020 -- Conserving riverine fish populations in dammed rivers: maintaining population connectivity using upstream fish passage at barriers. Presenter: Dr. Boyd Kynard, BK RiverFish.

June 24, 2020 – Restore Salt Creek. Presenter: Stephen McCracken and Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

August 26, 2020 – Changes in the Fish Assemblage of Chicago's Working Waterways over 3 Decades. Dr. Austin Happel, Ph.D. Research Biologist, John G. Shedd Aquarium & Dustin Gallagher, Aquatic Biologist, MWRDGC.

August 26, 2020– Restore Salt Creek. Presenter: Peter Gray, Aileron Communications.

October 29, 2020 – Update on Spring Brook Phase II. Presenter: Scott Meister, Manager of Natural Resources, Forest Preserve District of DuPage County.

December 9, 2021 – Reconnecting waterways in northeastern Illinois: Current progress and future challenges. Steve Pescitelli, Region II Steam Specialist, Illinois Department of Natural Resources

Other Water Quality Presentations or Workshops by the DRSCW

February 6, 2020 – Urban Winter Chloride Management - LTAP Drainage and Stormwater Conference, Purdue University, Indiana. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

April 6, 2020 – Alternatives at the Graue Mill Dam- Salt Creek Watershed Network. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

April 7, 2020 – Dam Removals in Northeast Illinois Press Conference. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

May 2020 – TMDLs – Thinking Beyond Permit Limits, River Rally (virtual conference). Presenter: Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

May 14, 2020 – IPS model - Project ID and NARP development, Lower Des Plaines Watershed Group. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

July 7 & 9, 2020 – Virtual Open Houses for the Master Plan for Salt Creek at Fullersburg Woods. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

September 8, 2020 – Master Plan for Salt Creek at Fullersburg Woods, Oak Brook Village Board Meeting. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

September 22, 2020 – Master Plan for Salt Creek at Fullersburg Woods, FPDDC Planning Meeting. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

October 1, 2020 – Chloride TMDLs in NE Illinois for USEPA Chloride Working Group. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

October 1, 8, & 14, 2020 – Welcome and Introductions for the Chloride Workshops, October 1, 8 and 14, 2020. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup and Jennifer Hammer, The Conservation Foundation.

October 19, 2020 – Impacts of Dams and the Benefits of Dam Removal, TCF Will County Advisory Council, October 19, 2020. Presenter: Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

October 24, 2020 – Master Plan for Salt Creek at Fullersburg Woods, LWV-LaGrange. Presenter: Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

November 12, 2020 – Master Plan for Salt Creek at Fullersburg Woods, TCF DuPage County Advisory Council. Presenter: Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

November 18, 2020 – Nutrient Assessment and Reduction Plans, North Branch Watershed Workgroup (NBWW) Membership Meeting, November 18, 2020. Presenter: Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

January 27, 2021 – Project Identification and Selection for Aquatic Life Improvement, Flint Creek/Spring Creek Watersheds Partnership. Presenter: Stephen McCracken and Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

February 26, 2021 – Managing Stream Resource Quality in Urban Watersheds, Water and Waste Management (WWM) 3rd International Conference and Expo. Presenter: Stephen McCracken, The Conservation Foundation/DuPage River Salt Creek Workgroup.

February 26, 2021 – Dam Removals: A Key Component of Stream Ecosystem Restoration, Water and Waste Management (WWM) 3rd International Conference and Expo. Presenter: Deanna Doohaluk, The Conservation Foundation/DuPage River Salt Creek Workgroup.

2. Public Involvement and Participation **–** no activities

3. Illicit Discharge Detection and Elimination – no activities

4. Construction Site Storm Water Runoff Control - no activities

5. Post-Construction Storm Water Management in New Development and Redevelopment - no activities

6. Pollution Prevention/Good Housekeeping for Municipal Operations

Chloride Questionnaires
As monitoring ambient chloride concentrations has proven an imperfect metric for tracking efficiency trends in winter salt use the DRSCW has attempted to track adoption of sensible salting BMPs in the program area since 2007. Tracking target BMP adoption in the program area provides opportunities to evaluate the impacts of the chloride management workshops, identify material for future workshops, and form suppositions about salt use per unit of service expended inside the program area relative to 2006 levels.

In 2007, 2010, 2012, 2014, 2016, and 2018 the DRSCW distributed a questionnaire to approximately 80 municipal highway operations and public works agencies to obtain information about deicing practices throughout the program area. Findings of the 2018 questionnaire were include in the 2018 Annual Report. A new questionnaire will be distributed in spring of 2021 and the results will be supplied in the 2021 MS4 Activities Report.

Chloride Reduction Workshops
During the reporting period March 1, 2020 to February 28, 2021, three chloride reduction workshops and four technical webinar briefs were held. Due to precautions necessitated by the Coronavirus pandemic, the workshops were held in a webinar format allowing the groups to collaborate and host the workshops jointly. Workshop registration was also made available to agencies in McHenry, Lake and Cook counties as their usual annual deicing workshops were cancelled. Accordingly, the webinars were attended by staff in DuPage, Will, Kane, Kendall, Lake, McHenry and Cook counties.

Public Roads Deicing Workshops were held on October 1 and October 14, 2020 (Plate 1). Fortin Consulting, Inc. from Minnesota was engaged to present the material. A registration fee was required per agency in order view the webinar. The links were sharable so the webinars could be viewed individually or in groups. A poll was taken at the beginning of each webinar asking how many persons were in the room. The polling results indicated that there were 280 persons viewing the Oct. 1 webinar and 190 persons viewing the Oct. 14th webinar for a total of 470 attendees for the Public Roads webinars. Certificates of attendance were provided to those who requested them. Evaluation surveys were sent to the persons who logged in to the webinars. A link to the Minnesota Snow and Ice Control: Field Book for Snowplow Operators was provided to each registrant. The registration list by agency for the Winter De-icing Workshops is included in Attachment A.

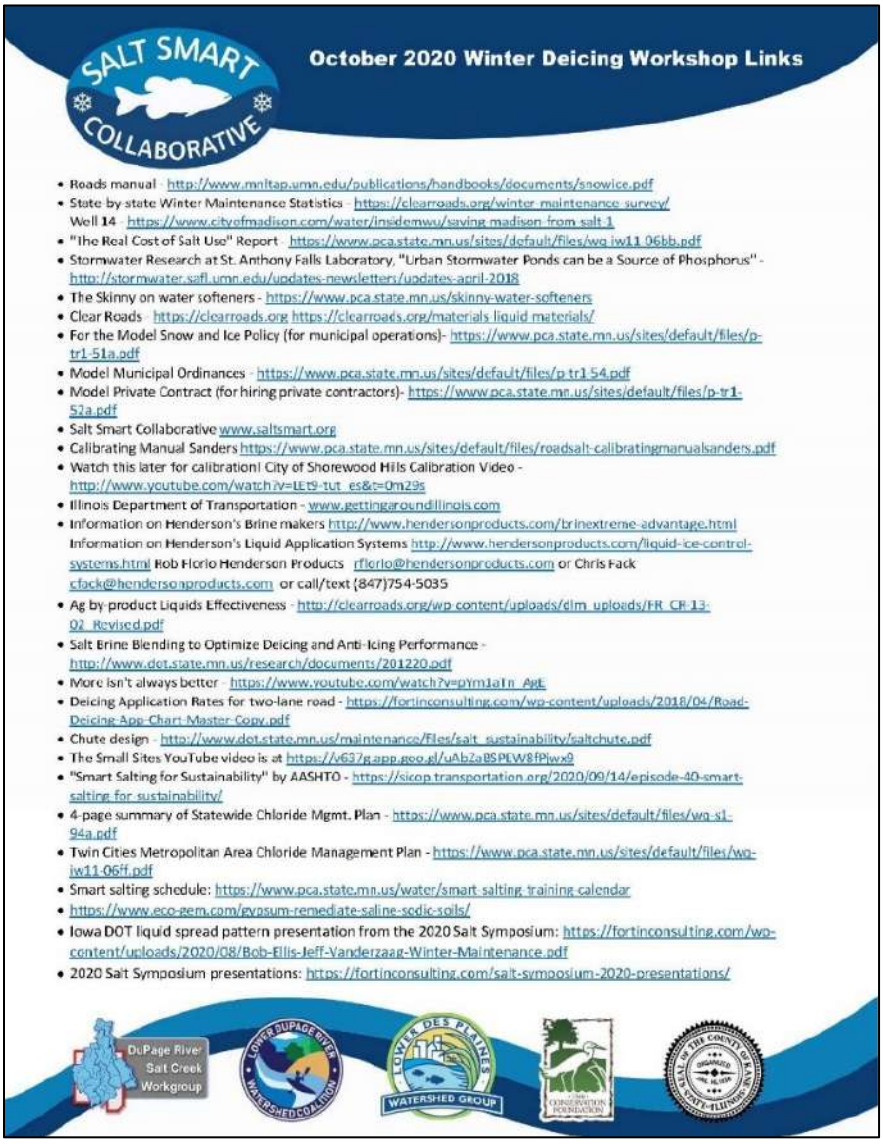
Plate 1. *Deicing Workshops Registration Form, 2020.*

On October 8, 2020 the Parking Lots and Sidewalks Deicing Workshop webinar was held, Fortin Consulting, Inc. was again engaged to present the material. The polling results indicated that there were 123 persons viewing the webinar. Certificates of attendance were provided to those who requested them. Evaluation surveys were sent to the persons who logged in to the webinars. A link to the Minnesota Pollution Control Agency Winter Parking Lot & Sidewalk Maintenance Manual was provided to each registrant. The registration list by agency for the Winter De-icing Workshops is included in Attachment A.

Questions from participants were entered into the chat and answered by Fortin Consulting or Workgroup staff as well as others participating in the training. A summary of all links provided during the training as well as other links added to the chat were captured and provided to the participants after the webinar (Plate 2).

To complement the Winter Deicing Workshops, the Winter Technical Briefs – Mini-Webinar Series was presented to focus on specific issues (Plate 13). Topics in 2020 included: October 20 – Reducing Salt With Organics: The Boost & Reduce Method, October 27 – Sourcewell & Cooperative Purchasing, November 10 – Benefits of Segmented Blades, and November 17 – The Fine Art of Brine Making. Staff also worked with local partners to create a training video on how to calibrate a walk behind salt spreader. These webinars and training video are posted on www.saltsmart.org .

Plate 2. *Links from webinar presentation and chat, 2020.*



Ambient Impact Monitoring

DRSCW's Chloride Education and Reduction Program is performing an analysis to demonstrate any observable reduction in chloride loading within the water quality data collected since the beginning of program efforts. For over a decade, the program has been implementing a number of chloride reduction efforts, including:

- Annual Educational workshops (for public roads and parking lots/sidewalks)
- Equipment calibration training
- Product and chemical alternative summaries
- Equipment and salt application advancements
- Salt usage, storage and deicing best management practices
- Example salt use policies and management plans

The goal of the analysis is to see if these efforts are resulting in a discernable impact on chloride loading within the instream water quality data collected by DRSCW from 2009 to present. The analysis is challenging. There are many factors that affect the resulting water quality data, including variability in winter weather over the years (temperatures, precipitation, number of storms, types of storms), inconsistency in municipal salt application events across the DRSCW's watershed areas, and inconsistency in the way events are defined and tracked by municipalities. The variability inherent in winter weather conditions, municipal application practices and record keeping does not allow the loading data to show the effect of reduction practices without accounting for it in some way. Additionally, the assumption that reductions in public or institutional use (the main recipients of training) will automatically translate into lowering of ambient chloride loading needs to be proven.

Our approach consists of using direct chloride sampling and analysis concentration data, along with adjusted specific conductivity concentration data collected by the DRSCW, and USGS flow data to calculate loading (in pound per day) of chloride for each DRSCW watershed over the past decade. This created loading data. The methodology then required that the loading data be adjusted or normalized to account for variabilities in winter weather and salt application events. The team examined several different weather datasets to try and overlay the loading data but none proved adequate. In early 2021, the DRSCW signed a contract with Weather Command / Murray and Trettel, Inc. for 10 years of detailed data.

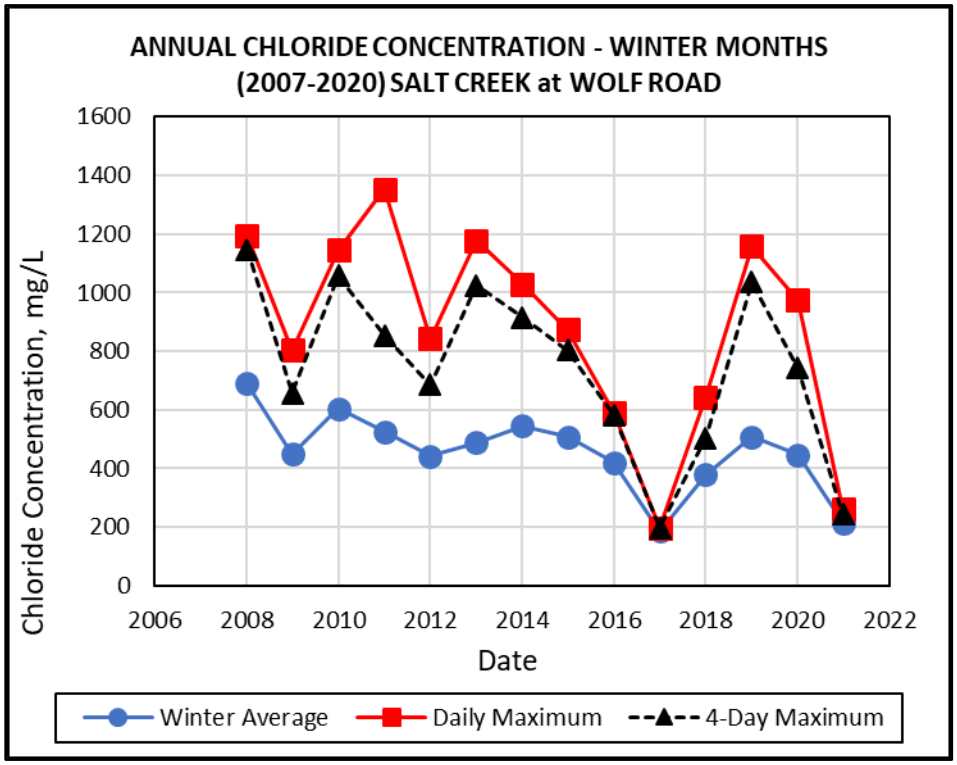
The weather data is being analyzed by individual watershed and separately for summer and winter periods each year. The hope is that once adjusted for variabilities, the loading data will better show the effect of the program's salt use reduction training and best management practices implementation by municipalities on water quality.

As of the time of this report, the data has been organized by watershed and season, and water quality loadings have been calculated for the study period. Detailed weather and precipitation data is being reviewed to develop a method for accounting for the variability in temperatures and precipitation, municipal salt application events, and the way salt application events are defined and tracked. Adjustments will be performed using those methods, and the resulting loading trends will be presented in a future report. This analysis may provide an indication of the effectiveness of the Workgroup's chloride education and reduction efforts.

Ambient Winter Chloride Monitoring

Ambient monitoring of winter conductivity was carried out at 6 locations in the program area in 2019-2020 (4 sites monitored by the DRSCW and 2 sites monitored by MWRD). Conductivity is used to calculate chloride concentrations based on a relationship established by the DRSCW in 2007 and 2019 (so the data is referred to as calculated). Calculated Annual chloride concentrations for the winter months for the 6 sites are depicted in Figure 1-3 and depicted in Map 1.

Figure 1. *Calculated annual chloride concentrations - winter months (2007-2020) for Salt Creek at Wolf Road (top panel) and Salt Creek at Busse Woods Main dam (bottom panel).*



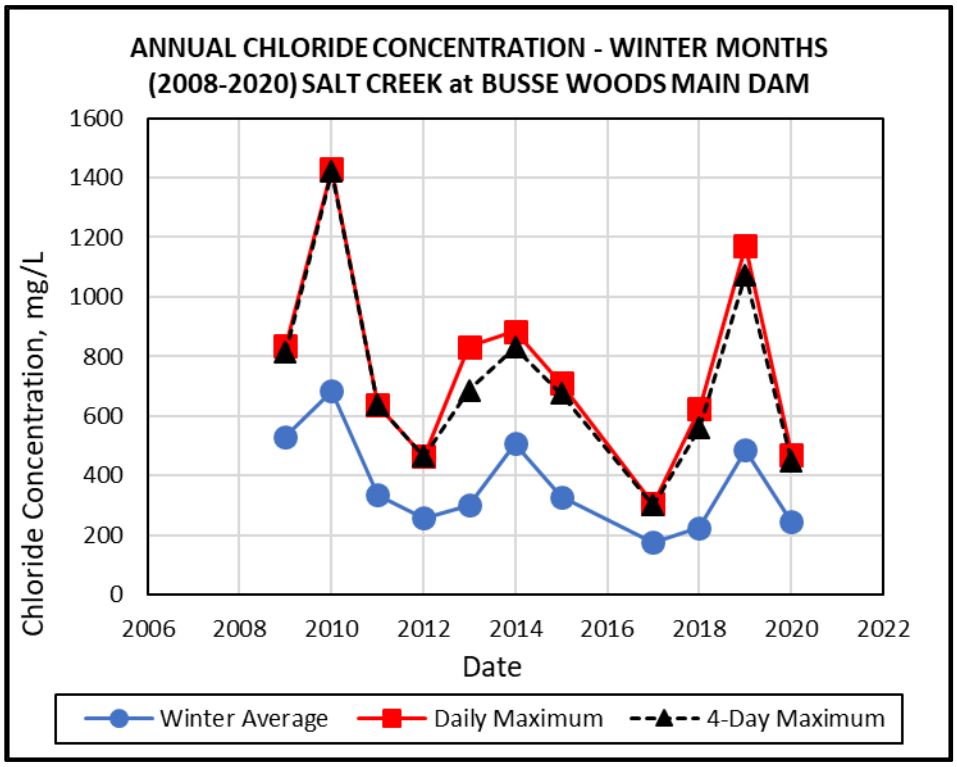
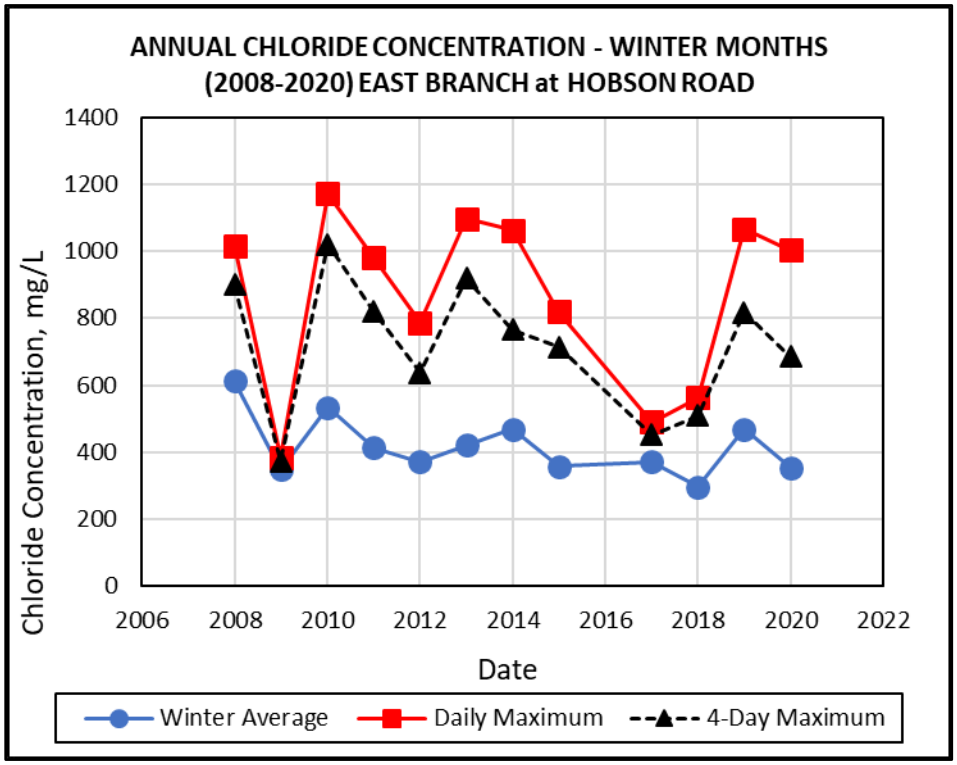


Figure 2. *Calculated annual calculated chloride concentrations - winter months (2008-2020) for East Branch at Hobson Road (top panel) and East Branch at Army Trail Road (bottom panel).*



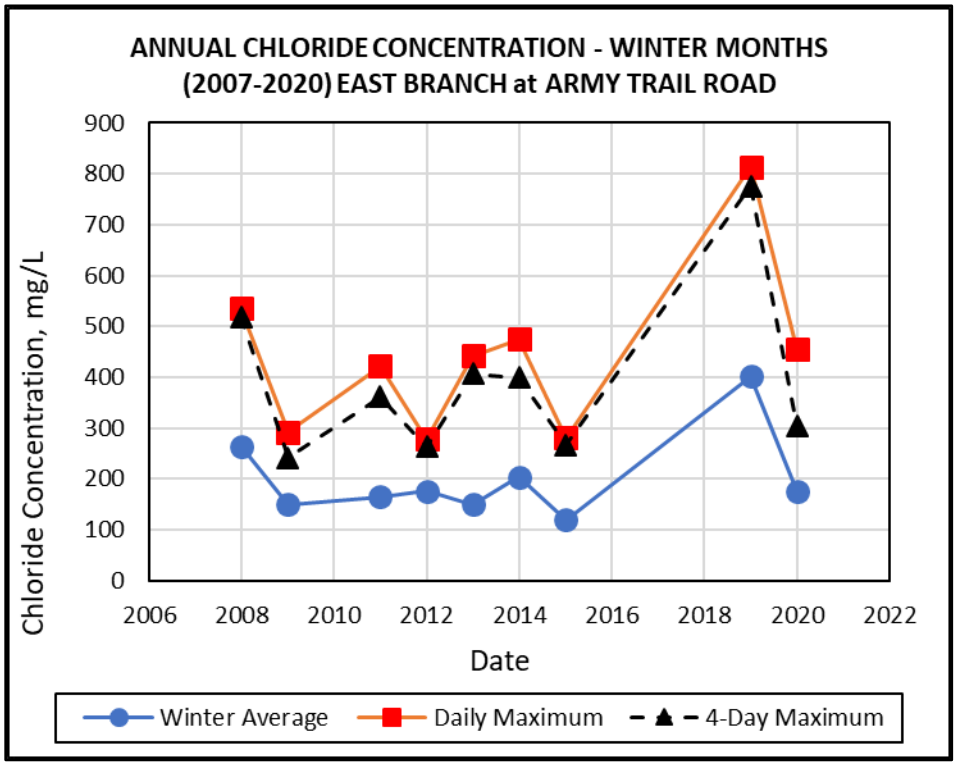
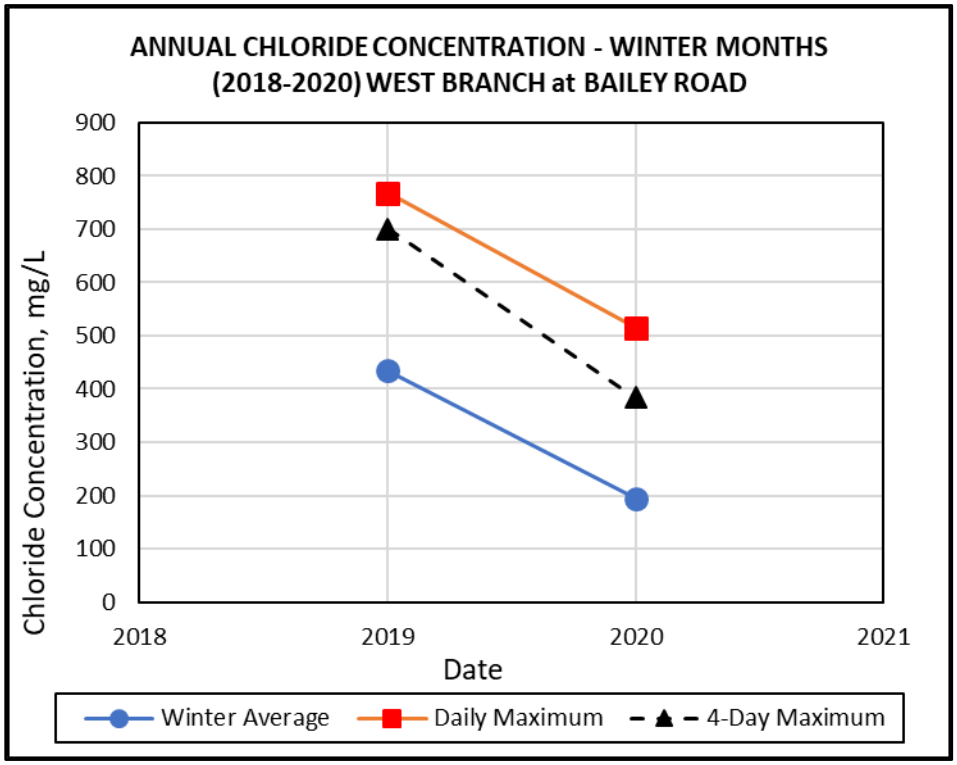
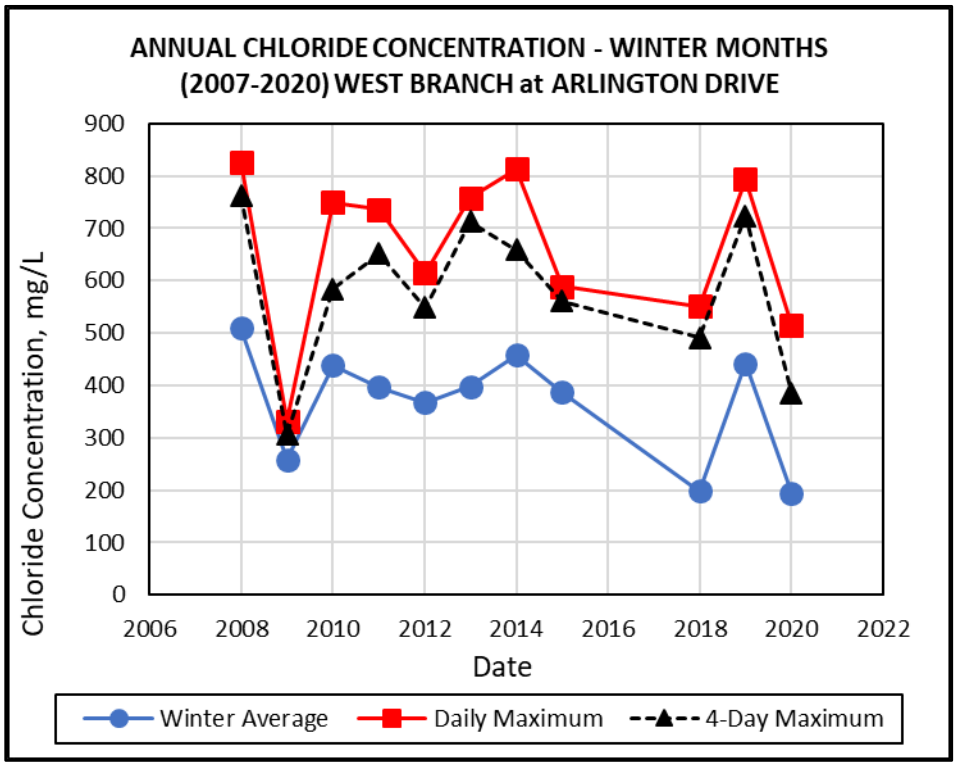


Figure 3. *Calculated annual chloride concentrations - winter months (2018-2020) for West Branch at Bailey Road (top panel) and West Branch at Arlington Road (bottom panel).*





C. Qualifying State, Country or Local Program

Not applicable to the work of the DRSCW.

D. Sharing Responsibility

This report outlines the activities conducted by the DRSCW on behalf of its' members related to the implementation of the ILR40 permit. It is the responsibility of the individual ILR40 permit holders to utilize this information to fulfill the reporting requirements outlined in Part V.C. of the permit.

E. Reviewing and Updating Stormwater Management Programs

Not applicable to the work of the DRSCW.

PART V. MONITORING, RECORDKEEPING, AND REPORTING

A. Monitoring

The ILR40 permit states that permit holders "must develop and implement a monitoring and assessment program to evaluate the effectiveness of the BMPs being implemented to reduce pollutant loadings and water quality impacts". The DRSCW monitoring program meets the following monitoring objectives and requirements outlined in the permit:

- Measuring pollutants over time (Part V. A. 2. b. ii)
- Sediment monitoring (Part V. A. 2. b. iii)
- Assessing physical and habitat characteristics such as stream bank erosion caused by storm water discharges ((Part V. A. 2. b. vi)
- Collaborative watershed-scape monitoring (Part V. A. 2. b. x)
- Ambient monitoring of total suspended solids, total nitrogen, total phosphorus, fecal coliform, chlorides, and oil and grease (Part V. A. 2. c.)

The DRSCW water quality monitoring program is made up of two components: 1) Bioassessment and 2) DO monitoring.

BIOASSESSMENT

Overview and Sampling Plan

A biological and water quality survey, or "biosurvey", is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. The DRSCW bioassessment is the latter. The DRSCW bioassessment program began in 2007 with sampling in the West Branch DuPage River, East Branch DuPage River and Salt Creek watersheds. From 2009-2016, each watershed was sampled

on a 3-year rotation beginning with the West Branch DuPage River watershed in 2006. Beginning in 2017, watershed will be sampled in a 5-year rotation ensuring that each watershed will be sampled during the effective period of the ILR40 permit. The bioassessment program functions under a quality assurance plan agreed on with the Illinois Environmental Protection Agency (http://drscw.org/wp/bioassessment/). Table 1 details the bioassessment sampling dates for each DRSCW watershed.

Table 1. *Bioassessment sampling dates for the DRSCW watershed*

Watershed	Sampling Completed (year)	Sampling Scheduled (year)
East Branch DuPage River	2007, 2011, 2014, 2019	2023
West Branch DuPage River	2007, 2009, 2012, 2015, 2020	2024
Salt Creek	2007, 2010, 2013, 2016	2021

The DRSCW bioassessment program utilizes standardized biological, chemical, and physical monitoring and assessment techniques employed to meet three major objectives:

1) determine the extent to which biological assemblages are impaired (using IEPA guidelines);
2) determine the categorical stressors and sources that are associated with those impairments; and,
3) add to the broader databases for the DuPage River and Salt Creek watersheds to track and understand changes through time in response to abatement actions or other influences.

The data collects as part of the bioassessment is processed, evaluated, and synthesized as a biological and water quality assessment of aquatic life use status. The assessments are directly comparable to previously conducted bioassessments such that trends in status can be examined and causes and sources of impairment can be confirmed, amended, or removed. A final report containing a summary of major findings and recommendations for future monitoring, follow-up investigations, and any immediate actions that are needed to resolve readily diagnosed impairments is prepared following each bioassessment. The bioassessment reports are posted on the DRSCW at http://drscw.org/wp/bioassessment/. It is not the role of the bioassessments to identify specific remedial actions on a site specific or watershed basis. However, the baseline data provided by the bioassessments contributes to the Integrated Priority System that was developed to help determine and prioritize remedial projects (http://drscw.org/wp/project-identification-and-prioritization-system/).

Sampling sites for the bioassessment were determined systematically using a geometric design supplemented by the bracketing of features likely to exude an influence over stream resource quality, such as CSOs, dams and wastewater outfalls. The geometric site selection process starts at the downstream terminus or “pour point” of the watershed (Level 1 site), then continues by deriving each subsequent “panel” at descending intervals of one-half the drainage area (D.A.) of the preceding level. Thus, the drainage area of each successive level decreases geometrically. This results in in seven drainage area levels in each of the three watersheds, starting at the largest

(150 sq. mi) and continuing through successive panels of 75, 38, 19, 9, 5 and 2 sq. mi. Targeted sites are then added to fill gaps left by the geometric design and assure complete spatial coverage in order to capture all significant pollution gradients including reaches that are impacted by wastewater treatment plants (WWTPs), major stormwater sources, combined sewer overflows (CSOs) and dams. The number of sampling sites by method/protocol and watershed are listed in Table 2.

Representativeness – Reference Sites

Data is collected from selected regional reference sites in northeastern Illinois preferably to include existing Illinois EPA and Illinois DNR reference sites, potentially being supplemented with other sites that meet the Illinois EPA criteria for reference conditions. One purpose of this data will be to index the biological methods used in this study that are different from Illinois EPA and/or DNR to the reference condition and biological index calibration as defined by Illinois EPA. In addition, the current Illinois EPA reference network does not yet include smaller headwater streams, hence reference data is needed to accomplish an assessment of that data. Presently thirteen (13) reference sites have been established.

Table 2. *Number of sampling sites in the DRSCW project area.*

Method/Protocol	West Branch DuPage River (2020)	East Branch DuPage River (2019)	Salt Creek (2016)	Reference Sites (2006-2020)	Total Sites
Biological sampling					
Fish	42	41	51	13	147
Macroinvertebrates	42	41	51	13	147
QHEI	42	41	51	13	147
Water Column Chemical/Physical Sampling					
Nutrients*	42	38	51	6	136
Water Quality Metals	30	38	51	6	136
Water Quality Organics	18	11	16	6	51
Sediment Sampling	23	15	16	6	60

*Also included indicators or organic enrichment and ionic strength, total suspended solids (TSS), DO, pH and temperature. Also, in 2019 and 2020, chlorophyll A was included as a nutrient parameter.

The bioassessment sampling includes four (4) sampling methods/protocols: biological sampling, Qualitative Habitat Evaluation Index (QHEI), water column chemical/physical parameter sampling and sediment chemistry. The biological sampling includes two assemblages: fish and macroinvertebrates.

The Fish, Habitat and Water Chemistry sampling results presented in this report summarize the findings for the mainstem reaches of the West Branch DuPage River including the 2020 data and macroinvertebrate sampling for the sampling conducted in 2019 in the East Branch DuPage River. A map of the 2019 East Branch DuPage River bioassessment sites can be found in Map 2 and a map of the 2020 West Branch DuPage River sampling sites can be found in Map 3. Detailed

analysis of all results for the East Branch DuPage River, the West Branch DuPage River and Salt Creek and their tributaries and can be found at http://drscw.org/wp/bioassessment/. Additionally, summaries of the findings for the mainstem East Branch DuPage River and Salt Creek can be found in the 2018 and 2019 DRSCW MS4 Activities Report.

The fish and macroinvertebrate results are presented as Index of Biotic Integrity (IBI) scores. IBI is an evaluation of a waterbodies biological community in a manner that allows the identification, classification and ranking of water pollution and other stressors. IBIs allow the statistical association of various anthropogenic influences on a water body with the observed biological activity in said water body and in turn the evaluation of management interventions in a process of adaptive management. Chemical testing of water samples produces only a snapshot of chemical concentrations while an IBI allows an evaluation of the net impact of chemical, physical and flow variables on a biological community structure. Dr. James Karr formulated the IBI concept in 1981.

FISH

Methodology

Methods for the collection of fish at wadeable sites was performed using a tow-barge or longline pulsed D.C. electrofishing apparatus (MBI 2006b). A Wisconsin DNR battery powered backpack electrofishing unit was used as an alternative to the long line in the smallest streams (Ohio EPA 1989). A three-person crew carried out the sampling protocol for each type of wading equipment sampling in an upstream direction. Sampling effort was indexed to linear distance and ranged from 150-200 meters in length. Non-wadeable sites were sampled with a raft-mounted pulsed D.C. electrofishing device in a downstream direction (MBI 2007). Sampling effort was indexed to lineal distance over 0.5 km. Sampling was conducted during a June 15-October 15 seasonal index period.

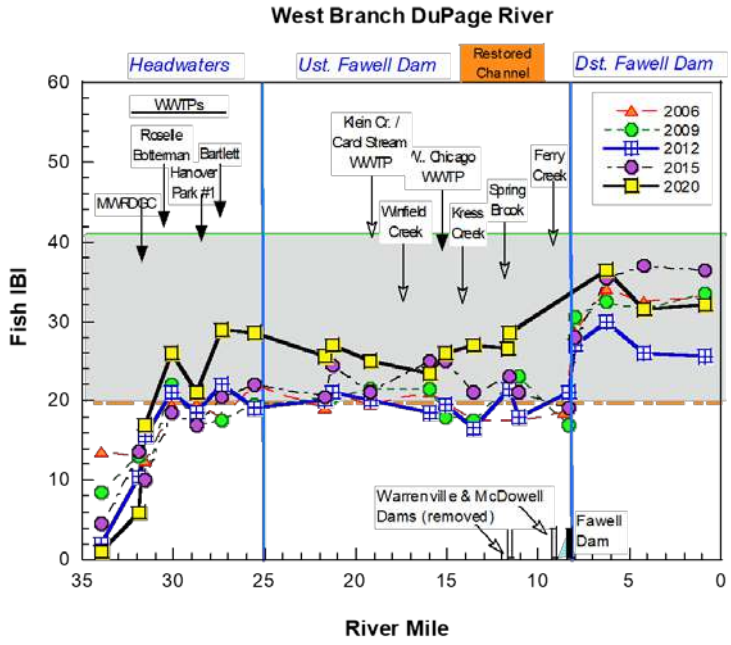
Samples from each site were processed by enumerating and recording weights by species and by life stage (y-o-y, juvenile, and adult). All captured fish were immediately placed in a live well, bucket, or live net for processing. Water was replaced and/or aerated regularly to maintain adequate D.O. levels in the water and to minimize mortality. Fish not retained for voucher or other purposes were released back into the water after they had been identified to species, examined for external anomalies, and weighed either individually or in batches. While the majority of captured fish were identified to species in the field, any uncertainty about the field identification required their preservation for later laboratory identification. Identification was made to the species level at a minimum and to the sub-specific level if necessary. Vouchers were deposited and verified at The Ohio State University Museum of Biodiversity (OSUMB) in Columbus, OH.

Results

West Branch DuPage River

Fish assemblage conditions throughout the West Branch DuPage River watershed a in the poor and fair ranges (Figure 4).

Figure 4. *Fish IBI scores in the West Branch DuPage River, 2009, 2012, 2015, and 2020 relation to municipal POTW dischargers and tributaries.*



Bars along the x-axis depict mainstem dams or weirs (only black bars impede fish passage). The shaded area demarcates the "fair" narrative range.

MACROINVERTEBRATES

Methodology

The macroinvertebrate assemblage is sampled using the Illinois EPA (IEPA) multi-habitat method (IEPA 2005). Laboratory procedures followed the IEPA (2005) methodology for processing multi-habitat samples by producing a 300-organism subsample with a scan and pre-pick of large and/or rare taxa from a gridded tray. Taxonomic resolution is performed to the lowest practicable resolution for the common macroinvertebrate assemblage groups such as mayflies, stoneflies, caddisflies, midges, and crustaceans, which goes beyond the genus level requirement of IEPA (2005). However, calculation of the macroinvertebrate IBI followed IEPA methods in using genera as the lowest level of taxonomy for mIBI calculation and scoring.

Results

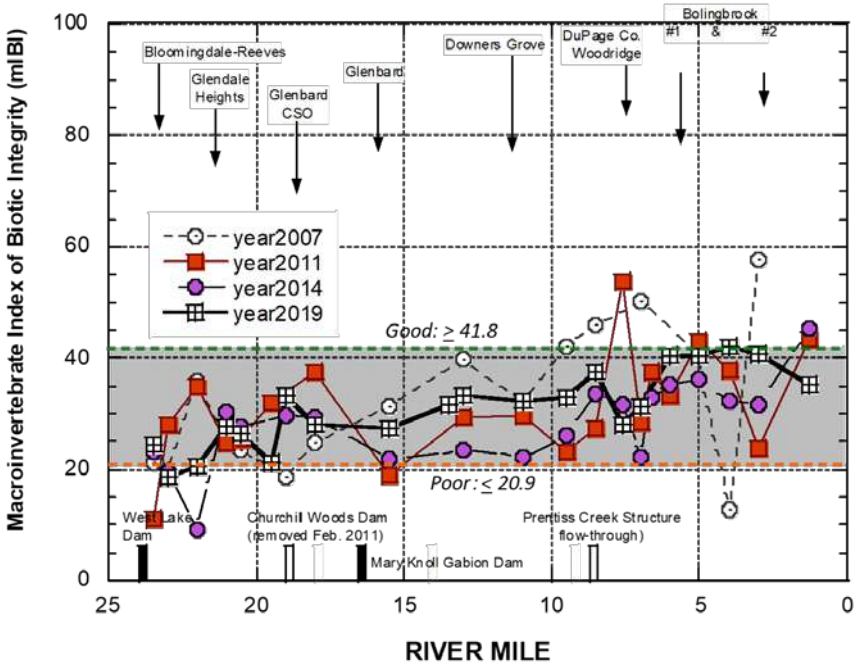
East Branch DuPage River

Macroinvertebrate collections from the 2019 East Branch are in the primarily in the fair ranges (Figure 5).

West Branch DuPage River

Macroinvertebrate collections from the 2020 West Branch are still pending and will be provided in the 2020 DRSCW MS4 Activities Report.

Figure 5. *Macroinvertebrate IBI scores in the East Branch DuPage River, 2007, 2011, 2014, and 2019 relation to municipal POTW dischargers.*



Bars along the x-axis depict mainstem dams or weirs (only black bars impede fish passage). The shaded area demarcates the "fair" narrative range.

HABITAT

Methodology

Physical habitat was evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995; Ohio EPA 2006b) and as modified by MBI for specific attributes. Attributes of habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient used to determine the QHEI score which generally ranges from 20 to less than 100. QHEI scores and physical habitat attribute were recorded in conjunction with fish collections.

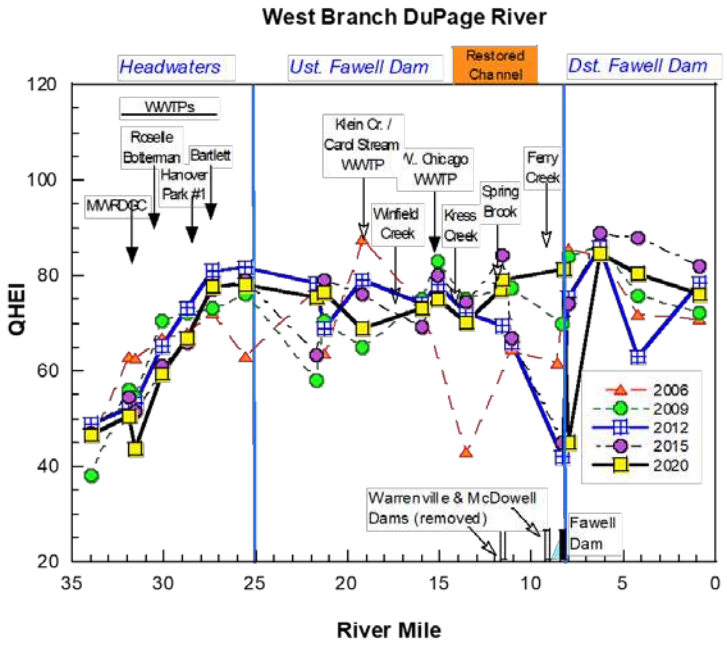
Results

The physical habitat of a stream is a primary determinant of biological quality. Streams in the glaciated Midwest, left in their natural state, typically possess riffle-pool-run sequences, high sinuosity, and well-developed channels with deep pools, heterogeneous substrates and cover in the form of woody debris, glacial tills, and aquatic macrophytes. The QHEI categorically scores the basic components of stream habitat into ranks according to the degree to which those components are found in a natural state, or conversely, in an altered or modified state.

West Branch DuPage River

Based on QHEI scores, mainstem habitat quality fell mostly in the good ranges, but varied by location (Figure 6).

Figure 6. *Qualitative Habitat Evaluation Index (QHEI) scores for the West Branch DuPage River in 2009, 2012, 2015, and 2020 in relation to municipal WWTP discharges and tributaries.*



Bars along the x-axis depict mainstem dams or weirs (black bars are dams that impede fish passage).

WATER QUALITY CHEMISTRY

Methodology

Water column and sediment samples are collected as part of the DRSCW bioassessment programs. The total number of sites sampled is detailed in Table 2. Total number of collected samples by watershed typical for a full assessment by watershed are given in Table 3. The number of samples collected at each site is largely a function of the site's drainage area with the frequency of sampling increasing as drainage size increases (Table 4). Organics sampling is a single sample done at a subset of sites. Sediment sampling is done at a subset of 60 sites using the same procedures as IEPA.

The parameters sampled for are included in Table 5 and can be grouped into demand parameters, nutrients, demand, metals and organics. All sampling occurs between June and October of the sample year with the exception of sediment that occurs October to December. The Standard Operating Procedure for water quality sampling can be found at http://drscw.org/wp/bioassessment/.

Table 3. *Total number of samples by watershed typical for a full assessment by watershed.*

Watershed	Approximate # Sites	Demand Samples	Nutrients Samples	Metals Samples	Organics Samples
Salt Creek (2016)	51	280	280	149	16
West Branch DR (2020)	42	225	225	116	18
East Branch DR (2019)	38	212	212	100	11

Table 4. *Approximate distribution of sample numbers by drainage area across the monitoring area.*

Drainage Area and site numbers	>100 sq mi (n=12)	>75 sq mi (n=25)	>38 sq mi (n=11)	>19 sq mi (n=11)	>8 sq mi (n=15)	>5 sq mi (n=24)	>2 sq mi (n= 46)
Mean # Samples demand /nutrients	12	9	6	6	4	4	2
Mean # Samples metals	6	6	4	4	2	2	0

Results

The discussion presented below focuses on the constituents listed in the MS4 permit: total suspended solids, total nitrogen, total phosphorus, fecal coliform, chlorides, and oil and grease. Total nitrogen is presented as ammonia, nitrate, and total kjeldahl nitrogen (TKN). Prior to the 2016 sampling period, fecal coliform and oil and grease sampling was not conducted. Oil and grease sampling and/or fecal coliform were added to the bioassessment sampling for Salt Creek in 2016, the East Branch DuPage River in 2019, and the West Branch DuPage River in 2020 ensuring that each watershed will be sampled for that parameter during the effective period of the ILR40 permit.

West Branch DuPage River

In 2020, samples for fecal coliform samples were collected at four (4) sites on the mainstem West Branch DuPage River and two (2) sites on Spring Brook #1. Each site was sampled 5 times within a 30-day period beginning on September 29, 2020. The results are summarized below in Table 6.

West Branch mainstem flows are effluent dominated during the late summer-early fall months. As such, chemical water quality is highly influenced by the concentration and composition of chemical constituents in WWTP effluents (Figures 7-9).

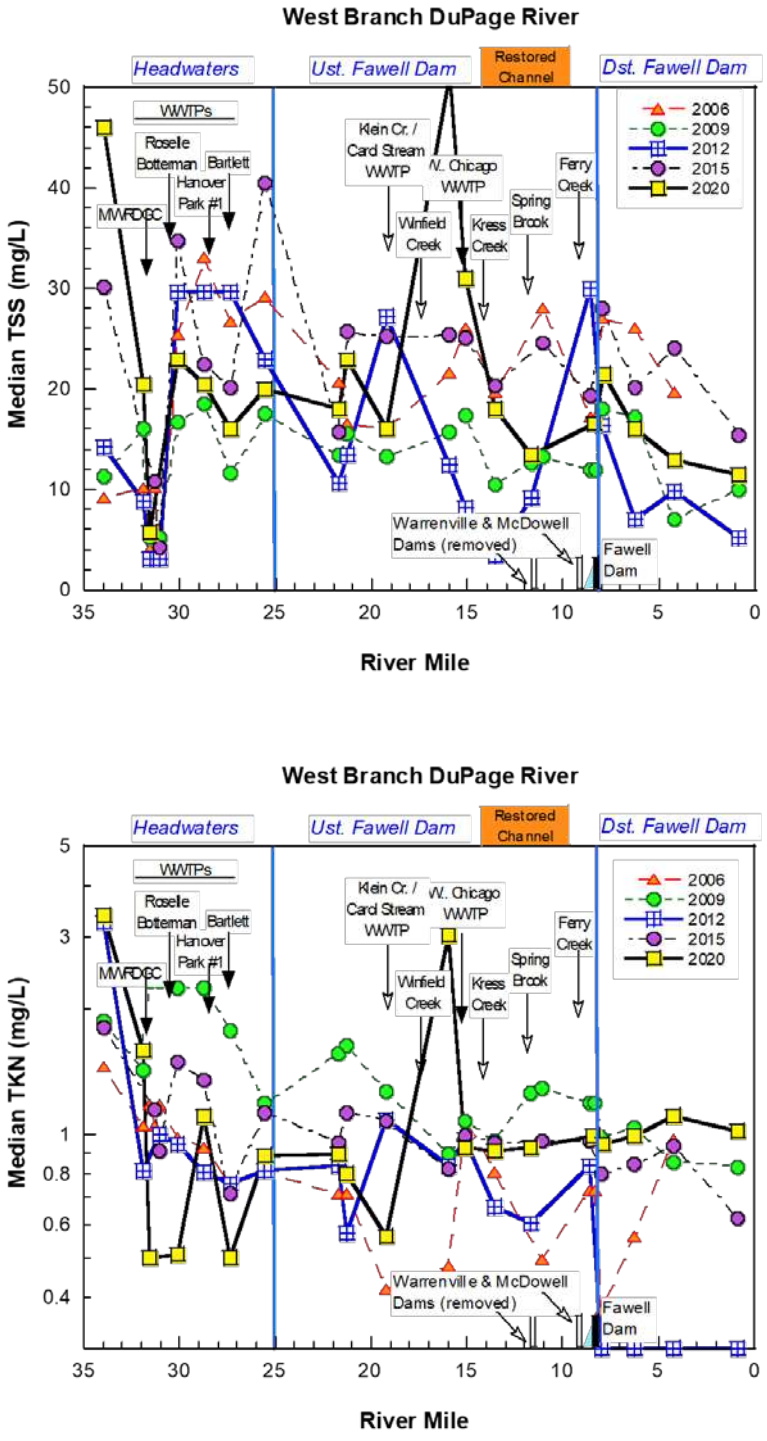
Table 5. *Water Quality and sediment Parameters sampled as part of the DRSCW Bioassessment Program.*

Water Quality Parameters	Sediment Parameters
Demand Parameters	**Sediment Metals**
5 Day BOD	Arsenic
Chloride	Barium
Conductivity	Cadmium
Dissolved Oxygen	Chromium
pH	Copper
Temperature	Iron
Total Dissolved Solids	Lead
Total Suspended Solids	Manganese
	Nickel
Nutrients	Potassium
Ammonia	Silver
Nitrogen/Nitrate	Zinc
Nitrogen – Total Kjeldahl	
Phosphorus, Total	
Chlorophyll A	**Sediment Organics**
	Organochlorine Pesticides
Metals	PCBS
Cadmium	Percent Moisture
Calcium	Semivolatile Organics
Copper	Volatile Organic Compounds
Iron	
Lead	
Magnesium	
Zinc	
Organics – Water	
PCBS Volatile Organics	
Pesticides	
Semivolatile Organics	

Table 6. *Concentrations of Fecal Coliform in 2020 in the West Branch DuPage River watershed.*

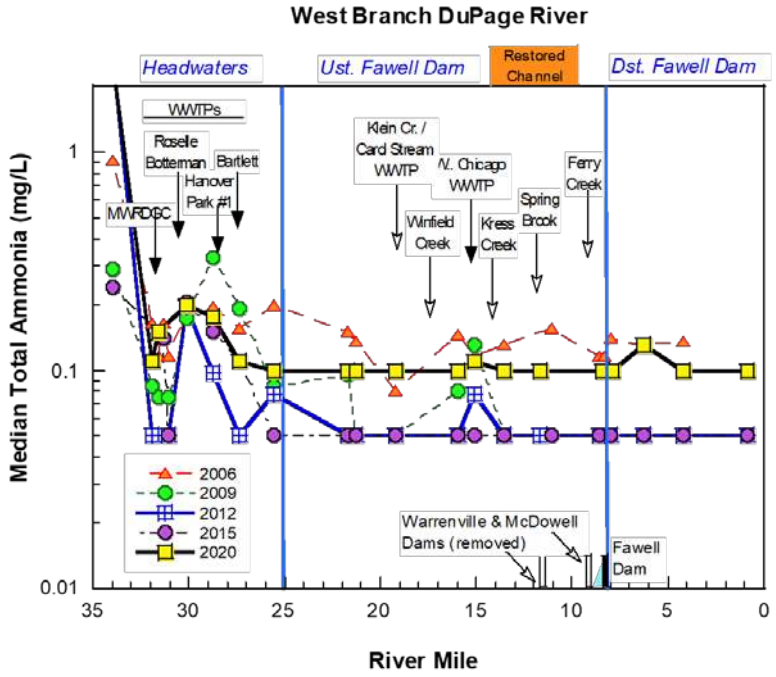
Site Number	Site Description	Fecal Coliform (cfu/100mL) 9/29/2020	10/1/2020	10/5/2020	10/12/2020	10/15/2020	Mean Fecal Coliform (cfu/100mL)
West Branch DuPage River							
WB20	West Branch DuPage River, Downstream of Struckman Boulevard	150.00	<50	50.00	<50	50.00	72.11
WB17	West Branch DuPage River, 1600' upstream from Geneva Rd. within Prairie Path Meadows	50.00	<50	<50	<50	<50	50
WB41	West Branch DuPage River, Upstream from Ogden Ave.; downstream from Fawell Dam	50.00	<50	<50	<50	<50	50
WB08	West Branch DuPage River, At Knoch Knolls Park	50.00	<50	<50	<50	<50	50
Spring Brook #1							
WB11	Spring Brook #1, Upstream of 2nd Bridge in Wheaton Sanitary District (WSD); upstream WSD discharge	<50	<50	<50	<50	<50	ND
WB28	Spring Brook #1, 700 feet Downstream of WSD discharge	<50	<50	5.00	<50	<50	5

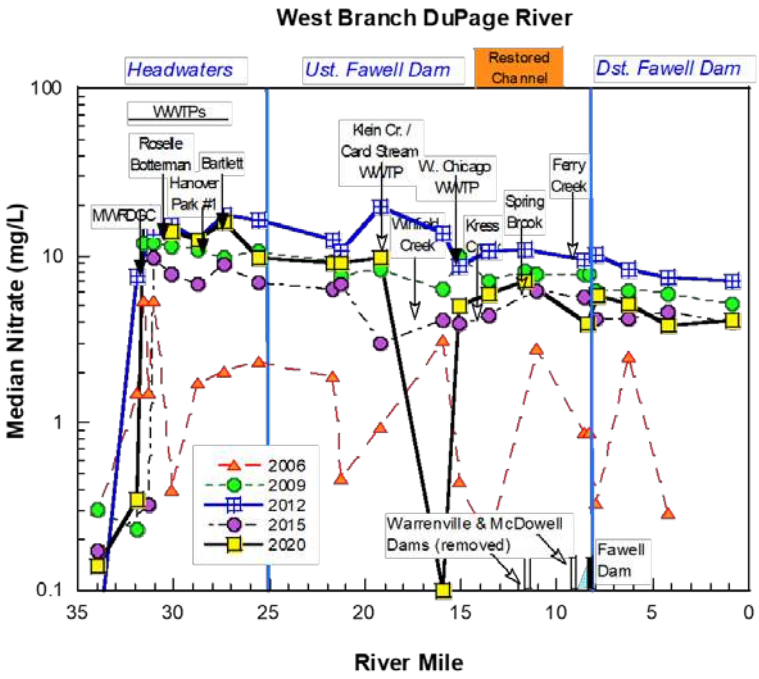
Figure 7. *Median concentrations of total suspended solids (top panel) and TKN (lower panel) from West Branch DuPage River samples in 2009, 2012, 2015, and 2020 in relation to municipal WWTP discharges.*



Bars along the x-axis depict mainstem dams or weirs (black bars are dams that impede fish passage).

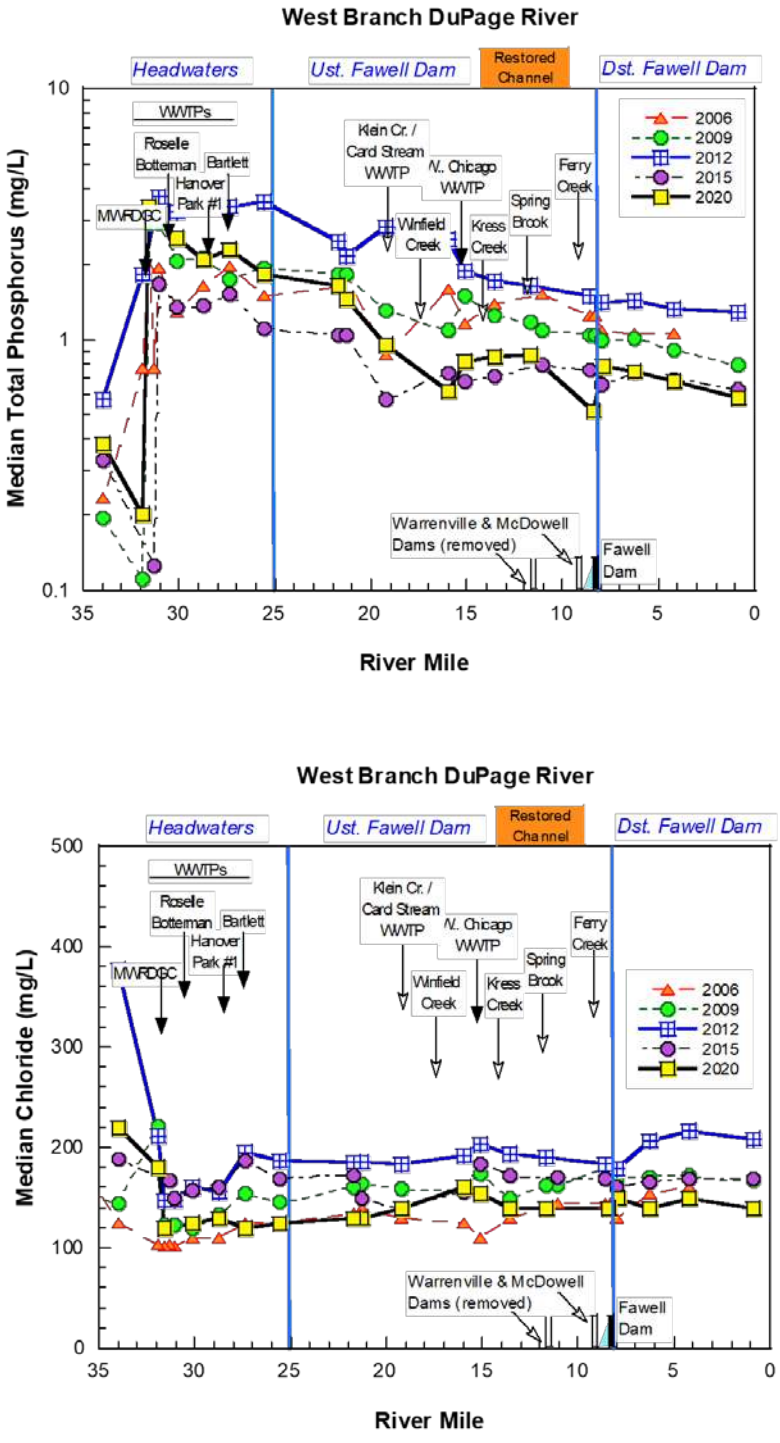
Figure 8. *Median concentrations of ammonia-N (top panel) and nitrate+nitrite-N (lower panel) from West Branch DuPage River samples in 2009, 2012, 2015, and 2020 in relation to municipal WWTP discharges and tributaries.*





Bars along the x-axis depict mainstem dams or weirs (only black bars for dams that impede fish passage).

Figure 9. *Median concentrations total phosphorus (top panel) and chloride (bottom panel) from West Branch DuPage River samples in 2009, 2012, 2015, and 2020 in relation to municipal WWTP discharges and tributaries.*



Bars along the x-axis depict mainstem dams or weirs (black bars are dams that impede fish passage).

Sediment Chemistry Results

Detailed analysis and results for sediment chemistry is located at http://drscw.org/wp/bioassessment/.

DISSOLVED OXYGEN (DO) MONITORING

Background and Methodology

The Illinois Environmental Protection Agency (IEPA) report, Illinois 2004 Section 303(d) List, listed dissolved oxygen (DO) as a potential impairment in Salt Creek, and the East and West Branches of the DuPage River. The report suggested that the DO levels in selected reaches of these waterways might periodically fall to levels below those required by healthy aquatic communities.

All rivers and creeks in DuPage County are classified as General Use Waters. The present water quality standards for dissolved oxygen in General Use Waters is:

1. During the period of March through July
    a. 5.0 mg/L at any time; and
    b. 6.0 mg/L as a daily mean averaged over 7 days.

2. During the period of August through February,
    a. 3.5 mg/L at any time;
    b. 4.0 mg/L as a daily minimum averaged over 7 days; and
    c. 5.5 mg/L as a daily mean averaged over 30 days.

Following listing on the 303 (d) list three TMDLs were prepared by the IEPA for Salt Creek and the East Branch of the DuPage River. In response to the TMDLs, the DRSCW committed to develop and manage a continuous long-term DO monitoring plan for the project area in order to assess the nature and extent of the DO impairment and to allow the design of remedial projects. The continuous DO data is also used to assess the impact of DO improvement projects such as the Churchill Woods and Oak Meadow dam removals.

Typically, the DRSCW continuous DO monitoring project includes four (4) sites on the West Branch DuPage River, four to five (4-5) sites of the East Branch DuPage River, and three to four (3-4) sites on Salt Creek. In 2020, an additional site was added on the West Branch DuPage River at Bailey Road in Naperville, Illinois. The DRSCW program began in 2006 and data has been collected each year since. Each site is equipped with a HydroLab DS 5X which collects data on DO, pH, conductivity and water temperature. Stations have a sample interval of one hour and collect data from June through to October (the seasonal period recognized as containing the lowest annual levels of stream DO). The continuous DO monitoring program functions under a quality assurance plan agreed on with the IEPA (http://drscw.org/wp/dissolved-oxygen/). Additionally, the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) maintains two sondes on Salt Creek (for a total of five (5) sites on Salt Creek. Details on the site location are included in Table 7 and site locations for 2020 are included on Map 4.

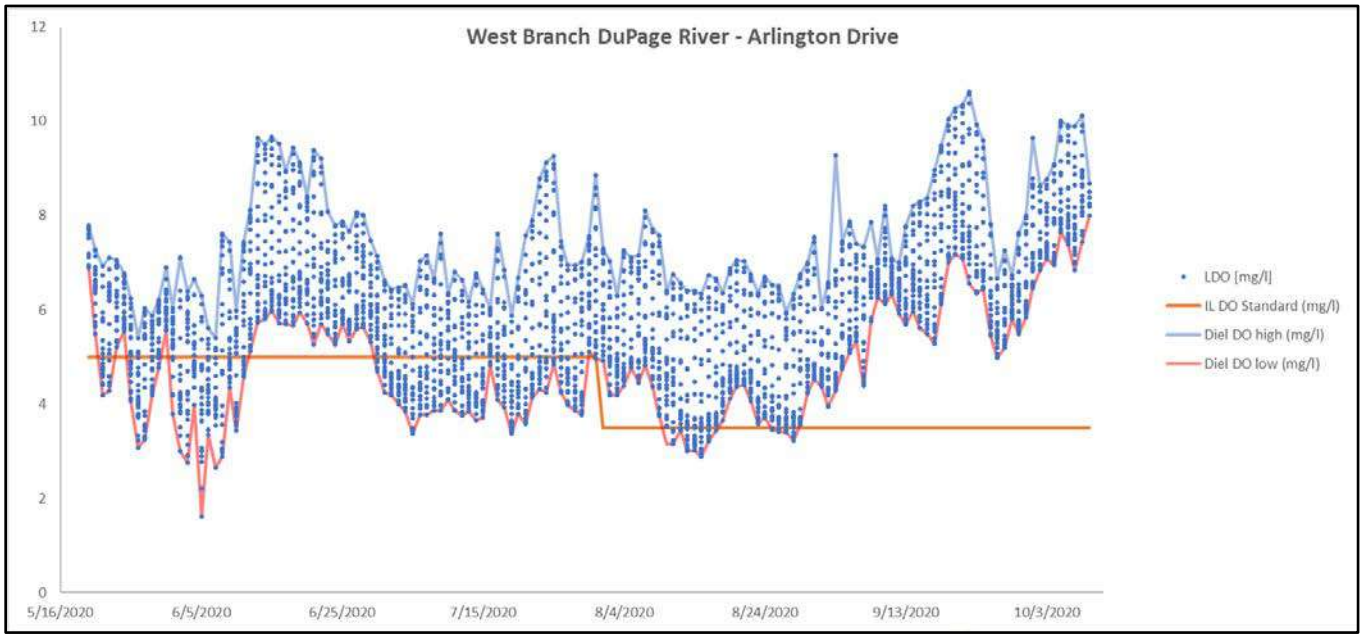
Table 7. *2020 Continuous DO monitoring locations in the DRSCW watersheds.*

Site ID	Stream Name	River Mile	Latitude	Longitude	Location
WBAD	W. Br. DuPage River	29.9	41.9750	-88.1386	Arlington Drive
WBBR	W. Br. DuPage River	11.7	41.825268	-88.179456	Butterfield Road
WBWD	W. Br. DuPage River	11.1	41.82027	-88.17212	Downstream of former Warrenville Grove Dam
WBMG	W. Br. DuPage River	8.6	41.795928	-88.187263	Upstream of former McDowell Grove Dam
WBNPV	W. Br. DuPage River	3.0	41.74029	-88.126879	Downstream Bailey Road
EBAR	E. Br. DuPage River	23.0	41.935171	-88.05843	Army Trail Road
EBCB	E. Br. DuPage River	18.8	41.88510	-88.04110	Crescent Boulevard
EBHL	E. Br. DuPage River	14.0	41.82570	-88.05316	Hidden Lake Preserve
EBHR	E. Br. DuPage River	8.5	41.76800	-88.07160	Hobson Road
EBWL	E. Br. DuPage River	3.8	41.712315	-88.094842	Whalon Lake
SCBW	Salt Creek	29.4	42.01630	-88.00061	Downstream of Busse Woods Dam (MWRDGC)
SCOM	Salt Creek	23.0	41.941279	-87.983363	Upstream of former Oak Meadows Dam
SCBR	Salt Creek	16.1	41.864686	-87.95073	Butterfield Road
SCFW	Salt Creek	11.1	41.825493	-87.93158	Fullersburg Woods impoundment
SCWR	Salt Creek	8.1	41.82576	-87.90045	Wolf Road (MWRDGC)

Results

Results of the continuous DO monitoring conducted in the summer of 2020 is included in Figures 10-17.

Figure 10. *Dissolved Oxygen plots for West Branch DuPage River sites at Arlington Drive (WBAD) (top panel) and Butterfield Road (WBBR) (lower panel).*



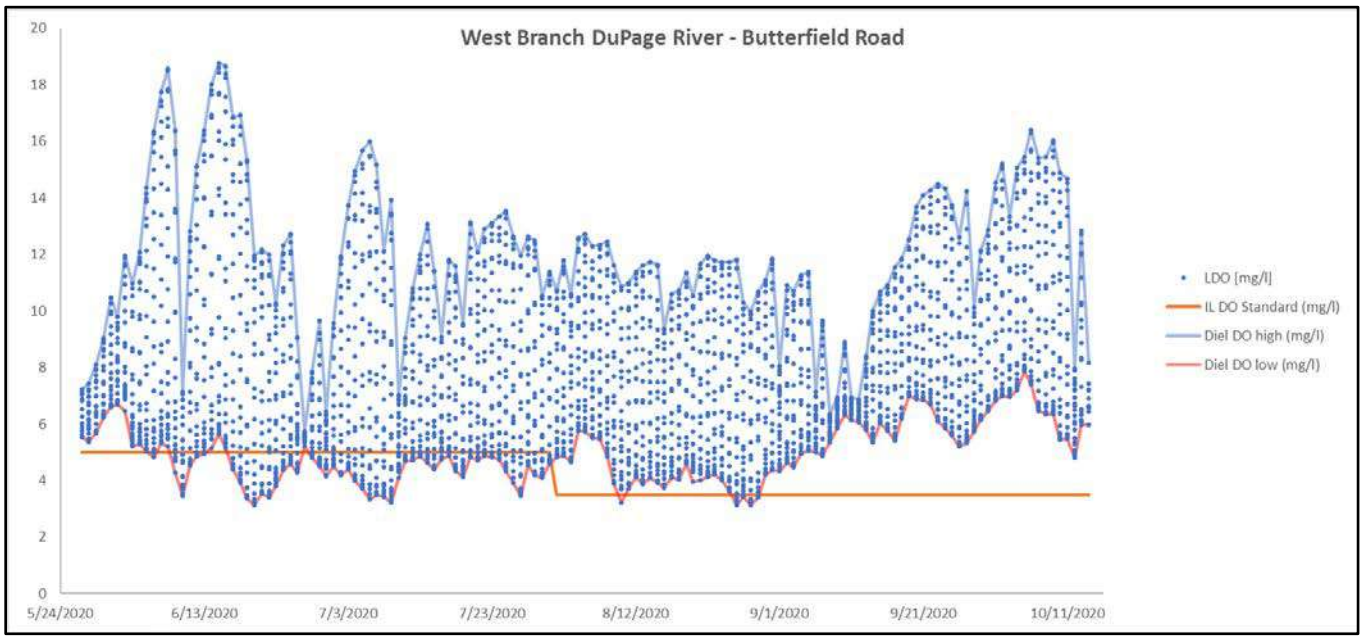
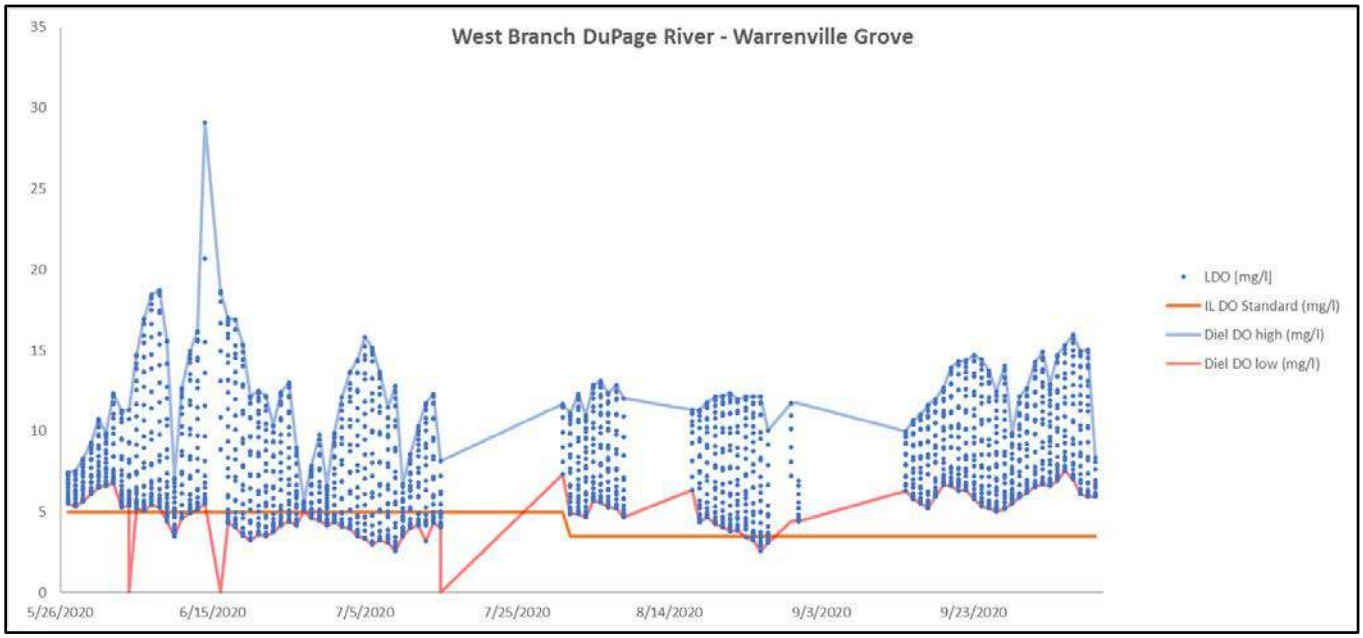


Figure 11. *Dissolved Oxygen plots for West Branch DuPage River sites at Warrenville Grove (WBWD) (top panel) and McDowell Grove Forest Preserve (WBMG) (lower panel).*



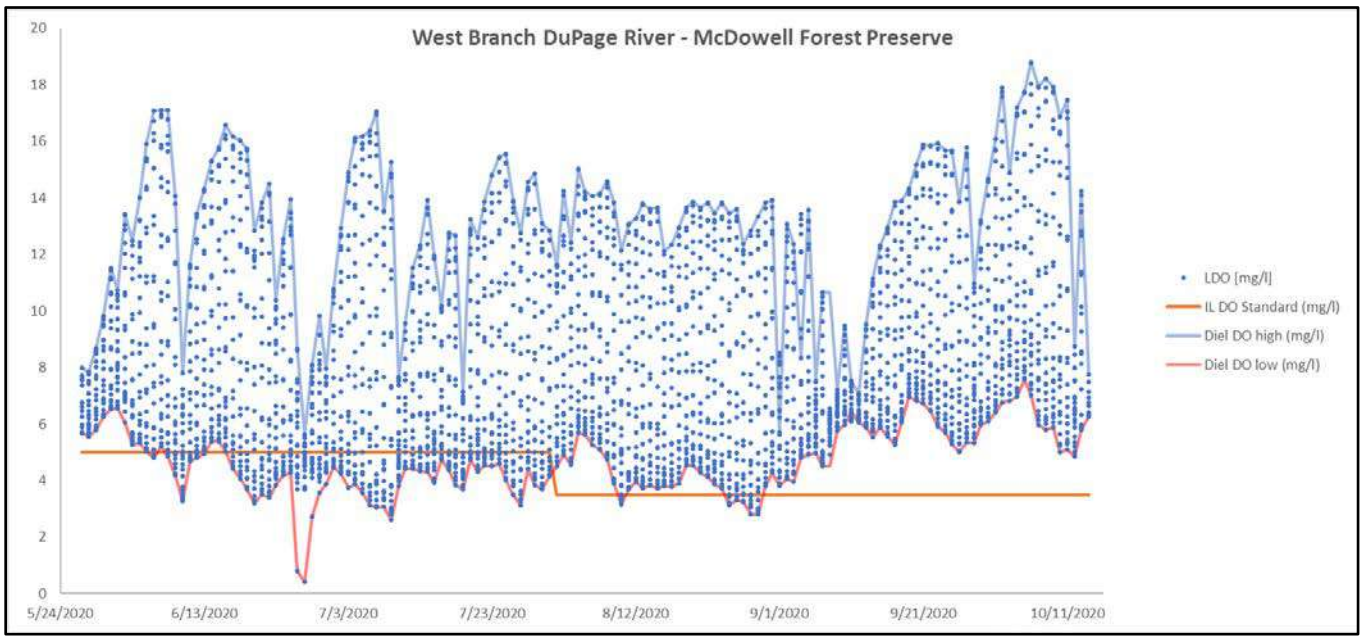
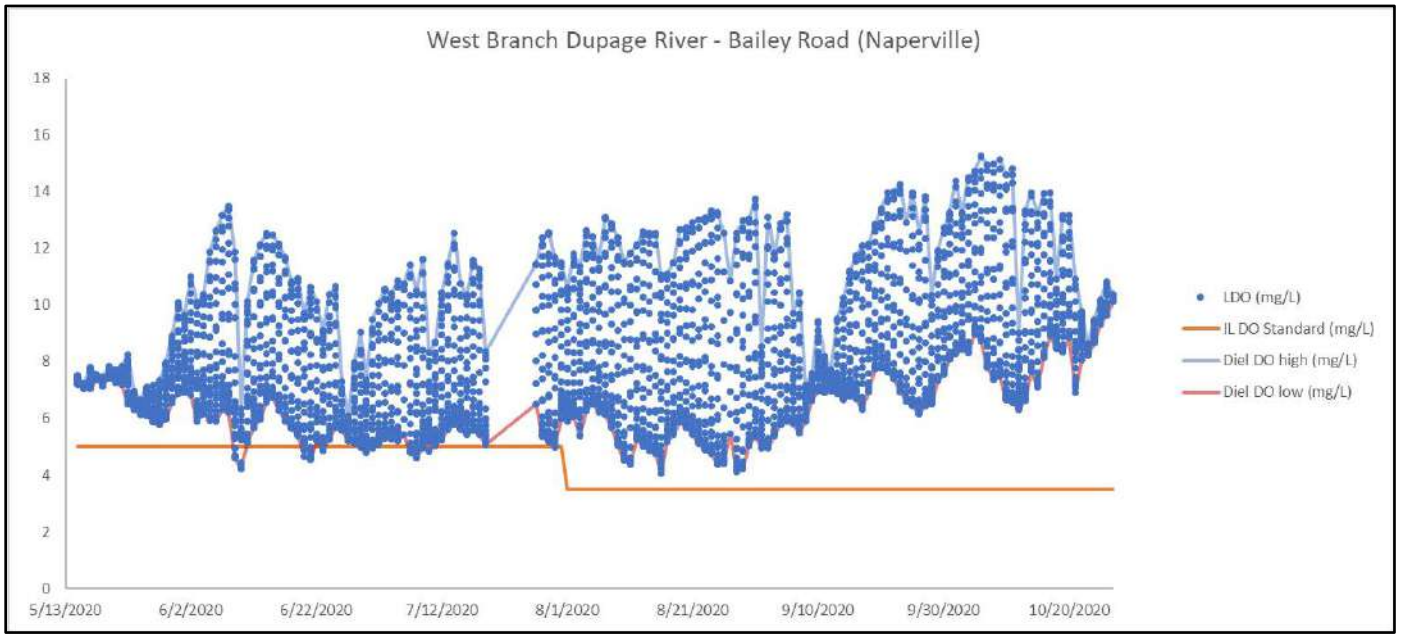


Figure 12. *Dissolved Oxygen plots for West Branch DuPage River at Bailey Road in Naperville (WBNPV) (top panel) and East Branch DuPage River sites at Army Trail Road (EBAR) (lower panel).*



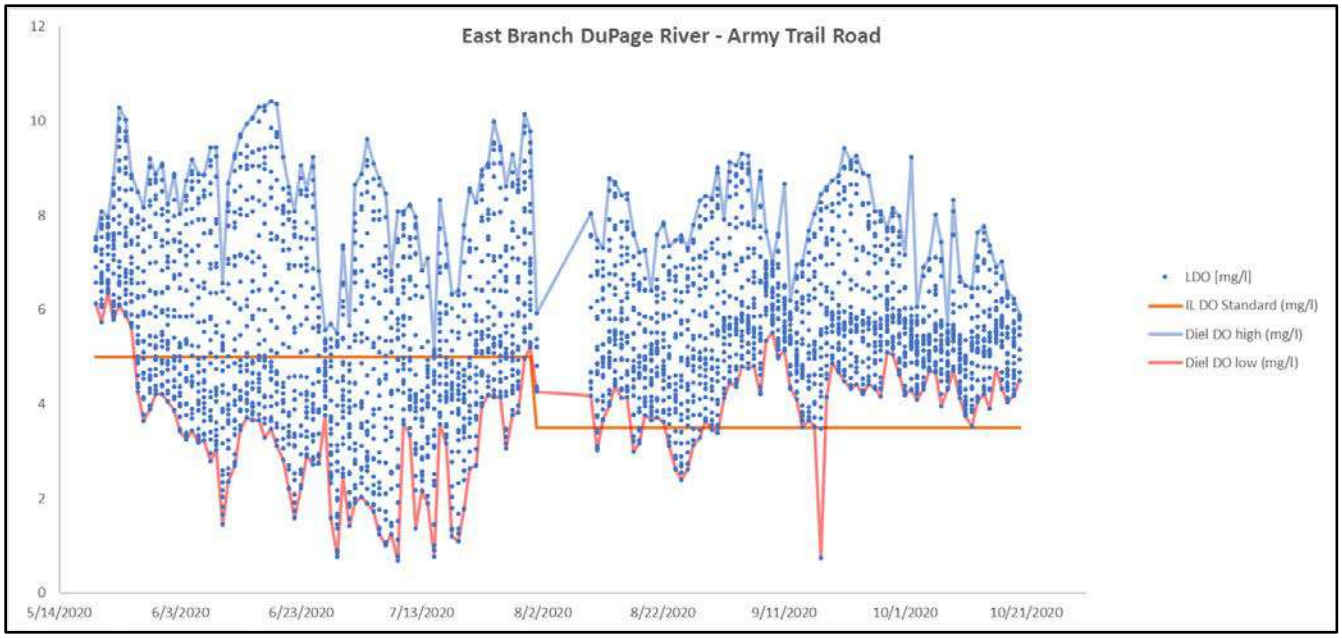
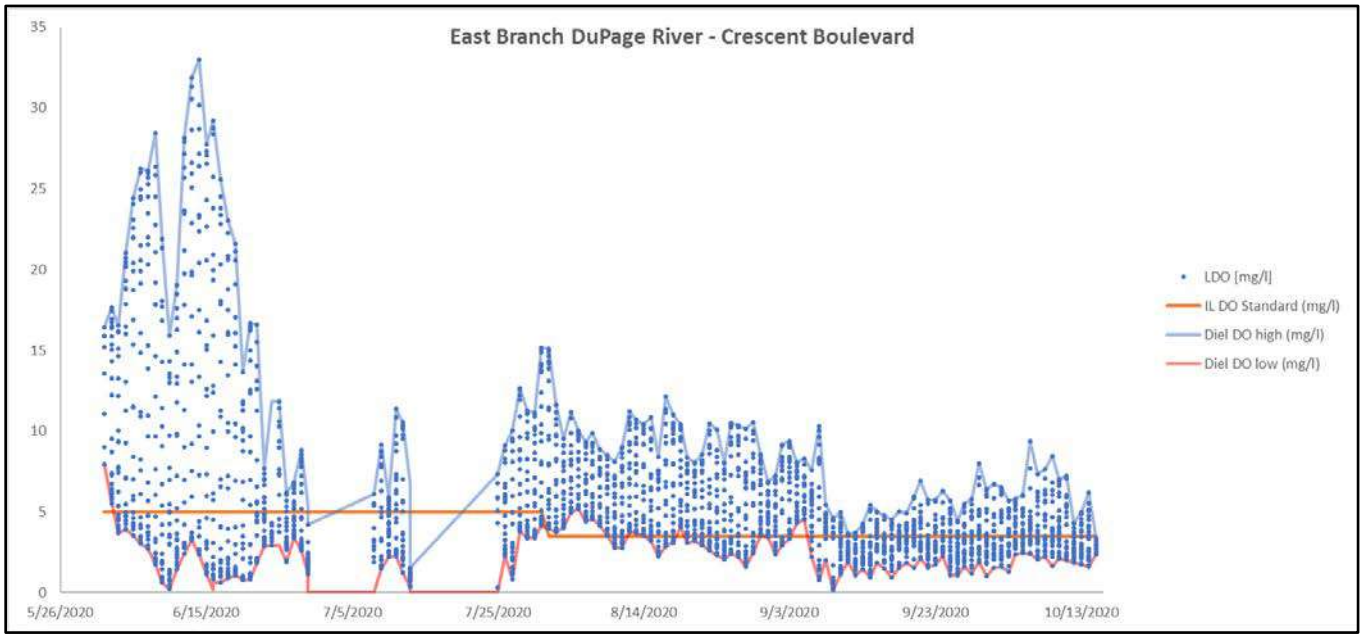


Figure 13. *Dissolved Oxygen plots for East Branch DuPage River Crescent Boulevard (EBCB) (top panel) and East Branch DuPage River sites at Hidden Lake (EBHL) (lower panel).*



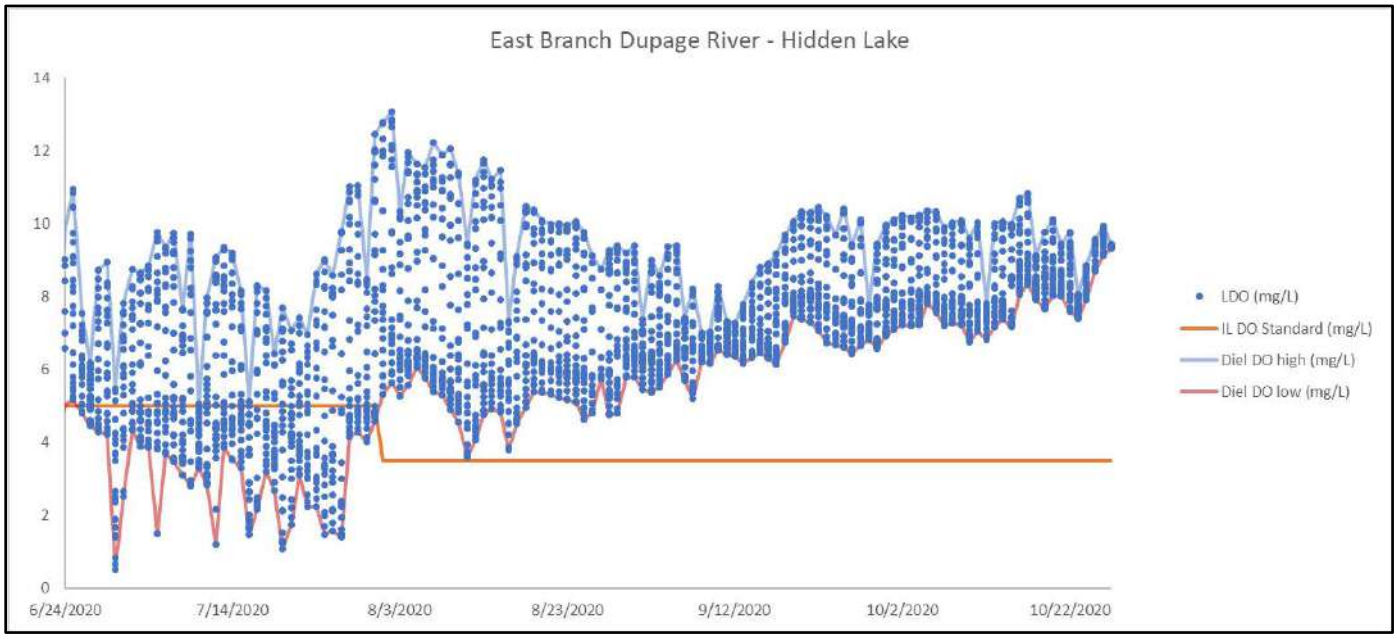
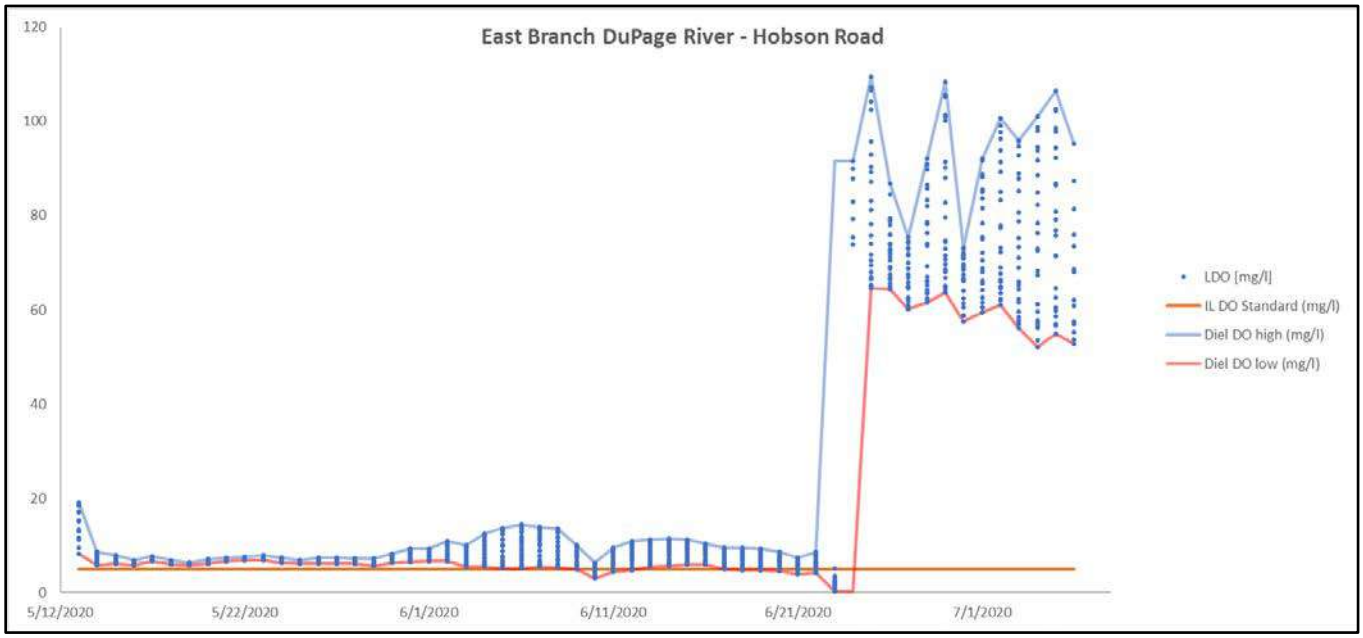


Figure 14. *Dissolved Oxygen plot for East Branch site at Hobson Road (EBHR) (top panel) and Whalon Lake (EBWL) (bottom panel).*



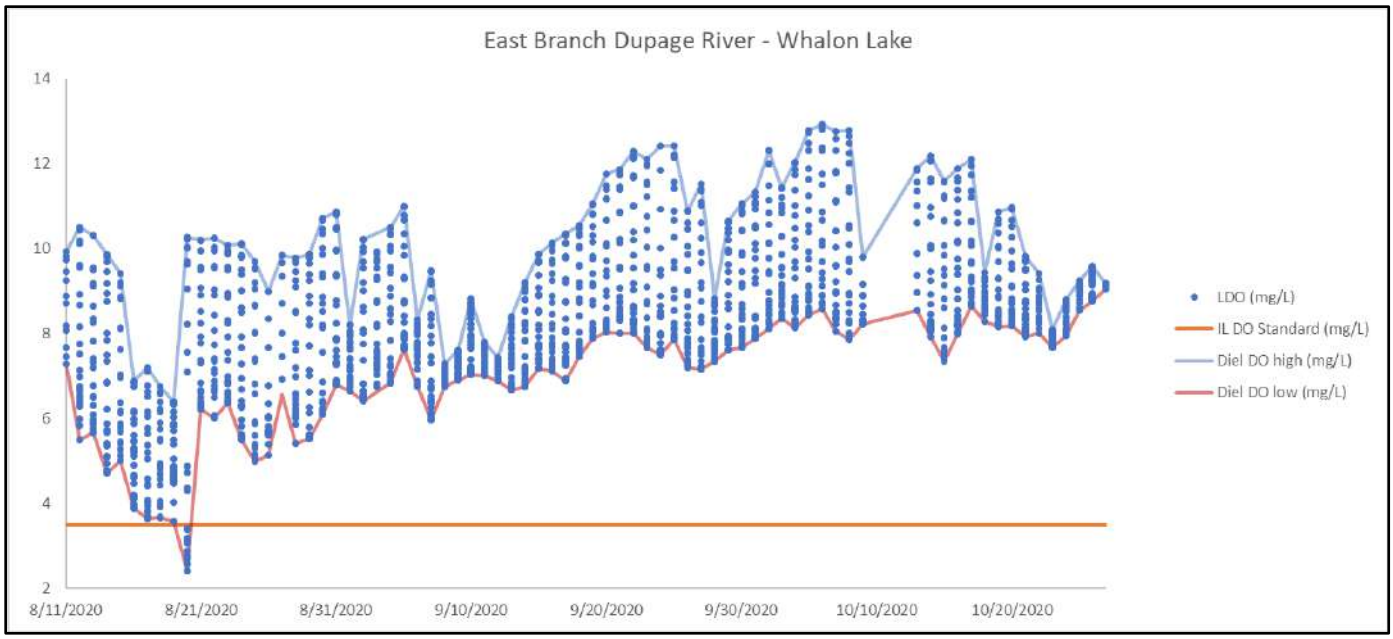
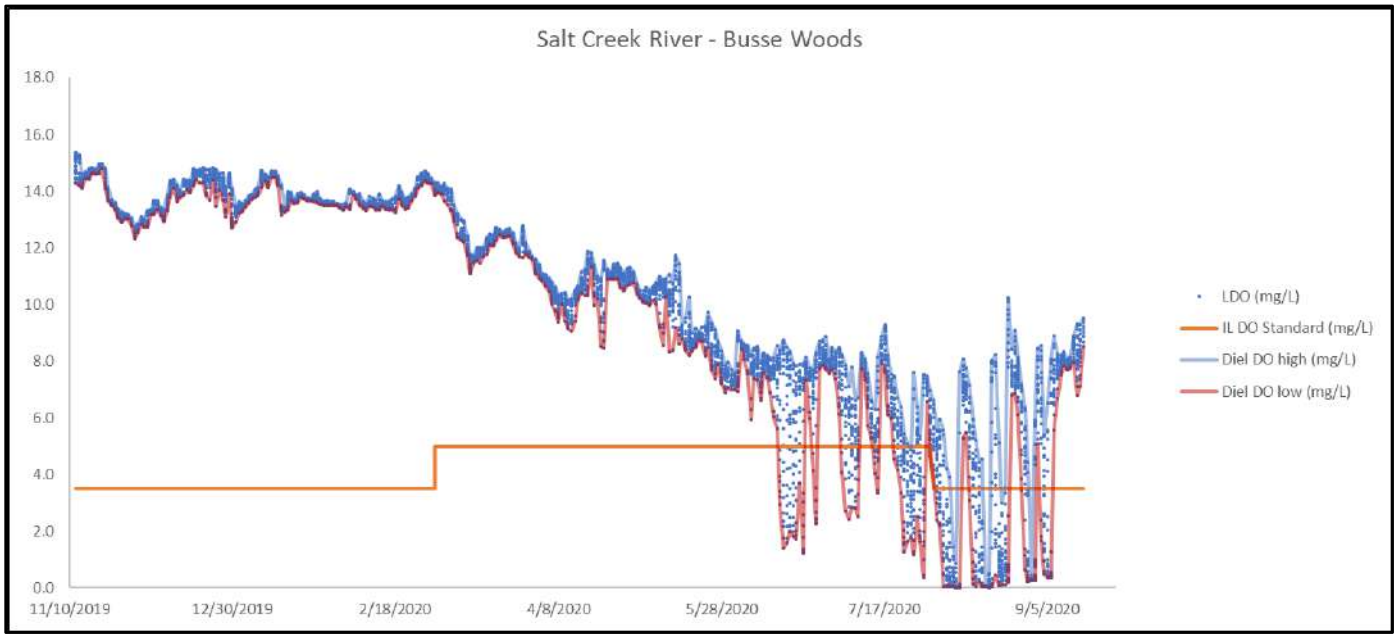


Figure 15. *Dissolved Oxygen plots for Salt Creek site at Busse Woods (SCBW) (top panel) and Salt Creek sites at Oak Meadows (SCOM) (bottom panel).*



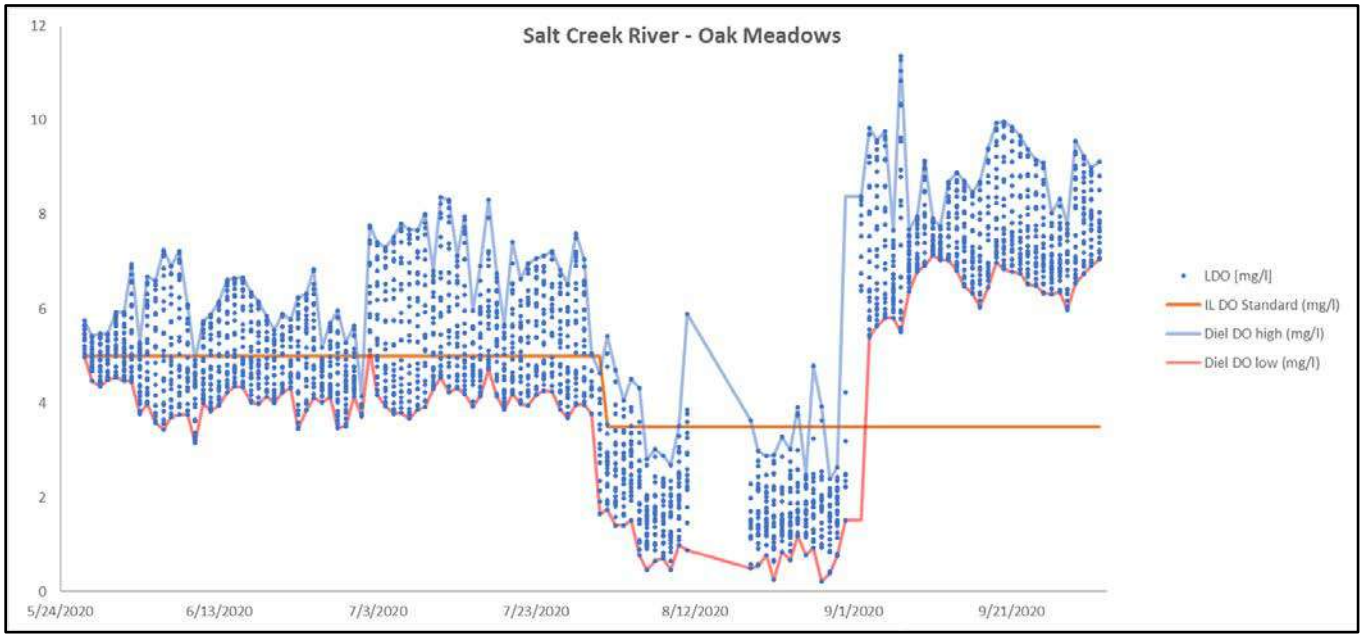
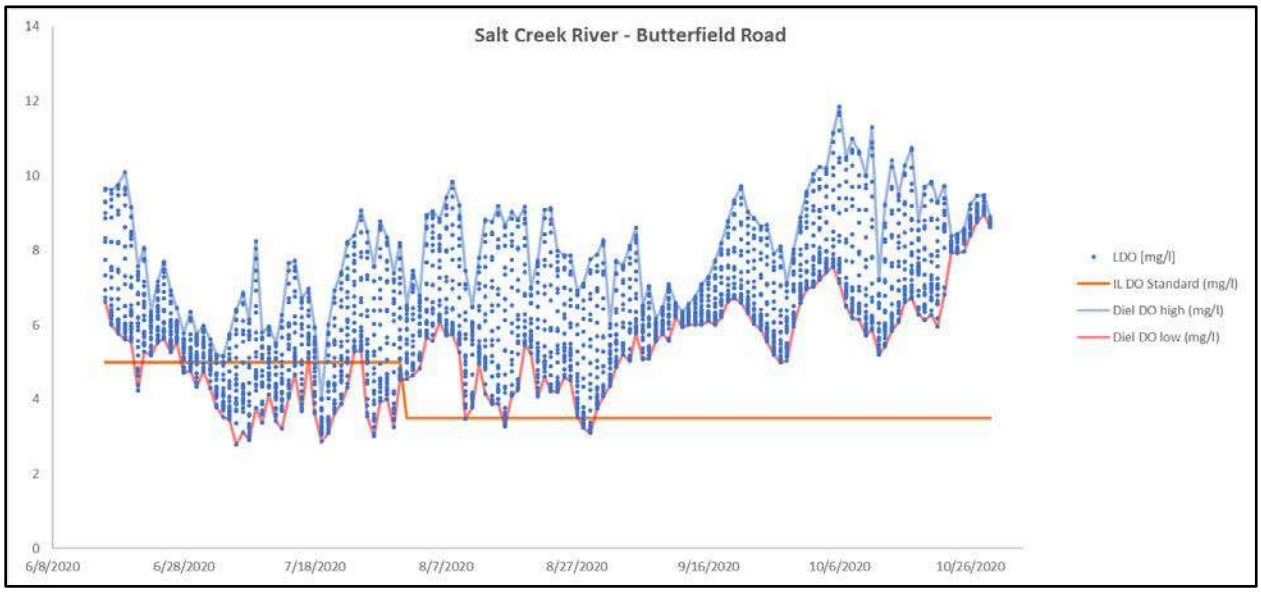


Figure 16. *Dissolved Oxygen plots for and Butterflied Road (SCBR) (top panel) and Salt Creek sites at Fullersburg Woods (SBFW) (bottom panel).*



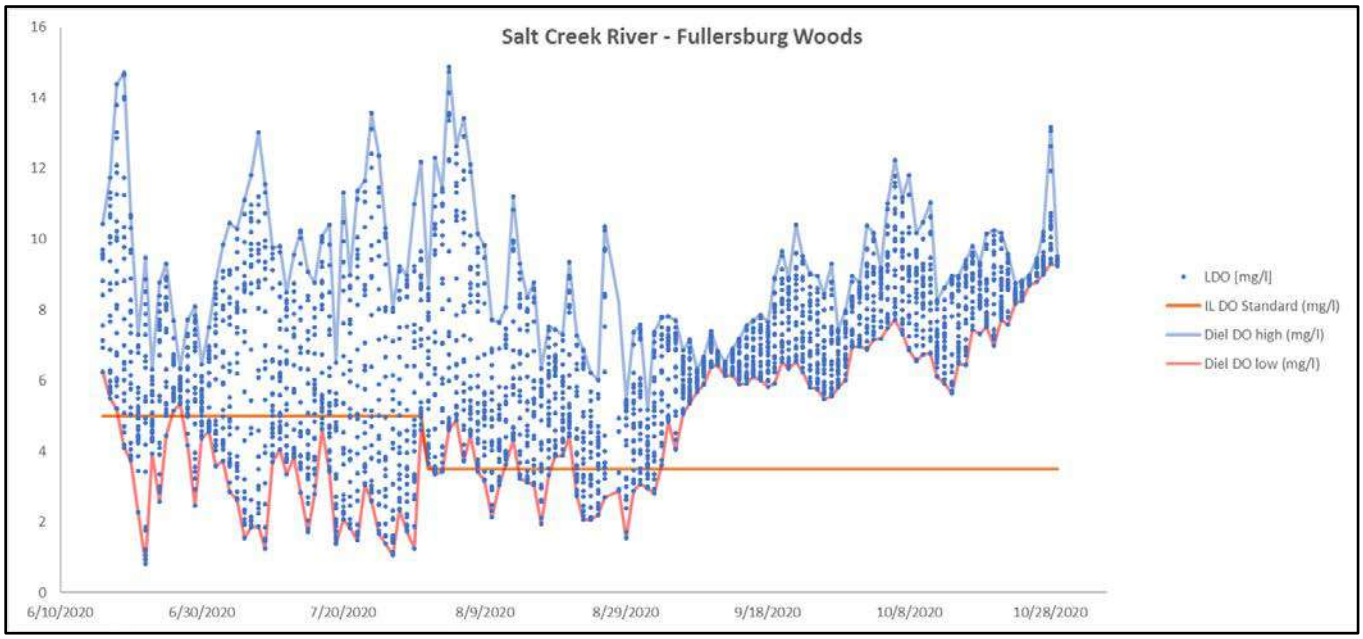
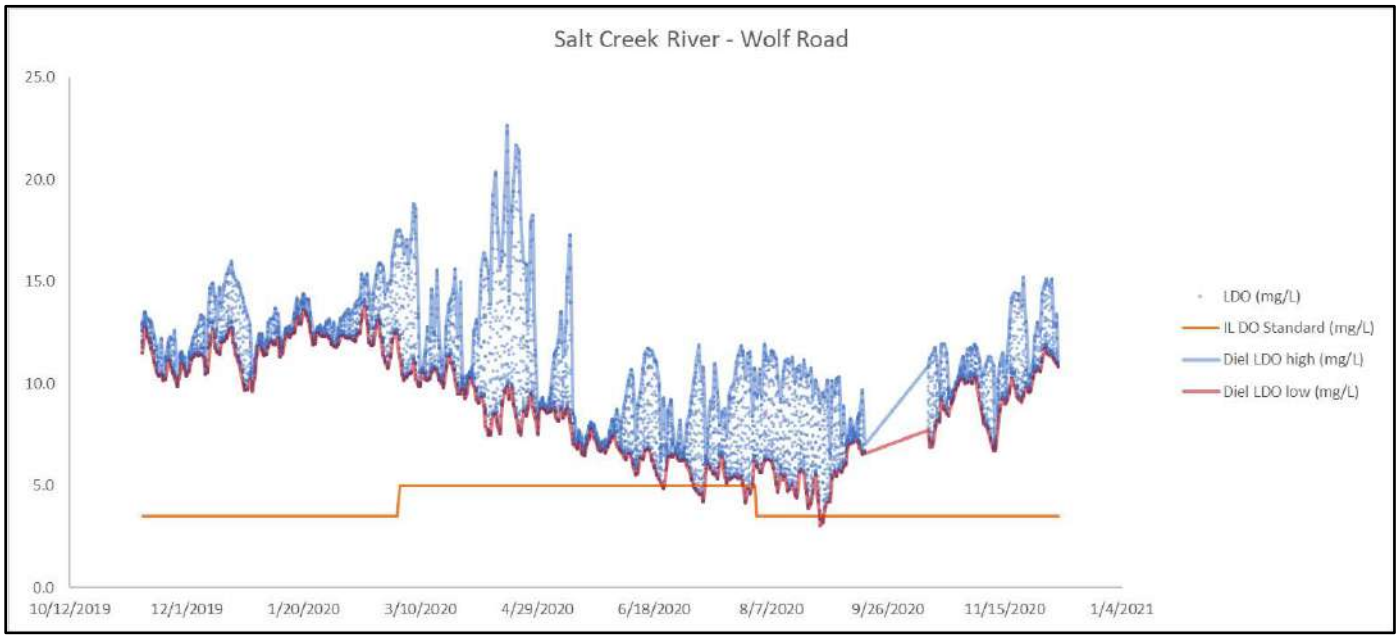


Figure 17. *Dissolved Oxygen plots for Wolf Road (SCWR).*



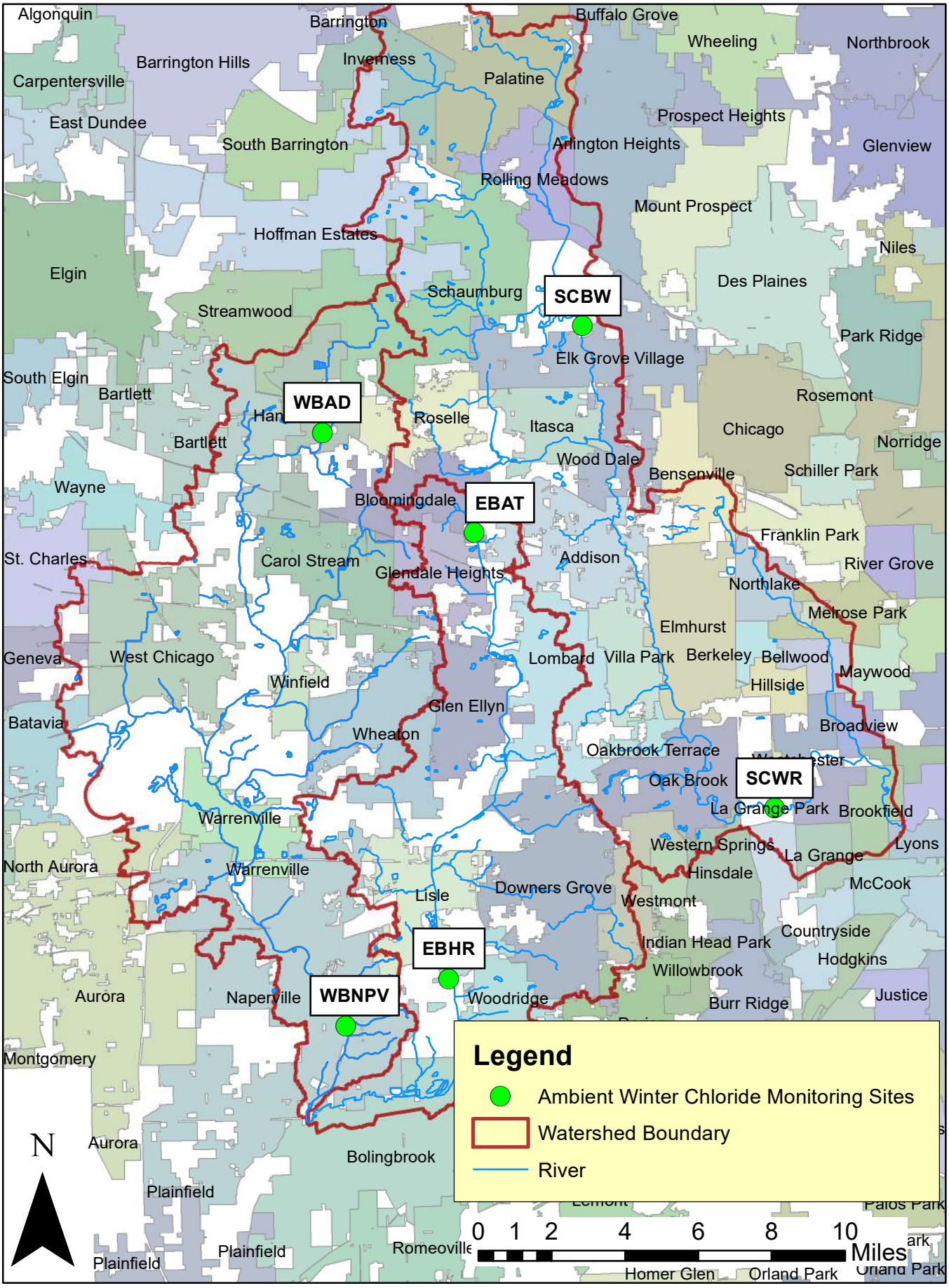
B. Recordkeeping

All monitoring data including by not limited to laboratory results, chain of custodies (COCs), and quality assurance protection plans (QAPP) will be maintained by the DRSCW for a minimum of 5 years after the expiration of the ILR40 (effective on 03/01/2016). The records are maintained at the DRSCW office located at The Conservation Foundation, 10S404 Knock Knolls Road, Naperville, Illinois 60656 and are accessible to the IEPA for review.

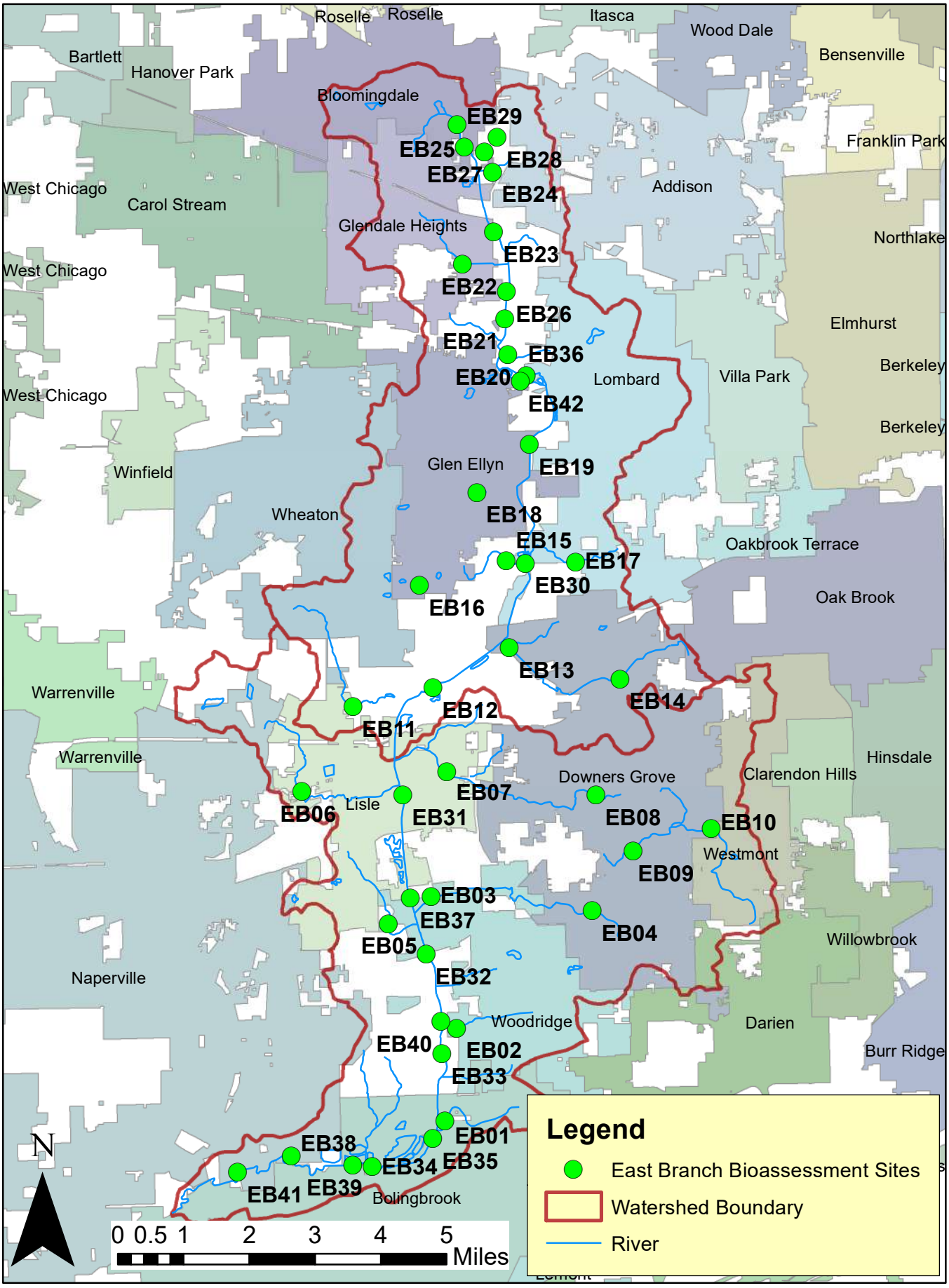
C. Reporting

The DRSCW is not responsible for preparing and submitting an Annual Report to the IEPA by the first day of June for each year that the permit is in effect. It is the responsibility of the individual ILR40 permit holders to utilize the information provided in this report to fulfill the reporting requirements outlined in the permit.

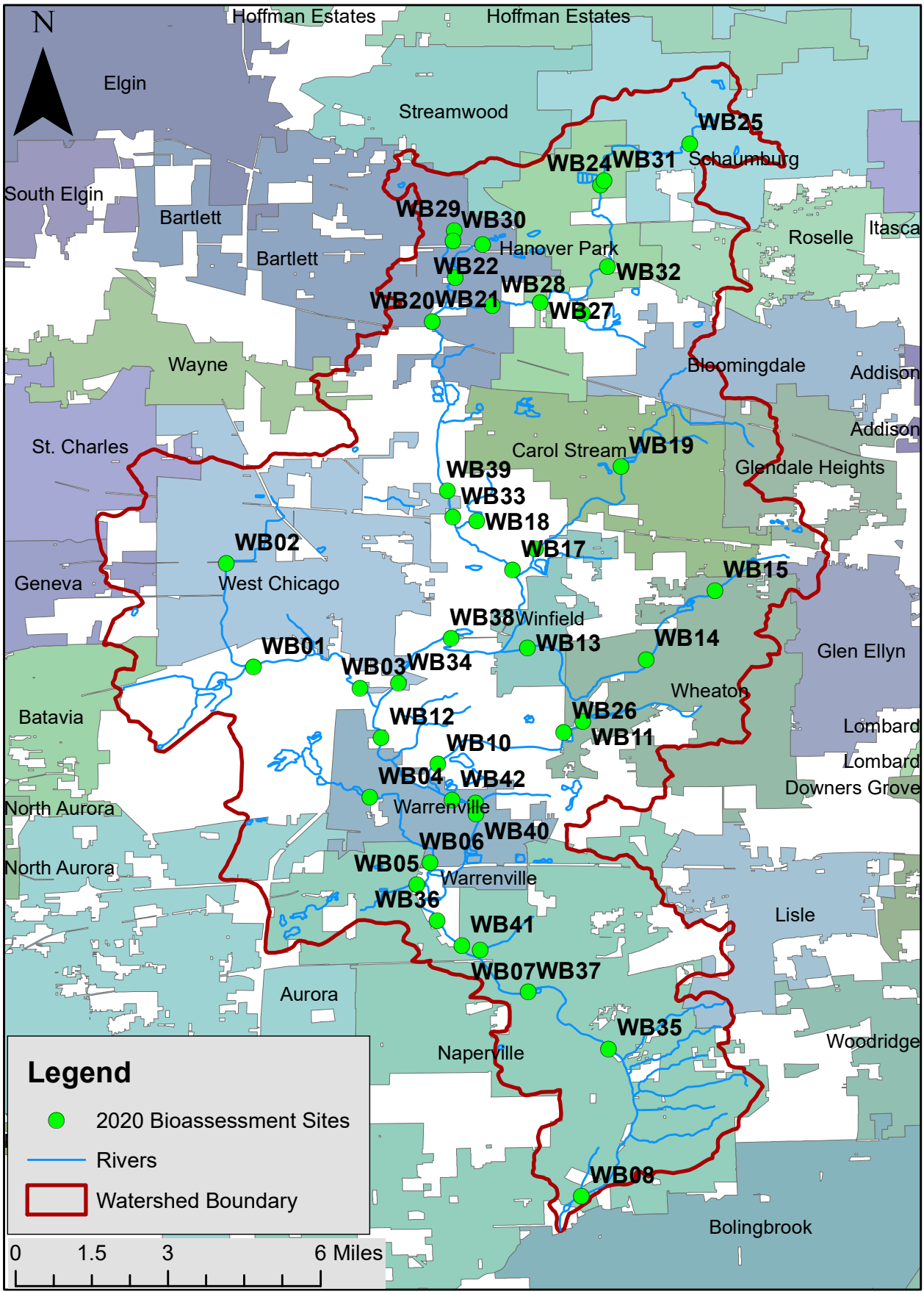
Maps



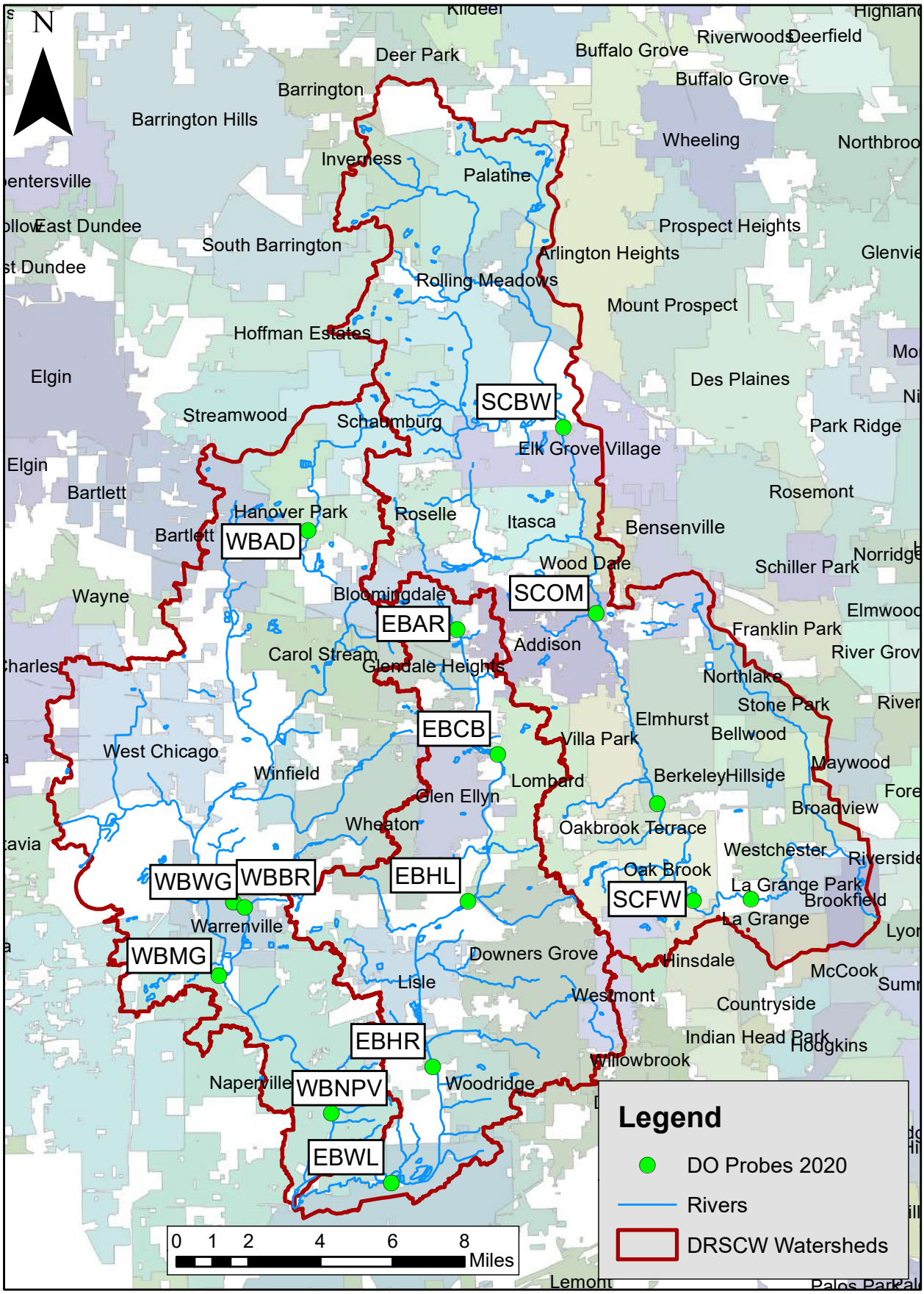
Map 1. *2019-2020 Ambient Winter Chloride Monitoring Sites.*



Map 2. *2019 East Branch DuPage River Bioassessment Sites.*



Map 3. *2020 West Branch DuPage River Bioassessment Sites.*



Map 4. *2020 Continuous Dissolved Oxygen Monitoring Sites.*

Attachment A

2020 Winter De-Icing Workshop Attendees
By Agency

2020 Deicing Workshop Webinars	County	Agency
October 14 Public Roads	Will	City of Crest Hill
October 14 Public Roads	DuPage	City of Elmhurst
October 14 Public Roads	Kane	City of Geneva
October 14 Public Roads	Cook	City of Hickory Hills
October 14 Public Roads	McHenry	City of McHenry
October 14 Public Roads	DuPage	City of Warrenville
October 14 Public Roads	DuPage	City of Wheaton
October 14 Public Roads	Lake	Cuba Road Road District
October 14 Public Roads	Lake	Fremont Township
October 14 Public Roads	NA	GSG Consultants
October 14 Public Roads	NA	Illinois State Toll Highway Authority
October 14 Public Roads	Lake	Lake County
October 14 Public Roads	Lake	Libertyville Township
October 14 Public Roads	McHenry	McHenry Township
October 14 Public Roads	Cook	Metropolitan Water Reclamation District
October 14 Public Roads	Lake	Vernon Township
October 14 Public Roads	DuPage	Village of Bartlett
October 14 Public Roads	Lake	Village of Beach Park
October 14 Public Roads	DuPage	Village of Burr Ridge
October 14 Public Roads	DuPage	Village of Carol Stream
October 14 Public Roads	DuPage	Village of Clarendon Hills
October 14 Public Roads	DuPage	Village of Darien
October 14 Public Roads	DuPage	Village of Downers Grove
October 14 Public Roads	Will	Village of Elwood
October 14 Public Roads	Kane	Village of Gilberts
October 14 Public Roads	DuPage	Village of Glen Ellyn
October 14 Public Roads	DuPage	Village of Glendale Heights
October 14 Public Roads	Cook	Village of Hoffman Estates
October 14 Public Roads	Will	Village of Homer Glen
October 14 Public Roads	McHenry	Village of Huntley
October 14 Public Roads	DuPage	Village of Itasca
October 14 Public Roads	Lake	Village of Lindenhurst
October 14 Public Roads	DuPage	Village of Lombard
October 14 Public Roads	Will	Village of Minooka
October 14 Public Roads	Will	Village of Mokena
October 14 Public Roads	DuPage	Village of Oak Brook
October 14 Public Roads	Kendall	Village of Oswego
October 14 Public Roads	Will	Village of Romeoville
October 14 Public Roads	DuPage	Village of Roselle
October 14 Public Roads	Lake	Village of Round Lake Beach
October 14 Public Roads	Will	Village of Shorewood
October 14 Public Roads	Cook	Village of Streamwood
October 14 Public Roads	DuPage	Village of Villa Park
October 14 Public Roads	Cook	Village of Wheeling
October 14 Public Roads	DuPage	Village of Woodridge

October 14 Public Roads	DuPage	Wayne Township
October 14 Public Roads	Will	Wheatland Road District
October 14 Public Roads	Will	Will County
October 14 Public Roads	DuPage	Winfield Township
October 14 Public Roads	NA	WSP
October 1st Public Roads	DuPage	Addison Township
October 1st Public Roads	Cook	City of Evanston
October 1st Public Roads	DuPage	City of Naperville
October 1st Public Roads	DuPage	City of Warrenville
October 1st Public Roads	Will	Exxon Mobil
October 1st Public Roads	NA	GSG Consultants
October 1st Public Roads	NA	IL State Toll Highway Authority
October 1st Public Roads	DuPage	Lisle Township
October 1st Public Roads	NA	Morton Arboretum
October 1st Public Roads	Kendall	Village of Bristol
October 1st Public Roads	McHenry	Village of Cary
October 1st Public Roads	Will	Village of Channahon
October 1st Public Roads	DuPage	Village of Darien
October 1st Public Roads	Kane	Village of Gilberts
October 1st Public Roads	DuPage	Village of Glendale Heights
October 1st Public Roads	Lake	Village of Gurnee
October 1st Public Roads	Will	Village of Manhattan
October 1st Public Roads	Cook	Village of Niles
October 1st Public Roads	Lake	Village of Round Lake Beach
October 1st Public Roads	Will	Village of Shorewood
October 1st Public Roads	Kane	Village of Sugar Grove
October 1st Public Roads	Cook	Village of Western Springs
October 8th Parking Lots & Sidewalks	DuPage	Addison Park District
October 8th Parking Lots & Sidewalks	DuPage	Bloomingdale Park District
October 8th Parking Lots & Sidewalks	DuPage	City of Elmhurst
October 8th Parking Lots & Sidewalks	DuPage	City of Wheaton
October 8th Parking Lots & Sidewalks	McHenry	Crystal Lake Park District
October 8th Parking Lots & Sidewalks	DuPage	DuPage County Forest Preserve District
October 8th Parking Lots & Sidewalks	NA	Exxon Mobil
October 8th Parking Lots & Sidewalks	Kane	Fox Valley Park District
October 8th Parking Lots & Sidewalks	Lake	Fremont Township
October 8th Parking Lots & Sidewalks	Kane	Geneva Park District
October 8th Parking Lots & Sidewalks	Lake	Lake County Tech Campus
October 8th Parking Lots & Sidewalks	Cook	Metropolitan Water Reclamation District
October 8th Parking Lots & Sidewalks	NA	Morton Arboretum
October 8th Parking Lots & Sidewalks	DuPage	Naperville Park District
October 8th Parking Lots & Sidewalks	Lake	North Shore Water Reclamation District
October 8th Parking Lots & Sidewalks	Lake	Round Lake School District 116
October 8th Parking Lots & Sidewalks	Cook	Streamwood Park District
October 8th Parking Lots & Sidewalks	Will	Valleyview School District
October 8th Parking Lots & Sidewalks	DuPage	Village of Bloomingdale
October 8th Parking Lots & Sidewalks	DuPage	Village of Clarendon Hills

October 8th Parking Lots & Sidewalks	DuPage	Village of Glen Ellyn
October 8th Parking Lots & Sidewalks	DuPage	Village of Hanover Park
October 8th Parking Lots & Sidewalks	Cook	Village of Hoffman Estates
October 8th Parking Lots & Sidewalks	Will	Village of Homer Glen
October 8th Parking Lots & Sidewalks	DuPage	Village of Oak Brook
October 8th Parking Lots & Sidewalks	Kane	Village of Sugar Grove
October 8th Parking Lots & Sidewalks	Cook	Village of Western Springs
October 8th Parking Lots & Sidewalks	Cook	Village of Wheeling
October 8th Parking Lots & Sidewalks	Lake	Wildwood Park District
October 8th Parking Lots & Sidewalks	DuPage	Woodridge Park District