UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SEP 0 5 2019

WW-16J

Sanjay Sofat, Chief
Bureau of Water
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, Illinois 62794-9276

Dear Mr. Sofat:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for fecal coliform, chloride, and dissolved oxygen-demanding substances for the DuPage River and Salt Creek watersheds, including supporting documentation and follow up information. The waterbodies are located in northeastern Illinois. The TMDLs submitted by the Illinois Environmental Protection Agency address the impaired Primary Contact and Aquatic Life Uses for the waterbodies.

The TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Illinois's eighteen TMDLs for fecal coliform, chloride, and dissolved oxygen-demanding substances as noted in the enclosed decision document. The statutory and regulatory requirements, and EPA's review of Illinois's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Illinois's effort in submitting these TMDLs and look forward to future TMDL submissions by the State of Illinois. If you have any questions, please contact Ms. Candice Bauer, Acting Chief of the Watersheds and Wetlands Branch, at 312-353-2106.

Sincerely,

Linda Holst

for Joan M. Tanaka
Acting Director, Water Division

Enclosure

cc: Abel Haile, IEPA

TMDL: DuPage River and Salt Creek Watersheds 2, Illinois
Date: SEP 0 5 2019

DECISION DOCUMENT FOR THE APPROVAL OF THE DUPAGE RIVER AND SALT CREEK 2, IL TMDL

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody and specify the link between the pollutant of concern and the water quality standard (see Section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

(1) the spatial extent of the watershed in which the impaired waterbody is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and

(5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:
Location Description: The Illinois Environmental Protection Agency (IEPA) developed TMDLs for fecal coliform, chloride, and dissolved oxygen (DO) demanding substances for impaired waters in the DuPage River and Salt Creek (DRSC) watersheds in north-eastern Illinois (Table 1 of this Decision Document). The DRSC watersheds are located in Cook, DuPage, and Will Counties. Table 1 of this Decision Document lists the waterbodies addressed by this TMDL.

Table 1. TMDLs in the DRSC watershed

Segment ID	Segment Name	Designated use	Pollutant Addressed
IL_GB-11	DuPage River	Aquatic Life	Chloride
		Primary Contact	Fecal Coliform
IL_GB-16	DuPage River	Aquatic Life	DO Demanding Substances (TP*, CBOD**, Ammonia)
		Primary Contact	Fecal Coliform
IL_GBK-05	West Branch DuPage River	Primary Contact	Fecal Coliform
IL_GBK-09	West Branch DuPage River	Primary Contact	Fecal Coliform
IL_GBK-14	West Branch DuPage River	Aquatic Life	DO Demanding Substances
		Primary Contact	Fecal Coliform
IL_GBKA	Spring Brook	Aquatic Life	DO Demanding Substances
		Primary Contact	Fecal Coliform
IL-GBKA-01	Spring Brook	Primary Contact	Fecal Coliform
IL_GBL-10	East Branch DuPage River	Primary Contact	Fecal Coliform
IL_GL-09	Salt Creek	Primary Contact	Fecal Coliform
IL_GL-10	Salt Creek	Primary Contact	Fecal Coliform
IL_GL-19	Salt Creek	Primary Contact	Fecal Coliform
IL_GLA-02	Addison Creek	Primary Contact	Fecal Coliform

* - TP = Total Phosphorus
**- CBOD = Carbonaceous Biochemical Oxygen Demand, the measurement of oxygen demand due to organic material in water

The DRSC watershed is approximately 335,000 acres in size. The two main waterbodies (DuPage River and Salt Creek) are separate watersheds. The DuPage River begins as the East Branch and West Branch of the DuPage River, which merge to form the mainstem DuPage River. The DuPage River flows south into the Des Plaines River near Channahon, Illinois (Figure 1 of the TMDL). Salt Creek begins in Cook County, flows south into the Des Plaines River upstream of the DuPage River. The Des Plaines joins with the Kankakee River a few miles south of Channahon to form the Illinois River.

Significant alteration of the drainage in the watersheds has occurred over the last 100 years. Numerous dams have been built in the watersheds, both altering flows and preventing fish migration (Section 3.6 of the TMDL). Some of the dams have been removed or modified. The United States Geological Survey (USGS) operates several gages in the watersheds, as noted on Figure 9 of the TMDL. Review of the gage data indicates that the river systems are effluent-dominated in mid-range to low flows.

IEPA identified several approved TMDL projects in the watersheds (Table 2 of the TMDL). In 2004, TMDLs were developed for the East Branch DuPage River (chloride, ammonia, CBOD), West Branch DuPage River (chloride), and Salt Creek (chloride, ammonia, CBOD, volatile suspended solids). The TMDLs addressed in this Decision Document followed up on watershed monitoring performed as part of the implementation of the 2004 TMDLs.

Distribution of land use: The land use for the DuPage River watershed is mainly urbanized in nature, with a small portion as agricultural (Table 2 of this Decision Document). The Salt Creek watershed is almost completely urbanized. Tables 3 and 4 and Figure 4 of the TMDL contain additional details on the land use in the watersheds. Both watersheds are highly populated; over 4.8 million people live in the two watersheds (Section 3.4 of the TMDL).

Table 2: Land use in the DRSC Watersheds

Land Use	DuPage River		Salt Creek	
	%	acres	%	acres
Agriculture	14	32,218	<1	234
Developed	75	183,058	93	87,488
Forest	4	10,268	3	2,689
Other	7	15,457	<4	4,431
Total	100	241,001	100	94, 842

Problem Identification:
The pollutants of concern are fecal coliform, low DO (DO-demanding substances), and chloride (Table 1 of this Decision Document).

Fecal coliform: The waterbodies identified in Table 1 of this Decision Document as being addressed for fecal coliform all exceeded the IEPA fecal coliform water quality standard (WQS), both the single-sample maximum and the geometric mean (Table 13 of the TMDL).

DO: Segment GB-16 (West Branch DuPage River) has been monitored for DO for several years, both discrete sampling and continuous monitoring (Section 5.1.2 of the TMDL). Results of the monitoring indicate that the waterbody exceeds the lower range of the DO standard during the later parts of the summer (Figures 22 and 23 of the TMDL). The DuPage River Salt Creek Workgroup (DRSCW) performed monitoring of Segments GBKA and GBK-14 in August of 2016. Monitoring results indicate the DO water quality standard is not being met.

Chloride: IEPA identified one segment (GB-11) as impaired for chloride (Section 5.1.4 of the TMDL). Water quality data indicted five exceedences out of 366 sampling observations between 1977 and 2010 (Table 16 and Figure 27 of the TMDL).

Pollutant:
Fecal coliform: Bacteria exceedances can negatively impact recreational uses (fishing, swimming, wading, boating, etc.) and public health. At elevated levels, bacteria may cause illness within humans who have contact with or ingest bacteria-laden water. Recreation-based contact can lead to ear, nose, and throat infections, and stomach illness.

DO: IEPA identified three segments as demonstrating degraded oxygen concentrations within the water column. Low dissolved oxygen concentrations can negatively impact aquatic life use. The decrease in dissolved oxygen can stress benthic macroinvertebrates and fish. Elevated levels of oxygen-consuming pollutants, such as ammonia, and CBOD, can reduce dissolved oxygen in the water column, and cause large shifts in dissolved oxygen and pH throughout the day. Excessive amounts of nutrients such as phosphorus can stimulate plant and algal growth, which can negatively impact DO levels in a waterbody as well. Shifting chemical conditions within the water column may stress aquatic biota (i.e., fish and macroinvertebrate species). In some instances, degradations in aquatic habitats or water quality have reduced fish populations or altered fish communities from those communities supporting sport fish species to communities which support more tolerant rough fish species.

Chloride: Chloride is essential for aquatic life to carry out a range of biological functions. However, high concentrations of chloride in the surrounding water can harm cellular osmotic processes in aquatic life. Excessive dissolved chlorides in water may stress aquatic species and prohibit the transport of needed molecules into the cell. Persistent elevated concentrations of chloride in the water may result in aquatic life such as fish, invertebrates and even some plant species becoming stressed and/or dying.

Priority Ranking:
The watershed was given priority for TMDL development due to the impairment impacts on the public value of the impaired water resource, and the timing as part of the Illinois basin monitoring process.

Source Identification (point and nonpoint sources):
Point Source Identification:
Fecal coliform: IEPA identified 39 individual point sources located in the DRSC watersheds (Section 5.3.1 and Table 18 of the TMDL). Of these 39 point sources, 31 are wastewater treatment facilities only (WWTFs). The remaining eight include Combined Sewer Overflow (CSO) systems, which can discharge mixed stormwater and sewage during high-flow events. IEPA also identified stormwater (Municipal Separate Storm Sewer System or MS4) as a potential source of bacteria in the watersheds.

Chloride: IEPA identified four NPDES-permitted facilities in Segment GB-11, which is impaired for chloride. WWTFs can discharge chloride as a result of deicing efforts as well as water softening discharge. IEPA also assigned allocations to the Illinois Department of Transportation (ILDOT) to address highway deicing efforts, as well as to MS4s in the watershed. (Table 27 of the TMDL).

DO substances: IEPA identified three WWTFs that discharge DO-demanding substances in Segment GB-16 (Lower DuPage River). Much of the organic material in wastewater is removed during the treatment process, but some amounts of organic material are discharged. When these substances decay in the stream, oxygen is consumed and the levels of dissolved oxygen drop. IEPA identified three pollutants: total phosphorus, total ammonia, and CBOD that need to be controlled in WWTF discharges. Although CSOs and MS4s can discharge DO-demanding substances, IEPA determined that the critical condition for low DO in the segment is during low-flow periods, when CSOs and MS4s are not significant contributors (Table 34 of the TMDL). The other two segments listed as impaired for low DO do not have any point source discharges.

Nonpoint Source Identification*:* The potential nonpoint sources for the DRSC watershed TMDLs are:

Fecal coliform:
Non-regulated stormwater runoff: Non-regulated urban stormwater runoff can add fecal coliform to the impaired waters. The sources of bacteria in stormwater include animal/pet wastes, and wildlife. IEPA noted that that much of the watersheds are covered by a MS4 permit, and therefore non-regulated stormwater runoff has limited impact in the watersheds.

Agricultural Operations: Runoff from agricultural lands may contain significant amounts of bacteria which may lead to impairments in the DuPage River watershed. There is limited agricultural land in the DuPage River watershed, and virtually none in the Salt Creek watershed.

Failing septic systems: IEPA noted that failing septic systems, where waste material can pond at the surface and eventually flow into surface waters or be washed in during precipitation events, are potential sources of bacteria. IEPA determined that while much of the watersheds are served by sewer systems, portions of the watersheds are not, and the potential for septic failure is possible.

Chloride:
Road salt runoff: IEPA determined that the major source of chloride loading to the DRSC watersheds is run-off from roadways containing road salt (Section 5.3.5 of the TMDL). Runoff from precipitation events as well as snowmelt can transport chloride into the waterbodies.

DO substances:
Agricultural Operations: IEPA noted that agricultural operations can generate DO-demanding substances that can run off farm fields and enter the waterbodies (Section 5. 4 of the TMDL). The use of fertilizers, field debris, and other organic matter can enter the waters, decompose, and use up the dissolved oxygen in the water column.

In-stream processes: Organic material can also enter the waters and settle to the streambed during the year, and then as flows are reduced during the late summer, decompose and scavenge oxygen. This is measured as sediment-oxygen demand (SOD). Nutrients can also stimulate the growth of algae and plants, which can consume oxygen during the night hours, causing significant daily swings in DO levels.

Non-regulated stormwater runoff: Non-regulated stormwater runoff can add DO-demanding substances to the impaired waters. Many of the same causes of bacteria loading also can contribute nutrients and organic material, such as pet wastes and wildlife.

Failing Septic Systems: Failing septics systems can contribute nutrients as well as bacteria to streams.

Population and future growth trends: The population for the watersheds is fairly significant; approximately 4.8 million people live in the two watersheds (Section 3.4 of the TMDL). The population is expected to continue to grow over the foreseeable future, particularly in the mainstem portion of the DuPage River in Will County. IEPA considered a reserve capacity to account for future growth, but determined that the loadings as calculated were sufficient (Section 6.3.3 of the TMDL). Future increases will require re-opening and possible modification of the TMDL. IEPA did determine allocations for two WWTFs based upon ongoing plant expansion, the Naperville-Springbrook WWTF (IL0034061) and the Bolingbrook WWTF (IL0069744) (Table 18 of the TMDL).

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this first element.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) - a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:
Designated Use/Standards: Section 4.2 of the TMDL states that the DRSC watersheds are not meeting the General Use designation. The applicable water quality standards (WQS) for these waterbodies are established in Illinois Administrative Rules Title 35, Environmental Protection; Subtitle C, Water Pollution; Chapter I, Pollution Control Board; Part 302, Water Quality Standards, Subpart B for General Use Water Quality Standards. The portions of the WQS that

apply to the DRSC are General Use, specifically the Aquatic Life Use and Primary Contact Use (Section 4.2 of the TMDL).

Criteria: The applicable criteria are found in Table 3 of this Decision Document.

Table 3: WQSs for the impaired waters in the DRSC watersheds

Pollutant	Units	Criteria
Chloride	mg/L	500
Dissolved Oxygen	mg/L	For most waters (GBK-14 and GBKA): March-July >5.0 minimum and >6.0 as a 7-day mean Aug-Feb >3.5 minimum and >4.0 as a 7-day mean and >5.5 as a 30-day mean For enhanced waters (GB-16): March-July >5.0 minimum and >6.25 as a 7-day mean Aug-Feb >4.0 minimum and >4.5 as a 7-day mean and >6.0 as a 30-day mean
Fecal coliform	Count/100 mL	May through October 200*, 400**

* - geometric mean based upon a minimum of 5 samples in a 30 day period
** - not to be exceed by more than 10% of the samples in a 30 day period

Target: The water quality targets for these TMDLs are in Table 4 of this Decision Document.

Fecal coliform: IEPA used both portions of the WQS to determine loads. Allocations were developed for each bacteria-impaired segment based upon the 200 counts/100mL geometric mean and the 400 counts/100 mL single sample maximum (SSM) (Section 3 of this Decision Document).

Chloride: The IEPA used the numeric WQS for chloride of 500 mg/L as the TMDL target.

DO: IEPA determined that the DO instantaneous minimum portion of the WQS was most likely to be exceeded (Appendices E1-E3 of the TMDL). IEPA reviewed the DO data for the impaired segments, and noted that the waterbodies are meeting the "mean" portions of the DO criteria. Therefore, the modeling effort focused on the "minimum" portion of the WQS. The State determined that attaining the "minimum" portion of the criteria will result in attainment of the entire DO WQS (Appendices E1-E3 of the TMDL). The modeling effort undertaken by the State for Segment GB-16 was developed for early August, the critical time of year with the lowest DO conditions due to low in-stream flows and higher water temperatures. The corresponding DO instantaneous minimum target is >4.0 mg/L (Appendix E1 of the TMDL). For the other two segments, the modeling effort also was developed for early August. However, the State utilized a more conservative target of >5.0 mg/L (Appendices E2 and E3 of the TMDL).

As further discussed in Section 3 of this Decision Document, IEPA modeled the impacts of DO-demanding substances on the levels of DO in the streams. Several scenarios were investigated, and IEPA determined that total phosphorus, total ammonia, and CBOD were the three pollutants that needed to be controlled in Segment GB-16, and a more general pollutant of DO-demanding

substances (DO-deficit; see Section 3 of this Decision Document for further explanation) need to be controlled in Segments GBK-14 and GBKA.

Table 4: TMDL targets for the DRSC Watersheds

Pollutant	Target
Chloride	500 mg/L
DO*	>4.0 for GB-16 >5.0 for GBK-14 and GBKA
Fecal coliform	200/400 counts/100 mL

* - Pollutants identified to address DO are total phosphorus, total ammonia, and CBOD for Segment GB-16 and DO-deficit for Segments GBK-14 and GBKA

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this second element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for stream flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:
The approach utilized by the IEPA to calculate the loading capacity for the fecal coliform and chloride TMDLs is described in Section 6.1 of the TMDL. The TMDL summaries for fecal coliform and chloride are presented in Tables 5-29 of this Decision Document. For DO-demanding substances, the approach utilized by IEPA is described in Section 6.2 and

Appendices E1-E3 of the TMDL. The TMDL summaries for DO-demanding substances are presented in Tables 30-32 of this Decision Document.

Fecal coliform and chloride: For the bacteria TMDLs both the geometric mean of 200 counts/100 ml fecal coliform for five samples equally spaced over a 30-day period, and the SSM of 400 counts/100mL exceeded in no more than 10% of the samples per 30 days, were used to calculate the loading capacity of the TMDLs.

Typically loading capacities are expressed as a mass per time (e.g. pounds per day). However, for bacteria loading capacity calculations, mass is not always an appropriate measure because bacteria is expressed in terms of organism counts. This approach is consistent with the EPA's regulations which define "load" as "an amount of matter that is introduced into a receiving water" (40 CFR §130.2). To establish the loading capacities for the DRSC bacteria TMDLs, IEPA used Illinois's water quality standards for fecal coliform (200 cfu/100 mL). By calculating loads based upon both portions of the fecal coliform WQS, IEPA determined that the WQS will be met under either portion. A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards." (40 CFR §130.2). Therefore, a loading capacity set at the WQS will assure that the water does not violate WQS. IEPA's fecal coliform TMDL approach is based upon the premise that all discharges (point and nonpoint) must meet the WQS when entering the water body. If all sources meet the WQS at discharge, then the water body should meet the WQS and the designated use.

For the chloride TMDL, the water quality target from Table 4 of this Decision Document (500 mg/L) was used to calculate the loading capacities.

Flow data from several USGS gages in the two watersheds were used to develop the Load Duration Curves (LDCs). Flow data was available for a number of years (Section 3.6 and Figure 9 of the TMDL). Daily stream flows are necessary to implement the LDC approach.

The LDCs were created by multiplying individual flow values by the WQS and then multiplying that value by a conversion factor. The resulting points are plotted onto a load duration curve graph. The LDC graphs for impaired waterbodies have flow duration interval (percentage of time flow exceeded) on the X-axis and pollutant loads (number of bacteria or pollutant mass per unit time) on the Y-axis. The fecal coliform LDC used fecal coliform measurements in millions of bacteria per day, while the chloride LDC used pounds per day. The curved line on a LDC graph represents the TMDL for the respective flow conditions observed at that location.

Pollutant values from the monitoring sites were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection. The individual sampling loads were plotted on the same figure with the LDC (Section 7 of the TMDL).

The LDC plot was subdivided into five flow regimes; very high flows (exceeded 0–10% of the time), high conditions (exceeded 10–40% of the time), mid-range flows (exceeded 40–60% of the time), low conditions (exceeded 60–90% of the time), and very low flows (exceeded 90–100% of the time). LDC plots can be organized to display individual sampling loads and the

calculated LDC. Watershed managers can interpret these plots (individual sampling points plotted with the LDC) to understand the relationship between flow conditions and water quality exceedances within the watershed. Individual sampling loads which plot above the LDC represent violations of the WQS and the allowable load under those flow conditions at those locations. The difference between individual sampling loads plotting above the LDC and the LDC, measured at the same flow, is the amount of reduction necessary to meet WQS.

The strengths of using the LDC method are that critical conditions and seasonal variation are considered in the creation of the LDC by plotting hydrologic conditions over the flows measured during the recreation season. Additionally, the LDC methodology is relatively easy to use and cost-effective. The weaknesses of the LDC method are that nonpoint source allocations cannot be assigned to specific sources, and specific source reductions are not quantified. Overall, IEPA believes and EPA concurs that the strengths outweigh the weaknesses for the LDC method.

Implementing the results shown by the LDC requires watershed managers to understand the sources contributing to the water quality impairment and which Best Management Practices (BMPs) may be the most effective for reducing pollutant loads based on flow magnitudes. Different sources will contribute pollutant loads under varying flow conditions. For example, if exceedances are significant during high flow events this would suggest storm events are the cause and implementation efforts can target BMPs that will reduce stormwater runoff and consequently pollutant loading into surface waters. This allows for a more efficient implementation effort.

The TMDLs for the DRSC were calculated as appropriate. The regulated permittees discharging fecal coliform and chloride have allocations determined for them (Table 5-29 of this Decision Document). The load allocations were calculated after the determination of the Margin of Safety. Other load allocations (ex. non-regulated stormwater runoff, wildlife inputs, etc.) were not divided amongst individual nonpoint contributors. Instead, load allocations were combined into a generalized loading.

The LDC for fecal coliform shows exceedences under all flow conditions, and in similar magnitudes, indicating a variety of sources are contributing to the impairment. The LDC for chloride has only four exceedences. These exceedences occurred under mid- to lower-flow conditions.

Tables 5-29 of this Decision Document calculates five points (the midpoints of the designated flow regime) on the loading capacity curves. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. The load duration curve method can be used to display collected pollutant monitoring data and allows for the estimation of load reductions necessary for attainment of the appropriate water quality standards. Using this method, daily loads were developed based upon the flow in the water body. Loading capacities were determined for the segment for multiple flow regimes. This allows the TMDLs to be represented by an allowable daily load across all flow conditions. Although there are numeric loads for each flow regime, the LDC is what is being approved for these TMDLs.

DO-demanding substances (Segment GB-16): To develop the TMDL for low DO for Segment GB-16, IEPA used the QUAL2K model (Section 6.2 and Appendices E1-E3 of the TMDL). QUAL2K is a steady state, one-dimensional model that can simulate DO concentrations on an hourly time step (Section 1 of Appendix E1 of the TMDL). Typically, daily data are simulated during critical conditions (e.g., low flow and warm temperatures) and iterated over multiple repeated days to achieve convergence. QUAL2K represents streams as a series of segments, each of which has approximately constant characteristics (e.g., slope, shading, bottom width). Each segment is further divided into a series of equally spaced model computational elements, which are assumed fully mixed. Factors that affect in-stream temperature and DO concentrations are represented in QUAL2K, including solar inputs, stream shading, air temperature, oxidation of suspended and dissolved organic matter. The relative magnitude of these factors can be determined through model application, and scenarios can be developed to evaluate if management actions can improve in-stream conditions.

The results of the QUAL2K modeling show that several factors are contributing to the DO impairment. Segment GB-16 receives flow from three WWTFs, which contribute various substances that consume oxygen. In-stream processes also were found to negatively impact DO levels in the segment. The QUAL2K model was used to investigate several scenarios to meet the WQS (Section 4.2 of Appendix E1 of the TMDL). Two scenarios were determined to attain the DO standard in Segment GB-16:

Table 33: DO-substance Scenarios for Segment GB-16

Scenario 2	Scenario 3
• SOD reduced to 2.04 $g/m^2/d$ • Point source minimum DO increased to 6.5 mg/L • Bolingbrook and Plainfield WWTPs CBOD decreased to 10 mg/L • Headwater total phosphorus decreased to 1 mg/L • *Naperville WWTF CBOD reduced to 7.5 mg/L* • *SOD coverage reduced to 7.5%*	• SOD reduced to 2.04 $g/m^2/d$ • Point source minimum DO increased to 6.5 mg/L • Bolingbrook and Plainfield WWTPs CBOD decreased to 10 mg/L • Headwater total phosphorus decreased to 1 mg/L • *Naperville WWTF CBOD remains the same* • *SOD coverage reduced to 5.0%*

SOD = Sediment Oxygen Demand

The difference between the two scenarios are noted in italics in Table 33. Results of the modeling determined that SOD was a significant component of low DO in the segment. To reduce SOD in the system, IEPA determined that the total phosphorus coming from upstream sources need to be reduced, as well as reducing pollutants from the three WWTFs (Section 4.2 of Appendix E1 of the TMDL). Controlling these various loads will reduce the intensity of SOD as well as the areal extent of the stream with elevated levels of SOD. Table 30 of this Decision Document summarizes the two sets of allocations for Segment GB-16. For the purposes of this TMDL approval, EPA is approving the allocations for Scenario 2, which are more conservative regarding allocations. However, the EPA notes that IEPA will pursue implementing Scenario 3 through the NPDES permit process. EPA has determined it is reasonable to expect either scenario to attain WQS if implemented appropriately.

DO-demanding substances (GBK-14 and GBKA): Similar to the process for Segment GB-16, IEPA used QUAL2K to develop the TMDLs for Segments GBK-14 and GBKA (Appendices E2 and E3 of the TMDL). However, the cause of the low DO differs for these two segments. These segments are small headwater streams with no WWTF inputs; IEPA determined the critical condition for low DO was summer very low flow, with no stormwater inputs (Section 6.2 of the TDML). Analysis of the data and modeling results by IEPA showed that the source of the low DO is a more diffuse set of DO-demanding substances than for Segment GB-16. The analysis showed that DO decreases are due to high SOD levels in the streambed, low reaeration rates, and low flow. Typically, low reaeration rates and low flow are not pollutants under the Clean Water Act, and therefore would not require a TMDL. SOD can be a pollutant, but IEPA determined that just controlling SOD alone was not sufficient to attain the WQS.

To address the DO impairment, IEPA used QUAL2K to determine the DO deficit, the measure of the difference between the DO saturation and the DO criterion. By using the QUAL2K model, IEPA was able to calculate the overall DO impacts of various pollutants (i.e., total phosphorus, nitrogen, SOD, CBOD, etc.) as well as stream characteristics (i.e., flow, depth, reaeration rate, etc.) and calculate the overall DO-demanding substances affecting the streams (Appendices E2 and E3 of the TMDL).

Tables 31 and 32 of this Decision Document summarize the TMDLs addressing low DO for these two segments. IEPA noted that in addition to reducing pollutant loads into the waterbodies, changes to the waterbody characteristics (increasing reaeration and flow) in the waterbodies will be needed to attain WQS.

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this third element.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comment:
Fecal coliform: The LAs for fecal coliform are found in Tables 5-28 of this Decision Document. IEPA identified several nonpoint sources of bacteria in the watersheds, such as agricultural runoff, failing septics, and wildlife. IEPA did not further quantify the LA for bacteria.

Chloride: The LAs for chloride are found in Table 29 of this Decision Document. IEPA identified winter de-icing activities as the likely source of chloride. IEPA did not further quantify the LA for chloride.

DO-demanding substances: The LAs for DO-demanding substances are found in Tables 30-32 of this Decision Document. Several nonpoint sources of DO-demanding substances were identified by IEPA, including SOD and agricultural runoff. IEPA did not further quantify the LAs, but did note several implementation targets that are needed to address nonpoint source reductions of DO-demanding substances in the TMDL.

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this fourth element.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:
Fecal coliform: IEPA determined loads for fecal coliform for the dischargers in the DRSC watersheds (Table 34 of this Decision Document; Appendix F of the TMDL). The WLAs are based upon two flow conditions; IEPA used the design average flow (DAF) of the facilities for the lower streamflow regimes (10%-100%) and the design maximum flow (DMF) of the facilities for the high streamflow regime (0%-10%). The appropriate flow was multiplied by the WQS of 200 cfu/100 mL geometric mean and the 400 SSM for the facilities noted in Table 34 of this Decision Document (Section 6.3.1 of the TMDL)

IEPA identified several CSO dischargers in the watershed. For the fecal coliform TMDLs, IEPA reviewed the discharge records from 2013-2015 for CSO events for each of the CSO systems. IEPA determined the maximum discharge event for that time period, and multiplied that flow by the WQS (the 200 counts/100 mL geometric mean and the 400 counts/100 mL SSM) (Section 6.3.1 of the TMDL). Several CSO systems are part of the Metropolitan Water Reclamation District (MWRD) of Greater Chicago Tunnel and Reservoir Plan (TARP). These systems

convey stormwater into a series of tunnels and reservoirs for storage before pumping the water out, treating it, and discharging to a waterbody. IEPA reviewed the data submitted by MWRD to determine the estimated maximum volume for discharge, and multiplied the flow by the appropriate WQS (Section 6.3.1 and Appendix F of the TMDL).

For MS4s, IEPA determined the land area within each segment watershed that was considered "developed" and assigned that portion of the runoff load to MS4s (Section 6.3.1 of the TMDL). Loads were determined as an aggregate load; loads were not determined for each individual MS4 permittee. Appendix J of the TMDL contains a list of all MS4 permittees in the two watersheds.

For several of the impaired waterbodies, the DAF exceeded the monitored instream flow. For these flow regimes, IEPA noted that the WLAs and LAs are a formula as noted in the TMDL tables in this Decision Document. The WLAs and LAs are expressed as the facility flow times the appropriate WQS (i.e., 500 mg/L for chloride). This applies to both fecal coliform and chloride.

Chloride: IEPA identified four individually permitted dischargers of chloride (Table 35 of this Decision Document) in Segment GB-11. Similar to the bacteria TMDLs, IEPA utilized the DMF for the high flow regime and the DAF for the remaining flow regimes (Section 6.3.1 of the TMDL). The DMF or the DAF was multiplied by the chloride WQS of 500 mg/L to determine the WLA for each facility. For MS4s, a similar process as described above for bacteria was used, where the developed land proportion was multiplied by the WQS (Table 35 of the TMDL). However, IEPA did separate out a WLA for ILDOT, based upon the road mileage in the subwatershed and multiplying that value by the chloride WQS.

DO-demanding substances: IEPA identified three individual point sources discharging DO-demanding substances in Segment GB-16 (Section 7.2.2 of the TMDL). As discussed in Section 3 of this Decision Document, a significant modeling effort was performed to determine the causes and impacts of various DO-demanding substances on the DO levels in the waterbody segment. IEPA determined that two scenarios could result in attaining the DO WQS. Table 30 of this Decision Document (Table 34 of the TMDL) contains the WLAs for the three facilities. WLAs were determined for CBOD, total phosphorus, and total ammonia.

The EPA is approving the WLAs in Scenario 2 (discussed above in Section 3 of the Decision Document) at this time, but notes that the allocations in Scenario 3 are consistent with the TMDL loading capacity, assuming that the additional NPDES permit conditions and implementation targets are met. The EPA is clarifying that it is not approving effluent limits as noted in Table 30 of this Decision Document (Table 34 of the TMDL), or permit conditions as contained in Appendix G of the TMDL. Permit conditions and issues will need to be pursued through the NPDES permit process. Both scenarios include a WLA = 0 for MS4 discharges. IEPA explained that the modeling effort for all three DO-impaired segments focused on the critical conditions when the DO criteria were exceeded, which are during low-flow high temperature summer conditions. IEPA noted that under higher in-stream flows, MS4 discharge at current levels should have no impact on DO levels in the waterbody (email from Abel Haile, IEPA dated 09/05/2019).

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this fifth element.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comment:
Fecal coliform: The DRSC bacteria TMDLs incorporate an explicit MOS of 10% of the total loading capacity (Section 6.3.2 of the TMDL and Tables 5-28 of this Decision Document). An additional conservative assumption is that IEPA did not use a rate of decay, or die-off rate of pathogen species, in the TMDL calculations or in the creation of the load duration curve for fecal coliform. Bacteria have a limited capability of surviving outside their hosts, and normally a rate of decay would be incorporated. IEPA determined that it was more conservative to use the WQS (200/400 counts/100 mL) and not to apply a rate of decay, which could result in a discharge limit greater than the WQS.

As stated in *EPA's Protocol for Developing Pathogen TMDLs* (EPA 841-R-00-002), many different factors affect the survival of pathogens, including the physical condition of the water. These factors include, but are not limited to sunlight, temperature, salinity, and nutrient deficiencies. These factors vary depending on the environmental condition/circumstances of the water, and therefore it would be difficult to assert that the rate of decay caused by any given combination of these environmental variables was sufficient to meet the WQS of 200 cfu/100 mL. Thus, it is more conservative to apply the State's WQS as the MOS, because this standard must be met at all times under all environmental conditions.

Chloride: The chloride TMDL for Segment GB-11 incorporates an explicit MOS of 10% of the total loading capacity. The MOS reserved 10% of the loading capacity and allocated the remaining loads to point and nonpoint sources (Table 29 of this Decision Document). The use of the LDC approach minimized variability associated with the development of the chloride TMDL because the calculation of the loading capacity was a function of flow multiplied by the target value. The MOS was set at 10% to account for uncertainty due to field sampling error and assumptions made during the TMDL development process.

DO-demanding substances: The TMDLs addressing the DO impairments in the DRSC watersheds incorporate an implicit MOS regarding the loading capacity. IEPA used a DO target that is 10% higher than the applicable criterion. For Segment GB-16, the WQS is a minimum of 5.0 mg/L. In the QUAL2K model, IEPA developed the TMDL to meet a target of 5.5 mg/L. For Segments GBK-14 and GBKA, the WQS is the minimum of >4.0 mg/L. The target for both

TMDLs is a DO minimum of >4.4 mg/L. The MOS was set to account for uncertainty due to field sampling error and assumptions made during the TMDL development process.

EPA finds that the TMDL document submitted by IEPA has an appropriate MOS satisfying all requirements concerning this sixth element.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comment:
The LDC process accounts for seasonal variation by utilizing streamflows over a wide range. The LDC graphs can be used to determine under which conditions exceedences are occurring, and any seasonal component (i.e., spring melt).

Bacterial loads vary by season, typically reaching higher values in the dry summer months when low flows and warm water contribute to increased bacteria abundance, and reaching relatively lower values in colder months when bacterial growth rates attenuate. Bacterial WQS need to be met between May 1st to October 31st, regardless of the flow condition. The development of the LDC utilized flow measurements from local flow gages. These flow measurements were collected over a variety of flow conditions observed during the recreation season. The LDC developed from these flow records represents a range of flow conditions within the impaired watersheds and thereby accounted for seasonal variability over the recreation season.

For chloride, the development of the LDC utilized flow measurements from local flow gages. These flow measurements were collected over a variety of flow conditions observed during the year. The LDC developed from these flow records represents a range of flow conditions within the impaired watersheds and thereby accounted for seasonal variability over the year.

For the DO-demanding substances, analysis of the DO data indicated that DO was a problem during the late summer, when flows and reaeration are the lowest, and the impacts of the pollutants the greatest (Appendices E1-E3 of the TMDL). IEPA focused the modeling effort in this time period to determine the allocations necessary to attain WQS under the most conservative conditions.

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this seventh element.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (NPDES) permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with

"the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comment:
Section 8 of the TMDL discusses reasonable assurance for the DRSC watershed TMDLs. IEPA provided information on controls of fecal coliform, chloride, and DO-demanding substances that will be targeted in the watershed.

Point Sources:
Reasonable assurance that the WLAs will be implemented are through the NPDES program. IEPA listed numerous WWTPs that discharge the pollutants of concern in the DRSC watershed. WLAs have been determined for all three pollutants, and individual WLAs calculated for each point source discharger. Stormwater was identified as a source of the three pollutants, and IEPA has determined aggregate WLAs for each pollutant by subwatershed. As discussed in Section 5 of this Decision Document, IEPA developed two scenarios to address the low-DO in Segment GB-16. These scenarios will require reductions in pollutant loads for the three WWTF dischargers on the segment.

Appendix G of the TMDL contains the NPDES Permit Special Condition either contained or to be contained in the NPDES permits for the permittees listed in Table 34-35 of this Decision Document. These conditions require the permittee to work with the DRSCW to determine the most effective means to address the chloride and low DO impairments in the DRSC watersheds. The Special Conditions include various projects to address other causes of the DO impairment, such as dam removal, waterbody restoration, and additional modeling efforts. Completion dates are included, and annual progress reports are required. The latest progress report is available at http://www.dupagerivers.org/wp-content/uploads/2018/04/DRSCW-LDRWC_SpecialConditionsReport17-18_03312018.pdf on the DRSCW website.

The Special Conditions also require implementation of a watershed Chloride Reduction Program, and to work with members of the DRSCW to reduce chloride discharge. A Phosphorus Discharge Optimization Plan is also required to be implemented to investigate the potential for

further reductions in phosphorus discharge from the facilities. The Permittees are also required to investigate nonpoint source phosphorus reductions through a Nutrient Implementation Plan.

Nonpoint Sources:
Fecal coliform: Section 8.5 of the TMDL discusses various BMPs that, when implemented, will significantly reduce fecal coliform loadings to attain WQS. For most of these BMPs, IEPA provided watershed analysis on the impacts these BMPs may have on fecal coliform loads. IEPA noted that the usual source of bacteria loading (agricultural runoff), is not present in much of the watershed. For the East Branch DuPage River and Salt Creek, nonpoint source actions will focus on sanitary surveys to identify failing septics. The West Branch DuPage River and Lower DuPage River have some agricultural lands, and therefore some controls will be needed for those sources.

Chloride: To control chloride loads into the Lower DuPage River, IEPA will focus on controlling road salt runoff in the watershed (Section 8.5.3 of the TMDL). To control chloride, IEPA will focus on operator training for both municipal salting operations as well as private contractors.

DO-demanding substances: To control DO-demanding substances in the TMDL watersheds, IEPA developed a STEPL model that calculates pollutant runoff from various land uses (Section 8 of the TMDL). Figures 69 and 71 in the TMDL identify the phosphorus and BOD loading rates from subwatersheds in the Segment GB-16 watershed. This modeling effort will help IEPA identify the critical areas for pollutant loading, and therefore target BMPs more efficiently.

Local efforts:
IEPA also identified numerous watershed projects in the TMD watershed that will reduce pollutant loads. The DRSCW is a local group of stakeholders that have been working in the watersheds for many years. Tables 66 and 67 of the TMDL contain a list of BMP projects planned for the East Branch and West Branch DuPage Rivers, including costs. The Lower DuPage River Watershed Coalition (LDRWC) has also been active in the watershed. Both groups have applied for and received funding to develop implementation actions and activities, perform monitoring, and target the removal of dams in the watershed. These projects will directly reduce pollutant loads in the waterbodies, as well as improve fish passages, habitat and biota within the impaired waters.

Additional TMDLs:
IEPA noted that several previously approved TMDLs in different portions of the watershed continue to be implemented (Table 2 of the TMDL and https://www2.illinois.gov/epa/topics/water-quality/watershed-management/tmdls/Pages/reports.aspx#dupeas). Previous TMDLs in the East Branch DuPage River focused on low DO and elevated chloride. TMDLs in the West Branch DuPage River addressed elevated chloride levels. TMDLs in Salt Creek addressed chloride and low DO. These TMDLs are being implemented, and the actions and activities as part of this implementation effort will very likely help reduce pollutants in the DRSC TMDLs (Section 8 of the TMDL).

EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:
The TMDL contains discussion on future monitoring and milestones (Section 9 and Table 70 of the TMDL). There were several monitoring sites used to gather data for the DRSC TMDLs. IEPA performs intensive basin surveys every 5 years on a rotating basins process. Additional monitoring has been done by the DRSCW and LDRWC who have worked in conjunction with IEPA and NPDES permittees in the watershed to gather a wide variety of data to better document the water quality. Some of the monitoring work is required under the Special Conditions in the NPDES permits (Appendix G of the TMDL).

EPA finds that this criterion has been adequately addressed.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment:
Numerous implementation options are discussed in Section 8 of the TMDL. Many of the options focus on stormwater controls and stream restoration activities.

The potential BMPs are:

- Ordinance development – local ordinances can have significant impacts on the design and operation of stormwater controls
- Pet waste education – reduction of bacteria and nutrients through implementation of controls on pet waste
- Septic System Inspection – improved septic system regulations and point of sale inspections can reduce the potential for failing systems

- Green infrastructure – the use of permeable paving, rain gardens, etc. to reduce and control stormwater runoff

- Stream restoration – the DRSCW and LDRWC have led efforts to improve streams within the TMDL watersheds
- Dam removal – Several dams have been removed or reduced to provide better stream hydrology and fish passage in the watersheds

IEPA also provided data on the potential removal efficiencies for several BMPs in Table 66 of the TMDL. The table also provides information on potential costs for the BMPs.

Significant efforts have been developed in the watershed to address the reduction of chloride in the watershed. The DRSCW and LDRWC have led efforts to develop and host annual workshops for public and private salt spreaders since 2008. The groups have also developed BMPs regarding salt practices in an effort to reduce salt loads throughout the watershed. A variety of best practices information and training materials are available on the DRSCW website (http://www.drscw.org/wp/chlorides-and-winter-management/).

EPA reviews, but does not approve, implementation plans. EPA finds that this criterion has been adequately addressed.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comment:
An initial public meeting was held on January 28, 2009, to describe the watershed plan and TMDL process. An additional stakeholder meeting was held on March 31, 2009. The TMDL process, NPDES Special Conditions, and project status in the watersheds were discussed during meetings of the DRSCW. The meetings were held approximately every 2 months. Numerous stakeholders were present at the meetings (http://www.drscw.org/wp/agendas-and-minutes/).

The public comment period for the draft TMDL opened on April 24, 2019 and closed on May 24, 2019. A public meeting was held on April 24, 2019, in Lombard, Illinois. The public notices

were published in the local newspaper and interested individuals and organizations received copies of the public notice. A hard copy of the TMDL was made available at the Conservation Foundation, DuPage County Stormwater Management Office, the Village of Lombard, and the Village of Plainfield. The draft TMDL was also made available at the website http://www.epa.illinois.gov/public-notices/index. One public comment was received, from the Metropolitan Water Reclamation District of Greater Chicago (Appendix D of the TMDL). The comments corrected the locations of several monitoring stations operated by the District. IEPA revised the TMDL as appropriate based on the comments.

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment:
On August 6, 2019, EPA received the DRSC watershed TMDLs and a submittal letter from Sanjay Sofat, IEPA to Joan Tanaka, EPA. In the submittal letter, IEPA stated it was submitting the TMDL report for EPA's final approval. The submittal letter included the name and location of the waterbodies and the pollutants of concern.

EPA finds that the TMDL document submitted by IEPA satisfies all requirements concerning this twelfth element.

Conclusion
After a full and complete review, EPA finds that the TMDLs for the DuPage River Salt Creek watersheds satisfy all of the elements of an approvable TMDL. This approval is for 18 TMDLs: 12 for fecal coliform, five for low DO (phosphorus, ammonia, CBOD, and DO-demanding substances) and one for chloride, as noted in Table 1 of this Decision Document.

EPA's approval of this TMDL does not extend to those waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

Fecal Coliform TMDLs

Table 34 of this Decision Document contains the individual WLAs summarized in Tables 5-28.

Table 5. Fecal coliform TMDL summary (single sample maximum standard; DuPage River at GB-11)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	372	-	-	-	-
	NPDES-permitted facilities	4,825	2,134	2,134	b	b
	MS4 [d]	5,641	1,931	339	b	b
Load Allocation		769	263	46	b	b
MOS		1,290	481	280	183	126
Loading Capacity		**12,897**	**4,809**	**2,799**	**1,830**	**1,260**
Existing Load		34,398	12,109	5,271	1,481	1,764
Load Reduction [a]		63%	60%	47%	0%	29%

a. TMDL reduction is based on the observed 90th percentile load in each flow regime.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
c. CSO events are assumed to occur no more than 4 times a year
d. the MS4 WLA is categorical, see section 6.3.1 for description

Table 6. Fecal coliform TMDL summary (geomean standard; DuPage River at GB-11)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	186	-	-	-	-
	NPDES-permitted facilities	2,415	1,065	1,065	b	b
	MS4 [d]	2,819	967	172	b	b
Load Allocation		384	132	23	b	b
MOS		645	240	140	92	63
Loading Capacity		**6,449**	**2,404**	**1,400**	**915**	**630**
Existing Load		34,398	12,109	5,271	1,481	1,764
Load Reduction [a]		Not calculated				

a. Insufficient data to calculate reduction based on the geomean standard.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 7. Fecal coliform TMDL summary (single sample maximum standard; DuPage River at GB-16)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	372	-	-	-	-
	NPDES-permitted facilities	4,707	2,086	b	b	b
	MS4 [d]	3,547	1,148	b	b	b
Load Allocation		351	113	b	b	b
MOS		998	372	217	142	97
Loading Capacity		**9,975**	**3,719**	**2,165**	**1,415**	**974**
Existing Load		125,380	37,179	2,069	1,399	456
Load Reduction [a]		92%	90%	0%	0%	0%

a. TMDL reduction is based on the observed 90th percentile load in each flow regime.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards..
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description

Table 8. Fecal coliform TMDL summary (geomean standard; DuPage River at GB-16)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	186	-	-	-	-
	NPDES-permitted facilities	2,356	1,041	b	b	b
	MS4 [d]	1,771	576	b	b	b
Load Allocation		175	57	b	b	b
MOS		499	186	108	71	49
Loading Capacity		**4,987**	**1,860**	**1,083**	**708**	**487**
Existing Load		125,380	37,179	2,069	1,399	456
Load Reduction [a]		Not calculated				

a. Insufficient data to calculate reduction based on the geomean standard.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards..
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 9. Fecal coliform TMDL summary (single sample maximum standard; West Branch DuPage River at GBK-05

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facilities	1,405	642	642	b	b
	MS4 [c]	2,349	594	54	b	b
Load Allocation		177	45	4	b	b
MOS		437	142	78	50	33
Loading Capacity		**4,368**	**1,423**	**778**	**500**	**333**
Existing Load		143,396	70,781	6,387	1,444	1,102
Load Reduction [a]		97%	98%	88%	65%	70%

a. TMDL reduction is based on the observed 90th percentile load in each flow regime.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
c. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 10. Fecal coliform TMDL summary (geomean standard; West Branch DuPage River at GBK-05)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facilities	704	320	320	b	b
	MS4 [c]	1,174	298	28	b	b
Load Allocation		88	22	2	b	b
MOS		218	71	39	25	17
Loading Capacity		**2,184**	**711**	**389**	**250**	**167**
Existing Load		143,396	70,781	6,387	1,444	1,102
Load Reduction [a]		Not calculated				

a. Insufficient data to calculate reduction based on the geomean standard.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.
c. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 11. Fecal coliform TMDL summary (single sample maximum standard; West Branch DuPage River at GBK-09)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facilities	612	293	293	b	b
	MS4 [c]	741	205	0.97	b	b
Load Allocation		23	6	0.03	b	b
MOS		153	56	33	22	15
Loading Capacity		**1,529**	**560**	**327**	**222**	**152**
Existing Load		24,165	13,295	1,030	2,822	416
Load Reduction [a]		94%	96%	68%	92%	64%

a. TMDL reduction is based on the observed 90th percentile load in each flow regime.

b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.

c. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 12. Fecal coliform TMDL summary (geomean standard; West Branch DuPage River at GBK-09)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facilities	307	146	146	b	b
	MS4 [c]	370	103	0.97	b	b
Load Allocation		11	3	0.03	b	b
MOS		77	28	16	11	8
Loading Capacity		**765**	**280**	**163**	**111**	**76**
Existing Load		24,165	13,295	1,030	2,822	416
Load Reduction [a]		Not calculated				

a. Insufficient data to calculate reduction based on the geomean standard.

b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.

c. The MS4 WLA is categorical, see section 6.3.1 for description

Table 13. Fecal coliform TMDL summary (single sample maximum; West Branch DuPage River at GBK-14)

TMDL Parameter	Flow Zones				
	High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation: MS4 [a]	200	73	42.6	29.7	19.8
Load Allocation	2	1	0.4	0.3	0.2
MOS	23	8	5	3	2
Loading Capacity	**225**	**82**	**48**	**33**	**22**
Existing Load	14,287	2,417	406	5,335	3,477
Load Reduction [b]	98%	97%	88%	99%	99%

a. The MS4 WLA is categorical, see section 6.3.1 for description.

b. TMDL reduction is based on the observed 90th percentile load in each flow regime.

Table 14. Fecal coliform TMDL summary (geomean standard; West Branch DuPage River at GBK-14)

TMDL Parameter	Flow Zones				
	High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation: MS4 [a]	100	36.6	21.8	13.9	9.9
Load Allocation	1	0.4	0.2	0.1	0.1
MOS	11	4	2	2	1
Loading Capacity	**112**	**41**	**24**	**16**	**11**
Existing Load	14,287	2,417	406	5,335	3,477
Load Reduction [b]	Not calculated				

a. The MS4 WLA is categorical, see section 6.3.1 for description.

b. Insufficient data to calculate reduction based on the geomean standard.

Table 15. Fecal coliform TMDL summary (single sample maximum standard; Spring Brook at GBKA)

TMDL Parameter	Flow Zones				
	High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation: MS4 [a]	202	93	57	40	29
Load Allocation [a]	0	0	0	0	0
MOS	22	10	6	5	3
Loading Capacity	**224**	**103**	**63**	**45**	**32**
Existing Load	7,380	1,737	809	100	117
Load Reduction [b]	97%	94%	92%	55%	73%

a. The MS4 WLA is categorical and accounts for 100% of the watershed, therefore the LA=0. See section 6.3.1 for description.

b. TMDL reduction is based on the observed 90th percentile load in each flow regime.

Table 16. Fecal coliform TMDL summary (geomean standard; Spring Brook at GBKA)

TMDL Parameter	Flow Zones				
	High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation: MS4 [a]	101	47	29	21	14
Load Allocation [a]	0	0	0	0	0
MOS	11	5	3	2	2
Loading Capacity	**112**	**52**	**32**	**23**	**16**
Existing Load	7,380	1,737	809	100	117
Load Reduction [b]	Not calculated				

a. The MS4 WLA is categorical and accounts for 100% of the watershed, therefore the LA=0. See section 6.3.1 for description.

b. Insufficient data to calculate reduction based on the geomean standard.

Table 17. Fecal coliform TMDL summary (single sample maximum standard; Spring Brook at GBKA-01)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facility: IL0031739 (Wheaton S.D.) [a]	289 (at DMF)	135 (at DAF)	b	b	b
	MS4 [c]	62	27	b	b	b
Load Allocation		1	1	b	b	b
MOS		39	18	11	8	6
Loading Capacity		**391**	**181**	**110**	**79**	**55**
Existing Load		5,777	1,610	211	103	148
Load Reduction [d]		93%	89%	48%	23%	63%

a. DMF = 19.1 MGD, DAF = 8.9 MGD
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
c. The MS4 WLA is categorical, see section 6.3.1 for description.
d. TMDL reduction is based on the observed 90th percentile load in each flow regime.

Table 18. Fecal coliform TMDL summary (geomean standard; Spring Brook at GBKA-01)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facility: IL0031739 (Wheaton S.D.) [a]	145 (at DMF)	67 (at DAF)	b	b	b
	MS4 [c]	30	13.7	b	b	b
Load Allocation		1	0.3	b	b	b
MOS		20	9	6	4	3
Loading Capacity		**196**	**90**	**55**	**40**	**28**
Existing Load		5,777	1,610	211	103	148
Load Reduction [d]		Not calculated				

a. DMF = 19.1 MGD, DAF = 8.9 MGD
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.
c. The MS4 WLA is categorical, see section 6.3.1 for description.
d. Insufficient data to calculate reduction based on the geomean standard.

Table 19. Fecal coliform TMDL summary (single sample maximum standard; East Branch DuPage River at GBL-10)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	372	-	-	-	-
	NPDES-permitted facilities	1,347	554	554	b	b
	MS4 [d]	1,086	457	89	b	b
Load Allocation		11	5	1	b	b
MOS		313	113	72	52	39
Loading Capacity		**3,129**	**1,129**	**716**	**521**	**391**
Existing Load		22,930	9,863	9,377	3,411	2,129
Load Reduction [a]		86%	89%	92%	85%	82%

a. TMDL reduction is based on the observed 90th percentile load in each flow regime.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 20. Fecal coliform TMDL summary (geomean standard; East Branch DuPage River at GBL-10)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	186	-	-	-	-
	NPDES-permitted facilities	674	276	276	b	b
	MS4 [d]	543	230	45.5	b	b
Load Allocation		5	2	0.5	b	b
MOS		156	56	36	26	20
Loading Capacity		**1,564**	**564**	**358**	**260**	**195**
Existing Load		22,930	9,863	9,377	3,411	2,129
Load Reduction [a]		Not calculated				

a. Insufficient data to calculate reduction based on the geomean standard.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 21. Fecal coliform TMDL summary (single sample maximum; Salt Creek at GL-09)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	2,719	-	-	-	-
	NPDES-permitted facilities	1,713	886	886	b	b
	MS4 [d]	1,176	1,007	160	b	b
Load Allocation		12	10	2	b	b
MOS		625	211	116	76	50
Loading Capacity		**6,245**	**2,114**	**1,164**	**756**	**500**
Existing Load		214,979	78,888	4,486	1,896	747
Load Reduction [a]		97%	97%	74%	60%	33%

a. TMDL reduction is based on the observed 90th percentile load in each flow regime.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 22. Fecal coliform TMDL summary (geomean standard; Salt Creek at GL-09)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [c]	1,359	-	-	-	-
	NPDES-permitted facilities	859	444	444	b	b
	MS4 [d]	586	502	79	b	b
Load Allocation		6	5	1	b	b
MOS		312	106	58	38	25
Loading Capacity		**3,122**	**1,057**	**582**	**378**	**250**
Existing Load		214,979	78,888	4,486	1,896	747
Load Reduction [a]		Not calculated				

a. Insufficient data to calculate reduction based on the geomean standard.
b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.
c. CSO events are assumed to occur no more than 4 times per year.
d. The MS4 WLA is categorical, see section 6.3.1 for description.

Table 23. Fecal coliform load duration curve (single sample maximum standard; Salt Creek at GL-10)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facility: IL0036340 (MWRDGC EGAN WRP – 001) [a]	757	454	c	c	c
	MS4 [b]	1,424	87	c	c	c
Load Allocation		14	1	c	c	c
MOS		244	60	26	11	3
Loading Capacity		**2,439**	**602**	**264**	**105**	**29**
Existing Load		5,938	3,027	332	342	121
Load Reduction [d]		59%	80%	20%	69%	76%

a. DMF = 50 MGD, DAF = 30 MGD. NPDES-permitted facility with excess flow outfall – excess flows not included in WLA.
b. The MS4 WLA is categorical, see section 6.3.1 for description.
c. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
d. TMDL reduction is based on the observed 90th percentile load in each flow regime.

Table 24. Fecal coliform load duration curve (geomean standard; Salt Creek at GL-10)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	NPDES-permitted facility: IL0036340 (MWRDGC EGAN WRP – 001) [a]	379	227	c	c	c
	MS4 [b]	712	43.6	c	c	c
Load Allocation		7	0.4	c	c	c
MOS		122	30	13	5	1
Loading Capacity		**1,220**	**301**	**132**	**52**	**14**
Existing Load		5,938	3,027	332	342	121
Load Reduction [d]		Not calculated				

a. DMF = 50 MGD, DAF = 30 MGD. NPDES-permitted facility with excess flow outfall – excess flows not included in WLA.
b. The MS4 WLA is categorical, see section 6.3.1 for description.
c. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.
d. Insufficient data to calculate reduction based on the geomean standard.

Table 25. Fecal coliform TMDL summary (single sample maximum; Salt Creek at GL-19)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [a]	b	-	-	-	-
	NPDES-permitted facilities	1,864	957	957	c	c
	MS4 [d]	5,017	1,375	332	c	c
Load Allocation		51	14	3	c	c
MOS		770	261	144	93	62
Loading Capacity		**7,702**	**2,607**	**1,436**	**932**	**617**
Existing Load		267,527	379,297	5,919	4,698	1,321
Load Reduction [e]		97%	99%	76%	80%	53%

a. CSO events are assumed to occur no more than 4 times per year.

b. Permitted CSO loads are estimated to be approximately 11,880 billion cfu/event. Permitted CSO facilities can discharge under high flow conditions if meeting permit conditions and long-term control plans.

c. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.

d. The MS4 WLA is categorical, see section 6.3.1 for description

e. TMDL reduction is based on the observed 90th percentile load in each flow regime.

Table 26. Fecal coliform TMDL summary (geomean standard; Salt Creek at GL-19)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSOs [a]	b	-	-	-	-
	NPDES-permitted facilities	935	480	480	c	c
	MS4 [d]	2,506	687	164	c	c
Load Allocation		25	7	2	c	c
MOS		385	130	72	47	31
Loading Capacity		**3,851**	**1,304**	**718**	**466**	**309**
Existing Load		267,527	379,297	5,919	4,698	1,321
Load Reduction [e]		Not calculated				

a. CSO events are assumed to occur no more than 4 times per year.

b. Permitted CSO loads are estimated to be approximately 5,940 billion cfu/event. Permitted CSO facilities can discharge under high flow conditions if meeting permit conditions and long-term control plans.

c. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.

d. The MS4 WLA is categorical, see section 6.3.1 for description.

e. Insufficient data to calculate reduction based on the geomean standard.

Table 27. Fecal coliform TMDL summary (single sample maximum standard; Addison Creek at GLA-02)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSO: IL0020853 (MWRDGC STICKNEY WRP CSOS – 150) [a]	b	-	-	-	-
	NPDES-permitted facility: IL0021849 (BENSENVILLE STP – 001) [c]	151	71	71	d	d
	MS4 [e]	702	210	52	d	d
Load Allocation		7	2	0.5	d	d
MOS		96	31	14	8	5
Loading Capacity		**956**	**314**	**138**	**84**	**47**
Existing Load		-	18,705	6,727	2,407	1,377
Load Reduction [f]		-	98%	98%	97%	97%

a. CSO events are assumed to occur no more than 4 times per year.
b. Permitted CSO loads are estimated to be approximately 5,891 billion cfu/event. Permitted CSO facilities can discharge under high flow conditions if meeting permit conditions and long-term control plans.
c. DMF = 10 MGD, DAF = 4.7 MGD. NPDES-permitted facility with excess flow outfall – excess flows not included in WLA.
d. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (400 counts per 100 mL). The allowable concentration is based on water quality standards.
e. The MS4 WLA is categorical, see section 6.3.1 for description.
f. TMDL reduction is based on the observed 90th percentile load in each flow regime.

Table 28. Fecal coliform TMDL summary (geomean standard; Addison Creek at GLA-02)

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Fecal Coliform Load (billion cfu/day)				
Wasteload Allocation	CSO: IL0020853 (MWRDGC STICKNEY WRP CSOS – 150) [a]	b	-	-	-	-
	NPDES-permitted facility: IL0021849 (BENSENVILLE STP – 001) [c]	76	36	36	d	d
	MS4 [e]	350	104	26	d	d
Load Allocation		3	1	0.3	d	d
MOS		48	16	7	4	2
Loading Capacity		**478**	**157**	**69**	**42**	**23**
Existing Load		-	18,705	6,727	2,407	1,377
Load Reduction [f]		Not calculated				

a. CSO events are assumed to occur no more than 4 times per year.

b. Permitted CSO loads are estimated to be approximately 2,945 billion cfu/event. Permitted CSO facilities can discharge under high flow conditions if meeting permit conditions and long-term control plans.

c. DMF = 10 MGD, DAF = 4.7 MGD. NPDES-permitted facility with excess flow outfall – excess flows not included in WLA.

d. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs and LA are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (200 counts per 100 mL). The allowable concentration is based on water quality standards.

e. The MS4 WLA is categorical, see section 6.3.1 for description.

f. Insufficient data to calculate reduction based on the geomean standard.

Chloride TMDL

Table 29. Chloride TMDL summary, DuPage River at GB-11

TMDL Parameter		Flow Zones				
		High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
		Chloride Load (tons/day)				
Boundary Condition: Upstream Approved TMDLs in East and West Branch DuPage Rivers		1,106	412	240	157	108
Wasteload Allocation	NPDES-permitted facilities	200	95	95	b	b
	ILDOT Roads	6	2	0.2	b	b
	Non-ILDOT MS4s [c]	220	67	9	b	b
Load Allocation		67	21	3	b	b
MOS		178	66	39	25	17
Loading Capacity		**1,777**	**663**	**386**	**252**	**174**
Existing Load		1,592	532	727	967	65
Load Reduction [a]		0%	0%	47%	74%	0%

a. TMDL reduction is based on the observed maximum load in each flow regime.

b. The permitted wastewater treatment facility design flows exceed the long-term monitored stream flow in the dry and low flow zones. NPDES-permitted facilities can discharge under these flow conditions if meeting permit conditions. To account for these unique situations only, the WLAs are expressed as an equation rather than an absolute number: Wasteload Allocation or Load Allocation = (flow contribution from a given source) x (500 mg/L). The allowable concentration is based on the water quality standard.

c. The Non-ILDOT MS4 WLA is categorical, see section 6.3.1 for description.

DO-demanding substances TMDLs

Table 30. $CBOD_5$, total phosphorus, and ammonia TMDLs to address dissolved oxygen summary (GB-16)

TMDL Parameter		Scenario 2				Scenario 3			
		$CBOD_5$ (lbs/day)	Total Phosphorus (lbs/day)	Total Ammonia (lbs/day)	Implementation Targets	$CBOD_5$ (lbs/day)	Total Phosphorus (lbs/day)	Total Ammonia (lbs/day)	Implementation Targets
Wasteload Allocation	CSOs	0 [b]	0 [b]	0 [b]	--	0 [b]	0 [b]	0 [b]	--
	Point Source: IL0034061 (Naperville STP)	1,877	250	350	- Minimum DO increased to 6.5 mg/L in permit - Reduce $CBOD_5$ permit limit to 7.5 mg/L	2,503	250	350	• Minimum DO increased to 6.5 mg/L in permit
	Point Source: IL0069744 (Bolingbrook STP #3)	350	53	53	- Minimum DO increased to 6.5 mg/L in permit - Reduce $CBOD_5$ permit limit to 10 mg/L	350	53	53	- Minimum DO increased to 6.5 mg/L in permit - Reduce $CBOD_5$ permit limit to 10 mg/L
	Point Source: IL0074373 (Plainfield North STP)	626	94	94	- Minimum DO increased to 6.5 mg/L in permit - Reduce $CBOD_5$ permit limit to 10 mg/L	626	63	94	- Minimum DO increased to 6.5 mg/L in permit - Reduce $CBOD_5$ permit limit to 10 mg/L
	MS4	0 [b]	0 [b]	0 [b]	--	0 [b]	0 [b]	0 [b]	--
Load Allocation		512	34	34	- SOD rate reduced to 2.04 $g/m^2/d$ - SOD coverage decreased by half to 7.5% - Headwater TP decreased to 1 mg/L - Headwater at 6 mg/L DO	511	34	34	- SOD rate reduced to 2.04 $g/m^2/d$ - SOD coverage decreased to 5% - Headwater TP decreased to 1 mg/L - Headwater at 6 mg/L DO
MOS [a]		*Implicit*			--	*Implicit*			--
Loading Capacity		**3,366**	**674**	**531**	--	**3,990**	**674**	**531**	--
In-stream losses per QUAL2K model (see Appendix E)		-197	-91	-159	--	-260	-74	-160	--
In-stream load of pollutant at downstream point of segment meeting DO standards		3,169	583	372	--	3,730	600	371	--

a. A 10% MOS was applied to the standard during modeling; see Appendix E.

b. This TMDL is provided for critical conditions occurring during low flow summer months; CSO and stormwater discharges are not anticipated at this time. Illinois EPA indicated that it is not intended to apply under higher flow conditions (9/5/19 email from Abel Haile, IEPA to Dave Werbach, EPA).

c. Conversion units used in WLA calculations: 1.547 (MGD per cfs), 86,400 (seconds per day), 28.317 (liters per 1 cubic ft) and 453,592 (mg per lb)

Table 31. Dissolved oxygen demand TMDL summary (GBK-14)

TMDL Parameter	DOD (kg/day)	DOD (lbs/day)
Wasteload Allocation: MS4 [a]	0 [b]	0 [b]
Load Allocation	11	24
MOS [c]	*implicit*	*implicit*
Loading Capacity (kg/day) [d]	**11**	**24**
Existing Load (kg/day)	19	42
Load Reduction	42%	

a. The MS4 WLA is categorical, see section 6.3.1 for description.
b. This TMDL is provided for critical conditions occurring during low flow summer months; CSO and stormwater discharges are not anticipated at this time.
c. A 10% MOS was applied to the standard during modeling; see Appendix E.
d. TMDL is provided for critical conditions: Flow = 1.33 cfs; Water temperature = 19.4 °C; DO_{sat} = 8.96 mg/l. TMDLs can be determined for any combination of flow and water temperature using the following equation:

$$DOD\ [\frac{kg}{\_\_}] = (DO_{sat} - DO)\ [mg/L]\ x\ Q\ [cfs]\ x\ 2.447[conversion\ factor]$$

Table 32. Dissolved oxygen demand TMDL summary (Spring Brook at GBKA)

TMDL Parameter	DOD (kg/day)	DOD (lbs/day)
Wasteload Allocation: MS4 [a]	0 [b]	0 [b]
Load Allocation	39	86
MOS [c]	*implicit*	*implicit*
Loading Capacity [d]	**39**	**86**
Existing Load	59	130
Load Reduction	34%	

a. The MS4 WLA is categorical, see section 6.3.1 for description.
b. This TMDL is provided for critical conditions occurring during low flow summer months; stormwater discharges are not anticipated at this time.
c. A 10% MOS was applied to the standard during modeling; see Appendix E.
d. TMDL is provided for critical conditions: Flow = 4.3 cfs; Water temperature = 22.26 °C; DO_{sat} = 8.76 mg/l. TMDLs can be determined for any combination of flow and water temperature using the following equation:

$$DOD\ [\frac{kg}{\_\_}] = (DO_{sat} - DO)\ [mg/L]\ x\ Q\ [cfs]\ x\ 2.447[conversion\ factor]\ d$$

Table 34. Fecal Coliform and Chloride Wasteload Allocations (See Table 18 of the TMDL for the waterbody segment locations of the dischargers)

Permit ID	Facility	Design Average Flow (MGD)	Design Maximum Flow (MGD)	Fecal Coliform WLA (billion cfu per day)	
				High Flows – Design Maximum Flow (single sample maximum/ geomean standard)	Moist Conditions to Low Flows – Design Average Flow (single sample maximum/ geomean standard)
IL0020061	WOOD DALE NORTH STP – 001[b]	1.97	3.93	60 / 30	30 / 15
IL0021130	BLOOMINGDALE-REEVES WRF – B01[b]	3.45	8.625	131 / 65	52 / 26
IL0021547	GLENBARD WW AUTH-GLENBARD – 001	16.02	47	712 / 356	243 / 121
IL0021849	BENSENVILLE STP – 001[b]	4.7	10.0	151 / 76	71 / 36
IL0022471	GLENBARD WW AUTH-LOMBARD – 001	0.8[a]		12 / 6	12 / 6
IL0022471	GLENBARD WW AUTH-LOMBARD – 002/003 (CSOs)[c]	24.6 (maximum CSO volume, February 2014)[d]		372 / 186	--
IL0023469	WEST CHICAGO STP – B01[b]	7.64	20.3	307 / 154	116 / 58
IL0026352	CAROL STREAM STP – B01[b]	6.5	13.0	197 / 98	98 / 49
IL0027367	ADDISON SOUTH-A.J. LAROCCA STP – B01[b]	3.2	8.0	121 / 61	48 / 24
IL0027367	ADDISON SOUTH-A.J. LAROCCA STP – 004 (CSO)[c]	17.07 (maximum CSO volume, April 2013)[d]		258 / 129	--
IL0027618	BARTLETT WWTP – B01[b]	3.679	5.151	78 / 39	56 / 28
IL0028380	DOWNERS GROVE SD WTC – B01[b]	11	22.0	333 / 167	167 / 83
IL0028398	DUPAGE COUNTY-NORDIC PARK STP – 001	0.5	1.0	15 / 8	42586
IL0028428	DUPAGE COUNTY-CASCADE STP – 001	0.00585	0.0234	0.4 / 0.2	0.1 / 0.05
IL0028746	ELMHURST WWTP – 001[b]	8	20.0	303 / 151	121 / 61
IL0028967	GLENDALE HEIGHTS STP – B01[b]	5.26	10.52	159 / 80	80 / 40
IL0030813	ROSELLE STP – B01[b]	2	4	61 / 30	30 / 15
IL0030953	SALT CREEK SANITARY DISTRICT – 001/002	3.3	8.0	121 / 61	50 / 25
IL0031739	WHEATON S.D. – 001[b]	8.9	19.1	289 /145	135 / 67
IL0031844	DUPAGE COUNTY-WOODRIDGE STP – 001[b]	12	28.6	433 / 217	182 / 91
IL0032689	BOLINGBROOK STP #1 – B01[b]	2.04	4.51	68 / 34	31 / 15
IL0032735	BOLINGBROOK WRF #2 – 001	3	7.5	114 / 57	45 / 23

IL0033618	VILLA PARK WET WEATHER STP – 001/002/003/004 (CSOs)[b,c]	38.5 (maximum CSO volume, based on annual average discharge and 4 events per year)[d]		583 / 291	--
IL0033812	ADDISON NORTH STP – B01[b]	5.3	7.6	115 / 58	80 / 40
Permit ID	**Facility**	**Design Average Flow (MGD)**	**Design Maximum Flow (MGD)**	**Fecal Coliform WLA (billion cfu per day)**	
				High Flows – Design Maximum Flow (single sample maximum/ geomean standard)	**Moist Conditions to Low Flows – Design Average Flow (single sample maximum/ geomean standard)**
IL0034061	NAPERVILLE SPRINGBROOK WRC – 001	26.25 current, 30 future	55.13 current, 63 future	954 / 477	454 / 227
IL0034274	WOOD DALE SOUTH STP – 001[b]	1.13	2.33	35 / 18	17 / 9
IL0034479	HANOVER PARK STP #1 – B01[b]	2.42	8.68	131 / 66	37 / 18
IL0036137	MWRDGC HANOVER PARK STP – 007	12	22	333 / 167	182 / 91
IL0036340	MWRDGC EGAN WRP – 001[b]	30	50	757 / 379	454 / 227
IL0045039	VILLAGE OF WESTERN SPRINGS CSOS – 004[c]	No reported CSO volume		0 / 0	--
IL0048721	ROSELLE-BOTTERMAN WWTF – 001	1.22	4.60	70 / 35	18 / 9
IL0052817	STONEWALL UTILITY COMPANY - STP	0.01	0.07	1.1 / 0.5	0.2 / 0.1
IL0069744	BOLINGBROOK WRF #3 – 001	2.8 current, 4.2 future	7.0 current, 10.5 future	159 / 79	64 / 32
IL0074373	PLAINFIELD NORTH STP – 001	7.5	15.0	227 /114	114 / 57
IL0076414	JOLIET AUX SABLE WWTP – 001	3.2	7.8	118 / 59	48 / 24
IL0079073	ITASCA STP – 001	3.2	8.2	124 / 62	48 / 24
IL0028053[e]	MWRDGC STICKNEY WRP CSOS – 150[c] (Westchester Pump Station)	389 (maximum CSO volume, October 2014)[d]		1,878 / 939 – discharges to GL-09 11,039 / 5,520 – discharges to GL-19 5,891 / 2,945 discharges to GLA-02	--
ILM580008[e]	LAGRANGE PARK CSOS – 001/002/003/004/005/006[c]	124 (maximum CSO volume, April 2013)[d]			
ILM580009[e]	VILLAGE OF LAGRANGE CSOS – 001/002/003[c]	No reported CSO volume			
ILM580032[e]	BROOKFIELD CSOS – 001/002/003/005/006/007[c]	341 (maximum CSO volume, April 2013)[d]			

a. 2013-2015 average DMR flows.

b. NPDES-permitted facility with excess flow outfall – excess flows not included in WLAs.

c. CSOs are only allowed to discharge 4 times per year at this level.

d. Maximum CSO volumes from 2013-2015 DMRs.

e. MWRD-permitted facilities are combined into one categorical WLA.

Table 35. Chloride WLAs for Individual Permits in GB-11

Permit ID	Facility Name	Design Average Flow (MGD)	Design Maximum Flow (MGD)	Chloride WLA (tons/day)	
				High Flows – Design Maximum Flow	Moist Conditions to Low Flows – Design Average Flow
IL0034061	NAPERVILLE SPRING-BROOK WRC – 001	30 (future conditions)	63 (future conditions)	131	63
IL0069744	BOLINGBROOK WRF #3 – 001	4.2 (future conditions)	10.5 (future conditions)	22	9
IL0074373	PLAINFIELD NORTH STP – 001	7.5	15.0	31	16
IL0076414	JOLIET AUX SABLE WWTP – 001	3.2	7.8	16	7
			Total	**200**	**95**

Table 36. Chloride WLAs for MS4 in GB-11

MS4	Chloride WLA (tons/day)		
	High Flows	Moist Conditions	Mid-Range Flows
ILDOT Roads	6	2	0.2
Non-ILDOT MS4s [a]	220	67	9
Total	**226**	**69**	**9..2**

a. The Non-ILDOT MS4 WLA is categorical, see section 6.3.1 for description and Appendix J for a list of MS4s.